ENGINEERING DATA TRANSMITTAL

1 EDT 625309

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River Protection Project	H Rossi	NA

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              (See Approval Designator for required signatures)

(G) Rea son	(H) Disp	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Rea son	(H) Disp	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority									
		Design Agent									
1	/	Cog Eng H Rossi	HRossi		R3-73	1	/	C E Grenard	CCGrenard	1/12/00	R3-74
1	/	Cog Mgr T J Conrads	Conrads	1/12/00	R3-73	1	1	M W Leonard	MWLeonard	1/11/00	R3-73
		QA				1	1	I I Kazmi	IIKazmi	1/11/00	R3-73
		Safety									
		Env									

18
H Rossi
Signature of EDT Originator   Date

19
T J Conrads
Authorized Representative   1/12/00
for Receiving Organization   Date

20
T J Conrads   1/12/99
Design Authority/
Cognizant Manager   Date

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Project Title/Work Order		EDT No 625309
System Description for the Double-Shell Tank Confinement System, RPP-5622, Rev 0		ECN No

Name	MSIN	Text With All Attach	Text Only	Attach / Appendix Only	EDT/ECN Only
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W T Thompson	P7-04	x			
W W Willis	R3-73	x			

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System Description for the Double-Shell Tank Confinement System

H Rossi
TRW Environmental Systems
Richland WA 99352
U S Department of Energy Contract DE-AC06-99RL14047
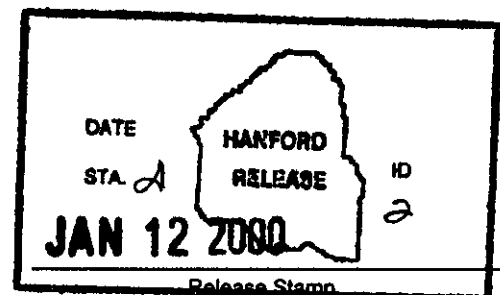
Key Words
double-shell tank, DST, confinement

Abstract
This document provides a description of the Double-Shell Tank (DST)
Confinement System This description will provide a basis for
developing functional, performance and test requirements (i e ,
subsystem specification), as necessary, for the DST Confinement System

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Release Approval   1/12/00
Date   Release Stamp

Approved For Public Release

RPP-5622
Revision 0

SYSTEM DESCRIPTION FOR THE DOUBLE-SHELL TANK CONFINEMENT SYSTEM

January 2000

H Rossi
Richland, Washington

I I Kazmi
Richland, Washington

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CONTENTS

FIGURES

TABLES

TERMS

DCRT	Double-Contained Receiver Tank
DST	Double-Shell Tank
GM	Gas Monitoring
LAW	Low-Activity Waste
M&C	Monitor & Control
MUST	Miscellaneous Underground Storage Tank
HLW	High-Level Waste
ORP	Office of River Protection
PFP	Plutonium Finishing Plant
RM	Radiation Monitor
RPP	River Protection Project
SALW	Saltwell Equipment
SST	Single-Shell Tank
TWRS	Tank Waste Retrieval System
VTA	Ventilation Tank Annulus
VTP	Ventilation Tank Primary
WESF	Waste Encapsulation & Storage Facility
WFD	Waste Feed Delivery
WST	Waste Storage Tank
WSTA	Waste Storage Tank Annulus

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SYSTEM DESCRIPTION FOR THE DOUBLE-SHELL TANK
CONFINEMENT SYSTEM

1 0 INTRODUCTION

1 1 DOCUMENT PURPOSE

This document provides a description of the Double-Shell Tank (DST) Confinement System This description will provide a basis for developing functional, performance, and test requirements (i e , subsystem specification), as necessary, for the DST Confinement System This system description fully identifies the equipment and system boundaries of the DST Confinement System

1 2 EXECUTIVE SUMMARY

The system description of the DST Confinement System presented in this document was developed to establish the boundaries of the DST Confinement System based on *the Tank Waste Remediation Architecture Tree* (Peck 1999) and the *Functional Analysis for DST Subsystems* (Smith 1999) This was done to provide a complete and accurate description of the system at the subsystem level

The DST Confinement System consists of the structures and components that make up the basic DST structure This includes the tank's primary (inner) shell, secondary (exterior) shell, annulus between the shells, reinforced concrete base, the concrete layer surrounding the secondary liner, risers, riser extensions and other tank penetrations, isolation valves directly attached to risers or in close proximity to risers, concrete pads provided to support pumps, air lift circulators, sensors embedded in the concrete portions of the DST, and leak detection pits The Confinement System does not include systems components, or equipment attached to or inserted into the DST

The DST Confinement System is made up of already existing structures and will not require modification, etc , to accomplish the waste confinement function A formal specification for the DST Confinement System is, therefore, not necessary

1 3   DOCUMENT ORGANIZATION

The remainder of this document is organized into sections, briefly described as follows

- Section 2 0 establishes the DST Confinement System as a subsystem of the DST System

- Section 3 0 discusses the rationale for the DST Confinement System description provided herein

- Section 4 0 describes the next steps required in the engineering process for the DST Confinement System

- Section 5 0 lists the documents referenced within this document

2 0   BACKGROUND

The *System Specification for the Double-Shell Tank System* (Grenard et al 1998) established DST System functions, system-level requirements and interfaces applicable to the first phase (Phase 1) of the River Protection Project (RPP) mission described in the *Tank Waste Remediation System Mission Analysis Report* (Acree 1998) The purpose for the DST System, according to the DST System Specification, is to receive, store and treat (prepare) waste, and to transfer it to the Phase 1 Privatization Contractor, as shown in the DST System Functional Flow Block Diagram (Figure 2 0-1)

The waste stored in the DSTs as part of the described waste storage function includes tank waste already in the DSTs, waste received from the Single-Shell Tank (SST) System and other onsite generators The flow of waste in and out of the DST System is shown in the DST Interface Diagram (Figure 2 0-2) Specifically, the DST Specification established functions to "Store Waste in East Area DSTs" and to "Store Waste in West Area DSTs "

A DST Storage System architecture to accomplish the waste storage functions was established in the *Tank Waste Remediation System Architecture Tree* (Peck 1999) (see Figure 2 0-3) As shown in Figure 2 0-3, the DST Waste Storage System architecture was further decomposed to include architectures for a DST Ventilation System and a DST Confinement System

Figure 2 0-1   Double-Shell Tank System Functional Flow Block Diagram   (Sheet 1 of 2)
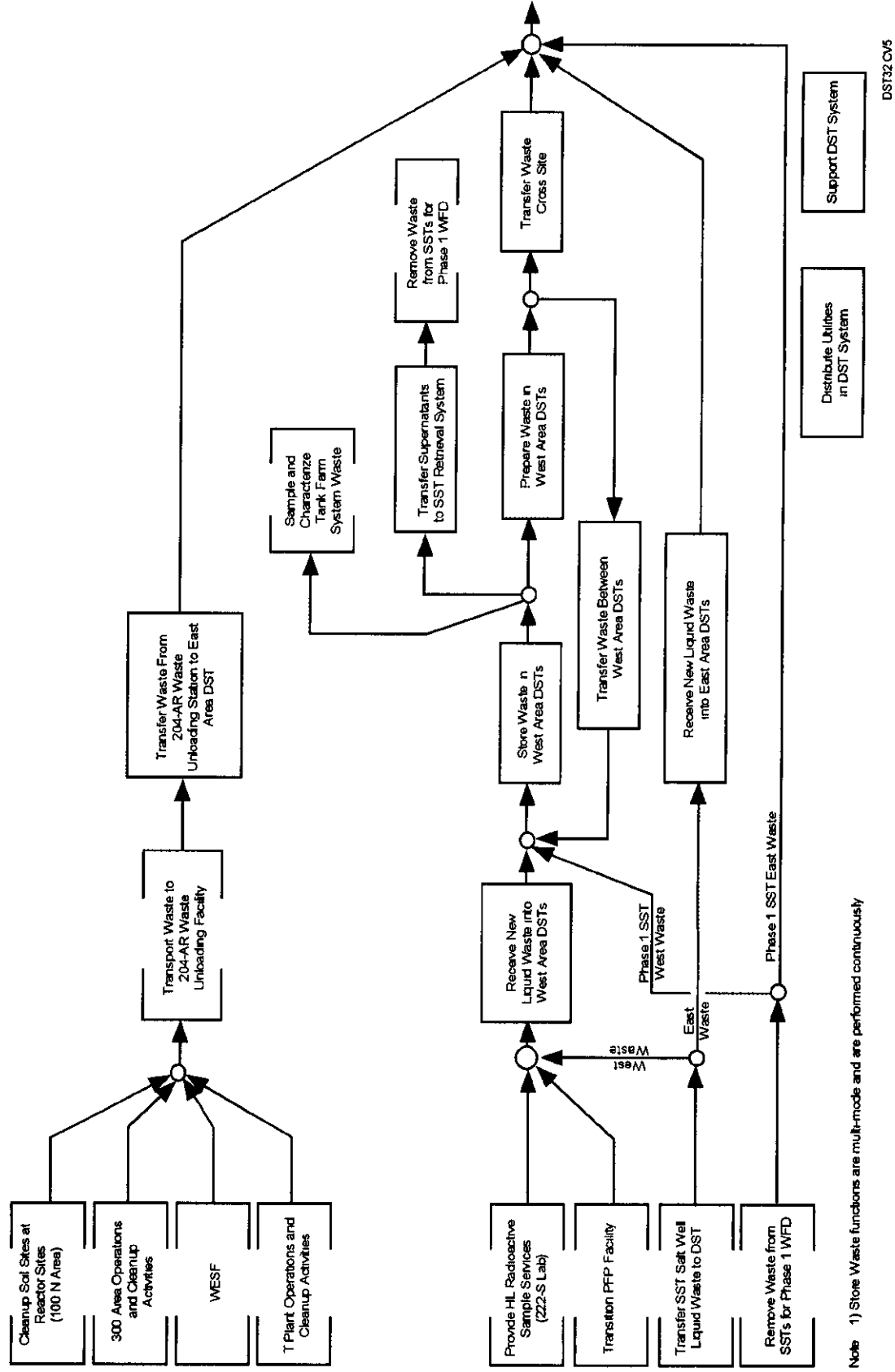
Note   1) Store Waste functions are multi-mode and are performed continuously

Figure 2 0-1   Double-Shell Tank System Functional Flow Block Diagram   (Sheet 2 of 2)

DST = double shell tank.

HLW = high level waste

LAW = low activity waste

PFP = Plutonium Finishing Plant
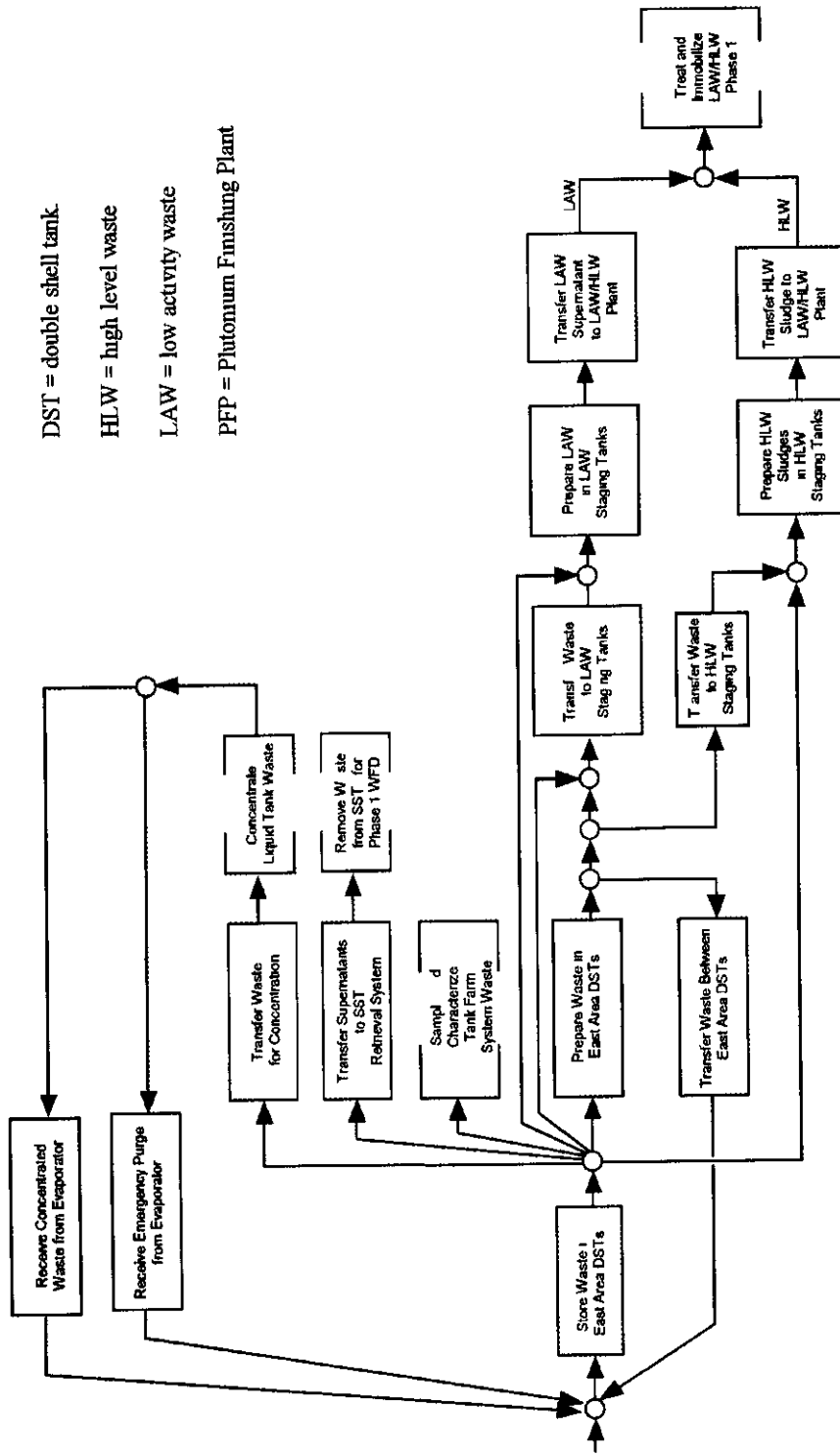
Note   1) Store Waste Functions are multi-mode and are performed continuously

Figure 2 0-2   Double-Shell Tank System Interface Diagram
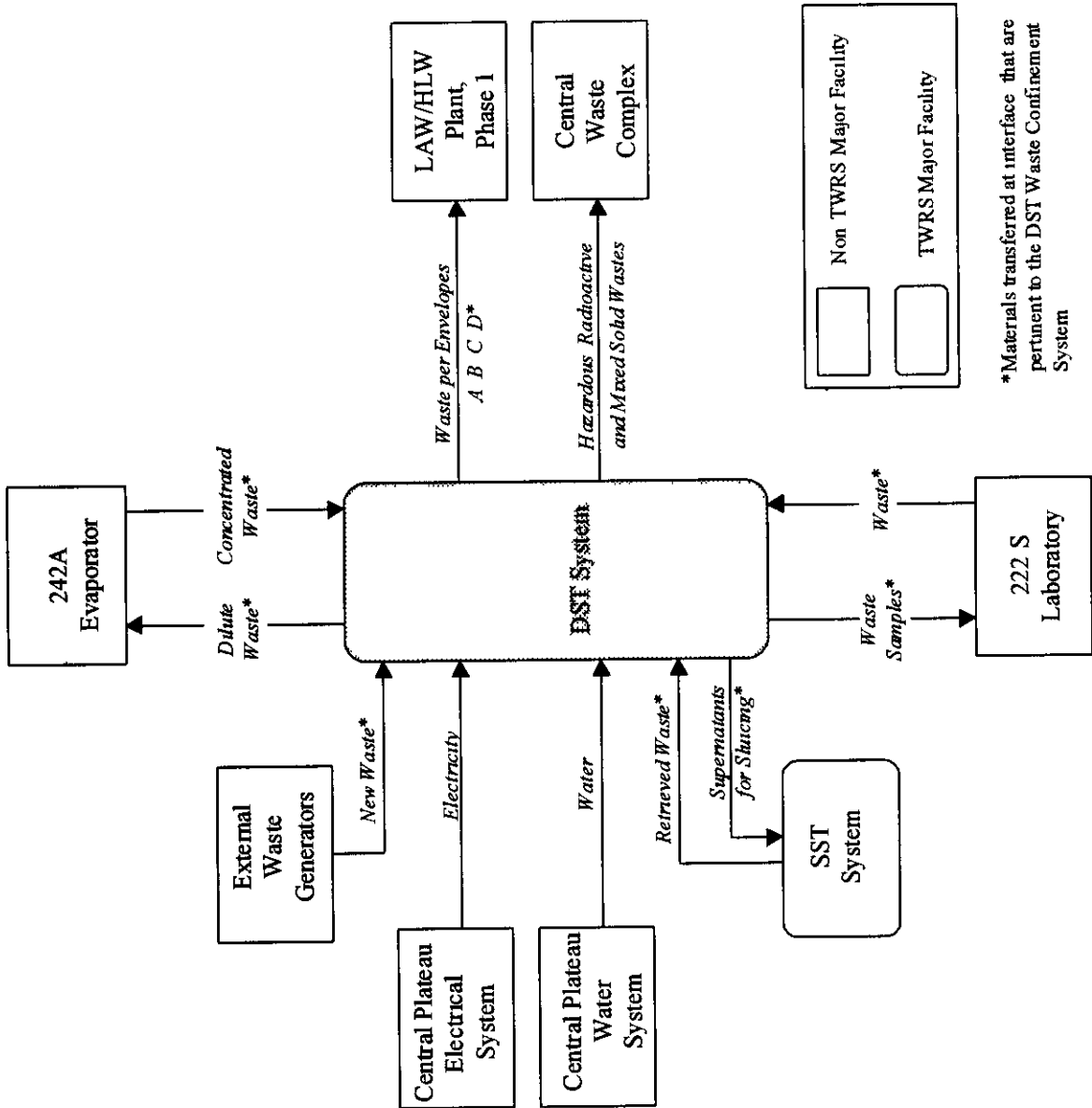
Figure 2 0-3   Double-Shell Tank System Architecture Tree*

*Taken from the DST System Architecture Tree (HNF-4208)

**DST I&C System function and subsystems have been relocated in this figure as compared to the DST System Architecture Tree (HNF-4208) These changes were made as the result of the development of the DST Monitor & Control System Description document (RPP 5586 Rev 0 (Draft) and will be reflected in revisions to HNF-4208)

Legend

GC = Gas Characterization   VTA = Ventilation Tank Annulus

GM = Gas Monitor   VTP = Ventilation Tank Primary

RM = Radiation Monitor   WST = Waste Storage Tank

SALW = Saltwell Equipment   WSTA = Waste Storage Tank Annulus

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3 0 DOUBLE-SHELL TANK CONFINEMENT SYSTEM DESCRIPTION

3 1 OVERVIEW

An analysis was performed to define Confinement System specific functions and architectures as the basis for describing the DST Confinement System This analysis included reviews of the *Functional Analysis for Double-Shell Tank Subsystems* (Smith 1999), the *Tank Waste Remediation System Architectural Tree* (Peck 1999), and all waste storage tank (WST) and Waste Storage Tank Annulus (WSTA) H-14 drawings as summarized in Appendix A A comprehensive list of structures and components associated with the DSTs was developed via this review, and is discussed in Section 3 3

3 2 DOUBLE-SHELL TANK CONFINEMENT SYSTEM DEFINITION METHOD

Based on the DST System specification, the DST System functions include Store Waste in West Area DSTs and Store Waste in East Area DSTs *The Functional Analysis for the Double-Shell Tank System* (Smith 1999) stated that these store waste functions were actually a series of functions to control tank and waste parameters to include monitor and control, and ventilation

A waste confinement function is not included in Smith (1999) and, considering that waste storage functions are considered to be a collection of control activities, it can be concluded that waste confinement in the DST System is the passive act of enclosing (isolating/holding) waste stored in the system It can therefore be concluded that the sole purpose for the DST Confinement System is to passively hold and isolate the waste stored in the DST System, as a platform from which all other active DST functions will be performed

Based on these functional considerations, the boundaries of the DST Waste Confinement System were established by determining all DST components or architectures associated solely with confining waste within DSTs The process and criteria for identifying DST Waste Confinement System components are summarized in Figure 3 2-1

Figure 3 2-1   Double-Shell Tank Waste Confinement System Architecture Identification Process

ARCHITECTURE TREE REVIEW (HNF-4208)	→	WST & WSTA H-14 DRAWINGS REVIEW	SORT BY CRITERIA	DST CONFINEMENT SUBSYSTEM DESCRIPTION

Identify Waste Storage Tank (WST) and Waste Storage Tank Annulus (WSTA) Designators on DST Storage System Subsystems

Sort DST Components (Equipment) Shown on WST and WSTA H 14 Drawings

Define DST Confinement System Boundaries Based on DST Components Related Solely to Confining (Isolating/Holding) Waste w/in DSTs

SORTING CRITERIA

If A Component	Then It Is A
(1) Contains Waste w/in DST	(1) DST Confinement Architecture
(2) Monitors/Controls DST System	(2) DST Monitor & Control Architecture
(3) Cools Waste or Maintains DST Pressure	(3) DST Ventilation System Architecture
(4) Maintains/Changes Waste Physical/Chemical Properties	(4) DST Waste Preparation Architecture

DST = Double-shell tank
WST = Waste Storage Tank
WSTA = Waste Storage Tank Annulus

3 3 DOUBLE-SHELL TANK CONFINEMENT SYSTEM DESCRIPTION

Implementing the methodology described in Section 3 2 yielded the findings shown in detail in Appendix A, and summarized in Table 3 3-1   Given these findings, a composite summary sketch of a DST as depicted on the WST and WSTA H-14 drawings could be made (see Figure 3 3-1)   Figure 3 3-1 depicts a "typical" DST, showing the Confinement System, as well as other non-confinement system equipment, components, etc , that may be found in or on a DST

Table 3 3-1   Double-Shell Tank System Components and Associated Systems and Functions

DST Component	System Function
DST Structure	
Primary Tank (Interior Shell)	DST Confinement System Waste Confinement
Annulus/Leak Detection Pit	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)	DST Confinement System Waste Confinement
Risers / Tank Penetration / Air Lift Circulators (Including Isolation Valves)	DST Confinement System Waste Confinement (Air Lift Circulators are for Waste Cooling but are structurally part of the DST and not considered part of other subsystems)
Intank Equipment	
Level Elements	M&C Waste Level Monitoring
Video Camera	M&C Various
Corrosion/Level Element	M&C Waste Level Monitoring
Mixer Pump	Mixer Pump DST Waste Preparation
Annulus Equipment	
Temperature Elements	M&C Thermal Monitoring
Leak Detection Pit and Assoc Equipment	M&C Leak Detection
Ventilation Instrument Pits	
Continuous Air Monitors	M&C Leak Detection
Flow Control Valves	DST Ventilation System Monitor DST Gas Discharge
Fans	DST Ventilation System Monitor DST Gas Discharge
Temperature Switches	DST Ventilation System Monitor DST Gas Discharge
Misc Pumps Heaters Filters etc	DST Ventilation System Monitor DST Gas Discharge

DST = Double shell tank
M&C = Monitor and control

Figure 3 3-1   Composite Representative Double-Shell Tank

(Typical double-shell tank including attached and inserted equipment)

= Airlift Circulator
= Flow Indicator w/Valve
= Level Element
= Level Indicating Switch
= Motor
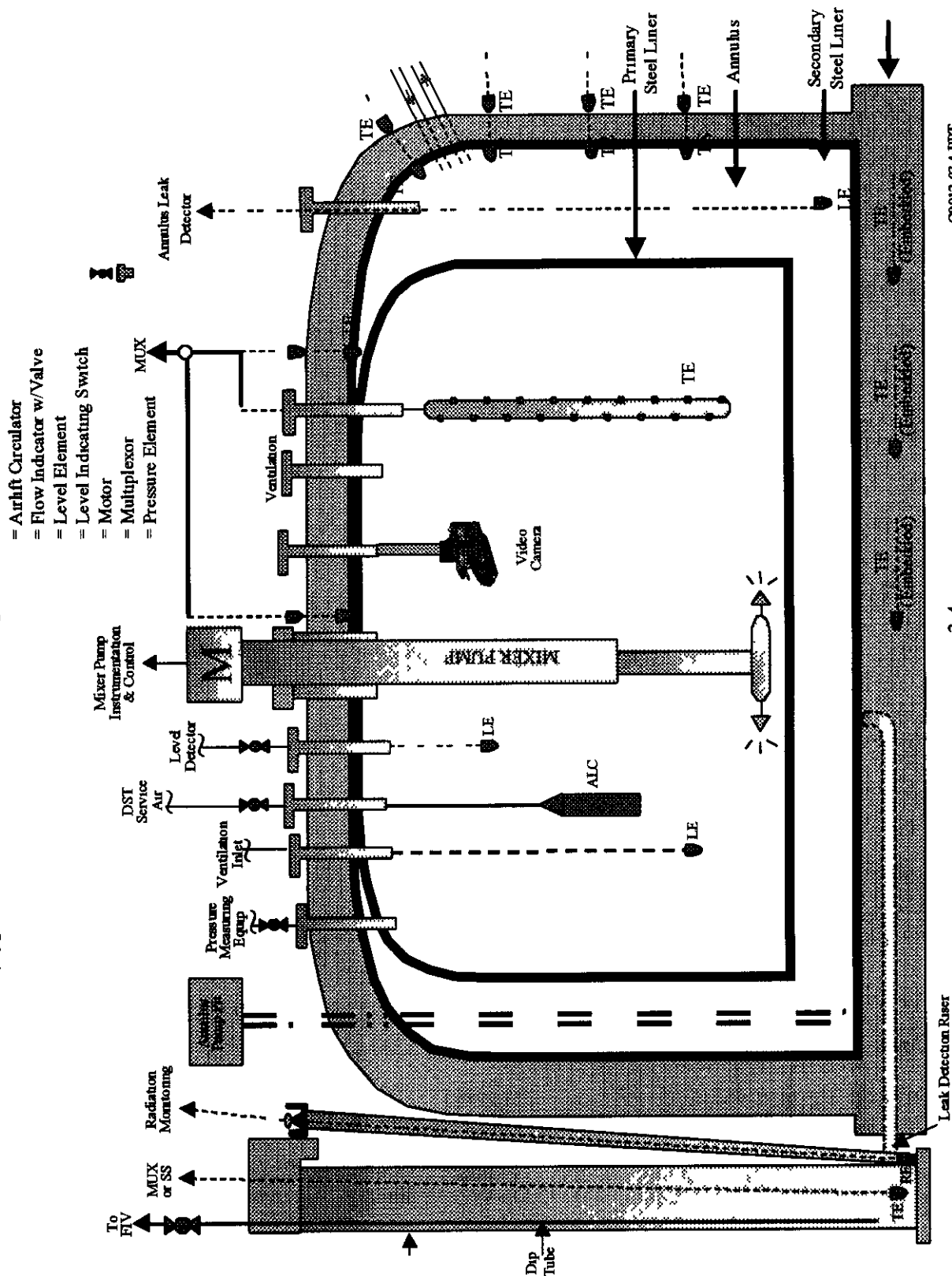= Multiplexor
= Pressure Element

3-4

Table 3 3-1 can be summarized as follows the DST Waste Confinement System is defined as all components of the DST structure, including the primary (inner) tank shell, the secondary (exterior) tank shell, the reinforced concrete base and reinforced concrete surrounding the secondary steel shell, all risers including riser extensions and pads provided for pump installations, and penetrations, all ALCs, and the leak detection pit When the isolation valve occurs immediately at or near the riser, the first isolation valves encountered when moving out from the confinement vessel are included as part of the Confinement System Isolation valves occurring away from the Confinement System riser are not part of the Confinement System For example, isolation valves located away from the originating riser, in other enclosures, buildings, etc , are not part of the Confinement System, they belong to the system to which they are attached The Confinement System does not include annulus pit and annulus pit sensors, etc The DST Confinement System also includes all components that are an inseparable and integral to the DST structure Since the sensors embedded in the DSTs' reinforced concrete components are physically inseparable from the DST structure, they are also included as part of the DST system A representative DST Confinement System sketch, based on the definition and boundaries presented above, is shown in Figure 3 3-2

As a subsystem within the DST System, the DST Waste Confinement System interfaces with other DST subsystems as shown in the DST Confinement System Interface Diagram (Figure 3 3-3) These interfaces include the passing of material between the Confinement System and the Transfer Valving System, Transfer Pump System, DST Service Air System, and DST Maintenance and Recovery System, as well as the physical support of other systems including the DST Monitor and Control System and the Mixer Pump System

Figure 3 3-2   Double-Shell Tank Confinement System
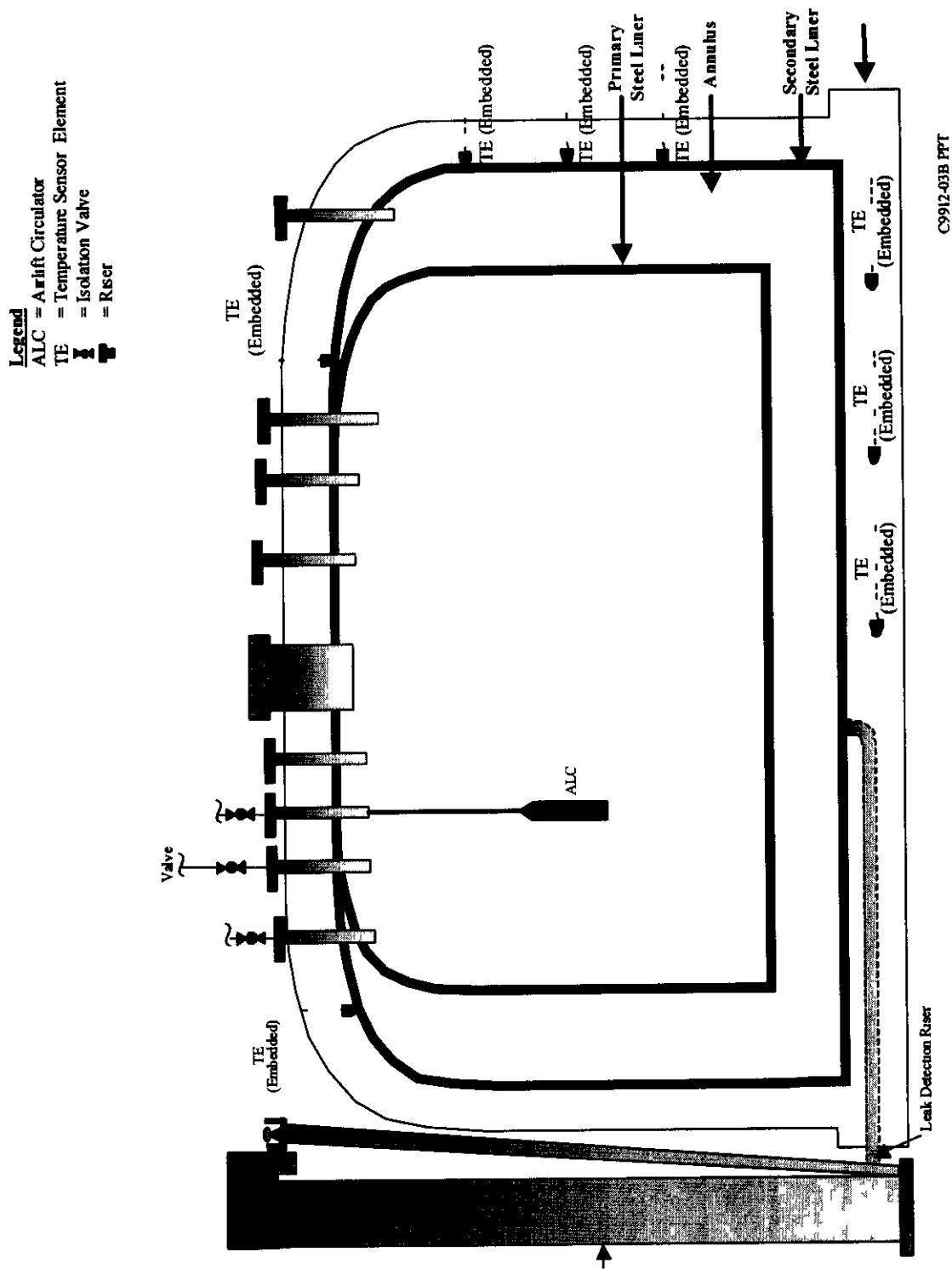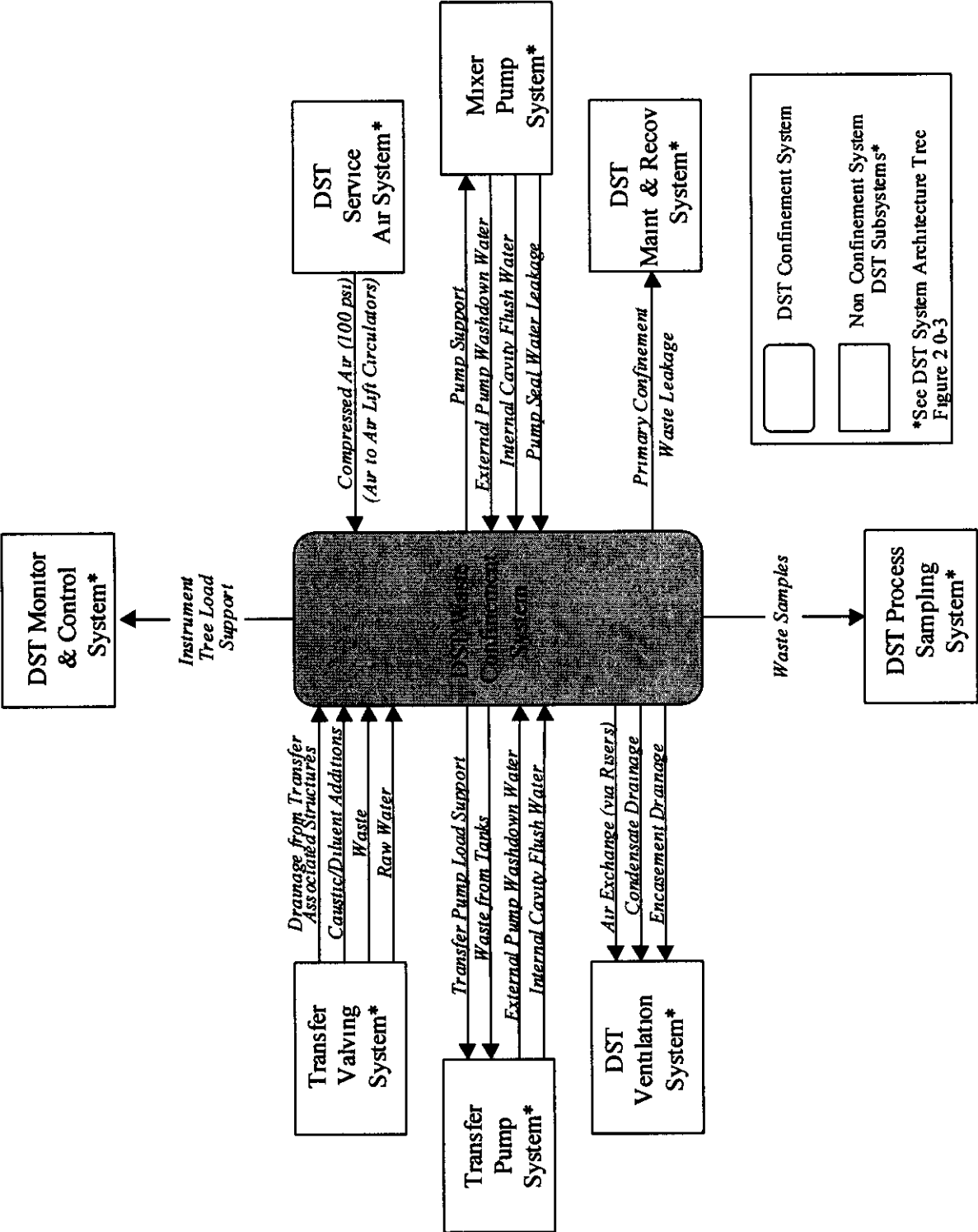
Legend
ALC = Airlift Circulator
TE = Temperature Sensor Element
     = Isolation Valve
     = Riser

C9912-03B PPT

Figure 3 3-3   Double-Shell Tank Confinement System Interface Diagram

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4 0   CONCLUSIONS

The DST Confinement System consists solely of the structures and components that make up the basic DST structure, and excludes all attachments and insertions   The Confinement System performs a passive activity by containing waste   Other systems are attached to or inserted into the DST Confinement System to accomplish the Waste Feed Delivery mission   The DST Confinement Systems, as already existing structures, will not require modification, etc   to accomplish their waste confinement task   A formal specification for the DST Confinement System is, therefore, not necessary

The DST Confinement System is defined as follows

> *The DST Confinement System includes the primary (inner) steel shell   secondary (exterior) steel shell   intermediate annulus area between the shells   reinforced concrete base and concrete surrounding the secondary steel shell   all tank penetrations and risers   including riser extensions   pads provided for pump installations and isolation valves attached to or located immediately adjacent to risers   air lift circulators   leak detection pits   excluding leak detection sensors and equipment   and other components that are an integral part of the DST structure   including sensors embedded in concrete*

While the task of confining DST wastes and architectures for accomplishing this task exists, there are no corresponding functions included in the functional breakdown of the Store Waste function   It is suggested that the *Functional Analysis for Double-Shell Tank Subsystems* (Smith 1999) be revised to include functions for confining waste in the DST system, as subfunctions under Store Waste

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5 0 REFERENCES

Acree, C D , Jr , 1998, *Tank Waste Remediation System Mission Analysis Report*, HNF-SD-WM-MAR-008, Rev 3, Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc , Richland, Washington

Grenard, C E , R D Claghorn R P Marshall, Jr , and M A deLamare, 1998 *System Specification for the Double-Shell Tank System*, HNF-SD-WM-TRD-007 Rev E, COGEMA Engineering Corporation, Richland Washington

Peck, L G , 1999, *Tank Waste Remediation System Architecture Tree*, HNF-4208, Rev 0 Lockheed Martin Hanford Corporation, Richland, Washington

Smith, D F , 1999, *Functional Analysis for Double-Shell Tank Subsystems* HNF-5136, Rev 0, Lockheed Martin Hanford Corporation, Richland Washington

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APPENDIX A

H-14 DRAWING REVIEW FINDINGS OF ARCHITECTURES PHYSICALLY ASSOCIATED WITH DOUBLE-SHELL TANK STRUCTURES

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Drawings Reviewed

Tank Farm	Drawing title	Drawing number
-	Tank Farms System P& ID Drawing/System Legend	H 14 020000
AN	Waste Storage Tank INSTM System (WST) O&M System P&ID	H-14-020601
AN	Waste Storage Tank Annulus System (WSTA) O&M System P&ID	H-14 020501
AN	Dome Penetration Schedules (WST/WSTA) Tank 241-AN-XX	H-14-010501
AP	Waste Storage Tank Annulus Instm Sys (WSTA) O&M Sys P&ID	H-14-020503
AP	Waste Storage Tank INSTM System (WST) O&M System P&ID	H 14 020603
AW	Waste Storage Tank INSTM System (WST) O&M System P&ID	H-14-020602
AW	Waste Storage Tank Annulus INSTM System (WSTA) O&M System P&ID	H-14-020502
AY	IEFD AY Tank farm	H-14-64400
AZ	Waste Storage Tank System (WST) O&M System P&ID	H 14 020607
AZ	Waste Storage Tank Annulus System (WSTA) O&M System P&ID	H-14-020507
SY	Waste Storage Tank Annulus System (WSTA) O&M System P&ID	H-14 020631
SY	Waste Storage Tank Annulus System (WSTA) O&M System P&ID	H-14-020531

AN Tank Farm Components (Identified from Waste Storage Tank and Waste Storage Tank Annulus H 14 drawings)			
DST Component	**AN Tank**	**System**	**System Function**
DST Structure			
Primary Tank (Interior Shell)		WST	DST Confinement System Waste Confinement
Annulus/Leak Detection Pits		WSTA	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)		WSTA	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)		WST	DST Confinement System Waste Confinement
Risers / Tank Penetration (Including Isolation Valves)		WST & WSTA	DST Confinement System Waste Confinement
Air Lift Circulators	107	WST	Waste Cooling
Intank Equipment			
Level Elements	All but 107	WST	M&C Waste Level Monitoring
Temperature Elements	All	WST	M&C Temperature Control
Moisture Elements	102	WST	M&C
Pressure Elements	102	WST	M&C
Virbration Sensor	none		N/A
Video Camera	103 104 105 107	WST	M&C Various
Corrosion/Level Element	107	WST	M&C Waste level
Pumps (Mixer, Motor+A20s, etc)	107	WST	Waste Preparation
Annulus Related Equipment			
Temperature Elements	All	WSTA	M&C Thermal Monitoring
Level Elements	none		N/A
Leak Detection Pit & Assoc Eq	All	WSTA	M&C Leak Detection
Continuous Air Monitors	All	WSTA	M&C Leak Detection
Flow Control Valves	All	WSTA	DST Ventilation System
Fans	All	WSTA	DST Ventilation System
Temperature Switches	2 per Pit	WSTA	DST Ventilation System
Misc Pumps, Heates, Filters, etc	All	WSTA	DST Ventilation System

*Listing includes all DST components etc directly on or inside of DSTs but excludes control rooms etc not physically located with the tank

    DST = Double shell tank

    M&C = Monitor and Control

    WSTA Waste Storage Tank Annulus

AP Tank Farm Components (Identified from Waste Storage Tank and Waste Storage Tank Annulus H 14 drawings)			
DST Component	AP Tank	System	System Function
DST Structure			
Primary Tank (Interior Shell)	All	WST	DST Confinement System Waste Confinement
Annulus/Leak Detection Pit	All	WSTA	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)	All	WSTA	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)	All	WST	DST Confinement System Waste Confinement
Risers / Tank Penetration (Including Isolation Valves)	All	WST & WSTA	DST Confinement System Waste Confinement
Air Lift Circulators	none		N/A
Intank Equipment			
Level Elements	All	WST	M&C Waste Level Monitoring
Temperature Elements	All	WST	M&C Temperature Control
Moisture Elements	102	WST	M&C
Pressure Elements	102	WST	M&C
Virbration Sensor	102	WST	M&C
Video Camera	none		N/A
Corrosion/Level Element	none		N/A
Pumps (Mixer, Motors, etc)	102	WST	Waste Preparation
Annulus Related Equipment			
Temperature Elements	All	WSTA	M&C Thermal Monitoring
Level Elements	All	WSTA	M&C Waste Level Monitoring
Leak Detection Pit & Assoc Eq	All	WSTA	M&C Leak Detection
Continuous Air Monitors	All	WSTA	M&C Leak Detection
Flow Control Valves	All	WSTA	DST Ventilation System
Fans	All	WSTA	DST Ventilation System
Temperature Switches	2 per Pit	WSTA	DST Ventilation System
Misc Pumps, Heates, Filters, etc	All	WSTA	DST Ventilation System
Listing includes all DST components etc directly on or inside of DSTs but excludes control rooms etc not physically located with the tank			

AW Tank Farm Components (Identified from Waste Storage Tank and Waste Storage Tank Annulus H 14 drawings)			
DST Component	**AW Tank**	**System**	**System Function**
DST Structure			
Primary Tank (Interior Shell)	All	WST	DST Confinement System Waste Confinement
Annulus/Leak Detection Pits	All	WSTA	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)	All	WSTA	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)	All	WST	DST Confinement System Waste Confinement
Risers / Tank Penetration (Including Isolation Valves)	All	WST & WSTA	DST Confinement System Waste Confinement
Air Lift Circulators	102	WST	Waste Cooling
Intank Equipment			
Level Elements	All	WST	M&C Waste Level Monitoring
Temperature Elements	All	WST	M&C Temperature Control
Moisture Elements	none		N/A
Pressure Elements	none		N/A
Virbration Sensor	none		N/A
Video Camera	101	WST	M&C Various
Corrosion/Level Element	none		N/A
Pumps (Mixer, Motors, etc)	none		N/A
Annulus Related Equipment			
Temperature Elements	All	WSTA	M&C Thermal Monitoring
Level Elements	All	WSTA	M&C Waste Level Monitoring
Leak Detection Pit & Assoc Eq	All	WSTA	M&C Leak Detection
Continuous Air Monitors	All	WSTA	M&C Leak Detection
Flow Control Valves	All	WSTA	DST Ventilation System
Fans	All	WSTA	DST Ventilation System
Temperature Switches	All	WSTA	DST Ventilation System
Misc Pumps, Heates, Filters, etc	All	WSTA	DST Ventilation System
Radiation Monitor	All	WSTA	M&C Leak Detection
Listing includes all DST components etc directly on or inside of DSTs but excludes control rooms etc not physically located with the tank			

AY Tank Farm Components (Identified from Waste Storage Tank and Waste Storage Tank Annulus H 14 drawings)			
DST Component	AY Tanks	System	System Function
DST Structure			
Primary Tank (Interior Shell)	All	WST	DST Confinement System Waste Confinement
Annulus/Leak Detection Pit	All	WSTA	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)	All	WSTA	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)	All	WST	DST Confinement System Waste Confinement
Risers / Tank Penetration (Including Isolation Valves)	All	WST & WSTA	DST Confinement System Waste Confinement
Air Lift Circulators	102	WST	M&C Temperature Control
Intank Equipment			
Leak Detector Element	102	WST	M&C Waste Level Monitoring
Level Elements	All	WST	M&C Waste Level Monitoring
Temperature Elements	All	WST	M&C Temperature Control
Moisture Elements	none		M&C
Pressure Elements	102		M&C
Virbration Sensor	none		M&C
Video Camera	none		M&C Waste Level Monitoring
Corrosion/Level Element	none		N/A
Pumps (Mixer, Motors, etc)	All		Waste Preparation
Heater	All		M&C Temperature Control
Annulus Related Equipment			
Temperature Elements	All	WSTA	M&C Thermal Monitoring
Leak Detector Element	All	WST	M&C Waste Level Monitoring
Level Elements	All	WSTA	M&C Waste Level Monitoring
Strain Gage	All	WSTA	M&C Waste Level Monitoring
Leak Detection Pit & Assoc Eq	All	WSTA	M&C Leak Detection
Continuous Air Monitors	All	WSTA	M&C Leak Detection
Flow Control Valves	none	WSTA	DST Ventilation System
Fans	none	WSTA	DST Ventilation System
Leak Detector Element	All	WSTA	DST Ventilation System
Temperature Switches	All	WSTA	DST Ventilation System
Temperature Elements	none	WSTA	DST Ventilation System
Misc Pumps, Heates, Filters, etc	All	WSTA	DST Ventilation System
Radiation Monitor	All	WSTA	M&C Leak Detection
Listing includes all DST components etc directly on or inside of DSTs but excludes control rooms etc not physically located with the tank			

AZ Tank Farm Components			
(Identified from Waste Storage Tank and Waste Storage Tank Annulus H 14 drawings)			
DST Component	**Tank**	**System**	**System Function**
DST Structure			
Primary Tank (Interior Shell)	All	WST	DST Confinement System Waste Confinement
Annulus/Leak Detection Pit	All	WSTA	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)	All	WSTA	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)	All	WST	DST Confinement System Waste Confinement
Risers / Tank Penetration (Including Isolation Valves)	All	WST & WSTA	DST Confinement System Waste Confinement
Air Lift Circulators	All		N/A
Intank Equipment			
Level Elements	All	WST	M&C Waste Level Monitoring
Temperature Elements	All	WST	M&C Temperature Control
Moisture Elements	none		N/A
Pressure Elements	none		N/A
Vibration Sensor	none		N/A
Video Camera	none		N/A
Corrosion/Level Element	none		N/A
Pumps (Mixer, Motors, etc)	101	WST	Waste Preparation
Vapor Probe	All	WST	M&C
Annulus Related Equipment			
Temperature Elements	All	WSTA	M&C Thermal Monitoring
Level Elements	none		N/A
Leak Detection Pit & Assoc Eq	All	WSTA	M&C Leak Detection
Continuous Air Monitors	All	WSTA	M&C Leak Detection
Flow Control Valves	All	WSTA	DST Ventilation System
Radiation Sensing Elements	All	WSTA	M&C
Fans	All	WSTA	DST Ventilation System
Temperature Switches	2 per Pit	WSTA	DST Ventilation System
Misc Pumps, Heates, Filters, etc	All	WSTA	DST Ventilation System
Listing includes all DST components etc directly on or inside of DSTs but excludes control rooms etc not physically located with the tank			

SY Tank Farm Components			
(Identified from Waste Storage Tank and Waste Storage Tank Annulus H 14 drawings)			
DST Component	**Tank**	**System**	**System Function**
DST Structure			
Primary Tank (Interior Shell)	All	WST	DST Confinement System Waste Confinement
Annulus/Leak Detection Pit	All	WSTA	DST Confinement System Waste Confinement
Secondary Tank (Exterior Shell)	All	WSTA	DST Confinement System Waste Confinement
Reinforced Concrete (Including Imbedded Sensors)	All	WST	DST Confinement System Waste Confinement
Risers / Tank Penetration (Including Isolation Valves)	All	WST & WSTA	DST Confinement System Waste Confinement
Air Lift Circulators	102	WST	Waste Cooling
Intank Equipment			
Level Elements	All	WST	M&C Level
Temperature Elements	All	WST	M&C Temperature Control
Moisture Elements	101 103	WST	M&C
Pressure Elements	101	WST	M&C
Density Elements	101	WST	M&C
Speed/Velocity Element	101	WST	M&C
Strain Gauge	101	WST	M&C
Virbration Sensor	101	WST	M&C
Video Camera	101 103	WST	M&C Various
Radar Gauge	101	WST	M&C
Corrosion/Level Element	none		N/A
Pumps (Mixer, Motor+A24s, etc)	101	WST	Waste Preparation
Annulus Related Equipment			
Temperature Elements	All	WSTA	M&C Thermal Monitoring
Level Elements	none		N/A
Leak Detection Pit & Assoc Eq	All	WSTA	M&C Leak Detection
Continuous Air Monitors	All	WSTA	M&C Leak Detection
Flow Control Valves	All	WSTA	DST Ventilation System
Fans	All	WSTA	DST Ventilation System
Temperature Switches	2 per Pit	WSTA	DST Ventilation System
Misc Pumps, Heates, Filters, etc	All	WSTA	DST Ventilation System
Listing includes all DST components etc directly on or inside of DSTs but excludes control rooms etc not physically located with the tank			

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