

**Department of the Army**  
**Program Manager for**  
**Chemical Demilitarization**  
Aberdeen Proving Ground, Maryland

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**Chemical Stockpile Disposal Project**

**Programmatic Process**  
**Functional Analysis Workbook (FAWB)**

**Book 24**

**Bulk Container Handling System**

**BCHS**

DRAFT Revision 1

March 12, 2004

**NOTE:** The BCHS programmatic process FAWB applies to ANCDF, PBCDF, TOCDF and UMCDF.

## ALL FAWB SYSTEMS

Book (Chapter <sup>1</sup> )	System Identifier	FAWB Title
<u>UTILITY SYSTEMS (Site-specific)</u>		
1 (5.15)	NGLPG	Fuel Gas System (Natural Gas and Liquefied Petroleum Gas)
2 (5.14)	HYPV	Hydraulic Power Unit and Distribution System
3 (5.19)	BCS	Bulk Chemical Storage System
4 (5.16)	CAS	Compressed Air Systems (Plant, Instrument, and Life Support)
5 (5.22)	SGS	Steam Generation System
6 (5.26)	DMS	Door Monitoring System
7 (5.28)	PCS	Primary Cooling Systems
8 (5.12)	EPS	Electrical Distribution and Emergency Power System
9 (5.13)	—	(HVAC FAWB moved to Book 20 (Process Systems))
10 (5.17)	WATER	Water Systems (Process Water, Potable Water, and Water Treatment Systems)
11 (5.21)	CDSS	Central Decon Supply System
12 (5.18)	TSHS	Toxic Storage and Handling Systems (Agent Collection, Spent Decon, and Sumps)
13 (5.20)	ACSWS	Acid and Caustic Storage and Wash System (DELETED <sup>2</sup> )
14 (5.27)	FDSS	Fire Detection and Suppression System
15 -19	—	(not assigned; reserved for future use)
<u>PROCESS SYSTEMS (Programmatic)</u>		
20	HVAC	Heating, Ventilation, and Air Conditioning System
21	RHS	Rocket Handling System
22	PHS	Projectile Handling System
23	MHS	Mine Handling System
24	BCHS	Bulk Container Handling System
25	DFS	Deactivation Furnace System
26	LIC	Liquid Incineration System
27	MPF	Metal Parts Furnace System
28 <sup>3</sup>	PAS/PFS	DFS, LIC and MPF Pollution Abatement System and PAS Filter System
29	BRA	Brine Reduction Area and BRA PAS
30	CHB	Container Handling Building
31	ACAMS	Automatic, Continuous Air-Monitoring System
32	TCE	Treaty Compliance Equipment
33 <sup>4</sup>	DUN	Dunnage Incineration System and DUN PAS
34 <sup>3</sup>	PFS	LIC, DFS, and MPF PAS Filter Systems (DRAFT only)

<sup>1</sup> TOCDF has original “chapter” numbers for utility system FAWBs.

<sup>2</sup> The ACSWS FAWB was deleted.

<sup>3</sup> The PAS and PFS FAWBs were combined into a single PAS/PFS FAWB (Book 28).

<sup>4</sup> A DUN FAWB is not being developed per direction of PM-CSD on 9-10-98.

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## REVISION LOG

<u>REV.#</u>	<u>PAGE(S)</u>	<u>REFERENCE AND DESCRIPTION OF CHANGE</u>
0	NA	Initial Issue
<i>Draft R1</i>	<i>Sect.1, 3-5, 4-1</i>	<i>Editorial to clarify operation</i>
	<i>2-8</i>	<i>Updated to reflect current TOCDF processing status.</i>
	<i>3-2,14,15, B-2</i>	<i>TEMP2627BDS – Bulk Drain System Software for MK-116 Weteye bombs.</i>
	<i>3-2, B-2, C-8,10</i>	<i>ANWC1483SRL – Incorp Redlines of As-Installed Cond., PBAP1359PUB - Bulk Drain System - Deletion of Drain Tube Drip Pan Assembly, UMSF724BDS – Remove BDS Drain Tube Drip Pans</i>
	<i>3-3,6,7,10, 12,14</i>	<i>Modification to incorporate modified spray tank sequence</i>
	<i>3-3,14</i>	<i>TEMP2706 – BDS Weteye Drill Fixture Modification</i>
	<i>3-4,8,11, 16,34-37, C-1,12,13</i>	<i>TEMP2892BDS - Alarm to Alert Conversion for the BDS</i>
	<i>3-4,8,11, 16,34-37, C-1,4,5,</i>	<i>ANWP1569SRL - Various Alarm Alert Modifications</i>
	<i>3-4,8,11, 16,34-37 C-1,10,11</i>	<i>PBSF1808STE,RI – Alarm/Alert Modifications</i>
	<i>3-4,8,11, 16,34-37, C-1,4,5</i>	<i>UMSF1218CON – Alarm/Alert Modifications</i>
	<i>3-7</i>	<i>TEMP2604BDS, PBSP1708MDB – Addition of Alarm on BDS</i>
	<i>C-2,28-31</i>	<i>PBSP1713MDB – BCHS FAWB and A&amp;I Matrix Corrections</i>
	<i>C-6,7</i>	<i>TEMP3015TRAY - Alarm to Alert Conversion for the Tray System</i>
<i>Appendix D</i>		<i>Added PLC automatic control sequences for ANCDF and UMCDF. Updated TOCDF PLC automatic control sequences.</i>
<i>Appendix E</i>		<i>Added operator screens for ANCDF and UMCDF. Updated TOCDF screens.</i>
<i>Appendix F</i>		<i>Updated TOCDF instrument ranges. Added TOCDF AQS instrumentation.</i>
<i>Appendix G</i>		<i>Added DICIs/DICOs for ANCDF and UMCDF. Updated TOCDF DICIs/DICOs.</i>

# SECTION 1

## INTRODUCTION

### 1.1 CSD PROJECT BASELINE TECHNOLOGY OVERVIEW

The Office of the Project Manager for Chemical Stockpile Disposal (PMCSO) is responsible for the disposal of the United States' existing unitary chemical weapon stockpile. PMCSO manages execution of the design, construction, equipment acquisition/installation, systemization, plant operations, and closure of all CSD project sites.

The CSD project baseline technology consists of the following:

- mechanical disassembly or puncturing the munitions to remove chemical agent and any explosives or propellant,
- incineration of the chemical agent and any explosives and propellant, and
- thermal detoxification of metal parts and any contaminated dunnage.

This technology was demonstrated during a series of operational verification testing (OVT) campaigns at the Johnston Atoll Chemical Agent Disposal System (JACADS). JACADS represented the first generation of a full-scale facility implementation of the project baseline technology. JACADS completed disposal of the chemical agent and munitions stockpiled at Johnston Atoll in November, 2000.

The second generation plants implementing the baseline technology include the following:

- Tooele Chemical Agent Disposal Facility (TOCDF), located at the Deseret Chemical Depot in Tooele, Utah;
- Anniston Chemical Agent Disposal Facility (ANCDF), located at the Anniston Army Depot near Anniston, Alabama;
- Umatilla Chemical Agent Disposal Facility (UMCDF), located at the Umatilla Chemical Depot near Hermiston, Oregon; and,
- Pine Bluff Chemical Agent Disposal Facility (PBCDF), located at the Pine Bluff Arsenal near Pine Bluff, Arkansas.

Unless otherwise noted, the programmatic functional analysis workbooks (FAWBs) for process systems apply to each of these CSD sites.

## **1.2 BACKGROUND**

FAWBs for 25 plant systems were issued for JACADS in January 1985 by The Ralph M. Parsons Company (now the Parsons Infrastructure & Technology Group, Inc.). Parsons is the Design and Systems Integration Contractor (DSIC) for the CSD project. The FAWBs provided the basis for the facility control system's programmable logic controller (PLC) and computer systems programming. The JACADS FAWBs were later revised by United Engineers & Constructors and, by the July 1989 issue, two additional systems had been added.

FAWBs for TOCDF were issued in April 1993 by Parsons. There were 28 plant systems defined for TOCDF; however, only 27 FAWBs were issued (The Residue Handling Area FAWB was not issued). Most of the TOCDF plant systems were the same as those for JACADS; however, there were some differences due to different plant configurations, system consolidations, and the inclusion of additional systems. The TOCDF systems contractor (SC) received the FAWBs and assumed responsibility for maintaining the set current with the TOCDF plant configuration and the evolution of its operational strategy. Utility system FAWBs also were developed for ANCDF, PBCDF and UMCDF. Their purpose is to assist the sites during utility systems equipment procurement, and to describe their use in facility operation. Utility system FAWBs are more site-specific, consist primarily of SC-procured equipment, and will be maintained by the individual demilitarization sites.

In September 1997, PMCSD began the development of programmatic process FAWBs for process systems common to all sites, eliminating the need to maintain separate process FAWBs at each site. Having a single set of process FAWBs provides a means to ensure operational consistency between the sites and to accurately record differences between the demil facilities. The programmatic process FAWBs serve as an invaluable training tool for the Systems Contractor for Training (SCT) to ensure consistent training on process systems for all sites, and to quickly identify site-specific training requirements.

## **1.3 PROGRAMMATIC PROCESS FAWB SYSTEMS**

Sixteen process systems having minimal differences between sites were designated as programmatic systems. These programmatic process FAWBs are maintained as a single reference rather than at each site. Minor site configuration differences between the sites are highlighted in the FAWB discussions and tables. Fourteen of these 16 systems were included in the 28 original plant system FAWBs developed by the DSIC. For conciseness, the dunnage incinerator (DUN) and DUN pollution abatement system (PAS) FAWBs were to be combined into a single FAWB, for a total of 15 programmatic process FAWBs. However, development of a programmatic FAWB for the DUN and DUN PAS was suspended indefinitely at the direction of the PMCSD Operations Team (see FAWB Note B-1). In addition, FAWBs for the wet PAS and the PAS filter system (PFS) were combined into a single FAWB (see FAWB Note B-2). Therefore, a total of 13 programmatic FAWBs were developed for the process systems. The heating, ventilating, and air-conditioning (HVAC) FAWB originally was included as one of the utility system FAWBs produced for ANCDF in 1996 (HVAC FAWB was Book 9 for ANCDF Utility

FAWBs). It has been recategorized as a process system and is included in the set of programmatic process FAWBs.

The programmatic process FAWBs are numbered in accordance with the convention established during production of the ANCDF and UMCDF utility system FAWBs. This convention reserves book numbers 1 through 19 for utility systems, and book numbers 20 through 34 for the process FAWBs. Programmatic process FAWB book numbers and titles are listed in Table 1.1. The original TOCDF FAWB chapter numbers are shown for reference.

Twelve of the 28 original plant system FAWBs are designated as site-specific utility systems. For these systems, the SC is delivered an initial utility FAWB indicating the system design configuration and operational strategy. The SC maintains the utility FAWBs to reflect the site-specific configuration. The utility FAWBs are listed in Table 1.2; original TOCDF FAWB chapter numbers are shown for reference.

The two remaining systems of the 28 originally planned plant system FAWBs are the acid and caustic storage and wash system (ACSWS) (5.20) and the residue handling area (5.24). The ACSWS FAWB at TOCDF no longer is maintained and has not been developed for follow-on sites (see FAWB Note B-3). A FAWB for the residue handling area was not produced due to its lack of automatic control features.

Table 1.1 Programmatic Process FAWBs

FAWB Book #	FAWB Title (TOCDF FAWB Chapter #)
20	Munitions Demilitarization Building HVAC (5.13)
21	Rocket Handling System (5.1)
22	Projectile Handling System (5.2)
23	Mine Handling System (5.3)
24	Bulk Container Handling System (5.4)
25	Deactivation Furnace System (DFS) (5.5)
26	Liquid Incinerator (LIC) System (5.6)
27	Metal Parts Furnace (MPF) System (5.7)
28 <sup>1</sup>	DFS, LIC, and MPF Pollution Abatement System and PAS Filter System (5.9)
29	Brine Reduction Area (BRA) and BRA PAS (5.23)
30	Container Handling Building (5.11)
31	Automatic Continuous Air Monitoring System (5.25)
32	Treaty Compliance Equipment (Not included in original FAWB)
33 <sup>2</sup>	DUN System and DUN PAS (5.8 & 5.10)

<sup>1</sup> Per discussions held during the comment resolution matrix meeting for the PAS FAWB on 11-10-98, the draft programmatic process FAWBs for the PAS and PFS were combined into a single PAS/PFS FAWB, Book 28 (See FAWB Note B-2).

<sup>2</sup> As directed at the FAWB teleconference on 9-10-98, a programmatic process FAWB for the DUN/DUN PAS is not being developed (See FAWB Note B-1).

Table 1.2 Site-Specific Utility FAWBs

FAWB Book #	FAWB Title (TOCDF FAWB Chapter #)
1	Fuel Gas System (5.15)
2	Hydraulic Power Unit and Distribution System (5.14)
3	Bulk Chemical Storage System (5.19)
4	Compressed Air Systems (5.16)
5	Steam Generation System (5.22)
6	Door Monitoring System (5.26)
7	Primary Cooling System (5.28)
8	Electrical Distribution & Emergency Power System (5.12)
9	Not used; formerly HVAC
10	Water Systems (5.17)
11	Central Decon Supply System (5.21)
12	Toxic Storage and Handling Systems (5.18)
13	Not used; formerly acid and caustic storage and wash system
14	Fire Detection and Protection System (5.27)
15 - 19	Not assigned; reserved for future use

#### 1.4 PROGRAMMATIC PROCESS FAWB PURPOSE

The programmatic process FAWBs serve as a repository for all control information for the automated aspects of the baseline technology demilitarization process systems. They serve as one of the source documents for PLC control system and computer system programming, operator training, and facility operation. These FAWBs also serve as programmatic reference documents that define how the process systems operate and capture the differences between facility operational configurations. Each programmatic process FAWB contains a subsection that defines the system boundaries and identifies the interfaces with other plant process and utility systems.

Programmatic process FAWBs are living documents, subject to configuration control under the CSD project Participant Quality Assurance Plan. They are meant to be continuously updated with user input whenever system modifications are made, or as needed to enhance the information presented. Programmatic process FAWB revisions are implemented as outlined in Section 1.6. The process by which the SCT maintains the programmatic process FAWBs and the roles and responsibilities of each organization affiliated with the CSD project are described in detail in the Programmatic Process FAWB Maintenance Plan.

##### Programmatic Process FAWB Limitations

Even though the FAWBs contain detailed descriptions of the configuration and control for each process system, they are not all-inclusive. Every effort is made to include the level of detail necessary to fully describe the specific operating configuration for each process system. Each process FAWB includes supporting references to direct the user to

relevant programmatic and site-specific documentation (e.g., standing operating procedures, drawings).

Because of the revision cycle time, there will be a slight lag time between recent changes and their reflection in the FAWB. Maintenance of the FAWBs will be done semiannually, or more frequently if needed, to reflect significant modifications.

The FAWB maintenance program relies heavily on input from each baseline technology demilitarization site. Timely and accurate input ensures that the FAWBs reflect the current configuration at each of the sites. All information received will be thoroughly reviewed to ensure consistent and accurate documentation.

As a programmatic document, the FAWBs describe the configuration and operation of four separate facilities. Care must be taken by the user to ensure that the information extracted from this document reflects the configuration for the facility of interest. Site-specific differences are highlighted in both the text and the appendices to avoid confusion.

## **1.5 PROGRAMMATIC PROCESS FAWB ORGANIZATION**

The process FAWBs document the chemical demilitarization facility operations at ANCDF, PBCDF, TOCDF, and UMCDF. The format and structure of the programmatic process FAWBs differ from the original format prepared by the DSIC, and from the format previously maintained at TOCDF. The information from earlier versions has been retained and updated to reflect lessons learned from the design, construction, systemization, and operation of the demilitarization facilities, including JACADS and the Chemical Agent Munition Disposal System (CAMDS). The overall layout of the programmatic process FAWBs is shown in Table 1-3.

## **1.6 PROGRAMMATIC PROCESS FAWB REVISIONS**

The programmatic process FAWBs are maintained by the SCT to reflect the operational and control system configuration at each CSD site that implements the baseline destruction technology. Each programmatic process FAWB will be reviewed and revised, as required, on a semiannual basis. Individual process FAWBs can be revised more frequently, if needed, to reflect significant configuration changes. Programmatic process FAWB modifications can be generated by the following:

- Engineering change proposals at any of the CSD sites
- CSD project programmatic lessons learned
- Operational modifications that do not involve configuration changes
- Programmatic changes
- Need for greater detail or clarification

The programmatic process FAWB maintenance plan identifies the organizations that participate in the FAWB maintenance program and the responsibilities of each to supply information that could result in revisions to the FAWB. All organizations are represented on the FAWB Evolvement/Evaluation Team (FEET), and are involved with review of

each FAWB revision to ensure that the site configuration and operating strategy is current.

Table 1.3 Organization of the Programmatic Process FAWBs

Section	Title	Contents
1	Introduction	General FAWB background, organization, and revision method
2	System Overview	Purpose of the system; operational and process design basis summary; system boundaries and interfaces
3	Process Description	Description of subsystems; control sequences
4	Component Summary	Tables listing parameters for primary components; power source listings
App. A	Acronyms and Abbreviations	
App. B	FAWB Notes	Notes that provide additional detail or background information
App. C	Alarm and Interlock Matrices	Programmatic matrices or matrices for each site
App. D	PLC Automatic Control Sequences	Automatic logic contained in the PLC code; burner management system automatic controls; sequencer logic for demil systems
App. E	Operator Screens	Advisor PC screens for each site
App. F	Instrument Ranges	Tables showing instrument ranges and setpoints
App. G	Intercontroller Communications	Tables listing the digital intercontroller inputs/outputs (DICIs/DICOs)
App. H	References	Listing of reference documents, including drawings, used to prepare and maintain the FAWB

## SECTION 2

# SYSTEM OVERVIEW

### 2.1 PURPOSE AND FUNCTION

The bulk container handling system (BCHS) removes agent from bulk items, preparing them for processing in the specialized furnace systems. The BCHS transports bulk items from the unpack area (UPA), through the explosive containment vestibule (ECV) and second-floor munitions corridor (COR), to the munitions processing bay (MPB), where agent is drained at the bulk drain station (BDS). Processing schematics for ton containers, spray tanks, and bombs are shown in Figures 2-1, 2-2, and 2-3, respectively<sup>1</sup>. At PBCDF, the BCHS transports bulk items directly from the first-floor UPA to the BDS room, where agent is drained at the BDS (see Figure 2-4<sup>1</sup>). At all sites, drained agent is collected in the toxic cubicle (TOX) and destroyed in the liquid incinerator (LIC). The bulk item bodies are transported to the metal parts furnace (MPF) for thermal processing.

### 2.2 OPERATIONAL SUMMARY

The BCHS is capable of processing the five nonexplosively configured bulk items found in the existing United States unitary chemical weapons stockpile. The unique dimensions and configuration of each bulk item require a specific hardware and software configuration at the BDS before the system can process a particular bulk item. In order to accommodate these variations, the programmable logic controllers (PLCs) supervising the process system are preconfigured to process only one type of munition at a time through the CAMPAIGN SELECT screen. The munition type and configuration data must be input into the PLC system prior to processing. The PLC then sets up the programming to handle special routines or functions required by that particular bulk item.

The BCHS consists of two parallel process lines, lines A and B. Each line consists of a feed airlock, material handling equipment (i.e., conveyors and charge car), process gates, and a BDS. The two lines are identical with respect to instrumentation, control, and process flow. Since the process flow for these lines bypasses the explosive containment room (ECR), design documents refer to them as “bypass line A” and “bypass line B”. At TOCDF and UMCDF, some bypass line B equipment is larger than line A equipment to accommodate spray tank processing. Spray tanks are not processed through bypass line A. Many conveyors, process gates, and lift conveyors that handle the bulk items also handle the trays for the projectile handling system (PHS). These functions are discussed in the PHS Functional Analysis Workbook (FAWB), Book 22. For clarity and conciseness, the following paragraphs describe the operation of a single process line at these facilities. At PBCDF, there is only a single line for ton container processing. The BCHS configuration at PBCDF is so unique that the operational summary is discussed separately in Section 2.2.3.

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<sup>1</sup> Figures 2-1 through 2-4 are schematic representations of the process flow and do not reflect actual physical layout.

# TON CONTAINER PROCESSING

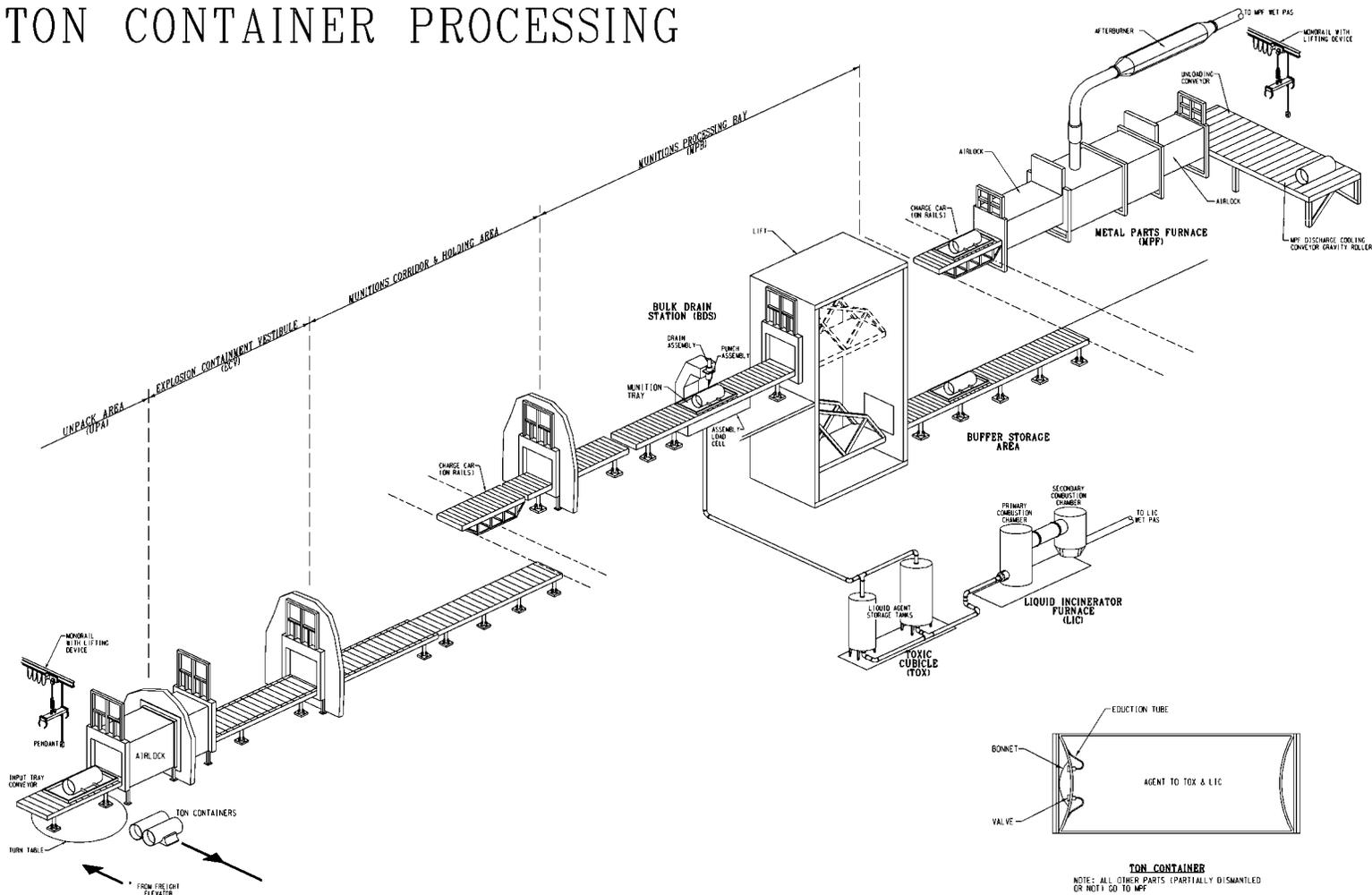


Figure 2-1. ANCDF, TOCDF, and UMCDF Ton Container Processing Schematic

# SPRAY TANK PROCESSING

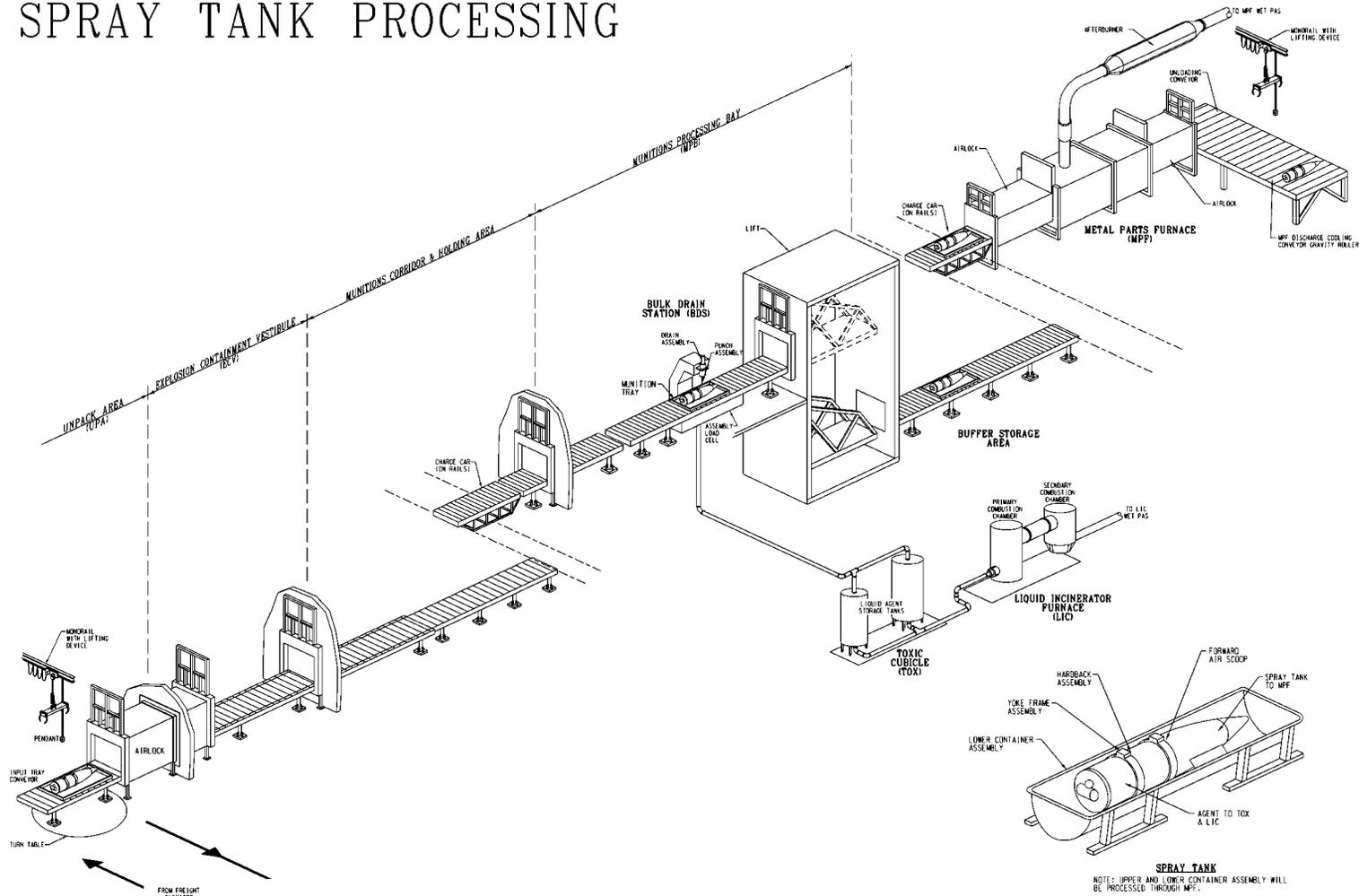


Figure 2-2. TOCDF and UMCDF Spray Tank Processing Schematic

# BOMB PROCESSING

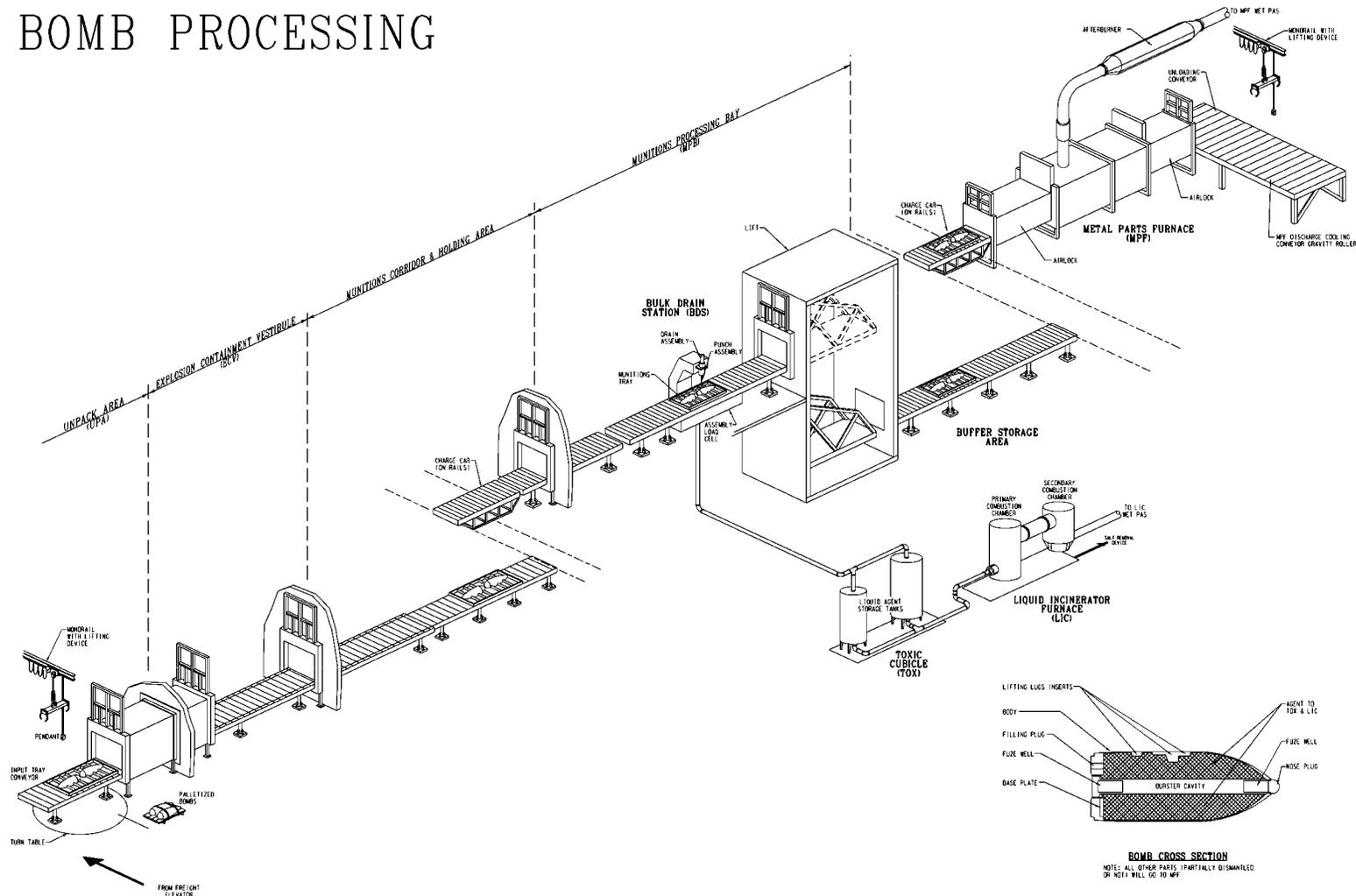


Figure 2-3. TOCDF and UMCDF Bomb Processing Schematic

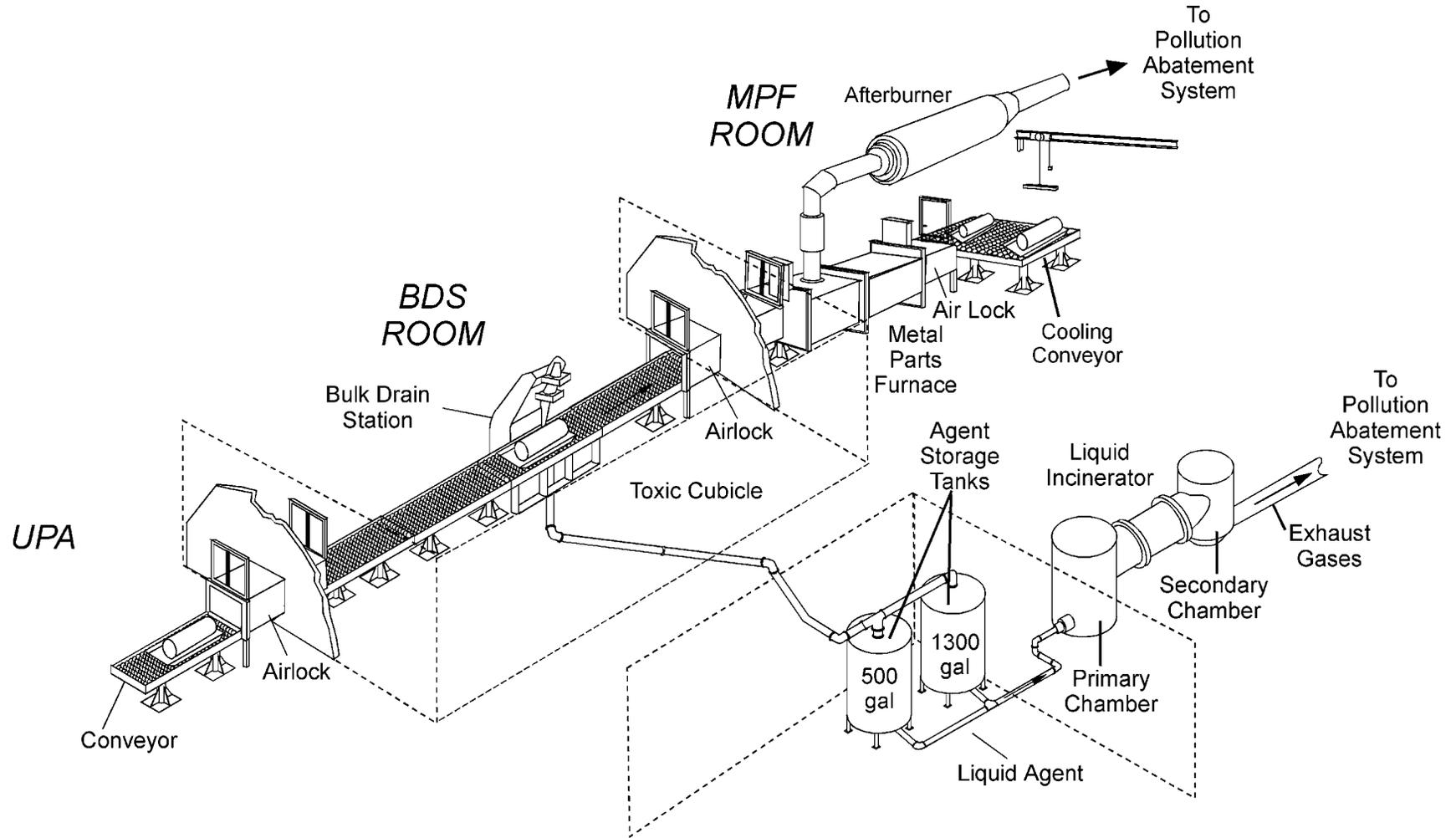


Figure 2-4. PBCDF Ton Container Processing Schematic

### 2.2.1 Bulk Item Preprocessing

Bulk items are kept offsite in storage igloos, warehouses, or storage yards in various configurations. The specific storage and transport configuration for each bulk item at each site is shown in Table 2.1. Onsite shipping containers (ONCs) containing ton containers or palletized 750-lb and 500-lb bombs, and weteye bombs and spray tanks in their shipping containers, are delivered to the CHB<sup>1</sup> loading docks, and moved to the CHB UPA adjacent to the MDB UPA. At PBCDF, ONCs containing ton containers are delivered to the first-floor UPA.

Table 2.1 Bulk Item Storage and Transport Configuration

Bulk Item (model #)	Baseline Site(s)	Storage Configuration	Transport Configuration
Ton Container (TC)	AN	Concrete igloos	ONCs (2 per ONC)
	PB	Outside in the TC storage yard	
	TE	Mustard-agent TCs outside in TC storage yard Nerve-agent TCs in concrete igloos	
	UM	Warehouse (mustard storage shed)	
750-lb Bomb (MC-1)	TE/UM	Wooden pallets (2 per pallet) in steel-arch igloos at TE & concrete igloos at UM	ONCs (2 pallets per ONC)
Spray Tank (TMU-28)	TE	Individual shipping containers (CNU-77/E23) in warehouses	Shipping containers from warehouses by transport vehicle (e.g., flatbed truck) (2 per truckload)
	UM	Individual shipping containers in concrete igloos	
Weteye Bomb (MK-116)	TE	Individual shipping containers (MK-398) in concrete igloos	Shipping containers from igloos by transport vehicle (e.g., flatbed truck) (8 per truckload)
500-lb Bomb (MK-94)	UM	Wooden pallets (2 per pallet) in concrete igloos	ONCs (1 pallet per ONC)

Once in the CHB UPA, or in the first-floor UPA at PBCDF, ONCs and shipping containers are monitored for leakers before being unloaded. If a leaker is found, the ONC is returned to the CHB first-floor lift area and taken by truck to the toxic maintenance area (TMA). At PBCDF, if a leaker is found, the ONC is transferred to the TMA using the TMA lift skid. ONCs with agent detected and ONCs with leaker pallets, or overpacks (see Section 3.6),

<sup>1</sup> The CHB FAWB, programmatic process FAWB Book 30, contains more information about the CHB and the operations to support the movement of ONCs to the CHB UPA, adjacent to the MDB UPA.

are unloaded in the TMA by personnel in demilitarization protective ensemble (DPE). If a leaker is detected in a spray-tank or weteye-bomb shipping container, it is transferred to the ECV via the tray-input bypass/spray-tank conveyor, where it is unloaded by personnel in DPE.

Nonleaking bulk items are removed from the ONC or shipping container in the CHB UPA, or in the first-floor UPA at PBCDF. Palletized 750-lb and 500-lb bombs are unpacked manually by UPA personnel. Bulk items are placed in cradles, on trays, and then on the tray-input bypass/spray-tank conveyor in the UPA. Nose cones are manually removed from MC-1 bombs in the UPA. At PBCDF, ton containers are placed in cradles, on trays, and then on ton-container conveyor no.1 in the first-floor UPA.

### 2.2.2 MDB Bulk Item Processing

At all sites except PBCDF, bulk item processing begins when trays containing bulk items are conveyed from the UPA. Processing schematics for bulk items are shown in Figures 2-1 through 2-3. A tray containing a bulk item or items (750-lb and 500-lb bombs have two per tray) is conveyed from the UPA, through a conveyor airlock, through the ECV, and through a process gate to the COR. The tray is transferred by conveyors to the second-floor charge car in the COR. The charge car is used to deliver trays loaded with bulk items to the BDS processing lines, on demand. Using the charge car, the tray also can be delivered to, or received from, one of six storage conveyors available for buffering in the COR.

The tray is transferred from the charge car in the COR, through a process gate to the MPB where the BDS resides. The BDS punches bulk items and drains the agent. Agent has been completely drained when the bubbler detects little to no backpressure in a bulk item. Comparisons of bulk item weights taken by load cells before and after draining also are used for verification. The drained agent is pumped, by the agent collection system (ACS), to the TOX for further processing in the LIC.

After BDS processing, drained bulk item(s) are conveyed to the munition lift for transport to the first floor. At the first floor, the trays are conveyed into the buffer storage area (BSA). The first-floor charge car accesses the stored trays by means of conveyors. Trays are delivered to the MPF when the feed airlock conveyor is vacant and ready to accept another tray. The tray and bulk item(s) then are transferred to the MPF for decontamination to the 5X level.

### 2.2.3 MDB Ton Container Processing at PBCDF

A tray containing a ton container is transferred from the UPA, through a conveyor airlock, into the BDS room (see Figure 2-4). The BDS punches ton containers and drains the agent. Agent has been completely drained when the bubbler detects little to no backpressure in a bulk item. Comparisons of bulk item weights taken by load cells before and after draining also are used for verification. Drained agent is pumped by the ACS to the TOX for further processing in the LIC.

After processing by the BDS, the tray containing the drained ton container is conveyed to the MPF when the feed airlock conveyor is vacant and ready to accept another tray. The tray and ton container then are transferred to the MPF for decontamination to the 5X level. There is no buffer storage capacity at PBCDF between the BDS and the MPF.

### 2.3 PROCESS DESIGN BASIS SUMMARY

The BCHS is designed to drain chemical agent from the bulk items listed in Table 2.2. The BCHS delivers the agent and drained bulk item bodies to the specialized furnace systems for continued processing.

Table 2.2 Stockpile Items for Bulk Processing

ANCDF	PBCDF	TOCDF	UMCDF
			500-lb bomb (MK-94), GB
		750-lb bomb <sup>b</sup> (MC-1), GB	750-lb bomb (MC-1), GB
		Weteye bomb <sup>b</sup> (MK-116), GB	
		Spray tank (TMU-28), VX	Spray tank (TMU-28), VX
Ton container, GB <sup>a</sup> HD VX <sup>a</sup>	Ton container, GB <sup>a</sup> HD HT	Ton container, GA GB <sup>b</sup> H <sup>a</sup> HD VX	Ton container, HD

<sup>a</sup>Limited inventory will be processed manually.

<sup>b</sup>TOCDF has completed all GB bulk item processing.

The BCHS is configured to have two BDSs processing simultaneously, except at PBCDF. PBCDF has only one BDS line. Design throughput rates for bulk item demilitarization operations are shown in Table 2.3.

Table 2.3 Design Throughput Rates<sup>1</sup> for Bulk Item Demilitarization Operations  
(munitions/hour)

Bulk Item	Agent <sup>2</sup>	Site	Agent Draining		Agent Incineration		Metal Thermal Detoxification		Limiting Process	
			Peak	Avg.	Peak	Avg.	Peak	Avg.	Step	Avg.
Ton Container	H	TE	5.8	5.15	1.36	1.18	1.72	1.45	LIC	1.18
	HD	AN	5.8	5.15	0.76	0.66	1.72	1.45	LIC	0.66
		PB	2.9	2.71	0.78	0.68	1.72	1.47	LIC	0.68
		TE	5.8	5.15	1.31	1.13	1.72	1.45	LIC	1.13
		UM	5.8	5.15	1.54	1.33	1.72	1.45	LIC	1.33
	HT	PB	2.9	2.71	0.71	0.62	1.72	1.47	LIC	0.62
	GB	TE	5.8	5.15	1.17	1.01	1.72	1.45	LIC	1.01
VX	TE	5.8	5.15	0.72	0.63	1.72	1.45	LIC	0.63	
Spray Tank	VX	TE	5.8	5.05	0.86	0.74	1.30	1.10	LIC	0.74
		UM	5.8	5.05	1.00	0.87	1.30	1.10	LIC	0.87
MC-1 Bomb	GB	TE	19.6	17.0	7.95	6.88	7.30	6.17	MPF	6.17
		UM	19.6	17.0	9.36	8.10	7.30	6.17	MPF	6.17
Weteye Bomb	GB	TE	13.6	11.7	5.04	4.36	2.70	2.28	MPF	2.28
MK-94 Bomb	GB	UM	26.0	22.2	19.1	16.5	7.30	6.17	MPF	6.17

<sup>1</sup> Design throughput rates are from Estimated Throughput Rates at CSDP Sites with Bases for Estimates, May 1992 (see FAWB Note B-4).

<sup>2</sup> The design basis for TOCDF included processing of GA and Lewisite ton containers. These items are not listed since they will not be processed at TOCDF. The original design basis for ANCDF included processing of HT ton containers, however, this item is not listed since there are no HT ton containers in the ANCDF stockpile.

## 2.4 SYSTEM BOUNDARIES AND INTERFACES

The BCHS system includes equipment that extends from the tray-input bypass/spray-tank conveyor and turntable in the UPA, through the ECV, COR, MPB, munitions lifts, buffer storage area, lower munitions corridor, and connecting to the MPF charge airlock. At PBCDF, the BCHS system includes equipment from the ton-container conveyor in the UPA, through the BDS room, connecting to the MPF charge airlock. At all sites, the BCHS has direct interface with only one furnace system, the MPF<sup>2</sup>. Bulk item draining operations are coordinated with the TOX system. Several plant systems are required to supply the utilities and power required by the various operations, machines, and conveyors. The primary interfaces include the following:

- (1) UPA: BCHS feed comes from the UPA, where operators load the trays with bulk items onto the input turntable, or onto the ton-container conveyor at PBCDF.
- (2) Toxic Storage and Handling: Drained agent is pumped to the ACS tank in the toxic storage and handling system (TSHS).
- (3) MPF: Drained bulk items are delivered on trays to the MPF for thermal processing.
- (4) TCE: The munitions sampling system extracts samples from the agent collection system associated with the Line A BDS. At TOCDF, samples are taken manually from bulk items.
- (5) Utilities: The BCHS requires electric and hydraulic power for processing and handling equipment operations. Plant and instrument air support BCHS equipment operation. Decon and process water are supplied to tray-input bypass/spray-tank conveyor 2 and airlock assembly to decon munitions that are run in reverse from the ECV to the UPA. At PBCDF, decon and process water are supplied to ton-container conveyor 2 and airlock assembly.

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<sup>2</sup> There is no interface listed for the dunnage furnace system (DUN). Final disposition of dunnage generated from bulk item unpacking operations at TOCDF and UMCDF is undetermined (see FAWB Note B-1). Since the only bulk items to be processed at ANCDF and PBCDF are ton containers, and unpacking of ton containers does not generate dunnage, there is no dunnage handling at these sites. Therefore, these sites will not have an interface with whatever system is chosen to handle dunnage.

## **SECTION 3**

### **PROCESS DESCRIPTION**

#### **3.1 INTRODUCTION**

The bulk container handling system (BCHS) is comprised of those subsystems and components used to handle and process bulk items at demilitarization facilities. Bulk item processing is accomplished by draining agent from the munitions at the bulk drain station (BDS), in the munitions processing bay (MPB); or in the BDS room at PBCDF. Drained agent is collected in the toxic cubicle (TOX) and destroyed in the liquid incinerator (LIC). There are two similar BDSs and two similar conveyor lines, lines A & B, that run through the MPB. At PBCDF, there is a single BDS and one conveyor line through the BDS room. For clarity and conciseness, the following subsections describe the operation of equipment associated with a single conveyor line and one BDS.

Bulk items are loaded into cradles on trays on the conveyor turntables (conveyor only at PBCDF) in the unpack area (UPA) and automatically fed through an airlock leading to the explosive containment vestibule (ECV), or directly to the BDS room at PBCDF. Bulk items are automatically transported from either of the two UPA feed lines to either of the MPB processing lines via a charge car located in the second-floor munitions corridor (COR). Bulk items fed from the UPA through the ECV on either line can be delivered to either process line in the MPB.

After BDS processing, a tray containing a drained bulk item, or items, is conveyed to a munition lift, which transports it to the first-floor buffer storage area (BSA). The first-floor charge car accesses the stored trays by means of conveyors and delivers them to the metal parts furnace (MPF) for decontamination to the 5X level.

#### **3.2 BCHS DEMILITARIZATION EQUIPMENT**

Ton containers, spray tanks, and bombs are demilitarized at the BDS, which must be uniquely configured for processing each type of bulk item. Each facility has two BDSs located in the MPB, except PBCDF. At PBCDF, there is only one BDS located in the BDS room. BDS operations also involve the use of ancillary equipment in the MPB, or in the BDS room at PBCDF. The following sections describe the BDS and associated ancillary equipment.

##### **3.2.1 Bulk Drain Station**

The BDS (MMS-BDS-101 or -102) is a hydraulically powered machine installed in the MPB, or in the BDS room at PBCDF, to access and remove chemical agent from bulk containers. The BDS is positioned adjacent to BDS indexing hydraulic conveyor BDS-CNVP-101/102 (see Section 3.2.2.1). The BDS consists of a punch station with a holddown clamp, and a drain station. The BDS indexing conveyor moves the bulk items to the correct position under each station. Then, the BDS performs the required action at each station, as described in the sequence of operation sections.

The punch station consists of a hydraulic cylinder equipped with a punch and a holddown clamp. The hydraulic cylinder is mounted vertically on the upper front of the BDS column assembly, which stands next to the BDS indexing conveyor. It is arranged such that the punch is suspended over the center line of the conveyor. When the cylinder is extended, it punches a hole through the top of the bulk item. The punch is mounted at the top of the column when processing ton containers, spray tanks, and MK-116 bombs; and on the bottom of the column when processing MC-1 and MK-94 bombs. Two position switches on the cylinder sense whether the punch is retracted or extended.

The holddown clamp is mounted on the punch itself. It consists of two hydraulic cylinders, one on each side of the punch. The hydraulic cylinders extend a holddown clamp to keep the bulk item in the cradle while the punch is retracted. Otherwise, the punch could catch on the inside wall of the bulk item, lifting it off the conveyor. The holddown clamp also is used to prevent accidental motion of the bulk item during the drain sequence. The holddown clamp cylinders are actuated by hydraulic fluid from the same control valve as the conveyor-lift cylinders. Therefore, whenever the conveyor is lowered and a tray rests on the internal steel frame, the holddown frame simultaneously lowers as well. Position switches on each holddown cylinder sense whether the holddown clamp is extended or retracted. Weteye-bomb processing at TOCDF *required* a unique configuration (see Section 3.3.5).

At the drain station, an agent drain probe is lowered into the bulk item through the punch hole. The agent drain probe is a stainless steel tube connected by flexible tubing to the agent transfer pump (see Section 3.2.2.3). A hydraulically driven lead screw raises and lowers the probe. The drain probe height adjusts for different munitions using clamps that hold it to the lead screw. In addition, the drain probe angle of insertion can be modified for MC-1 bombs to facilitate draining. All components are mounted on the same BDS column assembly as the punch station. Four position switches next to the probe sense whether it is in the retracted position or in the first, second, or third drain position.

*A retractable drip pan had been added to the BDS station to catch any residual agent dripping off the probe after it is withdrawn. Because of difficulties associated with its operation, the BDS drip pans have been removed at all sites (see FAWB Note B-5).*

Trays are discharged from the BDS to a multipurpose demilitarization machine (MDM) indexing hydraulic conveyor at all sites, except PBCDF. At PBCDF, the BDS indexing hydraulic conveyor operates in conjunction with MPF feed conveyor/airlock MMS-CNVP-119, transferring drained ton containers directly into the airlock.

### 3.2.2 BDS Ancillary Equipment

BDS ancillary equipment includes the following:

1. BDS indexing hydraulic conveyor
2. Bubbler level measurement system
3. Agent transfer pump and backflush
4. BDS local maintenance control panel

### 3.2.2.1 BDS Indexing Hydraulic Conveyor

The BDS indexing hydraulic conveyor (BDS-CNVP-101 or -102) slowly advances loaded trays through the BDS, stopping at the punch, drain, *and drill*<sup>1</sup> stations for each action. The indexing conveyor is powered by a hydraulic motor. Solenoid valves drive the motor at fast or slow speeds in the forward or reverse direction. Slow speed is used only with the conveyor indexing feature to process bulk items. When processing projectiles, the conveyor is used only for transferring trays from the MDM feed conveyor to the MDM indexing hydraulic conveyor, as described in the projectile handling system (PHS) programmatic process FAWB, Book 22. Emergency rope switches along each side of the conveyor can immediately disable all actions of the conveyor and the BDS for personnel safety.

The conveyor is mounted on a hydraulically actuated lift table that raises and lowers the entire conveyor holding the tray. When the lift is extended, the conveyor raises to support the tray and the tray can be moved. When the lift is retracted, the conveyor lowers below the level of the internal steel frame. The steel frame is designed to completely support the loaded tray during the punching operation.

Four load cells, built into the conveyor supports, constantly sense the weight supported by the conveyor when it is raised. These cells are used with the conveyor in the raised position to measure the weight of the bulk items before and after they are drained. An initial weight reading, *a final weight reading*, and a weight differential reading are indicated in the control room (CON). Eight switches, two per hydraulic cylinder, sense whether the lift is extended or retracted.

Five switches, mounted on the side of the conveyor, sense the following tray positions: slow down position P1; punch and drain positions P2 through P4; and exit position P5. Infrared retroreflective (I-R) switches P1 and P5 sense the first object to break the I-R beam. Proximity-type switches P2 through P4 sense metal flags on the side of a cradle.

In AUTO mode, the programmable logic controller (PLC) starts the BDS indexing conveyor forward, in fast speed, to transfer a tray from the MDM feed conveyor, when the BDS indexing conveyor is empty and the feed conveyor has a tray. The PLC slows the conveyor when a tray is sensed at the first position switch, and stops the conveyor when a tray is sensed by the first punch position sensor on the BDS indexing conveyor. At this point, indexing operations commence, moving a tray through the punch and drain operations. These steps are described in detail in the sequence of operations section for each bulk item. When punch and drain operations are complete, the PLC starts the conveyor motor in forward to transfer a tray in fast speed from the BDS indexing conveyor to the MDM indexing hydraulic conveyor, *or, at PBCDF, the MPF feed conveyor/airlock*, when that conveyor is empty and running.

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<sup>1</sup> *A drill station was used for weteye bomb processing at TOCDF (see section 3.3.5), and will be used for spray tank processing at TOCDF and UMCDF (see section 3.3.2).*

### 3.2.2.2 Bubbler Level Measurement System

The BDS uses a bubbler level measurement system to indicate the quantity of agent remaining in bulk items. Two different bubbler configurations are used, one for ton containers and spray tanks, and one for all bombs. The one used for ton containers and spray tanks has a dedicated bubbler sensing line that is inserted into the bulk item with the drain tube. In the one used for all bombs, the drain tube itself functions as a bubbler sensing line.

When processing ton containers and spray tanks, instrument air is supplied to the bubbler sensing line at 0.5 standard cubic feet per hour (scfh) by setting a local flow controller.

Pressure differential indicating transmitter 51-PDIT-60/50 (-61 for TOCDF line B) measures the backpressure in the line. The PLC continuously monitors the backpressure and acts five times during the drain sequence: (1) to indicate an initial level in the bulk item, (2) to allow advancement of the drain tube from the first draining position (midposition 1) to the second draining position (midposition 2), (3) to allow advancement of the drain tube from midposition 2 to the bottom of the bulk item, (4) to indicate an adequate drain of the bulk item, and (5) to calculate a heel value for the bulk item.

When processing bombs, the bubbler system is not online when agent is being drained. In order to align the bubbler system, agent block valve 51-XV-396/496 closes and PDIT isolation valve 51-XV-391/491, 51-XV-397/497 at TOCDF, opens to supply instrument air at 1.5 scfh. The PLC monitors the backpressure measured by 51-PDIT-60/50 (-61 for TOCDF line B) and acts two times during the drain sequence: (1) to indicate an initial level in the bomb, and (2) to calculate a heel value for the bomb.

Agent heel values from bubbler readings are determined based on PLC look-up tables. The tables correlate bubbler backpressure readings to agent heel weight for each type of munition. The calculated heel weight is sent to the tray information packet (TIP) and used by the residual agent and tray tracking system, as discussed in Section 3.5.

### 3.2.2.3 Agent Transfer Pump and Backflush

Agent is transferred from the BDS drain station to the TOX by air-powered diaphragm pump ACS-PUMP-114/115. Valves and instruments required to monitor agent transfer operations are located on the suction line of this pump. A strainer on the agent suction line removes any solids in the stream. Differential pressure across the strainer is monitored and indicated in the CON. A software *alert* is provided for high differential pressure.

The PLC purges the BDS agent drain line and bubbler sensor line using instrument air on every drain cycle in order to return any residual agent in the lines to the bulk item. The bubbler sensor line is purged before a final reading is taken, while the drain probe is fully extended into the munition. The agent drain line is purged after retracting the drain tube to midposition 1. The control room operator (CRO) also can purge the lines at any time if they become blocked.

For agent drain line purge, instrument air is supplied to the agent line through agent line purge valve 51-XV-395/495, just upstream of agent line block valve 51-XV-396/496. To purge the line, the PLC opens the purge valve for five seconds. The purge valve is interlocked from opening unless the agent block valve is closed.

The bubbler sensing line is purged for two seconds during ton container and spray tank processing. The PLC sends a single output signal to *realign the* drain verification system PDIT isolation valve 51-XV-391/491, 51-XV-397/497 at TOCDF, and *open the* drain verification system PDIT purge valve 51-XV-390/490, 51-XV-398/498 at TOCDF. The isolation valve is a three-way solenoid valve that *is* aligned to the bubbler sensing line *for agent verification*, and vents to the room when *the line is purged*.

#### 3.2.2.4 BDS Local Maintenance Control Panel

Unlike all other equipment associated with bulk item processing, the BDS and the BDS indexing conveyor have no local switches that would allow manual control. Typically, local switches are used for performing maintenance and troubleshooting. Instead, the BDS equipment has a local maintenance control panel (LMCP) that is connected by a cable to the PLC. A hand-held pendant, connected to the LMCP, has two pushbuttons: EXTEND and RETRACT. It also has three indicator lights: *white* to signal that a device is enabled; green to indicate extended; and *red* to indicate retracted. To initiate an LMCP action, local personnel first place the LMCP into Local and request the CRO to coordinate the operation of the specific device that is to be actuated (i.e., punch cylinder). The CRO sets a permissive from the CON screen for that device to be operated by the LMCP; only one device permissive can be set at any one time. When the *white* enable light on the pendant is on, it confirms to the local worker that the CRO has set the permissive for the LMCP. The LMCP control functions are listed in Table 3.1.

Table 3.1 BDS Local Maintenance Control Panel Functions

Component	Function	
	EXTEND Pushbutton	RETRACT Pushbutton
Conveyor (Slow Speed)	Forward	Reverse
Conveyor Lift	Raise	Lower
Punch Cylinder	Extend	Retract
Drain Probe	Lower	Raise
Agent Transfer Pump	Start	<i>NA</i>
Drain Tube Air Purge	On	<i>NA</i>

When the local operator has finished working with one device and desires to actuate another, the CON must be notified to reset the permissive. When working on equipment, the local operator can prevent inadvertent actuation of any PLC function by using the LMCP local-remote (LR) switch, located at the BDS. The CRO can stop the local actuation of the selected device by removing the permissive or by pressing the emergency stop pushbutton. All software interlocks still apply when using the LMCP.

### 3.3 BULK ITEM PROCESSING

All bulk items are processed on trays, in cradles. A unique cradle is used for each bulk item, except that spray tanks and MK-116 bombs use the same type cradle. Ton containers, spray tanks, and MK-116 bombs are processed one item per cradle. MC-1 and MK-94 bombs are processed two per cradle. Cradles are fitted with metal flags that are detected by the BDS proximity sensors to ensure that bulk items are correctly positioned for punching, draining, and drilling operations, as applicable. Ton container cradles have only one flag. MC-1 and MK-94 cradles have three flags. The cradle used for spray tanks and weteye bombs has three flag positions. When processing spray tanks, flags are fitted in the first and third positions. When processing weteye bombs, flags are fitted in the first and second positions.

The sequence of operations for ton containers, spray tanks, and MC-1, MK-94, and MK-116 bombs is described in the following subsections. Specific sequencer steps are listed in Appendix D. BDS configuration modifications required to process a particular bulk item also are described. Since the punch sequence is identical for *bulk items*, it is listed separately, rather than repeated for each item. Similarly, since the drain sequence is similar for all bombs, it is listed separately also.

#### 3.3.1 Ton Container Processing<sup>2</sup>

All four chemical agent demilitarization sites process ton containers filled with chemical agent. Ton containers are processed in a cradle that holds one ton container per tray. The cradle has a flag to ensure each bulk item properly indexes through all points of BDS operation. Each ton container is punched twice: one hole where draining takes place and an additional hole to facilitate complete agent destruction in the MPF. To process ton containers, the drain station should be vertical.

##### A. Sequence of Operations

The sequence of operations for BDS ton container processing is similar at all sites, except PBCDF. At PBCDF, minor modifications are required due to unique conveyor configuration and feed to the MPF. Therefore, steps 10 through 12 do not apply to PBCDF. Starting with the BDS indexing conveyor transferring a tray in the fast speed, the PLC initiates the following sequence of operations:

1. Sensor P1 detects tray; BDS conveyor switches to slow speed.
2. Sensor P2 detects flag; BDS and feed conveyor motors stop; PLC verifies the motors are stopped; the process gate closes.
3. CRO inputs tray number; PLC performs punch sequence (see below).
4. BDS conveyor motor starts in slow forward.
5. Sensor P3 detects flag; BDS conveyor motor stops.

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<sup>2</sup> *The ton container processing sequence described is the baseline process for ton containers filled with agent that can be processed normally in the LIC. TOCDF encountered GB ton containers that had high levels of mercury, which required significant BDS process modification to include washout, rinse, and analysis of metals content (see FAWB Note B-12).*

6. PLC performs drain sequence (see below).
7. BDS conveyor motor starts in slow forward.
8. Sensor P4 detects flag<sup>3</sup>; BDS conveyor motor stops.
9. PLC performs punch sequence (see below).
10. BDS conveyor motor starts in slow forward.
11. Sensor P5 detects tray; MDM indexing conveyor starts in forward; BDS conveyor motor switches to fast forward; munition counter increments by one.
12. Tray moves across MDM hydraulic indexing conveyors, into munitions lift, and down to first-floor BSA.

B. Ton Container Punch Sequence

Since the punch sequence for *all bulk items* is identical, it is described separately in Section 3.3.6.

C. Ton Container Drain Sequence

The following conditions exist prior to initiating a drain sequence: the agent line block valve (51-XV-396/496) is shut, air supply solenoid is deenergized; the agent line purge valve (51-XV-395/495) is shut, solenoid is deenergized; the drain verification system pressure differential indicating transmitter (PDIT) isolation valve (51-XV-391/491; 51-XV-397/497 at TOCDF) is open, solenoid is deenergized with the PDIT aligned to the bubbler sensing line; the drain verification system PDIT purge valve (51-XV-390/490; 51-XV-398/498 at TOCDF) is closed, solenoid is deenergized; and the agent transfer pump (ACS-PUMP-114/115) is not running. Then, when a tray stops at the drain station, the PLC initiates the following drain sequence:

1. Conveyor lift lowers and then raises; load cells measure total gross weight of tray, cradle, and munition; PLC records weight.  
The PLC retains this original gross weight of a tray, cradle, and munition for use in all subsequent weight cell comparisons.
2. Conveyor lift lowers tray to internal steel frame; holddown clamp extends.
3. PLC starts agent transfer pump; Drain tube fully extends into the ton container; agent level displays on Advisor control screen.  
Drain verification system PDIT should detect backpressure, ensuring the instrument is operating properly and no faults are detected.

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<sup>3</sup> An alarm is activated (at PBCDF and TOCDF) if the P4 sensor does not detect a flag after P3 has indicated a tray present. The alarm was added to prevent a container from bypassing the vent punch station (ref. TEMP2604BDS, PBSP1708BDS).

4. Drain tube retracts to midposition 1; agent line block valve opens; drain verification system PDIT isolation valve remains deenergized, aligned to internal sensing line.
5. Drain verification system PDIT indicates <1.2 in. wc.; drain tube advances to midposition 2.
6. Drain verification system PDIT indicates <1.2 in. wc.; drain tube fully extends to bottom of ton container.
7. Drain verification system PDIT indicates <1.2 in. wc.; drain tube remains on bottom of ton container for one additional minute.
8. Agent line block valve shuts.
9. Drain verification system PDIT isolation and purge valves energize for a two-second purge of the bubbler sensing line.
10. Drain verification system PDIT isolation and purge valves deenergize to close the purge valve and align the isolation valve with the bubbler sensing line.
11. Drain verification system measures backpressure and PLC assigns one of three heel values to the ton container based on the following:

Bubbler Reading	Heel Value
< 0.2 in. wc.	35 lb
0.2 – 1.2 in. wc.	74 lb
> 1.2 in. wc.	full ton container

12. Drain tube retracts to midposition 1.
13. Agent line purge valve energizes for five-second purge; agent line purge valve shuts.
14. Drain tube fully retracts to HOME position.
15. Conveyor-lift cylinder and holddown clamp raise; load cells measure total gross weight of tray, cradle, and munition; PLC records weight.  
This value is subtracted from the value measured in step 1 to yield the net weight of drained agent.
16. If net weight of drained agent  $\geq 95\%$ , the drain sequence continues with step 18.
17. If net weight of drained agent  $< 95\%$ , an insufficient agent drained alarm (*alert at TOCDF*) sounds in the CON; Operator selects REPEAT or BYPASS.
  - (a) If the operator selects REPEAT, the PLC reperforms the drain sequence, starting with step 2.

- (b) If the operator selects BYPASS, the drain sequence continues with step 18.

The operator can initiate agent backflush if blockage in drain probe or tubing is suspected, and then select REPEAT. If no blockage is suspected, but slow drain is caused by different problem, such as unusual agent characteristics, the operator can select REPEAT without backflush.

18. PLC stops agent transfer pump; Operator verifies two holes punched and agent drained using Advisor screen and closed-circuit television (CCTV).

### 3.3.2 Spray Tank Processing

Only TOCDF and UMCDF have spray tanks to process. Spray tanks are processed in the same cradle as that used for MK-116 weteye bombs. The cradle holds one spray tank per tray. The cradle has two flags, one in the first flag position and one in the third position, to ensure each spray tank properly indexes through all points of BDS operation. The position of the flags is such that the first flag completely clears position switch P3 before position switch P2 detects the second flag. Each spray tank is punched twice, the first to drain the agent and the second to facilitate complete agent destruction in the MPF. To process spray tanks, the drain station should be vertical.

The spray tank is equipped with a sealed nose closure that contains materials that will volatilize during MPF processing. Therefore, after draining at the BDS, a hole is drilled in the nose closure to prevent pressure buildup and rupture in the MPF. The drill fixture is positioned over the BDS conveyor, downstream of the drain station.

#### A. Sequence of Operations

The BDS spray tank sequence of operations is similar at TOCDF and UMCDF, where the PLC initiates the following sequence starting with the BDS indexing conveyor transferring a tray in fast speed:

1. Sensor P1 detects tray; BDS conveyor motor switches to slow speed.
2. Sensor P2 detects 1<sup>st</sup> flag; BDS and feed conveyor motors stop; PLC verifies the motors are stopped; the process gate closes.
3. PLC performs punch sequence (see below).
4. BDS conveyor motor starts in slow forward.
5. Sensor P3 detects 1<sup>st</sup> flag; BDS conveyor motor stops.
6. PLC performs drain sequence (see below).
7. Drill fixture extends, drills vent hole in nose cone, and retracts; BDS conveyor motor starts in slow forward.
8. Sensor P2 detects 2<sup>nd</sup> flag; BDS conveyor motor stops.
9. PLC performs punch sequence (see below).
10. BDS conveyor motor starts in slow forward.

11. Sensor P5 detects tray; MDM indexing conveyor starts in forward; BDS conveyor motor switches to fast forward; munition counter increments by one.
12. Tray moves across MDM hydraulic indexing conveyors, into munitions lift, and down to first-floor BSA.

B. Spray Tank Punch Sequence

*Since the punch sequence for bulk items is identical, it is described separately in Section 3.3.6.*

C. Spray Tank Drain Sequence

The following conditions exist prior to initiating a drain sequence: the agent line block valve (51-XV-396/496) is shut, air supply solenoid is deenergized; the agent line purge valve (51-XV-395/495) is shut, solenoid is deenergized; the drain verification system PDIT isolation valve (51-XV-391/491; 51-XV-397/497 at TOCDF) is open, solenoid is deenergized with the PDIT aligned to the bubbler sensing line; the drain verification system PDIT purge valve (51-XV-390/490; 51-XV-398/498 at TOCDF) is closed, solenoid is deenergized; and the agent transfer pump (ACS-PUMP-114/115) is not running. Then, when a tray stops at the drain station, the PLC initiates the following drain sequence:

1. Conveyor lift lowers and then raises; load cells measure total gross weight of tray, cradle, and munition; PLC records weight.
2. PLC starts agent transfer pump; Drain tube fully extends into the spray tank; agent level displays on Advisor control screen.  
Drain verification system PDIT should detect backpressure, ensuring the instrument is operating properly and no faults are detected.
3. Drain tube retracts to midposition 1; agent line block valve opens; drain verification system PDIT isolation valve remains deenergized, aligned to internal sensing line.
4. Drain verification system PDIT indicates <1.5 in. wc.; drain tube advances to midposition 2.
5. Drain verification system PDIT indicates <1.5 in. wc.; drain tube fully extends to bottom of spray tank.
6. Drain verification system PDIT indicates <1.5 in. wc.; drain tube remains on bottom of spray tank for one additional minute.
7. Agent line block valve shuts.
8. Drain verification system PDIT isolation and purge valves energize for a two-second purge of the bubbler sensing line.
9. Drain verification system PDIT isolation and purge valves deenergize to close the purge valve and align the isolation valve with the bubbler sensing line.

10. Drain verification system measures backpressure and PLC assigns heel value to the spray tank [Bubbler reading correlation to heel values to be determined].
11. PLC stops agent transfer pump; Drain tube retracts to midposition 2.
12. Agent line purge valve energizes for five-second purge; agent line purge valve shuts.
13. Drain tube fully retracts to HOME position.
14. Conveyor-lift cylinder and holddown clamp raise; load cells measure total gross weight of tray, cradle, and munition; PLC records weight.  
This value is subtracted from the value measured in step 1 to yield the net weight of drained agent.
15. If net weight of drained agent  $\geq 95\%$ , the drain sequence continues with step 17.
16. If net weight of drained agent  $< 95\%$ , an insufficient agent drained alarm (*alert at TOCDF*) sounds in the CON; Operator selects REPEAT or BYPASS.
  - (a) If the operator selects REPEAT, the PLC reperforms the drain sequence, starting with step 2.
  - (b) If the operator selects BYPASS, the drain sequence continues with step 17.The operator can initiate agent backflush if blockage in drain probe or tubing is suspected, and then select REPEAT. If no blockage is suspected, but slow drain is caused by different problem, such as unusual agent characteristics, the operator can select REPEAT without backflush.
17. Operator verifies two holes punched and agent drained using Advisor screen and closed-circuit television (CCTV).

### 3.3.3 MC-1 Bomb Processing

Only TOCDF and UMCDF have MC-1 bombs to process. MC-1 bombs are processed in a cradle that holds two bombs per tray. The bombs are positioned with the rear of each bomb against the center divider piece of the cradle. The cradle has three flags to ensure each bomb properly indexes through all points of BDS operation. Each bomb is punched twice: one hole through the rear lifting lug threads where draining takes place and an additional hole to facilitate complete agent destruction in the MPF. To process MC-1 bombs, the drain probe is mounted at  $23^\circ$  from vertical. The probe enters the bomb at that angle to avoid hitting the bomb's burster well. Additionally, a spring end is added to the bottom of the probe to accommodate the bomb's curvature and to place the suction tube at the bottom of the liquid.

A. Sequence of Operations

The BDS MC-1 bomb sequence of operations is similar at TOCDF and UMCDF, where the PLC initiates the following sequence, starting with the BDS indexing conveyor transferring a tray in fast speed:

1. Sensor P1 detects tray; BDS conveyor switches to slow speed.
2. Sensor P2 detects 1<sup>st</sup> flag; BDS and feed conveyor motors stop; PLC verifies the motors are stopped; the process gate closes.
3. CRO inputs tray number; PLC performs punch sequence (see below) for vent hole in nose of 1<sup>st</sup> bomb.
4. BDS conveyor motor starts in slow forward.
5. Sensor P2 detects 2<sup>nd</sup> flag; BDS conveyor motor stops.
6. PLC performs punch sequence (see below) for drain hole in rear of 1<sup>st</sup> bomb.
7. BDS conveyor motor starts in slow forward.
8. Sensor P3 detects 2<sup>nd</sup> flag; BDS conveyor motor stops.
9. PLC performs drain sequence (see below) on 1<sup>st</sup> bomb.
10. BDS conveyor motor starts in slow forward.
11. Sensor P2 detects 3<sup>rd</sup> flag; BDS conveyor motor stops.
12. PLC performs punch sequence (see below) for drain hole in rear of 2<sup>nd</sup> bomb.
13. BDS conveyor motor starts in slow forward.
14. Sensor P3 detects 3<sup>rd</sup> flag; BDS conveyor motor stops.
15. PLC performs drain sequence (see below) on 2<sup>nd</sup> bomb.
16. PLC performs punch sequence (see below) for vent hole in nose of 2<sup>nd</sup> bomb.
17. BDS conveyor motor starts in slow forward.
18. Sensor P5 detects tray; MDM indexing conveyor starts in forward; BDS conveyor motor switches to fast forward; munition counter increments by two.
19. Tray moves across MDM hydraulic indexing conveyors, into munitions lift, and down to first-floor BSA.

B. MC-1 Bomb Punch Sequence

Since the punch sequence for *all bulk items* is identical, it is described separately in Section 3.3.6.

### C. MC-1 Bomb Drain Sequence

Since the drain sequence for MC-1, MK-94, and MK-116 bombs is identical, it is described separately in Section 3.3.7.

### 3.3.4 MK-94 Bomb Processing

MK-94 bombs are processed only at UMCDF in a cradle that holds two bombs per tray. The bombs are positioned with the nose of each bomb against the center divider piece of the cradle. The cradle has three flags to ensure each bulk item properly indexes through all points of BDS operation. Each bomb is punched twice: one hole where draining takes place and an additional hole to facilitate complete agent destruction in the MPF. To process MK-94 bombs, the drain probe is mounted at 23° from vertical. The probe enters the bomb at that angle to avoid hitting the bomb's burster well (see FAWB Note B-6).

#### A. Sequence of Operations

Starting with the indexing conveyor transferring a tray in fast speed, the PLC initiates the following sequence of operations:

1. Sensor P1 detects tray; BDS conveyor switches to slow speed.
2. Sensor P2 detects 1<sup>st</sup> flag; BDS and feed conveyor motors stop; PLC verifies the motors are stopped; the process gate closes.
3. PLC performs punch sequence (see below) on rear of 1<sup>st</sup> bomb.
4. BDS conveyor motor starts in slow forward.
5. Sensor P3 detects 1<sup>st</sup> flag; BDS conveyor motor stops.
6. PLC performs drain sequence (see below).
7. PLC performs punch sequence (see below) on nose of 1<sup>st</sup> bomb.
8. BDS conveyor motor starts in slow forward.
9. Sensor P2 detects 2<sup>nd</sup> flag; BDS conveyor motor stops.
10. PLC performs punch sequence (see below) on nose of 2<sup>nd</sup> bomb.
11. BDS conveyor motor starts in slow forward.
12. Sensor P2 detects 3<sup>rd</sup> flag; BDS conveyor motor stops.
13. PLC performs punch sequence (see below) on rear of 2<sup>nd</sup> bomb.
14. BDS conveyor motor starts in slow forward.
15. Sensor P3 detects 3<sup>rd</sup> flag; BDS conveyor motor stops.
16. PLC performs drain sequence (see below).
17. BDS conveyor motor starts in slow forward.
18. Sensor P5 detects tray; MDM indexing conveyor starts in forward; BDS conveyor motor switches to fast forward; munition counter increments by two.

19. Tray moves across MDM hydraulic indexing conveyors, into munitions lift, and down to first-floor BSA.

B. MK-94 Bomb Punch Sequence

Since the punch sequence for *all bulk items* is identical, it is described separately in Section 3.3.6.

C. MK-94 Bomb Drain Sequence

Since the drain sequence for MC-1, MK-94, and MK-116 bombs is identical, it is described separately in Section 3.3.7.

### 3.3.5 MK-116 Weteye-Bomb Processing

MK-116 bombs *were located* only at TOCDF *and have all been processed* (see FAWB Note B-13). The cradle *that will be* used for spray tanks *was* used for weteye bombs. The cradle *held* one bomb per tray. The bomb *was* loaded such that the tail end of the bomb *was* toward the front of the cradle. The cradle *had* two flags, one in the first flag position and one in the second position, to ensure the MK-116 bomb properly *indexed* through all points of BDS operation. The position of the flags *was* such that the first flag completely *cleared* position switch P3 before the second flag *was* sensed by position switch P2. Each bomb *was* punched *three times* and *all three* holes *were* used for draining (see FAWB Note B-7). Banding material *was* placed around MK-116 bombs to prevent them from lifting off the cradle when the punch *was* retracted.

*During the weteye bomb campaign at TOCDF, a drill fixture was used to drill drain holes in each of the three agent cavities and the shipping container. This allowed the agent heel to drain from the bomb into the cradle to ensure that molten aluminum did not come in contact with liquid agent in the metal parts furnace.*

### 3.3.6 Punch Sequence for *All Bulk Items*

When a tray stops at the punch station, the PLC initiates the following punch sequence (see FAWB Note B-14):

1. Conveyor lift lowers tray to internal steel frame; holddown clamp extends.
2. Punch cylinder extends.
3. Five-second timed cycle performed.
4. Punch cylinder retracts.
5. Conveyor lift raises; holddown clamp retracts.

### 3.3.7 Drain Sequence for All Bombs

The following conditions exist prior to initiating a drain sequence: the agent line block valve (51-XV-396/496) is shut, air supply solenoid is deenergized; the agent line purge valve (51-XV-395/495) is shut, solenoid is deenergized; the drain verification system PDIT isolation valve (51-XV-391/491; 51-XV-397/497 at TOCDF) is open, solenoid is deenergized with the PDIT aligned to the drain tube; and the agent transfer pump (ACS-PUMP-114/115) is not running. Because the drain verification system PDIT purge valve (51-XV-390/490; 51-XV-398/498 at TOCDF) is not used during bomb draining, its

position does not affect the drain sequence. When a tray stops at the drain station, the PLC initiates the following drain sequence:

1. Conveyor lift lowers and then raises; load cells measure total gross weight of tray, cradle, and munition; PLC records weight.
2. Conveyor lift lowers tray to internal steel frame; holddown clamp extends.
3. PLC starts agent transfer pump; Drain tube fully extends into the bomb; agent level displays on Advisor control screen.  
Drain verification system PDIT should detect backpressure, ensuring the instrument is operating properly and no faults are detected.
4. Drain verification system PDIT isolation valve closes, solenoid energizes to vent PDIT; Agent line block valve opens.
5. Drain tube remains on bottom of bomb for PLC-timed cycle:
  - (a) 230-second timed cycle for MC-1 bombs;
  - (b) Three-minute timed cycle for MK-94 bombs;
6. Agent line block valve shuts.
7. Agent line purge valve opens for three-second purge; agent line purge valve shuts.
8. Drain verification system PDIT isolation valve deenergizes to align system with drain tube.
9. Drain verification system measures backpressure and, for MC-1 bombs, PLC assigns one of three heel values to the bomb based on the following<sup>4</sup>:

Bubbler Reading	Heel Value
< 0.3 in. wc.	2 lb
0.3 – 1.2 in. wc.	10 lb
> 1.2 in. wc.	full bomb

10. Drain tube retracts to midposition 2.
11. PLC stops agent transfer pump; Drain verification system PDIT isolation valve shuts, solenoid energizes to vent the PDIT.
12. Agent line purge valve energizes for five-second purge; agent line purge valve shuts.
13. Drain tube fully retracts to HOME position.

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<sup>4</sup> Bubbler reading correlation to heel values for other bombs to be determined.

14. Conveyor-lift cylinder and holddown clamp raise; load cells measure total gross weight of tray, cradle, and munition; PLC records weight.

This value is subtracted from the value measured in step 1 to yield the net weight of drained agent.

15. If net weight of drained agent  $\geq 95\%$ , the drain sequence continues with step 17.

16. If net weight of drained agent  $< 95\%$ , an insufficient agent drained alarm (*alert at TOCDF*) sounds in the CON; Operator selects REPEAT or BYPASS.

- (a) If the operator selects REPEAT, the PLC reperforms the drain sequence, starting with step 2.

- (b) If the operator selects BYPASS, the drain sequence continues with step 17.

The operator can initiate agent backflush if blockage in the drain probe or tubing is suspected, and then select REPEAT. If no blockage is suspected, but slow drain is caused by different problem, such as unusual agent characteristics, the operator can select REPEAT without backflush.

17. Operator verifies two holes punched and agent drained using Advisor screen and closed-circuit television (CCTV).

### 3.4 BCHS HANDLING EQUIPMENT

Bulk item handling and transport within the MDB is accomplished by conveyors and lifts. Some of the equipment also is used for projectile processing and is described in more detail in the PHS programmatic process FAWB Book 22. ANCDF, TOCDF, and UMCDF bulk container handling equipment is described for the following process areas:

1. Bulk Container Handling in the UPA
2. Bulk Container Handling in the ECV
3. Bulk Container Handling in the Upper COR
4. Bulk Container Handling in the MPB
5. Bulk Container Handling in the First-Floor BSA
6. Bulk Container Handling in the First-Floor COR

PBCDF bulk container handling is described for the following areas:

7. PBCDF Ton Container Handling in the First Floor UPA
8. PBCDF Ton Container Handling in the BDS Room

#### 3.4.1 Bulk Container Handling in the UPA

Bulk item processing begins in the UPA with the loading of an empty tray assembly and cradle onto tray input bypass/spray tank conveyor no.1 and turntable MMS-CNVP-101/102.

A bulk item then is placed on a tray and cradle. All munitions require a specific orientation in the cradle for BDS processing. For example, ton containers must be loaded with the eductor-tube end at the front of the cradle, at the UPA airlock.

The equipment in the UPA consists of a turntable/conveyor and an airlock for each bulk/bypass process line. A loaded tray runs from the UPA, through tray input bypass conveyor no.2 and airlock assembly MMS-CNVP-103/104, into the ECV.

At TOCDF and UMCDF, the nose cones of MC-1 bombs are removed after the bombs are loaded and secured on a munition tray and cradle assembly on the tray input bypass turntable. After nose cone removal, UPA operators inspect the burster well to ensure that there is no burster present.

PLC automatic control sequences for munition tray transfers are described in Appendix D, Advisor screens BLA and BLB for bypass lines A and B, respectively.

#### 3.4.1.1 Tray Input Bypass/Spray Tank Conveyor 1 and Turntable

UPA operators place trays and cradles on either line A turntable/conveyor MMS-CNVP-101, or line B spray tank turntable/conveyor<sup>5</sup> MMS-CNVP-102. The conveyor is integral to the turntable and sits on top of the pedestal-base turntable section. The conveyor assembly can rotate 90° in order to receive/load trays and bulk items. The cradle is fastened to a tray using mechanical clips and provides a stable platform to securely hold the bulk item(s). Trays and cradles are loaded onto the turntable conveyor using either the hoist located in the UPA or a forklift. The turntable must be in the 0° position, inline with the bypass conveyors, to allow the bulk item to travel into the munition airlock.

The conveyor section is a live-roller conveyor driven by a reversible, electric motor. A hard-wired interlock prevents operation of the conveyor motor when the turntable motor is running, and vice versa. The PLC controls the conveyor drive motor when the local hand switch is in the remote position. In AUTO mode, the PLC starts the conveyor motor in forward when a tray is present on the conveyor, the turntable is in the 0° position, in line with the airlock, the conveyor in the airlock is empty and running, the feed gate is in the open position, and a valid tray ID number has been entered. The PLC stops the turntable conveyor when the airlock conveyor stops.

The turntable conveyor can reverse directions to remove trays from the ECV. Transfer of a tray from the airlock to the turntable is accomplished in LOCAL mode by a UPA operator. When operated locally, the conveyor runs in a JOG mode in both forward and reverse to prevent accidental overtravel. Emergency rope switches along each side of the conveyor immediately stop both motors for personnel safety.

Turntable conveyors MMS-CNVP-101 and -102 also are used during the projectile and mortar campaigns to feed munition trays to the upper COR for projectile loading (see PHS programmatic process FAWB, Book 22).

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<sup>5</sup> At ANCDF, line A & B equipment are identical and referred to as tray input bypass conveyor no.1 and turntable. At TOCDF and UMCDF, line B equipment is sized to accommodate spray tanks and conveyor MMS-CNVP-102 is referred to as spray tank conveyor no.1 and turntable.

#### 3.4.1.2 Tray Input Airlock Feed Gate

Tray input airlock feed gates UPA-FDDR-101 and -102 on each line separate the airspace of the UPA from the input airlock, preventing migration of agent vapors from the ECV (category A/B) back to the UPA (category C). A reversible, electric motor raises and lowers the airlock gate. Proximity switches indicate whether each gate is open or closed. The PLC controls the gate when the local hand switch is in the remote position. In AUTO mode, the PLC raises the gate when the airlock conveyor is empty and the turntable conveyor has a tray present, the turntable is in the 0° position, in line with the airlock, and the turntable is in AUTO. The PLC closes the gate when a tray is present on the airlock conveyor. The feed gate is interlocked through software with the airlock discharge gate to prevent both gates from being opened at the same time (see Section 3.4.2.1). An interlock exists for all gates on the munition line that prohibits them from closing when the gate is fully raised and a munition is detected in the gateway.

#### 3.4.1.3 Tray Input Bypass/Spray Tank Conveyor 2 and Airlock Assembly

Tray input bypass/spray tank conveyor 2 and airlock assembly MMS-CNVP-103/104 is used in bulk item processing to maintain the boundaries between the nontoxic area of the UPA and the toxic area of the ECV, while allowing the transfer of material between the two areas. The charge and discharge feed gates are interlocked to prevent both gates from being opened at the same time. MMS-CNVP-103 and -104 also are used during the projectile and mortar campaigns to transfer munition trays to the upper COR for projectile loading (see PHS programmatic process FAWB, Book 22).

At ANCDF, line A and line B are identical. At TOCDF and UMCDF, the tray input bypass/spray tank conveyor 2 and airlock assembly on line B (MMS-CNVP-104) is sized larger to accommodate the length of the spray tank (i.e., about 15.5 feet). This line still can be used to process other bulk items.

Tray input bypass/spray tank conveyor 2 and airlock assembly receives a tray from tray input bypass/spray tank conveyor 1, holds it while the airlock doors cycle, and then transfers it into the ECV. Each airlock assembly is sealed by a feed gate on the UPA side and a discharge gate on the ECV side. Each conveyor section is a live-roller conveyor driven by a reversible, electric motor. Each conveyor also has a tray stop located at the discharge end of the conveyor to prevent tray collisions with the airlock discharge gate.

The tray stop is actuated by a pneumatic cylinder. Position switches provide feedback to the CON for stop position. The PLC controls the tray stop when the local hand switch is in the remote position. In AUTO mode, the PLC lowers the stop when the airlock conveyor is in AUTO, a tray is present, and the discharge gate is up. The PLC raises the stop when a tray reaches the next conveyor and the discharge gate is closed.

The PLC controls the conveyor motor when the local hand switch is in the remote position. To transfer a tray into the airlock when the airlock conveyor is in AUTO, the PLC starts the conveyor in forward when a tray is present on the turntable conveyor, the turntable conveyor is in AUTO, the airlock conveyor is empty, the tray stop is in the up position, and the airlock feed gate is open. The conveyor stops when a tray is present on the conveyor.

To transfer a tray from the airlock to the ECV when the conveyor is in AUTO, the PLC lowers the conveyor stop when the conveyor in the ECV is empty and in AUTO, a tray is present in the airlock, and the discharge gate is open. The conveyor starts in forward when the above conditions are met and the stop is down. The PLC stops the conveyor when a tray is no longer present in the airlock (i.e., received by the ECV conveyor).

Emergency rope switches are not provided in the airlock for this conveyor since it is inaccessible during normal operation.

The airlock conveyor can reverse directions to remove trays from the ECV to the airlock, and from the airlock to the UPA. This operation can be performed manually, locally by an operator, or remotely from the CON.

Because of the ability to transfer trays back from the ECV to the UPA and the potential for agent contamination in the ECV, these airlocks are provided with the capability to decontaminate a tray and its contents. Spray nozzles inside the airlock wash the entire contents from all angles with either water or decon. A drain line, located in the bottom of the airlock, drains the contents to the sump located in the ECV. All decon operations are performed manually by the local operator, using a local hand station located in the ECV. A single, three-position, Decon-Off-Water hand switch selects the wash fluid. Turning the switch to either decon or water opens a block valve on the appropriate supply line to the nozzles and on the drain line. A hard-wired interlock prevents opening of either the decon or water valves if the drain valve is not verified open. When the hand switch is returned to the off position, an off-delay timer keeps the drain valve open for five minutes after the decon or water valves are closed. The CON is informed of the airlock status by two PLC inputs, one from the timer energized and the other from the drain valve closed position switch. If either of these inputs are active, the CON screen shows a washdown in-progress icon. During decon operations, the local hand switch for the airlock feed and discharge gates should be placed in the LOCAL position to prevent their inadvertent opening until washdown operations are complete.

TOCDF recently installed ACAMS units to monitor the airlocks (see FAWB Note B-8). The tray input airlock feed gate is interlocked from opening until two consecutive ACAMS cycles are completed with readings below the limit of quantification (LOQ) level. Airlock monitoring and the interlock were added to prevent potential agent vapor migration from the ECV, through the airlock, to the UPA during an HVAC system imbalance.

### 3.4.2 Bulk Container Handling in the ECV

The equipment in the ECV that is used for bulk items and trays consists of the airlock discharge gate and a conveyor that carries trays the entire length of the ECV. No operation other than bulk item transport is performed on the bulk items or trays in the ECV.

#### 3.4.2.1 Tray Input Airlock Discharge Gate

Tray input airlock discharge gates ECV-FDDR-105 and -106 on each line separate the airspace of the ECV from the input airlock, preventing agent containment spreading from the ECV (category A/B) and the UPA (category C). A reversible, electric motor raises and lowers the gate. Proximity switches indicate whether each gate is open or closed.

The PLC controls the gate when the local hand switch is in the remote position. The PLC raises the gate when the airlock conveyor is in AUTO and has a tray present, the receiving conveyor is empty and running, and the tray input airlock feed gate is closed. The PLC lowers the gate when the airlock conveyor is empty and the tray stop is up. The gate is interlocked through software with the airlock feed gate (see Section 3.4.1.3) to prevent both gates from being opened at the same time.

#### 3.4.2.2 Bypass Conveyor 3

Bypass conveyors are used to transport bulk items through the ECV and into the upper COR. Since bulk items do not contain explosive components, the items bypass the explosive containment room (ECR). The bypass conveyors also are used during the projectile and mortar campaigns to transfer munition trays to the upper COR for projectile loading (see PHS programmatic process FAWB, Book 22).

Bypass conveyor 3 (MMS-CNVP-105 and -106<sup>6</sup>) receives a tray from the airlock and transfers it through the ECV to the upper COR. Each conveyor is a live-roller conveyor, driven by a reversible, electric motor. The PLC controls the motor when the local hand switch is in the remote position. In the AUTO mode, the PLC starts the bypass conveyor 3 in forward to transfer a tray from the airlock to the ECV when the conveyor is empty. The PLC starts the conveyor motor in forward to transfer to the upper COR when a tray is present on the conveyor, the receiving conveyor is empty and running, and the gate between the ECV and the upper COR is in the open position. The PLC stops the conveyor when a tray is present on the receiving conveyor. Emergency rope switches along each side of the conveyor immediately stop the conveyor drive motor for personnel safety.

The conveyor stops if a tray is present on the discharge end of the conveyor and the bypass conveyor process gate is not open.

The conveyor can reverse directions to transfer trays from the upper COR to the ECV. This operation is performed manually, remote from the CON, or local using the hand switch.

#### 3.4.3 Bulk Container Handling in the Upper COR

For each line, the equipment in the upper COR that is used for bulk items consists of a process gate on the ECV COR wall, three conveyors that carry trays through the upper COR to a charge car, and six buffer storage conveyors. No operations are performed on the bulk items in this area other than transport. However, when processing projectiles, they are loaded onto the trays either on conveyor MMS-CNVP-109 or -110 (see PHS programmatic process FAWB, Book 22).

##### 3.4.3.1 Bypass Conveyor Process Gate

Bypass/spray tank conveyor process gates COR-GATE-101 and -102 separate the airspace of the ECV from the upper COR, reducing air migration from the upper COR to the ECV. A reversible, electric motor raises and lowers each gate. Proximity switches

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<sup>6</sup> At ANCDF, MMS-CNVP-105 AND -106 are identical. At TOCDF and UMCDF, MMS-CNVP-106 (line B) is larger to accommodate spray tanks.

indicate whether each gate is open or closed. The PLC controls the gate when the local hand switch is in the remote position. The PLC raises the gate when the ECV conveyor is in AUTO, has a tray present, and the receiving conveyor is empty and running. The PLC lowers the gate when a tray reaches the first position switch on the receiving conveyor. This results in closure of the gate sooner than if the gate waited for the conveyor to stop since the receiving conveyor, in this case, is longer and the travel time is slightly longer. Since there is a gate but no airlock, a shorter open time is desirable to reduce the amount of air that could migrate through the open gate. No interlock exists between this gate and any other.

#### 3.4.3.2 Bypass Conveyor 4

Bypass conveyor 4 (MMS-CNVP-107 and -108<sup>7</sup>) on each line receives a tray from the ECV and transfers it in the upper COR to the next conveyor, the bypass indexing hydraulic conveyor (MMS-CNVP-109 and 110). Each conveyor is a live-roller conveyor, driven by a reversible, electric motor. The PLC controls the motor when the local hand switch is in the remote position. In the AUTO mode, the PLC starts the bypass conveyor 4 motor in forward to transfer to the next conveyor when a tray is sensed by the second position switch on bypass conveyor 4, the next conveyor is empty and running, and the tray stop is down. The PLC stops the conveyor when a tray is present on the receiving conveyor. The PLC starts the conveyor in forward to transfer from the ECV when the conveyor is empty, the tray stop is up, and the process gate is open. The PLC stops the conveyor when a tray is sensed by the last position switch on the conveyor. If the tray stop is in the up position, the PLC stops the conveyor if a tray is sensed by the discharge-end position switch, whether the conveyor is in AUTO or MANUAL mode. Emergency rope switches along each side of the conveyor immediately stop the conveyor drive motor for personnel safety. On an emergency stop, the pneumatic stop remains in its last position (up or down); if the tray stop is traveling, it completes the up or down movement, then stops.

At the discharge end of each bypass conveyor 4 is a tray stop, actuated by a pneumatic cylinder. Tray stop position switches provide feedback to the CON. The PLC controls the tray stop when the local hand switch is in the remote position and the CON screen is in AUTO mode. In AUTO mode, the PLC lowers the tray stop when bypass conveyor 4 is in AUTO and has a tray present, and the next conveyor is empty and running. The PLC raises the tray stop when a tray is present on bypass hydraulic indexing conveyor MMS-CNVP-109 or -110.

The conveyor can reverse directions to remove trays from the upper COR to the ECV. This operation is performed manually, remote from the CON, or local using a hand switch.

#### 3.4.3.3 Bypass Indexing Hydraulic Conveyor

The bypass indexing hydraulic conveyor (MMS-CNVP-109 and -110) for each line receives a tray from bypass conveyor 4. If bulk items are being processed, the sole

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<sup>7</sup> At ANCDF, MMS-CNVP-107 AND -108 are identical. At TOCDF and UMCDF, MMS-CNVP-108 (line B) is larger to accommodate spray tanks.

function of the conveyor is to transfer trays to the next conveyor. However, when processing projectiles, they are loaded onto a tray at this point by the multiposition loader (MPL) (see PHS programmatic process FAWB, Book 22).

The conveyor is equipped with hydraulic clamps that cycle as the tray arrives on the conveyor to ensure that the tray is properly aligned.

Each conveyor is a live-roller conveyor, driven by a hydraulic motor. The hydraulic motor can be driven fast or slow, in either forward or reverse. The slow speed is used only with the indexing feature of the conveyor to process projectiles. The PLC controls the motor when the local hand switch is in the remote position. When processing bulk items in AUTO mode, the PLC starts the conveyor motor in forward to transfer to the next conveyor when a tray is sensed by the first position switch on the conveyor, and the receiving conveyor is empty and running. The PLC stops the indexing conveyor when a tray is present on the receiving conveyor. The PLC starts the indexing conveyor in forward to transfer from bypass conveyor 4 when the indexing conveyor is empty and bypass conveyor 4 has a tray. The PLC stops the conveyor when a tray is sensed by the last position switch before the tray stop on the indexing conveyor.

The conveyor can reverse directions to remove trays from the upper COR to the ECV. This operation is performed manually, remote from the CON, or local using a hand switch. Emergency rope switches along each side of the conveyor immediately stop the conveyor drive motor for personnel safety.

#### 3.4.3.4 Tray Discharge Conveyor

Bypassing the ECR on the bypass indexing hydraulic conveyor, the bulk item comes to rest on the tray discharge conveyor (MMS-CNVP-111 and -112). The bulk item is held at this station until the upper COR charge car is available to pick up the load. From the tray discharge conveyor, bulk items are transferred to the charge car and on to the MPB. If the MPB is not ready to accept a tray, it can be stored on buffer storage conveyors in the upper COR, which make up the second-floor BSA.

MMS-CNVP-111 and -112 also are used during the projectile and mortar campaigns to transfer munition trays loaded with projectiles to the charge car in the upper COR (see PHS programmatic process FAWB, Book 22).

#### 3.4.3.5 Upper COR Charge Car

Two charge cars are used in the MDB. Charge car MMS-CHRG-101 is located in the upper COR and services the tray discharge conveyors, the buffer storage conveyors, and the MDM feed conveyors. Charge car MMS-CHRG-103 is located on the first-floor COR and services the BSA and MPF (see Section 3.4.6).

The charge cars are self-propelled, transfer-car conveyors that operate on a fixed-rail track. The charge car drive is a reversible, variable speed, electric motor that is configured to operate at two discrete speeds. Potentiometers at the variable speed drive determine the motor speed. The control system selects which speed to use, switching to the correct potentiometer output through a discrete contact.

A live, chain-driven, roller conveyor is mounted on top of the charge car. The upper COR charge car conveyor operates only at 40 fpm. The charge car conveyor has

redundant tray presence switches that are each capable of stopping a tray when it is completely loaded onto the charge car. The charge car drive and conveyor are interlocked with emergency rope switches along each side of the charge car conveyor that stop both motors when the rope switch is pulled. Control stations are located in the area to activate the motors during maintenance.

Slow down limit switches mounted on the undercarriage of the charge car are tripped when a FLOOR POSITION flag is encountered. A separate limit switch is provided on the charge car for each flag position. Stop photo sensors mounted on the ends of the charge car are tripped when the charge car aligns with either the tray discharge conveyors or the MDM feed conveyors. The charge car travels in fast speed to the destination selected and ignores the slow speed limit switches that do not correspond to its destination. When the charge car encounters the slow down limit switch at its selected destination, the charge car switches into slow speed. It then travels at slow speed until it trips the centering photo sensor at its destination.

The upper COR charge car also is used during projectile and mortar campaigns to transfer munition trays loaded with projectiles to the MPB (see PHS programmatic process FAWB, Book 22).

The upper COR charge car receives TRAY PRESENT flags to retrieve trays from both of the tray discharge conveyor lines in the upper COR and the six buffer storage conveyors. The charge car receives TRAY REQUEST flags to deliver trays to the conveyors in the MPB. Whenever the charge car receives either a TRAY PRESENT or a TRAY REQUEST flag it first checks the status of all the flags in the system. The charge car selects its action based on the established priority list as shown in Table 3.2.

Table 3.2 Charge Car Buffer Storage Priority

Order	Signal	Originator	Action
1	TRAY REQUEST	MPB Process Line <sup>1</sup>	Priority based on time conveyor in TRAY REQUEST
2	TRAY PRESENT	Buffer Storage Conveyors	Priority based on time in buffer TRAY PRESENT first-in-first-out philosophy
3	TRAY PRESENT	Tray Discharge Conveyors	Priority based on time in TRAY PRESENT first-in-first-out (FIFO) philosophy

<sup>1</sup> MPB process line TRAY REQUEST generated when there is no tray present on BDS-CNVP-101/102 and the corresponding MDM feed conveyor and gate are available to transfer a tray.

If a TRAY REQUEST flag has been set by a process line in the MPB, the charge car checks the buffer storage conveyors to see if a TRAY PRESENT flag has been raised. If a TRAY PRESENT flag has been raised, then the charge car goes to the buffer storage conveyor with the oldest TRAY PRESENT signal and retrieves a tray. If the buffer storage conveyors are not generating a TRAY PRESENT signal, then the charge car retrieves a tray from the tray discharge conveyor with the oldest TRAY PRESENT signal. The charge car takes a tray to the MDM process line that set the TRAY REQUEST flag to complete the cycle.

If the TRAY REQUEST flag has not been set by a process line in the MPB after a munition tray is transferred to a tray discharge conveyor, the charge car checks for an open position on one of the buffer storage conveyors. If an open position exists, a tray on the tray discharge conveyor is transferred to the charge car and the charge car takes it to the open buffer storage conveyor.

The upper COR has up to ten storage areas for munitions trays: six buffer storage conveyors, two tray discharge conveyors, and two bypass indexing hydraulic conveyors.

The PLC keeps track of the buffering by maintaining a FIFO buffer storage stack in memory (see FAWB Note B-9). Therefore, munitions are processed in relatively the same order in which they are received. In that way, TRAY REQUEST and TRAY PRESENT flag conflicts do not effect the time a tray must wait to be processed.

The charge car is designed to travel from point to point without stopping in between. If the charge car does not arrive within a set amount of time, a FAIL-TO-ARRIVE-AT-STATION malfunction alarm is generated.

The charge car may pass over a number of stops between destinations. The distance between stations can be divided into a whole number of discrete steps. The transit time between steps varies but can be grouped into two or three separate values. With the transit time set at one of these values, the charge car is given a fixed amount of time to reach a destination.

#### 3.4.3.6 MDM Feed Conveyor

MDM feed conveyors MMS-CNVP-125 and -126 receive munition trays from the upper COR charge car and transfer them, through MDM feed conveyor process gates MDM-GATE-101 and -102, to the BDS indexing hydraulic conveyors in the MPB. After a digital intercontroller communications output (DICO) signal from ICS-CONR-102 indicates to the appropriate MPB processing line controller that the charge car is aligned properly and has a munition tray present, the process gate opens and the MDM feed conveyor starts. The charge car conveyor then starts and the munition tray transfers from the charge car to the MDM feed conveyor, through the process gate, to the BDS indexing hydraulic conveyor.

#### 3.4.4 Bulk Container Handling in the MPB

The MPB contains the MDM and BDS machines as well as hydraulic conveyors that convey munition trays from the upper COR to the MPB, and between the machines and lift cars that move trays to the BSA. The MPB has two processing lines, A and B; each consisting of one BDS indexing hydraulic conveyor, BDS-CNVP-101 or -102; and three MDM indexing hydraulic conveyors, either MDM-CNVP-101, -103, and -105, or MDM-CNVP-102, -104, and -106; and lift car MMS-LIFT-101, or -102.

The hydraulic conveyors in the MPB are used in two different operational modes: indexing and transferring. When a hydraulic conveyor is in the INDEX mode, it senses the location of the munition trays, slowing them and then stopping them at a precise point. This is the normal operating mode for the hydraulic conveyors. The second mode of operation is the TRANSFER mode. In TRANSFER mode, the conveyors move trays through without slowing or stopping them. The designation of INDEX or TRANSFER mode of operation is done prior

to processing, through the MPB screen. BDS indexing hydraulic conveyor operation is described in detail in Section 3.2.2.1.

One hydraulic power unit (HYPU) (with a backup available if the primary should fail) powers the three MDMs, two BDSs, and eight hydraulically operated conveyors in the MPB. The operating modes for the hydraulically powered equipment in the MPB are defined in the site-specific Utility FAWBs for the HYPU system (see Utility FAWB Book 2 at ANCDF, PBCDF, and UMCDF and FAWB Chapter 5.14 at TOCDF).

#### 3.4.4.1 MDM Indexing Hydraulic Conveyors

MDM indexing hydraulic conveyors MDM-CNVP-101 through -106 transfer trays from the BDS, through the MPB, to the lift car. The conveyors operate in TRANSFER mode for bulk item processing. The conveyors operate in INDEX mode to process projectiles only (see PHS programmatic process FAWB, Book 22).

When processing bulk items in AUTO mode, the PLC starts the BDS indexing conveyor motor in fast forward to transfer the bulk item to the next conveyor when a tray is sensed by the last position switch on the BDS indexing conveyor, and the next conveyor is empty. The PLC stops the BDS indexing conveyor when a tray is present at the receiving conveyor.

The PLC starts the MDM indexing hydraulic conveyor in forward to transfer from the previous MDM indexing hydraulic conveyor when the MDM indexing hydraulic conveyor is empty, and the previous conveyor has a tray. The PLC stops the conveyor when a tray is sensed by the last position switch on the indexing conveyor. When a tray is detected on the third MDM indexing hydraulic conveyor, just before the lift car, a TRAY PRESENT flag is set for the tray. The lift car controller sends a DICO to the BSA controller to indicate TRAY PRESENT at the lift car.

When the TRAY PRESENT flag is set, the lift car checks the first floor buffer storage conveyors to see if a TRAY REQUEST flag exists for that line. If a TRAY REQUEST flag is set, the lift car loads a tray of processed munition(s) from the third MDM indexing hydraulic conveyor, and lowers it to the first floor.

#### 3.4.4.2 MPB Lift Car Assemblies A and B

The lift car assemblies travel between the second-floor MPB and first-floor BSA. The lift car is a chain-operated, electrically driven, enclosed elevator with a live-roller conveyor; the lift car enclosure and gates are fire rated for one hour. The lift car can lower or raise a fully loaded, 10,000 pound munition tray at a speed of 10 fpm.

The lift car includes an electric, motor-driven, chain-drive, live-roller conveyor. The conveyor operates at 40 fpm.

The lift car gates are controlled by the MDM/BDS controllers and are interlocked to prevent both gates from being opened at the same time, or a gate from being opened if the lift car is in motion. Although the lift cars can serve as storage conveyors, they usually are empty, except when transferring trays from one floor to the other. Over-travel limit switches automatically cut power off if the lift car travels beyond the terminal landings. Terminal floor stopping is automatic and independent of the CRO. The lift car enclosure has fire-resistant doors for maintenance access.

### 3.4.5 Bulk Container Handling in the First-Floor BSA

The first-floor BSA stores trays waiting to be processed by the MPF. The BSA has ten storage positions, not counting the charge car, the lift cars, or the second-floor MDM indexing hydraulic conveyors. Three separate conveyor lines make up the BSA. Lines A and B, also known as lift car buffer storage lines, are fed directly from the lift cars. Line C is fed from the first floor charge car, with munitions taken from the two lift car lines.

Trays are transferred from the second-floor MDM lines, lowered via lift car assemblies, to the first-floor munition buffer storage conveyor, just outside of the lift car.

The TRAY REQUEST position initiates tray transfer from the MPB, and is maintained outside of both lift cars by packing trays to the front of the buffer storage conveyor line. When a tray moves to the third buffer storage conveyor in front of the first-floor COR process gate, a TRAY PRESENT flag is set.

At this point, either the MPF requires a tray or all of the tray positions on the lift car buffer storage line have been filled. When the lift car buffer storage line is full, first-floor COR charge car MMS-CHRG-103 is called to transfer trays to line C. Line C is filled from front to back in a last-in-first-out (LIFO) stack from both line A and B. The charge car takes a tray from the line with the oldest TRAY PRESENT signal.

### 3.4.6 Bulk Container Handling in the First-Floor COR

First-floor COR equipment used for bulk items consists of a three conveyor process gates (MMS-GATE-105/106/107), three conveyors (MMS-CNVP-123/124/131) that carry trays from the buffer storage conveyor lines to the charge car, and the first-floor charge car. No operations are performed on bulk items in this area other than transport.

First-floor COR charge car MMS-CHRG-103 transfers munition trays from the first-floor BSA to the MPF. Operation of the charge car is similar to the second-floor COR charge car (see Section 3.4.3.5). However, the first-floor charge car conveyor can operate at both 20 and 40 fpm to match the transfer speeds of both the BSA conveyors and MPF feed conveyor/airlock MMS-CNVP-119.

The MPF sets a TRAY REQUEST flag after the MPF feed conveyor/airlock is empty. When the MPF TRAY REQUEST flag is set, the charge car checks for a TRAY PRESENT flag on the buffer storage conveyor lines. Line C is checked first, followed by the oldest of line A or B. Lines A and B are directly in line with the lift cars. If a TRAY PRESENT flag is set, the charge car receives a tray from the buffer storage conveyor and moves to align with the MPF feed conveyor/airlock. When there is no tray in zone 1 of the MPF, a tray is transferred into the airlock. After the transfer is complete the charge car cycle is reset.

The charge car FAIL-TO-ARRIVE-AT-STATION malfunction is identical to the upper COR charge car malfunction alarm.

The first-floor charge car also is used during projectile and mortar campaigns to transfer munition trays loaded with projectiles to the MPF (see PHS programmatic process FAWB, Book 22).

### 3.4.7 PBCDF Ton Container Handling in the First-Floor UPA

Ton container processing begins in the first-floor UPA with the loading of an empty tray and cradle onto ton container conveyor no.1, MMS-CNVP-137 (see FAWB Note B-10). A ton container then is placed on a tray and cradle. At PBCDF, ton containers are loaded with the educator-tube end at the rear of the cradle.

The first-floor UPA equipment includes ton container conveyor no.1, the ton container gate, and an input airlock. A tray loaded with a ton container travels from the first-floor UPA, through ton container conveyor no.2 and airlock assembly MMS-CNVP-104, directly into the BDS room.

#### 3.4.7.1 Ton Container Conveyor No.1

UPA operators place trays and cradles on ton container conveyor no.1, MMS-CNVP-137. The cradle is fastened to a tray using mechanical clips, providing a stable platform to securely hold the ton container. Trays and cradles are loaded onto the conveyor using either the hoist located in the first-floor UPA or a forklift.

The conveyor is a live-roller conveyor driven by a reversible, electric motor. The PLC controls the conveyor drive motor when the local hand switch is in the remote position. In AUTO mode, the PLC starts the conveyor motor in forward when a tray is present on the conveyor, the conveyor in the airlock is empty and running, the feed gate is in the open position, and a valid tray ID number has been entered. The PLC stops the conveyor when the airlock conveyor stops.

The conveyor can reverse directions to remove trays from the BDS room. In LOCAL mode, a UPA operator can transfer trays from the airlock to ton container conveyor no.1. Emergency rope switches along each side of the conveyor immediately stop both motors for personnel safety.

#### 3.4.7.2 Ton Container Gate

Ton container gate UPA-GATE-103 separates the airspace of the first-floor UPA from the input airlock, preventing agent vapor migration from the BDS room (category A) back to the first-floor UPA (category C). The ton container gate operates similar to the tray input airlock feed gate at other sites.

#### 3.4.7.3 Ton Container Conveyor 2 and Airlock Assembly

Ton container conveyor 2 and airlock assembly MMS-CNVP-104 is used in ton container processing to maintain the boundaries between the nontoxic area of the first-floor UPA and the toxic area of the BDS room, while still allowing the transfer of material between the two areas. The charge and discharge feed gates are interlocked to prevent both gates from being opened at the same time.

Ton container conveyor 2 and airlock assembly receives a tray from ton container conveyor 1, holds it while the airlock doors cycle, and then transfers it to the BDS room. The airlock assembly is sealed by a feed gate on the UPA side and a discharge gate on the BDS room side. The conveyor is a live-roller conveyor driven by a reversible, electric motor. The conveyor also has a tray stop located at the discharge end to prevent tray collisions with the airlock discharge gate.

The ton container conveyor no.2 and airlock assembly operates similar to the tray input bypass/spray tank conveyor 2 and airlock assembly at other sites.

Since tray transfer from the BDS room to the first-floor UPA has the potential for agent contamination, the airlock has the capability to decontaminate a tray and its contents. Spray nozzles inside the airlock wash the entire contents from all angles with either water or decon. A drain line, located in the bottom of the airlock, drains the contents to the sump located in the BDS room. All decon operations are performed manually by the local operator, using a local hand station located in the BDS room. The decontamination system operates similar to the system for tray input bypass/spray tank conveyor 2 and airlock assembly at other sites.

### 3.4.8 PBCDF Ton Container Handling in the BDS Room

The BDS room contains the BDS machine as well as the ton container airlock discharge gate, a transfer conveyor, the lift car assembly, the BDS indexing hydraulic conveyor, and the MPF charge airlock gate. The following sections discuss ton container handling for the gate, transfer conveyor, and lift car assembly. The BDS indexing hydraulic conveyor is discussed in Section 3.2.2.1. The MPF charge airlock gate is discussed in the MPF programmatic process FAWB, Book 27.

#### 3.4.8.1 Ton Container Gate

Ton container gate UPA-FDDR-104 separates the airspace of the BDS room from the input airlock, preventing agent vapor migration from the BDS room (category A) back to the first-floor UPA (category C). The ton container gate operates similar to the tray input airlock discharge gate at other sites.

#### 3.4.8.2 Ton Container Conveyor No.3

Ton container conveyor no.3, MMS-CNVP-136, receives a tray from the airlock and transfers it to lift car conveyor MMS-LIFT-101. Ton container conveyor no.3 is a live-roller conveyor, driven by a reversible, electric motor. The PLC controls the motor when the local hand switch is in the remote position. In AUTO mode, the PLC starts ton container conveyor no.3 in forward to transfer a tray from the airlock to the BDS room when the conveyor is empty, the tray stop is up, and a tray is present in the airlock. The PLC stops the conveyor when a tray is sensed by the last position switch on the conveyor. If the tray stop is in the up position, the PLC stops the conveyor if a tray is sensed by the discharge-end position switch, whether the conveyor is in AUTO or MANUAL mode. The PLC starts the conveyor motor in forward to transfer a tray to the lift car conveyor when a tray is present on the conveyor, the lift car conveyor is empty and running, and the tray stop is down. The PLC stops the conveyor when a tray is present on the receiving conveyor.

Emergency rope switches along each side of the conveyor immediately stop the conveyor drive motor for personnel safety. On an emergency stop, the pneumatic stop remains in its last position (i.e., up or down); if the tray stop is traveling, it completes the up or down movement, then stops.

At the discharge end of ton container conveyor 3 is a tray stop, actuated by a pneumatic cylinder. Tray stop position switches provide feedback to the CON for the tray stop position (i.e., up or down). The PLC controls the tray stop when the local hand switch is

in the remote position and the CON screen is in AUTO mode. In AUTO mode, the PLC lowers the tray stop when ton container conveyor 3 is in AUTO and has a tray present, and the next conveyor is empty and running. The PLC raises the tray stop when a tray is present on the lift car conveyor.

The conveyor can reverse direction to transfer trays from the BDS room, through the airlock, back to the first-floor UPA. This operation is performed manually, remote from the CON, or local using the hand switch.

#### 3.4.8.3 Lift Car Assembly

Lift car MMS-LIFT-101 travels between the BDS room on the first floor and the MDB second-floor COR. The lift car is a chain-operated, electrically driven, enclosed elevator with an electric, motor-driven, chain-drive, live-roller conveyor. The conveyor operates at 40 fpm.

The lift remains parked on the first floor with both gates open during ton container processing, operating only as a transfer conveyor to transport ton containers from ton container conveyor no. 3 to the BDS. The lift also can operate in LIFT mode during the mine campaign to transport mine baskets from the second-floor COR, to the BDS room, to the MPF (see MHS programmatic process FAWB, Book 23).

### **3.5 RESIDUAL AGENT AND TRAY TRACKING**

A residual agent and tray tracking system was implemented at TOCDF to comply with the site RCRA permit. The system tracks the amount of residual agent delivered to the MPF on a per tray basis. Similar tray tracking systems will be customized and implemented at follow-on sites to comply with site-specific permit requirements. The following paragraphs describe the TOCDF residual agent and tray tracking system. System attributes applicable to projectile/mortar processing are described only in the PHS Programmatic Process FAWB, Book 22. System attributes applicable to bulk item processing are described only in this FAWB. System attributes applicable to both bulk container and projectile/mortar processing are described both in this FAWB and in the PHS FAWB. If dunnage is handled using the tray system, dunnage trays will be tracked by the tray tracking system. However, actual dunnage handling and processing likely will not utilize the dunnage incinerator (see FAWB Note B-1).

#### **3.5.1 TOCDF Residual Agent and Tray Tracking System**

The MPF limitation on waste feed requires that the amount of residual agent be tracked on a per tray basis. The CROs and the control system are required to control the hourly agent feed into the MPF. The most current TOCDF permit was used to obtain VX and GB hourly rates. The State of Utah requires that the location of munitions be monitored throughout the facility on a per tray basis. To meet these requirements, the CON system utilizes a tray information packet (TIP) for each tray.

The TIP is a data packet in the control system that receives and stores information pertaining to a tray and its munitions as it travels from the UPA, or TMA, until it exits the system. Information is obtained at specified hold points or "stations" by direct operator entry, or automatically from the control system. The TIP typically contains the tray identification (Tray ID) number, the tray class number, and the amount of residual agent. Any additional information stored for process control or historical purposes is not required by the RCRA permit.

The TIP for a tray is identified by a Tray ID number and date/time group. The Tray ID numbers are three numeric characters long. Projectile and bulk container trays use the number series 100 through 109, 200 through 209, etc. Dunnage trays use numbers 1 through 10. The Tray ID number is entered by the operator at each station throughout the MDB, except when a tray bypasses a station, as noted in Sections 3.3 and 3.4 (see Figures 3-1 and 3-2).

Trays can be introduced into the control system in the UPA, or the TMA. Trays either leave the system, via the MPF or TMA, or they are consumed in the DUN (see FAWB Note B-1). Operators are prompted at the entry point for the required information. The control system adds data to the TIP as a tray proceeds through the plant and its contents are processed by the demil equipment. The TIP is closed out and stored in the process data acquisition and recording system (PDAR) either when a tray exits the discharge airlock of the MPF, when a tray enters the DUN lift (see FAWB Note B-1), or when a tray is completely in the toxic maintenance area (TMA).

The residual agent and tray tracking system functions when transferring trays in either the AUTO or MANUAL operation mode. However, if an operator takes local control of a tray and

moves it past a Tray ID station without following procedures, a controls engineer must manually update the tray-tracking queues for sending/receiving Tray ID stations.

#### 3.5.1.1 Tray Identification

The tray-tracking queue is a numerical list of Tray ID numbers that shows all trays in the system. When a tray is at a Tray ID Station, the operator uses the CCTV camera to read the Tray ID number. The operator then enters the Tray ID number on the Advisor Screen. The Tray ID number is compared against the indexed list that shows the Tray ID number that should be at this station. The system prompts the operator if an invalid Tray ID number is entered. The operator verifies the Tray ID number and re-enters it via the Advisor Screen. A tray is interlocked from moving forward until the correct Tray ID is entered. The operator can move a tray in reverse at any time. The PLC confirms the Tray ID number is valid by comparing it against the tray-tracking queue and records the number on the alarm printer. A successful comparison with the master file validates the operator input and allows a tray to proceed on to the next station, or begin processing at the current location.

#### 3.5.1.2 Tray in the UPA

A message on Advisor screen BLA or BLB prompts the operator to enter the Tray ID number and Tray class once a tray is on the turntable, in line with the bypass line, the airlock entry gate is open, and the airlock conveyor is running forward. The conveyor is interlocked from further advancement until the data is entered and accepted by the system. The operator performs this task by selecting the icon representing the required parameter to be entered. The operator obtains the Tray ID number placed on a tray by the unpack operator using the CCTV cameras, and obtains the Tray class from Table 3.3.

Table 3.3 Tray Class

Class	Tray Type
1	Empty Munition Tray
2	Empty Closeout Tray
3	Empty Tray for Reject
4	Dunnage Box
5	Leakers
6	Reprocess Rejects
7	Bulk Containers
8	TMA
9	Mines

After both parameters are entered, the operator confirms the entry by pressing the appropriate function key, which then loads the new values into the system. The operator-entered Tray ID is logged to the printer. The Tray ID, Tray class, Agent type, Munition type, time, and date are recorded in the TIP. Then, the TIP is sent to the master file, where it is stored with the existing ID number in the system.

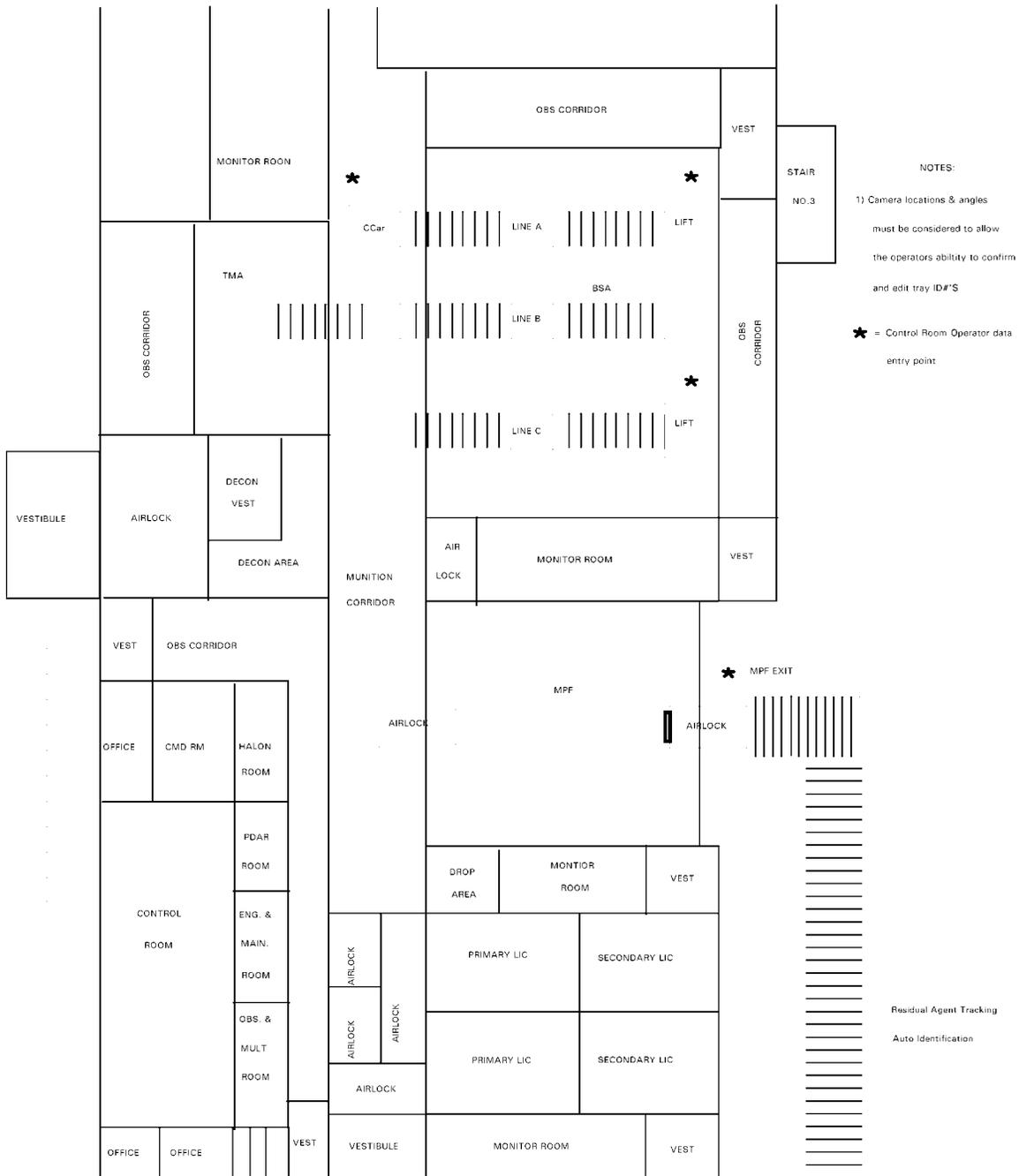


Figure 3-1. TOCDF MDB 1<sup>st</sup> Floor Station Locations

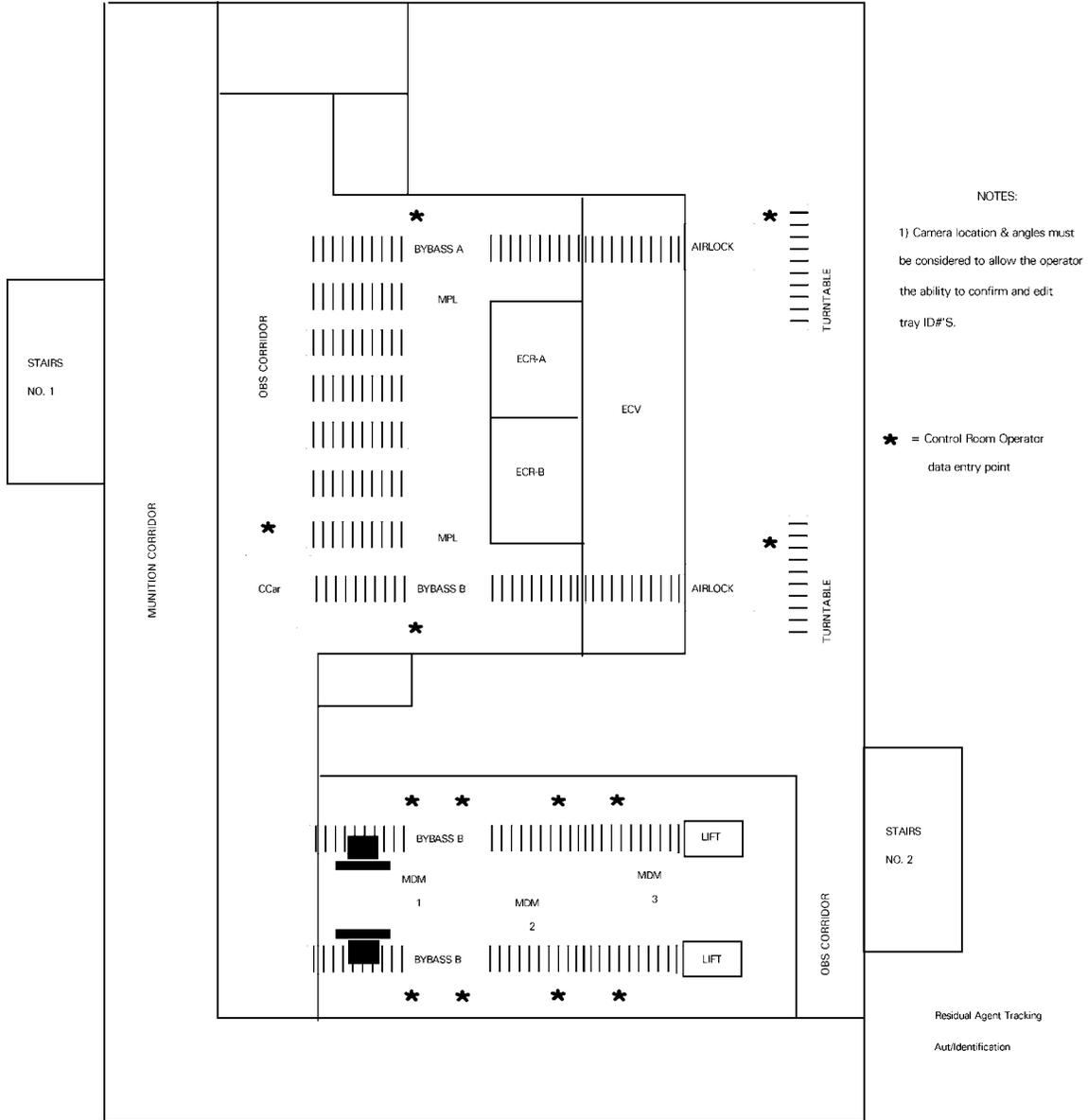


Figure 3-2. TOCDF MDB 2<sup>nd</sup> Floor Station Locations

If an operator enters a Tray ID number that is already in use, the system clears the entry from the screen and does not log it into the master file. The system then displays a "Tray Already Exists" message and awaits input of a new number. The number of trays that can be in the system at any one time is limited to the size of the master file. The master file is sized for a maximum of 40 trays. If this maximum is exceeded, a "File Full" *alert* appears on the screen and the Tray ID and class fields are cleared. The operator must wait until a tray leaves the system and the TIP is removed from the master file before attempting to load a tray and its information.

A successful entry of a Tray ID and class number removes the interlock and the tray continues to the next ID station. When a tray is sensed in the airlock, the Tray ID and Class are cleared from the screen in preparation for the next tray information entry.

#### 3.5.1.3 Tray at the MPL

When projectile processing is selected, as shown on the Campaign Select Screen (CSS), a tray stages at the bypass indexing hydraulic conveyor. Residual agent and tray tracking actions associated with projectile processing are included in the PHS programmatic process FAWB, Book 22. A campaign selection other than projectiles allows a tray to pass, without stopping at the MPL Tray ID station. Dunnage trays with ID numbers 1 through 10 do not stop at the MPL even if projectiles are selected.

#### 3.5.1.4 Tray at Charge Car in the Upper COR BSA

When a tray leaves the bypass line tray discharge conveyor and transfers to the charge car, the operator enters the Tray ID. A successful entry of the Tray ID permits the charge car to move. When a tray is transferred from a BSA storage conveyor to the charge car, the operator is not required to enter the Tray ID.

#### 3.5.1.5 Tray at BDS

Selection of any bulk item on the CSS screen configures the system to allow a tray being sent from the UPA airlock to automatically transfer past the MPL on its way to the charge car. The Tray ID procedure is invoked at the charge car. A successful Tray ID entry allows the charge car to transfer a tray to the MPB conveyors. Then, the tray stages at the BDS, and the arrival date, arrival time, and initial weight are logged to the TIP, and the BDS sequence continues.

Upon completion of the BDS sequence, the drain weight, departure time, departure date and agent heel weight are logged to the TIP. The TIP then is transferred to the master file and the tray proceeds to the lift. The bulk tray automatically bypasses the Tray ID station at each MDM. Residual agent and tray tracking actions associated with projectile processing are included in the PHS programmatic process FAWB, Book 22.

#### 3.5.1.6 Tray at First-Floor BSA

A successful Tray ID procedure is required before a tray is permitted to leave the munitions lift and enter the BSA. Once in the BSA, the tray agent heel is displayed to the operator. Tray agent heel weights greater than the RCRA-determined MPF agent limit flash red. The tray can be moved to the first-floor charge car, which is the next Tray ID station. The Tray ID procedure must be successfully completed before the charge car can

move. The operator is permitted to move the charge car conveyor in forward and reverse to return a tray to the BSA conveyors.

### 3.5.1.7 Tray at the TMA

After a tray is placed on the TMA conveyor and transferred forward to the charge car, the operator is prompted to enter the Tray ID. The prompt appears as a message on the BC1 Advisor control screen. The charge car is interlocked from further movement until the Tray ID is entered by the operator and accepted by the system. The TIP is sent to the master file where it is compared with existing ID numbers in the system. The last three numbers are automatically entered by the PLC. The date and time are recorded from the system clock. The Tray class default is "8" for the TMA since this is the origin of the tray. If an operator enters a Tray ID number already in use, the system clears the entry from the screen and does not log it into the master file. The system then displays a "Tray Already Exists" message and awaits input of a new number. If the master file is full and cannot store any more tray information, a "File Full" *alert* appears on the screen and the Tray ID field is cleared. The operator must wait until a tray leaves the system before attempting to load a tray along with its information again. A successful entry of the Tray ID removes the interlock and the tray transfers to the charge car.

### 3.5.1.8 Tray at the MPF

The PLC controls the MPF hourly feed rate based on the MPF agent feed rate limits. The MPF limits to the amount of agent heel that can be processed are listed in Table 3.4.

Table 3.4 TOCDF MPF Feed Rate Limits for Bulk Items

MUNITION	CHEMICAL AGENT (LB/HR) (UNITS/HR)						
	VX	GB	GA	H	HD	HT	L
Ton Container	57.6/1.72	129/1.72	129/1.72		146.2/1.72	146.2/1.72	146.2/1.72
Spray Tank	67.8/1.0						
MC-1 Bomb		80.3/7.3					
MK-116 Bomb		41.6/2.4					

The current MPF agent capacity is sent to the BSA controller. Current MPF agent capacity is calculated by subtracting the total agent weight of the trays in the MPF from the MPF agent limit. The selected tray must have an agent heel weight less than the current MPF agent capacity. The MPF agent capacity is compared with the agent heel weight of the tray selected to go to the MPF, prior to the tray transferring to the charge car. If the agent heel is greater than the current MPF agent capacity, the agent heel weight displayed on the BC1 Advisor screen flashes red, and the tray is interlocked in the AUTO mode from transferring to the charge car. The agent heel value continues to flash red until the MPF agent capacity is increased above the tray's agent heel.

The operator may elect to transfer the tray to the charge car and MPF charge airlock in the MANUAL mode. When a tray arrives in the MPF charge airlock, the MPF entrance door clamps are interlocked from opening until the current MPF agent capacity can handle the tray's agent heel weight. The current MPF agent capacity is increased when

an existing tray in the MPF exits and the value of agent heel that was associated with that tray is added to the current MPF agent capacity. The operator can elect to return the tray from the MPF charge airlock to the BSA and select another tray with less heel than the current MPF agent capacity.

When a tray exits the MPF discharge airlock, the Tray ID procedure is invoked. A successful Tray ID entry results in the tray transferring to the cooling conveyor. The Tray ID and the associated TIP are sent to PDAR for storage and deleted from the master file.

### 3.6 BCHS INITIALIZATION, STARTUP, AND PARK

Initialization of the bypass lines and BDSs is performed by the CRO prior to bulk item processing. Initialization prepares the lines for processing by ensuring that they are clear of trays, and verifying that the electrically operated components and selected other components are operating properly. Initialization of the BDSs restores the machines from the PARK condition.

Before initializing the bypass lines and the BDSs, the CRO completes the limiting conditions of operation (LCO) checklist and the pre-operational checklist, verifies that all necessary utility systems are up and running, and places all necessary equipment, including the BDS sequencers, in AUTOMATIC. The CRO also verifies that the proper campaign has been selected from the CSS screen. To ensure successful initialization, all emergency stops and rope switches must be reset and local/remote hand switches placed in remote.

The CRO initializes the bypass lines by accessing the BLA and BLB screens, selecting the INITIALIZE icon and depressing the START key. Each bypass line is initialized separately.

The CRO initializes the BDS by accessing the BDI screen, selecting the SYSTEM INITIALIZE icon and depressing the START key. Each BDS line is initialized separately.

After the START key is depressed, warning horns sound for ten seconds and the warning lights illuminate to notify plant personnel that the line is about to start. If the equipment was running within the last ten minutes, the warning lights still will be illuminated but the warning horns do not sound. If the horns sound, they are silenced after the ten-second delay, and the equipment commences the initialization sequence. After successful system initialization, icons on the respective screens change from flashing green to steady green. This notifies the CRO that the systems can be placed in RUN mode and begin processing. If initialization fails, an *alert* is generated and the appropriate icon flashes *with magenta lettering on a yellow background*. When the FAIL TO INITIALIZE *alert* is acknowledged, the failed station attempts to reinitialize.

After successful initialization of the bypass lines, the CRO starts automatic operation of the lines by accessing the BLA and BLB screens, selecting the AUTO TRANSFER icon, and depressing the START key. If all conditions for automatic operation are met, the screen icons are displayed in green.

After successful initialization of the BDS lines, the CRO can start BDS automatic operation by accessing the BDI and MPB screens, selecting the SYSTEM START/STOP icon, and depressing the START key. If all conditions for system start are met, all continuously running devices are started, and the screen icons are displayed in green.

When the processing run is completed, the systems should be parked. The PARK function drives all hydraulic devices to safe shutdown, or to the gravity-driven state, and de-energizes all outputs.

Before the BDS lines can be parked, the CRO visually checks each line for any remaining trays, which aids in the startup of the next processing run. The CRO then stops BDS automatic operation, which is a requirement before the machines can be parked. To stop each BDS, the CRO accesses the BDI screen, selects the SYSTEM START/STOP icon for the respective BDS, and depresses the STOP key. The SYSTEM START/STOP icon turns magenta indicating the system has been stopped. To initiate the PARK function, the CRO accesses the BDI screen, selects the PARK MACHINE icon, and depresses the START key. Once the BDS system park is complete, the screen icon changes from flashing green to steady green. If the park attempt fails, an *alert* is generated and the icon flashes *with magenta lettering on a yellow background*. Once the cause of the failure has been corrected, the CRO accesses the screen and depresses the ACKNOWLEDGE key. The PARK MACHINE icon returns to magenta. The CRO reselects the PARK MACHINE icon and depresses the START key again. The failed station then attempts to repark.

### 3.7 BULK ITEM LEAKER HANDLING

Bulk item leaker handling for ton containers, spray tanks, and MC-1, MK-94, and MK-116 bombs is presented in Table 3.5.

Table 3.5 Bulk Item Leaking Munition Handling

Bulk Item	Baseline Site(s)	Leaking Item Reconfiguration
Ton Container	AN/PB/TE/UM	Leaking ton containers detected are surface decontaminated, placed in a plastic overpack bag, and decontaminated again. In most cases, a faulty valve caused the leakage, and it was replaced with a new valve in the storage area. A damaged or leaking ton container is surface decontaminated and its contents transferred to an adequate container.
Spray Tank (TMU-28)	TE/UM	If a spray tank is leaking inside the shipping container, the entire unit is transported to ECV in the MDB.
750-lb Bomb (MC-1)	TE/UM	Leaking MC-1 bombs detected in storage are removed from the pallet, surface decontaminated, placed in a bull pup missile container, and repalletized prior to shipment to the container handling building (CHB).
500-lb Bomb (MK-94)	UM	Leaking MK-94 bombs detected in storage are placed in a pig and repalletized prior to shipment to the CHB.
Weteye Bomb (MK-116)	TE	Leaking MK-116 weteye bombs detected in storage are placed in an overpacked shipping container (pig).

Overpacked MC-1 bombs, MK-94 bombs, and ton containers are delivered in onsite containers (ONCs) to the UPA, similar to nonleaking munitions. Leaking spray tanks in shipping containers and overpacked MK-116s also are delivered to the UPA, similar to nonleaking munitions. Leaking spray tanks in shipping containers and overpacked bulk items are conveyed through the UPA airlock into the ECV, and unpacked by workers in demilitarization protective ensemble (DPE). Each munition is removed from its overpack and manually loaded onto the appropriate cradle on a tray in the ECV. Once the munitions

are loaded onto trays, they are conveyed into the MPB and processed in the same manner as nonleaking munitions. At PBCDF, if a ton container was placed in a plastic overpack bag, it is conveyed into the BDS room where the overpacking can be removed.

Leakers can also be discovered after delivery of a loaded ONC to the CHB UPA, or first floor UPA at PBCDF, where the ONCs are monitored before being unloaded. At all sites except PBCDF, the ONC is returned to the first-floor CHB lift area and taken by truck to the TMA. Leakers at these sites are unloaded by DPE personnel in the TMA, loaded onto the appropriate cradle on a tray, conveyed out of the TMA onto the lower COR charge car, and run backwards along the bulk conveyors lines to the BDS, where they are processed in the same manner as nonleaking munitions.

At PBCDF, if an ONC is found to contain leakers, it is picked up by first-floor UPA overhead crane UPA-CRAN-401 using its spreader bar, and placed on TMA lift skid TMA-SKID-101. The TMA lift skid carries the ONC, along an embedded rail, from the first-floor UPA through airlock 12-106 to TMA decon area 12-107. The ONC containing the leaking ton container is unloaded in the TMA decon area by DPE personnel. The munition trays are pulled by winch out of the container and placed on TMA scissors-lift conveyor TMA-CNVP-101. Ton containers are lifted off the munition tray by TMA crane TMA-CRAN-101, placed in a cradle on TMA conveyor TMA-CNVP-102, and conveyed out of the TMA to the BDS room onto overpack conveyor MMS-CNVP-134. The munition tray with the leaking ton container is moved from the overpack conveyor to ton container conveyor 3, MMS-CNVP-136, using BDS monorail BDS-MONO-401, and then processed the same as a nonleaking ton container.

Leaker spray tanks and MK-116s also can be discovered after delivery of a shipping container to the CHB UPA, where the shipping containers are monitored before being unloaded. If this occurs, the complete shipping container is placed on the UPA turntable and conveyed into the ECV where the munition is removed from its overpack and manually loaded onto a cradle on a tray in the ECV. Once the munitions are loaded onto trays, they are conveyed into the MPB and processed in the same manner as nonleaking munitions.

### **3.8 BULK ITEM DUNNAGE HANDLING**

Ton containers have no packing material unless they have a plastic overpack and, therefore, there is no associated dunnage to be processed. Spray tank and MK-116 shipping containers are not considered dunnage. Both contaminated and uncontaminated dunnage can be generated during the unpacking process for MC-1 and MK-94 bombs, which are delivered on pallets. MC-1 and MK-94 bomb dunnage consists of wood, miscellaneous packing material, and metal straps, clips, staples, or nails separating or surrounding the munitions. Prior to unpacking the munitions, the pallets are separated into lots of nonleakers and leakers. If the lot contains nonleakers, then the dunnage is treated as uncontaminated dunnage. If the lot contains leakers, then the dunnage from the entire lot of overpacked pallets is treated as contaminated dunnage.

Uncontaminated pallets are unloaded by operators in the UPA. Dunnage removed from around leakers is assumed to be contaminated with agent and can be handled in the ECV or TMA. Handling and disposal of both contaminated and uncontaminated dunnage is considered a site-specific activity that has not yet been determined (see FAWB Note B-1).

## SECTION 4

### COMPONENT SUMMARY

#### 4.1 BULK CONTAINER HANDLING SYSTEM COMPONENTS

The components of bulk container handling system (BCHS) include the bulk drain station (BDS), conveyors, lifts, doors, gates, and associated instrumentation. Power source information for the other components is listed in Tables 4.1 and 4.2.

#### 4.2 EQUIPMENT POWER SOURCES

Tables 4.1 lists the equipment power sources for the major equipment used in the BCHS *based on site drawing revisions listed in Appendix H*. Because of the uniqueness of the PBCDF BCHS, the equipment power sources for PBCDF are listed separately in Table 4.2. Power sources are characterized as critical, essential or utility. Critical loads are powered by the UPS panelboards and do not experience an interruption in power if offsite power is lost. Essential loads are required for safe shutdown of the facility, but can tolerate an interruption in power while being loaded on an onsite emergency diesel generator (EDG). Utility loads are not required if offsite power is lost and are not powered by the onsite EDG. Only motive power sources are listed in the tables; instrumentation and control power sources are not listed. In addition, hydraulically and pneumatically powered, and non-powered equipment are not included in the tables.

Table 4.1 ANCDF, TOCDF, and UMCDF BCHS Equipment Power Sources

Equipment Tag	Description	Site(s)	Power Source	Power Type
COR-GATE-101	Bypass Conveyor Process Gate (A)	AN/TE/UM	SPS-MCC-103	Utility
COR-GATE-102	Bypass Conveyor Process Gate (B)	AN	SPS-MCC-105	Utility
	Spray Tank Conveyor Process Gate (B)	TE/UM	SPS-MCC-105	Utility
COR-GATE-103	Transfer Idler Conveyor Process Gate	AN/TE/UM	SPS-MCC-107	Utility
ECV-FDDR-105	Tray Input Airlock Gate (A)	AN/TE/UM	SPS-MCC-103	Utility
ECV-FDDR-106	Tray Input Airlock Gate (B)	AN/TE/UM	SPS-MCC-105	Utility
LFT-GATE-101	Lift Process/Fire Gate (A)	AN/TE/UM	SPS-MCC-105	Utility
LFT-GATE-102	Lift Process/Fire Gate (A)	AN/TE/UM	SPS-MCC-105	Utility
LFT-GATE-103	Lift Process/Fire Gate (B)	AN/TE/UM	SPS-MCC-104	Utility
LFT-GATE-104	Lift Process/Fire Gate (B)	AN/TE/UM	SPS-MCC-104	Utility
MDM-GATE-101	MDM Feed Conveyor Process Gate (A)	AN/TE/UM	SPS-MCC-105	Utility
MDM-GATE-102	MDM Feed Conveyor Process Gate (B)	AN/TE/UM	SPS-MCC-104	Utility

Table 4.1 (Cont'd)

Equipment Tag	Description	Site(s)	Power Source	Power Type
MMS-CHRG-101	Charge Car – Drive	AN/TE/UM	SPS-MCC-103	Utility
	Charge Car – Conveyor	AN/TE/UM	SPS-MCC-103	Utility
MMS-CHRG-103	Charge Car – Drive	AN/TE/UM	SPS-MCC-107	Utility
	Charge Car – Conveyor	AN/TE/UM	SPS-MCC-107	Utility
MMS-CNVB-101	Buffer Storage Conveyor No.1	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVB-102	Buffer Storage Conveyor No.2	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVB-103	Buffer Storage Conveyor No.3	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVB-104	Buffer Storage Conveyor No.4	AN/TE/UM	SPS-MCC-104	Utility
MMS-CNVB-105	Buffer Storage Conveyor No.5	AN/TE/UM	SPS-MCC-104	Utility
MMS-CNVB-106	Buffer Storage Conveyor No.6	AN/TE/UM	SPS-MCC-104	Utility
MMS-CNVP-101	Tray Input Bypass Conveyor No.1 and Turntable (A) – Conveyor	AN/TE/UM	SPS-MCC-103	Utility
	Tray Input Bypass Conveyor No.1 and Turntable (A) – Turntable	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVP-102	Tray Input Bypass Conveyor No.1 and Turntable (B) – Conveyor	AN	SPS-MCC-105	Utility
	Spray Tank Conveyor No.1 and Turntable (B) – Conveyor	TE/UM	SPS-MCC-105	Utility
	Tray Input Bypass Conveyor No.1 and Turntable (B) – Turntable	AN	SPS-MCC-105	Utility
	Spray Tank Conveyor No.1 and Turntable (B) – Turntable	TE/UM	SPS-MCC-105	Utility
MMS-CNVP-103	Tray Input Bypass Conveyor No.2 and Airlock Assembly (A)	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVP-104	Tray Input Bypass Conveyor No.2 and Airlock Assembly (B)	AN	SPS-MCC-105	Utility
	Spray Tank Conveyor No.2 and Airlock Assembly (B)	TE/UM	SPS-MCC-105	Utility
MMS-CNVP-105	Bypass Conveyor No.3 (A)	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVP-106	Bypass Conveyor No.3 (B)	AN/TE/UM	SPS-MCC-105	Utility
MMS-CNVP-107	Bypass Conveyor No.4 (A)	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVP-108	Bypass Conveyor No.4 (B)	AN/TE/UM	SPS-MCC-105	Utility
MMS-CNVP-111	Tray Discharge Conveyor (A)	AN/TE/UM	SPS-MCC-103	Utility
MMS-CNVP-112	Tray Discharge Conveyor (B)	AN/TE/UM	SPS-MCC-105	Utility
MMS-CNVP-115	Munitions Buffer Storage Conveyor (A)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-116	Munitions Buffer Storage Conveyor (B)	AN/TE/UM	SPS-MCC-106	Utility

Table 4.1 (Cont'd)

Equipment Tag	Description	Site(s)	Power Source	Power Type
MMS-CNVP-117	Munitions Buffer Storage Conveyor (A)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-118	Munitions Buffer Storage Conveyor (B)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-123	Munitions Buffer Storage Conveyor (A)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-124	Munitions Buffer Storage Conveyor (B)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-125	MDM Feed Conveyor (A)	AN/TE/UM	SPS-MCC-105	Utility
MMS-CNVP-126	MDM Feed Conveyor (B)	AN/TE/UM	SPS-MCC-104	Utility
MMS-CNVP-127	Munitions Buffer Storage Conveyor (C)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-128	Munitions Buffer Storage Conveyor (C)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-129	Munitions Buffer Storage Conveyor (C)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-130	Munitions Buffer Storage Conveyor (C)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-131	Munitions Buffer Storage Conveyor (C)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-132	Munitions Buffer Storage Conveyor (A)	AN/TE/UM	SPS-MCC-106	Utility
MMS-CNVP-133	Munitions Buffer Storage Conveyor (B)	AN/TE/UM	SPS-MCC-106	Utility
MMS-GATE-105	Conveyor Process Gate (A)	AN/TE/UM	SPS-MCC-106	Utility
MMS-GATE-106	Conveyor Process Gate (B)	AN/TE/UM	SPS-MCC-106	Utility
MMS-GATE-107	Conveyor Process Gate (C)	AN/TE/UM	SPS-MCC-106	Utility
MMS-LIFT-101	Lift Car Assembly (A) – Lift	AN/TE/UM	SPS-MCC-105	Utility
	Lift Car Assembly (A) – Conveyor	AN/TE/UM	SPS-MCC-105	Utility
MMS-LIFT-102	Lift Car Assembly (B) – Lift	AN/TE/UM	SPS-MCC-104	Utility
	Lift Car Assembly (B) - Conveyor	AN/TE/UM	SPS-MCC-104	Utility
UPA-FDDR-101	Tray Input Airlock Feed Gate (A)	AN/TE/UM	SPS-MCC-103	Utility
UPA-FDDR-102	Tray Input Airlock Feed Gate (B)	AN/TE/UM	SPS-MCC-105	Utility

Table 4.2 PBCDF BCHS Equipment Power Sources

Equipment Tag	Description	Power Source	Power Type
BDS-MONO-401	BDS Monorail	SPS-PANB-403	Utility
LFT-GATE-103	Lift Process/Fire Gate	SPS-MCC-105	Utility
LFT-GATE-104	Lift Process/Fire Gate	SPS-MCC-105	Utility
MMS-CNVP-104	Ton Container Conveyor No.2 and Air Lock Assembly	SPS-MCC-105	Utility
MMS-CNVP-134	Overpack Conveyor	SPS-MCC-105	Utility
MMS-CNVP-136	Ton Container Conveyor No.3	SPS-MCC-105	Utility
MMS-CNVP-137	Ton Container Conveyor No.1	SPS-MCC-105	Utility
MMS-LIFT-101	Lift Car Assembly – Lift, Motor A	SPS-MCC-103	Utility
	Lift Car Assembly – Conveyor, Motor B	SPS-MCC-103	Utility
TMA-GATE-101	TMA Fire Gate	SPS-MCC-105	Utility
UPA-GATE-103	Ton Container Gate	SPS-MCC-105	Utility
UPA-GATE-104	Ton Container Gate	SPS-MCC-105	Utility

## APPENDIX A

### Acronyms and Abbreviations

The acronyms and abbreviations listed below are common for all of the programmatic process FAWBs:

A&I	alarm and interlock matrix
AASS	automatic agent sampling system
ABCDF	Aberdeen Chemical Agent Disposal Facility
AC	alternating current
ACAMS	automatic continuous air monitoring system
acfm	actual cubic foot per minute
ACS	agent collection system
ACSWS	acid and caustic storage and wash system
ADC	air dilution controller
AgF	silver fluoride
AHT	agent holding tank
AHU	air handling unit
AMC	Army Materiel Command
ANAD	Anniston Army Depot (Alabama)
ANCDF	Anniston Chemical Agent Disposal Facility
ANSI	American National Standards Institute
AQS	agent quantification system
AR	Army Regulation
ASA	automatic submerged arc
ASC	allowable stack concentration
ASD	adjustable-speed drive
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	acid wash system
AWFCO	automatic waste feed cutoff
BCHS	bulk container handling system
BCS	bulk chemical storage
BDS	bulk drain station
BGCDF	Blue Grass Chemical Agent Disposal Facility
BLAD	blast load attenuation duct
BMS	burner management system
BPS	burster punch station (MIN)
BRA	brine reduction area
BRS	burster removal station (PMD)
BSA	buffer storage area
BSR	burster size reduction machine
Btu	British thermal unit
°C	degrees Celsius
CAMDS	Chemical Agent Munition Disposal System
CAB	combustion air blower

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CAL	chemical assessment laboratory
CAS	compressed air system
CBR	chemical, biological, and radiological (filter)
CCB	configuration control board
CCS	central control system
CCTV	closed-circuit television
CDS	central decontamination supply
CDSS	central decontamination supply system
CDTF	Chemical Demilitarization Training Facility
CEHNC	U.S. Army Engineering & Support Center, Huntsville.
CEMS	continuous emission monitoring system
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CHB	container handling building
CHWS	chilled water supply
CO	carbon monoxide (monitors/analyzers)
COM	communications system
CON	control room
COR	munitions corridor
CPA	client-Parsons authorization
CRO	control room operator
CRT	cathode ray tube
CS	crimp station (PMD)
CSS	campaign select screen
CSD	Chemical Stockpile Disposal (Project)
CV	control variable
CWC	Chemical Weapons Convention
CWS	chilled water supply
DAAMS	depot area air monitoring system
DAFC	dilution airflow controller
db	dry bulb
DC	direct current
DCD	Deseret Chemical Depot
DDESB	Department of Defense Explosives Safety Board
decon	decontamination (solution)
demil	demilitarization
DFS	deactivation furnace system
DICI	digital intercontroller communication input
DICO	digital intercontroller communication output
DMS	door monitoring system
DPE	demilitarization protective ensemble (suit)
DSA	DPE support area
dscf	dry standard cubic foot
DSIC	design and systems integration contractor
DUN	dunnage incinerator
E&M	engineering and maintenance
E-stop	emergency stop
EAC	equipment acquisition contractor
ECF	entry control facility
ECP	engineering change proposal
ECL	engineering control level

ECR	explosive containment room
ECV	explosive containment vestibule
EDG	emergency diesel generator
EHM	equipment hydraulic module
EIC	equipment installation contractor
EONC	enhanced onsite container
EPS	emergency power system
ETL	extreme temperature limit
°F	degrees Fahrenheit
FARS	fuzewell assembly (or adapter) removal station
FAWB	functional analysis workbook
FDLL	field design lessons learned (program)
FDPS	fire detection and prevention system
FEET	FAWB evolvement/evaluation team
FEM	fire extinguishing medium
FIFO	first-in-first-out
FIL	activated carbon and HEPA filter
FPD	flame photometric detector
fpm	feet per minute
FSSS	flame safety shutdown system
ft	feet
GA	general arrangement; nerve agent ethyl N-dimethylphosphoramidocyanidate (C <sub>5</sub> H <sub>11</sub> N <sub>2</sub> O <sub>2</sub> P)
gal	gallon
GB	nerve agent Sarin, isopropyl methyl phosphonofluoridate (C <sub>4</sub> H <sub>10</sub> FO <sub>2</sub> P)
GC	gas chromatograph
GDL	gross detection level
GEN	emergency generator
GFE	government-furnished equipment
GLD	gross level detector
GPD	gas plasma display
GPL	general population limit
gpm	gallons per minute
gr	grain
H	blister agent mustard, made by the Levinstein process, bis(2-chloroethyl) sulfide or 2,2'-dichlorodiethyl sulfide (C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub> S <sub>1.5</sub> [empirical formula])
H <sub>3</sub> PO <sub>4</sub>	orthophosphoric acid
HCl	hydrochloric acid
HD	blister agent distilled mustard, bis(2-chloroethyl) sulfide or 2,2'-dichlorodiethyl sulfide (C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub> S)
HDC	heated discharge conveyor
HDV	hydraulic directional control valve
HEPA	high-efficiency particulate air (filter)
HLE	high-level exposure
HOA	hand-off-auto
hp	horsepower
hr	hour
HRA	health risk assessment
HT	60% by weight blister agent distilled mustard and 40% agent T [bis[2(2-chloroethylthio)ethyl] ether]
HVAC	heating, ventilating, and air-conditioning

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HVC	heating, ventilating, and cooling
HYD	hydraulic power
HYPU	hydraulic power unit
HYVM	hydraulic control valve manifold
I/O	input/output
I-lock	interlock
IAS	instrument air system
icfm	inlet cubic foot per minute (acfm at the inlet)
ICS	instrumentation and control system
ID	induced draft
	inside diameter
IDLH	immediately dangerous to life and health
IGS	inertial gas sampling
in.	inch
in. wc.	inches water column
IR	infrared
ISO	International Standards Organization
JACADS	Johnston Atoll Chemical Agent Disposal System
kW	kilowatt
L	Lewisite (blister agent)
LAB	laboratory
lb	pound
lb/hr	pounds per hour
LCO	limiting condition of operation
ln	line
LIC	liquid incinerator
LIFO	last-in-first-out
LIT	level-indicating transmitter
LOQ	limit of quantification
LOR	local-off-remote
LPG	liquefied petroleum gas
LQAP	Laboratory Quality Assurance Plan
LQCP	Laboratory Quality Control Plan
LR	local-remote
LSB	LSS bottle filling system
LSS	life support system
LVS	low volume sampler
mA	milliamperes
MCC	motor control center
	mine component container
MCP	Monitoring Concept Plan
MDB	munitions demilitarization building
MDM	multipurpose demilitarization machine
MEL	master equipment list
MER	mechanical equipment room
mg/m <sup>3</sup>	milligrams per cubic meter
MIG	mine glovebox
MIN	mine machine
MMS	mine and munitions system
MPB	munitions processing bay
MPF	metal parts furnace

MPL	multiposition loader
	maximum permissible limit (for DPE)
MPRS	miscellaneous parts removal station (PMD)
MSB	monitor support building
MSS	munition sampling system
NaOCl	sodium hypochlorite
NaOH	sodium hydroxide
NCRS	nose closure removal station (PMD)
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NG	natural gas
NRT	near real time
O&M	operations and maintenance
OBV	observation corridor
ONC	onsite container
OS	orientation station (MIN)
OSHA	Occupational Safety and Health Administration
OVT	operational verification testing
P&A	precision and accuracy
P&ID	pipng and instrument diagram
PA	public address
PAS	pollution abatement system
PBA	Pine Bluff Arsenal
PBCDF	Pine Bluff Chemical Agent Disposal Facility
PCS	primary cooling system
PCT	preconcentrator tube
PDAR(S)	process data acquisition and recording system
PDE	projectile deformation equipment
PDIT	pressure differential indicator transmitter
PDS	pull and drain station (MDM)
	punch and drain station (MIN)
PFD	process flow diagram
PFS	PAS filter system
pH	potential of hydrogen (a measure of acidity or alkalinity)
PHS	projectile handling system
PID	proportional integral derivative
pig	overpacked shipping container
PKPL	pick-and-place machine (also PPL)
PLA	plant air system
PLC	programmable logic controller
PLL	programmatic lessons learned (program)
PLS	proximity limit sensor/switch
PMB	personnel and maintenance building
PMCD	Program Manager for Chemical Demilitarization
PMCS	Project Manager for Chemical Stockpile Disposal
PMD	projectile/mortar disassembly (machine)
PML	personnel, maintenance, and laundry (complex or building)
POT	potable water
PPL	pick-and-place machine (also PKPL)
PPS	primary power system

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PQAP	Participant Quality Assurance Plan
PRW	process water
PSB	process support building
psig	pounds per square inch, gauge
PSV	pressure safety valve
PUB	process and utility building
PUDA	Pueblo Depot Activity (Colorado)
PWR	power systems (unit substation, uninterruptible power supply, battery rooms, and emergency generator)
RCRA	Resource Conservation and Recovery Act
RDS	rocket drain station
RDTE	research, development, testing, and evaluation
RFI	Request for Information
RHA	residue handling area
RHS	rocket handling system
rpm	revolutions per minute
rps	revolutions per second
RSM	rocket shear machine
RSS	rocket shear station
RTAP	real-time analytical platform
SC	systems contractor
SCBA	self-contained breathing apparatus
scf	standard cubic foot
scfh	standard cubic feet per hour
scfm	standard cubic feet per minute
SCW	secondary cooling water
SCT	systems contractor for training
SDS	spent decon system
sg	specific gravity
SGS	steam generation system
SOP	standing operating procedure
SPS	secondary power system
SRS	slag removal system
TBD	to be determined
TCE	treaty compliance equipment
TEAD	Tooele Army Depot (Utah)
TIP	tray information packet
TM	Army Technical Manual
TMA	toxic maintenance area
TNT	trinitrotoluene (explosive)
TOCDF	Tooele Chemical Agent Disposal Facility
TOX	toxic cubicle
TSCA	Toxic Substances Control Act
TSHS	toxic storage and handling system
TSO	Tight shutoff
TWA	time-weighted average
UE&C	United Engineers and Constructors
UMCDF	Umatilla Chemical Agent Disposal Facility
UPA	unpack area
UPS	uninterruptible power supply
UV	ultraviolet

VCR	video cassette recorder
VX	nerve agent, O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (C <sub>11</sub> H <sub>26</sub> NO <sub>2</sub> PS)
wc	water column
WTS	water treatment system
XXX	3X level of decontamination
XXXXX	5X level of decontamination (minimum of 1000°F for 15 minutes)
Z	general designation for monitoring hazard level



## APPENDIX B

### FAWB Notes

Appendix B contains notes to expand upon the descriptions contained in the text of the FAWB. The notes include related experiences at the Johnston Atoll Chemical Agent Disposal System (JACADS).

- B-1 Per discussions held during the comment resolution matrix meeting for the HVAC FAWB on 9-10-98, the programmatic process FAWBs are being prepared under the assumption that the DUN, DUN PAS and DUN PFS (at ANCDF) systems will not be used for processing at ANCDF, PBCDF, TOCDF, or UMCDF. A programmatic process FAWB for the DUN/DUN PAS/PFS is not being developed. Handling and disposal of dunnage is considered a site-specific activity that has not yet been determined. The DUN, however, is installed at TOCDF and remains in the designs at ANCDF and PBCDF. At UMCDF, the DUN was being removed from the design, however, its use at UMCDF is currently being studied.
- B-2 Per discussions held during the comment resolution matrix meeting for the PAS FAWB on 11-10-98, the programmatic process FAWBs for the PAS and PFS have been combined into a single PAS/PFS FAWB that applies to ANCDF, PBCDF, TOCDF, and UMCDF.
- B-3 The acid/caustic storage and wash system is no longer used at TOCDF and has been removed from the ANCDF, UMCDF, and PBCDF site designs by ECPs ANAC343PAS, R1, UMAC160PAS, R1, and PBAC340PAS, respectively.
- B-4 All munition throughput rates were specified in the document, Estimated Throughput Rates at CSDP Sites with Bases for Estimates, May 1992. The PBCDF ton container peak throughput rates specified in the PBCDF Process Design Basis, December 1998, incorrectly show an agent draining rate of 5.8 munitions/hour. Per the DSIC, the PBCDF Process Design Basis will be revised in a future revision. The TOCDF and UMCDF spray tank design throughput rates specified in the TOCDF Process Design Basis, July 1995, and the UMCDF Process Design Basis, April 1998, show peak rates of 2.90 munitions/hour for the BDS and 1.0 munitions/hour for the MPF, which are different than the rates shown in Table 2.3. Direction given in CPA-839, dated 5/12/1992 revised the throughput rates in Estimated Throughput Rates at CSDP Sites with Bases for Estimates. Direction has not been received to revise the TOCDF and UMCDF Process Design Basis spray tank design throughput rates.

- B-5 Under ECP TEMP-2285-BDS, TOCDF removed the drip pans and actuators from the BDS machines, and the control logic from the software. The FDLL reviewed this ECP and recommended this change for implementation at follow-on sites. *BDS drip pans and actuators were removed by ECPs PBAP1359PUB and UMSF724BDS at PBCDF and UMCDF, respectively. At ANCDF, BDS drip pans were not installed and the change was documented under ECP ANWC1483SRL that incorporated redlines of as-installed equipment.*
- B-6 JACADS encountered problems with drain tube operation during the MK-94 campaign. Modifications made to the BDS drain tube were captured in JACADS ECP BDSS-0005. A similar drain tube configuration will be used at UMCDF for MK-94 processing.
- B-7 In 1997, the CDTF developed a revised BDS processing sequence for weteye bombs that drains agent from three holes rather than two, as specified in the current weteye bomb BDS sequence. The revised sequence was developed to address the concern that crystallized GB agent could restrict agent flow from the center cavity to the front and back cavities, resulting in an insufficient drain. *TOCDF incorporated this sequence under ECP TEMP2627BDS. TOCDF furthered modified the sequence to include drilling through the bomb and shipping container to allow any agent heel to drain from the bomb into the cradle.*
- B-8 ACAMS monitoring of the tray input bypass/spray tank conveyor 2 and airlock assembly, MMS-CNVP-103/104, was added at TOCDF by ECP TEMP-2468-ECV. Implementation of a similar system is under consideration for the follow-on sites.
- B-9 The charge car has sufficient time to retrieve a tray from storage and take it to the MPB and to then retrieve a tray from the munitions lines and take it to storage. The concept of using a last-in-first-out (LIFO) buffering scheme was discussed and was discarded for these reasons. The proposed LIFO scheme essentially treated the tray discharge conveyors as extra buffer positions. Because the MPL filled tray discharges directly onto the tray discharge conveyors, the discharge conveyors would always be the last filled position in the buffer whenever they were ready and the MPB was ready. If the MPB was not ready, the buffer storage conveyors would be loaded. Once these buffer storage conveyors were loaded, they would be used only after the tray discharge conveyors were first serviced.
- B-10 Even though the PBCDF design includes tray conveyors in the second-floor UPA, ECV, and munitions corridor similar to ANCDF, TOCDF, and UMCDF, these conveyors are not used during the bulk campaign at PBCDF. Therefore, they are not discussed in the BCHS FAWB. Discussions related to operation of these conveyors and associated equipment are included in the MHS FAWB.
- B-11 Automatic sampling systems are not used at TOCDF and *will not* be used at the follow-on sites (see TCE programmatic process FAWB, Book 32).

- B-12 Under multiple ECPs, including TEMP2655BDS, TEMP2656MDB, TEMP2657MDB, BDS TEMP2658BDS, and TEMP2659MDB, TOCDF modified MMS-BDS-101 to process "mercury ton containers," GB ton containers that had high levels of mercury contamination. Wash and drain probes were installed for dispensing 18% NaOH, 2% HCl, and water for washout and rinsing the containers. Significant facility modifications were made to support mercury ton container processing, including addition of a conditioning and settling system, and installation of an x-ray fluorescence analyzer for detection of mercury and other metals in the agent and the rinse from the containers. MMS-BDS-101 was returned to baseline configuration for VX ton container processing by ECP TEMP2833BDS .*
- B-13 The final sequence of operations for weteye bomb processing was modified by TOCDF and sequencer tables were not updated to reflect the final sequencer steps. Since there are no weteye bombs remaining to be processed, the outdated sequence of operations in Section 3.3.5 and the sequencers tables in Appendix D have been deleted from the FAWB.*
- B-14 The original spray tank punch sequence did not include lowering the conveyor lift while punching. A revised sequence has been developed at the CDTF that includes lowering the lift during spray tank punching. It is expected that the revised sequence will be used at TOCDF and UMCDF, therefore, the FAWB was revised to include it.*
- B-15 Only TOCDF and UMCDF have spray tanks to process, which include use of the BDS drill fixture. Even though the ANCDF PLC code has logic for the drill devices, it is not listed in Appendix D since the drill devices will not be used there.*



## APPENDIX C

### Alarm and Interlock Matrices

Appendix C contains *alert tables, alarm and system response tables, and* alarm and interlock (A&I) matrices for the BCHS.

*The alert tables and alarm and system response tables list the instrument tag number, a description of the instrument, and the system response to the alarm/alert. Alert tables were created to implement recommendations from studies that reclassified many of the alarms to be alerts. The alert classification was created to distinguish between conditions that require immediate operation response (alarms) and those that don't (alerts). Alerts are indicated differently on the CON Advisor screens and are not accompanied by audible annunciation in the CON.*

*This appendix includes tables listing alerts and alarms associated with the bypass lines at ANCDF, TOCDF, and UMCDF, and the bulk drain stations at all sites. Because of differences between the bypass line alarm/alert configuration at TOCDF and ANCDF/UMCDF, the bypass line alarms and alerts are presented in two sets of tables. One set applies to ANCDF and UMCDF, and the other set applies to TOCDF only. For the BDS alarms and alerts, there are also differences between sites. Therefore, ANCDF and UMCDF BDS alarms and alerts are presented in one set of tables, and PBCDF and TOCDF BDS alarms and alerts are presented separately in site-specific tables.*

A&I matrices depict in a consolidated format the software and hardware alarms and interlocks for the equipment and instrumentation in a specific system. For the BCHS, *nine* A&I matrices are presented *that apply to ANCDF, PBCDF, and UMCDF. The A&I matrices depict software interlocks* associated with a specific conveyor line or BDS. *PLC interlocks for this equipment are also presented in Appendix D, which has been verified with the current code for ANCDF, TOCDF, and UMCDF. The matrices in this appendix were provided by the EIC in 1998 and have not been verified.* The 9 matrices are:

- (1) Bypass Line A
- (2) Bypass Line B
- (3) MDB Second Floor Buffer Storage Area
- (4) MPB Conveyor Line A
- (5) MPB Conveyor Line B
- (6) Bulk Drain Station – Line A
- (7) Bulk Drain Station – Line B
- (8) BSA and Lower Munitions Corridor – Matrix 1
- (9) BSA and Lower Munitions Corridor – Matrix 2

*Two A&I matrices apply to PBCDF only. A&I matrices depicting the PBCDF bulk drain room conveyor logic and the dunnage processing line were developed by the EIC for the PBCDF systems contractor (ref. PBSP1713MDB).*

Specific guidelines were developed during development of utility system FAWBs for ANCDF and UMCDF that will be followed in the programmatic FAWBs<sup>1</sup>. Fourteen specific guidelines have been established that define the format and content of entries in the A&I matrices:

1. Analog signals from transmitters (e.g., LITs) are not listed; the alarms are indicated separately.
2. All software prealarms and alarms (e.g., LAHs) that are indicated in the CON are listed. Setpoints and actions are shown where applicable.
3. Equipment and instrument status indication signals (e.g., open/close, on/off) are not listed unless they initiate action.
4. Alarms generated from GFE package units that report to the PLC are listed. If not already available and listed, the GFE internal alarms and actions will be added to the matrix when available from the site systems contractor and “SC to provide detail” will be entered into the “remarks” column.
5. For field switch generated alarms, the switch tag is listed, not the alarm tag. For example, a low-low pressure alarm (PALL) generated by the field switch, 13-PSLL-008, is listed as 13-PSLL-008 rather than 13-PALL-008. The purpose for this listing is to distinguish between field switch generated hardwired alarms and alarms generated in the software based on the analog output from a transmitter.
6. Instruments that initiate actions are listed in a vertical column sorted by prefix, loop number, instrument ID, then suffix. For example, for 99-TSH-100A, the prefix is 99, the loop number is 100, the instrument ID is TSH, and the suffix is A). Actions are listed in column across the top of the matrix and include prealarms and alarms.
7. Setpoints are listed for all instruments where applicable. Instrument ranges for analog transmitters are shown in Appendix F. Unless otherwise noted, tank level setpoints are shown from the level transmitter tap.
8. Only hand switches (push buttons) that cause system shutdowns are listed; other software and hardwired hand switches are not listed.
9. Local alarms are not listed.
10. Matrices are grouped by subsystem as applicable within each FAWB. For example, separate matrices are provided in the RHS FAWB for the rocket input feed assembly, the rocket drain station of the RSM, and the rocket shear station of the RSM.

11. Alarms associated with automatic actions are classified as “alarms” and alarms without automatic actions are classified as “prealarms.”
12. Instruments listed in the matrix that are RCRA reportable are designated as such by entering “RCRA” in the Remarks column.
13. Clarifications are provided when necessary in the remarks column of the A&I matrices, or in the system and/or operator response column in alarm and system response tables.
14. Device malfunction alarms are not shown unless they initiate automatic actions such as equipment switchovers (e.g., to a standby pump), system shutdowns, or a stop feed signal.

## ANCDF & UMCDF ALERT TABLE

### BYPASS LINES A and B

ANCDF P&IDs: AN-1-D-505,-506,511/1,-511/2,-512; PLCs: ICS-CONR-101B/104B; INTERLOCK I-1  
UMCDF P&IDs: UM-1-D-505,-506,511/1,-511/2,-512; PLCs: ICS-CONR-101B/104B; INTERLOCK I-1

LN	BYPASS LN A TAG NUMBER	BYPASS LN B TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALERT BIT B001:XX/XX
1	02-ZS-123	02-ZS-223	(AN ONLY) MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MUNITON FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL	ALARM AT UM.	621/04
2	02-XA-127	02-XA-227	(AN ONLY) MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALARM AT UM. MALFUNCTION FOR 02-HS-125[225].	662/11
3	02-XA-131	02-XA-231	(AN & UM LINE A ONLY) MMS-CNVP-101 [102] BYPASS CONVEYOR #1 MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	02-XA-231 IS AN ALARM AT UM. MALFUNCTION FOR 02-HS-129[229].	660/11
4	02-HS-245	02-HS-305	(AN ONLY) MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALARM AT UM.	663/11
5	04-ZS-102	04-ZS-202	MMS-CNVP-109 [110] INDEX HYD CONVEYOR FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL		621/12
6	04-HS-108A	04-HS-209C	(AN ONLY) MMS-CNVP-109 [110] INDEX HYD CONVEYOR CLAMP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALERT IS LISTED IN UM ALARM/ALERT STUDY, BUT IT IS NOT IN THE UM PLC CODE.	670/11
7	04-ZS-110	04-ZS-210	MMS-CNVP-109 [110] INDEX HYD CONVEYOR FAIL TO ARRIVE @ EXPECTED POSITION	STOP & PLACE DEVICE IN MANUAL		621/14
8	04-ZS-111	04-ZS-211	MMS-CNVP-111 [112] BYPASS CONVEYOR #6 MUNITON FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL		621/16
9	04-HS-121A	04-HS-208A	MMS-CNVP-109 [110] INDEX HYD CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		669/11
10	04-XA-129	04-XA-229	MMS-CNVP-111 [112] TRAY DISCHARGE CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	MALFUNCTION FOR 04-HS-126[226].	671/11
11	04-HS-329	NA	(AN LINE A ONLY) MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALARM AT UM. 04-HS-325 IS AN ALARM AT AN.	668/11
12	04-HS-331	04-HS-327	MMS-CNVP-111 [112] TRAY DISCHARGE CONV MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		672/11
13	BLAINITAL	BLBINITAL	BYPASS LINE A [LINE B] INITIALIZE MALFUNCTION	ALERT & STOP SEQUENCE		674/11
14	BLAXFRTCC	BLBXFRTCC	MMS-CNVP-111 [112] TRAY TO CHARGE CAR FAIL TO TRANSFER	STOP & PLACE DEVICE IN MANUAL		622/00
15	TIPA_FULL	TIPB_FULL	MASTER TRAY FILE IS FULL	STOP & PLACE DEVICES IN MANUAL		622/02

## ANCDF & UMCDF ALARM AND SYSTEM RESPONSE

### BYPASS LINES A and B

ANCDF P&IDs: AN-1-D-505,-506,511/1,-511/2,-512; PLCs: ICS-CONR-101B/104B; INTERLOCK I-1  
UMCDF P&IDs: UM-1-D-505,-506,511/1,-511/2,-512; PLCs: ICS-CONR-101B/104B; INTERLOCK I-1

LN	BYPASS LN A TAG NUMBER	BYPASS LN B TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALARM BIT B001:XX/XX
1	02-ZS-123	02-ZS-223	(UM ONLY) MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MUNITION FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL	ALERT AT AN.	621/04
2	02-XA-127	02-XA-227	(UM ONLY) MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALERT AT AN. MALFUNCTION FOR 02-HS-125[225].	662/11
3	02-XS-193A/B	02-XS-293A/B	MMS-CNVP-101 [102] BYPASS CONVEYOR #1 ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/00
4	NA	02-XA-231	(UM LINE B ONLY) MMS-CNVP-101 [102] BYPASS CONVEYOR #1 MALFUNCTION	ALARM & INTERLOCK DEVICE	ALERT AT AN. 02-XA-131 IS AN ALERT AT UM. MALFUNCTION FOR 02-HS-129[229].	660/11
5	02-HS-245	02-HS-305	(UM ONLY) MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALERT AT AN.	663/11
6	02-XA-282	02-XA-391	UPA-FDDR-101 [102] TRAY INPUT AIRLOCK FEED GATE MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 02-HS-281[390].	661/11
7	04-XS-132A/B	04-XS-232A/B	MMS-CNVP-109 [110] BYPASS INDEX HYD CONVEYOR ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/06
8	04-XS-133A/B	04-XS-233A/B	MMS-CNVP-111 [112] TRAY DISCHARGE CONVEYOR ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/10
9	04-XS-157A/B	04-XS-257A/B	MMS-CNVP-105 [106] BYPASS CONVEYOR #3 ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/02
10	04-XS-158A/B	04-XS-258A/B	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/04
11	04-ZS-177	04-ZS-277	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MUNITION FAIL TO ARRIVE	ALARM & INTERLOCK DEVICE		621/10
12	04-XA-181	04-XA-281	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-179[279].	667/11
13	04-ZS-184	04-ZS-284	MMS-CNVP-105 [106] BYPASS CONVEYOR #3 MUNITION FAIL TO ARRIVE	ALARM & INTERLOCK DEVICE		621/06
14	04-XA-189	04-XA-289	MMS-CNVP-105 [106] BYPASS CONVEYOR #3 MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-187[287].	665/11
15	04-XA-247	04-XA-315	COR-GATE-101 [102] BYPASS CONVEYOR PROCESS GATE MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-257[318].	666/11
16	04-XA-279	04-XA-386	ECV-FDDR-105 [106] TRAY INPUT AIRLOCK GATE MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-277[384].	664/11
17	04-HS-329	04-HS-325	(UM & AN LINE B ONLY) MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	04-HS-329 IS AN ALERT AT AN.	668/11
18	71-XS-009A	71-XS-010A	LINE A [LINE B] BYPASS LINE E-STOP CONS 110	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		620/12
19	71-XS-029A	71-XS-030A	LINE A [LINE B] BYPASS LINE E-STOP CONS 112	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		620/14
20	71-XS-089A	71-XS-090A	LINE A [LINE B] BYPASS LINE E-STOP CONS 113	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		620/16
21	71-XS-109A	71-XS-110A	LINE A [LINE B] BYPASS LINE E-STOP CONS 114	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		621/00
22	71-XS-129A	71-XS-130A	LINE A [LINE B] BYPASS LINE E-STOP CONS 116	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		621/02
23	71-XS-149A	71-XS-150A	LINE A [LINE B] BYPASS LINE E-STOP CONS 109	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		622/04

<b>TOCDF ALERT TABLE</b> <b>BYPASS LINES A and B</b> P&IDs: TE-1-D-505,-506,511/1,-511/2,-512; PLCs: ICS-CONR-101B/104B; INTERLOCK I-1							
LN	BYPASS LN A TAG NUMBER	BYPASS LN B TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALERT BIT B001:XX/XX	
1	02-ZS-123	02-ZS-223	MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MUNITON FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL		621/04	
2	02-XA-127	02-XA-227	MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	MALFUNCTION FOR 02-HS-125[225].	662/11	
3	02-XA-131	02-XA-231	MMS-CNVP-101 [102] BYPASS CONVEYOR #1 MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	MALFUNCTION FOR 02-HS-129[229].	660/11	
4	02-HS-245	02-HS-305	MMS-CNVP-103 [104] BYPASS CONVEYOR #2 MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		663/11	
5	02-XA-282	02-XA-391	UPA-FDDR-101 [102] TRAY INPUT AIRLOCK FEED GATE MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 02-HS-281[390].	661/11	
6	04-ZS-102	04-ZS-202	MMS-CNVP-109 [110] INDEX HYD CONVEYOR FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL		621/12	
7	04-HS-108A	04-HS-209C	MMS-CNVP-109 [110] INDEX HYD CONVEYOR CLAMP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		670/11	
8	04-ZS-110	04-ZS-210	MMS-CNVP-109 [110] INDEX HYD CONVEYOR FAIL TO ARRIVE @ EXPECTED POSITION	STOP & PLACE DEVICE IN MANUAL		621/14	
9	04-ZS-111	04-ZS-211	MMS-CNVP-111 [112] BYPASS CONVEYOR #6 MUNITON FAIL TO ARRIVE	STOP & PLACE DEVICE IN MANUAL		621/16	
10	04-HS-121A	04-HS-208A	MMS-CNVP-109 [110] INDEX HYD CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		669/11	
11	04-XA-129	04-XA-229	MMS-CNVP-111 [112] TRAY DISCHARGE CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	MALFUNCTION FOR 04-HS-126[226].	671/11	
12	04-ZS-177	04-ZS-277	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MUNITON FAIL TO ARRIVE	ALARM & INTERLOCK DEVICE		621/10	
13	04-XA-181	04-XA-281	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-179[279].	667/11	
14	04-ZS-184	04-ZS-284	MMS-CNVP-105 [106] BYPASS CONVEYOR #3 MUNITON FAIL TO ARRIVE	ALARM & INTERLOCK DEVICE		621/06	
15	04-XA-189	04-XA-289	MMS-CNVP-105 [106] BYPASS CONVEYOR #3 MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-187[287].	665/11	
16	04-XA-247	04-XA-315	COR-GATE-101 [102] BYPASS CONVEYOR PROCESS GATE MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-257[318].	666/11	
17	04-XA-279	04-XA-386	ECV-FDDR-105 [106] TRAY INPUT AIRLOCK GATE MALFUNCTION	ALARM & INTERLOCK DEVICE	MALFUNCTION FOR 04-HS-277[384].	664/11	
18	04-HS-329	04-HS-325	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		668/11	
19	04-HS-331	04-HS-327	MMS-CNVP-111 [112] TRAY DISCHARGE CONV MUNITION STOP MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		672/11	
20	BLAINITAL	BLBINITAL	BYPASS LINE A [LINE B] INITIALIZE MALFUNCTION	ALERT & STOP SEQUENCE		674/11	
21	BLAXFRGCC	BLBXFRGCC	MMS-CNVP-111 [112] TRAY TO CHARGE CAR FAIL TO TRANSFER	STOP & PLACE DEVICE IN MANUAL		622/00	
22	TIPA_FULL	TIPB_FULL	MASTER TRAY FILE IS FULL	STOP & PLACE DEVICES IN MANUAL		622/02	

## TOCDF ALARM AND SYSTEM RESPONSE BYPASS LINES A and B

P&IDs: TE-1-D-505,-506,511/1,-511/2,-512; PLCs: ICS-CONR-101B/104B; INTERLOCK I-1

LN	BYPASS LN A TAG NUMBER	BYPASS LN B TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALARM BIT B001:XX/XX
1	02-XS-193A/B	02-XS-293A/B	MMS-CNVP-101 [102] BYPASS CONVEYOR #1 ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/00
2	04-XS-132A/B	04-XS-232A/B	MMS-CNVP-109 [110] BYPASS INDEX HYD CONVEYOR ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/06
3	04-XS-133A/B	04-XS-233A/B	MMS-CNVP-111 [112] TRAY DISCHARGE CONVEYOR ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/10
4	04-XS-157A/B	04-XS-257A/B	MMS-CNVP-105 [106] BYPASS CONVEYOR #3 ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/02
5	04-XS-158A/B	04-XS-258A/B	MMS-CNVP-107 [108] BYPASS CONVEYOR #4 ROPE SWITCH	ALARM & INTERLOCK DEVICE		620/04
6	71-XS-009A	71-XS-010A	LINE A [LINE B] BYPASS LINE E-STOP CONS 110	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		620/12
7	71-XS-029A	71-XS-030A	LINE A [LINE B] BYPASS LINE E-STOP CONS 112	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		620/14
8	71-XS-089A	71-XS-090A	LINE A [LINE B] BYPASS LINE E-STOP CONS 113	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		620/16
9	71-XS-109A	71-XS-110A	LINE A [LINE B] BYPASS LINE E-STOP CONS 114	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		621/00
10	71-XS-129A	71-XS-130A	LINE A [LINE B] BYPASS LINE E-STOP CONS 116	ALARM & INTERLOCK BYPASS LINE A [LINE B] DEVICES		621/02

**ANCDF, UMCDF BDS ALERT TABLE**  
**BULK DRAIN STATIONS 101/102 (MMS-BDS-101/102)**  
P&IDs: AN/UM-1-D-514,-515; PLC: ICS-CONR-103A/103B; INTERLOCK I-4

LN	BDS 101 TAG NUMBER	BDS 102 TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALERT BIT B001:XX/XX
1	49-01-101	49-02-101	(AN ONLY) BDS-CNVP-101[102] BULK DRAIN CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALARM AT UMCDF	862/11
2	49-01-102	49-02-102	BDS-CNVP-101[102] BULK DRAIN CONVEYOR LIFT MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		661/11
3	49-01-103	49-02-103	MMS-BDS-101[102] BULK DRAIN PUNCH MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		662/11
4	49-01-104	49-02-104	MMS-BDS-101[102] BULK DRAIN DRAIN TUBE MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		663/11
5	51-PSH-060	51-PSH-050	MMS-BDS-101[102] BULK DRAIN AGENT STILL DETECTED	ALERT & STOP SEQUENCE	BDS-102 TAG NUMBER IS FROM P&ID. PLC CODE IDENTIFIES THIS ALERT AS 51-PSH-070.	620/14
6	51-PSL-060	51-PSL-050	MMS-BDS-101[102] BULK DRAIN NO AGENT DETECTED	ALERT & STOP SEQUENCE	BDS-102 TAG NUMBER IS FROM P&ID. PLC CODE IDENTIFIES THIS ALERT AS 51-PSL-070.	620/16
7	51-PDIT-066	51-PDIT-067	MMS-BDS-101[102] AGENT DRAIN STRAINER DIFF PRESS HIGH	ALERT ONLY	SP=8 IN WC.	650/04
8	51-XV-396	51-XV-496	MMS-BDS-101[102] DRAIN PUMP BLOCK VALVE MALFUNCTION	ALERT & PLACE DEVICE IN MANUAL		666/11
9	BDAINIT	BDBINIT	MMS-BDS-101[102] BULK DRAIN INITIALIZE FAILURE	ALERT & STOP SEQUENCE		675/11
10	BDANOTDRN	BDBNOTDRN	MMS-BDS-101[102] MUNITION DRAINING FAILURE	ALERT ONLY		620/00
11	BDASYPARK	BDBSYPARK	MMS-BDS-101[102] BULK DRAIN PARK FAILURE	ALERT & STOP SEQUENCE		676/11

NOTE: "49-XV-410[420] MMS-BDS-101[102] DRIP PAN ACTUATOR MALFUNCTION" IS LISTED AS AN ALERT IN ANCDF ALARM/ALERT STUDY, AND PLC CODE REMAINS TO OPERATE IT. PER ECP ANWC1483SRL, THE BDS DRIP PANS WERE NOT INSTALLED (SEE FAWB NOTE B-5).

## ANCDF, UMCDF BDS ALARM AND SYSTEM RESPONSE

### BULK DRAIN STATIONS 101/102 (MMS-BDS-101/102)

P&IDs: AN/UM-1-D-514,-515; PLC: ICS-CONR-103A/103B; INTERLOCK I-4

LN	BDS 101 TAG NUMBER	BDS 102 TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALARM BIT B001:XX/XX
1	49-01-101	49-02-101	(UM ONLY) BDS-CNVP-101[102] BULK DRAIN CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	ALERT AT ANCDF	862/11
2	49-XS-156A/B	49-XS-256A/B	BDS-CNVP-101[102] BULK DRAIN CONVEYOR ROPE SWITCH	ALARM & INTERLOCK BDS AND LINE A [LINE B] DEVICES		821/16
3	49-HS-190	49-HS-290	MMS-BDS-101[102] BULK DRAIN LINE LOCAL E-STOP	ALARM & INTERLOCK BDS AND LINE A [LINE B] DEVICES		620/10
4	49-XV-262	49-XV-464	(UM ONLY) MMS-BDS-101[102] BULK DRAIN DRILL CARRIAGE MALFUNCTION	ALARM, STOP & PLACE DRILL CARRIAGE IN MANUAL	USED FOR SPRAY TANKS AT UMCDF	669/11
5	49-ZS-263	49-ZS-463	(UM ONLY) MMS-BDS-101[102] BULK DRAIN DRILL BIT NOT PRESENT	ALARM ONLY	USED FOR SPRAY TANKS AT UMCDF	620/12
6	51-XV-301	51-XV-401	BDS-FILT-101[102] INLET VALVE MALFUNCTION	ALARM & DEENERGIZE 3-WAY FILTER VALVES (ALIGN TO FILTER A)		672/11
7	51-XV-302	51-XV-402	BDS-FILT-101[102] OUTLET VALVE MALFUNCTION	ALARM & DEENERGIZE 3-WAY FILTER VALVES (ALIGN TO FILTER A)		673/11
8	71-XS-011A	71-XS-011B	MPB SYSTEM SHIFT SUPERVISOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/00
9	71-XS-031A	71-XS-031B	MPB SYSTEM LEAD OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/02
10	71-XS-091A	71-XS-091B	MPB SYSTEM DEMIL OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/04
11	71-XS-111A	71-XS-111B	MPB SYSTEM DEMIL OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/10
12	71-XS-131A	71-XS-131B	MPB SYSTEM DEMIL/FURNACE OPER CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/10
13	71-XS-151A	71-XS-151B	MPB SYSTEM DEMIL OPERATOR CONTROL CONSOLE 109 E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	822/06
14	BDA_AGENT	BDB_AGENT	MMS-BDS-101[102] INSUFFICIENT AGENT DRAINED	ALARM & INTERLOCK 51-XV-396[496]		620/06
15	BDA_PDAR	BDB_PDAR	MMS-BDS-101[102] PDAR WAS UNABLE TO READ BULK WTS	ALARM ONLY		620/02
16	BDAPM	BDBPM	(UM ONLY) MMS-BDS-101[102] PREVENTIVE MAINTENANCE DUE (>100 ITEMS)	ALARM ONLY		621/00

NOTE 1: Each CON console has a single E-stop that shuts down both MPB processing lines. Switch inputs to PLCs are tagged with an A, B, and C suffix in ICS-CONR-103A, -103B, and -103C, respectively.

**PBCDF BDS ALERT TABLE**  
**BULK DRAIN STATION 101 (MMS-BDS-101)**  
 P&IDs: PB-1-D-515; PLC: ICS-CONR-103A; INTERLOCK I-4

LN	TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALERT BIT B001:XX/XX
1	49-01-102	BDS-CNVP-101 BULK DRAIN CONVEYOR LIFT MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		661/11
2	49-01-103	MMS-BDS-101 BULK DRAIN PUNCH MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		662/11
3	49-01-104	MMS-BDS-101 BULK DRAIN DRAIN TUBE MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		663/11
4	51-PSH-060	MMS-BDS-101 BULK DRAIN AGENT STILL DETECTED	ALERT & STOP SEQUENCE		620/14
5	51-PSL-060	MMS-BDS-101 BULK DRAIN NO AGENT DETECTED	ALERT & STOP SEQUENCE		620/16
6	51-PDIT-066	MMS-BDS-101 AGENT DRAIN STRAINER DIFF PRESS HIGH	ALERT ONLY	SP=8 IN WC.	650/04
7	51-XV-396	MMS-BDS-101 DRAIN PUMP BLOCK VALVE MALFUNCTION	ALERT & PLACE DEVICE IN MANUAL		666/11
8	BDSINIT	MMS-BDS-101 BULK DRAIN INITIALIZE FAILURE	ALERT & STOP SEQUENCE		675/11
9	BDSNOTDRN	MMS-BDS-101 MUNITION DRAINING FAILURE	ALERT ONLY		620/00
10	BDSSYPARK	MMS-BDS-101 BULK DRAIN PARK FAILURE	ALERT & STOP SEQUENCE		676/11

NOTE: ECP PBSF1808STE, R1 ALSO LISTS "49-XV-410 BDS-101 DRIP PAN ACTUATOR MALFUNCTION" AS AN ALERT. THE DRIP PAN WAS DELETED BY ECP PBAP1359PUB (SEE FAWB NOTE B-5).

## PBCDF BDS ALARM AND SYSTEM RESPONSE

### BULK DRAIN STATION 101 (MMS-BDS-101)

P&IDs: PB-1-D-515; PLC: ICS-CONR-103A; INTERLOCK I-4

LN	TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALARM BIT B001:XX/XX
1	49-01-101	BDS-CNVP-101 BULK DRAIN CONVEYOR MALFUNCTION	ALARM, STOP & PLACE DEVICE IN MANUAL	ON ADVISOR SCREEN BDR	076/11
2	49-XS-156A/B	BDS-CNVP-101 BULK DRAIN CONVEYOR ROPE SWITCH	ALARM & INTERLOCK BDS LINE DEVICES		021/16
3	49-HS-190	MMS-BDS-101 BULK DRAIN LINE LOCAL E-STOP	ALARM & INTERLOCK BDS DEVICES		620/10
4	51-XV-301	BDS-FILT-101 INLET VALVE MALFUNCTION	ALARM & DEENERGIZE 3-WAY FILTER VALVES (ALIGN TO FILTER A)		672/11
5	51-XV-302	BDS-FILT-101 OUTLET VALVE MALFUNCTION	ALARM & DEENERGIZE 3-WAY FILTER VALVES (ALIGN TO FILTER A)		673/11
6	71-XS-011A	BDS ROOM SHIFT SUPERVISOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES		021/00
7	71-XS-031A	BDS ROOM LEAD OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES		021/02
8	71-XS-091A	BDS ROOM DEMIL OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES		021/04
9	71-XS-131A	BDS ROOM DEMIL/FURNACE OPER CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES		021/10
10	71-XS-151A	BDS ROOM DEMIL OPERATOR CONTROL CONSOLE 109 E-STOP	ALARM, INTERLOCK MACHINE DEVICES		022/06
11	BDS_AGENT	MMS-BDS-101 INSUFFICIENT AGENT DRAINED	ALARM & INTERLOCK 51-XV-396		620/06
12	BDS_PDAR	MMS-BDS-101 PDAR WAS UNABLE TO READ BULK WEIGHTS	ALARM ONLY		620/02
13	BDS_PPM	MMS-BDS-101 PREVENTIVE MAINTENANCE DUE (>100 ITEMS)	ALARM ONLY		621/00
14	P4SENSOR	MMS-BDS-101 TRANSFER TO P4 (VENT PUNCH) FAIL TO ARRIVE	ALARM & INTERLOCK DEVICE		622/02

## TOCDF BDS ALERT TABLE

### BULK DRAIN STATIONS 101/102 (MMS-BDS-101/102)

P&IDs: EG-1-D-514,-515,-4902 TE-1-D-514,-515,-516,-517; PLC: ICS-CONR-103A/103B; INTERLOCK I-4

LN	BDS 101 TAG NUMBER	BDS 102 TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALERT BIT B001:XX/XX
1	49-01-101	49-02-101	BDS-CNVP-101[102] BULK DRAIN CONVEYOR MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		862/11
2	49-01-103	49-02-103	MMS-BDS-101[102] BULK DRAIN PUNCH MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		662/11
3	49-01-104	49-02-104	MMS-BDS-101[102] BULK DRAIN DRAIN TUBE MALFUNCTION	STOP & PLACE DEVICE IN MANUAL		663/11
4	49-XV-105	49-XV-205	MMS-BDS-101[102] BULK DRAIN DRILL CARRIAGE MALFUNCTION	STOP & PLACE DRILL CARRIAGE IN MANUAL		669/11
5	49-ZS-130	49-ZS-230	MMS-BDS-101[102] BULK DRAIN DRILL BIT NOT PRESENT	ALERT ONLY		620/12
6	49-9104AO	NA	MMS-BDS-101 BULK DRAIN ULTRASONIC LEVEL SWITCH MALFUNCTION	STOP & PLACE DEVICE IN MANUAL	NO ALERT FOR MMS-BDS-102	691/11
7	51-PSH-060	51-PSH-061	MMS-BDS-101[102] BULK DRAIN AGENT STILL DETECTED	ALERT & STOP SEQUENCE		620/14
8	51-PSL-060	51-PSL-061	MMS-BDS-101[102] BULK DRAIN NO AGENT DETECTED	ALERT & STOP SEQUENCE		620/16
9	51-PDIT-066	51-PDIT-067	MMS-BDS-101[102] AGENT DRAIN STRAINER DIFF PRESS HIGH	ALERT ONLY	SP=100 IN WC.	650/04
10	51-XV-301	51-XV-401	BDS-FILT-101[102] INLET VALVE MALFUNCTION	ALERT & DEENERGIZE 3-WAY FILTER VALVES (ALIGN TO FILTER A)		672/11
11	51-XV-302	51-XV-402	BDS-FILT-101[102] OUTLET VALVE MALFUNCTION	ALERT & DEENERGIZE 3-WAY FILTER VALVES (ALIGN TO FILTER A)		673/11
12	51-XV-396	51-XV-496	MMS-BDS-101[102] DRAIN PUMP BLOCK VALVE MALFUNCTION	ALERT, PLACE DEVICE IN MANUAL, & INTERLOCK THE VALVE		666/11
13	BDA_AGENT	BDB_AGENT	MMS-BDS-101[102] INSUFFICIENT AGENT DRAINED	ALERT ONLY		620/06
14	BDAINIT	BDBINIT	MMS-BDS-101[102] BULK DRAIN INITIALIZE FAILURE	ALERT & STOP SEQUENCE		675/11
15	BDANOTDRN	BDBNOTDRN	MMS-BDS-101[102] MUNITION DRAINING FAILURE	ALERT ONLY		620/00
16	NA	BDBOILPM	MMS-BDS-102 DRILL BIT OILER PM DUE	ALERT ONLY	NO ALERT FOR MMS-BDS-101	623/11
17	BDA_PDAR	BDB_PDAR	MMS-BDS-101[102] PDAR WAS UNABLE TO READ BULK WTS	ALERT ONLY		620/02
18	BDAPM	BDBPM	MMS-BDS-101[102] PREVENTIVE MAINTENANCE DUE (>100 ITEMS)	ALERT ONLY		621/11
19	BDASYPARK	BDBSYPARK	MMS-BDS-101[102] BULK DRAIN PARK FAILURE	ALERT & STOP SEQUENCE		676/11

## TOCDF BDS ALARM AND SYSTEM RESPONSE

### BULK DRAIN STATIONS 101/102 (MMS-BDS-101/102)

P&IDs: EG-1-D-514,-515,-4902 TE-1-D-514,-515,-516,-517; PLC: ICS-CONR-103A/103B; INTERLOCK I-4

LN	BDS 101 TAG NUMBER	BDS 102 TAG NUMBER	DESCRIPTION	SYSTEM RESPONSE	REMARKS	ALARM BIT B001:XX/XX
1	49-01-102	49-02-102	BDS-CNVP-101[102] BULK DRAIN CONVEYOR LIFT MALFUNCTION	ALARM & INTERLOCK DEVICE		661/11
2	49-XS-156A/B	49-XS-256A/B	BDS-CNVP-101[102] BULK DRAIN CONVEYOR ROPE SWITCH	ALARM & INTERLOCK BDS AND LINE A [LINE B] DEVICES		821/16
3	49-HS-190	49-HS-290	MMS-BDS-101[102] BULK DRAIN LINE LOCAL E-STOP	ALARM & INTERLOCK DEVICE		620/10
4	71-XS-011A	71-XS-011B	MPB SYSTEM SHIFT SUPERVISOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/00
5	71-XS-031A	71-XS-031B	MPB SYSTEM LEAD OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/02
6	71-XS-091A	71-XS-091B	MPB SYSTEM DEMIL OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/04
7	71-XS-111A	71-XS-111B	MPB SYSTEM DEMIL OPERATOR CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/10
8	71-XS-131A	71-XS-131B	MPB SYSTEM DEMIL/FURNACE OPER CONTROL CONSOLE E-STOP	ALARM, INTERLOCK MACHINE DEVICES	NOTE 1	821/10
9	BDA_XFRP4	BDB_XFRP4	MMS-BDS-101[102] TRANSFER TO P4 (VENT PUNCH) FAIL TO ARRIVE	ALARM & INTERLOCK DEVICE		622/02

NOTE 1: Each CON console has a single E-stop that shuts down both MPB processing lines. Switch inputs to PLCs are tagged with an A, B, and C suffix in ICS-CONR-103A, -103B, and -103C, respectively.

**PROGRAMMATIC  
ALARM AND INTERLOCK MATRIX  
ANCDF, TOCDF, AND UMCDF**

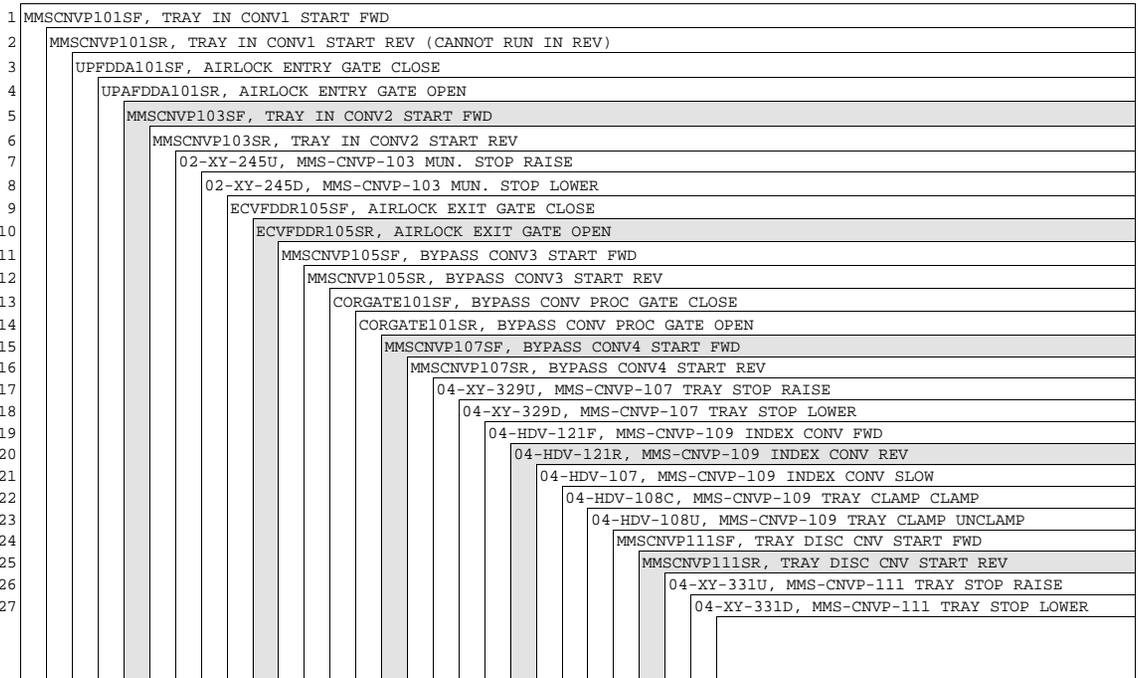
**BYPASS LINE A**

**LOCATION:  
UPA, ECV, UPPER MUNITIONS CORRIDOR  
SYSTEMS/AREAS: 02, 04**

**PLC: ICS-CONR-101B  
P&IDs: AN/TE/UM-1-D-505, -511/1, 512  
INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	REMARKS	
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
1	02-ZS-123	MMS-CNVP-103 TRAY PRESENT	S1																										
2	02-ZS-123	MMS-CNVP-103 TRAY NOT PRESENT					S2	S3																					
3	02-HS-129	MMS-CNVP-101 NOT IN REMOTE			X	X																							
4	02-ZS-133A	UPA-FDDR-101 GATE NOT OPEN	S1				1	S1																					
5	02-ZS-133B	UPA-FDDR-101 GATE NOT CLOSED										X																	
6	02-ZS-134	MMS-CNVP-101 TRAY NOT PRESENT	S2																										
7	02-XS-193A/B	MMS-CNVP-101 ROPE SWITCH IN ALARM	X																										
8	02-ZS-244A	MMS-CNVP-103 STOP NOT RAISED					1																						
9	02-ZS-244B	MMS-CNVP-103 STOP NOT LOWERED					2	2																					
10	02-ZS-360A	MMS-CNVP-101T OUT OF LINE	X				1																						
11	04-HS-108A	MMS-CNVP-109 CLAMP NOT UNCLMPD																	X	X						X			
12	04-ZS-111	MMS-CNVP-111 TRAY PRESENT																							S2				
13	04-ZS-111	MMS-CNVP-111 TRAY NOT PRESENT																							S1				
14	04-ZS-114	MMS-CNVP-107 PRESENT #3 (=1)														S2													
15	04-ZS-119B	MMS-CNVP-107 STOP NOT LOWERED													S1				X										
16	04-HS-121A	MMS-CNVP-109 MOVING FORWARD																								X			
17	04-HS-121B	MMS-CNVP-109 MOVING REVERSE																							X				
18	04-ZS-122A	ECV-FDDR-105 GATE NOT OPEN					2					S2																	
19	04-ZS-122B	ECV-FDDR-105 GATE NOT CLOSED				X	1																						
20	04-ZS-131A	MMS-CNVP-111 STOP NOT RAISED																								1			
21	04-HS-131B	MMS-CNVP-111 STOP NOT LOWERED																								2			
22	04-XS-132A/B	MMS-CNVP-109 ROPE SWITCH IN ALARM																	X	X				X	X				
23	04-XS-133A/B	MMS-CNVP-111 ROPE SWITCH IN ALARM																								X	X		
24	04-ZS-152A	GATE 101 OPEN															S2												
25	04-XS-157A/B	MMS-CNVP-105 ROPE SWITCH IN ALARM										X	X																
26	04-XS-158A/B	MMS-CNVP-107 ROPE SWITCH IN ALARM														X	X												
27	04-ZS-176	MMS-CNVP-107 TRAY PRESENT #1														S1													

**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, AND UMCDF**

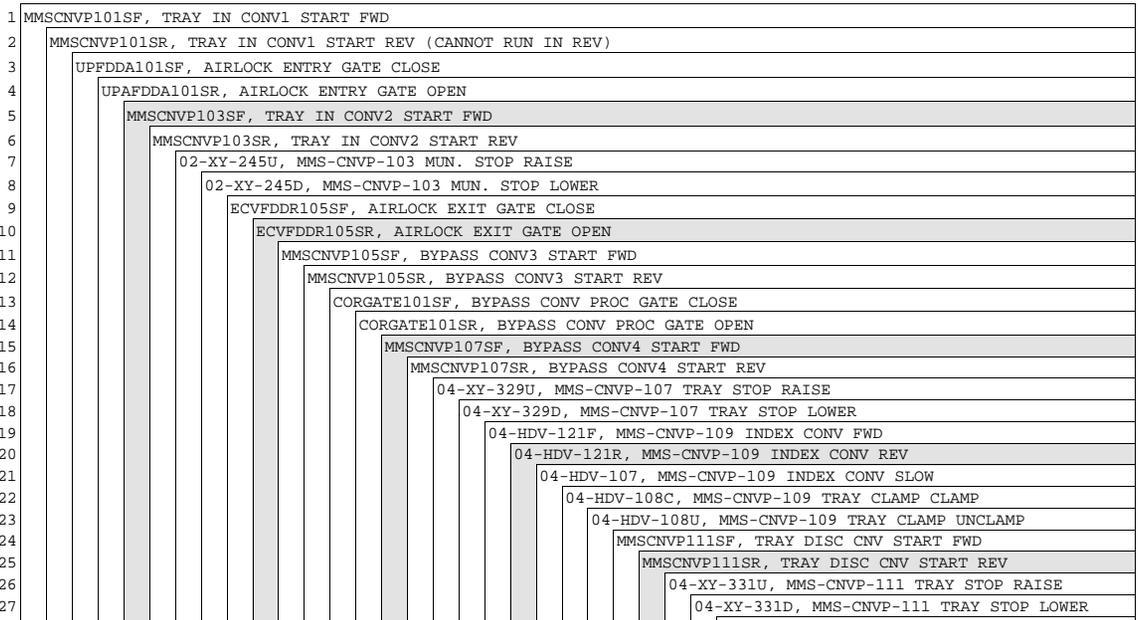
**BYPASS LINE A**

**LOCATION:  
 UPA, ECV, UPPER MUNITIONS CORRIDOR  
 SYSTEMS/AREAS: 02, 04**

**PLC: ICS-CONR-101B  
 P&IDs: AN/TE/UM-1-D-505, -511/1, 512  
 INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	REMARKS		
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
28	04-ZS-184	MMS-CNVP-105 TRAY PRESENT (=0)																											
29	04-ZS-185	MMS-CNVP-105 TRAY PRESENT #2 (=1)																											
30	04-ZS-400B	ALK DRAIN VALVE NOT CLOSED				X						X	S2																
31	04-KY-403	ALK WASH DOWN CYCLE IN PROG.				X						X																	
32	71-XS-009A	LINE A BYP CON 110 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33	71-XS-029A	LINE A BYP CON 112 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34	71-XS-089A	LINE A BYP CON 113 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35	71-XS-109A	LINE A BYP CON 114 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36	71-XS-129A	LINE A BYP CON 116 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37	71-XS-149A	LINE A BYP CON 109 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38	IBLACCRFT	CHARGE CAR NOT READY																											X
39	IBLASTTCC	SENDING TRAY TO CHARGE CAR																											X
40	IBLATXFRF	TRAY TRANSFER FAILURE																											X
41	XTGZS147	THROUGH GATE SENSOR									X																		
42	XTGZS179	THROUGH GATE SENSOR				X																							
43	XTGZS186	THROUGH GATE SENSOR																											X
44		CHARGE CAR CONVEYOR NOT RUNNING FORWARD																											X





**PROGRAMMATIC  
ALARM AND INTERLOCK MATRIX  
ANCDF, TOCDF, AND UMCDF**

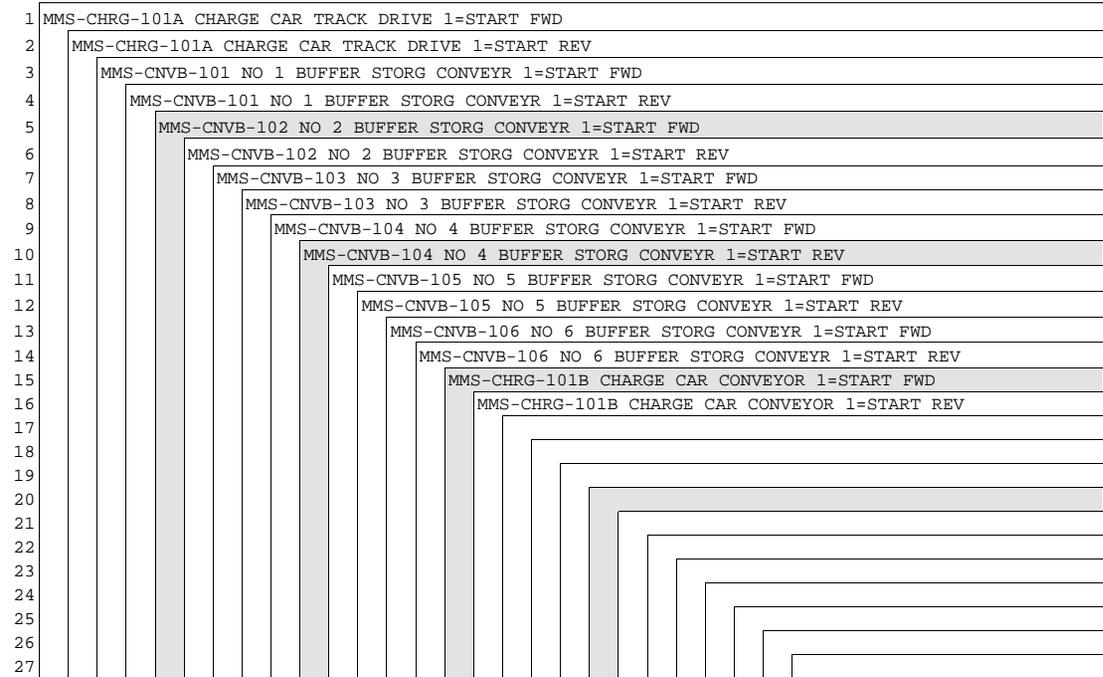
**MDB SECOND FLOOR BUFFER STORAGE AREA**

**LOCATION:  
UPPER MUNITIONS CORRIDOR  
SYSTEM/AREA: 05**

**PLC: ICS-CONR-102  
P&IDs: AN/TE/UM-1-D-512  
INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	REMARKS	
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
1	05-ZS-001	MMS-CNVB-103 TRAY PRESENT									X																		
2	05-ZS-002	MMS-CNVB-102 TRAY PRESENT						X																					
3	05-ZS-008	MMS-CNVB-101 TRAY PRESENT				X																							
4	05-ZS-015	MMS-CNVB-103 STORG CNVR ROPE SWITCH							X	X																			
5	05-ZS-016	MMS-CNVB-102 STORG CNVR ROPE SWITCH					X	X																					
6	05-ZS-017	MMS-CNVB-101 STORG CNVR ROPE SWITCH			X	X																							
7	05-XS-018	MMS-CHRG-101 CNVR & TRACK ROPE SWITCH	X	X													X	X											
8	05-ZS-019	MMS-CNVB-106 STORG CNVR ROPE SWITCH													X	X													
9	05-ZS-020	MMS-CNVB-105 STORG CNVR ROPE SWITCH										X	X																
10	05-ZS-021	MMS-CNVB-104 STORG CNVR ROPE SWITCH								X	X																		
11	05-ZS-040	MMS-CHRG-101 NOT IN LINE WITH CNVB-103						X	X								3	3											
12	05-ZS-041	MMS-CHRG-101 NOT IN LINE WITH CNVB-102				X	X										2	2											
13	05-ZS-042	MMS-CHRG-101 NOT IN LINE WITH CNVB-101			X	X										1	1												
14	05-ZS-071	MMS-CNVB-104 TRAY PRESENT									X																		
15	05-ZS-077	MMS-CNVB-106 TRAY PRESENT													X														
16	05-ZS-078	MMS-CNVB-105 TRAY PRESENT										X																	
17	05-XS-092	MMS-CHRG-101 AT CNVR-126 FWD OVERRUN	X																										
18	05-ZS-101	MMS-CHRG-101 NOT IN LINE WITH CNVB-105										X	X				5	5											
19	05-ZS-102	MMS-CHRG-101 NOT IN LINE WITH CNVB-104								X	X						4	4											
20	05-HS-114	CHARGE CAR CONV RUN FWD			X	X		X	X	X	X	X	X	X	X														
21	05-SSL-237F/R	MMS-CHRG-101A TRACTION DRV NOT STOPPED			X	X	X	X	X	X	X	X	X	X	X	X													

**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, AND UMCDF**

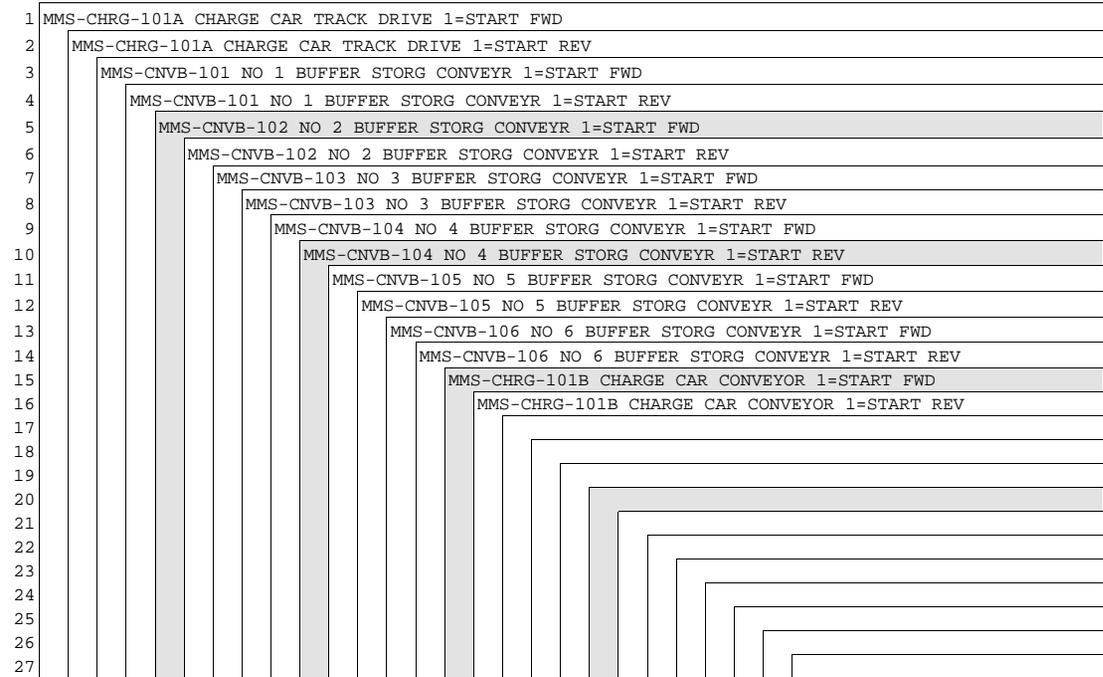
**MDB SECOND FLOOR BUFFER STORAGE AREA**

**LOCATION:  
 UPPER MUNITIONS CORRIDOR  
 SYSTEM/AREA: 05**

**PLC: ICS-CONR-102  
 P&IDs: AN/TE/UM-1-D-512  
 INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
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- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	REMARKS
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
22	05-ZS-435	MMS-CHRG-101 AT DUN FURNAS REV OVERRUN		X																									
23	05-ZS-65B	MMS-CHRG-101B TRAY AT OVERRUN																											
24	05-ZS-93	MMS-CHRG-101 NOT IN LINE WITH CNVB-106													X	X		6	6										
25	71-XS-009B	ICS-CONS-110 BYPASS LINE A E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
26	71-XS-010B	ICS-CONS-110 BYPASS LINE B E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
27	71-XS-029B	ICS-CONS-112 BYPASS LINE A E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
28	71-ZS-030B	ICS-CONS-112 BYPASS LINE B E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
29	71-XS-089B	ICS-CONS-113 BYPASS LINE A E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
30	71-XS-090B	ICS-CONS-113 BYPASS LINE B E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
31	71-XS-109B	ICS-CONS-114 BYPASS LINE A E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
32	71-XS-110B	ICS-CONS-114 BYPASS LINE B E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
33	71-XS-129B	ICS-CONS-116 BYPASS LINE A E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
34	71-XS-130B	ICS-CONS-116 BYPASS LINE B E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
35	71-XS-149B	ICS-CONS-109 BYPASS LINE A E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
36	71-XS-150B	ICS-CONS-109 BYPASS LINE B E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
37		MMS-CHRG-101 NOT RUNNING FORWARD			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									



**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, UMCDF  
 MUNITIONS PROCESSING BAY (MPB)  
 LINE B**

**LOCATION:  
 MPB (MDB 2ND FLOOR)  
 SYSTEMS/AREAS: 10, 45, 49  
 PLCs: ICS-CONR-103A, -103B, -103C  
 P&IDs: AN/TE/UM-1-D-514, -517  
 INTERLOCK I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTER-LOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.
- 6) SEE PHS FAWB (PROGRAMMATIC PROCESS FAWB BOOK 22) FOR DEVICE INTERLOCKS.

1	MMS-CNVP-126 MPB LINE B FEED CONVEYOR FORWARD
2	MMS-CNVP-126 MPB LINE B FEED CONVEYOR REVERSE
3	MDM-GATE-102 MPB LINE B FEED GATE OPEN
4	MDM-GATE-102 MPB LINE B FEED GATE CLOSE
5	BDS-CNVP-102 MPB LINE B BULK DRAIN CONVEYOR FORWARD
6	BDS-CNVP-102 MPB LINE B BULK DRAIN CONVEYOR REVERSE
7	(NOTE 6) 10-HS-804 MDM-CNVP-102 INDEXING CONVEYOR FORWARD
8	(NOTE 6) 10-HS-804 MDM-CNVP-102 INDEXING CONVEYOR REVERSE
9	(NOTE 6) 10-HS-803 MDM-CNVP-102 INDEXING CONVEYOR CLAMPS EXTEND
10	(NOTE 6) 10-HS-803 MDM-CNVP-102 INDEXING CONVEYOR CLAMPS RETRACT
11	(NOTE 6) 45-HS-802 MDM-CNVP-104 INDEXING CONVEYOR FORWARD
12	(NOTE 6) 45-HS-802 MDM-CNVP-104 INDEXING CONVEYOR REVERSE
13	(NOTE 6) 45-HS-806 MDM-CNVP-104 INDEXING CONVEYOR CLAMPS EXTEND
14	(NOTE 6) 45-HS-806 MDM-CNVP-104 INDEXING CONVEYOR CLAMPS RETRACT
15	(NOTE 6) 10-HS-808 MDM-CNVP-106 INDEXING CONVEYOR FORWARD
16	(NOTE 6) 10-HS-808 MDM-CNVP-106 INDEXING CONVEYOR REVERSE
17	(NOTE 6) 10-HS-807 MDM-CNVP-106 INDEXING CONVEYOR CLAMPS EXTEND
18	(NOTE 6) 10-HS-807 MDM-CNVP-106 INDEXING CONVEYOR CLAMPS RETRACT
19	(NOTE 6) 10-HS-276 MDM-CNVP-106 INDEXING CONVEYOR STOP EXTEND
20	(NOTE 6) 10-HS-276 MDM-CNVP-106 INDEXING CONVEYOR STOP RETRACT
21	MMS-LIFT-102 MMS-LIFT-102 LIFT CAR FEED GATE OPEN
22	MMS-LIFT-102 MMS-LIFT-102 LIFT CAR FEED GATE CLOSE
23	MMS-LIFT-102 MMS-LIFT-102 LIFT CAR CONVEYOR FWD
24	MMS-LIFT-102 MMS-LIFT-102 LIFT CAR CONVEYOR REV
25	MMS-LIFT-102 MMS-LIFT-102 LIFT CAR ASSEMBLY FWD
26	MMS-LIFT-102 MMS-LIFT-102 LIFT CAR ASSEMBLY REV

LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	REMARKS	
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	
1	10-ZS-242	MMS-LIFT-102 TRAY PRESENT																													
2	10-ZS-243	MMS-LIFT-102 LIFT CAR AT 2ND FLOOR																													
3	10-ZS-244	MMS-LIFT-102 LIFT CAR AT FIRST FLOOR																													
4	10-XS-372A/B	MMS-CNVP-126 FEED CONV. ROPE SWITCH ACTIVATED				X	X																								
5	10-ZS-376	THROUGH GATE SENSOR					X																								
6	10-HS-433A/B/C/D	MMS-LIFT-102 LOCAL EMERGENCY STOP ACTIVATED																													
7	45-XS-259A/B	MDM-CNVP-106 INDEXING CONVEYOR ROPE SWITCH																													
8	45-HS-1410	PHS-MDM-101 LOCAL E-STOP	X	X																											
9	45-HS-3410	PHS-MDM-103 LOCAL E-STOP																													
10	49-HS-209	LOCAL E-STOP (BDS)																													
11	49-XS-256A/B	BDS-CNVP-102 CONV. ROPE SWITCH ACTIVATED				X	X																								
12	49-2102A	BDS-CNVP-102 BULK DRAIN CONV LIFT EXTENDED					X	X																							
13	49-2103B	MMS-BDS-102 PUNCH ARM RETRACTED						X	X																						
14	49-2104B	MMS-BDS-102 DRAIN TUBE RETRACTED						X	X																						
15	71-XS-011A/B/C	SHIFT SUPERVISOR CONSOLE E-STOP	X	X	X	X	X	X																							SEE FOOTNOTE 1 BELOW
16	71-XS-031A/B/C	LEAD OPERATOR CONSOLE E-STOP	X	X	X	X	X	X																							SEE FOOTNOTE 1 BELOW
17	71-XS-091A/B/C	DEMIL OPERATOR CONSOLE E-STOP	X	X	X	X	X	X																							SEE FOOTNOTE 1 BELOW
18	71-XS-111A/B/C	DEMIL OPERATOR CONSOLE E-STOP	X	X	X	X	X	X																							SEE FOOTNOTE 1 BELOW
19	71-XS-131A/B/C	DEMIL/FC OPERATOR CONSOLE E-STOP	X	X	X	X	X	X																							SEE FOOTNOTE 1 BELOW
20	71-XS-151A/B/C	DEMIL OPERATOR CONSOLE E-STOP	X	X	X	X	X	X																							SEE FOOTNOTE 1 BELOW
21	DICI-102	CHARGE CAR CONV. NOT RUNNING FWD.				X																									
22	DICI-102	MMS-CHRG-102 CHARGE CAR NOT PRESENT				X																									
23	DICI-103C	LFT-GATE-104 STATUS OPEN																													
24	DICI-103C	LFT-GATE-104 STATUS CLOSED																													
25	DICI-107	LFT-GATE-103 FIRST FLOOR GATE OPEN																													
26	DICI-107	LFT-GATE-103 FIRST FLOOR GATE CLOSED																													

**FOOTNOTES:**

1. Each CON console has a single E-stop that shuts down both MPB processing lines. Switch inputs to PLCs are tagged with an A, B, and C suffix in ICS-CONR-103A, -103B, and -103C, respectively.



**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, AND UMCDF  
 BULK DRAIN STATION - LINE B**

**LOCATION:  
 MUNITIONS PROCESSING BAY (MDB 2ND FLOOR)  
 SYSTEMS/AREAS: 10, 49, 51**

**PLC: ICS-CONR-103B  
 P&IDs: AN/TE&EG/UM-1-D-514  
 INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.

1	49-2-101	BDS-CNVP-102 BULK DRAIN CONVEYOR FORWARD
2	49-2-101	BDS-CNVP-102 BULK DRAIN CONVEYOR REVERSE
3	49-2-102	BDS-CNVP-102 BULK DRAIN CONVEYOR LIFT EXTEND
4	49-2-102	BDS-CNVP-102 BULK DRAIN CONVEYOR LIFT RETRACT
5	49-2-103	MMS-BDS-102 BULK DRAIN PUNCH EXTEND
6	49-2-103	MMS-BDS-102 BULK DRAIN PUNCH RETRACT
7	49-2-104	MMS-BDS-102 BULK DRAIN DRAIN TUBE EXTEND
8	49-2-104	MMS-BDS-102 BULK DRAIN DRAIN TUBE RETRACT
9	51-XV-123	MMS-BDS-102 BDS PURGE AND BLOCK VALVE OPEN
10	ACS-PUMP-115	AGENT PUMP ON
11	51-XV-490/1	AGENT VERIFY VALVE CLOSED
12	51-XV-495	DRAIN LINE PURGE VALVE OPEN
13	51-XV-496	DRAIN LINE BLOCK VALVE OPEN
14	51-FV-020	PUMP BLOCK VALVE OPEN
15	51-XV-379	DRAIN PUMP AIR SOLINOID OPEN
16	49-XV-464	DRILL CARRIAGE EXT (TE/UM ONLY)
17	49-XV-464	DRILL CARRIAGE RET (TE/UM ONLY)
18	49-XV-467	DRILL MOTOR (TE/UM ONLY)
19	49-XV-420	DRAIN TUBE DRIP PAN
20	49-XV-422	DRAIN TUBE SUCTION VALVE

LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	1	1	1	1	15	16	17	18	19	20	REMARKS	
			1	2	3	4	5	6	7	8	9	0	1	2	3	4						
1	49-02-101	BDS-102 P3 NOT PRESENT																				
2	49-2-102	BDS-CNVP-102 LIFT NOT EXTENDED	X	X																		
3	49-2-102	BDS-CNVP-102 LIFT NOT RETRACTED				X	X															
4	49-2-103B	MMS-BDS-102 PUNCH ARM NOT RETRACTED	X	X	X																	
5	49-02-104	DRAIN TUBE NOT RETRACTED																		X		
6	49-2-104B	MMS-BDS-102 DRAIN TUBE NOT RETRACTED	X	X	X																	
7	49-XS-256A/B	BDS-CNVP-102 ROPE SWITCH ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	49-HS-290	LMCP E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
9	49-XV-420	MMS-BDS-102 DRAIN TUBE DRIP PAN NOT RETRACTED						X														
10	49-XV-467	BDS DRILL MOTOR NOT ON															X					
11	51-PAH-61	AGENT STILL DETECTED																			ALARM (BYPASS OR REPEAT)	
12	51-PAL-61	NO AGENT DETECTED																			ALARM, STOP & PLACE DEVICE IN MANUAL	
13	51-PDIT-61	BULK ITEM NOT DRAINING																			ALARM, STOP & PLACE DEVICE IN MANUAL	
14	51-PDIT-67	AGENT STRAINER DIFFERENTIAL PRESSURE HIGH																			ALARM	
15	51-XV-495	DRAIN PURGE VALVE NOT OPEN											X									
16	51-XV-496	DRAIN LINE BLOCK VALVE OPEN										X									X	
17	51-XV-496	DRAIN PUMP BLOCK VALVE NOT OPEN										X										
18	71-XS-011A/B/C	SHIFT SUPERVISOR CONSOLE E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SEE FOOTNOTE 1 BELOW	
19	71-XS-031A/B/C	LEAD OPERATOR CONSOLE E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SEE FOOTNOTE 1 BELOW	
20	71-XS-091A/B/C	DEMIL OPERATOR CONSOLE E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SEE FOOTNOTE 1 BELOW	
21	71-XS-111A/B/C	DEMIL OPERATOR CONSOLE E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SEE FOOTNOTE 1 BELOW	
22	71-XS-131A/B/C	DEMIL FCE OPERATOR CONSOLE E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SEE FOOTNOTE 1 BELOW	
23	71-XS-151A/B/C	DEMIL OPERATOR CONSOLE E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SEE FOOTNOTE 1 BELOW	
24	BDB AGENT	BDS-102 INSUFFICIENT AGENT DRAINED																			ALARM (BYPASS OR REPEAT)	
25	DICI-106	OK TO PUMP AGENT						X			X				X							
26		SPRAY TANKS NOT SELECTED															X	X			TOCDF AND UMCDF ONLY	

**FOOTNOTES:**

1. Each CON console has a single E-stop that shuts down both MPB processing lines. Switch inputs to PLCs are tagged with an A, B, and C suffix in ICS-CONR-103A, -103B, and -103C, respectively.

**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, AND UMCDF**

**BUFFER STORAGE AREA & LOWER MUNITIONS CORRIDOR  
 (BC1)**

**LOCATION:  
 BUFFER STORAGE AREA & LOWER MUNITIONS CORRIDOR  
 AREA/SYSTEM: 05**

**PLC: ICS-CONR-107  
 P&IDs: AN/TE/UM-1-D-513/1, -513/2  
 INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTER-LOCKED DUE TO THE LISTED CONDITION.
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- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	REMARKS		
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
1	05-ZS-166	MMS-CNVR-124 LINE B 1 = TRAY NOT PRESENT										S1																	
2	05-ZS-166	MMS-CNVR-124 LINE B 1 = TRAY PRESENT										S2																	
3	05-ZS-167A	MMS-CNVR-118 LINE B TRAY STOP NOT UP								X																			
4	05-ZS-168	CCAR IS NOT IN LINE WITH MPF FURNACE			5	5																							
5	05-ZS-180	CCAR IS NOT IN LINE WITH CNVR-124 (B)			3	3				X																			
6	05-ZS-195	MMS-CHRG-103 TRAY PRESENT				S1																							
7	05-ZS-196	MMS-CNVR-123 LINE A 1 = TRAY NOT PRESENT																				S1							
8	05-ZS-196	MMS-CNVR-123 LINE A 1 = TRAY PRESENT																				S2							
9	05-ZS-197A	MMS-CNVR-117 LINE A TRAY STOP NOT UP																X											
10	05-ZS-198	MMS-CHRG-103 TRAY PRESENT			X																								
11	05-ZS-199	CCAR IS NOT IN LINE WITH CNVR-123 (A)			1	1														X									
12	05-ZS-200	MMS-CHRG-103 PRESENT AT REV OVERRUN		X																									
13	05-XS-215	MMS-CHRG-103 CCAR CNVR ROPE SWITCH	X	X																									
14	05-ZS-218	MMS-CHRG-103 PRESENT AT FWD OVERRUN	X																										
15	05-SSL-240F/R	CCAR-103 TRACK DRIVE RUNNING			X	X				X				X						X									
16	05-HS-292	MMS-CNVR-105 LINE A GATE NOT OPEN																										1	
17	05-HS-297	MMS-CNVR-106 LINE B GATE NOT OPEN										1																	
18	05-XS-306	MMS-CNVR-123 LINE A ROPE SWITCH																				X	X						
19	05-XS-307	MMS-CNVR-124 LINE B ROPE SWITCH								X	X																		
20	05-ZS-314	MMS-CHRG-103 CCAR CNVR TRAY @ OVERRUN			X																								
21	05-ZS-315	CCAR IS NOT IN LINE WITH CNVR-122			4	4																							
22	05-ZS-317	TRAY OVERTRAVEL				S1																							
23	05-ZS-346	CCAR IS NOT IN LINE WITH CNVR-131 (C)			2	2								X															

**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, AND UMCDF**

**BUFFER STORAGE AREA & LOWER MUNITIONS CORRIDOR  
 (BC1)**

**LOCATION:  
 BUFFER STORAGE AREA & LOWER MUNITIONS CORRIDOR  
 AREA/SYSTEM: 05**

**PLC: ICS-CONR-107  
 P&IDs: AN/TE/UM-1-D-513/1, -513/2  
 INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
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- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.

1	MMS-CHRG-102 CHARGE CAR TRACK DRIVE 1=START FWD
2	MMS-CHRG-102A CHARGE CAR TRACK DRIVE 1=START REV
3	MMS-CHRG-103 CHARGE CAR CNVR MOTOR 1=START FWD
4	MMS-CHRG-103 CHARGE CAR CNVR MOTOR 1=START REV
5	COR-GATE-103 CORRIDOR GATE 1=OPEN
6	COR-GATE-103 CORRIDOR GATE 1=CLOSE
7	MMS-GATE-106 LINE B PROCESS GATE 1=OPEN
8	MMS-GATE-106 LINE B PROCESS GATE 1=CLOSE
9	MMS-CNVR-124 LINE B MUN STOR CNVR 1=START FWD
10	MMS-CNVR-124 LINE B MUN STOR CNVR 1=START REV
11	MMS-GATE-107 LINE C PROCESS GATE 1=OPEN
12	MMS-GATE-107 LINE C PROCESS GATE 1=CLOSE
13	MMS-CNVR-131 LINE C MUN STOR CNVR 1=START FWD
14	MMS-CNVR-131 LINE C MUN STOR CNVR 1=START REV
15	MMS-GATE-105 LINE A PROCESS GATE 1=OPEN
16	MMS-GATE-105 LINE A PROCESS GATE 1=CLOSE
17	MMS-CNVR-123 LINE A MUN STOR CNVR 1=START FWD
18	MMS-CNVR-123 LINE A MUN STOR CNVR 1=START REV
19	
20	
21	
22	
23	
24	
25	
26	
27	

LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	REMARKS			
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	
24	05-ZS-409A	MMS-CNVR-130 LINE C TRAY STOP NOT UP												X																
25	05-HS-412	MMS-GATE-107 LINE C GATE NOT OPEN																												
26	05-ZS-418	MMS-CNVR-131 LINE C 1 = TRAY NOT PRESENT																												
27	05-ZS-418	MMS-CNVR-131 LINE C 1 = TRAY PRESENT																												
28	05-XS-419	MMS-CNVR-131 LINE C ROPE SWITCH																												
29	71-XS-006	ICS-CONS-110 ACCUM-E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30	71-XS-026	ICS-CONS-112 ACCUM-E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31	71-XS-086	ICS-CONS-113 ACCUM-E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32	71-XS-106	ICS-CONS-114 ACCUM-E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33	71-XS-126	ICS-CONS-116 ACCUM-E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34	71-XS-146	ICS-CONS-109 ACCUM-E-STOP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35		MMS-CHRG-101 NOT RUNNING FORWARD									X																			
36		CHARGE CAR CONV. RUNNING FWD/REV	X	X																										
37		CNVP-125 RUNNING FWD	X	X																										
38		CNVP-124 RUNNING FWD	X	X																										
39		CNVP-131 RUNNING FWD	X	X																										



**PROGRAMMATIC  
 ALARM AND INTERLOCK MATRIX  
 ANCDF, TOCDF, AND UMCDF**

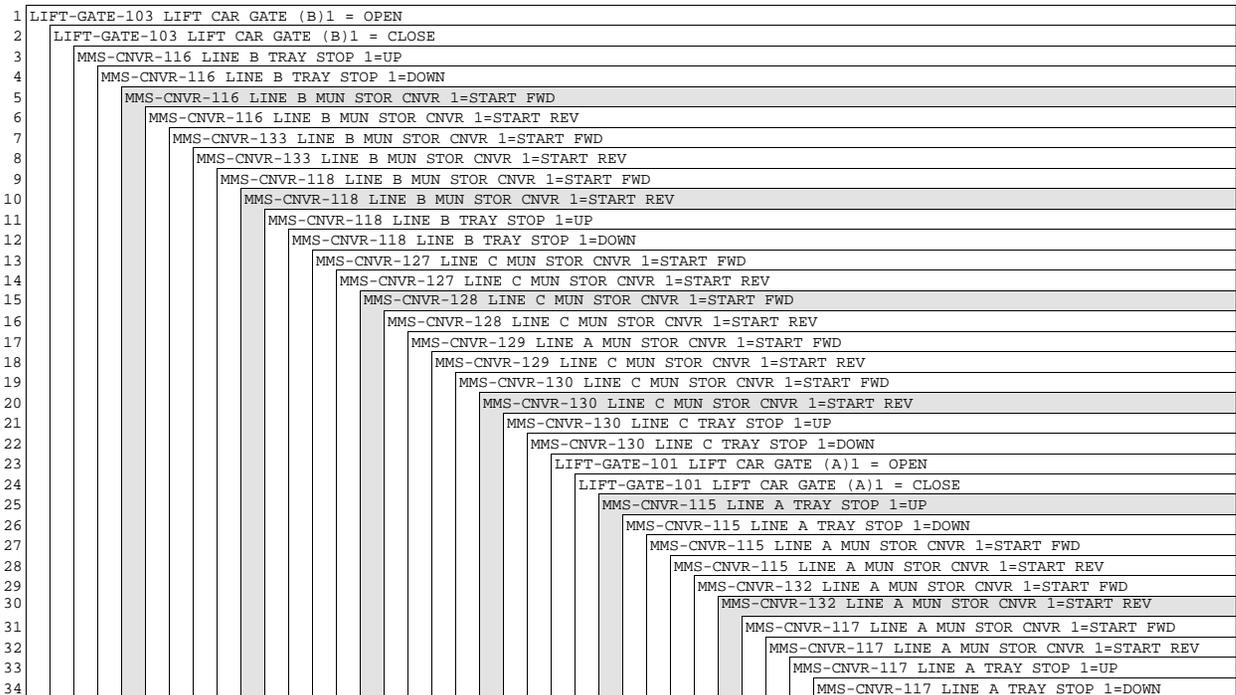
**BUFFER STORAGE AREA & LOWER MUNITIONS CORRIDOR  
 (BC2)**

**LOCATION:  
 BUFFER STORAGE AREA & LOWER MUNITIONS CORRIDOR  
 AREA/SYSTEM: 05**

**PLC: ICS-CONR-107**  
**P&IDs: AN/TE/UM-1-D-513/1, -513/2**  
**INTERLOCK: I-4**

NOTES:

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BE VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTER-LOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	REMARKS							
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4		
28	05-ZS-403 FR	MMS-CNVR-130 LINE C TRAY NOT PRESENT																																				
29	05-HS-410	MMS-CNVR-130 LINE C TRAY STOP NOT DOWN																																				
30	05-ZS-412A	MMS-GATE-107 LINE C NOT OPEN																																				
31	05-XS-432	MMS-CNVR-133 LINE B ROPE SWITCH							X	X																												
32	10-HS-383	LIFT-GATE-101 LIFT CAR GATE (A) NOT OPENED																																				
33	10-HS-385	LIFT-GATE-103 LIFT CAR GATE (B) NOT OPEN					X																															
34	71-XS-006	ICS-CONS-110 ACCUM-E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
35	71-XS-026	ICS-CONS-112 ACCUM-E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
36	71-XS-086	ICS-CONS-113 ACCUM-E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
37	71-XS-106	ICS-CONS-114 ACCUM-E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
38	71-XS-126	ICS-CONS-116 ACCUM-E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
39	71-XS-146	ICS-CONS-109 ACCUM-E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
40	CONR-103A DICI	LIFT-GATE-102 LINE A NOT CLOSED																																			X	
41	CONR-103B DICI	LIFT-GATE-104 LINE B NOT CLOSED	X																																			
42	DICI-103A	LIFT NOT @ FIRST FLOOR																																			X	
43	DICI-103A	LIFT-101 E-STOP																																			X X	
44	DICI-103B	LIFT NOT @ FIRST FLOOR	X																																			
45	DICI-103B	LIFT-102 E-STOP	X	X																																		

**PROGRAMMATIC  
ALARM AND INTERLOCK MATRIX  
PBCDF**

**BULK DRAIN LINE**

**LOCATION:  
UPA, BULK DRAIN ROOM  
SYSTEMS/AREAS: 02,49**

**PLC: ICS-CONR-103A  
P&IDs: PB-1-D-514  
INTERLOCK: I-4**

**NOTES:**

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1	MMSCNVP137SF TON CONTAINER CONVEYOR #1 FORWARD
2	MMSCNVP137SR TON CONTAINER CONVEYOR #1 REVERSE
3	UPAGATE103SF TON CONTAINER GATE OPEN
4	UPAGATE103SR TON CONTAINER GATE CLOSE
5	MMSCNVP104SF TON CONTAINER CONVEYOR #2 FORWARD
6	MMSCNVP104SR TON CONTAINER CONVEYOR #2 REVERSE
7	02-XY-305U MMS-CNVP-104 TRAY STOP RAISE
8	02-XY-305D MMS-CNVP-104 TRAY STOP LOWER
9	UPAGATE104SF TON CONTAINER GATE OPEN
10	UPAGATE104SR TON CONTAINER GATE CLOSE
11	MMSCNVP136SF TON CONTAINER CONVEYOR #3 FORWARD
12	MMSCNVP136SR TON CONTAINER CONVEYOR #3 REVERSE
13	49-XY-245U MMS-CNVP-136 TRAY STOP RAISE
14	49-XY-245D MMS-CNVP-136 TRAY STOP LOWER
15	LFTGATE104SF LIFT-GATE-104 OPEN
16	LFTGATE104SR LIFT-GATE-104 CLOSE
17	49-XY-431U MMS-LIFT-101 N. TRAY STOP RAISE
18	49-XY-431D MMS-LIFT-101 N. TRAY STOP LOWER
19	49-XY-435U MMS-LIFT-101 S. TRAY STOP RAISE
20	49-XY-435D MMS-LIFT-101 S. TRAY STOP LOWER
21	MMSLIFT101BSF LIFT CONVEYOR START FORWARD
22	MMSLIFT101BSR LIFT CONVEYOR START REVERSE
23	MMSLIFT101ASF LIFT CAR START UP
24	MMSLIFT101ASR LIFT CAR START DOWN
25	LFTGATE103SF LIFT-GATE-103 OPEN
26	LFTGATE103SR LIFT-GATE-103 CLOSE
27	49-1101A-O BDS-CNVP-101 BDS INDEX CNV FORWARD
28	49-1101B-O BDS-CNVP-101 BDS INDEX CNV REVERSE
29	49-1100-O BDS-CNVP-101 BDS INDEX CNV FAST

LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	REMARKS	
1	71-XS-011A	CONSOLE 110 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
2	71-XS-031A	CONSOLE 112 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
3	71-XS-091A	CONSOLE 113 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
4	71-XS-131A	CONSOLE 116 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
5	71-XS-151A	CONSOLE 109 E-STOP ACTIVATED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	02-XS-372A/B	MMS-CNVP-137 ROPE SWITCH ACTIVATED	X	X	X	X	X																										
7	02-HS-359	UPA-GATE-103 NOT OPENED	X																														
8	BULKIDOKD	TRAY ID AND CLASS NUMBER NOT ENETERED	X																														
9	02-HS-231	UPA-GATE-104 NOT CLOSED			X																												
10	02-KY-408	AIR LOCK WASH DOWN IN CYCLE		X					X																								
11	02-ZS-405B	AIR LOCK DRAIN VALVE NOT CLOSED		X					X																								
12	GATE103IO	AIR LOCK LOADED IN REVERSE PREVENT CON OPERATION	X			S3	2																										
13	XTGZS377	UPA-GATE-103 THROUGH-GATE SENSOR BLOCKED			X																												
14	49-XS-109A/B	MMS-CNVP-136 ROPE SWITCH ACTIVATED			X	X			X	X	X			X	X																		
15	02-ZS-223	MMS-CNVP-104 TRAY PRESENT			S1	2																											
16	02-HS-305	MMS-CNVP-104 MUNITION STOP NOT DOWN			2	X																											
17	02-HS-231	UPA-GATE-104 NOT OPENED			2	X		X																									
18	49-ZS-139	MMS-CNVP-136 TRAY PRESENT			2					S1	3																						
19	XTGZS310	UPA-GATE-104 THROUGH GATE SENSOR NOT BLOCKED				1			X																								
20	02-HS-359	UPA-GATE-103 NOT CLOSED						X																									
21	49-HS-391	LIFT-GATE-104 NOT OPENED										2	2	X			1						1	5									
22	LIFT101DN	MMS-LIFT-101 NOT DOWN								2				X		1			1	1	1	5			1								
23	49-ZS-147	MMS-LIFT-101 TRAY PRESENT								2																							
24	49-HS-245	MMS-CNVP-136 MUNITION STOP NOT DOWN								2	2																						
25	49-ZS-142	MMS-LIFT-101 TRAY PRESENT									2																						
26	49-XS-432	MMS-LIFT-101 SYSTEM ESTOP ACTIVATED																	X	X	X	X	X	X	X	X	X	X	X	X	X		
27	IBDR1GTOF	LIFT-GATE-101 NOT CLOSED																	X	X	X	X	X	X	X	X	X	X	X	X	X		



**PROGRAMMATIC  
ALARM AND INTERLOCK MATRIX  
PBCDF**

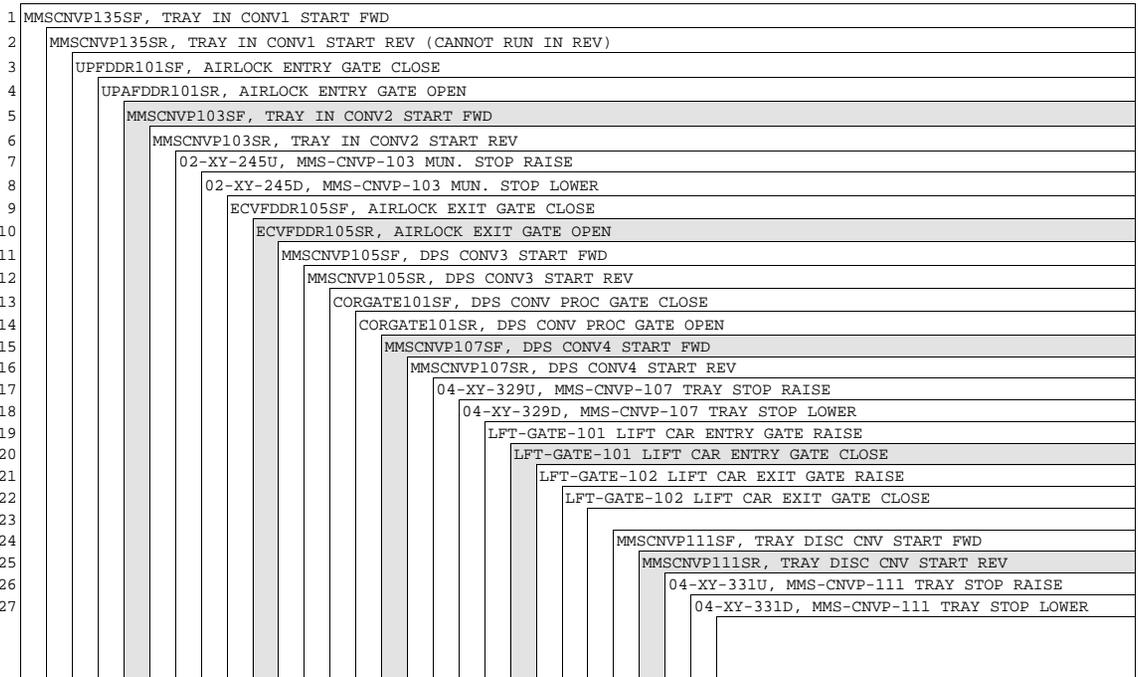
**DUNNAGE PROCESSING LINE**

**LOCATION:  
UPA, ECV, UPPER MUNITIONS CORRIDOR  
SYSTEMS/AREAS: 02, 04**

**PLC: ICS-CONR-101B  
P&IDs: PB1-D-507, 512  
INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
- 4) SQUARES MARKED WITH A NUMBER INDICATE THE BRANCH LEVEL WITHIN THE INTERLOCK RUNG. LIKE NUMBERS ARE COMBINED TO MAKE A BRANCH.
- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	REMARKS	
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
1	02-XS-193A/B	MMS-CNVP-135 ROPE SWITCH IN ALARM	X	X																									
2	02-ZS-134	MMS-CNVP-135 TRAY PRESENT	S2	X			X																						
3	02-ZS-134	MMS-CNVP-135 TRAY NOT PRESENT																											
4		TRAY ID ENTRY	S1																										
5	02-ZS-133A	UPA-FDDR-101 GATE NOT OPEN	S1				X																						
6	02-ZS-133B	UPA-FDDR-101 GATE NOT CLOSED					S1				X																		
7	XTGZS138	THROUGH GATE SENSOR - UPA-FDDR-101			X																								
8		MMS-CONV-135 TO MMS-CONV-103 XFER FAIL			X																								
9	02-ZS-123	MMS-CNVP-103 TRAY PRESENT	S1				S2																						
10	02-ZS-123	MMS-CNVP-103 TRAY NOT PRESENT					S1																						
11	02-ZS-244A	MMS-CNVP-103 STOP NOT RAISED					S1																						
12	02-ZS-244B	MMS-CNVP-103 STOP NOT LOWERED					S2																						
13	04-ZS-400B	ALK DRAIN VALVE NOT CLOSED			X						X																		
14	04-KY-403	ALK WASH DOWN CYCLE IN PROG.			X						X																		
15		INHIBIT UPA-FDDR-101 OPEN ONCE TRAY HAS ENTERED				X																							
16	04-ZS-122A	ECV-FDDR-105 GATE NOT OPEN					S2					S2	X																
17	04-ZS-122B	ECV-FDDR-105 GATE NOT CLOSED			X	S1			X																				
18	XTGZS164	THROUGH GATE SENSOR - ECV-FDDR-105							X	X																			
19		MMS-CONV-103 TO MMS-CONV-105 XFER FAIL							X	X																			
20		ECR EXPLOSION DETECT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
21	04-XS-157A/B	MMS-CNVP-105 ROPE SWITCH IN ALARM										X	X																
22	04-ZS-184	MMS-CNVP-105 TRAY PRESENT #1 (=0)									X	X	S1																
23	04-ZS-185	MMS-CNVP-105 TRAY PRESENT #2 (=1)									X	S1		S1															
24	04-HS-125F	MMS-CNVP-105 CONV RUNNING FWD					S2																						
25	04-HS-125R	MMS-CNVP-105 CONV RUNNING REV																									S2		
25	02-ZS-152A	COR-GATE-101 GATE NOT OPEN										S2																	
26	02-ZS-152B	COR-GATE-101 GATE NOT CLOSED					S1				X																		

**PROGRAMMATIC  
ALARM AND INTERLOCK MATRIX  
PBCDF**

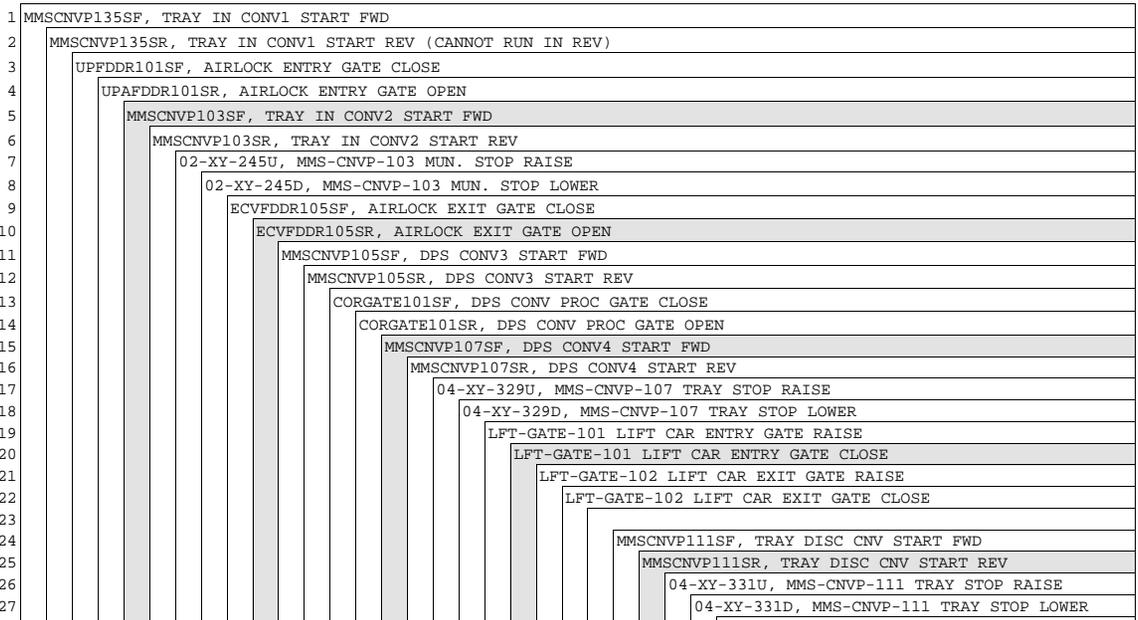
**DUNNAGE PROCESSING LINE**

**LOCATION:  
UPA, ECV, UPPER MUNITIONS CORRIDOR  
SYSTEMS/AREAS: 02, 04**

**PLC: ICS-CONR-101B  
P&IDs: PB1-D-507, 512  
INTERLOCK: I-4**

**NOTES:**

- 1) INSTRUMENTATION AND LOGIC IN THIS MATRIX HAVE NOT BEEN VERIFIED. SEE APPENDIX D FOR VERIFIED DEVICE LOGIC.
- 2) DEVICES ARE SHOWN ACROSS THE TOP, INTERLOCKING CONDITIONS ARE SHOWN DOWN THE SIDE.
- 3) SQUARES MARKED BY "X" INDICATE DEVICE IS INTERLOCKED DUE TO THE LISTED CONDITION.
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- 5) SQUARES MARKED WITH AN "S" AND A NUMBER INDICATE THAT THE CONDITION IS USED TO SELECT BETWEEN MULTIPLE BRANCH LEVELS WITHIN THE INTERLOCK RUNG. THE NUMBER INDICATES THE BRANCH LEVEL.



LN	TAG NUMBER	DESCRIPTION	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	REMARKS	
			1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
27	03-ZS-123	MMS-GATE-101 ENTRY BLAST GATE CLOSED										X																	
28	03-ZS-124	MMS-GATE-102 ENTRY BLAST GATE CLOSED										X																	
29	XTGZS165	THROUGH GATE SENSOR - COR-GATE-101												X															
30		MMS-CONV-105 TO MMS-CONV-107 XFER FAIL												X															
31		ECV TRAY ID ENTRY										S2																	
31	04-XS-158A/B	MMS-CNVP-107 ROPE SWITCH IN ALARM																X	X										
32	04-ZS-176	MMS-CNVP-107 TRAY PRESENT #1																	S1										
33	04-ZS-177	MMS-CNVP-107 TRAY PRESENT #2																	S2										
34	04-HS-179F	MMS-CNVP-107 CONV RUNNING FWD										S2																	
35	04-ZS-114	MMS-CNVP-107 PRESENT #3 (=1)																	S2										
36	04-ZS-119A	MMS-CNVP-107 STOP NOT RAISED																	S2										
37	04-ZS-119B	MMS-CNVP-107 STOP NOT LOWERED																	S1										
38		MMS-CONV-107 TO MMS-LIFT-101 XFER FAIL																X											
39	04-ZS-110A	LFT-GATE-101 NOT OPEN																	X	X									
40		MMS-LIFT-101 LIFT CAR NOT AT 2ND STOP																	X	X									
41	XTGZS114	THROUGH GATE SENSOR LFT-GATE-101																	X										
42		MMS-LIFT-101 TO MMS-CONV-111 XFER FAIL																			X								
43	XTGZS378	THROUGH GATE SENSOR LFT-GATE-102																				X							
44	04-XS-133A/B	MMS-CNVP-111 ROPE SWITCH IN ALARM																					X	X					
45	04-ZS-111	MMS-CNVP-111 TRAY PRESENT																					S2						
46	04-ZS-111	MMS-CNVP-111 TRAY NOT PRESENT																					S1						
47	04-ZS-131A	MMS-CNVP-111 STOP NOT RAISED																					S1						
48	04-HS-131B	MMS-CNVP-111 STOP NOT LOWERED																					S2						



## APPENDIX D

### PLC Automatic Control Sequences

Appendix D contains a summary of PLC automatic control sequences based on the current versions of the PLC code for each of the sites. This appendix also includes the sequencer tables for the sequencers that control operation of the BDS.

The PLC automatic control sequence summaries were generated based on the control system rung ladders in the PLC code for the bulk container handling system. The operator interface with the PLCs, the Advisor PC system, stores device information in a database that consists of *tags*, or database records used for storing all necessary information related to a device that is monitored or controlled by the Advisor PC system. **D6** tags are used for discrete devices that may be controlled from the Control Room. In this appendix, automatic control for all devices with **D6** tags are described, grouped by the Advisor PC screens on which they appear. Details related to **D6**-device format can be found in the CSDP Control Systems Software Design Guide. Note that Advisor PC tag numbers may not match P&ID tag numbers exactly since Advisor PC tag numbers are labels in the code that refer to a device that may be more encompassing than the P&ID device.

#### D.1 BCHS PLC Automatic Control Sequences

Because BCHS PLC automatic control sequences are similar for ANCDF, TOCDF, and UMCDF, the control sequences for these sites *are* listed in a single table for each screen (Tables *D.3 thru D.5*), with annotations in the description to indicate the differences, if any, between the control for the device at the different sites. In addition, if control differences exist between the two similar bulk processing lines at any of the sites, these differences *are* also noted.

*The PBCDF ton container processing line has a unique configuration; therefore, PBCDF BCHS PLC automatic control sequences are listed in site-specific tables for the two processing screens (Tables D.6 and D.7). Initialization sequences are similar to the other sites, so PBCDF logic for Advisor screen BDI is included with the other sites in Table D.5.*

At *ANCDF*, TOCDF, *and UMCDF* control for bypass line A is provided by ICS-CONR-101B and control for bypass line B is provided by ICS-CONR-104B. Control sequences for analogous devices for each of the two bypass lines are listed in Table D.2, with the device identifiers (e.g., tag numbers, component numbers) for line B enclosed in brackets []. MMS-BDS-101 and -102 are controlled by ICS-CONR-103A and ICS-CONR-103B, respectively. Control sequences for analogous devices for each of the two bulk drain lines are listed in Tables D.3 and D.4, with the device identifiers (e.g., tag numbers, component numbers) for line B enclosed in brackets []. The information in the tables is based on *PLC control system rung ladders as of December 2003 for ANCDF, January 2004 for TOCDF, and November 2003 for UMCDF.*

The three screens described in this appendix for the *ANCDF*, *TOCDF*, and *UMCDF* BCHS are listed in Table D.1. The screen designations for similar screens for bulk line B are shown in [].

Table D.1 *ANCDF, TOCDF, & UMCDF* BCHS Advisor PC Screens

Advisor PC Screen Name	Process Screen Designation
Bypass Line A [B]	BLA [BLB]
Bulk Drain Line A [B]	BDA [BDB]
Bulk Drain Initialize	BDI

*At PBCDF, control for the ton container processing line, including the bulk drain station is provided by ICS-CONR-103A. The three screens described in this appendix for PBCDF ton container processing are listed in Table D.2. PBCDF control sequences are based on PLC control system rung ladders as of February 2004.*

Table D.2 *PBCDF* BCHS Advisor PC Screens

<i>Advisor PC Screen Name</i>	<i>Process Screen Designation</i>
<i>Bulk Drain Room</i>	<i>BDR</i>
<i>Bulk Drain Station</i>	<i>BDS</i>
<i>Bulk Drain Initialize</i>	<i>BDI</i>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
<b>Device:</b>	<b>MMS-CNVP-101 [MMS-CNVP-102] Tray Input Bypass Conveyor #1</b>
Advisor PC Tag:	X02HS129 [X02HS229]
CONR:	C101B [C104B]
Driver Word:	0660 [0660]
Driver Type:	7
Auto Forward:	The auto forward relay will be active if either of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing, 02-ZS-360A [02-ZS-362A] (MMS-CNVP-101T [MMS-CNVP-102T] at 0 degrees) is made, and 02-ZS-134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray not present) is made</li> <li>• MMS-CNVP-101 [MMS-CNVP-102] run forward relay is latched (see below)</li> </ul>
Auto Reverse:	None.
Forward I-Lock:	The following conditions must be satisfied to allow the device to operate forward: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 02-XS-193A/B [02-XS-293A/B] MMS-CNVP-101 [MMS-CNVP-102] rope switch not pulled</li> <li>• Either of the following:                             <ul style="list-style-type: none"> <li>• 02-ZS-133A [02-ZS-233A] (UPA-FDDR-101 [UPA-FDDR-102] gate open) is made, valid tray ID has been entered, and <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made</i></li> <li>• <i>(TE/UM) 02-ZS-134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray not present) is made, or (at AN) 02-ZS-134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray present) is not made</i></li> </ul> </li> <li>• 02-ZS-360A [02-ZS-362A] (MMS-CNVP-101T [MMS-CNVP-102T] at 0 degrees) is made</li> </ul>
Reverse I-Lock:	The PLC will not allow the device to be remotely operated in reverse.
Relay:	MMS-CNVP-101 [MMS-CNVP-102] run forward relay (see above) gets latched when all of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• 02-ZS-133A [02-ZS-233A] (UPA-FDDR-101 [UPA-FDDR-102] gate open) is made</li> <li>• <i>(TE/UM) 02-ZS-134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray not present) is not made or (at AN) 02-ZS-</i></li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<p><i>134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray present) is made</i></p> <ul style="list-style-type: none"> <li>• 02-ZS-244A [02-ZS-304A] (MMS-CNVP-103 [MMS-CNVP-104] munition stop raised) is made</li> <li>• 02-ZS-360A [02-ZS-362A] (MMS-CNVP-101T [MMS-CNVP-102T] at 0 degrees) is made</li> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made</i></li> <li>• MMS-CNVP-103 [MMS-CNVP-104] tray input bypass conveyor #2 running forward</li> </ul> <p>MMS-CNVP-101 [MMS-CNVP-102] run forward relay gets unlatched when any of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is not made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is made</i></li> <li>• Bypass Line A [Line B] is initializing</li> <li>• Bypass Line A [Line B] is not running in auto</li> </ul>
<p><b>Device:</b>                  Advisor PC Tag:                  CONR:                  Driver Word:                  Driver Type:</p>	<p><b>UPA-FDDR-101 [UPA-FDDR-102] Tray Input Airlock Feed Gate</b>                  X02HS281 [X02HS390]                  C101B [C104B]                  0661 [0661]                  9</p>
<p>Auto Open:</p>	<p>The auto open relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• UPA-FDDR-101 [UPA-FDDR-102] open feed gate relay is latched (see below)</li> <li>• Bypass Line A [Line B] is initializing and Bypass Line A [Line B] initializing timer &lt; 40 seconds</li> </ul>
<p>Auto Close:</p>	<p>The auto close relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• UPA-FDDR-101 [UPA-FDDR-102] close feed gate relay is latched (see below)</li> <li>• Bypass Line A [Line B] is initializing and Bypass Line A [Line B] initializing timer &gt; 40 seconds</li> </ul>
<p>Open I-Lock:</p>	<p>The following conditions must be satisfied to allow the device to open:</p> <ul style="list-style-type: none"> <li>• 04-ZS-122B [04-ZS-222B] (ECV-FDDR-105 [ECV-FDDR-106] gate closed) is made</li> <li>• MMS-CNVP-101 [MMS-CNVP-101] is in remote</li> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• Airlock wash down cycle not active</li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<ul style="list-style-type: none"> <li>• 04-ZS-400B [04-ZS-405B] (airlock drain valve closed) is made</li> <li>• Relay not active that prohibits opening UPA-FDDR-101 [UPA-FDDR-102] from CON if a tray is loaded in reverse into the airlock (from ECV).</li> <li>• <i>Relay not active that prohibits opening UPA-FDDR-101 [UPA-FDDR-102] until ACAMS sampling of the airlock is finished.</i></li> </ul>
Close I-Lock:	<p>The following conditions must be satisfied to allow the device to close:</p> <ul style="list-style-type: none"> <li>• MMS-CNVP-101 [MMS-CNVP-101] is in remote</li> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• Munition on the way to MMS-CNVP-103 [MMS-CNVP-104] bypass conveyor 2</li> <li>• Any of the following:                             <ul style="list-style-type: none"> <li>• <i>02-ZS-136 @ AN/UM, 02-ZS-179 @ TE [02-ZS-236 @ AN/UM, 02-ZS-279 @ TE] (UPA-FDDR-101 [UPA-FDDR-102] through gate sensor) not blocked</i></li> <li>• <i>02-ZS-133A [02-ZS-233A] (UPA-FDDR-101 [UPA-FDDR-102] gate open) is not made</i></li> <li>• <i>(AN only) 02-ZS-360B [02-ZS-362B] (MMS-CNVP-101T [MMS-CNVP-102T] at 90 degrees) is made</i></li> </ul> </li> </ul>
Relay:	<p>UPA-FDDR-101 [UPA-FDDR-102] open feed gate relay (see above) gets latched when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• 04-ZS-122B [04-ZS-222B] (ECV-FDDR-105 [ECV-FDDR-106] gate closed) is made</li> <li>• <i>(TE/UM) 02-ZS-134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray not present) is not made or (at AN) 02-ZS-134 [02-ZS-234] (MMS-CNVP-101 [MMS-CNVP-102] tray present) is made</i></li> <li>• 02-ZS-244A [02-ZS-304A] (MMS-CNVP-103 [MMS-CNVP-104] munition stop raised) is made</li> <li>• 02-ZS-360A [02-ZS-362A] (MMS-CNVP-101T [MMS-CNVP-102T] at 0 degrees) is made</li> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made</i></li> </ul> <p>UPA-FDDR-101 [UPA-FDDR-102] open feed gate relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is not made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is made</i></li> <li>• Bypass Line A [Line B] is initializing</li> </ul>

Table <i>D.3.</i> <i>ANCDF</i> , <i>TOCDF</i> , & <i>UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
<b>Device:</b>	<b>MMS-CNVP-103 [MMS-CNVP-104] Tray Input Bypass Conv #2</b>
Advisor PC Tag:	X02HS125 [X02HS225]
CONR:	C101B [C104B]
Driver Word:	0662 [0662]
Driver Type:	12
Auto Forward:	The auto forward relay will be active if either of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• All of the following:                             <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing</li> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) switch is made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made</i></li> <li>• 02-ZS-244A [02-ZS-304A] (MMS-CNVP-103 [MMS-CNVP-104] munition stop raised) is made</li> </ul> </li> </ul>
Auto Reverse:	None.
Forward I-Lock:	The following conditions must be satisfied to allow the device to operate forward: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• Either of the following:                             <ul style="list-style-type: none"> <li>• All of the following:                                     <ul style="list-style-type: none"> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made</i></li> <li>• 02-ZS-133A [02-ZS-233A] (UPA-FDDR-101 [UPA-FDDR-102] gate open) is made,</li> <li>• 02-ZS-244A [02-ZS-304A] (MMS-CNVP-103 [MMS-CNVP-104] munition stop raised) is made,</li> <li>• 04-ZS-122B [04-ZS-222B] (ECV-FDDR-105 [ECV-FDDR-106] gate closed) is made</li> </ul> </li> <li>• All of the following:                                     <ul style="list-style-type: none"> <li>• Tray loaded in reverse, or <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is not made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is made</i></li> <li>• <i>(AN/TE) 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop lowered) is made, or (at UM) 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop not lowered) is not</i></li> </ul> </li> </ul> </li> </ul>

Table D.3. <i>ANCDF</i> , <i>TOCDF</i> , & <i>UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<ul style="list-style-type: none"> <li>• <i>made</i> 04-ZS-122A [04-ZS-222A] (ECV-FDDR-105 [ECV-FDDR-106] gate open) is made</li> </ul>
Reverse I-Lock:	<p><i>(TE/UM only)</i> The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• Either of the following:                             <ul style="list-style-type: none"> <li>• 02-ZS-133A [02-ZS-233A] (UPA-FDDR-101 [UPA-FDDR-102] gate open) is made and 02-ZS-360A [02-ZS-362A](MMS-CNVP-101T [MMS-CNVP-102T] at 0 degrees) is made</li> <li>• 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray not present) is not made or 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is not made, and <i>(at TE)</i> 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop lowered) is made, <i>or (at UM)</i> 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop not lowered) is not made</li> </ul> </li> </ul>
Reverse I-Lock:	<p><i>(AN only)</i> The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• <i>Bypass Line A [Line B] CON E-stop not active</i></li> <li>• <i>Any of the following:</i> <ul style="list-style-type: none"> <li>• <i>02-ZS-133A [02-ZS-233A] (UPA-FDDR-101 [UPA-FDDR-102] gate open) is made and 02-ZS-360A [02-ZS-362A](MMS-CNVP-101T [MMS-CNVP-102T] at 0 degrees) is made</i></li> <li>• <i>02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop lowered) is made and 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray present) is made</i></li> <li>• <i>02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop lowered) is made, 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made, and 04-ZS-164 [04-ZS-264] (ECV-FDDR-105 [ECV-FDDR-106] through gate blocked) is not made</i></li> <li>• <i>02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop lowered) is made, 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray present) is made, 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray present) is made or MMS-CNVP-103 [MMS-CNVP-104] Tray Input Bypass Conveyor #2 reverse interlock is active (latch)</i></li> </ul> </li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
<b>Device:</b>	<b>MMS-CNVP-103 [MMS-CNVP-104] Bypass Conveyor #2 Munition Stop</b>
Advisor PC Tag:	X02HS245 [X02HS305]
CONR:	C101B [C104B]
Driver Word:	0663 [0663]
Driver Type:	11
Auto Extend:	The auto extend relay will be active if either of the following condition are satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] has been initializing for more than two seconds or Bypass Line is initializing and <i>(at AN/TE) 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stopped lowered) is not made, or (at UM) 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop not lowered) is made</i></li> <li>• Bypass Line A [Line B] is running in auto and MMS-CNVP-103 [MMS-CNVP-104] tray stop lower relay is not latched (see below)</li> </ul>
Auto Retract:	The auto retract relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] has been initializing for less than two seconds and <i>(at AN/TE) 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stopped lowered) is made, or (at UM) 02-ZS-244B [02-ZS-304B] (MMS-CNVP-103 [MMS-CNVP-104] munition stop not lowered) is not made</i></li> <li>• MMS-CNVP-103 [MMS-CNVP-104] tray stop lower relay is latched (see below)</li> </ul>
Extend I-Lock:	The following conditions must be satisfied to allow the device to extend: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> </ul>
Retract I-Lock:	The following conditions must be satisfied to allow the device to retract: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> </ul>
Relay:	MMS-CNVP-103 [MMS-CNVP-104] tray stop lower relay (see above) gets latched when all of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• <i>(TE/UM) 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is not made, or (at AN) 02-ZS-123 [02-ZS-223] MMS-CNVP-103 [MMS-CNVP-104] tray present) is made</i></li> <li>• 04-ZS-122A [04-ZS-222A] (ECV-FDDR-105 [ECV-FDDR-106] gate open) is made</li> <li>• 04-ZS-122B [04-ZS-222B] (ECV-FDDR-105 [ECV-FDDR-106] gate closed) is not made</li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<p>MMS-CNVP-103 [MMS-CNVP-104] tray stop lower relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• 04-ZS-122B [04-ZS-222B] (ECV-FDDR-105 [ECV-FDDR-106] gate closed) is made</li> <li>• Bypass Line A [Line B] is initializing</li> </ul>
<p><b>Device:</b>                  Advisor PC Tag:                  CONR:                  Driver Word:                  Driver Type:                  Auto Open:</p>	<p><b>ECV-FDDR-105 [ECV-FDDR-106] Tray Input Airlock Feed Gate</b>                  X04HS277 [X04HS384]                  C101B [C104B]                  0664 [0664]                  9                  The auto open relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• ECV-FDDR-105 [ECV-FDDR-106] open airlock exit gate relay is latched (see below)</li> </ul>
<p>Auto Close:</p>	<p>The auto close relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto and ECV-FDDR-105 [ECV-FDDR-106] open airlock exit gate relay is unlatched (see below)</li> <li>• Bypass Line A [Line B] is initializing</li> </ul>
<p>Open I-Lock:</p>	<p>The following conditions must be satisfied to allow the device to open:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 02-ZS-133B [02-ZS-233B] (UPA-FDDR-101 [UPA-FDDR-102] gate closed) is made</li> <li>• Airlock wash down cycle not active</li> <li>• 04-ZS-400B [04-ZS-405B] (airlock drain valve closed) is made</li> </ul>
<p>Close I-Lock:</p>	<p>The following conditions must be satisfied to allow the device to close:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• No tray transfer through gate - forward direction</li> <li>• No tray transfer through gate - reverse direction</li> <li>• <i>(All sites except AN Line B) 04-ZS-164 @ AN/UM, 04-ZS-147 @ TE [04-ZS-264 @ AN/UM, 04-ZS-247 @ TE] (ECV-FDDR-105 [ECV-FDDR-106] through gate sensor) not blocked or 04-ZS-122A [04-ZS-222A] (ECV-FDDR-105 [ECV-FDDR-106] gate open) is not made</i></li> <li>• <i>(AN Line B only) Munition is not on the way to MMS-CNVP-106 (Bypass conveyor 3)</i></li> <li>• <i>(AN only) 04-ZS-164 [04-ZS-264] (ECV-FDDR-105 [ECV-FDDR-106] through gate blocked) is not made (on time delay)</i></li> </ul>

Table <i>D.3</i> . <i>ANCDF</i> , <i>TOCDF</i> , & <i>UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Relay:	<p>ECV-FDDR-105 [ECV-FDDR-106] open airlock exit gate relay (see above) gets latched when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• <i>(TE/UM)</i> 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is not made, <i>or (at AN)</i> 02-ZS-123 [02-ZS-223] <i>MMS-CNVP-103 [MMS-CNVP-104] tray present) is made</i></li> <li>• <i>(TE/UM)</i> 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray not present) is made, <i>or (at AN)</i> 04-ZS-184 [04-ZS-283] <i>(MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray present) is not made</i></li> <li>• MMS-CNVP-105 [MMS-CNVP-106] tray input bypass conveyor #3 is running forward</li> <li>• 02-ZS-133B [02-ZS-233B] (UPA-FDDR-101 [UPA-FDDR-102] gate closed) is made</li> <li>• <i>(TE/UM)</i> 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray not present) is made, <i>or (at AN)</i> 04-ZS-185 [04-ZS-284] <i>(MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray present) is not made</i></li> </ul> <p>ECV-FDDR-105 [ECV-FDDR-106] open airlock exit gate relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing</li> <li>• All of the following:                             <ul style="list-style-type: none"> <li>• <i>(TE/UM)</i> 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray not present) is made, <i>or (at AN)</i> 02-ZS-123 [02-ZS-223] <i>(MMS-CNVP-103 [MMS-CNVP-104] tray present) is not made</i></li> <li>• <i>(TE/UM)</i> 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray not present) is made, <i>or (at AN)</i> 04-ZS-184 [04-ZS-283] <i>(MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray present) is not made</i></li> <li>• 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray not present) is not made</li> </ul> </li> </ul>
<b>Device:</b>	<b>MMS-CNVP-105 [MMS-CNVP-106] Tray Input Bypass Conveyor #3</b>
Advisor PC Tag:	X04HS187 [X04HS287]
CONR:	C101B [C104B]
Driver Word:	0665 [0665]
Driver Type:	12
Auto Forward:	<p>The auto forward relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing and <i>(at TE/UM)</i> 04-ZS-177 [04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray not present) is made, <i>or (at AN)</i> 04-ZS-177</li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
<p><i>[04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray present) is not made</i></p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto and either of the following:                             <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray not present) is made, or (at AN) 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray present) is not made</i></li> <li>• 04-ZS-152A [04-ZS-252A] (COR-GATE-101 [COR-GATE-102] gate open) is made, MMS-CNVP-107 [MMS-CNVP-108] tray input bypass conveyor #4 running forward, <i>(TE/UM) 04-ZS-177 [04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray not present) is made, or (at AN) 04-ZS-177 [04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray present) is not made, and (TE/UM) 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is made, or (at AN) 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray present) is not made</i></li> </ul> </li> </ul>	<p>Auto Reverse: None.</p> <p>Forward I-Lock: The following conditions must be satisfied to allow the device to operate forward:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-157A/B [04-XS-257A/B] MMS-CNVP-105 [MMS-CNVP-106] rope switch not pulled</li> <li>• Either of the following:                             <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray not present) is made, or (at AN) 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray present) is not made</i></li> <li>• 04-ZS-152A [04-ZS-252A] (COR-GATE-101 [COR-GATE-102] gate open) is made</li> </ul> </li> <li>• <i>(AN only) Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray present) is not made,</i></li> <li>• <i>04-ZS-122B [04-ZS-222B] (ECV-FDDR-105 [ECV-FDDR-106] gate closed) is not made, 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray present) is made, and one of the following: 02-ZS-123 [02-ZS-223] (MMS-CNVP-103 [MMS-CNVP-104] tray present) is made, 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106]</i></li> </ul> </li> </ul>

Table <i>D.3.</i> <i>ANCDF</i> , <i>TOCDF</i> , & <i>UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
<i>presence #1 tray present) is not made, or MMS-CNVP-105 [MMS-CNVP-106] Forward I-Lock is active (latch).</i>	
Reverse I-Lock:	<p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-157A/B [04-XS-257A/B] MMS-CNVP-105 [MMS-CNVP-106] rope switch not pulled</li> <li>• Either of the following:                             <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray not present) is made, or (at AN) 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray present) is not made</i></li> <li>• 04-ZS-122A [04-ZS-222A] (ECV-FDDR-105 [ECV-FDDR-106] gate open) is made</li> </ul> </li> <li>• <i>(AN Line A only) Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>04-ZS-152A (COR-GATE-101 gate open) is made</i></li> <li>• <i>MMS-CNVP-103 is running in reverse</i></li> </ul> </li> </ul>
<b>Device:</b>	<b>COR-GATE-101 [COR-GATE-102] Bypass Conveyor Process Gate</b>
Advisor PC Tag:	X04HS257 [X04HS318]
CONR:	C101B [C104B]
Driver Word:	0666 [0666]
Driver Type:	9
Auto Open:	<p>The auto open relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• COR-GATE-101 [COR-GATE-102] open bypass conveyor process gate relay is latched (see below)</li> </ul>
Auto Close:	<p>The auto close relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto and COR-GATE-101 [COR-GATE-102] open bypass conveyor process gate relay is unlatched (see below)</li> <li>• Bypass Line A [Line B] is initializing</li> </ul>
Open I-Lock:	<p>The following conditions must be satisfied to allow the device to operate forward:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> </ul>
Close I-Lock:	<p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• No tray transfer through gate - forward direction</li> <li>• No tray transfer through gate - reverse direction</li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Relay:	<ul style="list-style-type: none"> <li>• 04-ZS-186 [04-ZS-286] (COR-GATE-101 [COR-GATE-102] through gate sensor) not blocked or 04-ZS-152A [04-ZS-252A] (COR-GATE-101 [COR-GATE-102] gate open) is not made</li> </ul> <p>COR-GATE-101 [COR-GATE-102] open bypass conveyor process gate relay (see above) gets latched when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• <i>(TE/UM)</i> 04-ZS-176 [04-ZS-276] (MMS-CNVP-107 [MMS-CNVP-108] presence #1 tray not present) is made, <i>or (at AN) 04-ZS-176 [04-ZS-276] (MMS-CNVP-107 [MMS-CNVP-108] presence #1 tray present) is not made</i></li> <li>• <i>(TE/UM)</i> 04-ZS-177 [04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray not present) is made, <i>or (at AN) 04-ZS-177 [04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray present) is not made</i></li> <li>• <i>(TE/UM)</i> 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is made, <i>or (at AN) 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray present) is not made</i></li> <li>• MMS-CNVP-107 [MMS-CNVP-108] tray input bypass conveyor #4 is running forward</li> <li>• <i>{(TE/UM) 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray not present) is not made, or (at AN) 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray present) is made}, or {(TE/UM) 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray not present) is not made, or (at AN) 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray present) is made}</i></li> </ul> <p>COR-GATE-101 [COR-GATE-102] open bypass conveyor process gate relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• 04-ZS-184 [04-ZS-283] (MMS-CNVP-105 [MMS-CNVP-106] presence #1 tray not present) is made, 04-ZS-185 [04-ZS-284] (MMS-CNVP-105 [MMS-CNVP-106] presence #2 tray not present) is made and either of the following:                         <ul style="list-style-type: none"> <li>• 04-ZS-177 [04-ZS-277] (MMS-CNVP-107 [MMS-CNVP-108] presence #2 tray not present) is not made</li> <li>• 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is not made</li> </ul> </li> <li>• Bypass Line A [Line B] is initializing</li> </ul>
<b>Device:</b>	<b>MMS-CNVP-107 [MMS-CNVP-108] Tray Input Bypass Conv #4</b>
Advisor PC Tag:	X04HS179 [X04HS279]
CONR:	C101B [C104B]

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Driver Word:	0667 [0667]
Driver Type:	7
Auto Forward:	<p>The auto forward relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing, 04-ZS-119A [04-ZS-219A] (MMS-CNVP-107 [MMS-CNVP-108] tray stop raise) is made, and <i>(TE/UM)</i> 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is made, <i>or (at AN) 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray present) is not made</i></li> <li>• Bypass Line A [Line B] is running in auto, and MMS-CNVP-107 [MMS-CNVP-108] lower tray stop relay is active (see below), or <i>(TE/UM)</i> 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is made, <i>or (at AN) 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray present) is not made</i></li> </ul>
Auto Reverse:	None.
Forward I-Lock:	<p>The following conditions must be satisfied to allow the device to operate forward:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-158A/B [04-XS-258A/B] MMS-CNVP-107 [MMS-CNVP-108] rope switch not pulled</li> <li>• Either of the following:                     <ul style="list-style-type: none"> <li>• <i>(AN/TE)</i> 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop lowered) is made, <i>or (at UM) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop not lowered) is not made</i></li> <li>• <i>(TE/UM)</i> 04-ZS-114 [04-ZS-214] (MMS-CNVP-103 [MMS-CNVP-104] presence #3 tray not present) is made, <i>or (at AN) 04-ZS-114 [04-ZS-214] (MMS-CNVP-103 [MMS-CNVP-104] presence #3 tray present) is not made</i></li> </ul> </li> </ul>
Reverse I-Lock:	<p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-158A/B [04-XS-258A/B] MMS-CNVP-107 [MMS-CNVP-108] rope switch not pulled</li> <li>• Either of the following:                     <ul style="list-style-type: none"> <li>• <i>(TE/UM only)</i> 04-ZS-176 [04-ZS-276] (MMS-CNVP-107 [MMS-CNVP-108] presence #1 tray not present) is made, <i>or (at AN) 04-ZS-176 [04-ZS-276] (MMS-CNVP-107 [MMS-CNVP-108] presence #1 tray present) is not made</i></li> <li>• 04-ZS-152A [04-ZS-252A] (COR-GATE-101 [COR-GATE-102] gate open) is made</li> </ul> </li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Relay:	<ul style="list-style-type: none"> <li>• <i>(AN Line A only) Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>04-ZS-119A (MMS-CNVP-107 tray stop raised) is not made</i></li> <li>• <i>MMS-CNVP-105 is running in reverse</i></li> </ul> </li> </ul> <p>MMS-CNVP-107 [MMS-CNVP-108] lower tray stop relay (see above) will be active when both of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• MMS-CNVP-107 [MMS-CNVP-108] raise tray stop relay (see below) is not active</li> </ul>
Relay:	<p>MMS-CNVP-107 [MMS-CNVP-108] raise tray stop relay (see above) will be active when Bypass Line A [Line B] is running in auto and any of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-102 [04-ZS-202] (MMS-CNVP-109 [MMS-CNVP-110] clamp #1 tray not present) is not made and 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is made</i></li> <li>• <i>(TE/UM) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray not present) is not made, or (at AN) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray present) is made</i></li> <li>• <i>(TE/UM) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is not made, or (at AN) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot present) is made</i></li> <li>• MMS-CNVP-109 [MMS-CNVP-110] bypass indexing conveyor is not running forward and MMS-CNVP-109 [MMS-CNVP-110] bypass indexing conveyor is not running reverse</li> </ul>
<b>Device:</b>	<b>MMS-CNVP-107 [MMS-CNVP-108] Tray Input Bypass Conveyor #4 Munition Stop</b>
Advisor PC Tag:	X04HS329 [X04HS325]
CONR:	C101B [C104B]
Driver Word:	0668 [0668]
Driver Type:	7
Auto Raise:	<p>The auto raise relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] has been initializing for more than two seconds or Bypass Line A [Line B] is initializing and <i>(AN/TE) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop lowered) is not made, or (at UM) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop not lowered) is not made</i></li> <li>• MMS-CNVP-107 [MMS-CNVP-108] raise tray stop relay (see below) is active</li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Auto Lower:	<p>The auto lower relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] has been initializing for less than two seconds or Bypass Line A [Line B] is initializing and <i>(AN/TE) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop lowered) is made, or (at UM) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop not lowered) is made</i></li> <li>• MMS-CNVP-107 [MMS-CNVP-108] lower tray stop relay (see below) is active <i>and (AN Line A only) MMS-CNVP-109 move out command is not active</i></li> </ul>
Raise I-Lock:	<p>The following condition must be satisfied to allow the device to raise:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> </ul>
Lower I-Lock:	<p>The following condition must be satisfied to allow the device to lower:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> </ul>
Relay:	<p>MMS-CNVP-107 [MMS-CNVP-108] lower tray stop relay (see above) will be active when both of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• MMS-CNVP-107 [MMS-CNVP-108] raise tray stop relay (see below) is not active</li> </ul>
Relay:	<p>MMS-CNVP-107 [MMS-CNVP-108] raise tray stop relay (see above) will be active when Bypass Line A [Line B] is running in auto and any of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-102 [04-ZS-202] (MMS-CNVP-109 [MMS-CNVP-110] clamp #1 tray not present) is not made and 04-ZS-114 [04-ZS-214] (MMS-CNVP-107 [MMS-CNVP-108] presence #3 tray not present) is made</i></li> <li>• <i>(TE/UM) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray not present) is not made, or (at AN) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray present) is made</i></li> <li>• <i>(TE/UM) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is not made, or (at AN) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot present) is made</i></li> <li>• MMS-CNVP-109 [MMS-CNVP-110] bypass indexing conveyor is not running forward and MMS-CNVP-109 [MMS-CNVP-110] bypass indexing conveyor is not running reverse</li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
<b>Device:</b>	<b>MMS-CNVP-109 [MMS-CNVP-110] Bypass Indexing Conveyor</b>
Advisor PC Tag:	X04HS121A [X04HS208A]
CONR:	C101B [C104B]
Driver Word:	0669 [0669]
Driver Type:	7
Auto Forward:	The auto forward relay will be active if any of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing and <i>(TE/UM) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray not present) is made, or (at AN) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray present) is not made</i></li> <li>• MMS-CNVP-109 [MMS-CNVP-110] index forward relay is active (see below)</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay is active (see below)</li> </ul>
Auto Reverse:	None.
Forward I-Lock:	The following conditions must be satisfied to allow the device to operate forward: <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-132A/B [04-XS-232A/B] MMS-CNVP-109 [MMS-CNVP-110] rope switch not pulled</li> <li>• <i>(AN/TE only) MMS-CNVP-109 [MMS-CNVP-110] clamp unclamped</i></li> <li>• Any of the following: <ul style="list-style-type: none"> <li>• PHS-MPL-101 robot end effector clear of conveyor A</li> <li>• ECR A [ECR B] campaign select - clear</li> <li>• ECR A [ECR B] campaign select - rockets</li> </ul> </li> <li>• Either of the following: <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray not present) is made, or (at AN) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray present) is not made</i></li> <li>• <i>(TE/UM) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray not present) is made, or (at AN) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray present) is not made</i></li> </ul> </li> <li>• Any of the following: <ul style="list-style-type: none"> <li>• Tray number entered for MMS-CNVP-109 [MMS-CNVP-110] (MDM mode) <i>and (UM only) valid tray ID number entered (MPL mode)</i></li> <li>• <i>(TE only) Dunnage tray at MPL station</i></li> <li>• <i>(AN/UM only) MMS-CNVP-109 [MMS_CNVP-110] move out command is active and MMS-CNVP-109 [MMS_CNVP-110] no tray present relay is not active</i></li> </ul> </li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Reverse I-Lock:	<ul style="list-style-type: none"> <li>• No tray present on MMS-CNVP-109 [MMS-CNVP-110] at MPL station</li> <li>• ECR A [ECR B] campaign not projectiles (clear, rockets or mines)</li> </ul> <p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-132A/B [04-XS-232A/B] MMS-CNVP-109 [MMS-CNVP-110] rope switch not pulled</li> <li>• <i>(AN/TE only)</i> MMS-CNVP-109 [MMS-CNVP-110] clamp unclamped</li> <li>• <i>(AN/TE)</i> 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop lowered) is made, <i>or (at UM) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop not lowered) is not made</i></li> <li>• Any of the following:                         <ul style="list-style-type: none"> <li>• PHS-MPL-101 [PHS-MPL-102] robot end effector clear of conveyor A</li> <li>• ECR A [ECR B] campaign select - clear</li> <li>• ECR A [ECR B] campaign select - rockets</li> </ul> </li> </ul>
Relay:	<p>MMS-CNVP-109 [MMS-CNVP-110] index forward relay (see above) will be active when Bypass Line A [Line B] is running in auto and any of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• MMS-CNVP-109 [MMS-CNVP-110] processing projectiles in the indexing mode and any of the following:                         <ul style="list-style-type: none"> <li>• MMS-CNVP-109 [MMS-CNVP-110] tray clamp has not cycled unclamped and <i>(TE/UM) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is made, or (at AN) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray present at robot) is not made</i></li> <li>• MMS-CNVP-109 [MMS-CNVP-110] has not made the first index on a tray and MMS-CNVP-109 [MMS-CNVP-110] tray clamp has cycled unclamped</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] move out command is active</li> </ul> </li> <li>• MMS-CNVP-109 [MMS-CNVP-110] processing bulk items in the indexing mode and either of the following:                         <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray not present) is made, or (at AN) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray present) is not made</i></li> <li>• All of the following:                                 <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence</i></li> </ul> </li> </ul> </li> </ul>

Table <i>D.3.</i> <i>ANCDF</i> , <i>TOCDF</i> , & <i>UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Relay:	<p>tray not present) is not made, <i>or (at AN) 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray present) is made</i></p> <ul style="list-style-type: none"> <li>• <i>(TE/UM) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray not present) is made, or (at AN) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray present) is not made</i></li> <li>• MMS-CNVP-111 [MMS-CNVP-112] is running forward,</li> <li>• <i>(TE only) MMS-CNVP-109 [MMS-CNVP-110] tray clamp has cycled unclamped</i></li> </ul> <p>MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay (see above) will be active when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• PHS-MPL-101 [PHS-MPL-102] index row command from robot is active or MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay is active (latch)</li> <li>• <i>(TE/UM) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is not made, or (at AN) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray present at robot) is made</i></li> <li>• MMS-CNVP-109 [MMS-CNVP-110] index command is not complete</li> <li>• PHS-MPL-101 [PHS-MPL-102] move out command is not active</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] is not processing bulk items in the indexing mode</li> </ul>
<p><b>Device:</b></p> <p>Advisor PC Tag:</p> <p>CONR:</p> <p>Driver Word:</p> <p>Driver Type:</p> <p>Auto Clamp:</p>	<p><i>(AN/TE only) MMS-CNVP-109 [MMS-CNVP-110] Bypass Indexing Conveyor Clamp</i></p> <p>X04HS108A [X04HS209C]</p> <p>C101B [C104B]</p> <p>0670 [0670]</p> <p>11</p> <p>The auto clamp relay will be active if all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• <i>(TE only) MMS-CNVP-109 [MMS-CNVP-110] processing projectiles in the indexing mode and 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is not made or MMS-CNVP-109 [MMS-CNVP-110] processing bulk items in the bypass mode and 04-ZS-110 [04-ZS-210] (MMS-CNVP-109 [MMS-CNVP-110] end presence tray not present) is not made</i></li> <li>• <i>(AN only) MMS-CNVP-109 [MMS-CNVP-110] processing projectiles in the indexing mode and 04-ZS-112 [04-ZS-212]</i></li> </ul>

Table D.3. <i>ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<p><i>(MMS-CNVP-109 [MMS-CNVP-110] tray present at robot) is made (on time delay)</i></p> <ul style="list-style-type: none"> <li>• MMS-CNVP-109 [MMS-CNVP-110] not running forward</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] not running reverse</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] tray clamp has not cycled clamped</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay is not active (see below) or MMS-CNVP-109 [MMS-CNVP-110] has not made the first index on a tray</li> <li>• Bypass Line A [Line B] is not initializing</li> <li>• <i>(AN only) MMS-CNVP-109 [MMS-CNVP-110] bypass indexing conveyor clamp auto unclamp relay is not active</i></li> </ul>
Auto Unclamp:	<p>The auto unclamp relay will be active if any of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• MMS-CNVP-109 [MMS-CNVP-110] tray clamp cycle has been completed</li> <li>• Bypass Line A [Line B] is initializing</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] move out command is active</li> <li>• <i>(AN only) MMS-CNVP-109 [MMS-CNVP-110] bypass indexing conveyor clamp auto unclamp relay is active (latch) and MMS-CNVP-109 [MMS-CNVP-110] clamp not unclamped</i></li> </ul>
Clamp I-Lock:	<p>The following conditions must be satisfied to allow the device to clamp:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-132A/B [04-XS-232A/B] MMS-CNVP-109 [MMS-CNVP-110] rope switch not pulled</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] run forward driver is not active</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] run reverse driver is not active</li> </ul>
Unclamp I-Lock:	<p>The following conditions must be satisfied to allow the device to unclamp:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-132A/B [04-XS-232A/B] MMS-CNVP-109 [MMS-CNVP-110] rope switch not pulled</li> </ul>
Relay:	<p>MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay (see above) is active when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• PHS-MPL-101 [PHS-MPL-102] index row command from robot is active or MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay is active (latch)</li> <li>• <i>(TE/UM) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is not made, or (at AN)</i></li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<p><i>04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray present at robot) is made</i></p> <ul style="list-style-type: none"> <li>• MMS-CNVP-109 [MMS-CNVP-110] index command is not complete</li> <li>• PHS-MPL-101 [PHS-MPL-102] move out command is not active</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] is not processing bulk items in the indexing mode</li> </ul>
<b>Device:</b>	<b>MMS-CNVP-111 [MMS-CNVP-112] Tray Discharge Conveyor</b>
Advisor PC Tag:	X04HS126 [X04HS226]
CONR:	C101B [C104B]
Driver Word:	0671 [0671]
Driver Type:	7
Auto Forward:	<p>The auto forward relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is initializing, 04-ZS-131A [04-ZS-231A] (MMS-CNVP-111 [MMS-CNVP-112] tray stop raised) is made, and <i>(TE/UM) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray not present) is made, or (at AN) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray present) is not made</i></li> <li>• Bypass Line A [Line B] is running in auto</li> </ul>
Auto Reverse:	None.
Forward I-Lock:	<p>The following conditions must be satisfied to allow the device to operate forward:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-133A/B [04-XS-233A/B] MMS-CNVP-111 [MMS-CNVP-112] rope switch not pulled</li> <li>• Either of the following:                     <ul style="list-style-type: none"> <li>• 04-ZS-131A (MMS-CNVP-111 [MMS-CNVP-112] tray stop raised) is made, <i>(TE/UM) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray not present) is made, or (at AN) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray present) is not made, and {(AN/UM only) MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay is active (see below), MMS-CNVP-109 [MMS-CNVP-110] move out command hold in relay is active, or bypass Line A [Line B] is initializing.}</i></li> <li>• Charge car conveyor is running forward, charge car is aligned, <i>(AN/TE) 04-ZS-131B [04-ZS-231B] (MMS-CNVP-111 [MMS-CNVP-112] tray stop lowered) is made, or (at UM) 04-ZS-131B [04-ZS-231B] (MMS-CNVP-111 [MMS-CNVP-112] tray stop not lowered) is not made, and (TE/UM) 04-ZS-111 [04-ZS-211]</i></li> </ul> </li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Reverse I-Lock:	<p style="text-align: center;">(MMS-CNVP-111 [MMS-CNVP-112] tray not present) is not made, <i>or (at AN) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray present) is made</i></p> <p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• 04-XS-133A/B [04-XS-233A/B] MMS-CNVP-111 [MMS-CNVP-112] rope switch not pulled</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] clamp unclamped</li> </ul>
Relay:	<p>MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay (see above) is active when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• PHS-MPL-101 [PHS-MPL-102] index row command from robot is active or MMS-CNVP-109 [MMS-CNVP-110] is indexing forward relay is active (latch)</li> <li>• <i>(TE/UM) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray at robot not present) is not made, or (at AN) 04-ZS-112 [04-ZS-212] (MMS-CNVP-109 [MMS-CNVP-110] tray present at robot) is made</i></li> <li>• MMS-CNVP-109 [MMS-CNVP-110] index command is not complete</li> <li>• PHS-MPL-101 [PHS-MPL-102] move out command is not active</li> <li>• MMS-CNVP-109 [MMS-CNVP-110] is not processing bulk items in the indexing mode</li> </ul>
<b>Device:</b>	<b>MMS-CNVP-111 [MMS-CNVP-112] Tray Discharge Conveyor Munition Stop</b>
Advisor PC Tag:	X04HS331 [X04HS327]
CONR:	C101B [C104B]
Driver Word:	0672 [0672]
Driver Type:	7
Auto Raise:	<p>The auto raise relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] has been initializing for more than two seconds or Bypass Line A [Line B] is initializing and <i>(AN/TE) 04-ZS-131B [04-ZS-231B] (MMS-CNVP-111 [MMS-CNVP-112] tray stop lowered) is not made, (at UM) 04-ZS-131B [04-ZS-231B] (MMS-CNVP-111 [MMS-CNVP-112] tray stop not lowered) is not made</i></li> <li>• MMS-CNVP-111 [MMS-CNVP-112] raise tray stop relay (see below) is active</li> </ul>
Auto Lower:	<p>The auto lower relay will be active if either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] has been initializing for less than two seconds and <i>(AN/TE) 04-ZS-119B [04-ZS-219B] (MMS-</i></li> </ul>

Table <i>D.3. ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
	<p>CNVP-107 [MMS-CNVP-108] tray stop lowered) is made, <i>or (at UM) 04-ZS-119B [04-ZS-219B] (MMS-CNVP-107 [MMS-CNVP-108] tray stop not lowered) is made</i></p> <ul style="list-style-type: none"> <li>• MMS-CNVP-107 [MMS-CNVP-108] lower tray stop relay (see below) is active</li> </ul>
Raise I-Lock:	<p>The following conditions must be satisfied to allow the device to raise:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• Tray transfer to charge car not in progress</li> <li>• Tray transfer to charge car 'fail to transfer' alarm not active</li> </ul>
Lower I-Lock:	<p>The following conditions must be satisfied to allow the device to lower:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] CON E-stop not active</li> <li>• Charge car is ready</li> </ul>
Relay:	<p>MMS-CNVP-111 [MMS-CNVP-112] raise tray stop relay (see above) will be active when both of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• MMS-CNVP-111 [MMS-CNVP-112] lower tray stop relay (see below) is not active</li> </ul>
Relay:	<p>MMS-CNVP-111 [MMS-CNVP-112] lower tray stop relay (see above) will be active when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bypass Line A [Line B] is running in auto</li> <li>• MMS-CNVP-111 [MMS-CNVP-112] lower stop relay (latch) is active, or <i>(TE/UM) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray not present) is not made, or (at AN) 04-ZS-111 [04-ZS-211] (MMS-CNVP-111 [MMS-CNVP-112] tray present) is made</i></li> <li>• Charge car is ready</li> </ul>
<p><b>Device:</b>                      Advisor PC Tag:                      CONR:                      Driver Word:                      Driver Type:</p>	<p><b>Bypass Line A [Line B] Auto Run Icon</b>                      BLAAUTOST [BLBAUTOST]                      C101B [C104B]                      0673 [0673]                      NA</p> <p>The CRO selects this icon and issues a manual start command to place Bypass Line A [Line B] running in auto. All bypass Line A [Line B] devices must be in auto, Bypass Line A [Line B] initialization must be complete, hydraulics for MMS-CNVP-109 [MMS-CNVP-110] and PHS gates must be o.k. and plant air must be o.k. for Bypass Line to run in auto.</p>
<p><b>Device:</b>                      Advisor PC Tag:                      CONR:</p>	<p><b>Bypass Line A [Line B] Initialize Icon</b>                      BLAINITAL [BLBINITAL]                      C101B [C104B]</p>

Table <i>D.3.</i> <i>ANCDF, TOCDF, &amp; UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BLA [BLB]</b>	
Driver Word:	0674 [0674]
Driver Type:	NA The CRO selects this icon and issues a manual start command to initialize Bypass Line A [Line B].
<b>Device:</b>	<b>MMS-CNVP-109 [MMS-CNVP-110] Bypass Indexing Conveyor - Fast/Slow Speed Icon</b>
Advisor PC Tag:	X04HS121F [X04HS208F]
CONR:	C101B [C104B]
Driver Word:	0675 [0675]
Driver Type:	NA The CRO selects this icon and issues a manual slow command to place the conveyor in slow speed or a manual fast command to place the conveyor in fast speed.

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
<b>Device:</b>	<b>BDS-CNVP-101 [BDS-CNVP-102] Bulk Drain Conveyor Line A [Line B]</b>
Advisor PC Tag:	X4901101 [X4902101]
CONR:	C103A [C103B]
Driver Word:	0660 [0660] ( <i>controlled via Advisor screen MPB, driver word 0862</i> )
Driver Type:	10
Auto Forward:	The auto forward relay will be active if any of the following conditions is satisfied: <ul style="list-style-type: none"> <li>• “BDS-CNVP-101 [BDS-CNVP-102] Run forward” output from the BDS sequencer (see sequencer tables) is active</li> <li>• “MPB Line A [Line B] Conveyors Automatic Infeed” relay (see below) is active</li> <li>• All of the following: <ul style="list-style-type: none"> <li>• MPB Line A [Line B] BDS-CNVP-101 [BDS-CNVP-102] transfer to any MDM</li> <li>• Tray is not in position at the Robot on MDM-CNVP-101 [MDM-CNVP-102]</li> <li>• (<i>Line A only</i>) MPB Line A MDM-CNVP-101 conveyor is in fast speed</li> <li>• MPB Line A [Line B] MDM-CNVP-101 [MDM-CNVP-102] conveyor is running forward (<i>Line B is DICO from ICS-CONR-103A</i>).</li> </ul> </li> </ul>
Auto Reverse:	None.
Forward I-Lock:	The following conditions must be satisfied to allow the device to operate forward: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• (<i>All sites except TE line B</i>) Drill Carriage retracted or Campaign not selected to Spray Tanks</li> <li>• (<i>TE line B only</i>) <i>Drill Carriage retracted and drill bit clear alarm not active or Campaign not selected to Spray Tanks or Weteye bombs</i></li> <li>• (<i>TE line A only</i>) <i>Bulk drain ultrasonic level switch (49-9104B-I) retracted</i></li> <li>• MMS-BDS-101 [MMS-BDS-102] Drain Tube (49-1104B-I [49-2104B-I]) retracted</li> <li>• MMS-BDS-101 [MMS-BDS-102] Bulk Drain Punch (49-01-103 [49-02-103]) retracted</li> <li>• MMS-BDS-101 [MMS-BDS-102] Conveyor Lift (49-01-102 [49-02-102]) extended</li> <li>• Any of the following: <ul style="list-style-type: none"> <li>• Tray ID entered by the CRO</li> <li>• Tray is not present at BDS-CNVP-101 [BDS-CNVP-102] 2<sup>nd</sup> punch position (49-IP4-I [49-2P4-I]), tray is not present at BDS-CNVP-101 [BDS-CNVP-102] drain position (49-IP3-I [49-2P3-I]), and (<i>all sites</i></li> </ul> </li> </ul>

Table D.4. <i>ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
	<p><i>except AN Line B</i>) tray is not present at BDS-CNVP-101 [BDS-CNVP-102] 1<sup>st</sup> punch position (49-IP2-I [49-2P2-I])</p> <ul style="list-style-type: none"> <li>• Bulk campaign not selected</li> </ul>
Reverse I-Lock:	<p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• <i>(All sites except TE line B)</i> Drill Carriage retracted or Campaign not selected to Spray Tanks</li> <li>• <i>(TE line B only) Drill Carriage retracted and drill bit clear alarm not active or Campaign not selected to Spray Tanks or Weteye bombs</i></li> <li>• <i>(TE line A only) Bulk drain ultrasonic level switch (49-9104B-I) retracted</i></li> <li>• MMS-BDS-101 [MMS-BDS-102] Drain Tube (49-1104B-I [49-2104B-I]) retracted</li> <li>• MMS-BDS-101 [MMS-BDS-102] Bulk Drain Punch (49-01-103 [49-02-103]) retracted</li> <li>• MMS-BDS-101 [MMS-BDS-102] Conveyor Lift (49-01-102 [49-02-102]) extended</li> </ul>
Relay:	<p>“MPB Line A [Line B] Conveyors Automatic Infeed” relay is active (see above) if the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• “MPB Line A [Line B] Conveyors Automatic Infeed Start” relay is active (see below) or “MPB Line A [Line B] Conveyors Automatic Infeed” relay is active (latch)</li> <li>• Either of the following:                     <ul style="list-style-type: none"> <li>• Tray is not present at BDS-CNVP-101 [BDS-CNVP-102] 1<sup>st</sup> punch position (49-IP2-I) and projectile campaign not selected <i>or (TE Line A: bulk and projo campaign selected and BDS-101 running in Auto; TE Line B: Weteye bomb campaign selected or BDS-102 running in Auto)</i></li> <li>• Tray is not present at BDS-CNVP-101 [BDS-CNVP-102] exit sensor (49-IP5-I) and projectile campaign is selected <i>and (TE Line A: bulk and projo campaign not selected or BDS-101 not running in Auto; TE Line B: Weteye bomb campaign not selected and BDS-101 not running in Auto)</i></li> </ul> </li> </ul>
Relay:	<p>“MPB Line A [Line B] Conveyors Automatic Infeed Start” relay is active (see above) if the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• “2<sup>nd</sup> Floor Charge Car Ready to Load MPB Line A [Line B]” (DICO from CONR-102) is active</li> <li>• MPB Line A [Line B] infeed conveyors are empty and available</li> <li>• MPB Line A [Line B] is in “System Auto Run”</li> </ul>

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
<b>Device:</b>	<b>MMS-BDS-101 [MMS-BDS-102] Bulk Drain Conveyor Lift</b>
Advisor PC Tag:	X4901102 [X4902102]
CONR:	C103A [C103B]
Driver Word:	0661 [0661]
Driver Type:	11
Auto Extend:	The auto extend relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>“MMS-BDS-101 [MMS-BDS-102] Conveyor Lift Extend” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Auto Retract:	The auto retract relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>“MMS-BDS-101 [MMS-BDS-102] Conveyor Lift Retract” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Extend I-Lock:	The following conditions must be satisfied to allow the device to extend: <ul style="list-style-type: none"> <li>CON and local E-Stops not active</li> <li>MMS-BDS-101 [MMS-BDS-102] Drain Tube (49-01-104B-I [49-02-104B-I]) retracted</li> <li>MMS-BDS-101 [MMS-BDS-102] Bulk Drain Punch (49-01-103B-I [49-02-103B-I]) retracted</li> <li><i>(TE line A only) Bulk drain ultrasonic level switch (49-9104B-I) retracted</i></li> </ul>
Retract I-Lock:	The following condition must be satisfied to allow the device to retract: <ul style="list-style-type: none"> <li>CON and local E-Stops not active</li> </ul>
<b>Device:</b>	<b>MMS-BDS-101 [MMS-BDS-102] Bulk Drain Punch</b>
Advisor PC Tag:	X4901103 [X4902103]
CONR:	C103A [C103B]
Driver Word:	0662 [0662]
Driver Type:	11
Auto Extend:	The auto extend relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>“MMS-BDS-101 [MMS-BDS-102] Extend Drain Punch” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Auto Retract:	The auto retract relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>“MMS-BDS-101 [MMS-BDS-102] Conveyor Lift Retract” output from the BDS sequencer (see sequencer tables) is active (on time delay)</li> </ul>

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
Extend I-Lock:	<p>The following conditions must be satisfied to allow the device to extend:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• MMS-BDS-101 [MMS-BDS-102] Bulk Drain Conveyor Lift (49-01-102 [49-02-102]) retracted or Campaign is selected to Spray Tanks</li> <li>• Any of the following:                             <ul style="list-style-type: none"> <li>• Tray ID entered by the CRO</li> <li>• No tray present on BDS-CNVP-101 [BDS-CNVP-102] past P1</li> <li>• Bulk Campaign is not selected</li> </ul> </li> <li>• MMS-BDS-102 [MMS-BDS-101] is not Draining (DICO from CONR-103B [CONR-103A])</li> </ul>
Retract I-Lock:	<p>The following condition must be satisfied to allow the device to retract:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> </ul>
<p><b>Device:</b>                      Advisor PC Tag:                      CONR:                      Driver Word:                      Driver Type:                      Auto Extend:</p>	<p><b>MMS-BDS-101 [MMS-BDS-102] Bulk Drain Tube</b>                      X4901104 [X4902104]                      C103A [C103B]                      0663 [0663]                      11</p> <p>The auto extend relay will be active if any of the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Drain Tube Extend” output from the BDS sequencer (see sequencer tables) is active</li> <li>• <i>(All sites except TE Line B)</i> All of the following:                             <ul style="list-style-type: none"> <li>• CRO issued a “Reset Step” command to the sequencer</li> <li>• BDS sequencer is on step 4.1 or 9.1</li> <li>• Campaign is selected to MK-116 bombs, or <i>(all sites except TE)</i> campaign is selected to MC-1 bombs</li> </ul> </li> </ul>
Auto Retract:	<p>The auto retract relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Drain Tube Retract” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Extend I-Lock:	<p>The following conditions must be satisfied to allow the device to extend:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• MMS-BDS-101 [MMS-BDS-102] Bulk Drain Conveyor Lift (49-01-102 [49-02-102]) retracted <i>(not extended status bit is used for interlock at AN Line B)</i></li> <li>• “OK to Pump Agent” (DICO from CONR-106)</li> </ul>

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
Retract I-Lock:	The following condition must be satisfied to allow the device to retract: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> </ul>
<b>Device:</b> Advisor PC Tag: CONR: Driver Word: Driver Type: Auto Start:	<b>ACS-PUMP-114 [ACS-PUMP-115] (51-PV-12 [51-PV-17])</b> X51PV12 [X51PV17] C103A [C103B] 0664 [0664] 4 The auto start relay will be active if either of the following condition is satisfied: <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] <i>Run Agent Drain Pump</i>” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Start I-Lock:	The following conditions must be satisfied to allow the device to run: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• “OK to Pump Agent” (DICO from CONR-106)</li> </ul>
<b>Device:</b> Advisor PC Tag: CONR: Driver Word: Driver Type: Auto Open:	<b>MMS-BDS-101 [MMS-BDS-102] BDS Drain Purge Valve (51-XV-395 [51-XV-495])</b> X51XV395 [X51XV495] C103A [C103B] 0665 [0665] 4 The auto open relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Open Drain Tube Purge Valve” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Open I-Lock:	The following conditions must be satisfied to allow the device to open: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• Agent line block valve 51-XV-396 is closed</li> </ul>
<b>Device:</b> Advisor PC Tag: CONR: Driver Word: Driver Type: Auto Open:	<b>MMS-BDS-101 [MMS-BDS-102] BDS Drain Tube Block Valve (51-XV-396 [51-XV-496])</b> X51XV396 [X51XV496] C103A [C103B] 0666 [0666] 5 The auto open relay will be active if both of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Open Drain Tube Block Valve” output from the BDS sequencer (see sequencer tables) is active</li> <li>• MMS-BDS-101 [MMS-BDS-102] BDS Drain Purge Valve (51-XV-395 [51-XV-495]) is closed</li> </ul>

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
Open I-Lock:	The following conditions must be satisfied to allow the device to open: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• MMS-BDS-101 [MMS-BDS-102] BDS Drain Purge Valve (51-XV-395 [51-XV-495]) is closed</li> </ul>
Device:	<i>(AN/TE only) MMS-BDS-101 [MMS-BDS-102] BDS Agent Verify Valve (51-XV-391/390 @ AN, 51-XV-397/398 @ TE [51-XV-491/490 @ AN, 51-XV-497/498 @ TE])</i>
Advisor PC Tag:	<i>X51XV391 @ AN, X51XV397 @ TE [X51XV491 @ AN, X51XV497 @ TE]</i>
CONR:	C103A [C103B]
Driver Word:	0667 [0667]
Driver Type:	5 (fail open)
Auto Close:	The auto close relay will be active if the following condition is satisfied ( <i>activating the auto close relay repositions the bubbler valve to vent to the room and opens the purge valve</i> ): <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Open Verify Valve” output from the BDS sequencer (see sequencer tables) is not active</li> </ul>
Close I-Lock:	The following condition must be satisfied to allow the device to close: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> </ul>
Device:	<i>(UM only) MMS-BDS-101 [MMS-BDS-102] BDS Agent Verify Valve (51-XV-391/390 [51-XV-491/490])</i>
Advisor PC Tag:	<i>X51XV391 [X51XV491]</i>
CONR:	<i>C103A [C103B]</i>
Driver Word:	<i>0667 [0667]</i>
Driver Type:	<i>5 (fail closed)</i>
Auto Open:	<i>The auto open relay will be active if the following condition is satisfied (activating the auto open relay aligns the bubbler valve to supply air to the bubbler sensing line and closes the purge valve):</i> <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Open Verify Valve” output from the BDS sequencer (see sequencer tables) is active</li> </ul>
Open I-Lock:	<i>The following condition must be satisfied to allow the device to open:</i> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> </ul>
Device:	<b>MMS-BDS-101 [MMS-BDS-102] BDS Instrument Air Isolation Valve (51-XV-380 @ AN/UM, 51-XV-127 @ TE [51-XV-379 @ AN/UM, 51-XV-123 @ TE])</b>
Advisor PC Tag:	<i>X51XV380 @ AN/UM, X51HV127 @ TE [X51XV379 @ AN/UM, X51HV123 @ TE]</i>
CONR:	C103A [C103B]
Driver Word:	0668 [0668]
Driver Type:	5

Table D.4. <i>ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
Auto Open:	The auto open relay will be active if the following condition is satisfied: <ul style="list-style-type: none"> <li>• MMS-BDS-101 [MMS-BDS-102] system in “Auto Run”</li> </ul>
Open I-Lock:	The following condition must be satisfied to allow the device to open: <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> </ul>
<b>Device:</b>	<i>(TE/UM only; see FAWB Note B-15)</i> <b>MMS-BDS-101 [MMS-BDS-102] Bulk Drain Drill Carriage</b>
Advisor PC Tag:	X49XV105@ <i>TE</i> , X49XV262@ <i>UM</i> , [X49XV205@ <i>TE</i> , X49XV464@ <i>UM</i> ]
CONR:	C103A [C103B]
Driver Word:	0669 [0669]
Driver Type:	11
Auto Extend:	<i>(TE Line A; UM Lines A/B)</i> The auto extend relay will be active (for the duration of the dwell timer) if the following conditions are satisfied: <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Drill Munition” output from the BDS sequencer (see sequencer tables) is active</li> <li>• Campaign is selected to Spray Tanks</li> </ul>
<i>Auto Extend:</i>	<i>(TE Line B)</i> The auto extend relay will be active if the auto retract relay is not active and either of the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Campaign is selected to Spray Tanks, “MMS-BDS-102 Drill Munition” output from the BDS sequencer (see sequencer tables) is active, and drill motor dwell timer is not done.</li> <li>• Campaign is selected to Weteye bombs, the bulk drain drill carriage is in Auto, and the “Weteye 5-hole drill sequence” relay is active.</li> </ul>
Auto Retract:	<i>(TE Line A; UM Lines A/B)</i> The auto retract relay will be active (after dwell timer has expired) if the following conditions are satisfied: <ul style="list-style-type: none"> <li>• “MMS-BDS-101 [MMS-BDS-102] Drill Munition” output from the BDS sequencer (see sequencer tables) is active</li> <li>• Campaign is selected to Spray Tanks</li> </ul>
<i>Auto Retract:</i>	<i>(TE Line B)</i> The auto retract relay will be active if the following conditions are satisfied: <ul style="list-style-type: none"> <li>• Campaign is selected to Spray Tanks, “MMS-BDS-101 [MMS-BDS-102] Drill Munition” output from the BDS sequencer (see sequencer tables) is active, and the drill motor dwell timer is done.</li> <li>• Campaign is selected to Weteye bombs, the bulk drain drill carriage is in Auto, and either of the following:                             <ul style="list-style-type: none"> <li>• MMS-BDS-102 drill point location counter equals 5 and the drill point fully extended timer is done</li> <li>• MMS-BDS-102 drill carriage auto retract relay is active (latch) and 49-ZS-205B (MMS-BDS-102 drill carriage retracted) is not active (on time delay)</li> </ul> </li> </ul>

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
Extend I-Lock:	<p>The following conditions must be satisfied to allow the device to extend:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• MMS-BDS-101 [MMS-BDS-102] BDS Drill Motor is running <i>or (TE line B only) campaign is selected to Weteye bombs</i></li> <li>• BDS-CNVP-101 [BDS-CNVP-102] Tray Present at 49-1P3-I [49-2P3-I] <i>or (TE line B only) campaign is selected to Weteye bombs and 49-1P4-I (tray present at second punch position) is made</i></li> <li>• Campaign is selected to Spray Tanks <i>or (TE line B only) campaign is selected to Weteye bombs</i></li> </ul>
Retract I-Lock:	<p>The following condition must be satisfied to allow the device to retract:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> </ul>
<b>Device:</b> Advisor PC Tag: CONR: Driver Word: Driver Type:	<p><b><i>(TE/UM only; see FAWB Note B-15)</i> MMS-BDS-101 [MMS-BDS-102] Drill Motor</b></p> <p>X49XV107@ <i>TE</i>, X49XV267@ <i>UM</i> [X49XV207@ <i>TE</i>, X49XV467@ <i>UM</i>]                      C103A [C103B]                      0670 [0670]                      4</p>
Auto Start:	<p>The auto start relay will be active if the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Campaign is selected to Spray Tanks and “MMS-BDS-101 [MMS-BDS-102] Drill Munition” output from the BDS sequencer (see sequencer tables) is active</li> <li>• <i>(TE Line B only) Campaign is selected to Weteye bombs, MMS-BDS-102 drill point location 1-shot timer is not timing, and MMS-BDS-102 drill carriage auto retract relay is not active.</i></li> </ul>
Start I-Lock:	<p>The following conditions must be satisfied to allow the device to run:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• Campaign is selected to Spray Tanks <i>or (TE line B only) campaign is selected to Weteye bombs</i></li> </ul>
<b>Device:</b> Advisor PC Tag: CONR: Driver Word: Driver Type: Auto Open:	<p><b>MMS-BDS-101 [MMS-BDS-102] Drain Pump Block Valve (51-FV-120 [51-FV-020])</b></p> <p>X51FY120 [X51FY020]                      C103A [C103B]                      0671 [0671]                      5</p> <p>The auto open relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• ACS-PUMP-114 [ACS-PUMP-115] is running</li> </ul>

Table <i>D.4. ANCDF, TOCDF, and UMCDF</i> BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDA [BDB]</b>	
Open I-Lock:	<p>The following condition must be satisfied to allow the device to open:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• “OK to Pump Agent” (DICO from CONR-106)</li> </ul>
<p><b>Device:</b>                      Advisor PC Tag:                      CONR:                      Driver Word:                      Driver Type:</p>	<p><b>MMS-BDS-101 [MMS-BDS-102] Agent Inlet Filter A/B Valve (51-XV-301/302 [51-XV-401/402]) Icon</b>                      X51XV301 [X51XV401]                      C103A [C103B]                      0672 [0672]                      N/A</p> <p>The CRO uses this icon to select which ACS filter to use. The CRO issues a manual OPEN command to select filter ‘B’ or a manual CLOSE command to select filter ‘A’.</p>
<p><b>Device:</b>                      Advisor PC Tag:                      CONR:                      Driver Word:                      Driver Type:</p>	<p><b>MMS-BDS-101 [MMS-BDS-102] Sequencer Mode Icon</b>                      BDAAMODE [BDBAMODE]                      C103A [C103B]                      0678 [0678]                      N/A</p> <p>The CRO selects this icon and issues a “AUTO MODE” or a “MAN MODE” command to place the MMS-BDS-101 [MMS-BDS-102] sequencer in auto or manual respectively.</p>
<p><b>Device:</b>                      Advisor PC Tag:                      CONR:                      Driver Word:                      Driver Type:</p>	<p><b>MMS-BDS-101 [MMS-BDS-102] Bypass/Repeat Icon</b>                      BDABYSTEP [BDBBYSTEP]                      C103A [C103B]                      0679 [0679]                      N/A</p> <p>The CRO selects this icon and issues a “BYP” or a “RPT” command to bypass or repeat an MMS-BDS-101 [MMS-BDS-102] sequencer step respectively. Note that only certain steps can be bypassed and/or repeated (see sequencer tables).</p>

Table <i>D.5</i> . BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDI</b>	
<p><b>Device:</b> MMS-BDS-101 [MMS-BDS-102] Initialize Icon                      Advisor PC Tag: BDAINIT [BDBINIT]                      CONR: C103A [C103B]                      Driver Word: 0675 [0675]                      Driver Type: N/A</p>	<p>The CRO selects this icon and issues a manual START command to initialize MMS-BDS-101 [MMS-BDS-102]. <i>At all sites except ANCDF</i>, ICS-CONR-103A [ICS-CONR-103B] will attempt to initialize MMS-BDS-101 [MMS-BDS-102] as long as “OK to Start Processing” (DICO from CONR-106) is active. <i>ANCDF does not require this condition.</i></p>
<p><b>Device:</b> MMS-BDS-101 [MMS-BDS-102] Park Icon                      Advisor PC Tag: BDAYSPARK [BDBYSPARK]                      CONR: C103A [C103B]                      Driver Word: 0676 [0676]                      Driver Type: N/A</p>	<p>The CRO selects this icon and issues a manual START command to park MMS-BDS-101 [MMS-BDS-102]. ICS-CONR-103A [ICS-CONR-103B] will attempt to park MMS-BDS-101 [MMS-BDS-102] as MMS-BDS-101 [MMS-BDS-102] is not in “Auto Run” or “Initializing”.</p>
<p><b>Device:</b> MMS-BDS-101 [MMS-BDS-102] System Initialize Icon                      Advisor PC Tag: BDASYSINIT [BDBSYSINIT]                      CONR: C103A [C103B]                      Driver Word: 0680 [0680]                      Driver Type: N/A</p>	<p>The CRO selects this icon and issues a manual START command to initialize the MMS-BDS-101 [MMS-BDS-102] system.</p>
<p><b>Device:</b> MMS-BDS-101 [MMS-BDS-102] System Start Icon                      Advisor PC Tag: BDASYSTRT [BDBSYSTRT]                      CONR: C103A [C103B]                      Driver Word: 0681 [0681]                      Driver Type: N/A</p>	<p>The CRO selects this icon and issues a manual START command to place the MMS-BDS-101 [MMS-BDS-102] system in “Auto Run”. The system will go to the “Auto Run” mode as long as the system is initialized and the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• CON and local E-Stops not active</li> <li>• Campaign is selected to a Bulk Item</li> </ul>

Table <i>D.5</i> . BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDI</b>	
	<ul style="list-style-type: none"><li>• “Hydraulics System is OK” (DICO from ICS-CONR-105) is active</li><li>• “Plant Air is Available” (DICO from ICS-CONR-105) is active</li><li>• <i>(UM only) MMS-BDS-102 [MMS-BDS-101] is not running in Auto (DICO from ICS-CONR-103B [ICS-CONR-103A])</i></li></ul>

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences  
 Advisor PC Screen: **BDR***

<p><b>Device:</b>                  Advisor PC Tag:                  CONR:                  Driver Word:                  Driver Type:                  Auto Forward:</p>	<p><b>MMS-CNVP-137 Ton Container Conveyor #1</b>                  X02HS367                  C103A                  0060                  7                  The auto forward relay will be active when the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• MMS-CNVP-137 run forward relay is latched (see below)</li> </ul>
<p><b>Auto Reverse:</b></p>	<p>None.</p>
<p><b>Forward I-Lock:</b></p>	<p>The following conditions must be satisfied to allow the device to operate forward:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 02-XS-372A/B MMS-CNVP-137 rope switch not pulled</li> <li>• Valid tray ID has been entered</li> <li>• 02-ZS-358A (UPA-GATE-103 gate open) is made</li> </ul>
<p><b>Reverse I-Lock:</b></p>	<p>The following conditions must be satisfied to allow the device to operate reverse:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 02-XS-372A/B MMS-CNVP-137 rope switch not pulled</li> </ul>
<p><b>Relay:</b></p>	<p>MMS-CNVP-137 run forward relay (see above) gets latched when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk drain room line is running in auto</li> <li>• 02-ZS-358A (UPA-GATE-103 gate open) is made</li> <li>• 02-ZS-435 (MMS-CNVP-137 tray present) is made</li> <li>• 02-ZS-304A (MMS-CNVP-104 tray stop raised) is made</li> <li>• 02-ZS-223 (MMS-CNVP-104 tray present) is not made</li> <li>• MMS-CNVP-104 ton container conveyor #2 running forward</li> <li>• Bulk drain room line feed request is active</li> </ul> <p>MMS-CNVP-137 run forward relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• 02-ZS-223 (MMS-CNVP-104 tray present) is made</li> <li>• Bulk drain room line is not running in auto</li> </ul>
<p><b>Device:</b>                  Advisor PC Tag:                  CONR:                  Driver Word:                  Driver Type:                  Auto Open:</p>	<p><b>UPA-GATE-103 Ton Container Gate</b>                  X02HS359                  C103A                  0061                  9                  The auto open relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• UPA-GATE-103 open feed gate relay is latched (see below)</li> </ul>

<i>Table D.6. PBCDF BCHS PLC Automatic Control Sequences</i> Advisor PC Screen: <b>BDR</b>	
<i>Auto Close:</i>	<p>The auto close relay will be active if the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk drain room line is running in auto</li> <li>• UPA-GATE-103 open feed gate relay is not latched (see below)</li> </ul>
<i>Open I-Lock:</i>	<p>The following conditions must be satisfied to allow the device to open:</p> <ul style="list-style-type: none"> <li>• 02-XS-372A/B MMS-CNVP-137 rope switch not pulled</li> <li>• Bulk drain room system CON E-stops not active</li> <li>• 02-ZS-231B (UPA-GATE-104 gate closed) is made</li> <li>• Airlock wash down cycle not active</li> <li>• 04-ZS-405B (airlock drain valve closed) is made</li> <li>• Relay not active that prohibits opening UPA-GATE-103 from CON if a tray is loaded in reverse into the airlock (from ECV).</li> </ul>
<i>Close I-Lock:</i>	<p>The following conditions must be satisfied to allow the device to close:</p> <ul style="list-style-type: none"> <li>• 02-XS-372A/B MMS-CNVP-137 rope switch not pulled</li> <li>• Bulk drain room system CON E-stops not active</li> <li>• 02-ZS-377 (UPA-GATE-103 through gate sensor) not blocked or 02-ZS-358A (UPA-GATE-103 gate open) is not made</li> </ul>
<i>Relay:</i>	<p>UPA-GATE-103 open feed gate relay (see above) gets latched when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk drain room line is running in auto</li> <li>• 02-ZS-435 (MMS-CNVP-137 tray present) is made</li> <li>• 02-ZS-304A (MMS-CNVP-104 tray stop raised) is made</li> <li>• 02-ZS-231B (UPA-GATE-104 gate closed) is made</li> <li>• 02-ZS-223 (MMS-CNVP-104 tray present) is not made</li> </ul> <p>UPA-GATE-103 open feed gate relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• 02-ZS-223 (MMS-CNVP-104 tray present) is made</li> <li>• Bulk drain room line is not running in auto</li> </ul>
<i>Device:</i>	<b>MMS-CNVP-104 Ton Container Conveyor #2</b>
<i>Advisor PC Tag:</i>	X02HS225
<i>CONR:</i>	C103A
<i>Driver Word:</i>	0062
<i>Driver Type:</i>	12
<i>Auto Forward:</i>	<p>The auto forward relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk drain room line is running in auto</li> </ul>
<i>Auto Reverse:</i>	None.

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences*  
*Advisor PC Screen: **BDR***

<i>Forward I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate forward:</i></p> <ul style="list-style-type: none"><li>• <i>Bulk drain room system CON E-stops not active</i></li><li>• <i>02-XS-372A/B MMS-CNVP-137 rope switch not pulled</i></li><li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li><li>• <i>Either of the following:</i><ul style="list-style-type: none"><li>• <i>02-ZS-223 (MMS-CNVP-104 tray present) is not made and relay that prohibits CON operation if the airlock is loaded in reverse (see below) is not active</i></li><li>• <i>02-ZS-304B (MMS-CNVP-104 tray stop not lowered) is not made, 02-ZS-231A (UPA-GATE-104 gate open) is made, 49-ZS-139 (MMS-CNVP-136 tray present) is made, and either 02-ZS-223 (MMS-CNVP-104 tray present) is made or relay that prohibits CON operation if the airlock is loaded in reverse (see below) is active</i></li></ul></li></ul>
<i>Reverse I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate reverse:</i></p> <ul style="list-style-type: none"><li>• <i>Bulk drain room system CON E-stops not active</i></li><li>• <i>02-XS-372A/B MMS-CNVP-137 rope switch not pulled</i></li><li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li><li>• <i>02-ZS-304B (MMS-CNVP-104 tray stop not lowered) is not made</i></li><li>• <i>02-ZS-231A (UPA-GATE-104 gate open) is made</i></li><li>• <i>Either of the following:</i><ul style="list-style-type: none"><li>• <i>49-ZS-110 (UPA-GATE-104 through gate sensor) not blocked or 02-ZS-231A (UPA-GATE-104 gate open) is not made (1.0 sec time delay before interlocking)</i></li><li>• <i>02-ZS-223 (MMS-CNVP-104 tray present) is not made and relay that prohibits CON operation if the airlock is loaded in reverse (see below) is not active</i></li></ul></li></ul>
<i>Relay:</i>	<p><i>Relay that prohibits CON operation of MMS-CNVP-104 if the airlock is loaded in reverse (see above) gets latched when the following conditions are satisfied:</i></p> <ul style="list-style-type: none"><li>• <i>MMS-CNVP-104 is running in reverse</i></li><li>• <i>02-ZS-223 (MMS-CNVP-104 tray present) is made</i></li></ul> <p><i>Relay that prohibits CON operation of MMS-CNVP-104 if the airlock is loaded in reverse (see above) gets unlatched if either of the following conditions are satisfied:</i></p> <ul style="list-style-type: none"><li>• <i>MMS-CNVP-104 is running forward and 49-ZS-139 (MMS-CNVP-136 tray present) is made</i></li><li>• <i>MMS-CNVP-104 is running in reverse, MMS-CNVP-137 is running in reverse, and 02-ZS-435 (MMS-CNVP-137 tray present) is made</i></li></ul>

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences  
 Advisor PC Screen: **BDR***

<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b>  <b>Auto Raise:</b></p>	<p><b>MMS-CNVP-104 Ton Container Conveyor #2 Tray Stop</b>                  X02HS305                  C103A                  0063                  11                  The auto raise relay will be active if the following condition are satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk drain room line is running in auto</li> <li>• MMS-CNVP-104 tray stop lower relay is not latched (see below)</li> </ul> <p><b>Auto Lower:</b>                  The auto lower relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• MMS-CNVP-104 tray stop lower relay is latched (see below)</li> </ul> <p><b>Raise I-Lock:</b>                  The following condition must be satisfied to allow the stop to be raised:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> </ul> <p><b>Lower I-Lock:</b>                  The following conditions must be satisfied to allow the stop to be lowered:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 02-ZS-231A (UPA-GATE-104 gate open) is made</li> </ul> <p><b>Relay:</b>                  MMS-CNVP-104 tray stop lower relay (see above) gets latched when all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk drain room line is running in auto</li> <li>• 02-ZS-223 (MMS-CNVP-104 tray present) is made</li> <li>• 02-ZS-231A (UPA-GATE-104 gate open) is made</li> <li>• 02-ZS-231B (UPA-GATE-104 gate closed) is not made</li> </ul> <p>MMS-CNVP-104 tray stop lower relay gets unlatched when either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• 02-ZS-231B (UPA-GATE-104 gate closed) is made</li> <li>• Bulk drain room line is not running in auto</li> </ul>
<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b>  <b>Auto Open:</b></p>	<p><b>UPA-GATE-104 Ton Container Gate</b>                  X04HS231                  C103A                  0066                  9                  The auto open relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• UPA-GATE-104 open feed gate relay is latched (see below)</li> </ul>

<i>Table D.6. PBCDF BCHS PLC Automatic Control Sequences</i>	
<i>Advisor PC Screen: <b>BDR</b></i>	
<i>Auto Close:</i>	<p><i>The auto close relay will be active if the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> <li>• <i>UPA-GATE-104 open feed gate relay is not latched (see below)</i></li> </ul>
<i>Open I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate forward:</i></p> <ul style="list-style-type: none"> <li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>02-ZS-358B (UPA-GATE-103 gate closed) is made</i></li> <li>• <i>Airlock wash down cycle not active</i></li> <li>• <i>04-ZS-405B (airlock drain valve closed) is made</i></li> </ul>
<i>Close I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to close:</i></p> <ul style="list-style-type: none"> <li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-ZS-110 (UPA-GATE-104 through gate sensor) not blocked or 02-ZS-231A (UPA-GATE-104 gate open) is not made</i></li> </ul>
<i>Relay:</i>	<p><i>UPA-GATE-104 open feed gate relay (see above) gets latched when all of the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> <li>• <i>49-ZS-139 (MMS-CNVP-136 tray present) is not made</i></li> <li>• <i>MMS-CNVP-136 is running forward</i></li> <li>• <i>02-ZS-223 (MMS-CNVP-104 tray present) is made</i></li> <li>• <i>02-ZS-358B (UPA-GATE-103 gate closed) is made</i></li> </ul> <p><i>UPA-GATE-104 open feed gate relay gets unlatched when either of the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>49-ZS-139 (MMS-CNVP-136 tray present) is made</i></li> <li>• <i>Bulk drain room line is not running in auto</i></li> </ul>
<i>Device:</i>	<b><i>MMS-CNVP-136 Ton Container Conveyor #3</i></b>
<i>Advisor PC Tag:</i>	<b><i>X49HS170</i></b>
<i>CONR:</i>	<b><i>C103A</i></b>
<i>Driver Word:</i>	<b><i>0067</i></b>
<i>Driver Type:</i>	<b><i>12</i></b>
<i>Auto Forward:</i>	<p><i>The auto forward relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> </ul>
<i>Auto Reverse:</i>	<b><i>None.</i></b>
<i>Forward I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate forward:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li> </ul>

<i>Table D.6. PBCDF BCHS PLC Automatic Control Sequences</i>	
<i>Advisor PC Screen: <b>BDR</b></i>	
<i>Reverse I-Lock:</i>	<ul style="list-style-type: none"> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>49-ZS-139 (MMS-CNVP-136 tray present) is not made</i></li> <li>• <i>49-ZS-139 (MMS-CNVP-136 tray present) is made, 49-ZS-244B (MMS-CNVP-136 tray stop not lowered) is not made, 49-ZS-223A (LFT-GATE-104 gate open) is made, 49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made, and 49-ZS-147 (MMS-LIFT-101 tray present at south end) is not made</i></li> </ul> </li> </ul> <p><i>The following conditions must be satisfied to allow the device to operate reverse:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>02-ZS-231A (UPA-GATE-104 gate open) is made</i></li> <li>• <i>[49-ZS-142 (MMS-LIFT-101 tray present at north end) is made or 49-ZS-139 (MMS-CNVP-136 tray present) is made] and 49-ZS-244B (MMS-CNVP-136 tray stop not lowered) is not made, and 49-ZS-223A (LFT-GATE-104 gate open) is made</i></li> </ul> </li> </ul>
<i>Device:</i>	<b><i>MMS-CNVP-136 Ton Container Conveyor #3 Tray Stop</i></b>
<i>Advisor PC Tag:</i>	<b><i>X49HS245</i></b>
<i>CONR:</i>	<b><i>C103A</i></b>
<i>Driver Word:</i>	<b><i>0068</i></b>
<i>Driver Type:</i>	<b><i>11</i></b>
<i>Auto Raise:</i>	<p><i>The auto raise relay will be active if the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> <li>• <i>49-ZS-139 (MMS-CNVP-136 tray present) is made</i></li> <li>• <i>49-ZS-223A (LFT-GATE-104 gate open) is not made</i></li> </ul>
<i>Auto Lower:</i>	<p><i>The auto lower relay will be active if the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> <li>• <i>MMS-CNVP-136 tray stop auto raise relay is not active</i></li> </ul>
<i>Raise I-Lock:</i>	<p><i>The following condition must be satisfied to allow the stop to be raised:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> </ul>
<i>Lower I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the stop to be lowered:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-ZS-223A (LFT-GATE-104 gate open) is made</i></li> </ul>

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences  
 Advisor PC Screen: **BDR***

<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b></p> <p><b>Auto Open:</b></p> <p><b>Auto Close:</b></p> <p><b>Open I-Lock:</b></p> <p><b>Close I-Lock:</b></p>	<p><b>LFT-GATE-104 Lift Process/Fire Gate (First Floor North)</b>  <i>X49HS391</i>  <i>C103A</i>  <i>0069</i>  <i>9</i></p> <p><i>The auto open relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> </ul> <p><i>None.</i></p> <p><i>The following conditions must be satisfied to allow the device to open:</i></p> <ul style="list-style-type: none"> <li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made</i></li> <li>• <i>LFT-GATE-101 gate closed (DICO from ICS-CONR-101B)</i></li> <li>• <i>LFT-GATE-102 gate closed (DICO from ICS-CONR-101B)</i></li> </ul> <p><i>The following conditions must be satisfied to allow the device to close:</i></p> <ul style="list-style-type: none"> <li>• <i>02-XS-109A/B MMS-CNVP-136 rope switch not pulled</i></li> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>49-ZS-378 (LFT-GATE-104 through gate sensor) not blocked or 49-ZS-223A (LFT-GATE-104 gate open) is not made</i></li> </ul>
<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b>  <b>Auto Raise:</b></p> <p><b>Auto Lower:</b></p>	<p><b>MMS-LIFT-101 North Tray Stop</b>  <i>X49HS431</i>  <i>C103A</i>  <i>0070</i>  <i>11</i></p> <p><i>The auto raise relay will be active if the MMS-LIFT-101 conveyor is running in reverse and either of the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>49-ZS-223A (LFT-GATE-104 gate open) is not made and 49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made</i></li> <li>• <i>LFT-GATE-101 gate not open (DICO from ICS-CONR-101B) and 49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made</i></li> </ul> <p><i>The auto lower relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>MMS-LIFT-101 north tray stop auto raise relay is not active</i></li> </ul>

<i>Table D.6. PBCDF BCHS PLC Automatic Control Sequences</i> Advisor PC Screen: <b>BDR</b>	
<i>Raise I-Lock:</i>	<p>The following conditions must be satisfied to allow the stop to be raised:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• MMS-LIFT-101 first floor local E-stops not active</li> <li>• MMS-LIFT-101 second floor local E-stops not active</li> </ul>
<i>Lower I-Lock:</i>	<p>The following conditions must be satisfied to allow the stop to be lowered:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• MMS-LIFT-101 first floor local E-stops not active</li> <li>• MMS-LIFT-101 second floor local E-stops not active</li> <li>• Either of the following:                             <ul style="list-style-type: none"> <li>• 49-ZS-223A (LFT-GATE-104 gate open) is made and 49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made</li> <li>• LFT-GATE-102 gate open (DICO from ICS-CONR-101B) and 49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made</li> </ul> </li> </ul>
<i>Device:</i>	<b>MMS-LIFT-101 South Tray Stop</b>
<i>Advisor PC Tag:</i>	X49HS435
<i>CONR:</i>	C103A
<i>Driver Word:</i>	0071
<i>Driver Type:</i>	11
<i>Auto Raise:</i>	<p>The auto raise relay will be active if the MMS-LIFT-101 conveyor is running forward and either of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• 49-ZS-201A (LFT-GATE-103 gate open) is not made and 49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made</li> <li>• LFT-GATE-102 gate not open (DICO from ICS-CONR-101B) and 49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made</li> </ul>
<i>Auto Lower:</i>	<p>The auto lower relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• MMS-LIFT-101 south tray stop auto raise relay is not active</li> </ul>
<i>Raise I-Lock:</i>	<p>The following conditions must be satisfied to allow the stop to be raised:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• MMS-LIFT-101 first floor local E-stops not active</li> <li>• MMS-LIFT-101 second floor local E-stops not active</li> </ul>
<i>Lower I-Lock:</i>	<p>The following conditions must be satisfied to allow the stop to be lowered:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• MMS-LIFT-101 first floor local E-stops not active</li> </ul>

<i>Table D.6. PBCDF BCHS PLC Automatic Control Sequences</i>	
<i>Advisor PC Screen: <b>BDR</b></i>	
	<ul style="list-style-type: none"> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>49-ZS-201A (LFT-GATE-103 gate open) is made and 49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made</i></li> <li>• <i>LFT-GATE-101 gate open (DICO from ICS-CONR-101B) and 49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made</i></li> </ul> </li> </ul>
<i><b>Device:</b></i>	<i><b>MMS-LIFT-101 Lift Conveyor</b></i>
<i>Advisor PC Tag:</i>	<i>X49HS145</i>
<i>CONR:</i>	<i>C103A</i>
<i>Driver Word:</i>	<i>0072</i>
<i>Driver Type:</i>	<i>12</i>
<i>Auto Forward:</i>	<p><i>The auto forward relay will be active if the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> </ul>
<i>Auto Reverse:</i>	<i>None.</i>
<i>Forward I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate forward:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>Lift conveyor arrival forward interlock relay is active (see below)</i></li> <li>• <i>Lift conveyor departure forward interlock relay is active (see below)</i></li> </ul> </li> </ul>
<i>Reverse I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate reverse:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>Lift conveyor arrival reverse interlock relay is active (see below)</i></li> <li>• <i>Lift conveyor departure reverse interlock relay is active (see below)</i></li> </ul> </li> </ul>
<i>Relay:</i>	<p><i>Lift conveyor arrival forward interlock relay is active when the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>49-ZS-147 (MMS-LIFT-101 tray present at south end) is not made</i></li> </ul>

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences*

*Advisor PC Screen: **BDR***

<p><i>Relay:</i></p>	<ul style="list-style-type: none"> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made, and either 49-ZS-223A (LFT-GATE-104 gate open) is made or 49-ZS-434A (MMS-LIFT-101 south tray stop raised) is made</i></li> <li>• <i>49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made, and either LFT-GATE-101 gate open (DICO from ICS-CONR-101B) or 49-ZS-434A (MMS-LIFT-101 south tray stop raised) is made</i></li> </ul> </li> </ul>
<p><i>Relay:</i></p>	<p><i>Lift conveyor departure forward interlock relay is active when the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>49-ZS-434B (MMS-LIFT-101 south tray stop lowered) is made</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made, 49-ZS-201A (LFT-GATE-103 gate open) is made, and BDS-CNVP-101 is running forward and requesting a tray.</i></li> <li>• <i>49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made and LFT-GATE-102 gate open (DICO from ICS-CONR-101B)</i></li> </ul> </li> </ul>
<p><i>Relay:</i></p>	<p><i>Lift conveyor arrival reverse interlock relay is active when the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>49-ZS-142 (MMS-LIFT-101 tray present at north end) is not made</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made, and either 49-ZS-201A (LFT-GATE-103 gate open) is made or 49-ZS-430A (MMS-LIFT-101 north tray stop raised) is made</i></li> <li>• <i>49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made, and either LFT-GATE-102 gate open (DICO from ICS-CONR-101B) or 49-ZS-430A (MMS-LIFT-101 north tray stop raised) is made</i></li> </ul> </li> </ul>
	<p><i>Lift conveyor departure reverse interlock relay is active when the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>49-ZS-430B (MMS-LIFT-101 north tray stop lowered) is made</i></li> <li>• <i>Either of the following:</i> <ul style="list-style-type: none"> <li>• <i>49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made and 49-ZS-223A (LFT-GATE-104 gate open) is made</i></li> <li>• <i>49-ZS-143 (MMS-LIFT-101 lift car present at second floor) is made and LFT-GATE-101 gate open (DICO from ICS-CONR-101B)</i></li> </ul> </li> </ul>

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences  
 Advisor PC Screen: **BDR***

<p><b>Device:</b> <i>MMS-LIFT-101 Lift Car</i>  <b>Advisor PC Tag:</b> <i>X49HS137</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0073</i>  <b>Driver Type:</b> <i>12</i>  <b>Auto Up:</b> <i>None.</i></p> <p><b>Auto Down:</b> <i>The auto down relay will be active if the following conditions are satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> <li>• <i>49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is not made</i></li> </ul> <p><b>Up I-Lock:</b> <i>The following conditions must be satisfied to allow the lift to go up:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>49-ZS-223B (LFT-GATE-104 gate closed) is made</i></li> <li>• <i>49-ZS-201B (LFT-GATE-103 gate closed) is made</i></li> <li>• <i>LFT-GATE-101 gate closed (DICO from ICS-CONR-101B)</i></li> <li>• <i>LFT-GATE-102 gate closed (DICO from ICS-CONR-101B)</i></li> </ul> <p><b>Down I-Lock:</b> <i>The following conditions must be satisfied to allow the lift to go down:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>49-ZS-223B (LFT-GATE-104 gate closed) is made</i></li> <li>• <i>49-ZS-201B (LFT-GATE-103 gate closed) is made</i></li> <li>• <i>LFT-GATE-101 gate closed (DICO from ICS-CONR-101B)</i></li> <li>• <i>LFT-GATE-102 gate closed (DICO from ICS-CONR-101B)</i></li> </ul>	<p><b>Device:</b> <i>LFT-GATE-103 Lift Process/Fire Gate (First Floor South)</i>  <b>Advisor PC Tag:</b> <i>X49HS385</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0074</i>  <b>Driver Type:</b> <i>9</i>  <b>Auto Open:</b> <i>The auto open relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room line is running in auto</i></li> </ul> <p><b>Auto Close:</b> <i>None.</i></p> <p><b>Open I-Lock:</b> <i>The following conditions must be satisfied to allow the device to open:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>MMS-LIFT-101 first floor local E-stops not active</i></li> <li>• <i>MMS-LIFT-101 second floor local E-stops not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> </ul>
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<i>Table D.6. PBCDF BCHS PLC Automatic Control Sequences</i>	
<i>Advisor PC Screen: <b>BDR</b></i>	
<i>Close I-Lock:</i>	<ul style="list-style-type: none"> <li>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</li> <li>• 49-ZS-144 (MMS-LIFT-101 lift car present at first floor) is made</li> <li>• LFT-GATE-101 gate closed (DICO from ICS-CONR-101B)</li> <li>• LFT-GATE-102 gate closed (DICO from ICS-CONR-101B)</li> </ul> <p>The following conditions must be satisfied to allow the device to close:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• MMS-LIFT-101 first floor local E-stops not active</li> <li>• MMS-LIFT-101 second floor local E-stops not active</li> <li>• 49-XS-156A/B BDS-CNVP-101 rope switch not pulled</li> <li>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</li> <li>• 49-ZS-111 (LFT-GATE-103 through gate sensor) not blocked or 49-ZS-201A (LFT-GATE-103 gate open) is not made</li> </ul>
<i>Device:</i>	<b>BDS-CNVP-101 Bulk Drain Conveyor Line</b>
<i>Advisor PC Tag:</i>	X4901101
<i>CONR:</i>	C103A
<i>Driver Word:</i>	0076 (also 0660 for status indication on screen BDS)
<i>Driver Type:</i>	10
<i>Auto Forward:</i>	<p>The auto forward relay will be active if the bulk drain room line is running in auto and any of the following conditions is satisfied:</p> <ul style="list-style-type: none"> <li>• Bulk campaign is selected and “BDS-CNVP-101 run forward” output from the BDS sequencer (see sequencer tables) is active</li> <li>• Bulk campaign is not selected and tray is not present at BDS-CNVP-101 discharge position (49-IP5-I)</li> <li>• MPF Demands BDS Tray relay (see below) is active</li> </ul>
<i>Auto Reverse:</i>	None.
<i>Forward I-Lock:</i>	<p>The following conditions must be satisfied to allow the device to operate forward:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</li> <li>• 49-XS-156A/B BDS-CNVP-101 rope switch not pulled</li> <li>• MMS-BDS-101 Drain Tube (49-1104B-I) retracted</li> <li>• MMS-BDS-101 Bulk Drain Punch (49-01-103) retracted</li> <li>• MMS-BDS-101 Conveyor Lift (49-01-102) extended</li> <li>• Any of the following:                             <ul style="list-style-type: none"> <li>• Tray is not present at BDS-CNVP-101 discharge position (49-IP5-I) and valid tray ID entered by the CRO</li> <li>• Tray is not present at BDS-CNVP-101 discharge position (49-IP5-I), tray is not present at BDS-CNVP-101 2<sup>nd</sup> punch position (49-IP4-I), tray is not present at BDS-CNVP-101 drain position (49-IP3-I), tray is not present at BDS-CNVP-101 1<sup>st</sup> punch position (49-</li> </ul> </li> </ul>

*Table D.6. PBCDF BCHS PLC Automatic Control Sequences  
Advisor PC Screen: **BDR***

	<p><i>IP2-I), and tray is not present at BDS-CNVP-101 arrival position (49-IP1-I)</i></p> <ul style="list-style-type: none"><li><i>• Tray is present at BDS-CNVP-101 discharge position (49-IP5-I), BDS tray agent weight is less than MPF max agent weight limit, tray is not present on MPF charge airlock conveyor, and MPF charge airlock conveyor is running forward.</i></li></ul>
<i>Reverse I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to operate reverse:</i></p> <ul style="list-style-type: none"><li><i>• Bulk drain room system CON E-stops not active</i></li><li><i>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li><li><i>• 49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li><li><i>• MMS-BDS-101 Drain Tube (49-1104B-I) retracted</i></li><li><i>• MMS-BDS-101 Bulk Drain Punch (49-01-103) retracted</i></li><li><i>• MMS-BDS-101 Conveyor Lift (49-01-102) extended</i></li></ul>
<i>Relay:</i>	<p><i>“MPF Demands BDS Tray” relay is active (see above) if the following conditions are satisfied:</i></p> <ul style="list-style-type: none"><li><i>• MPF requests a tray (DICO from ICS-CONR-113)</i></li><li><i>• BDS tray agent weight is less than MPF max agent weight limit</i></li><li><i>• Tray is present at BDS-CNVP-101 discharge position (49-IP5-I) or “MPF Demands BDS Tray” relay is active (latch)</i></li><li><i>• Tray has not arrived on MPF charge airlock conveyor (DICO from ICS-CONR-113)</i></li></ul>

*Table D.7. PBCDF BCHS PLC Automatic Control Sequences Advisor PC Screen: **BDS***

<p><b>Device:</b> <i>MMS-BDS-101 Bulk Drain Conveyor Lift</i>  <b>Advisor PC Tag:</b> <i>X4901102</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0661</i>  <b>Driver Type:</b> <i>11</i></p> <p><b>Auto Extend:</b> <i>The auto extend relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Conveyor Lift Extend” output from the BDS sequencer (see sequencer tables) is active</i></li> </ul> <p><b>Auto Retract:</b> <i>The auto retract relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Conveyor Lift Retract” output from the BDS sequencer (see sequencer tables) is active</i></li> </ul> <p><b>Extend I-Lock:</b> <i>The following conditions must be satisfied to allow the device to extend:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> <li>• <i>MMS-BDS-101 Drain Tube (49-01-104B-I) retracted</i></li> <li>• <i>MMS-BDS-101 Bulk Drain Punch (49-01-103B-I) retracted</i></li> </ul> <p><b>Retract I-Lock:</b> <i>The following condition must be satisfied to allow the device to retract:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> </ul>
<p><b>Device:</b> <i>MMS-BDS-101 Bulk Drain Punch</i>  <b>Advisor PC Tag:</b> <i>X4901103</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0662</i>  <b>Driver Type:</b> <i>11</i></p> <p><b>Auto Extend:</b> <i>The auto extend relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Extend Drain Punch” output from the BDS sequencer (see sequencer tables) is active</i></li> </ul> <p><b>Auto Retract:</b> <i>The auto retract relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Conveyor Lift Retract” output from the BDS sequencer (see sequencer tables) is active (on time delay)</i></li> </ul>

<i>Table D.7. PBCDF BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDS</b></i>	
<i>Extend I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to extend:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> <li>• <i>MMS-BDS-101 Bulk Drain Conveyor Lift (49-01-102) retracted</i></li> <li>• <i>Any of the following:</i> <ul style="list-style-type: none"> <li>• <i>Tray ID entered by the CRO</i></li> <li>• <i>No tray present on BDS-CNVP-101 past P1</i></li> <li>• <i>Bulk Campaign is not selected</i></li> </ul> </li> </ul>
<i>Retract I-Lock:</i>	<p><i>The following condition must be satisfied to allow the device to retract:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> </ul>
<i>Device:</i>	<b><i>MMS-BDS-101 Bulk Drain Tube</i></b>
<i>Advisor PC Tag:</i>	<i>X4901104</i>
<i>CONR:</i>	<i>CI03A</i>
<i>Driver Word:</i>	<i>0663</i>
<i>Driver Type:</i>	<i>11</i>
<i>Auto Extend:</i>	<p><i>The auto extend relay will be active if any of the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Drain Tube Extend” output from the BDS sequencer (see sequencer tables) is active</i></li> </ul>
<i>Auto Retract:</i>	<p><i>The auto retract relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Drain Tube Retract” output from the BDS sequencer (see sequencer tables) is active</i></li> </ul>
<i>Extend I-Lock:</i>	<p><i>The following conditions must be satisfied to allow the device to extend:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> <li>• <i>MMS-BDS-101 Bulk Drain Conveyor Lift (49-01-102) retracted</i></li> <li>• <i>“OK to Pump Agent” (DICO from ICS-CONR-106)</i></li> </ul>
<i>Retract I-Lock:</i>	<p><i>The following condition must be satisfied to allow the device to retract:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> </ul>

<i>Table D.7. PBCDF BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDS</b></i>	
<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b>  <b>Auto Start:</b></p>	<p><b>ACS-PUMP-114 (51-PV-12)</b>                      X51PV12                      C103A                      0664                      4                      The auto start relay will be active if either of the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• “MMS-BDS-101 Run Agent Drain Pump” output from the BDS sequencer (see sequencer tables) is active</li> </ul> <p><b>Start I-Lock:</b> The following conditions must be satisfied to allow the device to run:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</li> <li>• 49-XS-156A/B BDS-CNVP-101 rope switch not pulled</li> <li>• “OK to Pump Agent” (DICO from CONR-106)</li> </ul>
<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b>  <b>Auto Open:</b></p>	<p><b>MMS-BDS-101 BDS Drain Purge Valve (51-XV-395)</b>                      X51XV395                      C103A                      0665                      4                      The auto open relay will be active if the following condition is satisfied:</p> <ul style="list-style-type: none"> <li>• “MMS-BDS-101 Open Drain Tube Purge Valve” output from the BDS sequencer (see sequencer tables) is active</li> </ul> <p><b>Open I-Lock:</b> The following conditions must be satisfied to allow the device to open:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</li> <li>• 49-XS-156A/B BDS-CNVP-101 rope switch not pulled</li> <li>• Agent line block valve 51-XV-396 is closed</li> </ul>
<p><b>Device:</b>  <b>Advisor PC Tag:</b>  <b>CONR:</b>  <b>Driver Word:</b>  <b>Driver Type:</b>  <b>Auto Open:</b></p>	<p><b>MMS-BDS-101 BDS Drain Tube Block Valve (51-XV-396)</b>                      X51XV396                      C103A                      0666                      5                      The auto open relay will be active if both of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• “MMS-BDS-101 Open Drain Tube Block Valve” output from the BDS sequencer (see sequencer tables) is active</li> </ul> <p><b>Open I-Lock:</b> The following conditions must be satisfied to allow the device to open:</p> <ul style="list-style-type: none"> <li>• Bulk drain room system CON E-stops not active</li> <li>• 49-HS-190 (MMS-BDS-101 local E-Stop) is not active</li> <li>• 49-XS-156A/B BDS-CNVP-101 rope switch not pulled</li> <li>• MMS-BDS-101 BDS Drain Purge Valve (51-XV-395) is closed</li> </ul>

*Table D.7. PBCDF BCHS PLC Automatic Control  
 Sequences Advisor PC Screen: **BDS***

<p><b>Device:</b> <i>MMS-BDS-101 BDS Agent Verify Valve (51-XV-391/390)</i>  <b>Advisor PC Tag:</b> <i>X51XV391</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0667</i>  <b>Driver Type:</b> <i>5 (fail open)</i></p> <p><b>Auto Close:</b> <i>The auto close relay will be active if the following condition is satisfied (activating the auto close relay repositions the bubbler valve to vent to the room and opens the purge valve):</i></p> <ul style="list-style-type: none"> <li>• <i>“MMS-BDS-101 Open Verify Valve” output from the BDS sequencer (see sequencer tables) is not active</i></li> </ul> <p><b>Close I-Lock:</b> <i>The following condition must be satisfied to allow the device to close:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> </ul>
<p><b>Device:</b> <i>MMS-BDS-101 BDS Instrument Air Isolation Valve (51-XV-380)</i>  <b>Advisor PC Tag:</b> <i>X51XV380</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0668</i>  <b>Driver Type:</b> <i>5</i>  <b>Auto Open:</b> <i>The auto open relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>MMS-BDS-101 system in “Auto Run”</i></li> </ul> <p><b>Open I-Lock:</b> <i>The following condition must be satisfied to allow the device to open:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> </ul>
<p><b>Device:</b> <i>MMS-BDS-101 Drain Pump Block Valve (51-FV-120)</i>  <b>Advisor PC Tag:</b> <i>X51FY120</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0671</i>  <b>Driver Type:</b> <i>5</i></p> <p><b>Auto Open:</b> <i>The auto open relay will be active if the following condition is satisfied:</i></p> <ul style="list-style-type: none"> <li>• <i>ACS-PUMP-114 is running</i></li> </ul> <p><b>Open I-Lock:</b> <i>The following condition must be satisfied to allow the device to open:</i></p> <ul style="list-style-type: none"> <li>• <i>Bulk drain room system CON E-stops not active</i></li> <li>• <i>49-HS-190 (MMS-BDS-101 local E-Stop) is not active</i></li> <li>• <i>49-XS-156A/B BDS-CNVP-101 rope switch not pulled</i></li> <li>• <i>“OK to Pump Agent” (DICO from ICS-CONR-106)</i></li> </ul>

<i>Table D.7. PBCDF BCHS PLC Automatic Control Sequences Advisor PC Screen: <b>BDS</b></i>	
<p><b>Device:</b> <i>MMS-BDS-101 Agent Inlet Filter A/B Valve (51-XV-301/302) Icon</i>  <b>Advisor PC Tag:</b> <i>X51XV301</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0672</i>  <b>Driver Type:</b> <i>N/A</i></p>	<p><i>The CRO uses this icon to select which ACS filter to use. The CRO issues a manual OPEN command to select filter 'B' or a manual CLOSE command to select filter 'A'.</i></p>
<p><b>Device:</b> <i>MMS-BDS-101 Sequencer Mode Icon</i>  <b>Advisor PC Tag:</b> <i>BDSAMODE</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0678</i>  <b>Driver Type:</b> <i>N/A</i></p>	<p><i>The CRO selects this icon and issues a "AUTO MODE" or a "MAN MODE" command to place the MMS-BDS-101 sequencer in auto or manual respectively.</i></p>
<p><b>Device:</b> <i>MMS-BDS-101 Bypass/Repeat Icon</i>  <b>Advisor PC Tag:</b> <i>BDSBYSTEP</i>  <b>CONR:</b> <i>C103A</i>  <b>Driver Word:</b> <i>0679</i>  <b>Driver Type:</b> <i>N/A</i></p>	<p><i>The CRO selects this icon and issues a "BYP" or a "RPT" command to bypass or repeat an MMS-BDS-101 sequencer step respectively. Note that only certain steps can be bypassed and/or repeated (see sequencer tables).</i></p>

## D.2 BCHS Sequencer Tables

Sequencers are used throughout chemical demilitarization facilities to perform sequenced machine control. A sequence is a series of steps that a machine performs to accomplish a task. One or more actions are required to perform each step. The step is complete when the desired results are met. Sequencers are used to control BDS operations in the BCHS.

Sequencer charts are provided for BDS processing of ton containers, spray tanks, and MC-1, and MK-94 bombs<sup>1</sup>. *MC-1 and MK-94* sequencer tables are based on TOCDF control code as of March 1999<sup>2</sup>. *The spray tank sequencer tables are based on CDTF code that is expected to be implemented at TOCDF and UMCDF (see FAWB Note B-14). The ton container sequencer tables are based on TOCDF control code as of February 2004. For each munition type, sequencers tables corresponding to the four fixed data sets (Input Comparison, Normal Mask, Bypass Mask, and Output) are provided.*

When a sequencer advances to a step, up to 32 bits of output control information are generated to produce a desired set of actions. The sequencer monitors up to 32 bits of status input data and remains at that step until all the desired results are met. Once a step is complete, the sequencer advances to the next step. This continues until the task that the sequencer controls is complete. When the task is complete, the sequencer resets itself back to the beginning (usually step 1.1).

The design of the CSDP PLC-3 sequencer uses five sets of data and two counters. The data sets are defined as follows:

1. Actual Input - Up to 32 discrete status indications can be defined for each sequencer. They can be inputs from the field (proximity switch, pressure switch, etc.) or internally generated relays (level indication > 17.0 inwc.). Once defined, these 32 bits have the same meaning for each step in the sequencer. For example, if bit 1 is defined as "Stop Clamp Retracted", then that is the definition of bit 1 for all of the sequencer steps. On every scan of the PLC-3 application code, these 32 data points are packed into one contiguous area of memory to be compared to the Input Comparison data for the sequencer step.
2. Input Comparison - The Input Comparison data are stored in the PLC-3 memory, one 32-bit set for each step. For a sequencer step to be complete, the Actual Input data and the Input Comparison data must be equal when filtered through the Normal Mask data set for the step.

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<sup>1</sup> *No sequencer tables are included for MK-116 weteye bombs since the tables were not updated to reflect the final TOCDF processing sequence (see FAWB Note B-13).*

<sup>2</sup> MK-94 output table, datatable word 1, step 0.1 was revised to match the EIC baseline sequencer table. The hexadecimal value is 0098 versus 0058 that is in the TOCDF code. The revised value puts the drain tube in the retracted position rather than the extended position when the BDS is parked.

3. Normal Mask - The Normal Mask data are stored in the PLC-3 memory, one 32-bit set for each set. The Normal Mask is used during normal, vice bypass mode, operation. Not all Actual Input data are meaningful at every step of the sequence. The Normal Mask allows the sequencer to ignore the status of a particular input while testing for completion of a step. For example, at RDS sequencer step 2.2 “Extend Bottom Clamp”, we “don’t care” if the RSM is in a shear cycle. Therefore, bit 15 of word 2 of the normal mask for step 2.2 is a zero or “don’t care.” Now when the Actual Input is moved through the Normal Mask, the result will be a zero for bit 15 so that when the result and the Input Comparison data are compared, step 2.2 can be completed whether bit 15 of word 2 is set or not.
4. Bypass Mask - The Bypass Mask works just like the Normal Mask except it is only used when the operator bypasses a sequencer step. For example, step 5.3 of the RDS sequencer is where the rocket is drained. To complete step 5.3 under normal conditions the AVS system must indicate that a good drain has occurred. If, after repeated drain attempts, the AVS system fails to ) provide a good drain indication, the operator can bypass the step and force the sequencer to step 5.4. Not all steps can be bypassed. For bypass to be enabled, bit 14 of Output word 2 must be set for the step that is to be bypassed.
5. Output - The Output data are stored in the PLC-3 memory, one 32-bit set for each step. When a sequencer advances to a step, up to 32 bits of output control information are generated to produce a desired set of actions. This data is generally used in the logic that energizes the automatic action relays for the sequenced machine components. Bits 14-17 of Output word 2 have special functions as follows:
  - 14 - Bit 14 is set if the step can be bypassed.
  - 15 - Bit 15 is set if the step can be repeated.
  - 16 - Bit 16 is set if the step is the last Minor Step in the current Major Step.
  - 17 - Bit 17 is set if the step is the last step in the sequencer.

The sequencer step status is maintained by two counters. One counter is for the Major Step, the other is for the Minor Step. For example, step 7.2 is Major Step 7 and Minor Step 2. A Major Step reflects a complete task. A Minor Step is one of the tasks required to complete a Major Step. For example, RDS Major Step 7 will rotate the rocket. The Minor Steps to rotate the rocket are: 1) raise the lift table, 2) actuate the rotator, 3) lower the lift table, and 4) home the rotator. When a step is complete (i.e., Actual Inputs match the Input Comparisons) the Minor Step counter increments. If the step was the last Minor Step in the Major Step (Output word 2, bit 16 set), the Minor Step counter is reset to zero and the Major Step counter is incremented. If the step was the last Minor Step in the sequencer (Output word 2, bit 17), the Major Step counter is set to the initial step for the campaign (usually 1) and the Minor Step counter is set to 1.

Repeat. Some steps, such as RDS step 5.3 “rocket drain verification”, can be repeated. For these steps, Output word 2, bit 15 is set as a permissive. When the operator requests that a step be repeated, the Major Step is decremented and the Minor Step is reset to zero. In the case of the rocket drain, the sequencer would reset to step 4.0 to punch and drain the rocket a second time. The sequencer goes to manual when the repeat command is issued and must be returned to automatic to resume normal operation.

Manual Stepping. The operator can manually step through the sequencer. To do this the sequencer must be in manual. Once the machine status and the desired status are equal for a step, the operator can request a manual step. The sequencer will increment to the next step and issue new Output data and access new Input Comparison data.

Reset. The operator can reset the sequencer at any time. When the sequencer resets, the Major Step counter for the sequencer is set to the initial step for the campaign (usually 1). The Minor Step counter is reset to zero, the sequencer goes from automatic to manual, and the Input Comparison data for the initial step for the campaign becomes the desired status for completion of the step. Because the machine can be in any combination of states, the operator must take manual action to match the Actual Input data to the Input Comparison data using the View Sequencer display on the Advisor. Once the machine status and the desired status are equal, the operator can place the sequencer back into automatic and processing will resume starting with Minor Step 1 of the initial Major Step.

View Sequencer. The operator can determine the status of a sequencer step by accessing the View Sequencer information on the Advisor control screen for the sequencer. The View Sequencer feature displays the Actual Input data from the machine and the Input Comparison data for the sequencer step. Any mismatches are highlighted to provide the operator with immediate feedback as to what actions must be taken to complete the sequencer step.

Initialize. During initialization, the Major Step counter for the sequencer is set to the initial step for the campaign (usually 1). The Minor Step counter is reset to zero.

Park. During system park, the sequencer is set to step 0.1. When the Actual Input data and the Input Comparison data are equal, the sequencer is reset to step 0.0.

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter		
Pointer Number: 11 Datatable Word (1 or 2) = 1 REV - 6A																	C51 - Minor Step Location		
<b>Bulk Drain Station</b>																	N53 - Display Location		
INPUT COMPARISON File = B15 : 0																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- BULK DRAIN CONV FORWARD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10		STEP DESCRIPTION
																	WORD ADRS	HEX VALUE	
0.0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :0	0016	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :1	0016	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :10	0019	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :11	1019	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :12	1019	BDS-CNVP-101 SLOW SPEED
1.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :13	0019	STOP BDS-CNVP-101
2.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :20	0019	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :21	001A	LOWER LIFT
2.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :22	0016	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :23	001A	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :24	0019	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :30	0019	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :31	1019	ADVANCE TO DRAIN POSITION
3.2	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :32	401A	STOP AND LOWER LIFT
3.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :33	0019	RAISE LIFT
3.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :34	0019	WEIGH CONTAINER
3.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :35	001A	LOWER LIFT
4.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :40	001A	INITIALIZE
4.1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :41	008A	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :42	018A	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :50	018A	INITIALIZE
5.1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	B15 :51	002A	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	1	0	0	0	0	1	0	1	0	1	0	B15 :52	042A	OPEN BLK VLV / 1ST POS COMPLETE
5.3	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :53	004A	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	B15 :54	044A	SECOND POS. COMPLETE
5.5	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :55	008A	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :60	008A	INITIALIZE
6.1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :61	048A	THIRD POS. COMPLETE
6.2	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :62	048A	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	B15 :63	068A	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :64	048A	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :70	048A	INITIALIZE
7.1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	B15 :71	002A	RET DRN TUBE 1ST POS. / STP PUMP
7.2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	B15 :72	002A	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :73	001A	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :74	0019	RAISE LIFT
7.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :75	0019	WEIGH CONTAINER
8.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :80	0019	STEP INITIALIZE
8.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :81	1019	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04			
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter			
Pointer Number: 11 Datable Word (1 or 2) = 1 REV - 6A																	C51 - Minor Step Location			
<b>Bulk Drain Station</b>																	N53 - Display Location			
INPUT COMPARISON File = B15 : 0																				
17- SPARE																				
16- LIFT RETRACTED DWELL TIMER																				
15- DRILLING COMPLETE																				
14- BULK DRAIN CONV FORWARD																				
13- SPARE																				
12- TIME DELAY FOR AGENT LEVEL < 1.5"																				
11- TIME DELAY FOR VERIFY LEVEL DRAINED																				
10- AGENT PRESENT IN BULK ITEM																				
07- DRAIN TUBE AT POS #3 (EXTENDED)																				
06- DRAIN TUBE AT POS #2																				
05- DRAIN TUBE AT POS #1																				
04- DRAIN TUBE RETRACTED																				
03- PUNCH ARM RETRACTED																				
02- PUNCH ARM EXTENDED																				
01- LIFT CYLINDERS RETRACTED																				
00- LIFT CYLINDERS EXTENDED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	WORD ADRS	HEX VALUE	STEP DESCRIPTION
8.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :82	0019	0019	STOP BDS-CNVP-101
9.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :90	0019	0019	STEP INITIALIZE
9.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :91	001A	001A	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :92	0016	0016	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :93	001A	001A	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :94	0019	0019	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :100	0019	0019	STEP INITIALIZE
10.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :101	1019	1019	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :102	1019	1019	TRAY AT END
10.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :103	0019	0019	CONV FAST - XFER COMPLETE

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter		
Pointer Number: 11 Datable Word (1 or 2) = 2 REV - 6A																	C51 - Minor Step Location		
<b>Bulk Drain Station INPUT COMPARISON</b> File = B15 : 200																	N53 - Display Location		
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11 WORD ADRS	HEX VALUE	STEP DESCRIPTION
	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :200	0000
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :201	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :210	0000	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :211	4000	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :212	4200	BDS-CNVP-101 SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :213	0200	STOP BDS-CNVP-101
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :220	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :221	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :222	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :223	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :224	0200	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :230	0000	STEP INITIALIZE
3.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :231	0400	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :232	0400	STOP AND LOWER LIFT
3.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :233	0400	RAISE LIFT
3.4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :234	0C00	WEIGH CONTAINER
3.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :235	0400	LOWER LIFT
4.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :240	0400	INITIALIZE
4.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :241	0400	START PUMP / EXT DRAIN TUBE FULL
4.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :242	8400	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :250	8400	INITIALIZE
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :251	0400	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :252	0400	OPEN BLK VLV / 1ST POS COMPLETE
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :253	0400	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :254	0400	SECOND POS. COMPLETE
5.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :255	0400	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :260	0400	INITIALIZE
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :261	0400	THIRD POS. COMPLETE
6.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :262	8400	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :263	0400	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :264	0400	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :270	0400	INITIALIZE
7.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :271	0400	RET DRN TUBE 1ST POS. / STP PUMP
7.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :272	0480	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :273	0400	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :274	0400	RAISE LIFT
7.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :275	1C00	WEIGH CONTAINER
8.0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :280	1C00	STEP INITIALIZE
8.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :281	2000	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter		
Pointer Number: 11 Datatable Word (1 or 2) = 2 REV - 6A																	C51 - Minor Step Location		
<b>Bulk Drain Station</b>																	N53 - Display Location		
INPUT COMPARISON File = B15 : 200																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
	WORD ADRS																		
8.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :282	2000	STOP BDS-CNVP-101
9.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :290	2000	STEP INITIALIZE
9.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :291	2000	LOWER LIFT
9.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :292	2000	EXTEND PUNCH
9.3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :293	2000	RETRACT PUNCH
9.4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :294	2000	RAISE LIFT
10.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :300	2000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :301	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	B15 :302	0100	TRAY AT END
10.3	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	B15 :303	0140	CONV FAST - XFER COMPLETE

Programmatic Process FAWB - BASELINE COPY														March-12-04					
Ton Containers (AN/PB/TE/UM)				File Name: BDSTON3.XLS Cntl - ICS-CONR-103B				C51 - Major Step Counter											
Pointer Number: 12				Datatable Word (1 or 2) = 1				REV - 6A			C51 - Minor Step Location								
<b>Bulk Drain Station</b>				<b>NORMAL MASK</b>				File = B15 : 400			N53 - Display Location								
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- BULK DRAIN CONV FORWARD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10 WORD ADRS	HEX VALUE	STEP DESCRIPTION
	0.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :400	10FF
0.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :401	10FF	BDS GOTO PARK
1.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :410	10FF	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :411	10FF	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :412	10FF	BDS-CNVP-101 SLOW SPEED
1.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :413	10FF	STOP BDS-CNVP-101
2.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :420	10FF	STEP INITIALIZE
2.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :421	10FF	LOWER LIFT
2.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :422	10FF	EXTEND PUNCH
2.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :423	10FF	RETRACT PUNCH
2.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :424	10FF	RAISE LIFT
3.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :430	10FF	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :431	10FF	ADVANCE TO DRAIN POSITION
3.2	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :432	50FF	STOP AND LOWER LIFT
3.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :433	10FF	RAISE LIFT
3.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :434	10FF	WEIGH CONTAINER
3.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :435	10FF	LOWER LIFT
4.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :440	10FF	INITIALIZE
4.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :441	10FF	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :442	11FF	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :450	11FF	INITIALIZE
5.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :451	10FF	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :452	14FF	OPEN BLK VLV / 1ST POS COMPLETE
5.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :453	10FF	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :454	14FF	SECOND POS. COMPLETE
5.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :455	10FF	EXTEND DRAIN TUBE
6.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :460	10FF	INITIALIZE
6.1	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :461	14FF	THIRD POS. COMPLETE
6.2	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :462	14FF	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	B15 :463	16FF	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :464	14FF	CHECK FOR GOOD DRAIN
7.0	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :470	14FF	INITIALIZE
7.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :471	10FF	RET DRN TUBE 1ST POS. / STP PUMP
7.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :472	10FF	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :473	10FF	RETRACT DRAIN TUBE
7.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :474	10FF	RAISE LIFT
7.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :475	10FF	WEIGH CONTAINER
8.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :480	10FF	STEP INITIALIZE
8.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :481	10FF	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM)				File Name: BDSTON3.XLS				Cntl - ICS-CONR-103B				C51 - Major Step Counter							
Pointer Number: 12				Datatable Word (1 or 2) = 1				REV - 6A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>NORMAL MASK</b>				File = B15 : 400				N53 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- BULK DRAIN CONV FORWARD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	HEX VALUE	STEP DESCRIPTION
	WORD ADRS																		
8.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :482	10FF	STOP BDS-CNVP-101
9.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :490	10FF	STEP INITIALIZE
9.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :491	10FF	LOWER LIFT
9.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :492	10FF	EXTEND PUNCH
9.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :493	10FF	RETRACT PUNCH
9.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :494	10FF	RAISE LIFT
10.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :500	10FF	STEP INITIALIZE
10.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :501	10FF	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :502	10FF	TRAY AT END
10.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :503	10FF	CONV FAST - XFER COMPLETE

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter		
Pointer Number: 12 Datable Word (1 or 2) = 2 REV - 6A																	C51 - Minor Step Location		
<b>Bulk Drain Station</b>																	N53 - Display Location		
NORMAL MASK File = B15 : 600																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11 WORD ADRS	HEX VALUE	STEP DESCRIPTION
	0.0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :600	6600
0.1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :601	6600	BDS GOTO PARK
1.0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :610	6600	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :611	4000	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :612	4200	BDS-CNVP-101 SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :613	0200	STOP BDS-CNVP-101
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :620	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :621	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :622	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :623	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :624	0200	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :630	0000	STEP INITIALIZE
3.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :631	0400	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :632	0400	STOP AND LOWER LIFT
3.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :633	0400	RAISE LIFT
3.4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :634	0C00	WEIGH CONTAINER
3.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :635	0400	LOWER LIFT
4.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :640	0400	INITIALIZE
4.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :641	0400	START PUMP / EXT DRAIN TUBE FULL
4.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :642	8400	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :650	8400	INITIALIZE
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :651	0400	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :652	0400	OPEN BLK VLV / 1ST POS COMPLETE
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :653	0400	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :654	0400	SECOND POS. COMPLETE
5.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :655	0400	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :660	0400	INITIALIZE
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :661	0400	THIRD POS. COMPLETE
6.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :662	8400	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :663	0400	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :664	0400	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :670	0400	INITIALIZE
7.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :671	0400	RET DRN TUBE 1ST POS. / STP PUMP
7.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :672	0480	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :673	0400	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :674	0400	RAISE LIFT
7.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :675	1C00	WEIGH CONTAINER
8.0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :680	1C00	STEP INITIALIZE
8.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :681	2000	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04			
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter			
Pointer Number: 12 Datatable Word (1 or 2) = 2 REV - 6A																	C51 - Minor Step Location			
<b>Bulk Drain Station</b>																	N53 - Display Location			
NORMAL MASK File = B15 : 600																				
17- DRAIN TUBE POSITION TIME COMPLETE																				
16- TRAY AT SLOW SPEED POSITION																				
15- TRAY AT 2ND PUNCH POSITION																				
14- CONTAINER DRAINED O.K.																				
13- WEIGH TIME COMPLETE																				
12- TRAY AT DRAIN POSITION																				
11- TRAY AT 1ST PUNCH POSITION																				
10- TRAY AT DISCHARGE POSITION																				
07- DRAIN TUBE PURGE COMPLETE																				
06- CONTINUE WITH NEXT TRAY																				
05- SPARE																				
04- SPARE																				
03- SPARE																				
02- SPARE																				
01- SPARE																				
00- MPB FEED GATE CLOSED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	WORD ADRS	HEX VALUE	STEP DESCRIPTION
8.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :682	2000	2000	STOP BDS-CNVP-101
9.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :690	2000	2000	STEP INITIALIZE
9.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :691	2000	2000	LOWER LIFT
9.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :692	2000	2000	EXTEND PUNCH
9.3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :693	2000	2000	RETRACT PUNCH
9.4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :694	2000	2000	RAISE LIFT
10.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :700	2000	2000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	B15 :701	0100	0100	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	B15 :702	0140	0140	TRAY AT END
10.3	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	B15 :703	0140	0140	CONV FAST - XFER COMPLETE

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter		
Pointer Number: 13 Datable Word (1 or 2) = 1 REV - 6A																	C51 - Minor Step Location		
<b>Bulk Drain Station</b>																	N53 - Display Location		
BYPASS MASK File = B15 : 800																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- BULK DRAIN CONV FORWARD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10 WORD ADRS	HEX VALUE	STEP DESCRIPTION
	0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :800	FFFF
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :801	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :810	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :811	FFFF	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :812	FFFF	BDS-CNVP-101 SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :813	FFFF	STOP BDS-CNVP-101
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :820	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :821	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :822	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :823	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :824	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :830	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :831	FFFF	ADVANCE TO DRAIN POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :832	FFFF	STOP AND LOWER LIFT
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :833	FFFF	RAISE LIFT
3.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :834	FFFF	WEIGH CONTAINER
3.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :835	FFFF	LOWER LIFT
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :840	FFFF	INITIALIZE
4.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :841	FFFF	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :842	0000	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :850	FFFF	INITIALIZE
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :851	FFFF	RETRACT DRAIN TUBE TO 1ST POS.
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :852	FFFF	OPEN BLK VLV / 1ST POS COMPLETE
5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :853	0000	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :854	0000	SECOND POS. COMPLETE
5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :855	0000	EXTEND DRAIN TUBE
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :860	FFFF	INITIALIZE
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :861	FFFF	THIRD POS. COMPLETE
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :862	FFFF	TIME DELAY FOR PUMP DOWN
6.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :863	FFFF	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :864	FFFF	CHECK FOR GOOD DRAIN
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :870	FFFF	INITIALIZE
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :871	FFFF	RET DRN TUBE 1ST POS. / STP PUMP
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :872	FFFF	STOP AND PURGE DRAIN TUBE
7.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :873	FFFF	RETRACT DRAIN TUBE
7.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :874	FFFF	RAISE LIFT
7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :875	0000	WEIGH CONTAINER
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :880	FFFF	STEP INITIALIZE
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :881	FFFF	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04					
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter					
Pointer Number: 13 Datatable Word (1 or 2) = 1 REV - 6A																	C51 - Minor Step Location					
<b>Bulk Drain Station</b>																	BYPASS MASK File = B15 : 800			N53 - Display Location		
17- SPARE																						
16- LIFT RETRACTED DWELL TIMER																						
15- DRILLING COMPLETE																						
14- BULK DRAIN CONV FORWARD																						
13- SPARE																						
12- TIME DELAY FOR AGENT LEVEL < 1.5"																						
11- TIME DELAY FOR VERIFY LEVEL DRAINED																						
10- AGENT PRESENT IN BULK ITEM																						
07- DRAIN TUBE AT POS #3 (EXTENDED)																						
06- DRAIN TUBE AT POS #2																						
05- DRAIN TUBE AT POS #1																						
04- DRAIN TUBE RETRACTED																						
03- PUNCH ARM RETRACTED																						
02- PUNCH ARM EXTENDED																						
01- LIFT CYLINDERS RETRACTED																						
00- LIFT CYLINDERS EXTENDED																						
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	WORD ADRS	HEX VALUE	STEP DESCRIPTION		
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :882	FFFF	STOP BDS-CNVP-101			
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :890	FFFF	STEP INITIALIZE			
9.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :891	FFFF	LOWER LIFT			
9.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :892	FFFF	EXTEND PUNCH			
9.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :893	FFFF	RETRACT PUNCH			
9.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :894	FFFF	RAISE LIFT			
10.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :900	FFFF	STEP INITIALIZE			
10.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :901	FFFF	ADVANCE TO END OF BDS CONVEYOR			
10.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :902	FFFF	TRAY AT END			
10.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :903	FFFF	CONV FAST - XFER COMPLETE			

Programmatic Process FAWB - BASELINE COPY														March-12-04					
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B														C51 - Major Step Counter					
Pointer Number: 13 Datable Word (1 or 2) = 2 REV - 6A														C51 - Minor Step Location					
<b>Bulk Drain Station</b>														N53 - Display Location					
BYPASS MASK File = B15 : 1000																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1000	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1001	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1010	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1011	FFFF	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1012	FFFF	BDS-CNVP-101 SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1013	FFFF	STOP BDS-CNVP-101
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1020	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1021	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1022	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1023	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1024	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1030	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1031	FFFF	ADVANCE TO DRAIN POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1032	FFFF	STOP AND LOWER LIFT
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1033	FFFF	RAISE LIFT
3.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1034	FFFF	WEIGH CONTAINER
3.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1035	FFFF	LOWER LIFT
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1040	FFFF	INITIALIZE
4.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1041	FFFF	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :1042	0000	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1050	FFFF	INITIALIZE
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1051	FFFF	RETRACT DRAIN TUBE TO 1ST POS.
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1052	FFFF	OPEN BLK VLV / 1ST POS COMPLETE
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1053	FFFF	EXTEND DRAIN TUBE TO 2ND POS.
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1054	FFFF	SECOND POS. COMPLETE
5.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1055	FFFF	EXTEND DRAIN TUBE
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1060	FFFF	INITIALIZE
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1061	FFFF	THIRD POS. COMPLETE
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1062	FFFF	TIME DELAY FOR PUMP DOWN
6.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1063	FFFF	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1064	FFFF	CHECK FOR GOOD DRAIN
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1070	FFFF	INITIALIZE
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1071	FFFF	RET DRN TUBE 1ST POS. / STP PUMP
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1072	FFFF	STOP AND PURGE DRAIN TUBE
7.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1073	FFFF	RETRACT DRAIN TUBE
7.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1074	FFFF	RAISE LIFT
7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :1075	0000	WEIGH CONTAINER
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1080	FFFF	STEP INITIALIZE
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1081	FFFF	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04			
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter			
Pointer Number: 13 Datatable Word (1 or 2) = 2 REV - 6A																	C51 - Minor Step Location			
<b>Bulk Drain Station</b>																	N53 - Display Location			
BYPASS MASK File = B15 : 1000																				
17- DRAIN TUBE POSITION TIME COMPLETE																				
16- TRAY AT SLOW SPEED POSITION																				
15- TRAY AT 2ND PUNCH POSITION																				
14- CONTAINER DRAINED O.K.																				
13- WEIGH TIME COMPLETE																				
12- TRAY AT DRAIN POSITION																				
11- TRAY AT 1ST PUNCH POSITION																				
10- TRAY AT DISCHARGE POSITION																				
07- DRAIN TUBE PURGE COMPLETE																				
06- CONTINUE WITH NEXT TRAY																				
05- SPARE																				
04- SPARE																				
03- SPARE																				
02- SPARE																				
01- SPARE																				
00- MPB FEED GATE CLOSED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	WORD ADRS	HEX VALUE	STEP DESCRIPTION
STEP	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1082	FFFF	STOP BDS-CNVP-101	
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1090	FFFF	STEP INITIALIZE	
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1091	FFFF	LOWER LIFT	
9.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1092	FFFF	EXTEND PUNCH	
9.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1093	FFFF	RETRACT PUNCH	
9.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1094	FFFF	RAISE LIFT	
9.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1100	FFFF	STEP INITIALIZE	
10.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1101	FFFF	ADVANCE TO END OF BDS CONVEYOR	
10.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1102	FFFF	TRAY AT END	
10.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :1103	FFFF	CONV FAST - XFER COMPLETE	
10.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				

Programmatic Process FAWB - BASELINE COPY														March-12-04					
Ton Containers (AN/PB/TE/UM)				File Name: BDSTON3.XLS Cntl - ICS-CONR-103B				C51 - Major Step Counter											
Pointer Number: 15				Datatable Word (1 or 2) = 1				REV - 6A			C51 - Minor Step Location								
<b>Bulk Drain Station</b>				<b>OUTPUT</b>				File = B15 : 1600			N53 - Display Location								
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- SECOND																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:18		STEP DESCRIPTION
																	WORD ADRS	HEX VALUE	
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :1600	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	B15 :1601	0098	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	B15 :1610	00A4	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	B15 :1611	00A5	BDS-CNVR-101 FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :1612	01A5	BDS-CNVP-101 SLOW SPEED
1.3	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1613	01A4	STOP BDS-CNVP-101
2.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1620	01A4	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1621	01A8	LOWER LIFT
2.2	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	B15 :1622	0198	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1623	01A8	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1624	01A4	RAISE LIFT
3.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1630	01A4	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :1631	01A5	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1632	01A8	STOP AND LOWER LIFT
3.3	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1633	01A4	RAISE LIFT
3.4	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1634	01A4	WEIGH CONTAINER
3.5	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1635	01A8	LOWER LIFT
4.0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1640	01A8	INITIALIZE
4.1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :1641	0168	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	B15 :1642	0828	WAIT FOR 5 SEC / CHK FOR AGENT
5.0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	B15 :1650	0828	INITIALIZE
5.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1651	01A8	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :1652	0128	OPEN BLK VLV / 1ST POS COMPLETE
5.3	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :1653	0168	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :1654	0128	SECOND POS. COMPLETE
5.5	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :1655	0168	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :1660	0168	INITIALIZE
6.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :1661	0128	THIRD POS. COMPLETE
6.2	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	B15 :1662	1128	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :1663	0128	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	B15 :1664	0928	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :1670	0128	INITIALIZE
7.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1671	01A8	RET DRN TUBE 1ST POS. / STP PUMP
7.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :1672	0128	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1673	01A8	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1674	01A4	RAISE LIFT
7.5	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	B15 :1675	11A4	WEIGH CONTAINER
8.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1680	01A4	STEP INITIALIZE
8.1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :1681	01A5	ADVANCE TO 2ND PUNCH POS.

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM)				File Name: BDSTON3.XLS				Cntl - ICS-CONR-103B				C51 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 1				REV - 6A				C51 - Minor Step Location							
Bulk Drain Station				OUTPUT				File = B15 : 1600				N53 - Display Location							
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- SECOND																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:18		STEP DESCRIPTION
	WORD	ADRS	HEX VALUE		WORD	ADRS	HEX VALUE		WORD	ADRS	HEX VALUE		WORD	ADRS	HEX VALUE		WORD	ADRS	
8.2	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1682	01A4	STOP BDS-CNVP-101
9.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1690	01A4	STEP INITIALIZE
9.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1691	01A8	LOWER LIFT
9.2	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	B15 :1692	0198	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :1693	01A8	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1694	01A4	RAISE LIFT
10.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :1700	01A4	STEP INITIALIZE
10.1	0	0	0	0	0	0	1	1	1	0	1	0	0	1	0	1	B15 :1701	03A5	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :1702	01A5	TRAY AT END
10.3	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	B15 :1703	00A4	CONV FAST - XFER COMPLETE

Programmatic Process FAWB - BASELINE COPY																	March-12-04								
Ton Containers (AN/PB/TE/UM) File Name: BDSTON3.XLS Cntl - ICS-CONR-103B																	C51 - Major Step Counter								
Pointer Number: 15 Datable Word (1 or 2) = 2 REV - 6A																	C51 - Minor Step Location								
<b>Bulk Drain Station</b>																	<b>OUTPUT</b>			File = B15 : 1800			N53 - Display Location		
17- LAST STEP																									
16- LAST SUB STEP																									
15- REPEAT PERMISSION																									
14- BYPASS PERMISSION																									
13- DRAIN TUBE PURGE VALVE OPEN																									
12- START DRAIN TUBE POSITION TIMER																									
11- BDS INITIAL WEIGHT REQUEST																									
10- VERIFY DRAIN COMPLETE																									
07- RUN AGENT DRAIN PUMP																									
06- REQUEST NEXT TRAY TO PROCESS																									
05- PROCESS NEXT TRAY ??? TO ADVSIOR																									
04- CHECK AGENT LEVEL 1=VERIFY																									
03- SEQ DELAY TIMER 3RD PRESET																									
02- SEQ DELAY TIMER 2ND PRESET																									
01- SEQ DELAY TIMER 1ST PRESET																									
00- AGENT LINE BLOCK VALVE OPEN																									
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:19		STEP DESCRIPTION						
																	WORD ADRS	HEX VALUE							
0.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1800	0010	BDS PARK						
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :1801	0000	BDS GOTO PARK						
1.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1810	0010	BDS INITIALIZE						
1.1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	B15 :1811	0050	BDS-CNVR-101 FWD & REQUEST TRAY						
1.2	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	B15 :1812	0050	BDS-CNVP-101 SLOW SPEED						
1.3	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1813	4010	STOP BDS-CNVP-101						
2.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1820	0010	STEP INITIALIZE						
2.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1821	0010	LOWER LIFT						
2.2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1822	0010	EXTEND PUNCH						
2.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1823	0010	RETRACT PUNCH						
2.4	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1824	4010	RAISE LIFT						
3.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1830	0010	STEP INITIALIZE						
3.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1831	0010	ADVANCE TO DRAIN POSITION						
3.2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1832	0010	STOP AND LOWER LIFT						
3.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1833	0010	RAISE LIFT						
3.4	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	B15 :1834	0210	WEIGH CONTAINER						
3.5	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1835	4010	LOWER LIFT						
4.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1840	0010	INITIALIZE						
4.1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	B15 :1841	0092	START PUMP / EXT DRAIN TUBE FULL						
4.2	0	1	0	1	0	1	0	0	1	0	0	1	0	0	0	0	B15 :1842	5490	WAIT FOR 5 SEC / CHK FOR AGENT						
5.0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	B15 :1850	0490	INITIALIZE						
5.1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :1851	0090	RETRACT DRAIN TUBE TO 1ST POS.						
5.2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :1852	0091	OPEN BLK VLV / 1ST POS COMPLETE						
5.3	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :1853	0091	EXTEND DRAIN TUBE TO 2ND POS.						
5.4	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :1854	0091	SECOND POS. COMPLETE						
5.5	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :1855	4091	EXTEND DRAIN TUBE						
6.0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :1860	0091	INITIALIZE						
6.1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :1861	0091	THIRD POS. COMPLETE						
6.2	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	B15 :1862	0495	TIME DELAY FOR PUMP DOWN						
6.3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :1863	0080	PURGE VERIFY VLV / CLOSE BLK VLV						
6.4	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :1864	4090	CHECK FOR GOOD DRAIN						
7.0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :1870	0090	INITIALIZE						
7.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1871	0010	RET DRN TUBE 1ST POS. / STP PUMP						
7.2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	B15 :1872	0810	STOP AND PURGE DRAIN TUBE						
7.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1873	0010	RETRACT DRAIN TUBE						
7.4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1874	0010	RAISE LIFT						
7.5	0	1	1	1	0	0	0	1	0	0	0	1	0	0	0	0	B15 :1875	7110	WEIGH CONTAINER						
8.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1880	0010	STEP INITIALIZE						
8.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1881	0010	ADVANCE TO 2ND PUNCH POS.						

Programmatic Process FAWB - BASELINE COPY																	March-12-04		
Ton Containers (AN/PB/TE/UM)				File Name: BDSTON3.XLS				Cntl - ICS-CONR-103B				C51 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 2				REV - 6A				C51 - Minor Step Location							
Bulk Drain Station				OUTPUT				File = B15 : 1800				N53 - Display Location							
17- LAST STEP																			
16- LAST SUB STEP																			
15- REPEAT PERMISSION																			
14- BYPASS PERMISSION																			
13- DRAIN TUBE PURGE VALVE OPEN																			
12- START DRAIN TUBE POSITION TIMER																			
11- BDS INITIAL WEIGHT REQUEST																			
10- VERIFY DRAIN COMPLETE																			
07- RUN AGENT DRAIN PUMP																			
06- REQUEST NEXT TRAY TO PROCESS																			
05- PROCESS NEXT TRAY ??? TO ADVSIOR																			
04- CHECK AGENT LEVEL 1=VERIFY																			
03- SEQ DELAY TIMER 3RD PRESET																			
02- SEQ DELAY TIMER 2ND PRESET																			
01- SEQ DELAY TIMER 1ST PRESET																			
00- AGENT LINE BLOCK VALVE OPEN																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:19 WORD ADRS	HEX VALUE	STEP DESCRIPTION
	8.2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1882	4010
9.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1890	0010	STEP INITIALIZE
9.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1891	0010	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1892	0010	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1893	0010	RETRACT PUNCH
9.4	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1894	4010	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1900	0010	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1901	0010	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :1902	0010	TRAY AT END
10.3	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	B15 :1903	8030	CONV FAST - XFER COMPLETE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMJ_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 11				Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>INPUT COMPARISON</b>				File = B15 : 8000				N53 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :8000	0016	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :8001	0016	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8010	0019	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8011	1019	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8012	1019	BULK CONVEYOR SLOW SPEED
1.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8013	0019	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8020	0019	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8021	0019	LOWER LIFT
2.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :8022	0016	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8023	001A	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8024	0019	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8030	0019	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8031	1019	ADVANCE TO DRAIN POSITION
3.2	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8032	401A	STOP AND LOWER LIFT
3.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8033	0019	RAISE LIFT
3.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8034	0019	WEIGH CONTAINER
3.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8035	001A	LOWER LIFT
4.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8040	001A	STEP INITIALIZE
4.1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :8041	008A	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :8042	018A	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :8050	018A	STEP INITIALIZE
5.1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	B15 :8051	002A	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	1	0	0	0	0	1	0	1	0	1	0	B15 :8052	042A	OPEN BLOCK VALVE
5.3	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :8053	004A	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	B15 :8054	044A	SECOND POS. COMPLETE
5.5	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :8055	008A	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :8060	008A	STEP INITIALIZE
6.1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :8061	048A	THIRD POS. COMPLETE
6.2	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :8062	048A	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	B15 :8063	068A	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :8064	048A	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	B15 :8070	048A	STEP INITIALIZE
7.1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :8071	004A	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :8072	004A	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8073	001A	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8074	0019	DRILL CONTAINER
7.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8075	0019	RAISE LIFT
7.6	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8076	2019	WEIGH CONTAINER
8.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8080	0019	STEP INITIALIZE
8.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8081	1019	ADVANCE TO 2ND PUNCH POS.
8.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8082	0019	STOP BULK CONVEYOR
9.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8090	0019	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																				
Spray Tank (TE/UM)				File Name: TMJ_28.XLS				Cntl - CTC121B				C51 - Major Step Counter								
Pointer Number: 11				Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location								
<b>Bulk Drain Station</b>				<b>INPUT COMPARISON</b>				File = B15 : 8000				N53 - Display Location								
17- SPARE																				
16- LIFT RETRACTED DWELL TIMER																				
15- DRILLING COMPLETE																				
14- MMS-BDS-101 BDS CONV 1=FWD																				
13- SPARE																				
12- TIME DELAY FOR AGENT LEVEL < 1.5"																				
11- TIME DELAY FOR VERIFY LEVEL DRAINED																				
10- AGENT PRESENT IN BULK ITEM																				
07- DRAIN TUBE AT POS #3 (EXTENDED)																				
06- DRAIN TUBE AT POS #2																				
05- DRAIN TUBE AT POS #1																				
04- DRAIN TUBE RETRACTED																				
03- PUNCH ARM RETRACTED																				
02- PUNCH ARM EXTENDED																				
01- LIFT CYLINDERS RETRACTED																				
00- LIFT CYLINDERS EXTENDED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	WORD ADRS	HEX VALUE	STEP DESCRIPTION
STEP																				
9.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8091	001A	LOWER LIFT	
9.2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :8092	0016	EXTEND PUNCH		
9.3	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :8093	001A	RETRACT PUNCH		
9.4	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8094	0019	RAISE LIFT		
10.0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8100	0019	STEP INITIALIZE		
10.1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	B15 :8101	1019	ADVANCE TO END OF BDS CONVEYOR		
10.2	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	B15 :8102	1019	TRAY AT END, STOP CONVEYOR		
10.3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :8103	0019	REMOVE TRAY		

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)		File Name: TMJ_28.XLS				Cntl - CTC121B				C51 - Major Step Counter									
Pointer Number: 11		Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location									
<b>Bulk Drain Station</b>		<b>INPUT COMPARISON</b>				File = B15 : 8200				N53 - Display Location									
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- SPARE																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8200	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8201	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8210	0000	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8211	4000	BULK CONV FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8212	4200	BULK CONVEYOR SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8213	0200	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8220	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8221	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8222	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8223	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8224	0200	RAISE LIFT
3.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8230	0200	STEP INITIALIZE
3.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8231	0400	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8232	0400	STOP AND LOWER LIFT
3.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8233	0400	RAISE LIFT
3.4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :8234	0C00	WEIGH CONTAINER
3.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8235	0400	LOWER LIFT
4.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8240	0400	STEP INITIALIZE
4.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8241	0400	START PUMP / EXT DRAIN TUBE FULL
4.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8242	8400	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8250	8400	STEP INITIALIZE
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8251	0400	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8252	0400	OPEN BLOCK VALVE
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8253	0400	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8254	0400	SECOND POS. COMPLETE
5.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8255	0400	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8260	0400	STEP INITIALIZE
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8261	0400	THIRD POS. COMPLETE
6.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8262	8400	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8263	0400	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8264	0400	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8270	0400	STEP INITIALIZE
7.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8271	0400	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :8272	0480	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8273	0400	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8274	0400	DRILL CONTAINER
7.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :8275	1C00	RAISE LIFT
7.6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8276	0400	WEIGH CONTAINER
8.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8280	0400	STEP INITIALIZE
8.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8281	2000	ADVANCE TO 2ND PUNCH POS.
8.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8282	2000	STOP BULK CONVEYOR
9.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8290	2000	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 11				Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>INPUT COMPARISON</b>				File = B15 : 8200				N53 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- SPARE																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8291	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8292	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8293	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8294	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8300	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8301	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8302	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8303	0000	REMOVE TRAY

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)			File Name: TMJ_28.XLS			Cntl - CTC121B			C51 - Major Step Counter										
Pointer Number: 12			Datatable Word (1 or 2) = 1			REV - 7A			C51 - Minor Step Location										
<b>Bulk Drain Station</b>			<b>NORMAL MASK</b>			File = B15 : 8400			N53 - Display Location										
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8400	10FF	BDS PARK
0.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8401	10FF	BDS GOTO PARK
1.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8410	10FF	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8411	10FF	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8412	10FF	BULK CONVEYOR SLOW SPEED
1.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8413	10FF	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8420	10FF	STEP INITIALIZE
2.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8421	10FF	LOWER LIFT
2.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8422	10FF	EXTEND PUNCH
2.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8423	10FF	RETRACT PUNCH
2.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8424	10FF	RAISE LIFT
3.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8430	10FF	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8431	10FF	ADVANCE TO DRAIN POSITION
3.2	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8432	50FF	STOP AND LOWER LIFT
3.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8433	10FF	RAISE LIFT
3.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8434	10FF	WEIGH CONTAINER
3.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8435	10FF	LOWER LIFT
4.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8440	10FF	STEP INITIALIZE
4.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8441	10FF	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :8442	11FF	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :8450	11FF	STEP INITIALIZE
5.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8451	10FF	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :8452	14FF	OPEN BLOCK VALVE
5.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8453	10FF	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :8454	14FF	SECOND POS. COMPLETE
5.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8455	10FF	EXTEND DRAIN TUBE
6.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8460	10FF	STEP INITIALIZE
6.1	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :8461	14FF	THIRD POS. COMPLETE
6.2	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :8462	14FF	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	B15 :8463	16FF	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :8464	14FF	CHECK FOR GOOD DRAIN
7.0	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	B15 :8470	14FF	STEP INITIALIZE
7.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8471	10FF	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8472	10FF	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8473	10FF	RETRACT DRAIN TUBE
7.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8474	10FF	DRILL CONTAINER
7.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8475	10FF	RAISE LIFT
7.6	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8476	30FF	WEIGH CONTAINER
8.0	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8480	30FF	STEP INITIALIZE
8.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8481	10FF	ADVANCE TO 2ND PUNCH POS.
8.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8482	10FF	STOP BULK CONVEYOR
9.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :8490	10FF	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 12				Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>NORMAL MASK</b>				File = B15 : 8400				N53 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10		
STEP																	WORD ADRS	HEX VALUE	STEP DESCRIPTION
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8491	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8492	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8493	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8494	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8500	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8501	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8502	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8503	0000	REMOVE TRAY

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)		File Name: TMJ_28.XLS				Cntl - CTC121B				C51 - Major Step Counter									
Pointer Number: 12		Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location									
<b>Bulk Drain Station</b>		<b>NORMAL MASK</b>				File = B15 : 8600				N53 - Display Location									
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- SPARE																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :8600	6600	BDS PARK
0.1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :8601	6600	BDS GOTO PARK
1.0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :8610	6600	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8611	4000	BULK CONV FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8612	4200	BULK CONVEYOR SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8613	0200	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8620	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8621	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8622	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8623	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8624	0200	RAISE LIFT
3.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8630	0200	STEP INITIALIZE
3.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8631	0400	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8632	0400	STOP AND LOWER LIFT
3.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8633	0400	RAISE LIFT
3.4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :8634	0C00	WEIGH CONTAINER
3.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8635	0400	LOWER LIFT
4.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8640	0400	STEP INITIALIZE
4.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8641	0400	START PUMP / EXT DRAIN TUBE FULL
4.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8642	8400	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :8650	8400	STEP INITIALIZE
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8651	0400	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8652	0400	OPEN BLOCK VALVE
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8653	0400	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8654	0400	SECOND POS. COMPLETE
5.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8655	0400	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8660	0400	STEP INITIALIZE
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8661	0400	THIRD POS. COMPLETE
6.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8662	8400	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8663	0400	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8664	0400	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8670	0400	STEP INITIALIZE
7.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8671	0400	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :8672	0480	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8673	0400	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8674	0400	DRILL CONTAINER
7.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :8675	1C00	RAISE LIFT
7.6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8676	0400	WEIGH CONTAINER
8.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :8680	0400	STEP INITIALIZE
8.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8681	2000	ADVANCE TO 2ND PUNCH POS.
8.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8682	2000	STOP BULK CONVEYOR
9.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8690	2000	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)		File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter									
Pointer Number: 12		Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location									
<b>Bulk Drain Station</b>				<b>NORMAL MASK</b>				File = B15 : 8600				N53 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- SPARE																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8691	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8692	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8693	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8694	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8700	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8701	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8702	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8703	0000	REMOVE TRAY

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>BYPASS MASK</b>				File = B15 : 8800				N53 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8800	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8801	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8810	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8811	FFFF	BULK CONV FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8812	FFFF	BULK CONVEYOR SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8813	FFFF	STOP BULK DRAIN CONVEYOR
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8820	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8821	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8822	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8823	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8824	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8830	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8831	FFFF	ADVANCE TO DRAIN POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8832	FFFF	STOP AND LOWER LIFT
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8833	FFFF	RAISE LIFT
3.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8834	FFFF	WEIGH CONTAINER
3.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8835	FFFF	LOWER LIFT
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8840	FFFF	STEP INITIALIZE
4.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8841	FFFF	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8842	0000	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8850	FFFF	STEP INITIALIZE
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8851	FFFF	RETRACT DRAIN TUBE TO 1ST POS.
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8852	FFFF	OPEN BLOCK VALVE
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8853	FFFF	EXTEND DRAIN TUBE TO 2ND POS.
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8854	FFFF	SECOND POS. COMPLETE
5.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8855	FFFF	EXTEND DRAIN TUBE
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8860	FFFF	STEP INITIALIZE
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8861	FFFF	THIRD POS. COMPLETE
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8862	FFFF	TIME DELAY FOR PUMP DOWN
6.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8863	FFFF	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8864	FFFF	CHECK FOR GOOD DRAIN
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8870	FFFF	STEP INITIALIZE
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8871	FFFF	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8872	FFFF	STOP AND PURGE DRAIN TUBE
7.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8873	FFFF	RETRACT DRAIN TUBE
7.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8874	FFFF	DRILL CONTAINER
7.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8875	FFFF	RAISE LIFT
7.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8876	FFFF	WEIGH CONTAINER
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8880	FFFF	STEP INITIALIZE
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8881	FFFF	ADVANCE TO 2ND PUNCH POS.
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8882	FFFF	STOP BULK CONVEYOR
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :8890	FFFF	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>BYPASS MASK</b>				File = B15 : 8800				N53 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:10		
STEP																	WORD ADRS	HEX VALUE	STEP DESCRIPTION
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8891	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8892	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8893	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8894	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8900	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8901	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8902	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :8903	0000	REMOVE TRAY

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>BYPASS MASK</b>				File = B15 : 9000				N53 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- SPARE																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9000	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9001	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9010	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9011	FFFF	BULK CONV FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9012	FFFF	BULK CONVEYOR SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9013	FFFF	STOP BULK DRAIN CONVEYOR
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9020	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9021	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9022	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9023	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9024	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9030	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9031	FFFF	ADVANCE TO DRAIN POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9032	FFFF	STOP AND LOWER LIFT
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9033	FFFF	RAISE LIFT
3.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9034	FFFF	WEIGH CONTAINER
3.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9035	FFFF	LOWER LIFT
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9040	FFFF	STEP INITIALIZE
4.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9041	FFFF	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9042	0000	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9050	FFFF	STEP INITIALIZE
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9051	FFFF	RETRACT DRAIN TUBE TO 1ST POS.
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9052	FFFF	OPEN BLOCK VALVE
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9053	FFFF	EXTEND DRAIN TUBE TO 2ND POS.
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9054	FFFF	SECOND POS. COMPLETE
5.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9055	FFFF	EXTEND DRAIN TUBE
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9060	FFFF	STEP INITIALIZE
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9061	FFFF	THIRD POS. COMPLETE
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9062	FFFF	TIME DELAY FOR PUMP DOWN
6.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9063	FFFF	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9064	FFFF	CHECK FOR GOOD DRAIN
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9070	FFFF	STEP INITIALIZE
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9071	FFFF	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9072	FFFF	STOP AND PURGE DRAIN TUBE
7.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9073	FFFF	RETRACT DRAIN TUBE
7.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9074	FFFF	DRILL CONTAINER
7.5	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9075	AFFF	RAISE LIFT
7.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9076	FFFF	WEIGH CONTAINER
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9080	FFFF	STEP INITIALIZE
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9081	FFFF	ADVANCE TO 2ND PUNCH POS.
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9082	FFFF	STOP BULK CONVEYOR
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :9090	FFFF	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>BYPASS MASK</b>				File = B15 : 9000				N53 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- SPARE																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:11	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9091	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9092	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9093	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9094	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9100	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9101	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9102	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9103	0000	REMOVE TRAY

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)		File Name: TMJ_28.XLS				Cntl - CTC121B				C51 - Major Step Counter									
Pointer Number: 15		Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location									
<b>Bulk Drain Station</b>				<b>OUTPUT</b>				File = B15 : 9600				N53 - Display Location							
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- CHECK FOR NOT AGENT PRESENT																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:18	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9600	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	B15 :9601	0098	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	B15 :9610	00A4	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	B15 :9611	00A5	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :9612	01A5	BULK CONVEYOR SLOW SPEED
1.3	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9613	01A4	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9620	01A4	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9621	01A8	LOWER LIFT
2.2	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	B15 :9622	0198	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9623	01A8	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9624	01A4	RAISE LIFT
3.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9630	01A4	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :9631	01A5	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9632	01A8	STOP AND LOWER LIFT
3.3	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :9633	0124	RAISE LIFT
3.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :9634	0124	WEIGH CONTAINER
3.5	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9635	0128	LOWER LIFT
4.0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9640	01A8	STEP INITIALIZE
4.1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :9641	0168	START PUMP / EXT DRAIN TUBE FULL
4.2	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	B15 :9642	0928	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	B15 :9650	0928	STEP INITIALIZE
5.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9651	01A8	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9652	0128	OPEN BLOCK VALVE
5.3	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :9653	0168	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9654	0128	SECOND POS. COMPLETE
5.5	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :9655	0168	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :9660	0168	STEP INITIALIZE
6.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9661	0128	THIRD POS. COMPLETE
6.2	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9662	1128	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9663	0128	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	B15 :9664	0928	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	B15 :9670	0928	STEP INITIALIZE
7.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9671	01A8	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :9672	0128	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :9673	01A8	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :9674	0124	DRILL CONTAINER
7.5	0	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9675	11A4	RAISE LIFT
7.6	0	1	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9676	41A4	WEIGH CONTAINER
8.0	0	1	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9680	41A4	STEP INITIALIZE
8.1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	B15 :9681	01A5	ADVANCE TO 2ND PUNCH POS.
8.2	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9682	01A4	STOP BULK CONVEYOR
9.0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	B15 :9690	01A4	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 1				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>OUTPUT</b>				File = B15 : 9600				N53 - Display Location							
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- CHECK FOR NOT AGENT PRESENT																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:18	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9691	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9692	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9693	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9694	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9700	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9701	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9702	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9703	0000	REMOVE TRAY

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)			File Name: TMU_28.XLS			Cntl - CTC121B			C51 - Major Step Counter										
Pointer Number: 15			Datatable Word (1 or 2) = 2			REV - 7A			C51 - Minor Step Location										
<b>Bulk Drain Station</b>					<b>OUTPUT</b>					File = B15 : 9800					N53 - Display Location				
<b>17- LAST STEP</b>																			
<b>16- LAST SUB STEP</b>																			
<b>15- REPEAT PERMISSION</b>																			
<b>14- BYPASS PERMISSION</b>																			
<b>13- DRAIN TUBE PURGE VALVE OPEN</b>																			
<b>12- START DRAIN TUBE POSITION TIMER</b>																			
<b>11- BDS INITIAL WEIGHT REQUEST</b>																			
<b>10- VERIFY DRAIN COMPLETE</b>																			
<b>07- RUN AGENT DRAIN PUMP</b>																			
<b>06- REQUEST NEXT TRAY TO PROCESS</b>																			
<b>05- PROCESS NEXT TRAY ??? TO ADVSIOR</b>																			
<b>04- CHECK AGENT LEVEL 1=VERIFY</b>																			
<b>03- SEQ DELAY TIMER 3RD PRESET</b>																			
<b>02- SEQ DELAY TIMER 2ND PRESET</b>																			
<b>01- SEQ DELAY TIMER 1ST PRESET</b>																			
<b>00- AGENT LINE BLOCK VALVE OPEN</b>																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:19	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
0.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9800	0010	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9801	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9810	0010	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	B15 :9811	0050	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	B15 :9812	0050	BULK CONVEYOR SLOW SPEED
1.3	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9813	4010	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9820	0010	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9821	0010	LOWER LIFT
2.2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9822	0010	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9823	0010	RETRACT PUNCH
2.4	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9824	4010	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9830	0010	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9831	0010	ADVANCE TO DRAIN POSITION
3.2	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	B15 :9832	4210	STOP AND LOWER LIFT
3.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9833	0010	RAISE LIFT
3.4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9834	0010	WEIGH CONTAINER
3.5	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9835	4010	LOWER LIFT
4.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9840	0010	STEP INITIALIZE
4.1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	B15 :9841	0092	START PUMP / EXT DRAIN TUBE FULL
4.2	0	1	0	1	0	1	0	0	1	0	0	1	0	0	0	0	B15 :9842	5490	WAIT FOR 5 SEC / CHECK FOR AGENT
5.0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	B15 :9850	0490	STEP INITIALIZE
5.1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :9851	0090	RETRACT DRAIN TUBE TO 1ST POS.
5.2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :9852	0091	OPEN BLOCK VALVE
5.3	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :9853	0091	EXTEND DRAIN TUBE TO 2ND POS.
5.4	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :9854	0091	SECOND POS. COMPLETE
5.5	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :9855	4091	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :9860	0091	STEP INITIALIZE
6.1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	B15 :9861	0091	THIRD POS. COMPLETE
6.2	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	B15 :9862	0495	TIME DELAY FOR PUMP DOWN
6.3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :9863	0080	PURGE VERIFY VLV / CLOSE BLK VLV
6.4	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :9864	4090	CHECK FOR GOOD DRAIN
7.0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :9870	0090	STEP INITIALIZE
7.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9871	0010	RET DRN TUBE 2ND POS. / STOP PUMP
7.2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	B15 :9872	0810	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9873	0010	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9874	0010	DRILL CONTAINER
7.5	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	B15 :9875	3110	RAISE LIFT
7.6	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9876	4010	WEIGH CONTAINER
8.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9880	0010	STEP INITIALIZE
8.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9881	0010	ADVANCE TO 2ND PUNCH POS.
8.2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9882	4010	STOP BULK CONVEYOR
9.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B15 :9890	0010	STEP INITIALZE

Programmatic Process FAWB - CDTF Job #9338900 (see FAWB Note B-14)																			
Spray Tank (TE/UM)				File Name: TMU_28.XLS				Cntl - CTC121B				C51 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 2				REV - 7A				C51 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>OUTPUT</b>				File = B15 : 9800				N53 - Display Location							
17- LAST STEP																			
16- LAST SUB STEP																			
15- REPEAT PERMISSION																			
14- BYPASS PERMISSION																			
13- DRAIN TUBE PURGE VALVE OPEN																			
12- START DRAIN TUBE POSITION TIMER																			
11- BDS INITIAL WEIGHT REQUEST																			
10- VERIFY DRAIN COMPLETE																			
07- RUN AGENT DRAIN PUMP																			
06- REQUEST NEXT TRAY TO PROCESS																			
05- PROCESS NEXT TRAY ??? TO ADVSIOR																			
04- CHECK AGENT LEVEL 1=VERIFY																			
03- SEQ DELAY TIMER 3RD PRESET																			
02- SEQ DELAY TIMER 2ND PRESET																			
01- SEQ DELAY TIMER 1ST PRESET																			
00- AGENT LINE BLOCK VALVE OPEN																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:19	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADRS		
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9891	0000	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9892	0000	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9893	0000	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9894	0000	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9900	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9901	0000	ADVANCE TO END OF BDS CONVEYOR
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9902	0000	TRAY AT END, STOP CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :9903	0000	REMOVE TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 11				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				INPUT COMPARISON				File = B15 : 6000				B1:710 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDRESS		
0.0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :6000	0016	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :6001	0016	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6010	0019	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6011	1019	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6012	1019	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6013	0019	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6020	0019	STEP INITIALIZE
2.1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	B15 :6021	801A	LOWER LIFT
2.2	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :6022	8016	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6023	001A	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6024	0019	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6030	0019	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6031	1019	ADVANCE PAST 1ST PUNCH POSITION
3.2	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6032	1019	ADVANCE TO 2ND PUNCH POSITION
3.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6033	0019	STOP BDS CONVEYOR
4.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6040	0019	STEP INTIALIZE
4.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6041	001A	LOWER LIFT
4.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :6042	0016	EXTEND PUNCH
4.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6043	001A	RETRACT PUNCH
4.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6044	0019	RAISE LIFT
5.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6050	0019	STEP INITIALIZE
5.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6051	1019	ADVANCE TO DRAIN POSITION
5.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6052	0019	STOP BDS CONVEYOR
5.3	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6053	1019	ADVANCE PAST DRAIN POSITION
5.4	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6054	1019	ADVANCE TO DRAIN POSITION
5.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6055	001A	LOWER LIFT
5.6	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6056	0019	RAISE LIFT
5.7	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6057	0019	WEIGH CONTAINER
5.8	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6058	001A	LOWER LIFT
5.9	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6059	008A	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6060	008A	STEP INTIALIZE - PUMP ON
6.1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :6061	018A	CHECK VERIFY SYSTEM FOR AGENT
6.2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6062	008A	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6063	008A	CLOSE BLOCK VALVE, OPEN PURGE
																			CHECK VERIFY SYSTEM FOR GOOD DRAIN
6.4	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	B15 :6064	068A	
7.0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	B15 :6070	068A	STEP INTIALIZE - STOP PUMP
7.1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :6071	004A	RETRACT DRAIN TUBE TO 2ND POS.
7.2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :6072	004A	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6073	001A	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6074	0019	RAISE LIFT
7.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6075	0019	WEIGH TRAY
8.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6080	0019	STEP INTIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 11				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				INPUT COMPARISON				File = B15 : 6000				B1:710 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDRESS		
8.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6081	1019	ADVANCE TO 1ST PUNCH POSITION
8.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6082	0019	STOP BDS CONVEYOR
9.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6090	0019	STEP INITIALIZE
9.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6091	001A	LOWER LIFT
9.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :6092	0016	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6093	001A	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6094	0019	RAISE LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6100	0019	STEP INITIALIZE
10.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6101	1019	ADVANCE TO DRAIN POSITION
10.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6102	0019	STOP BDS CONVEYOR
10.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6103	001A	LOWER LIFT
10.4	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6104	008A	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6110	008A	STEP INITIALIZE
11.1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :6111	018A	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6112	008A	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :6113	008A	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	B15 :6114	068A	CHECK VERIFY SYSTEM FOR GOOD DRAIN
12.0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	B15 :6120	068A	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :6121	004A	RETRACT DRAIN TUBE TO 2ND POS.
12.2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :6122	004A	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6123	001A	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6124	0019	RAISE LIFT
12.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6125	0019	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :6130	0019	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6131	001A	LOWER LIFT
13.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :6132	0016	EXTEND PUNCH
13.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :6133	001A	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6134	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6140	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6141	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6142	0000	TRAY AT END, STOP CONVEYOR
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6143	0000	TRAY COMPLETE, PROCESS NEXT TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM) File Name: BDS - MC-1.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 11 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																			
Bulk Drain Station INPUT COMPARISON File = B15 : 6200 B1:710 - Display Location																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6200	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6201	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6210	0000	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6211	4000	BULK CONV FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6212	4200	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6213	0200	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6220	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6221	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6222	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6223	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6224	0200	RAISE LIFT
3.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6230	0200	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6231	0000	ADVANCE PAST 1ST PUNCH POSITION
3.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6232	0200	ADVANCE TO 2ND PUNCH POSITION
3.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6233	0200	STOP BDS CONVEYOR
4.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6240	0200	STEP INITIALIZE
4.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6241	0200	LOWER LIFT
4.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6242	0200	EXTEND PUNCH
4.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6243	0200	RETRACT PUNCH
4.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6244	0200	RAISE LIFT
5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6250	0000	STEP INITIALIZE
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6251	0400	ADVANCE TO DRAIN POSITION
5.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6252	0400	STOP BDS CONVEYOR
5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6253	0000	ADVANCE PAST DRAIN POSITION
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6254	0400	ADVANCE TO DRAIN POSITION
5.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6255	0400	LOWER LIFT
5.6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6256	0400	RAISE LIFT
5.7	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	B15 :6257	0C02	WEIGH CONTAINER
5.8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6258	0400	LOWER LIFT
5.9	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6259	0400	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6260	0400	STEP INITIALIZE - PUMP ON
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6261	0400	CHECK VERIFY SYSTEM FOR AGENT
6.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6262	8400	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6263	0480	CLOSE BLOCK VALVE, OPEN PURGE
6.4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6264	1400	CHECK VERIFY SYSTEM FOR GOOD DRAIN
7.0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6270	1400	STEP INITIALIZE - STOP PUMP
7.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6271	0400	RETRACT DRAIN TUBE TO 2ND POS.
7.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6272	0480	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6273	0400	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6274	0400	RAISE LIFT
7.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	B15 :6275	1C02	WEIGH TRAY
8.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6280	0400	STEP INITIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 11				Datatable Word (1 or 2) = 2				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				INPUT COMPARISON				File = B15 : 6200				B1:710 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
8.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6281	0200	ADVANCE TO 1ST PUNCH POSITION
8.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6282	0200	STOP BDS CONVEYOR
9.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6290	0200	STEP INITIALIZE
9.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6291	0200	LOWER LIFT
9.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6292	0200	EXTEND PUNCH
9.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6293	0200	RETRACT PUNCH
9.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6294	0200	RAISE LIFT
10.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6300	0200	STEP INITIALIZE
10.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6301	0400	ADVANCE TO DRAIN POSITION
10.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6302	0400	STOP BDS CONVEYOR
10.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6303	0400	LOWER LIFT
10.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6304	0400	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6310	0400	STEP INITIALIZE
11.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6311	0400	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6312	8400	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6313	0480	CLOSE BLOCK VALVE, OPEN PURGE CHECK VERIFY SYSTEM FOR GOOD DRAIN
11.4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6314	1400	
12.0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6320	1400	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6321	0400	RETRACT DRAIN TUBE TO 2ND POS.
12.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6322	0480	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6323	0400	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6324	0400	RAISE LIFT
12.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	B15 :6325	1C02	WEIGH TRAY
13.0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :6330	1C00	STEP INITIALIZE
13.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6331	0400	LOWER LIFT
13.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6332	0400	EXTEND PUNCH
13.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6333	0400	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6334	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6340	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6341	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6342	0000	TRAY AT END, STOP CONVEYOR
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6343	0000	TRAY COMPLETE, PROCESS NEXT TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 12				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				NORMAL MASK				File = B15 : 6400				B1:710 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6400	0000	BDS PARK
0.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6401	10FF	BDS GOTO PARK
1.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6410	10FF	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6411	10FF	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6412	10FF	BULK CONV SLOW SPEED
1.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6413	10FF	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6420	10FF	STEP INITIALIZE
2.1	1	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6421	90FF	LOWER LIFT
2.2	1	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6422	90FF	EXTEND PUNCH
2.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6423	10FF	RETRACT PUNCH
2.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6424	10FF	RAISE LIFT
3.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6430	10FF	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6431	10FF	ADVANCE PAST 1ST PUNCH POSITION
3.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6432	10FF	ADVANCE TO 2ND PUNCH POSITION
3.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6433	10FF	STOP BDS CONVEYOR
4.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6440	10FF	STEP INTIALIZE
4.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6441	10FF	LOWER LIFT
4.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6442	10FF	EXTEND PUNCH
4.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6443	10FF	RETRACT PUNCH
4.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6444	10FF	RAISE LIFT
5.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6450	10FF	STEP INITIALIZE
5.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6451	10FF	ADVANCE TO DRAIN POSITION
5.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6452	10FF	STOP BDS CONVEYOR
5.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6453	10FF	ADVANCE PAST DRAIN POSITION
5.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6454	10FF	ADVANCE TO DRAIN POSITION
5.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6455	10FF	LOWER LIFT
5.6	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6456	10FF	RAISE LIFT
5.7	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6457	10FF	WEIGH CONTAINER
5.8	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6458	10FF	LOWER LIFT
5.9	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6459	10FF	EXTEND DRAIN TUBE
6.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6460	10FF	STEP INTIALIZE - PUMP ON
6.1	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :6461	11FF	CHECK VERIFY SYSTEM FOR AGENT
6.2	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :6462	11FF	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :6463	11FF	CLOSE BLOCK VALVE, OPEN PURGE
6.4	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	B15 :6464	17FF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
7.0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	B15 :6470	17FF	STEP INTIALIZE - STOP PUMP
7.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6471	10FF	RETRACT DRAIN TUBE TO 2ND POS.
7.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6472	10FF	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6473	10FF	RETRACT DRAIN TUBE
7.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6474	10FF	RAISE LIFT
7.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6475	10FF	WEIGH TRAY
8.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6480	10FF	STEP INTIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 12				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				NORMAL MASK				File = B15 : 6400				B1:710 - Display Location							
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
8.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6481	10FF	ADVANCE TO 1ST PUNCH POSITION
8.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6482	10FF	STOP BDS CONVEYOR
9.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6490	10FF	STEP INITIALIZE
9.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6491	10FF	LOWER LIFT
9.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6492	10FF	EXTEND PUNCH
9.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6493	10FF	RETRACT PUNCH
9.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6494	10FF	RAISE LIFT
10.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6500	10FF	STEP INITIALIZE
10.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6501	10FF	ADVANCE TO DRAIN POSITION
10.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6502	10FF	STOP BDS CONVEYOR
10.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6503	10FF	LOWER LIFT
10.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6504	10FF	EXTEND DRAIN TUBE
11.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6510	10FF	STEP INITIALIZE
11.1	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :6511	11FF	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :6512	11FF	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :6513	11FF	CLOSE BLOCK VALVE, OPEN PURGE CHECK VERIFY SYSTEM FOR GOOD DRAIN
11.4	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	B15 :6514	17FF	
12.0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	B15 :6520	17FF	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6521	10FF	RETRACT DRAIN TUBE TO 2ND POS.
12.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6522	10FF	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6523	10FF	RETRACT DRAIN TUBE
12.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6524	10FF	RAISE LIFT
12.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6525	10FF	WEIGH TRAY
13.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6530	10FF	STEP INITIALIZE
13.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6531	10FF	LOWER LIFT
13.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6532	10FF	EXTEND PUNCH
13.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6533	10FF	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6534	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6540	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6541	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6542	0000	TRAY AT END, STOP CONVEYOR
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6543	0000	TRAY COMPLETE, PROCESS NEXT TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 12				Datatable Word (1 or 2) = 2				REV - 0				C169 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>NORMAL MASK</b>				File = B15 : 6600				B1:710 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6600	0000	BDS PARK
0.1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :6601	6600	BDS GOTO PARK
1.0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :6610	6600	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6611	4000	BULK CONV FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6612	4200	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6613	0200	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6620	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6621	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6622	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6623	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6624	0200	RAISE LIFT
3.0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6630	2400	STEP INITIALIZE
3.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6631	0200	ADVANCE PAST 1ST PUNCH POSITION
3.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6632	0200	ADVANCE TO 2ND PUNCH POSITION
3.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6633	0200	STOP BDS CONVEYOR
4.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6640	0200	STEP INTIALIZE
4.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6641	0200	LOWER LIFT
4.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6642	0200	EXTEND PUNCH
4.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6643	0200	RETRACT PUNCH
4.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6644	0200	RAISE LIFT
5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6650	0000	STEP INITIALIZE
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6651	0400	ADVANCE TO DRAIN POSITION
5.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6652	0400	STOP BDS CONVEYOR
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6653	0400	ADVANCE PAST DRAIN POSITION
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6654	0400	ADVANCE TO DRAIN POSITION
5.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6655	0400	LOWER LIFT
5.6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6656	0400	RAISE LIFT
5.7	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	B15 :6657	0C02	WEIGH CONTAINER
5.8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6658	0400	LOWER LIFT
5.9	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6659	0400	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6660	0400	STEP INTIALIZE - PUMP ON
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6661	0400	CHECK VERIFY SYSTEM FOR AGENT
6.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6662	8400	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6663	0480	CLOSE BLOCK VALVE, OPEN PURGE
6.4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6664	1400	CHECK VERIFY SYSTEM FOR GOOD DRAIN
7.0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6670	1400	STEP INTIALIZE - STOP PUMP
7.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6671	0400	RETRACT DRAIN TUBE TO 2ND POS.
7.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6672	0480	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6673	0400	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6674	0400	RAISE LIFT
7.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	B15 :6675	1C02	WEIGH TRAY
8.0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6680	2400	STEP INTIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 12				Datatable Word (1 or 2) = 2				REV - 0				C169 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>NORMAL MASK</b>				File = B15 : 6600				B1:710 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
8.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6681	0200	ADVANCE TO 1ST PUNCH POSITION
8.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6682	0200	STOP BDS CONVEYOR
9.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6690	0200	STEP INITIALIZE
9.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6691	0200	LOWER LIFT
9.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6692	0200	EXTEND PUNCH
9.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6693	0200	RETRACT PUNCH
9.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6694	0200	RAISE LIFT
10.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :6700	0200	STEP INITIALIZE
10.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6701	0400	ADVANCE TO DRAIN POSITION
10.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6702	8400	STOP BDS CONVEYOR
10.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6703	0400	LOWER LIFT
10.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6704	0400	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6710	0400	STEP INITIALIZE
11.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6711	0400	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6712	8400	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6713	0480	CLOSE BLOCK VALVE, OPEN PURGE CHECK VERIFY SYSTEM FOR GOOD DRAIN
11.4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6714	1400	
12.0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6720	1400	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6721	0400	RETRACT DRAIN TUBE TO 2ND POS.
12.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :6722	0480	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6723	0400	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6724	0400	RAISE LIFT
12.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	B15 :6725	1C02	WEIGH TRAY
13.0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :6730	1C00	STEP INITIALIZE
13.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6731	0400	LOWER LIFT
13.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6732	0400	EXTEND PUNCH
13.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :6733	0400	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6734	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6740	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6741	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6742	0000	TRAY AT END, STOP CONVEYOR
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6743	0000	TRAY COMPLETE, PROCESS NEXT TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
<b>Bulk Drain Station</b>				<b>BYPASS MASK</b>				File = B15 : 6800				B1:710 - Display Location							
<b>17- SPARE</b>																			
<b>16- LIFT RETRACTED DWELL TIMER</b>																			
<b>15- DRILLING COMPLETE</b>																			
<b>14- MMS-BDS-101 BDS CONV 1=FWD</b>																			
<b>13- SPARE</b>																			
<b>12- TIME DELAY FOR AGENT LEVEL &lt; 1.5"</b>																			
<b>11- TIME DELAY FOR VERIFY LEVEL DRAINED</b>																			
<b>10- AGENT PRESENT IN BULK ITEM</b>																			
<b>07- DRAIN TUBE AT POS #3 (EXTENDED)</b>																			
<b>06- DRAIN TUBE AT POS #2</b>																			
<b>05- DRAIN TUBE AT POS #1</b>																			
<b>04- DRAIN TUBE RETRACTED</b>																			
<b>03- PUNCH ARM RETRACTED</b>																			
<b>02- PUNCH ARM EXTENDED</b>																			
<b>01- LIFT CYLINDERS RETRACTED</b>																			
<b>00- LIFT CYLINDERS EXTENDED</b>																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6800	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6801	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6810	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6811	FFFF	BULK CONV FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6812	FFFF	BULK CONV SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6813	FFFF	STOP BULK DRAIN CONVEYOR
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6820	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6821	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6822	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6823	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6824	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6830	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6831	FFFF	ADVANCE PAST 1ST PUNCH POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6832	FFFF	ADVANCE TO 2ND PUNCH POSITION
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6833	FFFF	STOP BDS CONVEYOR
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6840	FFFF	STEP INTIALIZE
4.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6841	FFFF	LOWER LIFT
4.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6842	FFFF	EXTEND PUNCH
4.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6843	FFFF	RETRACT PUNCH
4.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6844	0000	RAISE LIFT
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6850	FFFF	STEP INITIALIZE
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6851	FFFF	ADVANCE TO DRAIN POSITION
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6852	FFFF	STOP BDS CONVEYOR
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6853	FFFF	ADVANCE PAST DRAIN POSITION
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6854	FFFF	ADVANCE TO DRAIN POSITION
5.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6855	FFFF	LOWER LIFT
5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6856	0000	RAISE LIFT
5.7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6857	FFFF	WEIGH CONTAINER
5.8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6858	FFFF	LOWER LIFT
5.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6859	0000	EXTEND DRAIN TUBE
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6860	FFFF	STEP INTIALIZE - PUMP ON
6.1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6861	10FF	CHECK VERIFY SYSTEM FOR AGENT
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6862	FFFF	OPEN BLOCK VALVE, START TIMER
6.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6863	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
6.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6864	FFFF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6870	FFFF	STEP INTIALIZE - STOP PUMP
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6871	FFFF	RETRACT DRAIN TUBE TO 2ND POS.
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6872	FFFF	STOP AND PURGE DRAIN TUBE
7.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6873	FFFF	RETRACT DRAIN TUBE
7.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6874	FFFF	RAISE LIFT
7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6875	0000	WEIGH TRAY
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6880	FFFF	STEP INTIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)			File Name: BDS - MC-1.XLS			Cntl - CONR-103A, B			C168 - Major Step Counter										
Pointer Number: 13			Datatable Word (1 or 2) = 1			REV - 0			C169 - Minor Step Location										
<b>Bulk Drain Station</b>			<b>BYPASS MASK</b>			File = B15 : 6800			B1:710 - Display Location										
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6881	FFFF	ADVANCE TO 1ST PUNCH POSITION
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6882	FFFF	STOP BDS CONVEYOR
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6890	FFFF	STEP INTIALIZE
9.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6891	FFFF	LOWER LIFT
9.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6892	FFFF	EXTEND PUNCH
9.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6893	FFFF	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6894	0000	RAISE LIFT
10.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6900	FFFF	STEP INTIALIZE
10.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6901	FFFF	ADVANCE TO DRAIN POSITION
10.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6902	FFFF	STOP BDS CONVEYOR
10.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6903	FFFF	LOWER LIFT
10.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6904	FFFF	EXTEND DRAIN TUBE
11.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6910	FFFF	STEP INTIALIZE
11.1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	B15 :6911	10FF	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6912	FFFF	OPEN BLOCK VALVE, START TIMER
11.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6913	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
11.4	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	B15 :6914	FCFF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
12.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6920	FFFF	STEP INTIALIZE - STOP PUMP
12.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6921	FFFF	RETRACT DRAIN TUBE TO 2ND POS.
12.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6922	FFFF	STOP AND PURGE DRAIN TUBE
12.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :6923	FFFF	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6924	0000	RAISE LIFT
12.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6925	0000	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6930	0000	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6931	0000	LOWER LIFT
13.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6932	0000	EXTEND PUNCH
13.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6933	0000	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6934	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6940	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6941	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6942	0000	TRAY AT END, STOP CONVEYOR
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :6943	0000	TRAY COMPLETE, PROCESS NEXT TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 2				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				BYPASS MASK				File = B15 : 7000				B1:710 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7000	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7001	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7010	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7011	FFFF	BULK CONV FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7012	FFFF	BULK CONV SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7013	FFFF	STOP BULK DRAIN CONVEYOR
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7020	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7021	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7022	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7023	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7024	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7030	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7031	FFFF	ADVANCE PAST 1ST PUNCH POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7032	FFFF	ADVANCE TO 2ND PUNCH POSITION
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7033	FFFF	STOP BDS CONVEYOR
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7040	FFFF	STEP INTIALIZE
4.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7041	FFFF	LOWER LIFT
4.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7042	FFFF	EXTEND PUNCH
4.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7043	FFFF	RETRACT PUNCH
4.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7044	0000	RAISE LIFT
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7050	FFFF	STEP INITIALIZE
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7051	FFFF	ADVANCE TO DRAIN POSITION
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7052	FFFF	STOP BDS CONVEYOR
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7053	FFFF	ADVANCE PAST DRAIN POSITION
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7054	FFFF	ADVANCE TO DRAIN POSITION
5.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7055	FFFF	LOWER LIFT
5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7056	0000	RAISE LIFT
5.7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7057	FFFF	WEIGH CONTAINER
5.8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7058	FFFF	LOWER LIFT
5.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7059	0000	EXTEND DRAIN TUBE
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7060	FFFF	STEP INTIALIZE - PUMP ON
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :7061	0400	CHECK VERIFY SYSTEM FOR AGENT
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7062	FFFF	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7063	0000	CLOSE BLOCK VALVE, OPEN PURGE
6.4	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7064	BFFF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7070	FFFF	STEP INTIALIZE - STOP PUMP
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7071	FFFF	RETRACT DRAIN TUBE TO 2ND POS.
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7072	FFFF	STOP AND PURGE DRAIN TUBE
7.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7073	FFFF	RETRACT DRAIN TUBE
7.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7074	FFFF	RAISE LIFT
7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7075	0000	WEIGH TRAY
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7080	FFFF	STEP INTIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 13				Datatable Word (1 or 2) = 2				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				BYPASS MASK				File = B15 : 7000				B1:710 - Display Location							
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7081	FFFF	ADVANCE TO 1ST PUNCH POSITION
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7082	FFFF	STOP BDS CONVEYOR
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7090	FFFF	STEP INITIALIZE
9.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7091	FFFF	LOWER LIFT
9.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7092	FFFF	EXTEND PUNCH
9.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7093	FFFF	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7094	0000	RAISE LIFT
10.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7100	FFFF	STEP INITIALIZE
10.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7101	FFFF	ADVANCE TO DRAIN POSITION
10.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7102	FFFF	STOP BDS CONVEYOR
10.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7103	FFFF	LOWER LIFT
10.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7104	FFFF	EXTEND DRAIN TUBE
11.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7110	FFFF	STEP INITIALIZE
11.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :7111	0400	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7112	FFFF	OPEN BLOCK VALVE, START TIMER
11.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7113	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
11.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7114	FFFF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
12.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7120	FFFF	STEP INITIALIZE - STOP PUMP
12.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7121	FFFF	RETRACT DRAIN TUBE TO 2ND POS.
12.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7122	FFFF	STOP AND PURGE DRAIN TUBE
12.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :7123	FFFF	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7124	0000	RAISE LIFT
12.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7125	0000	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7130	0000	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7131	0000	LOWER LIFT
13.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7132	0000	EXTEND PUNCH
13.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7133	0000	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7134	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7140	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7141	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7142	0000	TRAY AT END, STOP CONVEYOR
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7143	0000	TRAY COMPLETE, PROCESS NEXT TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				OUTPUT				File = B15 : 7600				B1:710 - Display Location							
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- CHECK FOR NOT AGENT PRESENT																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:48	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7600	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	B15 :7601	0098	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	B15 :7610	00A4	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	B15 :7611	0025	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7612	0125	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7613	0124	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7620	0124	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7621	0128	LOWER LIFT
2.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :7622	0118	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7623	0128	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7624	0124	RAISE LIFT
3.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7630	0124	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7631	0125	ADVANCE PAST 1ST PUNCH POSITION
3.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7632	0125	ADVANCE TO 2ND PUNCH POSITION
3.3	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7633	0124	STOP BDS CONVEYOR
4.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7640	0124	STEP INITIALIZE
4.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7641	0128	LOWER LIFT
4.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :7642	0118	EXTEND PUNCH
4.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7643	0128	RETRACT PUNCH
4.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7644	0124	RAISE LIFT
5.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7650	0124	STEP INITIALIZE
5.1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7651	0125	ADVANCE TO DRAIN POSITION
5.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7652	0124	STOP BDS CONVEYOR
5.3	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7653	0125	ADVANCE PAST DRAIN POSITION
5.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7654	0125	ADVANCE TO DRAIN POSITION
5.5	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7655	0128	LOWER LIFT
5.6	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7656	0124	RAISE LIFT
5.7	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7657	0124	WEIGH CONTAINER
5.8	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7658	0128	LOWER LIFT
5.9	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7659	0168	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7660	0168	STEP INITIALIZE - PUMP ON
6.1	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	B15 :7661	0968	CHECK VERIFY SYSTEM FOR AGENT
6.2	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7662	0168	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7663	0168	CLOSE BLOCK VALVE, OPEN PURGE
																			CHECK VERIFY SYSTEM FOR GOOD DRAIN
6.4	0	0	0	0	0	1	0	1	0	1	1	0	1	0	0	0	B15 :7664	0568	
7.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7670	0168	STEP INITIALIZE - STOP PUMP
7.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :7671	01A8	RETRACT DRAIN TUBE TO 2ND POS.
7.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7672	0128	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :7673	01A8	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7674	0124	RAISE LIFT
7.5	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	B15 :7675	1124	WEIGH TRAY
8.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7680	0124	STEP INITIALIZE

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TE/UM)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 1				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				OUTPUT				File = B15 : 7600				B1:710 - Display Location							
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- CHECK FOR NOT AGENT PRESENT																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:48	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
8.1	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	1	B15 :7681	0325	ADVANCE TO 1ST PUNCH POSITION
8.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7682	0124	STOP BDS CONVEYOR
9.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7690	0124	STEP INTIALIZE
9.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7691	0128	LOWER LIFT
9.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :7692	0118	EXTEND PUNCH
9.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7693	0128	RETRACT PUNCH
9.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7694	0124	RAISE LIFT
10.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7700	0124	STEP INTIALIZE
10.1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :7701	0125	ADVANCE TO DRAIN POSITION
10.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7702	0124	STOP BDS CONVEYOR
10.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7703	0128	LOWER LIFT
10.4	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7704	0168	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7710	0168	STEP INTIALIZE
11.1	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	B15 :7711	0968	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7712	0168	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7713	0168	CLOSE BLOCK VALVE, OPEN PURGE
																			CHECK VERIFY SYSTEM FOR GOOD
11.4	0	0	0	0	0	1	0	1	0	1	1	0	1	0	0	0	B15 :7714	0568	DRAIN
12.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :7720	0168	STEP INTIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :7721	01A8	RETRACT DRAIN TUBE TO 2ND POS.
12.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7722	0128	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :7723	01A8	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7724	0124	RAISE LIFT
12.5	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7725	2124	WEIGH TRAY
13.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :7730	0124	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7731	0128	LOWER LIFT
13.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :7732	0118	EXTEND PUNCH
13.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :7733	0128	RETRACT PUNCH
13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7734	0000	RAISE LIFT
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7740	0000	STEP INITIALIZE
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7741	0000	ADVANCE TO END OF BULK CONVEYOR
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7742	0000	TRAY AT END, STOP CONVEYOR
																			TRAY COMPLETE, PROCESS NEXT
14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7743	0000	TRAY

Programmatic Process FAWB - BASE LINE COPY																			
MC-1 750 lb. Bomb (TEU/M)				File Name: BDS - MC-1.XLS				Cntl - CONR-103A, B				C168 - Major Step Counter							
Pointer Number: 15				Datatable Word (1 or 2) = 2				REV - 0				C169 - Minor Step Location							
Bulk Drain Station				OUTPUT				File = B15 : 7800				B1:710 - Display Location							
17- LAST STEP																			
16- LAST SUB STEP																			
15- REPEAT PERMISSION																			
14- BYPASS PERMISSION																			
13- DRAIN TUBE PURGE VALVE OPEN																			
12- START DRAIN TUBE POSITION TIMER																			
11- BDS INITIAL WEIGHT REQUEST																			
10- VERIFY DRAIN COMPLETE																			
07- RUN AGENT DRAIN PUMP																			
06- REQUEST NEXT TRAY TO PROCESS																			
05- PROCESS NEXT TRAY ??? TO ADVSIOR																			
04- CHECK AGENT LEVEL 1=VERIFY																			
03- SEQ DELAY TIMER 3RD PRESET																			
02- SEQ DELAY TIMER 2ND PRESET																			
01- SEQ DELAY TIMER 1ST PRESET																			
00- AGENT LINE BLOCK VALVE OPEN																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:49	HEX VALUE	STEP DESCRIPTION
STEP																	WORD ADDR		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7800	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7801	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7810	0000	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	B15 :7811	0040	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	B15 :7812	0040	BULK CONV SLOW SPEED
1.3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7813	4000	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7820	0000	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7821	0000	LOWER LIFT
2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7822	0000	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7823	0000	RETRACT PUNCH
2.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7824	4000	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7830	0000	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7831	0000	ADVANCE PAST 1ST PUNCH POSITION
3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7832	0000	ADVANCE TO 2ND PUNCH POSITION
3.3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7833	4000	STOP BDS CONVEYOR
4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7840	0000	STEP INITIALIZE
4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7841	0000	LOWER LIFT
4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7842	0000	EXTEND PUNCH
4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7843	0000	RETRACT PUNCH
4.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7844	4000	RAISE LIFT
5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7850	0000	STEP INITIALIZE
5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7851	0000	ADVANCE TO DRAIN POSITION
5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7852	0000	STOP BDS CONVEYOR
5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7853	0000	ADVANCE PAST DRAIN POSITION
5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7854	0000	ADVANCE TO DRAIN POSITION
5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7855	0000	LOWER LIFT
5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7856	0000	RAISE LIFT
5.7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :7857	0200	WEIGH CONTAINER
5.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7858	0000	LOWER LIFT
5.9	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :7859	4080	EXTEND DRAIN TUBE
6.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :7860	0080	STEP INITIALIZE - PUMP ON
6.1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	B15 :7861	1090	CHECK VERIFY SYSTEM FOR AGENT
6.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	B15 :7862	0481	OPEN BLOCK VALVE, START TIMER
6.3	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	B15 :7863	0880	CLOSE BLOCK VALVE, OPEN PURGE
																			CHECK VERIFY SYSTEM FOR GOOD DRAIN
6.4	0	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	B15 :7864	7190	
7.0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	B15 :7870	0190	STEP INITIALIZE - STOP PUMP
7.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :7871	0080	RETRACT DRAIN TUBE TO 2ND POS.
7.2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	B15 :7872	0800	STOP AND PURGE DRAIN TUBE
7.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7873	0000	RETRACT DRAIN TUBE
7.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7874	0000	RAISE LIFT
7.5	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	B15 :7875	7100	WEIGH TRAY
8.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7880	0000	STEP INITIALIZE

Programmatic Process FAWB - BASE LINE COPY																				
MC-1 750 lb. Bomb (TE/UM) File Name: BDS - MC-1.XLS Cntl - CONR-103A, B C168 - Major Step Counter																				
Pointer Number: 15 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																				
<b>Bulk Drain Station OUTPUT File = B15 : 7800 B1:710 - Display Location</b>																				
17- LAST STEP																				
16- LAST SUB STEP																				
15- REPEAT PERMISSION																				
14- BYPASS PERMISSION																				
13- DRAIN TUBE PURGE VALVE OPEN																				
12- START DRAIN TUBE POSITION TIMER																				
11- BDS INITIAL WEIGHT REQUEST																				
10- VERIFY DRAIN COMPLETE																				
07- RUN AGENT DRAIN PUMP																				
06- REQUEST NEXT TRAY TO PROCESS																				
05- PROCESS NEXT TRAY ??? TO ADVSIOR																				
04- CHECK AGENT LEVEL 1=VERIFY																				
03- SEQ DELAY TIMER 3RD PRESET																				
02- SEQ DELAY TIMER 2ND PRESET																				
01- SEQ DELAY TIMER 1ST PRESET																				
00- AGENT LINE BLOCK VALVE OPEN																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:49	WORD ADDR	HEX VALUE	STEP DESCRIPTION
STEP																				
8.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7881	0000	ADVANCE TO 1ST PUNCH POSITION	
8.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7882	4000	STOP BDS CONVEYOR	
9.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7890	0000	STEP INTIALIZE	
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7891	0000	LOWER LIFT	
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7892	0000	EXTEND PUNCH	
9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7893	0000	RETRACT PUNCH	
9.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7894	4000	RAISE LIFT	
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7900	0000	STEP INTIALIZE	
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7901	0000	ADVANCE TO DRAIN POSITION	
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7902	0000	STOP BDS CONVEYOR	
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7903	0000	LOWER LIFT	
10.4	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :7904	4080	EXTEND DRAIN TUBE	
11.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :7910	0080	STEP INTIALIZE	
11.1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	B15 :7911	1090	CHECK VERIFY SYSTEM FOR AGENT	
11.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	B15 :7912	0481	OPEN BLOCK VALVE, START TIMER	
11.3	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	B15 :7913	0880	CLOSE BLOCK VALVE, OPEN PURGE	
11.4	0	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	B15 :7914	7190	CHECK VERIFY SYSTEM FOR GOOD DRAIN	
12.0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	B15 :7920	0190	STEP INTIALIZE - STOP PUMP	
12.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :7921	0080	RETRACT DRAIN TUBE TO 2ND POS.	
12.2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	B15 :7922	0800	STOP AND PURGE DRAIN TUBE	
12.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7923	0000	RETRACT DRAIN TUBE	
12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7924	0000	RAISE LIFT	
12.5	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	B15 :7925	7100	WEIGH TRAY	
13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7930	0000	STEP INITIALIZE	
13.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7931	0000	LOWER LIFT	
13.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7932	0000	EXTEND PUNCH	
13.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7933	0000	RETRACT PUNCH	
13.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7934	4000	RAISE LIFT	
14.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7940	0000	STEP INITIALIZE	
14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7941	0000	ADVANCE TO END OF BULK CONVEYOR	
14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :7942	0000	TRAY AT END, STOP CONVEYOR	
14.3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	B15 :7943	8020	TRAY COMPLETE, PROCESS NEXT TRAY	

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 11 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
Bulk Drain Station INPUT COMPARISON File = B15 : 4000 B1:710 - Display Location																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40		STEP DESCRIPTION
																	WORD ADDRESS	HEX VALUE	
0.0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	B15 :4000	0086	BDS PARK
0.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	B15 :4001	0086	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4010	0019	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4011	1019	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4012	1019	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4013	0019	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4020	0019	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4021	001A	LOWER LIFT
2.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :4022	0016	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4023	001A	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4024	0019	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4030	0019	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4031	1019	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4032	0019	WEIGH CONTAINER
3.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4033	001A	LOWER LIFT
3.4	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4034	008A	EXTEND DRAIN TUBE
4.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4040	008A	STEP INTIALIZE - PUMP ON
4.1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	B15 :4041	018A	CHECK VERIFY SYSTEM FOR AGENT
4.2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4042	008A	OPEN BLOCK VALVE, START TIMER
4.3	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4043	008A	CLOSE BLOCK VALVE, OPEN PURGE
4.4	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	B15 :4044	028A	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	B15 :4050	028A	STEP INTIALIZE - STOP PUMP
5.1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :4051	004A	RETRACT DRAIN TUBE TO 2ND POS.
5.2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	B15 :4052	004A	STOP AND PURGE DRAIN TUBE
5.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4053	001A	RETRACT DRAIN TUBE
5.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4054	0019	RAISE LIFT
5.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4055	0019	WEIGH TRAY
6.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4060	0019	STEP INITIALIZE
6.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4061	001A	LOWER LIFT
6.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :4062	0016	EXTEND PUNCH
6.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4063	001A	RETRACT PUNCH
6.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4064	0019	RAISE LIFT
7.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4070	0019	STEP INTIALIZE
7.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4071	1019	ADVANCE TO 1ST PUNCH POSITION
7.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4072	0019	STOP BDS CONVEYOR
8.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4080	0019	STEP INTIALIZE
8.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4081	001A	LOWER LIFT
8.2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :4082	0016	EXTEND PUNCH
8.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4083	001A	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 11 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station INPUT COMPARISON File = B15 : 4000 B1:710 - Display Location</b>																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
	WORD ADDRESS																		
8.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4084	0019	RAISE LIFT
9.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4090	0019	STEP INITIALIZE
9.1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4091	1019	ADVANCE TO 2ND PUNCH POSITION
9.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4092	0019	STOP BDS CONVEYOR
9.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4093	001A	LOWER LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4100	001A	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	B15 :4101	0016	EXTEND PUNCH
10.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4102	001A	RETRACT PUNCH
10.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4103	0019	RAISE LIFT
10.4	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4104	1019	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4105	0019	STOP BDS CONVEYOR
10.6	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4106	0019	WEIGH TRAY
10.7	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4107	001A	LOWER LIFT
10.8	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4108	008A	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4110	008A	STEP INITIALIZE - PUMP ON
11.1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	B15 :4111	018A	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	B15 :4112	008A	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	B15 :4113	008A	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	B15 :4114	028A	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	B15 :4120	028A	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4121	004A	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	B15 :4122	004A	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	B15 :4123	001A	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4124	0019	RAISE LIFT
12.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4125	0019	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4130	0019	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4131	0019	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	B15 :4132	0019	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 11 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																			
Bulk Drain Station INPUT COMPARISON File = B15 : 4200 B1:710 - Display Location																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41		STEP DESCRIPTION
																	WORD ADDR	HEX VALUE	
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4200	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4201	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4210	0000	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4211	4000	BULK CONV FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4212	4200	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4213	0200	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4220	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4221	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4222	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4223	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4224	0200	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4230	0000	STEP INITIALIZE
3.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4231	0400	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :4232	0C00	WEIGH CONTAINER
3.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4233	0400	LOWER LIFT
3.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4234	0400	EXTEND DRAIN TUBE
4.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4240	0400	STEP INTIALIZE - PUMP ON
4.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4241	0400	CHECK VERIFY SYSTEM FOR AGENT
4.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4242	8400	OPEN BLOCK VALVE, START TIMER
4.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :4243	0480	CLOSE BLOCK VALVE, OPEN PURGE
4.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4244	0400	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4250	0400	STEP INTIALIZE - STOP PUMP
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4251	0400	RETRACT DRAIN TUBE TO 2ND POS.
5.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :4252	0480	STOP AND PURGE DRAIN TUBE
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4253	0400	RETRACT DRAIN TUBE
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4254	0400	RAISE LIFT
5.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :4255	1C00	WEIGH TRAY
6.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4260	0400	STEP INITIALIZE
6.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4261	0400	LOWER LIFT
6.2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4262	0400	EXTEND PUNCH
6.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4263	0400	RETRACT PUNCH
6.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4264	0400	RAISE LIFT
7.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4270	0400	STEP INTIALIZE
7.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4271	0200	ADVANCE TO 1ST PUNCH POSITION
7.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4272	0200	STOP BDS CONVEYOR
8.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4280	0200	STEP INTIALIZE
8.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4281	0200	LOWER LIFT
8.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4282	0200	EXTEND PUNCH
8.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4283	0200	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 11 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station INPUT COMPARISON</b> File = B15 : 4200 B1:710 - Display Location																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	HEX VALUE	STEP DESCRIPTION
																	WORD ADDR		
8.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4284	0200	RAISE LIFT
9.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4290	0200	STEP INITIALIZE
9.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4291	0200	ADVANCE TO 2ND PUNCH POSITION
9.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4292	0200	STOP BDS CONVEYOR
9.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4293	0200	LOWER LIFT
10.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4300	0200	STEP INITIALIZE
10.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4301	0200	EXTEND PUNCH
10.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4302	0200	RETRACT PUNCH
10.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4303	0200	RAISE LIFT
10.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4304	0400	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4305	0400	STOP BDS CONVEYOR
10.6	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :4306	0C00	WEIGH TRAY
10.7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4307	0400	LOWER LIFT
10.8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4308	0400	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4310	0400	STEP INITIALIZE - PUMP ON
11.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4311	0400	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4312	8400	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	B15 :4313	0480	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4314	0400	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4320	0400	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4321	0400	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	B15 :4322	0480	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4323	0400	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4324	0400	RAISE LIFT
12.5	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	B15 :4325	1D00	WEIGH TRAY
13.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4330	0400	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :4331	0100	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	B15 :4332	0140	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 12 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> <b>NORMAL MASK</b> File = B15 : 4400      B1:710 - Display Location																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
	WORD ADDR																		
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4400	0000	BDS PARK
0.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4401	10FF	BDS GOTO PARK
1.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4410	10FF	BDS INITIALIZE
1.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4411	10FF	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4412	10FF	BULK CONV SLOW SPEED
1.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4413	10FF	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4420	10FF	STEP INITIALIZE
2.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4421	10FF	LOWER LIFT
2.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4422	10FF	EXTEND PUNCH
2.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4423	10FF	RETRACT PUNCH
2.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4424	10FF	RAISE LIFT
3.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4430	10FF	STEP INITIALIZE
3.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4431	10FF	ADVANCE TO DRAIN POSITION
3.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4432	10FF	WEIGH CONTAINER
3.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4433	10FF	LOWER LIFT
3.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4434	10FF	EXTEND DRAIN TUBE
4.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4440	10FF	STEP INTIALIZE - PUMP ON
4.1	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :4441	11FF	CHECK VERIFY SYSTEM FOR AGENT
4.2	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :4442	11FF	OPEN BLOCK VALVE, START TIMER
4.3	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :4443	11FF	CLOSE BLOCK VALVE, OPEN PURGE
4.4	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	B15 :4444	13FF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	B15 :4450	13FF	STEP INTIALIZE - STOP PUMP
5.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4451	10FF	RETRACT DRAIN TUBE TO 2ND POS.
5.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4452	10FF	STOP AND PURGE DRAIN TUBE
5.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4453	10FF	RETRACT DRAIN TUBE
5.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4454	10FF	RAISE LIFT
5.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4455	10FF	WEIGH TRAY
6.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4460	10FF	STEP INITIALIZE
6.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4461	10FF	LOWER LIFT
6.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4462	10FF	EXTEND PUNCH
6.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4463	10FF	RETRACT PUNCH
6.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4464	10FF	RAISE LIFT
7.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4470	10FF	STEP INTIALIZE
7.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4471	10FF	ADVANCE TO 1ST PUNCH POSITION
7.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4472	10FF	STOP BDS CONVEYOR
8.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4480	10FF	STEP INTIALIZE
8.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4481	10FF	LOWER LIFT
8.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4482	10FF	EXTEND PUNCH
8.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4483	10FF	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 12 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> NORMAL MASK File = B15 : 4400 B1:710 - Display Location																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
	WORD ADDR																		
8.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4484	10FF	RAISE LIFT
9.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4490	10FF	STEP INITIALIZE
9.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4491	10FF	ADVANCE TO 2ND PUNCH POSITION
9.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4492	10FF	STOP BDS CONVEYOR
9.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4493	10FF	LOWER LIFT
10.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4500	10FF	STEP INITIALIZE
10.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4501	10FF	EXTEND PUNCH
10.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4502	10FF	RETRACT PUNCH
10.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4503	10FF	RAISE LIFT
10.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4504	10FF	ADVANCE TO DRAIN POSITION
10.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4505	10FF	STOP BDS CONVEYOR
10.6	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4506	10FF	WEIGH TRAY
10.7	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4507	10FF	LOWER LIFT
10.8	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4508	10FF	EXTEND DRAIN TUBE
11.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4510	10FF	STEP INITIALIZE - PUMP ON
11.1	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :4511	11FF	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :4512	11FF	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	B15 :4513	11FF	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	B15 :4514	13FF	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	B15 :4520	13FF	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4521	10FF	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4522	10FF	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4523	10FF	RETRACT DRAIN TUBE
12.4	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4524	10FF	RAISE LIFT
12.5	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4525	10FF	WEIGH TRAY
13.0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4530	10FF	STEP INITIALIZE
13.1	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4531	10FF	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	B15 :4532	10FF	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 12 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> NORMAL MASK File = B15 : 4600 B1:710 - Display Location																			
17- DRAIN TUBE POSITION TIME COMPLETE																			
16- TRAY AT SLOW SPEED POSITION																			
15- TRAY AT 2ND PUNCH POSITION																			
14- CONTAINER DRAINED O.K.																			
13- WEIGH TIME COMPLETE																			
12- TRAY AT DRAIN POSITION																			
11- TRAY AT 1ST PUNCH POSITION																			
10- TRAY AT DISCHARGE POSITION																			
07- DRAIN TUBE PURGE COMPLETE																			
06- CONTINUE WITH NEXT TRAY																			
05- SPARE																			
04- SPARE																			
03- SPARE																			
02- SPARE																			
01- SPARE																			
00- MPB FEED GATE CLOSED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41 WORD ADDR	HEX VALUE	STEP DESCRIPTION
	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4600	0000
0.1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :4601	6600	BDS GOTO PARK
1.0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	B15 :4610	6600	BDS INITIALIZE
1.1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4611	4000	BULK CONV FWD & REQUEST TRAY
1.2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4612	4200	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4613	0200	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4620	0200	STEP INITIALIZE
2.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4621	0200	LOWER LIFT
2.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4622	0200	EXTEND PUNCH
2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4623	0200	RETRACT PUNCH
2.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4624	0200	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4630	0000	STEP INITIALIZE
3.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4631	0400	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :4632	0C00	WEIGH CONTAINER
3.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4633	0400	LOWER LIFT
3.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4634	0400	EXTEND DRAIN TUBE
4.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4640	0400	STEP INTIALIZE - PUMP ON
4.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4641	0400	CHECK VERIFY SYSTEM FOR AGENT
4.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4642	8400	OPEN BLOCK VALVE, START TIMER
4.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :4643	0480	CLOSE BLOCK VALVE, OPEN PURGE
4.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4644	0400	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4650	0400	STEP INTIALIZE - STOP PUMP
5.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4651	0400	RETRACT DRAIN TUBE TO 2ND POS.
5.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :4652	0480	STOP AND PURGE DRAIN TUBE
5.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4653	0400	RETRACT DRAIN TUBE
5.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4654	0400	RAISE LIFT
5.5	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	B15 :4655	1C00	WEIGH TRAY
6.0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4660	2400	STEP INITIALIZE
6.1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4661	2400	LOWER LIFT
6.2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4662	2400	EXTEND PUNCH
6.3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4663	2400	RETRACT PUNCH
6.4	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4664	2400	RAISE LIFT
7.0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4670	2400	STEP INTIALIZE
7.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4671	0200	ADVANCE TO 1ST PUNCH POSITION
7.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4672	0200	STOP BDS CONVEYOR
8.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4680	0200	STEP INTIALIZE
8.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4681	0200	LOWER LIFT
8.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4682	0200	EXTEND PUNCH
8.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4683	0200	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																				
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																				
Pointer Number: 12 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																				
Bulk Drain Station NORMAL MASK File = B15 : 4600 B1:710 - Display Location																				
17- DRAIN TUBE POSITION TIME COMPLETE																				
16- TRAY AT SLOW SPEED POSITION																				
15- TRAY AT 2ND PUNCH POSITION																				
14- CONTAINER DRAINED O.K.																				
13- WEIGH TIME COMPLETE																				
12- TRAY AT DRAIN POSITION																				
11- TRAY AT 1ST PUNCH POSITION																				
10- TRAY AT DISCHARGE POSITION																				
07- DRAIN TUBE PURGE COMPLETE																				
06- CONTINUE WITH NEXT TRAY																				
05- SPARE																				
04- SPARE																				
03- SPARE																				
02- SPARE																				
01- SPARE																				
00- MPB FEED GATE CLOSED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	WORD ADDR	HEX VALUE	STEP DESCRIPTION
8.4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4684		0200	RAISE LIFT
9.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4690		0200	STEP INITIALIZE
9.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4691		0200	ADVANCE TO 2ND PUNCH POSITION
9.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4692		0200	STOP BDS CONVEYOR
9.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4693		0200	LOWER LIFT
10.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4700		0200	STEP INITIALIZE
10.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4701		0200	EXTEND PUNCH
10.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4702		0200	RETRACT PUNCH
10.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :4703		0200	RAISE LIFT
10.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4704		0400	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4705		0400	STOP BDS CONVEYOR
10.6	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	B15 :4706		0C00	WEIGH TRAY
10.7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4707		0400	LOWER LIFT
10.8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4708		0400	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4710		0400	STEP INITIALIZE - PUMP ON
11.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4711		0400	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4712		8400	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :4713		0480	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4714		0400	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4720		0400	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4721		0400	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :4722		0480	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	B15 :4723		0419	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4724		0400	RAISE LIFT
12.5	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	B15 :4725		1D00	WEIGH TRAY
13.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	B15 :4730		0400	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	B15 :4731		0100	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	B15 :4732		0140	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 13 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> BYPASS MASK File = B15 : 4800 B1:710 - Display Location																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40		STEP DESCRIPTION
																	WORD ADDR	HEX VALUE	
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4800	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4801	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4810	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4811	FFFF	BULK CONV FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4812	FFFF	BULK CONV SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4813	FFFF	STOP BULK DRAIN CONVEYOR
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4820	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4821	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4822	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4823	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4824	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4830	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4831	FFFF	ADVANCE TO DRAIN POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4832	FFFF	WEIGH CONTAINER
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4833	FFFF	LOWER LIFT
3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4834	0000	EXTEND DRAIN TUBE
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4840	FFFF	STEP INTIALIZE - PUMP ON
4.1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	B15 :4841	FCFF	CHECK VERIFY SYSTEM FOR AGENT
4.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4842	FFFF	OPEN BLOCK VALVE, START TIMER
4.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4843	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
4.4	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	B15 :4844	FCFF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4850	FFFF	STEP INTIALIZE - STOP PUMP
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4851	FFFF	RETRACT DRAIN TUBE TO 2ND POS.
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4852	FFFF	STOP AND PURGE DRAIN TUBE
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4853	FFFF	RETRACT DRAIN TUBE
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4854	FFFF	RAISE LIFT
5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4855	0000	WEIGH TRAY
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4860	FFFF	STEP INITIALIZE
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4861	FFFF	LOWER LIFT
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4862	FFFF	EXTEND PUNCH
6.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4863	0000	RETRACT PUNCH
6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4864	0000	RAISE LIFT
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4870	FFFF	STEP INTIALIZE
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4871	FFFF	ADVANCE TO 1ST PUNCH POSITION
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4872	FFFF	STOP BDS CONVEYOR
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4880	FFFF	STEP INTIALIZE
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4881	FFFF	LOWER LIFT
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4882	FFFF	EXTEND PUNCH
8.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4883	FFFF	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 13 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> BYPASS MASK File = B15 : 4800 B1:710 - Display Location																			
17- SPARE																			
16- LIFT RETRACTED DWELL TIMER																			
15- DRILLING COMPLETE																			
14- MMS-BDS-101 BDS CONV 1=FWD																			
13- SPARE																			
12- TIME DELAY FOR AGENT LEVEL < 1.5"																			
11- TIME DELAY FOR VERIFY LEVEL DRAINED																			
10- AGENT PRESENT IN BULK ITEM																			
07- DRAIN TUBE AT POS #3 (EXTENDED)																			
06- DRAIN TUBE AT POS #2																			
05- DRAIN TUBE AT POS #1																			
04- DRAIN TUBE RETRACTED																			
03- PUNCH ARM RETRACTED																			
02- PUNCH ARM EXTENDED																			
01- LIFT CYLINDERS RETRACTED																			
00- LIFT CYLINDERS EXTENDED																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:40	HEX VALUE	STEP DESCRIPTION
	WORD ADDR																		
8.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4884	0000	RAISE LIFT
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4890	FFFF	STEP INITIALIZE
9.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4891	FFFF	ADVANCE TO 2ND PUNCH POSITION
9.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4892	FFFF	STOP BDS CONVEYOR
9.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4893	FFFF	LOWER LIFT
10.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4900	FFFF	STEP INITIALIZE
10.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4901	FFFF	EXTEND PUNCH
10.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4902	FFFF	RETRACT PUNCH
10.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4903	FFFF	RAISE LIFT
10.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4904	FFFF	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4905	0000	STOP BDS CONVEYOR
10.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4906	0000	WEIGH TRAY
10.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4907	0000	LOWER LIFT
10.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4908	0000	EXTEND DRAIN TUBE
11.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4910	FFFF	STEP INITIALIZE - PUMP ON
11.1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	B15 :4911	FCFF	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4912	FFFF	OPEN BLOCK VALVE, START TIMER
11.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :4913	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
11.4	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	B15 :4914	FCFF	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4920	0000	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4921	0000	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4922	0000	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4923	0000	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4924	0000	RAISE LIFT
12.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4925	0000	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4930	0000	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4931	0000	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :4932	0000	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																				
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																				
Pointer Number: 13 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																				
Bulk Drain Station BYPASS MASK File = B15 : 5000 B1:710 - Display Location																				
17- DRAIN TUBE POSITION TIME COMPLETE																				
16- TRAY AT SLOW SPEED POSITION																				
15- TRAY AT 2ND PUNCH POSITION																				
14- CONTAINER DRAINED O.K.																				
13- WEIGH TIME COMPLETE																				
12- TRAY AT DRAIN POSITION																				
11- TRAY AT 1ST PUNCH POSITION																				
10- TRAY AT DISCHARGE POSITION																				
07- DRAIN TUBE PURGE COMPLETE																				
06- CONTINUE WITH NEXT TRAY																				
05- SPARE																				
04- SPARE																				
03- SPARE																				
02- SPARE																				
01- SPARE																				
00- MPB FEED GATE CLOSED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	WORD ADDR	HEX VALUE	STEP DESCRIPTION
STEP																				
0.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5000	FFFF	FFFF	BDS PARK
0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5001	FFFF	FFFF	BDS GOTO PARK
1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5010	FFFF	FFFF	BDS INITIALIZE
1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5011	FFFF	FFFF	BULK CONV FWD & REQUEST TRAY
1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5012	FFFF	FFFF	BULK CONV SLOW SPEED
1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5013	FFFF	FFFF	STOP BULK DRAIN CONVEYOR
2.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5020	FFFF	FFFF	STEP INITIALIZE
2.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5021	FFFF	FFFF	LOWER LIFT
2.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5022	FFFF	FFFF	EXTEND PUNCH
2.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5023	FFFF	FFFF	RETRACT PUNCH
2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5024	FFFF	FFFF	RAISE LIFT
3.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5030	FFFF	FFFF	STEP INITIALIZE
3.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5031	FFFF	FFFF	ADVANCE TO DRAIN POSITION
3.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5032	FFFF	FFFF	WEIGH CONTAINER
3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5033	FFFF	FFFF	LOWER LIFT
3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5034	0000	0000	EXTEND DRAIN TUBE
4.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5040	FFFF	FFFF	STEP INTIALIZE - PUMP ON
4.1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5041	BFFF	BFFF	CHECK VERIFY SYSTEM FOR AGENT
4.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5042	FFFF	FFFF	OPEN BLOCK VALVE, START TIMER
4.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5043	FFFF	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
4.4	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5044	BFFF	BFFF	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5050	FFFF	FFFF	STEP INTIALIZE - STOP PUMP
5.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5051	FFFF	FFFF	RETRACT DRAIN TUBE TO 2ND POS.
5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5052	FFFF	FFFF	STOP AND PURGE DRAIN TUBE
5.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5053	FFFF	FFFF	RETRACT DRAIN TUBE
5.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5054	FFFF	FFFF	RAISE LIFT
5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5055	0000	0000	WEIGH TRAY
6.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5060	FFFF	FFFF	STEP INITIALIZE
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5061	FFFF	FFFF	LOWER LIFT
6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5062	FFFF	FFFF	EXTEND PUNCH
6.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5063	0000	0000	RETRACT PUNCH
6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5064	0000	0000	RAISE LIFT
7.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5070	FFFF	FFFF	STEP INTIALIZE
7.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5071	FFFF	FFFF	ADVANCE TO 1ST PUNCH POSITION
7.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5072	FFFF	FFFF	STOP BDS CONVEYOR
8.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5080	FFFF	FFFF	STEP INTIALIZE
8.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5081	FFFF	FFFF	LOWER LIFT
8.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5082	FFFF	FFFF	EXTEND PUNCH
8.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B15 :5083	FFFF	FFFF	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																				
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																				
Pointer Number: 13 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																				
Bulk Drain Station BYPASS MASK File = B15 : 5000 B1:710 - Display Location																				
17- DRAIN TUBE POSITION TIME COMPLETE																				
16- TRAY AT SLOW SPEED POSITION																				
15- TRAY AT 2ND PUNCH POSITION																				
14- CONTAINER DRAINED O.K.																				
13- WEIGH TIME COMPLETE																				
12- TRAY AT DRAIN POSITION																				
11- TRAY AT 1ST PUNCH POSITION																				
10- TRAY AT DISCHARGE POSITION																				
07- DRAIN TUBE PURGE COMPLETE																				
06- CONTINUE WITH NEXT TRAY																				
05- SPARE																				
04- SPARE																				
03- SPARE																				
02- SPARE																				
01- SPARE																				
00- MPB FEED GATE CLOSED																				
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:41	WORD ADDR	HEX VALUE	STEP DESCRIPTION
STEP																				
8.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5084	0000	RAISE LIFT
9.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5090	FFFF	STEP INITIALIZE
9.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5091	FFFF	ADVANCE TO 2ND PUNCH POSITION
9.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5092	FFFF	STOP BDS CONVEYOR
9.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5093	FFFF	LOWER LIFT
10.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5100	FFFF	STEP INITIALIZE
10.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5101	FFFF	EXTEND PUNCH
10.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5102	FFFF	RETRACT PUNCH
10.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5103	FFFF	RAISE LIFT
10.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5104	FFFF	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5105	0000	STOP BDS CONVEYOR
10.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5106	0000	WEIGH TRAY
10.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5107	0000	LOWER LIFT
10.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5108	0000	EXTEND DRAIN TUBE
11.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5110	FFFF	STEP INITIALIZE - PUMP ON
11.1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1		B15 :5111	BEFF	CHECK VERIFY SYSTEM FOR AGENT
11.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5112	FFFF	OPEN BLOCK VALVE, START TIMER
11.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		B15 :5113	FFFF	CLOSE BLOCK VALVE, OPEN PURGE
11.4	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1		B15 :5114	BEFF	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5120	0000	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5121	0000	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5122	0000	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5123	0000	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5124	0000	RAISE LIFT
12.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5125	0000	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5130	0000	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5131	0000	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		B15 :5132	0000	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 15 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> OUTPUT File = B15 : 5600 B1:710 - Display Location																			
17- MMS-CNVP-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- CHECK FOR NOT AGENT PRESENT																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:48		STEP DESCRIPTION
																	WORD ADDR	HEX VALUE	
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5600	0000	BDS PARK
0.1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	B15 :5601	0098	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	B15 :5610	00A4	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	B15 :5611	0025	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :5612	0125	BULK CONV SLOW SPEED
1.3	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5613	0124	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5620	0124	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5621	0128	LOWER LIFT
2.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :5622	0118	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5623	0128	RETRACT PUNCH
2.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5624	0124	RAISE LIFT
3.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5630	0124	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :5631	0125	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5632	0124	WEIGH CONTAINER
3.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5633	0128	LOWER LIFT
3.4	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5634	0168	EXTEND DRAIN TUBE
4.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5640	0168	STEP INTIALIZE - PUMP ON
4.1	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	B15 :5641	0968	CHECK VERIFY SYSTEM FOR AGENT
4.2	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5642	0168	OPEN BLOCK VALVE, START TIMER
4.3	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5643	0168	CLOSE BLOCK VALVE, OPEN PURGE
4.4	0	0	0	0	0	1	0	1	0	1	1	0	1	0	0	0	B15 :5644	0568	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5650	0168	STEP INTIALIZE - STOP PUMP
5.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :5651	01A8	RETRACT DRAIN TUBE TO 2ND POS.
5.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5652	0128	STOP AND PURGE DRAIN TUBE
5.3	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :5653	01A8	RETRACT DRAIN TUBE
5.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5654	0124	RAISE LIFT
5.5	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	B15 :5655	1124	WEIGH TRAY
6.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5660	0124	STEP INITIALIZE
6.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5661	0128	LOWER LIFT
6.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :5662	0118	EXTEND PUNCH
6.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5663	0128	RETRACT PUNCH
6.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5664	0124	RAISE LIFT
7.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5670	0124	STEP INTIALIZE
7.1	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	1	B15 :5671	0325	ADVANCE TO 1ST PUNCH POSITION
7.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5672	0124	STOP BDS CONVEYOR
8.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5680	0124	STEP INTIALIZE
8.1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5681	0128	LOWER LIFT
8.2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :5682	0118	EXTEND PUNCH
8.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5683	0128	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 15 Datatable Word (1 or 2) = 1 REV - 0 C169 - Minor Step Location																			
Bulk Drain Station OUTPUT File = B15 : 5600 B1:710 - Display Location																			
17- MMS-CNPV-125 NEEDS TO RUN																			
16- BDA DRILL MUNITION																			
15- 2ND BOMB 2ND WEIGHT																			
14- 1ST BOMB 2ND WEIGHT																			
13- CHECK FOR NOT AGENT PRESENT																			
12- CHECK FOR AGENT DRAINED																			
11- MUNITION COUNT																			
10- BDS CONVEYOR SLOW SPEED																			
07- DRAIN TUBE RETRACT																			
06- DRAIN TUBE EXTEND																			
05- PUNCH ARM RETRACT																			
04- PUNCH ARM EXTEND																			
03- LIFT CYLINDERS RETRACT																			
02- LIFT CYLINDERS EXTEND																			
01- BDS CONV REV (NOT USED)																			
00- BULK DRAIN CONVEYOR FORWARD																			
BITS	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:48		
8.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5684	0124	RAISE LIFT
9.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5690	0124	STEP INITIALIZE
9.1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :5691	0125	ADVANCE TO 2ND PUNCH POSITION
9.2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5692	0124	STOP BDS CONVEYOR
9.3	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5693	0128	LOWER LIFT
10.0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5700	0128	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	B15 :5701	0118	EXTEND PUNCH
10.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5702	0128	RETRACT PUNCH
10.3	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5703	0124	RAISE LIFT
10.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	B15 :5704	0125	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5705	0124	STOP BDS CONVEYOR
10.6	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5706	1124	WEIGH TRAY
10.7	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5707	0128	LOWER LIFT
10.8	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5708	0168	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5710	0168	STEP INITIALIZE - PUMP ON
11.1	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	B15 :5711	0968	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5712	0168	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5713	0168	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	0	0	0	0	1	0	1	0	1	1	0	1	0	0	0	B15 :5714	0568	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	B15 :5720	0168	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	B15 :5721	01A8	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	B15 :5722	0128	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	B15 :5723	01A0	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5724	0124	RAISE LIFT
12.5	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5725	2124	WEIGH TRAY
13.0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	B15 :5730	0124	STEP INITIALIZE
13.1	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	1	B15 :5731	0325	ADVANCE TO END OF BULK CONVEYOR
13.2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	B15 :5732	0024	TRAY AT END, STOP CONVEYOR

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 15 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> OUTPUT File = B15 : 5800 B1:710 - Display Location																			
17- LAST STEP																			
16- LAST SUB STEP																			
15- REPEAT PERMISSION																			
14- BYPASS PERMISSION																			
13- DRAIN TUBE PURGE VALVE OPEN																			
12- START DRAIN TUBE POSITION TIMER																			
11- BDS INITIAL WEIGHT REQUEST																			
10- VERIFY DRAIN COMPLETE																			
07- RUN AGENT DRAIN PUMP																			
06- REQUEST NEXT TRAY TO PROCESS																			
05- PROCESS NEXT TRAY ??? TO ADVSIOR																			
04- CHECK AGENT LEVEL 1=VERIFY																			
03- SEQ DELAY TIMER 3RD PRESET																			
02- SEQ DELAY TIMER 2ND PRESET																			
01- SEQ DELAY TIMER 1ST PRESET																			
00- AGENT LINE BLOCK VALVE OPEN																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:49 WORD ADDR	HEX VALUE	STEP DESCRIPTION
	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5800	0000
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5801	0000	BDS GOTO PARK
1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5810	0000	BDS INITIALIZE
1.1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	B15 :5811	0040	BULK CONV FWD & REQUEST TRAY
1.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	B15 :5812	0040	BULK CONV SLOW SPEED
1.3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5813	4000	STOP BULK DRAIN CONVEYOR
2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5820	0000	STEP INITIALIZE
2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5821	0000	LOWER LIFT
2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5822	0000	EXTEND PUNCH
2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5823	0000	RETRACT PUNCH
2.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5824	4000	RAISE LIFT
3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5830	0000	STEP INITIALIZE
3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5831	0000	ADVANCE TO DRAIN POSITION
3.2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	B15 :5832	0200	WEIGH CONTAINER
3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5833	0000	LOWER LIFT
3.4	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :5834	4080	EXTEND DRAIN TUBE
4.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :5840	0080	STEP INTIALIZE - PUMP ON
4.1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	B15 :5841	1090	CHECK VERIFY SYSTEM FOR AGENT
4.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	B15 :5842	0481	OPEN BLOCK VALVE, START TIMER
4.3	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	B15 :5843	0880	CLOSE BLOCK VALVE, OPEN PURGE
4.4	0	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0	B15 :5844	7090	CHECK VERIFY SYSTEM FOR GOOD DRAIN
5.0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :5850	0090	STEP INTIALIZE - STOP PUMP
5.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :5851	0080	RETRACT DRAIN TUBE TO 2ND POS.
5.2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	B15 :5852	0800	STOP AND PURGE DRAIN TUBE
5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5853	0000	RETRACT DRAIN TUBE
5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5854	0000	RAISE LIFT
5.5	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	B15 :5855	7100	WEIGH TRAY
6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5860	0000	STEP INITIALIZE
6.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5861	0000	LOWER LIFT
6.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5862	0000	EXTEND PUNCH
6.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5863	0000	RETRACT PUNCH
6.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5864	4000	RAISE LIFT
7.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5870	0000	STEP INTIALIZE
7.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5871	0000	ADVANCE TO 1ST PUNCH POSITION
7.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5872	4000	STOP BDS CONVEYOR
8.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5880	0000	STEP INTIALIZE
8.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5881	0000	LOWER LIFT
8.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5882	0000	EXTEND PUNCH
8.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5883	0000	RETRACT PUNCH

Programmatic Process FAWB - BASE LINE COPY																			
MK-94 500 lb. Bomb (UM Only) File Name: BDS - MK-94.XLS Cntl - CONR-103A, B C168 - Major Step Counter																			
Pointer Number: 15 Datatable Word (1 or 2) = 2 REV - 0 C169 - Minor Step Location																			
<b>Bulk Drain Station</b> OUTPUT File = B15 : 5800 B1:710 - Display Location																			
17- LAST STEP																			
16- LAST SUB STEP																			
15- REPEAT PERMISSION																			
14- BYPASS PERMISSION																			
13- DRAIN TUBE PURGE VALVE OPEN																			
12- START DRAIN TUBE POSITION TIMER																			
11- BDS INITIAL WEIGHT REQUEST																			
10- VERIFY DRAIN COMPLETE																			
07- RUN AGENT DRAIN PUMP																			
06- REQUEST NEXT TRAY TO PROCESS																			
05- PROCESS NEXT TRAY ??? TO ADVSIOR																			
04- CHECK AGENT LEVEL 1=VERIFY																			
03- SEQ DELAY TIMER 3RD PRESET																			
02- SEQ DELAY TIMER 2ND PRESET																			
01- SEQ DELAY TIMER 1ST PRESET																			
00- AGENT LINE BLOCK VALVE OPEN																			
BITS STEP	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	B10:49	HEX VALUE	STEP DESCRIPTION
	WORD ADDR																		
8.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5884	4000	RAISE LIFT
9.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5890	0000	STEP INITIALIZE
9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5891	0000	ADVANCE TO 2ND PUNCH POSITION
9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5892	0000	STOP BDS CONVEYOR
9.3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5893	4000	LOWER LIFT
10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5900	0000	STEP INITIALIZE
10.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5901	0000	EXTEND PUNCH
10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5902	0000	RETRACT PUNCH
10.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5903	0000	RAISE LIFT
10.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5904	0000	ADVANCE TO DRAIN POSITION
10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5905	0000	STOP BDS CONVEYOR
10.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5906	0000	WEIGH TRAY
10.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5907	0000	LOWER LIFT
10.8	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :5908	4080	EXTEND DRAIN TUBE
11.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :5910	0080	STEP INITIALIZE - PUMP ON
11.1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	B15 :5911	1090	CHECK VERIFY SYSTEM FOR AGENT
11.2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	B15 :5912	0481	OPEN BLOCK VALVE, START TIMER
11.3	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	B15 :5913	0880	CLOSE BLOCK VALVE, OPEN PURGE
11.4	0	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0	B15 :5914	7090	CHECK VERIFY SYS FOR GOOD DRAIN
12.0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	B15 :5920	0090	STEP INITIALIZE - STOP PUMP
12.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B15 :5921	0080	RETRACT DRAIN TO 2ND POS.
12.2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	B15 :5922	0800	STOP AND PURGE DRAIN TUBE
12.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5923	0000	RETRACT DRAIN TUBE
12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5924	0000	RAISE LIFT
12.5	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	B15 :5925	7100	WEIGH TRAY
13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5930	0000	STEP INITIALIZE
13.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B15 :5931	0000	ADVANCE TO END OF BULK CONVEYOR
13.2	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	B15 :5932	8060	TRAY AT END, STOP CONVEYOR

## APPENDIX E

### Operator Screens

Appendix E contains the Advisor PC screens associated with operation and control of the BCHS based *ANCDF control code from December 2003, PBCDF control code from February 2004, TOCDF control code from January 2004, and UMCDF control code from November 2003*. Table E.1 provides an index to the screens.

Table E.1 BCHS Advisor PC Screens

Figure #	Advisor PC Screen Name	Process Screen
<i>E-1</i>	<i>ANCDF Bypass Line A</i>	<i>BLA</i>
<i>E-2</i>	<i>TOCDF Bypass Line A</i>	<i>BLA</i>
<i>E-3</i>	<i>UMCDF Bypass Line A</i>	<i>BLA</i>
<i>E-4</i>	<i>ANCDF Bypass Line B</i>	<i>BLB</i>
<i>E-5</i>	<i>TOCDF Bypass Line B</i>	<i>BLB</i>
<i>E-6</i>	<i>UMCDF Bypass Line B</i>	<i>BLB</i>
<i>E-7</i>	<i>ANCDF Buffer Storage Area</i>	<i>BSA</i>
<i>E-8</i>	<i>TOCDF Buffer Storage Area</i>	<i>BSA</i>
<i>E-9</i>	<i>UMCDF Buffer Storage Area</i>	<i>BSA</i>
<i>E-10</i>	<i>ANCDF Bulk Drain System Initialize</i>	<i>BDI</i>
<i>E-11</i>	<i>PBCDF Bulk Drain System Initialize</i>	<i>BDI</i>
<i>E-12</i>	<i>TOCDF Bulk Drain System Initialize</i>	<i>BDI</i>
<i>E-13</i>	<i>UMCDF Bulk Drain System Initialize</i>	<i>BDI</i>
<i>E-14</i>	<i>ANCDF Bulk Drain Station A</i>	<i>BDA</i>
<i>E-15</i>	<i>PBCDF Bulk Drain Station</i>	<i>BDS</i>
<i>E-16</i>	<i>TOCDF Bulk Drain Station A</i>	<i>BDA</i>
<i>E-17</i>	<i>UMCDF Bulk Drain Station A</i>	<i>BDA</i>
<i>E-18</i>	<i>ANCDF Bulk Drain Station B</i>	<i>BDB</i>
<i>E-19</i>	<i>TOCDF Bulk Drain Station B</i>	<i>BDB</i>
<i>E-20</i>	<i>UMCDF Bulk Drain Station B</i>	<i>BDB</i>
<i>E-21</i>	<i>ANCDF Munitions Processing Bay</i>	<i>MPB</i>
<i>E-22</i>	<i>PBCDF Bulk Drain Room</i>	<i>BDR</i>
<i>E-23</i>	<i>TOCDF Munitions Processing Bay</i>	<i>MPB</i>
<i>E-24</i>	<i>UMCDF Munitions Processing Bay</i>	<i>MPB</i>
<i>E-25</i>	<i>ANCDF Buffer Conveyor Area</i>	<i>BC1</i>
<i>E-26</i>	<i>TOCDF Buffer Conveyor Area</i>	<i>BC1</i>
<i>E-27</i>	<i>UMCDF Buffer Conveyor Area</i>	<i>BC1</i>
<i>E-28</i>	<i>ANCDF Buffer Conveyor Area</i>	<i>BC2</i>
<i>E-29</i>	<i>TOCDF Buffer Conveyor Area</i>	<i>BC2</i>
<i>E-30</i>	<i>UMCDF Buffer Conveyor Area</i>	<i>BC2</i>

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### Advisor PC Screen Bypass Line A – BLA

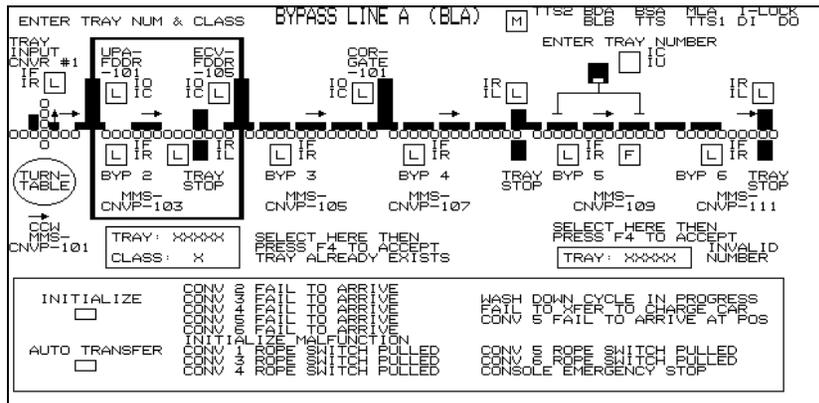


Figure E-1 ANCDF Advisor PC Screen BLA

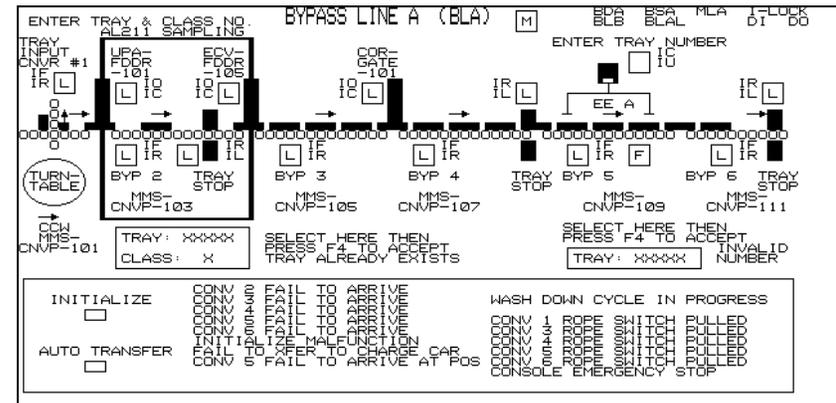


Figure E-2 TOCDF Advisor PC Screen BLA

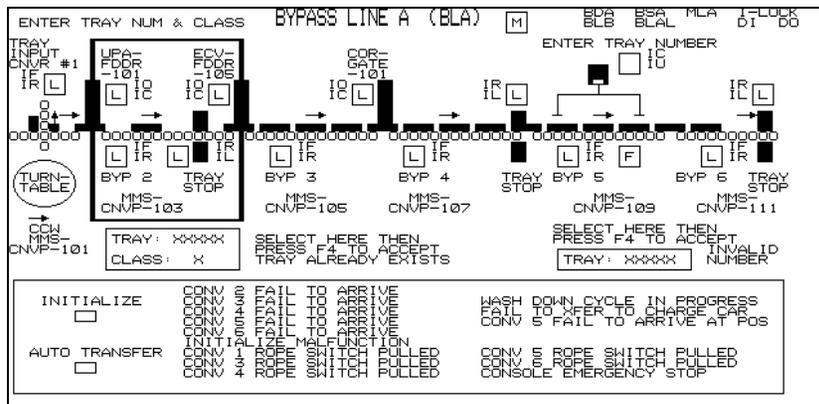


Figure E-3 UMCDF Advisor PC Screen BLA

### Advisor PC Screen Bypass Line B – BLB

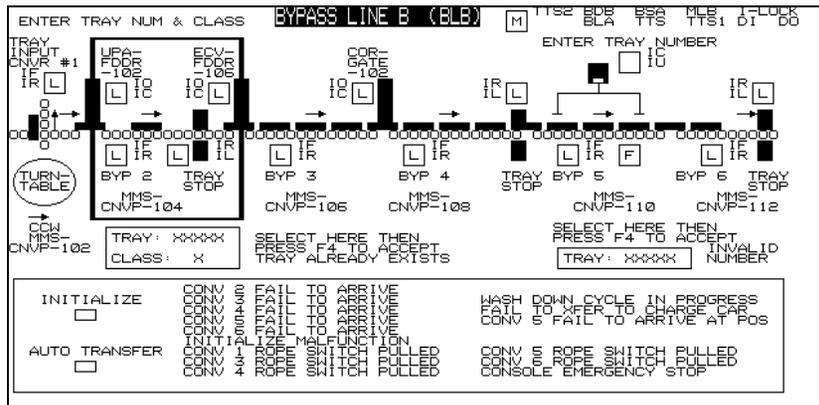


Figure E-4 ANCDF Advisor PC Screen BLB

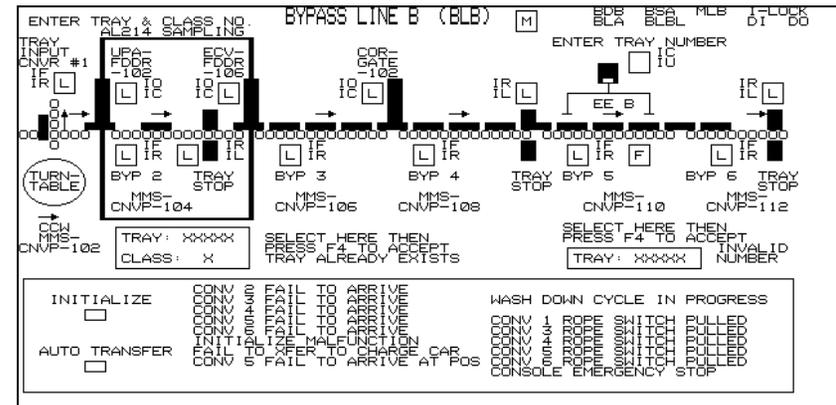


Figure E-5 TOCDF Advisor PC Screen BLB

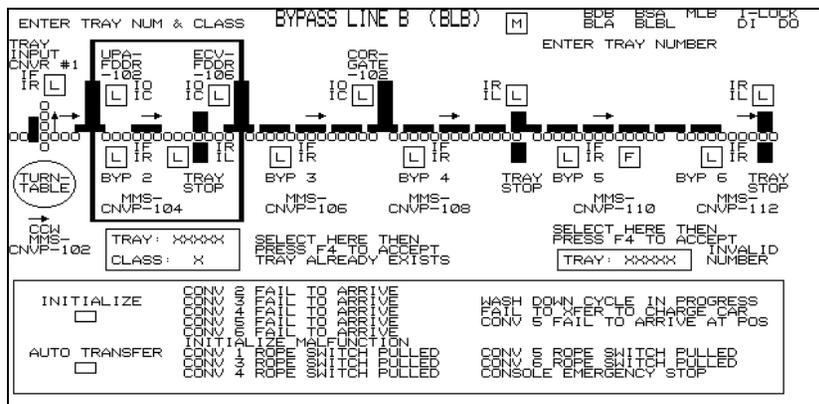


Figure E-6 UMCDF Advisor PC Screen BLB

### Advisor PC Screen Buffer Storage Area – BSA

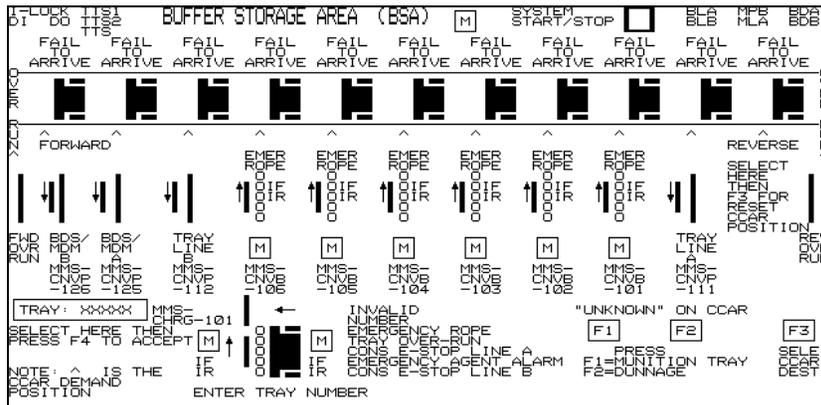


Figure E-7 ANCDF Advisor PC Screen BSA

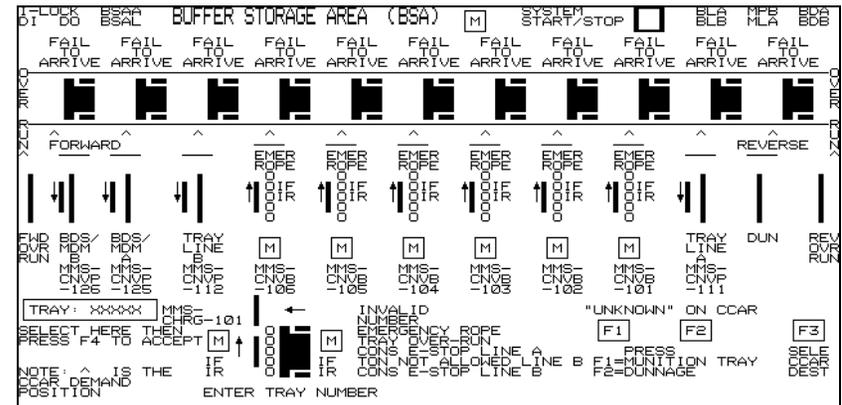


Figure E-8 TOCDF Advisor PC Screen BSA

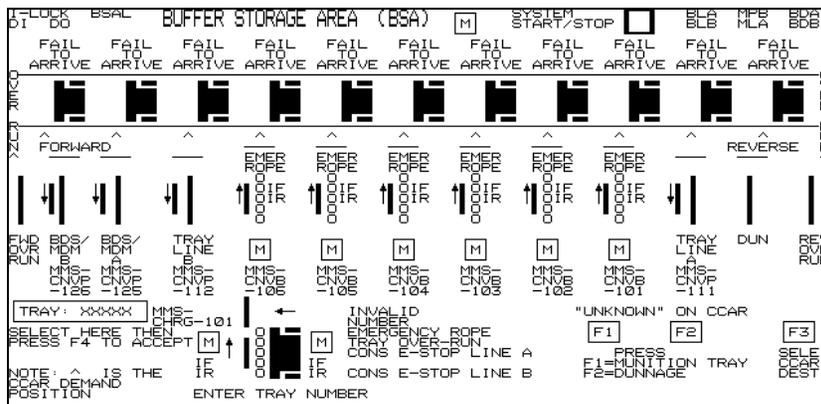


Figure E-9 UMCDF Advisor PC Screen BSA

### Advisor PC Screen Bulk Drain System Initialize – BDI

BHAL BHEL BULK DRAIN SYSTEM INITIALIZE (BDI) BDA BLA BDB	
BULK DRAIN SYSTEM A DEVICES MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE  SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE	BULK DRAIN SYSTEM B SCREENS MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE  SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE
***** PRESS START KEY TO INITIALIZE/PARK *****	

Figure E-10 ANCDF Advisor PC Screen BDI

BULK DRAIN SYSTEM INITIALIZE (BDI) BDS BDR	
BULK DRAIN SYSTEM A DEVICES MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE  SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE	
***** PRESS START KEY TO INITIALIZE/PARK *****	

Figure E-11 PBCDF Advisor PC Screen BDI

BHAL BHEL BULK DRAIN SYSTEM INITIALIZE (BDI) BDA BLA BDB	
BULK DRAIN SYSTEM A DEVICES MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE SYSTEM INITIALIZED  SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE	BULK DRAIN SYSTEM B SCREENS MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE SYSTEM INITIALIZED  SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE  <input type="checkbox"/> MK116 START/STOP
***** PRESS START KEY TO INITIALIZE/PARK *****	

Figure E-12 TOCDF Advisor PC Screen BDI

BHAL BHEL BULK DRAIN SYSTEM INITIALIZE (BDI) BDA BLA BDB	
BULK DRAIN SYSTEM A DEVICES MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE  CANNOT RUN BOTH BDS AT THE SAME TIME SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE	BULK DRAIN SYSTEM B SCREENS MUST BE IN AUTO TO INITIALIZE <input type="checkbox"/> SYSTEM INITIALIZE <input type="checkbox"/> BDS INITIALIZE  CANNOT RUN BOTH BDS AT THE SAME TIME SYSTEM MUST BE INITIALIZED TO START <input type="checkbox"/> SYSTEM START/STOP  SYSTEM MUST BE STOPPED TO PARK <input type="checkbox"/> PARK MACHINE
***** PRESS START KEY TO INITIALIZE/PARK *****	

Figure E-13 UMCDF Advisor PC Screen BDI

**Advisor PC Screen Bulk Drain Station A – BDA  
 (Bulk Drain Station – BDS @ PBCDF)**

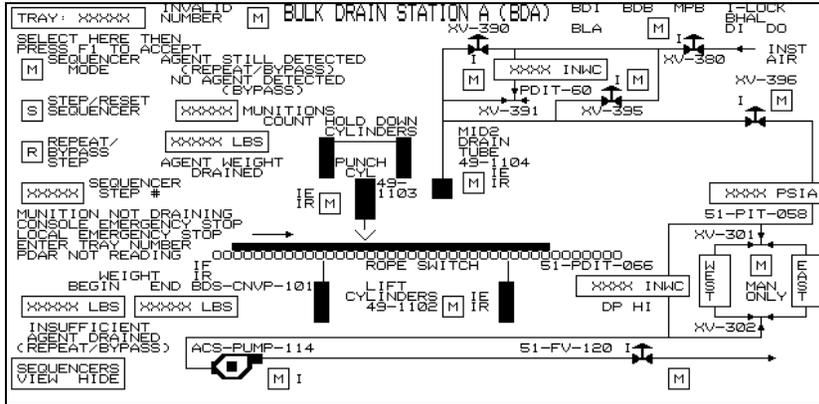


Figure E-14 ANCDF Advisor PC Screen BDA

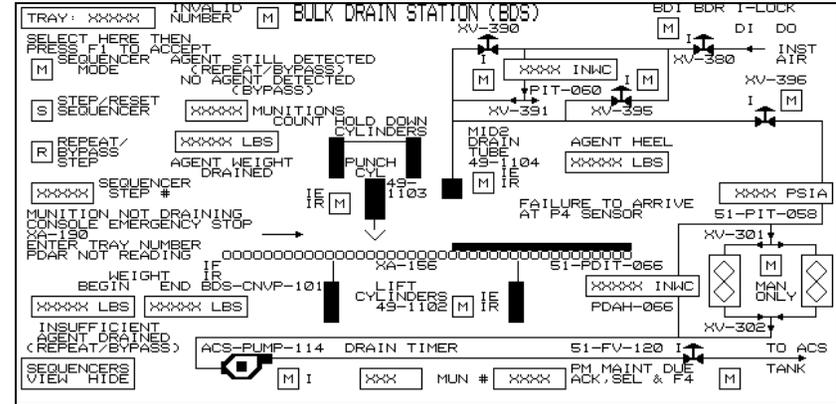


Figure E-15 PBCDF Advisor PC Screen BDS

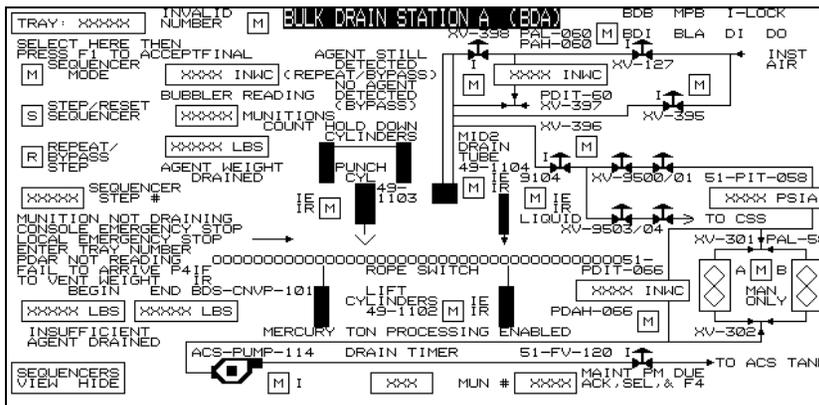


Figure E-16 TOCDF Advisor PC Screen BDA

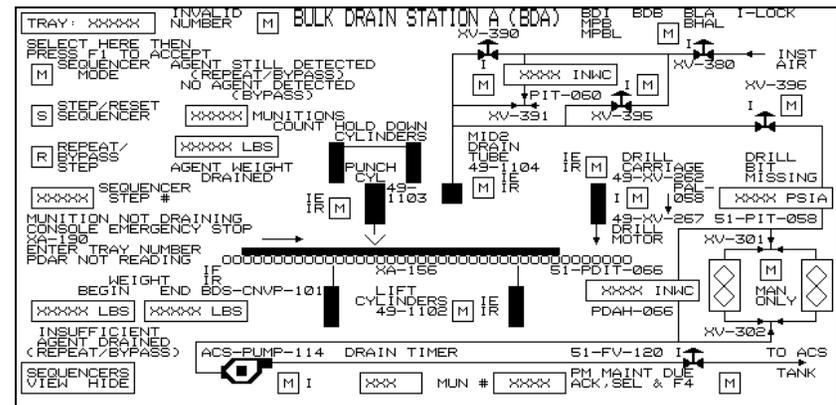


Figure E-17 UMCDF Advisor PC Screen BDA

Advisor PC Screen Bulk Drain Station B – BDB

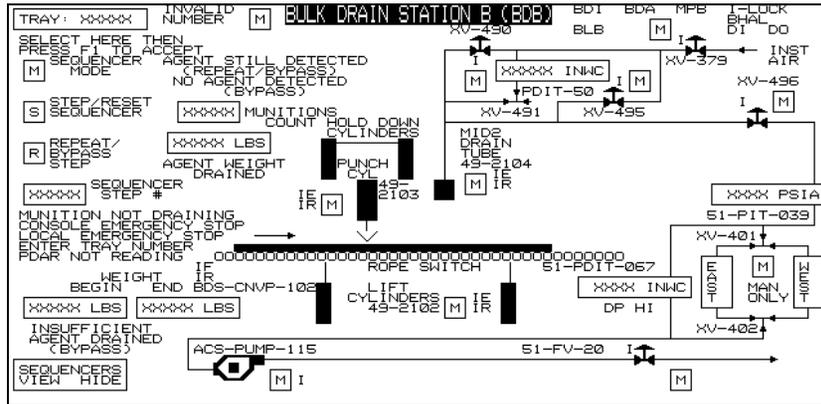


Figure E-18 ANCDF Advisor PC Screen BDB

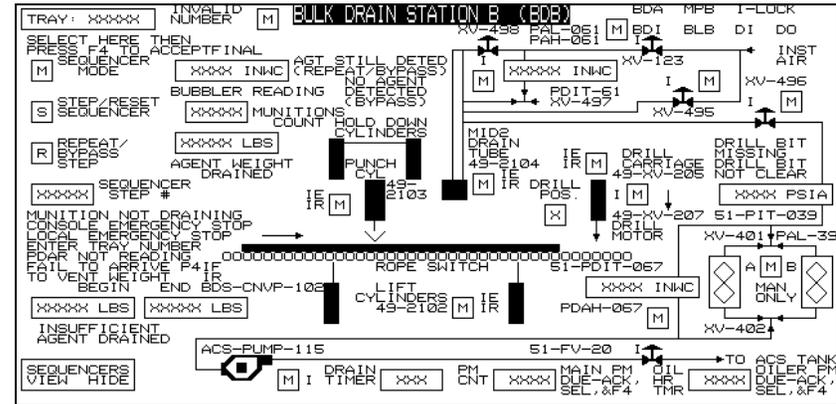


Figure E-19 TOCDF Advisor PC Screen BDB

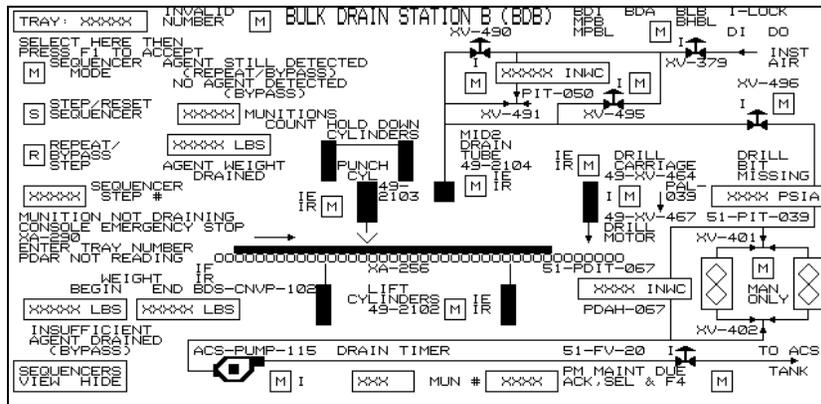


Figure E-20 UMCDF Advisor PC Screen BDB

### Advisor PC Screen Munitions Processing Bay – MPB (Bulk Drain Room – BDR @ PBCDF)

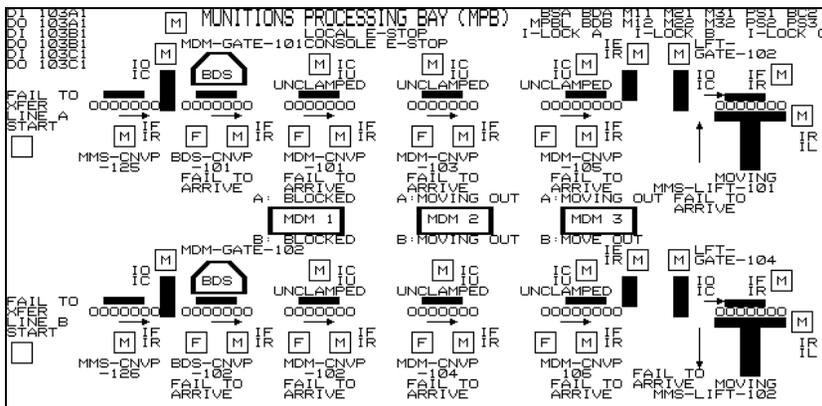


Figure E-21 ANCDF Advisor PC Screen MPB

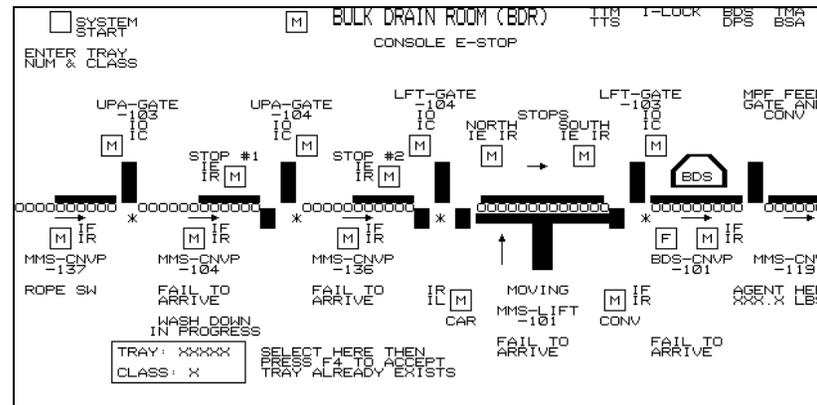


Figure E-22 PBCDF Advisor PC Screen BDR

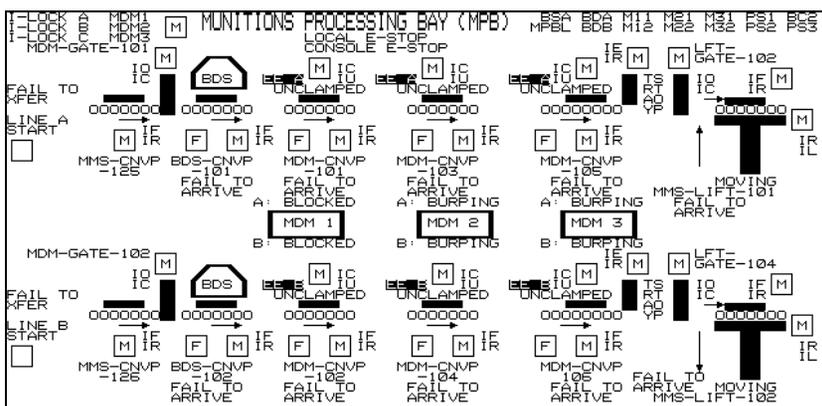


Figure E-23 TOCDF Advisor PC Screen MPB

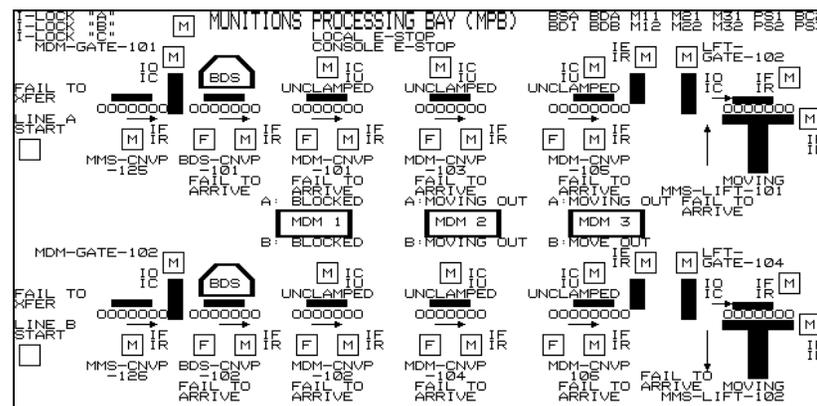


Figure E-24 UMCDF Advisor PC Screen MPB

Advisor PC Screen Buffer Conveyor Area – BC1

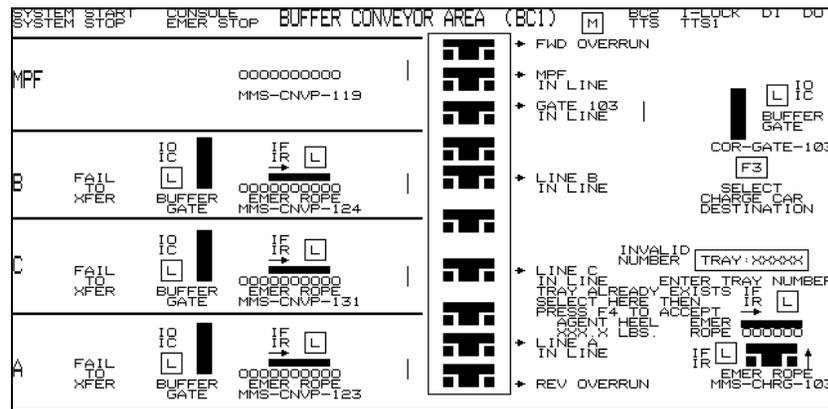


Figure E-25 ANCDF Advisor PC Screen BC1

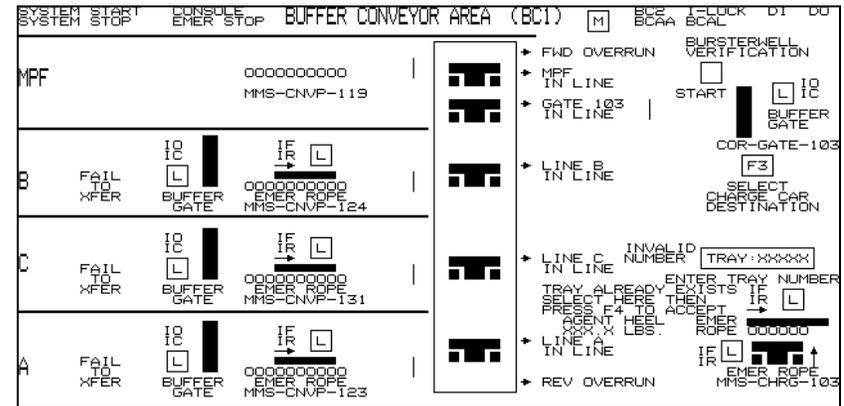


Figure E-26 TOCDF Advisor PC Screen BC1

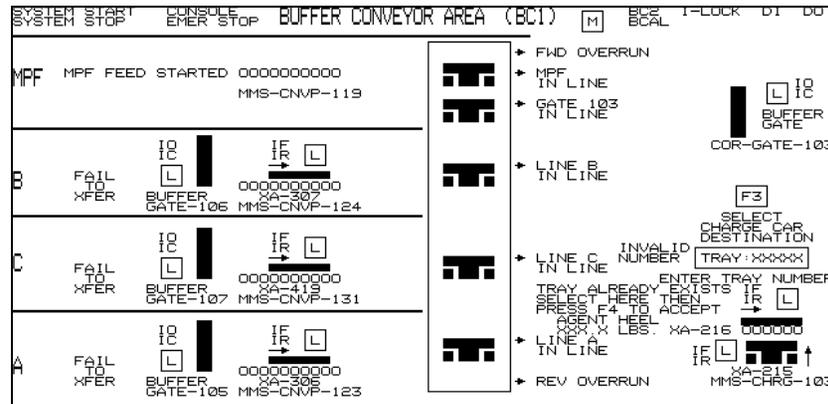


Figure E-27 UMCDV Advisor PC Screen BC1

Advisor PC Screen Buffer Conveyor Area – BC2

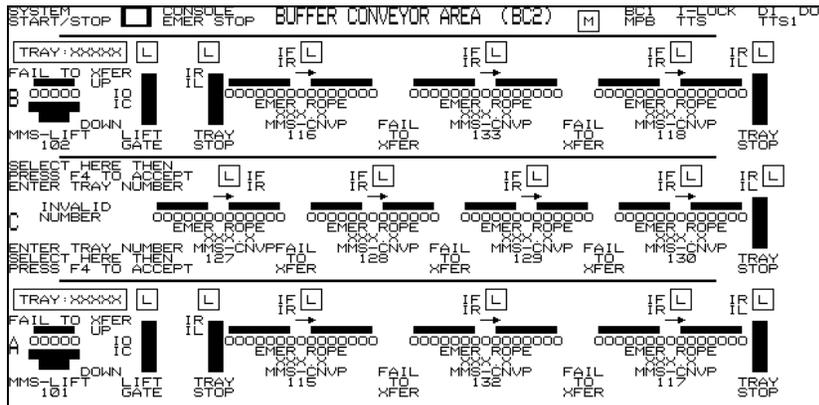


Figure E-28 ANCDF Advisor PC Screen BC2

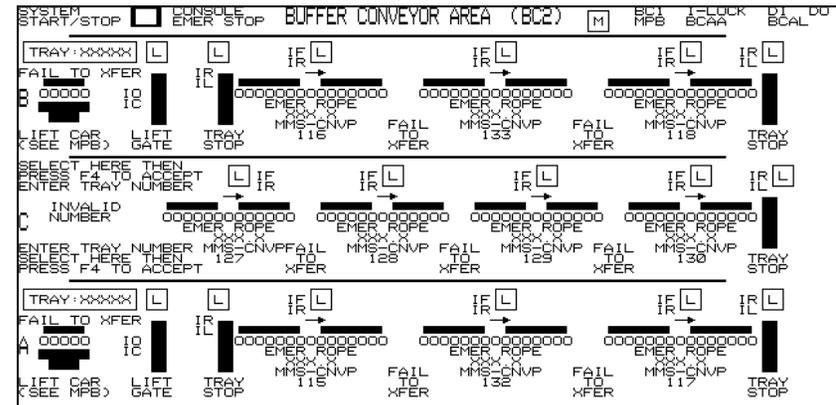


Figure E-29 TOCDF Advisor PC Screen BC2

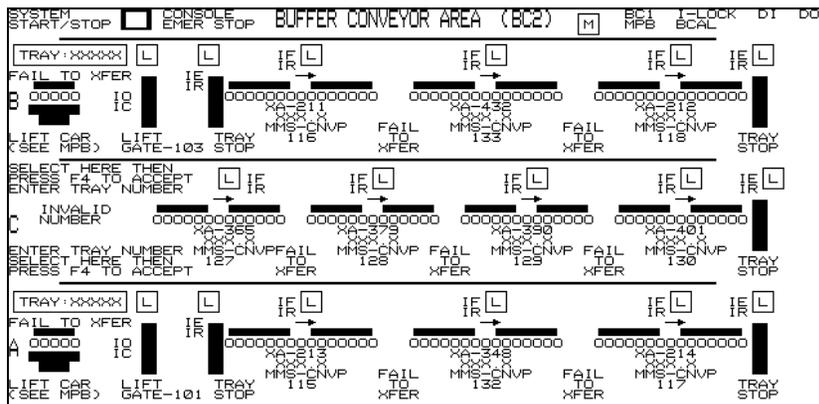


Figure E-30 UMCDF Advisor PC Screen BC2



**APPENDIX F****Instrument Ranges**

Table F.1 shows the instrument data extracted from the TOCDF Loveland calibration database for BCHS instrumentation as of *August 2000*. Not all instrument tag numbers listed are part of the design at ANCDF, PBCDF, and UMCDF. *When instrument databases for other sites are available, the instrument ranges will be added to this appendix.*

Table F.1 BCHS Instrumentation in TOCDF Loveland Instrument Calibration Database

INSTRUMENT TAG	RCRA	INPUT			OUTPUT			SET POINT	LOOP DEFINITION
		LOW	HI	UNIT	LOW	HI	UNIT		
49-WY-152A	No	0	10	VDC	4	20	mA		BDS-CNVP-101 BDS Indexing Hydraulic Conveyor Load Cells
49-WY-252A	No	0	10	VDC	4	20	mA		BDS-CNVP-201 BDS Indexing Hydraulic Conveyor Load Cells
<i>51-PIT-039</i>	<i>No</i>	<i>0</i>	<i>15</i>	<i>psi</i>	<i>4</i>	<i>20</i>	<i>mA</i>		<i>MMS-BDS-102 AQS pressure</i>
<i>51-PIT-058</i>	<i>No</i>	<i>0</i>	<i>15</i>	<i>psi</i>	<i>4</i>	<i>20</i>	<i>mA</i>		<i>MMS-BDS-101 AQS pressure</i>
<i>51-PDIT-060</i>	<i>No</i>	<i>0</i>	<i>40</i>	<i>in. wc.</i>	<i>4</i>	<i>20</i>	<i>mA</i>		<i>MMS-BDS-101 bubbler pressure</i>
<i>51-PDIT-061</i>	<i>No</i>	<i>0</i>	<i>40</i>	<i>in. wc.</i>	<i>4</i>	<i>20</i>	<i>mA</i>		<i>MMS-BDS-102 bubbler pressure</i>
<i>51-PDIT-066</i>	<i>No</i>	<i>0</i>	<i>106</i>	<i>in. wc.</i>	<i>4</i>	<i>20</i>	<i>mA</i>		<i>MMS-BDS-101 strainer differential pressure</i>
<i>51-PDIT-067</i>	<i>No</i>	<i>0</i>	<i>106</i>	<i>in. wc.</i>	<i>4</i>	<i>20</i>	<i>MA</i>		<i>MMS-BDS-102 strainer differential pressure</i>



## APPENDIX G

### Intercontroller Communications

BCHS operations are or will be controlled by the same 6 PLCs at ANCDF, TOCDF, and UMCDF. The PLCs and the portion of the BCHS that they control are listed in Table G.1. At PBCDF, operations associated with the single ton container line are provided by ICS-CONR-103A.

Table G.1 ANCDF, TOCDF, UMCDF BCHS PLCs

PLC	BCHS Equipment Controlled
ICS-CONR-101B	Bypass Line A
ICS-CONR-102	Upper COR BSA and Charge Car
ICS-CONR-103A	Bulk Drain Line A
ICS-CONR-103B	Bulk Drain Line B
ICS-CONR-104B	Bypass Line B
ICS-CONR-107	First-Floor BSA and Charge Car

Because ICS-CONR-101B, -103A, -103B, and -104B also provide control for the projectile handling system at ANCDF, TOCDF, and UMCDF, intercontroller communications associated with these controllers are not listed in this workbook and are included in the PHS programmatic process FAWB, Book 22.

Table G.2 lists the digital intercontroller inputs and outputs (DICIs/DICOs) for ICS-CONR-102, and Table G.3 lists the DICIs/DICOs for ICS-CONR-107, *for ANCDF, TOCDF, and UMCDF*. The DICIs/DICOs listed are based on *ANCDF code as of December 2003, TOCDF code as of January 2004, and UMCDF code as of November 2003. Table G.4 lists the DICIs/DICOs for ICS-CONR-103A at PBCDF, based on the February 2004 PBCDF PLC code.*

Table G.2 *ANCDF, TOCDF, and UMCDF* BCHS ICS-CONR-102 DICIs/DICOs

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
101A	005	105	102	051	00	Fire Alarm in ECR A		Alarm	0
101B	005	105	102	053	00	Charge Car Ready For Load		Ready	0
101B	005	105	102	053	01	Charge Car Received Load		Received	0
101B	005	105	102	053	02	Tray Transfer Failure		Failed	0
101B	005	105	102	053	03	Request Horn Honk		Request	0
101B	005	105	102	053	04	Charge Car Conv. Run Fwd		Running Forward	0
101B	005	105	102	053	05	Charge Car Inline		Inline	0
102	003	103	101B	055	00	Dunnage Request		Request	0
102	003	103	101B	055	01	Projectile Tray Request		Request	0
102	003	103	101B	055	02	Sending Tray to Charge Car		Sending	0
102	003	103	101B	055	03	Horn Honk Complete – OK to Run		Complete	0
102	003	103	101B	055	10	(AN only) Start PMD Spray Water in ECR A		Start	0
102	003	103	101B	055	11	(AN only) Stop PMD Spray Water in ECR A		Stop	0
102	007	107	103A	055	00	MMS-CNVP-125 Tray Demand		Demand	0
102	007	107	103A	055	01	MMS-CNVP-125 Request to Start Transfer		Start	0
102	007	107	103A	055	02	MMS-CNVP-125 Transfer Failure		Failed	0
102	007	107	103A	055	03	Horn Honk Request		Request	0
102	007	107	103A	055	04	MMS-CNVP-125 Running Fwd		Running Forward	0
102	007	107	103A	055	05	MMS-CNVP-125 Running Rev.		Running Reverse	0
102	007	107	103A	055	06	MMS-CNVP-125 Tray Present		Present	0
102	007	107	103A	055	07	(TE only) Tray ID Received From 103A		Received	0
102	009	109	103B	055	00	MMS-CNVP-126 Tray Demand		Demand	0
102	009	109	103B	055	01	MMS-CNVP-126 Request to Start Transfer		Start	0
102	009	109	103B	055	02	MMS-CNVP-126 Transfer Failure		Failed	0

Table G.2 (Cont'd)

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
102	009	109	103B	055	03	Horn Honk Request		Request	0
102	009	109	103B	055	04	MMS-CNVP-126 Running Fwd		Running Forward	0
102	009	109	103B	055	05	MMS-CNVP-126 Running Rev.		Running Reverse	0
102	009	109	103B	055	06	MMS-CNVP-126 Tray Present		Present	0
102	009	109	103B	055	07	(TE only) Tray ID Received From 103B		Received	0
102	015	115	104B	055	00	Dunnage Request		Request	0
102	015	115	104B	055	01	Projectile Tray Request		Request	0
102	015	115	104B	055	02	Sending Tray to Charge Car		Sending	0
102	015	115	104B	055	10	(AN only) Start PMD Spray Water in ECR B		Start	0
102	015	115	104B	055	11	(AN only) Stop PMD Spray Water in ECR B		Stop	0
102	017	117	105	055	00	Plant Air Available		Available	0
102	019	119	106	055	00	Sump Pump Enable	Enabled	Inhibited	0
102	019	119	106	055	01	(AN only) Cat A Sump Running		Running	0
102	019	119	106	055	02	(AN only) Cat B Sump Running		Running	0
102	025	125	109	055	00	Elec. System OK		Normal	0
102	025	125	109	055	01	Elec. System Power Loss		Power Loss	0
102	025	125	109	055	02	Start Essential Power Equip.		Start	0
102	029	129	111	055	00	DUN Ready For Transfer		Ready	0
102	029	129	111	055	01	Start Dunnage Transfer		Start	0
102	029	129	111	055	02	Dunnage Transfer Failure		Failed	0
102	029	129	111	055	03	DUN-LIFT-101 Load Position (Tray Present)		Tray Present	0
102	029	129	111	055	04	DUN-GATE-103 Open		Open	0
103A	005	105	102	057	00	Charge Car Ready to Transfer Tray		Ready	0
103A	005	105	102	057	01	Horn Honk Complete – OK to Run		Complete	0

Table G.2 (Cont'd)

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
103A	005	105	102	057	02	Charge Car at MDM Line A		Present	0
103A	005	105	102	057	04	Charge Car Conv. Running Fwd		Running Forward	0
103A	005	105	102	057	06	Charge Car Rec'd Load		Received	0
103B	005	105	102	059	00	Charge Car Ready to Transfer Tray		Ready	0
103B	005	105	102	059	01	Horn Honk Complete – OK to Run		Complete	0
103B	005	105	102	059	02	Charge Car at MDM Line B		Present	0
103B	005	105	102	059	04	Charge Car Conv. Running Fwd		Running Forward	0
103B	005	105	102	059	06	Charge Car Rec'd Load		Received	0
104A	005	105	102	063	00	Fire Alarm in ECR B		Alarm	0
104B	005	105	102	065	00	Charge Car Ready For Load		Ready	0
104B	005	105	102	065	01	Charge Car Received Load		Received	0
104B	005	105	102	065	02	Tray Transfer Failure		Failed	0
104B	005	105	102	065	04	Charge Car Conv. Run Fwd		Running Forward	0
104B	005	105	102	065	05	Charge Car Inline		Inline	0
106	005	105	102	069	00	Category "C" Sump Running		Running	0
106	005	105	102	069	01	<i>(TE only)</i> RCRA Sump 12-hour Alarm		Alarm	0
106	005	105	102	069	02	<i>(TE only)</i> RCRA Sump 18-hour Alarm		Alarm	0
108	005	105	102	073	00	Agent Alarm From CON	Alarm	OK	0
110	005	105	102	077	00	FPE-PNL-102A/B 8-111,8-109,8-108,8-110,30-112	Alarm	OK	0
110	005	105	102	077	01	FPE-PNL-103A/B 8-106,8-113,8-114,8-112	Alarm	OK	0
110	005	105	102	077	02	FPE-PNL-100A/B CON Main Fire Panel Zone 01	Alarm	OK	0
<i>110</i>	<i>005</i>	<i>105</i>	<i>102</i>	<i>077</i>	<i>03</i>	<i>(AN/UM only)</i> FPE-PNL-109A/B DFS Room 16-136	<i>OK</i>	<i>Alarm</i>	<i>0</i>

Table G.2 (Cont'd)

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
110	005	105	102	077	04	(AN/UM only) FPE-PNL-114EA ECR A Zone 04	OK	Alarm	0
110	005	105	102	077	05	(AN only) FPE- PNL-109FA ECR B Zone 05	OK	Alarm	0
110	005	105	102	078	00	Screen D02 Diagnostic Adv. Alarm			0
110	005	105	102	078	01	Screen D02 Diagnostic Adv. Unack.			0
111	005	105	102	079	00	Bypass Line Dunnage Transfer Demand		Ready	0
111	005	105	102	079	01	Charge Car Ready to Transfer Dunnage		Ready	0
113	005	105	102	083	00	(AN/UM only) Agent Alarm From CON	Alarm	OK	0
115	005	105	102	087	04	(AN only) FPE- PNL-114EA ECR A Zone 04	OK	Alarm	0
115	005	105	102	087	05	(AN only) FPE- PNL-109FA ECR B Zone 05	OK	Alarm	0

Table G.3 *ANCDF, TOCDF, and UMCDF* BCHS ICS-CONR-107 DICIs/DICOs

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
103A	021	121	107	057	00	Line A Start Tray Transfer From Lift		Start	0
103A	021	121	107	057	01	Line A Failed to Tray Transfer		Failed	0
103A	021	121	107	057	02	Line A Lift Exit Gate Closed		Closed	0
103A	021	121	107	057	03	Line A BSA Ready to Receive Tray		Ready	0
103A	021	121	107	057	04	Line A Lift Exit Gate Open		Open	0
103A	021	121	107	057	05	Horn Honk Complete – OK to Run		Complete	0
103A	021	121	107	057	06	MMS-CNVP-115 Tray Present Forward Sensor		Present	0
103A	021	121	107	057	07	MMS-CNVP-115 Running Forward		Forward	0
103A	021	121	107	057	10	MMS-CNVP-115 Running Reverse		Reverse	0
103A	021	121	107	057	11	MMS-CNVP-115 Tray Stop Down		Down	0
103A	021	121	107	057	12	MMS-CNVP-115 Received Load		Received	0
103A	021	121	107	057	13	MMS-CNVP-115 Tray Present Back Sensor		Present	0
103B	021	121	107	059	00	Line B Start Tray Transfer From Lift		Start	0
103B	021	121	107	059	01	Line B Failed to Tray Transfer		Failed	0
103B	021	121	107	059	02	Line B Lift Exit Gate Closed		Closed	0
103B	021	121	107	059	03	Line B BSA Ready to Receive Tray		Ready	0
103B	021	121	107	059	04	Line B Lift Exit Gate Open		Open	0
103B	021	121	107	059	05	Horn Honk Complete – OK to Run		Complete	0
103B	021	121	107	059	06	MMS-CNVP-116 Tray Present Forward Sensor		Present	0
103B	021	121	107	059	07	MMS-CNVP-116 Running Forward		Forward	0
103B	021	121	107	059	10	MMS-CNVP-116 Running Reverse		Reverse	0
103B	021	121	107	059	11	MMS-CNVP-116 Tray Stop Down		Down	0
103B	021	121	107	059	12	MMS-CNVP-116 Received Load		Received	0

Table G.3 (Cont'd)

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
103B	021	121	107	059	13	MMS-CNVP-116 Tray Present Back Sensor		Present	0
103C	021	121	107	061	00	LFT-GATE-101 Closed (Line A)		Closed	0
103C	021	121	107	061	01	LFT-GATE-103 Closed (Line B)		Closed	0
107	007	107	103A	071	00	Line A has Tray at First Floor		Tray at First Floor	0
107	007	107	103A	071	01	Line A LFT-GATE-102 Closed		Closed	0
107	007	107	103A	071	02	Line A Requests to Transfer Tray to BSA		Request	0
107	007	107	103A	071	03	Request Horn Honk		Request	0
107	007	107	103A	071	04	Line A Lift at First Floor		Lift at First Floor	0
107	007	107	103A	071	05	MMS-LIFT-101 Local E-Stop	Stop	Run	0
107	007	107	103A	071	06	<i>(UM only) Valid Tray ID # Entered by Operator</i>		<i>Valid ID</i>	<i>0</i>
107	007	107	103A	071	10	MMS-LIFT-101 Tray Present		Present	0
107	007	107	103A	071	11	Tray ID Received From 103A		Received	0
107	007	107	103A	071	12	Operator Enter Tray ID #		Enter ID	0
107	009	109	103B	071	00	Line B has Tray at First Floor		Tray at First Floor	0
107	009	109	103B	071	01	Line B LFT-GATE-104 Closed		Closed	0
107	009	109	103B	071	02	Line B Requests to Transfer Tray to BSA		Request	0
107	009	109	103B	071	03	Request Horn Honk		Request	0
107	009	109	103B	071	04	Line B Lift at First Floor		Lift at First Floor	0
107	009	109	103B	071	05	MMS-LIFT-102 Local E-Stop	Stop	Run	0
107	009	109	103B	071	06	<i>(UM only) Valid Tray ID # Entered by Operator</i>		<i>Valid ID</i>	<i>0</i>
107	009	109	103B	071	10	MMS-LIFT-102 Tray Present		Present	0

Table G.3 (Cont'd)

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
107	009	109	103B	071	11	Tray ID Received From 103B		Received	0
107	009	109	103B	071	12	Operator Enter Tray ID #		Enter ID	0
107	025	125	109	071	01	Elec. System Power Loss		Power Loss	0
107	034	134	113	072	00	MPF Ready for Loaded Charge Car		Ready	0
107	034	134	113	072	01	MPF Received Tray		Received	0
107	034	134	113	072	02	MPF Fail to Transfer Tray		Failed	0
107	034	134	113	072	03	MPF Airlock Door Open and Conv. Running Fwd		OK to Transfer	0
107	034	134	113	072	04	MPF Rec'd Tray From Charge Car		Received	0
107	034	134	113	072	05	MPF Airlock Door Raised		Raised	0
107	034	134	113	072	06	Tray Present on MPF Charge Airlock Conv.		Present	0
107	034	134	113	072	07	MPF Charge Airlock Conv. Running Rev.		Running Reverse	0
107	039	139	117	071	00	Tray ID Already in Master File		Already in File	0
107	039	139	117	071	01	Master File is Full		File is Full	0
110	022	122	107	078	00	Screen D07 Diagnostic Adv. Alarm			0
110	022	122	107	078	01	Screen D07 Diagnostic Adv. Unack.			0
113	021	121	107	083	00	Loaded Charge Car at Airlock Door		Present/ Full	0
113	021	121	107	083	01	Unloaded Charge Car at Airlock Door		Present/ Empty	0
113	021	121	107	083	02	Charge Car at MPF and Start Transfer		Start	0
113	021	121	107	083	03	Charge Car at MPF and Inline		Inline	0
113	021	121	107	083	04	Tray Present on Charge Car		Present	0
113	021	121	107	083	05	Charge Car Conv. Run Fwd		Run Forward	0
113	021	121	107	083	06	Charge Car Rec'd Tray From MPF		Received	0

Table G.4 PBCDF BCHS ICS-CONR-103A DICIs/DICOs

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
101B	008	108	103A	054	00	MMS-CNVP-107 OK to Load Lift Car (Lift Ready)		OK to Load	0
101B	008	108	103A	054	01	MMS-LIFT-101 Rec'd Tray from MMS-CNVP-107		Received	0
101B	008	108	103A	054	02	MMS-CNVP-136 Rec'd Tray from MMS-CNVP-134		Received	0
101B	008	108	103A	054	03	MMS-LIFT-101 Lift Car at 2 <sup>nd</sup> Floor		At 2 <sup>nd</sup> Floor	0
101B	008	108	103A	054	07	MMS-LIFT-101 Lift Car in Auto		Auto	0
101B	008	108	103A	054	12	MMS-LIFT-101 Lift Conv Running Forward		Forward	0
101B	008	108	103A	054	13	MMS-LIFT-101 Lift Conv Running Reverse		Reverse	0
101B	008	108	103A	054	14	MMS-CNVP-111 OK to Load Lift Car (Lift Ready)		OK to Load	0
101B	008	108	103A	054	15	MMS-LIFT-101 Rec'd Tray from MMS-CNVP-111		Received	0
103A	004	104	101B	058	00	MMS-CNVP-107 to Lift Car Load Request		Request	0
103A	004	104	101B	058	01	LIFT-GATE-101 Gate Closed		Closed	0
103A	004	104	101B	058	02	LIFT-GATE-101 Gate Opened		Opened	0
103A	004	104	101B	058	03	MMS-LIFT-101 Both Gates Closed & Auto Available		Available for Auto	0
103A	004	104	101B	058	04	MMS-LIFT-101 to MMS-CNVP-107 OK to Unload		OK to Unload	0
103A	004	104	101B	058	10	MMS-LIFT-101 to MMS-CNVP-111 OK to Unload		OK to Unload	0
103A	004	104	101B	058	12	LIFT-GATE-102 Gate Opened		Opened	0
103A	004	104	101B	058	14	MMS-CNVP-111 to Lift Car Load Request		Request	0
103A	004	104	101B	058	15	LIFT-GATE-102 Gate Closed		Closed	0
103A	017	117	105	057	01	Hydraulic System to BDS-HYVM-101 Normal		Normal	0
103A	018	118	105	058	00	Plant Air Available		Available	1

Table G.4 (Cont'd)

To Controller			From Controller			Description	Interpretation		
CONR	Input Word (B4:)	Safe Mask (B4:)	CONR	Output Word	Bit		0	1	Safe
103A	019	119	106	057	00	OK to Pump Agent		OK	0
103A	019	119	106	057	01	OK to Start Processing		OK	0
103A	019	119	106	057	03	OK to Punch Bulk Items	Stop	OK	0
103A	025	125	109	057	01	Elec. System Power Loss		Power Lost	0
103A	025	125	109	057	02	Start Essential Power Equip.		Start	0
103A	027	127	110	057	00	HVAC Normal		Normal	0
103A	027	127	110	057	05	Demil Counter Reset		Reset	0
103A	034	134	113	058	00	MPF Requests a Tray		Request	0
103A	034	134	113	058	01	Tray Arrived on Charge Airlock Conveyor		Arrived	0
103A	034	134	113	058	02	MMS-CNVP-119 Tray Fail to Arrive		Fail to Arrive	0
103A	034	134	113	058	03	MPF Charge AL Open & Running Forward		Open & Running Forward	0
103A	034	134	113	058	04	MPF Received Tray from BDS		Received	0
103A	034	134	113	058	05	MPF Charge AL Open & Running Reverse		Open & Running Reverse	0
103A	034	134	113	058	06	MMS-CNVP-119 Tray at Mid Position		At Mid Position	0
103A	039	139	113	057	00	Tray ID Not Found in Master File		Not Found	0
103A	039	139	113	057	10	Tray ID Already in Master File		Already in File	0
103A	039	139	113	057	11	Master File is Full		File is Full	0
110	007	107	103A	077	15	Received Campaign Data		Received	0
110	007	107	103A	077	16	Request Campaign Data		Request	0
110	008	108	103A	078	00	Screen D3A Diagnostic Adv. Alarm		Alarm	0
110	008	108	103A	078	01	Screen D3A Diagnostic Adv. Unack.		Unack.	0
113	007	107	103A	083	00	Tray on BDS Conveyor Wait for MPF		Tray Present	0
113	007	107	103A	083	01	BDS Conveyor No Tray Present		No Tray Present	0

*Table G.4 (Cont'd)*

<i>To Controller</i>			<i>From Controller</i>			<i>Description</i>	<i>Interpretation</i>		
<i>CONR</i>	<i>Input Word (B4:)</i>	<i>Safe Mask (B4:)</i>	<i>CONR</i>	<i>Output Word</i>	<i>Bit</i>		<i>0</i>	<i>1</i>	<i>Safe</i>
113	007	107	103A	083	02	<i>BDS Conveyor Xfering Tray to MPF</i>		<i>Xfering</i>	<i>0</i>
113	007	107	103A	083	05	<i>BDS Conveyor Running Reverse</i>		<i>Running Reverse</i>	<i>0</i>
113	007	107	103A	083	06	<i>BDS Conveyor Received Tray</i>		<i>Received</i>	<i>0</i>
113	007	107	103A	083	07	<i>Tray ID &amp; Wt OK Allow Xfer to MPF</i>		<i>OK</i>	<i>0</i>



## APPENDIX H

### References

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CSDP Control Systems Software Design Guide, Revision 19, 3-12-93.

Programmatic Process FAWB Maintenance Plan, *Revision 1, 10-16-02.*

Estimated Throughput Rates at CSDP Sites with Bases for Estimates, May 1992.

#### ANCDF

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*ANCDF Control System Source Code, December 2003.*

AN-1-D-505-SC, Rev.0, 1-23-03	Projectile/Mortar & Bulk Item Processing System (A), P&ID
AN-1-D-506-SC, Rev.0, 1-23-03	Projectile/Mortar & Bulk Item Processing System (B), P&ID
AN-1-D-511/1-SC, Rev.1, 1-23-03	Multiposition Loader (A), P&ID
AN-1-D-511/2-SC, Rev.1, 1-22-03	Multiposition Loader (B), P&ID
AN-1-D-512, Rev. 2, 10-2-98	Buffer Storage/Charge Car (2nd Floor), P&ID
AN-1-D-513/1, Rev. 2, 10-2-98	Buffer Storage, P&ID
AN-1-D-513/2, Rev. 2, 6-13-97	Buffer Storage, P&ID
AN-1-D-514-SC, Rev.2, 1-28-03	Multipurpose Demil & Bulk Drain System (B), P&ID
AN-1-D-515-SC, Rev.3, 3-13-03	Multipurpose Demil & Bulk Drain System (A), P&ID
AN-1-D-516-SC, Rev.0, 5-28-02	Multipurpose Demil & Bulk Drain System (A), P&ID
AN-1-D-517, Rev.3, 10-2-98	Multipurpose Demil & Bulk Drain System (B), P&ID
AN-1-E-907-SC, Rev.0, 6-17-02	SPS-MCC-103 480V MCC - Conveyor No.1, Single Line Diagram
AN-1-E-908, Rev.2, 12-14-01	SPS-MCC-104 480V MCC - Conveyor No.2, Single Line Diagram
AN-1-E-909-SC, Rev.0, 12-12-02	SPS-MCC-105 480V MCC - Conveyor No.3, Single Line Diagram

## ANCDF (cont'd)

AN-1-E-910- <i>SC, Rev.0, 10-4-02</i>	SPS-MCC-106 480V MCC – TOX/HYD, Single Line Diagram
AN-1-E-911, <i>Rev.4, 12-14-01</i>	SPS-MCC-107 480V MCC – MPF/LIC, Single Line Diagram

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| *PBCDF Control System Source Code, February 2004.*

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PB-1-D-512, <i>Rev.3, 1-10-03</i>	Charge Car (2nd Floor), P&ID
PB-1-D-514, <i>Rev.7, 5-10-01</i>	Bulk Processing Line, P&ID
PB-1-D-515, <i>Rev.7, 1-10-03</i>	Bulk Drain System, P&ID
PB-1-D-520, <i>Rev.1, 7-10-98</i>	UPA Conveyors, P&ID
PB-1-D-528, <i>Rev.7, 10-3-03</i>	Metal Parts Furnace, P&ID
PB-1-E-654, <i>Rev.7, 10-3-03</i>	MDB Electrical, Panel Schedule
PB-1-E-908, <i>Rev.3, 10-3-03</i>	SPS-MCC-103 480V MCC – Conveyor No.1, Single Line Diagram
PB-1-E-910, <i>Rev.6, 10-3-03</i>	SPS-MCC-105 480V MCC – MPF/BDS/DFS, Single Line Diagram

## TOCDF

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| TOCDF Standing Operating Procedure, CHB Operation and Transfer to the UPA, TE-SOP-001, *Rev.6, Change 15, July 15, 2003.*

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TE-1-D-511/1, Rev.13, 7-28-98	Multiposition Loader (A), P&ID
TE-1-D-511/2, Rev.12, 7-28-98	Multiposition Loader (B), P&ID
TE-1-D-512, Rev.12, 4-14-98	Buffer Storage/Charge Car (2nd Floor), P&ID
TE-1-D-513/1, Rev.13, 4-14-98	Buffer Storage, P&ID
TE-1-D-513/2, Rev.12, 4-14-98	Buffer Storage, P&ID
EG-1-D-514, <i>Rev.24, 12-8-03</i>	Multipurpose Demil & Bulk Drain System (B), P&ID
TE-1-D-514, <i>Rev.19, 4-3-03</i>	Multipurpose Demil & Bulk Drain System (B), P&ID
EG-1-D-515, <i>Rev.30, 9-18-03</i>	Multipurpose Demil & Bulk Drain System (A), P&ID
TE-1-D-515, <i>Rev.17, 4-4-01</i>	Multipurpose Demil & Bulk Drain System (A), P&ID
TE-1-D-516, Rev.12, 1-26-96	Multipurpose Demil & Bulk Drain System (A), P&ID
TE-1-D-517, Rev.12, 1-26-96	Multipurpose Demil & Bulk Drain System (B), P&ID
<i>EG-1-D-4902, Rev.6, 9-18-03</i>	<i>Multipurpose Demil &amp; Bulk Drain System (Mercury Tons), P&amp;ID</i>
TE-1-E-907, <i>Rev.13, 10-24-01</i>	SPS-MCC-103 480V MCC – Conveyor No.1, Single Line Diagram
TE-1-E-908, <i>Rev.16, 12-6-02</i>	SPS-MCC-104 480V MCC – Conveyor No.2, Single Line Diagram
TE-1-E-909, <i>Rev.13, 10-24-01</i>	SPS-MCC-105 480V MCC – Conveyor No.3, Single Line Diagram
TE-1-E-910, <i>Rev.15, 12-14-00</i>	SPS-MCC-106 480V MCC – TOX/HYD, Single Line Diagram
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UM-1-D-506, <i>Rev.4, 9-13-00</i>	Projectile & Bulk Item Processing System (B), P&ID
UM-1-D-511/1, <i>Rev.2, 9-13-00</i>	Multiposition Loader (A), P&ID
UM-1-D-511/2, <i>Rev.2, 9-13-00</i>	Multiposition Loader (B), P&ID

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UM-1-D-513/1, <i>Rev.5, 7-20-01</i>	Buffer Storage, P&ID
UM-1-D-513/2, <i>Rev.2, 9-13-00</i>	Buffer Storage, P&ID
UM-1-D-514, <i>Rev.8, 3-12-03</i>	Multipurpose Demil & Bulk Drain System (B), P&ID
UM-1-D-515, <i>Rev.9, 3-12-03</i>	Multipurpose Demil & Bulk Drain System (A), P&ID
UM-1-D-516, <i>Rev.5, 7-20-01</i>	Multipurpose Demil & Bulk Drain System (A), P&ID
UM-1-D-517, <i>Rev.5, 7-20-01</i>	Multipurpose Demil & Bulk Drain System (B), P&ID
UM-1-E-907, <i>Rev.1, 2-1-02</i>	SPS-MCC-103 480V MCC – Conveyor No.1, Single Line Diagram
UM-1-E-908, Rev.1, 4-17-98	SPS-MCC-104 480V MCC – Conveyor No.2, Single Line Diagram
UM-1-E-909, Rev.1, 4-17-98	SPS-MCC-105 480V MCC – Conveyor No.3, Single Line Diagram
UM-1-E-910, <i>Rev.1, 8-28-00</i>	SPS-MCC-106 480V MCC – TOX/HYD, Single Line Diagram
UM-1-E-911, Rev.3, 7-6-99	SPS-MCC-107 480V MCC – MPF/LIC, Single Line Diagram