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been divided into smaller sections.

Section 3 OF 3

Document Information			
Document #	0500555		
Title	LETTER FROM R. SCHEPENS TO M. WILSON "FINAL DANGEROUS AND MIXED WASTE RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMIT FOR THE DEMONSTRATION BULK VITRIFICATION FACILITY REQUIRED SUBMITTAL - REVIEW OF WASTE RECEIPT TANK SYSTEM"		
DATE	05/04/2005		
Originator	MA WILSON	Originator Co.	DOEC
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Keywords			
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Other Information			


TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-027	REV. 1
PROJECT NO.:	145579	WASTE TRANSFER PUMP SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix E
Bidder's Drawing and Data Commitments
(4 pages including cover)



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-027.1	REV. 1
PROJECT NO.:	145579	WASTE TRANSFER PUMP SKID	
CLIENT:	AMEC E&E - Richland, Washington		
		EQUIPMENT NO.: 32-D58-007	

BIDDER'S DRAWING AND DATA COMMITMENTS

Vendor shall supply all drawings, manuals and documentation in the quantities indicated. Approval drawings are due within the listed number of calendar days after issue of the Purchase Order or Letter of Intent. The dates set out for drawing and data submissions are governed by the engineering design schedule of the project. The Vendor shall supply one Autocad disk file and requested number of copies within the listed number of calendar days. Final drawings must be certified as correct and bear the Vendors name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revision numbers, quantities, status and document types must be included with all submissions (including electronic submittals)

SEND ALL DOCUMENTS TO:	DMJM+H, Inc. dba DMJM Technology 3250 Port of Benton Blvd Richland, WA 99354-1670 Attn: Project Records Phone: (509) 375-7856 Fax: (509) 375-5331
Submit all documents via courier service Faxed documents must be followed by the originals. Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control Always include a transmittal	

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal	Bidder shall include this data for each item		REVIEW	VENDOR
	Review	Required before ordering or start of fabrication	ITEMS DUE	COMMITMENT
		Final	WITHIN	
		Required within 7 days prior to shipment and before final payment	(DAYS)	(DAYS)
PROPOSAL	REVIEW	FINAL	DESCRIPTION	
E+3			Proof of NQA-1 or equivalent QA program	
E+3			Experience list and maintainability information	
E+3			Completed data sheet	
E+3			Subcontractor list	
E+3	E+3		Design, fabrication & delivery schedule	PO+7
	E+3		90% Design and Fabrication Package including: - Drawings - Calculations - Completed Equipment Data Sheets - Vendor Cut Sheets/Technical Brochures - Bill of materials	PO+14
	E+3		Test Plan/Test Procedure	PO+28
	E+1		NDE personnel certifications	PO+28
	E+1		Visual Weld/NDE procedures	PO+28
	E+3		100% Design and Fabrication Package including: - Mechanical, Structural and Electrical Drawings - Mechanical, Structural and Electrical Calculations - Completed Equipment Data Sheets - Vendor Cut Sheets/Technical Brochures - Bill of materials	PO+28
	E+1		Visual weld examination procedure/weld map	Fab-10
	E+3		Welding procedures, procedure qualification records, and welder procedure qualification records	Fab-10
	E+3		AWS CWI certificate	Fab-10



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-027.1	REV. 1
PROJECT NO.:	145579	WASTE TRANSFER PUMP SKID EQUIPMENT NO.: 32-D58-007	
CLIENT:	AMEC E&E - Richland, Washington		

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SEND ALL DOCUMENTS TO:	DMJMH+N, Inc. dba DMJM Technology 3250 Port of Benton Blvd Richland, WA 99354-1670 Attn: Project Records Phone: (509) 375-7856 Fax: (509) 375-5331
Submit all documents via courier service Faxed documents must be followed by the originals. Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control Always include a transmittal	

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal	Bidder shall include this data for each item			REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (DAYS)
	Review	Required before ordering or start of fabrication			
		Final	Required within 7 days prior to shipment and before final payment		
PROPOSAL	REVIEW	FINAL	DESCRIPTION	(DAYS)	(DAYS)
	E+3		Material Control Procedures	Fab-10	
	E+3		Protective coating specifications and application procedure	Fab-10	
	E+3		Fabrication travelers	Fab-10	
	E+3		Cleaning procedures	Fab-10	
		E+1	NCR's	When identified +3	
		E+3	Fabrication red-line changes	When identified	
		E+1	Preliminary Data Package Including: - Recommended spare parts and frequency of replacement - Rigging sketches - System assembly instructions - Operation and maintenance manuals - Field Calibration Procedures and Reports - Inspection Reports - CoC's / CMTRs - NEC inspection certificate & electromagnetic interference test results	FAT-10	
	E+3	E+1	Packaging and Shipping Plan	Del-21	

DMJM technology

**TECHNICAL SPECIFICATION**

PROJECT:	Final DBVS Design	145579-D-SP-027	REV. 1
PROJECT NO.:	145579	WASTE TRANSFER PUMP SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix F**TFC-ESHQ-Q_C-C-03, Revision B, *Control of Suspect/Counterfeit Items*****(53 pages including cover)**

WASTE TRANSFER PUMP SKID
16-Dec-04

CH2M HILL Hanford Group, Inc.	Manual	ESHQ
	Document	TFC-ESHQ-Q_C-C-03, REV B
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	Issue Date	December 31, 2003
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1.0 PURPOSE AND SCOPE (7.1.1, 7.1.2, 7.1.3, 7.1.4)

This procedure describes the process for the identification, prevention, evaluation, notification, and disposition of suspect/counterfeit items (S/CIs) at CH2M HILL. This procedure applies to items that are:

- In the procurement cycle
- In source or receiving inspection
- In inventory at warehouses and staging areas
- Installed
- In operation.

This procedure applies to:

- Company ordered material
- Material supplied by subcontractors
- Material and test equipment supplied by test sponsors
- Construction
- Fabrication shops
- Laboratory work and experiments
- Surplus/excess property
- Government property
- Material obtained from U.S. Department of Energy (DOE) sources.

2.0 IMPLEMENTATION

This procedure is effective on the date shown in the header.

3.0 RESPONSIBILITIES

3.1 Procurement Personnel

Maintain awareness of S/CI and support S/CI program implementation.

3.2 Inspection Personnel

Perform inspections for conformance or acceptance of material including verifications that the item(s) being inspected do not exhibit indications attributed to potential suspect/counterfeit items.

3.3 Quality Assurance Engineer

1. Ensures appropriate procurement controls are implemented to preclude entry of S/CI to the site through review of procurement documents.
2. Notifies the S/CI coordinator of nonconformance reports (NCRs) associated with S/CI.

3.4 S/CI Coordinator

Apprises company, DOE, and DOE local Office of the Inspector General personnel of S/CI status and final disposition.

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3.5 Assigned Engineering Personnel

1. Evaluate S/CI information for applicability to design and procurement specifications, system configuration, and operating conditions.
2. Provide technical specifications, critical characteristics, and acceptance methods in support of procurement and inspection activities to prevent introduction of S/CI.

3.6 Responsible Managers and Supervisors

1. Maintain awareness of S/CI.
2. Control potential S/CI.
3. Evaluate training needs based on job classification and ensure individuals receive training in S/CI awareness, prevention, detection, and reporting, as appropriate, to respective assignments.

4.0 PROCEDURE

4.1 Introduction

The two most common S/CIs found at DOE facilities have been threaded fasteners fraudulently marked as high-strength bolts, and refurbished electrical circuit breakers sold and distributed under false certifications. Purchasers have also been misled into accepting S/CIs that do not conform to specified requirements by falsified documentation.

NOTE: Questions about a specific item should be referred to the S/CI coordinator. Attachment A provides a historical listing of suspect components. Equipment/material types or classes have been established to identify those specific items which are classified as potentially misrepresented or S/CI. Attachment B provides a listing of those classifications and items subject to S/CI control at tank farm facilities.

4.2 Procurement

CH2M HILL
Personnel

1. Ensure material requirements are specified in subcontracts to preclude the purchase or introduction of S/CI. Use the information in Attachments A, B, C, D, E, F, G, H, and I to identify specific components, characteristics, precautions, and other considerations that are to be addressed during the procurement process to prevent introduction of S/CI.
2. Ensure material requests for quality level 1, 2, and 3 items and services include appropriate technical specifications, procurement quality clauses, documentation, and inspection requirements to prevent introduction of S/CI.
3. In maintenance and construction/fabrication subcontracts, specify appropriate requirements to preclude the purchase or introduction of S/CI.

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- | | |
|----------------------------|--|
| Quality Assurance Engineer | 4. Review procurement documents to ensure they contain the appropriate procurement controls to preclude entry of S/CI to the site. |
| Procurement Personnel | 5. Ensure vendor selection complies with qualification requirements for the quality level of the items and services and is based on the vendor's ability to demonstrate the capability of delivering acceptable items. |

4.3 Inspection for Potential S/CI

- | | |
|-------------------------------|---|
| Bill of Material Preparers | 1. For quality level 0 and P-Card items listed in Attachment B, designate an S/CI inspection in the special instruction of the Bill of Material (BOM) in accordance with the requirements of <u>TFC-BSM-FPM_MC-C-01</u> . |
| | 2. Ensure quality level 0 and P-Card items are inspected prior to material issuance. |
| First Line Manager | 3. Obtain on-site S/CI inspection for quality level 0 and P-Card items prior to material issue and use. |
| Engineering Personnel | 4. Provide technical specifications, critical characteristics, and acceptance methods to facilitate inspection planning for S/CI prevention and detection. |
| Quality Assurance Engineer | 5. Ensure S/CI detection criteria is incorporated into QA inspection planning activities. |
| Assigned Inspection Personnel | 6. Use Attachments G, H, and I as resources for detecting S/CIs during walkdowns and inspections. Specific items are subject to inspection. |
| | 7. Verify and document that the items being inspected do not exhibit indications attributed to potential S/CIs as described in Attachments G through J. |
| | 8. If an S/CI is detected during inspection activities, document and control the S/CI in accordance with <u>TFC-ESHQ-Q_ADM-C-02</u> . |

4.4 Control of Material Identified as S/CI

- | | |
|---------------------------------|--|
| Responsible Manager or Delegate | 1. Ensure items identified as potential S/CI are documented as nonconforming and controlled in accordance with <u>TFC-ESHQ-Q_ADM-C-02</u> . Non conformances identified as S/CI shall be reviewed and processed within four working days to determine whether or not the items are S/CI. |
| | 2. Transfer tagged S/CIs to 2101-HV for storage. |
| Cognizant Quality Engineer | 3. Notify the S/CI coordinator of all NCRs associated with the S/CI. |

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4.5 Reporting of S/CI

Assigned Company
Personnel

1. Report all items identified as potential S/CI in accordance with TFC-OPS-OPER-C-24. (7.1.1)

NOTE: Reporting of S/CIs is required regardless of safety class, where the S/CIs are located (receiving inspection, inventory/storage areas, fabrication and maintenance areas, installed, etc.), or their operating status.

S/CI Coordinator

2. Notify the DOE S/CI coordinator of all occurrence reports associated with S/CIs. As appropriate, transmit copies of NCRs and applicable documentation.
3. Notify the DOE local Office of Inspector General of all S/CIs. Notification should be e-mailed to the DOE local Office of Inspector General points of contact providing information in the following format:

- NCR number
- Date NCR was written
- Purchase order/job control number (if known)
- End use of product
- Name of manufacturer, distributor, supplier
- Safety class (if known)
- Occurrence report number
- Value of item(s)
- Point(s) of contact
- Description of item(s)
- Quantity
- Description of nonconformance
- Any other pertinent information that would help the DOE local Office of Inspector General.

4.6 Acceptance, Removal, and Disposition of S/CI

S/CI Coordinator

1. Notify responsible company personnel that S/CI may not be destroyed or disposed of without written release from the DOE local Office of Inspector General.
2. Prior to destroying or disposing of S/CIs, consult the Inspector General to determine if there is a need to retain the items as evidence for potential litigation. Based on the Office of Inspector General's decision, either:
 - a. Retain S/CI material as evidence for potential litigation, or
 - b. Release S/CI material for final disposition and/or disposal as directed by the S/CI coordinator.

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- | | |
|-------------------------------|---|
| Engineering
Personnel | 3. Evaluate S/CI to determine if its use could create a safety hazard in its current/proposed application. |
| Assigned Company
Personnel | <p>4. If the engineering evaluation of the S/CI has determined that its use could not create a safety hazard in its current/proposed application:</p> <p>a. Disposition the S/CI to remain in place.</p> <p>NOTE: Criteria for dispositioning S/CI is by acceptance, removal, or replacement after an engineering evaluation. This should be based on the deficient characteristic of the particular item.</p> <p>b. Identify the accepted S/CI by marking with orange paint or other appropriate methods and note its location.</p> <p>c. In areas where operating temperatures are 500°F and above or are subject to cyclic loading where fatigue failure is likely to occur, replace all grades 8 and 8.2 S/CI fasteners prior to further use of the equipment.</p> <p>d. Engineering must also identify a way to prevent its reuse in an application it may not be suitable for.</p> <p>e. If removed, prepare the S/CI for disposal.</p> <p>5. If the engineering evaluation of the S/CI has determined that its use could create a safety hazard in its current/ proposed application:</p> <p>a. Contact Waste Feed Operations (WFO) Shift Operations to secure the equipment.</p> <p>b. Remove the S/CI as soon as practical.</p> <p>c. Tag, segregate, or otherwise control the S/CI to prevent inadvertent use.</p> <p>d. Prepare the S/CI for disposal.</p> |
| S/CI Coordinator | <p>6. Ensure that all S/CI material dispositioned for disposal is properly controlled and arranged for the material to be permanently and irrevocably altered so that it cannot be used. Examples of alterations include:</p> <ul style="list-style-type: none"> • Melting • Shredding • Destroying the threads on fasteners. |

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7. If the DOE/Office of Inspector General has approved disposal, arrange for pick-up and disposal of the altered S/CI material on a yearly basis. Burying S/CIs may be acceptable if they do not contain hazardous material or material prohibited by federal, state, or local regulations.

4.7 Surplus/Excess Material

- | | |
|--------------------------|---|
| Responsible
Personnel | <ol style="list-style-type: none"> 1. Remove S/CI from surplus/excess material before they are released for sale or transfer of accountability. 2. Ensure surplus items received from DOE or other facilities are inspected for S/CI prior to installation. |
|--------------------------|---|

4.8 Assessments

- | | |
|-------------------|--|
| Quality Assurance | <ol style="list-style-type: none"> 1. Conduct assessments of the effectiveness of the S/CI program.

NOTE: The assessment should be performance based and designed to determine if company activities are conducted in accordance with this procedure, DOE 414.1A, DOE O 440.1A, DOE G 440.1-6, and 10 CFR 830, Subpart A. 2. Lines of inquiry will be used as appropriate during assessments in areas that interface with the S/CI process. See Attachment J. |
|-------------------|--|

4.9 Training

- | | |
|-----------------------------|---|
| Managers and
Supervisors | <ol style="list-style-type: none"> 1. Evaluate individual training needs of assigned personnel to ensure they are proficient in S/CI identification and control procedures within their areas of responsibility. 2. All personnel involved in the following specific areas will receive S/CI process and hands-on training, whether it be formal, continuing training, or required reading. The formal training course that is available is Module #1, Course 170720, "Suspect/Counterfeit Items." <ul style="list-style-type: none"> • Quality Assurance/technicians • Engineers (design, systems, etc.) who procure materials/equipment • Maintenance personnel (electricians, pipefitters, millwrights, instrument technicians) • Warehouse personnel who handle and process materials/equipment • Tool Crib attendants. |
|-----------------------------|---|

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5.0 DEFINITIONS

Counterfeit part. A part made or altered so as to imitate or resemble an "approved part" without authority or right, and with the intent to mislead or defraud by passing the imitation as original or genuine. (Source: U. S. Department of Transportation Federal Aviation Administration Advisory Circular 21-29B, Detecting and Reporting Suspected Unapproved Parts).

Fastener (regardless of the safety classification). (Source: Fastener Quality Act, Public Law 101-592 as amended by Public Law 104-113).

- A screw, nut, bolt, or stud with internal or external threads or a load-indicating washer with a nominal diameter of 5 millimeters or greater in the case of such items described in metric terms; or 1/4 inch or greater in the case of such items in terms of the English system of measurement which contains any quantity of metal and held out as meeting a standard or specification which requires through-hardening; or
- A screw, nut, bolt, or stud having internal or external threads which bears a grade identification marking required by a standard or specification; or
- A washer to the extent that it is subject to a standard or specification applicable to a screw, nut, bolt, or studs described above, except that such term does not include any screw, nut, bolt, or stud that is produced and marked as American Society for Testing and Materials (ASTM) A 307 Grade A or produced in accordance with ASTM F432.

Grade identification. Any symbol appearing on a fastener purporting to indicate that the fastener's base material, strength properties, or performance capabilities conform to a specific standard of a consensus standards organization or government agency.

Graded classifications. System used to determine minimum requirements for structures, systems and components (e.g., design, operation, procurement, and maintenance requirements). The graded classifications in order of precedence are safety class, safety significant, and enhanced quality general services.

High strength graded fastener. Fasteners having a minimum tensile strength of 75 ksi, including those produced and procured in accordance with the Society of Automotive Engineers Standard J429, Grades 5, 5.2, 8, and 8.2; ASTM Standard A325, Types 1, 2, and 3; ASTM A490, ASTM A354, ASTM A449 (I&II), and some ASTM F468.

Item. An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, or unit. (Source: ASME-NQA-1-1989, Quality Assurance Requirements for Nuclear Facilities).

An all-inclusive term used in place of any of the following: appurtenance, facility, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, documented concept, or data. (Source: DOE G 440.1-6, Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10 CFR 830.120; and DOE 5700.6C, Quality Assurance).

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Substantial safety hazard. A loss of safety function to the extent that there is a major reduction in the degree of protection to the public or employee health and safety. (Source: U.S. Department of Energy (DOE) M 232.1-1A, "Occurrence Reporting and Processing of Operations Information").

Suspect/counterfeit items. A suspect item is one in which there is an indication by visual inspection, testing, or other information that it may not conform to established Government or industry-accepted specifications or national consensus standards. A counterfeit item is a suspect item that is a copy or substitute without legal right or authority to do so or one whose material, performance, or characteristics are knowingly misrepresented by the vendor, supplier, distributor, or manufacturer. An item that does not conform to established requirements is not normally considered S/CI if the nonconformity results from one or more of the following conditions, which should be controlled by site procedures as nonconforming items:

- Defects resulting from inadequate design or production quality control
- Damage during shipping, handling, or storage
- Improper installation
- Deterioration during service
- Degradation during removal
- Failure resulting from aging or misapplication, or
- Other controllable causes.

(Source: DOE G 440.1-6, Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, "Worker Protection Management;" 10 CFR 830.120; and DOE 700.6C, "Quality Assurance").

6.0 RECORDS

No records are generated during the performance of this procedure.

7.0 SOURCES

7.1 Requirements

1. DOE-O-232.1A Part 4.f. (1), "Occurrence Reporting and Processing of Operations Information." (S/RID)
2. DOE O 414.1A, "Quality Assurance."
3. 10 CFR 830, Subpart A, "Quality Assurance Requirements."
4. DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees."

7.2 References

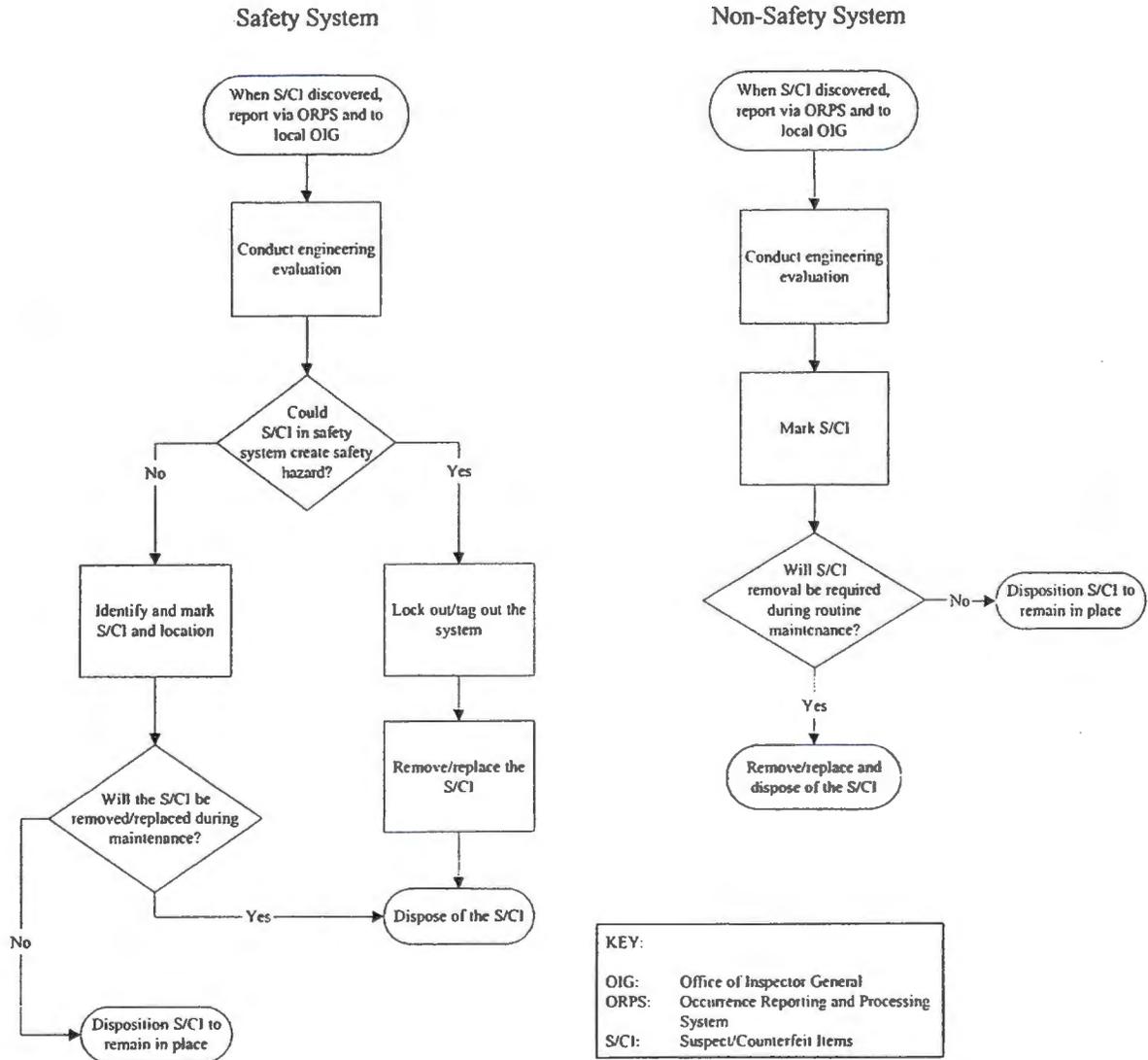
1. HNF-SD-MP-SRID-001, "Standards/Requirements Identification Document for the Tank Farm Contractor."

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2. DOE G 440.1-6, "Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10CFR830.120; and DOE5700.6C, Quality Assurance."
3. NRC Information Notice 89-70: "Possible Indications of Misrepresented Vendor Products."
4. NRC Information Notice 89-70, Supplement 1: "Possible Indications of Misrepresented Vendor Products."
5. TFC-BSM-CP CPR-C-01, "Purchasing Card (P-Card)."
6. TFC-BSM-CP CPR-C-03, "Buyer's Technical Representative Process."
7. TFC-BSM-CP CPR-C-06, "Procurement of Items (Materials)."
8. TFC-BSM-CP CPR-C-09, "Supply Chain Process."
9. TFC-BSM-CP CPR-C-11, "Acquisition Planning."
10. TFC-BSM-FPM MC-C-01, "Material Receipt, Storage, Issuance, Return, and Excess Control."
11. TFC-ESHQ-Q ADM-C-02, "Nonconforming Item Reporting and Control."
12. TFC-OPS-OPER-C-24, "Occurrence Reporting and Processing of Operations Information."
13. TFC-PLN-03, "Engineering Program Management Plan."

**CONTROL OF SUSPECT/
COUNTERFEIT ITEMS**

Figure 1. Management of Suspect/Counterfeit Items.



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ATTACHMENT A - SUSPECT COMPONENTS LIST

This list was extracted from the U.S. Department of Energy Quarterly Reports on the "Analysis and Trending of Suspect/Counterfeit Items at Department of Energy Facilities," July 1997.

NOTE: It is not necessarily a negative reflection on a supplier or manufacturer if S/CIs are reported regarding its particular product. Reputable manufacturers and suppliers have a vital interest in preventing the manufacture or distribution of S/CI associated with themselves. It may be that the supplier or manufacturer was victimized and is pursuing S/CI associated with its products in an aggressive, prudent, and professional manner in order to get such items off the market. Therefore, each particular case regarding the manufacture or supply of S/CI must be examined on its own merit without making premature conclusions regarding fault or culpability of the manufacturer or supplier whose name is associated with the S/CI. In short, what follows is a "suspect components list" and not a "suspect manufacturer or supplier list." The manufacturer or supplier identified in the following table should not be considered to have engaged in any wrongdoing without additional information.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (Component Examples)			
	<ul style="list-style-type: none"> • TF136090 • TF361050WL • TED1130020 	Commercial Grade	Westinghouse Electric Supply Co. (WESCO)	NRC I.N. 91-48
	<ul style="list-style-type: none"> • Not Provided 			
	<ul style="list-style-type: none"> • DB-25 & DS-416 	Low Voltage	Satin America & Circuit Breaker Systems, Inc.	NRC I.N. 89-45 & Supplement #2
	<ul style="list-style-type: none"> • FSN-5925-628-0641 • DB-25 • DB-50 • HKB3150T • FB3020 • FB3070 • FB3050 • EHB3025 • LBB3125 • HKA31250 • JA3200 • EHB2100 • 225N 	Trip units; Navy Trip units; 1, 2, & 3 pole various amp. ratings	General Circuit Breaker & Electrical Supply	NRC I.N. 88-46, Supplements and Attachments
	<ul style="list-style-type: none"> • EB 1020 • HDEA 2030 • MCP331100R • MCP431550CR • BAB3060H • 656D14 8G03 • FA-2100 • EH-2050 • HFB-3050 • HFD(B)-3020 • MA3600 • F2020 • EH2100 • EB3050 • HMC3800F • EA2090 • FA3125 • HMCP 150 		HLC Electrical Supply	Office Of Nuclear Safety 93-9
			California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	
			ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
			Molded Case Circuit Breakers	
			NSSS, Inc.	
			Spectrum, Tech.	
			Rosen Electric	
		Luckow Circuit Breaker		

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)			
	<ul style="list-style-type: none"> • HFD • EH2070 • FA2050 • JA2225 • JL3B125 • JL3B070 • JL3B150 • JL3B200 • JL3B090 • JL3B100 • HLM3800T • F3100N • MA3500 • EH2015 • FA3035 • FA2100 • HLA2125OTM • EH2070 • JB3100 • EB2030 • 8MC800 • CAH3200 • EHB3040 • JL3-B150 • JL3-B200 • JL3-B090 • JL3-B1000 • HFA, HFB, FA • JL3-(B)8070 • JL3-B125 • EH-2020 • FA-3035 • EH-2050 • FA-2100 • FA-2050 • HFB-3050 • JA-2225 • HLM3800T • F3100N • MA3500 • EH2015 • LA3200WL • HLA3200T • 2602D58U9 	Shunt Trips Aux. Contacts 2 & 3 pole circuit breakers of various amperages	<p>General Circuit Breaker & Electrical Supply</p> <p>HLC Electrical Supply</p> <p>PENCON International (DBA) General Magnetics/ Electric Wholesale</p> <p>ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply</p> <p>Molded Case Circuit Breakers Co. (MCCB)</p>	NRC I.N. 88-46 Supplements and Attachments

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)			
	<ul style="list-style-type: none"> • HLB3200T • 262156G19 • 1A & 1B • HL300T • HLA2400TM • HMA3600T • HMA3700T • HKA3225T • HNB2700T 	225 amp, 3 pole 3 pole, 20 amp 3 pole, 30 amp 1 pole, 20 & 30 amp 2 pole, 20 & 30 amp 3 pole, 60 amp	Not Provided	NRC I.N. 88-46 Supp. & Attach.
	<ul style="list-style-type: none"> • MDL#KAF • QNB3020 • QNB3030 • BA 	3 pole, 20 amp	Not Provided	SENS ID #10 3-17-89 SENS ID #11 3-3-89
	<ul style="list-style-type: none"> • BA • BA • E3060 • F3020 			SENS Report ID #12 10-19-88 NRC I.N. 88-46
Circuit Breakers	ITE (Component Examples)			
	<ul style="list-style-type: none"> • Model - E43B015 	3-phase 480 volt	Cal. Breakers/Elect. Wholesale Supply Co.	SENS Report ID #8, 5-5-89
	<ul style="list-style-type: none"> • EQ-B • EE-3B030 	1 pole, 20 amp 3 pole, 30 amp	Not Provided	SENS ID #10 3-17-89 SENS ID #11 3-3-89
	<ul style="list-style-type: none"> • EF3B070 • EF3H050 • EF3B125 • EF3B040 • E42B020 • Q12B200 • JL3B400 	2 & 3 pole various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply	NRC I.N. 88-46, Supplements and Attachments

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	ITE (cont.) (Component Examples) <ul style="list-style-type: none"> • HE9B040 • EE3B050 • BQ2B030 • EE3B070 • EE2B100 • EE2B050 • EE2B030 • FJ3B225 • ET • KA • EH-313015 • JL-3B070 • JL-3B150 • E43B015 • EF2-B030 • EH3B100 • QP1B020 • QJ3B200 • EF3B100 • 1193 		California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ATS Circuit Breakers, Inc. Panel Board Specialties Rosen Electric Equipment	
Circuit Breakers	ITE, Gould & ITE Imperial Brown Boveri Elect. (BBE) ASEA Brown Boveri (Component Examples) <ul style="list-style-type: none"> • Type HK • 5 HK • 7.5 HK • 15 HK • 38 HK • ITE 62-6 	Not Provided ID-4KV Not Provided Not Provided Not Provided	Brown Boveri ASEA Brown Boveri	NRC I.N. 89-86 NRC I.N. 87-41 Office of Nuclear Safety, 92-25
Circuit Breakers	Square "D" Co. Component Examples <ul style="list-style-type: none"> • KHL 36125 (Any Type) 	Molded Case	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale	NRC I.N. 88-46 Supp. & Attach. NRCB 88-10 NRC I.N. 90-46

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Square "D" Co. Component Examples (cont.)		ANTI THEFT Systems Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
	• QOB220	1 pole, 15 amp	Not Provided	SENS ID #10 3-17-89
	• QO220 • LO-3	2 & 3 pole 20 & 50 amp breakers	General Circuit Breaker & Electrical Supply	NRC I.N. 89-45 & Supplement #2
	• SBW-12 • 989316 • FAL3650-16M or • FAL36050-16M • KA36200	3 pole - 200 amp breaker 30A/600V	HLC Electric Supply California Breakers, Inc.	
• 999330	Not Provided	PENCON International (DBA) General Magnetics/Electric Wholesale		
Manufacturer not Provided	Not Provided	Stokely Enterprises	DOE Letter 8-26-91 Reprinted NuVEP: Bulletin 7-26-91	
• EHB3025		Molded Case Circuit Breakers		
Circuit Breakers	Fed. Pacific (Component Examples)		General Circuit Breaker & Electrical Supply	
	• NEF431020R • NE111020 • NE	3 pole, 20 amp 1 pole, 20 amp 1 pole, 15 amp	HLC Electric Supply	
			California Breakers, Inc.	
		PENCON International (DBA) General Magnetics/Electric Wholesale	SENS ID. #10 3-17-89	

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Fed. Pacific (Component Examples) (cont.)	1, & 3 pole - 30, 60 & 100 amp breakers	ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	SENS ID. #11 3-3-89
	<ul style="list-style-type: none"> • NF63-1100 • NE22-4060 • NE22-4100 • NEF-433030 • 2P125 		General Circuit Breaker & Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers	Jefferson (Component Examples)	Not Provided	HLC Electric Supply	
			California Breakers, Inc.	
Circuit Breakers	Superior (Component Examples)	Not Provided	PENCON International (DBA) General Magnetics/electric Wholesale	NRC I.N. 88-46, Supp. & Attach.
			ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
Circuit Breakers	246U-3	Not Provided	Mid West Co.	
			General Circuit Breaker & Electrical Supply	
Circuit Breakers	246U-3	Not Provided	Rosen Electric	
			HLC Electric Supply	
Circuit Breakers	246U-3	Not Provided	California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	
Circuit Breakers	246U-3	Not Provided	ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Manufacturer Not Provided (Component Examples) 50DHP250	2 pole - 50 amp	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers Heaters	Cutler Hammer (Component Examples) • 10177H13 • 10177H21 • 10177H32 • 10177H036 • 10177H1049	Not Provided	AAKER General Circuit Breaker & Electrical Supply HLC Electrical Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Switches	(Component Examples) Crouse Hinds #EDSC2129 Sq. D Type G. Class 9012, 9025, 9016	Tumbler, ft. op	Platt Electric Supply Co. Gen. Motors, Electro-Motive Design	SENS ID #16 1-27-92 Office of Nuclear Safety 93-24 & 93-27
Transmitters	Rosemount	(Component Examples) • Model 1151 GP • Model 1151 DP	Venotech	E.L. Wilmot letter dated 8-1-91 H. Richardson letter HR-81-91 dated 8-15-91
Motors	Siemen & Allis (Component Examples) INP 143 T 215 T	10 H.P.	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Rosen Electric Equipment	NRC I.N. 88-46, Supplements and Attachments

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Relays	Potter & Brumfield (Component Examples) MDR-138, 173-1 134-1, 142-1	Not-latching rotary	Stokely Enterprises Spectronics, Inc. Nutherm International The Martin Co.	NRC I.N. 90-57 & Attach.
	Teledyne	All qualified to MIL-R-28776 and MIL-R-39016	Not Provided	DOE-ID Wilmot letter, 7-16-91
	G.E. & Exide (Component Examples) • 12HGA-11S52 • NX 400	Overload & Aux.	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
	Manufacturer not provided • FSC-5945	Not Provided	Stokely Enterprises	DOE Letter 8-26-91 Reprinted NuVEP: Bulletin 7-26-91
	Amerace (or Agastat) (Component Examples) Models: E7024 E7022	Electro Pneumatic Timing Relays	Amerace Control Components Supply	SENS ID #1 11-1-91 NRC I.N. 92-24
	A through L Series Model 7032	PRB		

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Fuses	Bussman Co. (Component Examples) REN 15 & NOS-30 Class 1E	15A-250V & 30A-600V All Supplied by PMS	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Preventive Maintenance Systems (PMS)	NRC I.N. 88-46, Supp. & Attach. NRC I.N. 88-19
Controllers	Manufacturer Not Listed (Component Examples)	Motor Controllers	Stokely Distributors & Stokely Enterprises, Inc.	DOE letter 8-26-91 & NUVEP Bulletin 7-26-91
Starters	Westinghouse (Component Examples) 626B187G17 626B187G13	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-45 Supp. & Attach.
Resistors	Unknown	All	Impala Electronics	NRC I.N. 91-01

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Semiconductors	Solid State Devices Inc. (SSDI) SFF 9140	P-Channel MOSFET	SSDI	DOE Albuquerque Letter, 06-25-96 to DOD Inspector General
	SPD 1511-1-11	Pin Diode (SA3059)		
	2A14/18 or 2A14/52	Ion Implanted Diode		
	SSR4045CTTXV	SCHOTTKY Diodes		
	SFF9140TWX	Power Transistors		
	SPMF106ANH	Special Pack MOSFET Switch		
	SPD 5818 or IN5858JTXV	Axial Leaded SCHOTTKY Diode		
	2N797	Transistor		
Unknown	Diode (SA 3436)			
Starter Controls	Westinghouse (Component Examples)	Not Provided	General Circuit Breaker & Electrical Supply	NRC I.N. 88-48
	• A200MICAC		HLC Electric Supply	
	• A201KICA		California Breakers, Inc.	
	• A201L2CA		PENCON International (DBA) General Magnetics/Electric Wholesale	
	• AN13A		ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Gauge Glasses	Siemen & Allis (Component Examples) #00-737-637-118 215 T	Not Provided	Rosen Electric Co.	NRC I.N. 88-46 Supp. & Attach.
Mercury Lamps	Spectro Inc. (Component Examples) V00014	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46
Electrical Frames	Westinghouse (Component Examples) LA2600F LA3600F MA2800F	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46
Push button station	Crouse Hinds (Component Examples) #00-737-637-118	Single gang, pushbutton	Platt Electric Supply Co.	SENS Report ID #16 1-27-92

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Overload Relay Thermal Unit	Square D (Component Examples) B19.5, B22	Not Provided	Not Provided	NRC I.N. 88-46
Piping, Fittings, Flanges, and Components	Tube-line Corp. Ray Miller, Inc.	Subassemblies, fittings, flanges, & other components (Carbon and Stainless Steel components)	Tube-line Ray Miller, Inc.	NRC IEB 83-06 NRC I.N. 89-18 NRC IEB 83-07 NRC I.N. 83-01
Piping, Fittings, Flanges, and Components	Piping Supplies, Inc. & West Jersey Mfg. & Chews Landing Metal Mfg.	Carbon and Stainless Steel Fittings and Flanges	Piping Supplies, Inc. & West Jersey Mfg. & Chews Landing Metal Mfg.	NRC Bulletin 88-05 & Supplements
Valves	VOGT	Full port design 2-inch Model SW-13111 & 1023	CMA International IMA Valve Refurbisher	NRC I.N. 88-48 & Supplements
	Crane	4"-1500psi, pressure sealed	Southern Cal. Valve Maintenance co., Amesse Welding Service & CMA Int.	NRC I.N. 91-09
	ITT Grinnell Valve Co., Inc	Diaphragm valves	ITT Grinnell Valve Co. Inc. Div. of Diaflo & ITT Engineered Valves	NRC Comp. Bulletin 87-02
	Crane, Pacific, Powell, Walworth & Lunkenheimer	Gate Valves	Coffeyville Valve Inc.	NRC I.N. 92-56
	Pacific	8" & 3" Globe Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Crane Chapman	24" Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Pacific	Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Valves	Kerotest	8" Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Pacific	4" Gate Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Lukenheimer	6" Model 1542 20" Model 3013	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Crane	All	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
Flanges	China Ding Zinang Nan Xi Li Flange Co. Shou Gang Mach. Eng. Co.	Flanges, ASTM A105, ASME SA105	Billiongold Co. LTD. Tain Gong Co. Sanxi Province Overseas Trading Corp	NRC I.N. 92-68 and Attachments Office of Nuclear Safety 92-25, 93-23, and 92-35 National Board of Boiler and Pressure Vessel Inspectors (NBBI) Bulletin: Special Report, 1992, Volume 48, Number 2, The Chinese Flange Investigation
Valve Replacement Parts	Masoneilian-Dresser Industries	Plug stem, stem to plug anti-rotation pin, seat ring, valve plugs, bushings, cages & packing box components	Cor-Val, Control Valve Specialists, H.H. Barnum & M.D. Norwood, Sample Webtrol Controls, Inc.	NRC I.N. 88-97 Supp. & Attach.
Pumps & Replacement Parts	Hayward Tyler Pump Co.	HTPC ASME Nuclear Code	Hayward Tyler Pump Co.	IEB 83-05 & Attachments
Channel Members	Unistrut Corporation	Continuously slotted channels, structural framing members, fasteners, nuts, fittings, pipe clamps	Unistrut Corporation	NRC I.N. 91-25
Fire Barriers	Thermal Science Inc.	Thermo-Log 330	None Listed	ES&Q Update #8 NRC I.N. 92-55
Valve Actuator	Limitorque	Eyebolts on housing cover	None Listed	Office of Nuclear Safety 93-25 NRC I.N. 93-37

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Steel	Alloy & Carbon Steel Co. Inc., Atlantic Steel Co., Livingston Steel Co., & Copperweld Steel co.	Plate Angle Flat Bar Bar	Meredith Corporation Pressure Vessel Nuclear Alloy & Carbon Steel Co., Inc.	NRC I.N. 89-56, Attachments and Supplements
Fasteners (Bolts, Screws, Nuts, and Washers)	(parentheses designated headmark) Asahi (A) Daiichi (D) Daiei (E) Fastener Co. of Japan (FM) Hinomoto Metal (H) Jin Her (J) Kyowa (K) Kosaka Kogyo (KS) Kyoiei Minamida Seiybo (M) Mnato Kogyo (MS) Nippon (NF) Takai (RT) Tsukimori (S) Unytte (UNY) Yamadai (Y) Ivaco, Infasco (hollow triangled)	<ul style="list-style-type: none"> • Those with suppliers or manufacturers • Those that are improperly marked • Those of foreign manufacture that do not meet Public Law 101-592. Fastener Quality Act 	<p>Note: Listed suppliers may also be manufacturers</p> <p>Lawrence Engineering & Supply Co. Metal Building Bolts Nichimin Corporation UNICO Ace Corporation E. K. Fasteners, Inc. H. Y. Port Fasteners Co. Kobayashi Metals, LTD. Takai Screw Mfg. Co. LTD. Yamaguchi Sesakusho Co. LTD. Highland Bolt & Nut Porteous Fastener Co. Northwest Fasteners Ziegler Bolts & Parts Co. Edgewater Fasteners, Inc. Reynolds Fasteners A & G Engineering</p>	<p>Commercial Carrier Journal Articles for: 6/88, 1/90, 2/90, 3/90, 4/90, 6/90, 7/90, 12/90</p> <p>INEL Suspect Headmark List</p> <p>SENS Report #5 2/6/91</p> <p>SENS Report #13 2/6/91</p> <p>HR 3000, U.S. House of Representatives, July 1988</p> <p>J. A. Jones, Ltr, 9/23/92</p> <p>Memo from L. Kubicek, 3/28/91</p> <p>Memo from D. Sanow, 3/8/91</p> <p>"Fastener Technology International," Feb., April, and June 1993</p> <p>Rep. J. Dingell Ltr to Comm. Dept. & NRC June 18, 1993</p> <p>Office of Nuclear Safety 93-26, 93-22, 93-11</p> <p>DOE Quality Alert, Bulletin, Issue No. 92-4, August 1992</p> <p>FDH Hanford Suspect Headmark List</p>

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Fasteners (Bolts, Screws, Nuts, and Washers)	NUCOR	1-1/4" x 2" Zinc Chromate plated surface Hexhead cap screws	Cordova Bolt, Inc.	SENS ID #13 11-6/91
	Any	Any	Aircom Barnett Bolt Works Bolts & Nuts, Inc. Glasser & Assoc. Knoxville Bolt & Screw Metal Fastener Supply Phoell Mfg. Co. Service Supply Co. Southeastern Bolt & Screw Sure Loc Victory Bolt	NRC Compliance Bulletin 87-02 NRC I.N. 89-59

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**ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT
ITEMS**

A. ELECTRICAL ITEMS

- Molded Case Circuit Breakers
- Motor Control Centers
 - Complete Units
 - Components
 - Starters
 - Starting coils
 - Contactors
 - Overload relays
 - Starter control relays
 - Overload heaters
- Protective/control relays
- DC power supplies/chargers
- AC inverters
- Current/potential transformers
- Exciters/regulators
- Bus transfers/auto bus transfers
- Motor generator sets
- Generators
- Rewindable motors
- Printed circuit boards
- Bulk commodity items
 - Fuses
 - Splices
 - Electrical connectors
- Indicators/controllers
- Panel lights/switches
- Transmitters/instrument switches
- Isolation devices.

The following items are excluded unless required by the applicable program/project: 600V or less: motors; outlets, switches, and plugs; boxes, conduit (i.e., bodies and covers, nipples, fittings, EMT, flex, liquid tight, rigid); wire; miscellaneous wire connections #10 and below; fixtures; lights.

B. MECHANICAL ITEMS

- Welding materials
 - Rod
 - Wire
 - Flux
- Structural members (pipe supports)
- Channel members

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**ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT
ITEMS (cont.)**

- Sheet
- Plate
- Bars
- Round stock
- Other raw material which requires an ASTM or national standard
- All lifting/rigging gear (wire rope shall be made in the United States by a member of the Wire Rope Technical Board (WRTB) or the Associated Wire Rope Fabricators (AWRF) (except stainless steel, and unless recommended otherwise by a crane or hoist manufacturer); stainless steel wire rope shall be made in the United States and shall be 302 or 304 grade stainless steel unless otherwise recommended by a crane or hoist manufacturer)
- Ratchet tie-downs/strapping devices and come-a-longs, with fasteners.

The following materials are excluded unless required by the applicable program/project:
ASTM-A36, brass, copper, sheet metal 7 GA or less, and aluminum.

C. PIPING - which requires an ASTM or ASME standard

- Fittings
- Flanges
- Valves
- Pipe
- Components.

The following materials are excluded unless required by the applicable program/project:
ASTM-A-53, Swagelock; cast iron, galvanized, copper, bronze, and brass; PVC; and gaskets.

D. FASTENERS - All fasteners 1/4" and above in diameter

- Bolts
- Studs
- Cap screws
- High-strength washers
- Nuts
- Anchors.

NOTE: Attachment I identifies headmarkings for stainless steel and carbon steel high strength fasteners that are considered counterfeit. Fasteners exhibiting these headmarks are counterfeit and no further testing is required.

The following items are excluded, unless required by the applicable program/project: sheetmetal screws, wood screws, stove bolts, pan heads, machine screws, lag bolts, threaded rod, rivets, and carriage bolts.

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST

A wide variety of industry and Government sources publish information relative to suspect/counterfeit products. The following sources provide information which is available on a continuing basis:

Industrial Fasteners Institute (IFI)

The following information is available from IFI via subscription:

- "Fastener Application Advisory" (Published Monthly)
- "North American Manufacturers Identification Markings for Fasteners"
- Fastener-related video cassettes.

The National Board of Pressure Vessel Inspectors (NBBI)

The NBBI publishes "National Board Bulletins" to alert manufacturers and users of misrepresented products as they are discovered.

National Highway Traffic Safety Administration (NHTSA)

The NHTSA's Office of Defects Investigation issued a "Suspect Bolt List" in late 1990 identifying numerous fasteners, which they determined to be misrepresented.

Trade Journals and Magazines

There are numerous trade-oriented magazines which have carried articles identifying incidents of failure of substandard parts in industry applications which have caused personal injury and death, as well as serious property damage.

Newspaper and Television Reports

Another good source of information are news reports, which provide current accounts of problems encountered as a result of misrepresented products.

U.S. Nuclear Regulatory Commission (NRC)

The NRC issues bulletins, notices, and regulatory guidance on a continuing basis to alert nuclear power utilities of potential intrusion of misrepresented products into the operations environment of operating nuclear power plants.

U.S. Department of Defense (DOD) and U.S. Department of Commerce publications are also monitored by the DOE to assure that the deficiencies identified do not contaminate DOE facilities.

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST (cont.)

Government Industry Data Exchange Program (GIDEP)

The mission of this program, established by the Office of Management and Budget, is to support government systems readiness, logistics effectiveness, productivity, and cost reduction through timely retrieval, storage, and distribution of data among government and industry organizations.

U.S. Department of Energy

The following documents are issued by the DOE to provide information and guidance relative to the suspect/counterfeit parts issue:

- DOE Orders
- Letters of Direction
- Bulletins and Quality Alerts

(In addition, the DOE periodically sponsors seminars/workshops relative to the detection and control of suspect/counterfeit parts).

U.S. Customs Service

The U.S. Customs Service has published the Suspect Headmark List (Figure 1) identifying graded fasteners determined to be of indeterminate quality, which has been adopted by DOE and, ultimately, Project Hanford, as a formal guide for use when evaluating currently installed and newly procured graded fasteners to assure their fitness for use on the Hanford Site.

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ATTACHMENT D - CHARACTERISTICS THAT MAY MAKE PRODUCTS VULNERABLE TO MISREPRESENTATION, FRAUDULENT PRACTICES, AND COUNTERFEITING

The following information has been extracted from the NRC Information Notice 89-70, Supplement 1, Attachment 3:

- High-turnover usage rate.
- No easy or practical way to uniquely mark the component itself.
- Critical characteristics, including environmental qualification not easily discernable in external visual inspection, or characteristics that are difficult to verify through receipt testing.
- May be widely used in non-critical and critical applications.
- Use may not result in used appearance.
- Often marketed through a supplier and dropped shipped from locations other than that of the original supplier.
- Special processes for ASME materials may be subcontracted (heat treating, testing, and inspections).
- Easily copied by secondary market suppliers.
- Viable salvage market.
- Reduced number of original equipment manufacturers.
- Obsolete or hard-to-get components.
- Components manufactured by a company that is no longer in business.
- Items with documentation from a plant where construction has been suspended, canceled, or deferred.
- Moderate or low cost.
- High potential for profit (rejected heats of material are purchased and decertified).

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ATTACHMENT E - WHERE TO LOOK FOR SUSPECT/COUNTERFEIT ITEMS

The following areas should receive increased scrutiny to assure that suspect/counterfeit items are not evident:

Items in Supply

- Company supply stock
- Wagon stock
- Other sources of supply contamination.

Items in Use

- Plant facilities, components, and systems
- Equipment
- Operations and maintenance.

Items Being Procured

- "Known" critical items
- Critical equipment and assemblies
- Non-critical "known" purchases.

Operations Decisions

- Major disaster risks
- Personnel safety risks
- Program/mission risks (cost and schedule).

Cost of Implementation

- Potential consequential costs
- Management risk assessment
- Cost of focusing established controls
- Impact on schedule and program mission.

Cost of Focus on Known Suspect/Counterfeit Parts

- Uses existing procurement program
- Focuses on "known parts first"
- Reduction in major disaster potential
- Program costs low/benefits high.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION

It is very important to remember that just because an item is identified as being "suspect/counterfeit" it may not be appropriate to simply reject it. A review should be performed prior to formal disposition of the item to assure that it is indeed unfit for the intended application.

DETECTION METHODS

Visual Inspection

Items may be substandard or fraudulent when:

- Nameplates, labels, or tags have been altered, photocopied, painted over, are not secured well, show incomplete data, or are missing (e.g., preprinted labels normally show typed entries).
- Obvious attempts at beautification have been made, e.g., excess painting or wire brushing, evidence of hand painting (touch-up), or stainless steel is painted.
- Handmade parts are evident, gaskets are rough cut, shims and thin metal part edges show evidence of cutting or dressing by hand tools (filing, hacksaw marking, use of tin snips or nippers).
- Hand tool marks on fasteners or other assembly parts (upset metal exists on screw or bolt heads) or dissimilar parts are evident (e.g., seven or eight bolts are of the same material and one is a different material).
- Poor fit between assembled items.
- Configuration is not consistent with other items from the same supplier or varies from that indicated in supplier literature or drawings.
- Unusual box or packing of component or item.
- The supplier is not a factory-authorized distributor.
- Dimensions of the item are inconsistent with the specifications requested on the purchase order and/or those provided by the supplier at the time of shipment.
- The item or component matches the description of one that is on a suspect items list (e.g., U.S. Customs Service "Suspect Headmark List," National Board of Boiler and Pressure Vessel Inspectors (NBBI) "Special Bulletin," etc.).

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Documentation

Documents may be suspect/counterfeit when:

- The use of correction fluid or correction tape is evident. Type or pitch change is evident.
- The document is not signed or initialed when required, is excessively faded or unclear (indicating multiple, sequential copying), or data are missing.
- The name or title of the document approved cannot be determined.
- Technical data is inconsistent (e.g., chemical analysis indicates one material and physical tests indicate another).
- Certification or test results are identical between items when normal variations should be expected.
- Document traceability is not clear. The document should be traceable to the item(s).
- Technical data are not consistent with code or standard requirements (e.g., no impact test results provided when impact testing is required or CMTRS physical test data indicate no heat treatment and heat treatment is required).
- Documentation is not delivered as required on the purchase order or is in an unusual format.
- Lines on forms are bent, broken, or interrupted indicating data has been deleted or exchanged (cut and paste).
- Handwritten entries of data are on the same document where typed or preprinted data exists.
- Data on a single line located at different heights indicate the possibility of retyping.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Fasteners

- Headmarkings are marred, missing, or appear to have been altered.
- Threads show evidence of dressing or wear (threads should be of uniform color and finish).
- Headmarkings are inconsistent with a heat lot.
- Headmarkings matching one of those identified on the U.S. Customs Service, "Suspect Headmark List" (Figure QP 3.2-1).
 - Headmarkings which depict both raised and hand-stamped markings, such as those described in WHC Quality Assurance Bulletin # 94-01, "Discrepant Dual Head Stamped Stainless Steel Bolts." This bulletin documents the results of internal inspections and independent testing of stainless steel bolts purchased to ASTM A193, Grade B8, which were found to be substandard.
 - Only manufacturers listed on the "Suspect Fastener Headmark List" (Figure QP 3.2-1) are known to produce substandard graded fasteners. If graded fasteners are discovered which exhibit headmarks matching those on the Suspect/Fastener Headmark List, they shall be considered to be defective without further testing, unless traceable manufacturer's certifications are received which provide documented evidence that the fasteners were not produced by the manufacturer listed on the Suspect Fastener Headmark List.
 - Interpretation of headmark/manufacturers listed on the "Suspect Fastener Headmark List," including newly discovered variations thereto, shall only be provided by the designated S/CI coordinator based on guidance received from the DOE.

Electrical Devices

- Connections show evidence of previous attachment (metal upset or marring).
- Connections show arcing or discoloration.
- Fasteners are loose, missing, or show metal upset.
- Molded case circuit breakers are not consistent with manufacturer-provided checklists for detecting substandard/fraudulent breakers.
- Missing or photocopied Underwriters Laboratories (UL) labels on products requiring such.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Rotating Machinery and Valve Internal Parts

- Shows marring, tool impressions, wear marks, traces of Prussian blue or lapping compound, or other evidence of previous attempts at fit up or assembly.
- Heat discoloration is evident.
- Evidence of erosion, corrosion, wire-drawing or "dimples" (inverted cone-shaped impressions) on valve discs, seats, or pump impellers.

Valves

- Paint
 - Valve appears to be freshly painted and valve stem has paint on it
 - Wear marks on any painted surface
 - Valve stem is protected, but protection has paint on it
 - Paint does not match standard Original Equipment Manufacturer (OEM) color.
- Valve Tags
 - Tags attached with screws instead of rivets
 - Tags attached in a different location than normal
 - Tags appear to be worn or old
 - Tags with paint on them
 - Tags that look newer than the valve
 - Tags with no part numbers
 - Tags with irregular stamping.
- Hand Wheels
 - Old looking hand wheels on new looking valves
 - Hand wheels that look sand blasted or newer than the valve
 - Different types of hand wheels on valves of the same manufacturer.
- Bolts and Nuts
 - Bolts and nuts have a used appearance (excessive wrench marks on flats)
 - Improper bolt/nut material (e.g., a bronze nut on a stainless stem).

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

- Valve Body
 - Ground off casting marks with other markings stamped in the area (OEM markings are nearly always raised, not stamped)
 - Signs of weld repairs
 - Incorrect dimensions
 - Freshly sand-blasted appearance, including eye bolts, grease fittings, stem, etc.
 - Evidence of previous bolt head scoring on backsides of flanges, or evidence that this area has been ground to remove such marks
 - On a stainless valve, a finish that is unusually shiny indicates bead-blasting. A finish that is unusually dull indicates sand-blasting. The finish on a new valve is in-between.

Manufacturer's Logo

- Missing.
- Logo plate looks newer than the valve.
- Logo plate shows signs of discoloration from previous use.

Other

- Foreign material inside the valve (e.g., metal shavings).
- Valve stem packing that shows all the adjustments have been run out.
- In gate valves, a gate that is off-center when checked through the open end of the valve.
- Obvious differences between valves in the same shipment.

Price

- Price is significantly less than that of the competition.

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ATTACHMENT G - FASTENERS

1.0 Counterfeit/Substandard High-Strength Bolts

1.1 General Background

Counterfeit bolts have been found in military and commercial aircraft, surface ships, submarines, nuclear weapon production facilities, bridges, buildings, and the space shuttle. These bolts often do not possess the capabilities of the genuine bolts they counterfeit and can threaten the reliability of industrial and consumer products, National Security, or lives. At Congressional hearings in 1987, the Army testified that they had purchased bolts that bore the headmarks of Grade 8 high-strength bolts, but that were actually inferior Grade 8.2 bolts.

The International Fasteners Institute (IFI) reported finding substandard, mis-marked, and/or counterfeit high-strength Grade 8 bolts in the United States commercial marketplace. In 1988, IFI reported that counterfeit medium-strength Grade 5 bolts had also been found.

Foreign bolts dominate the American marketplace due to their price advantage, and the majority of suspect/counterfeit bolts are imported. Identifying, testing, and replacing these bolts has proven expensive and difficult, both mechanically and technically. Not finding and replacing these bolts, however, has proven fatal in some instances.

1.2 Headmarks

Attachment I may be removed and photocopied, as needed, for use as a poster and reference to known suspect fastener headmarks. Bolts with the headmarkings shown have a significant likelihood of being found to be inferior to standards. Generally, the cost of replacement of these bolts is less than the cost of chemical, hardness, and tensile strength testing. Note also that counterfeit bolts can be delivered with counterfeit certificates. Documentation alone is insufficient to demonstrate compliance with standards.

1.3 Consensus Standards

There are several consensus organizations that have published standards for the properties of fasteners. One of these is the Society of Automotive Engineers (SAE). The SAE grade (or alleged grade on a suspect item) of a bolt is indicated by raised or indented radial lines on the bolt's head, as shown in Attachment I. These markings are called headmarks. DOE is currently concerned with two different grades of fasteners: one has three equally spaced radial lines on the head of a bolt which indicate that it should meet the specifications for a Grade 5 bolt; the other has six equally spaced radial lines which indicate a Grade 8 bolt. Letters or symbols on the head of a bolt indicate the manufacturer.

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ATTACHMENT G - FASTENERS (cont.)

Attachment I is a Suspect/Counterfeit Headmark List that was prepared by the United States Customs Service after extensive testing of many samples of bolts from around the nation. Any bolts anywhere in the DOE community that are currently in stock, in bins, or installed that are on the Customs Headmark List should be considered suspect/counterfeit. The headmarks on this list are those of manufacturers that have often been found to have sold bolts that did not meet the indicated consensus standards. Sufficient testing has been done on the bolts on this list to presume them defective without further testing.

1.4 Precautions: Selective Testing

Some facilities (manufacturers, distributors, etc.) perform selective testing of sample bolts rather than have an independent testing laboratory run all the tests required by consensus standards. In many cases, a new counterfeit bolt has roughly the same physical strength as the graded bolt it mimics, but does not have either the chemical composition or the heat treatment specified by the consensus standards. As a result, it will stretch, exhibit metal fatigue, or corrode under less harsh service than the genuine bolt. Simple tensile strength tests cannot be used to identify substandard high-strength fasteners and should not be solely relied upon in performing acceptance test.

1.5 Using Suspect/Counterfeit Grade 5 Bolts in Grade 2 Applications

Some sites use suspect/counterfeit Grade 5 bolts in applications that only call for Grade 2 bolts. Eventually, the suspect/counterfeit Grade 5 bolts may find its way into an application that requires a genuine Grade 5 bolt and that application may fail. In some cases, cheap imported graded bolts have been purchased in place of upgraded bolts because the small price differential made the extra quality seem to be a bargain. Given the expense of removing suspect bolts from DOE facilities, the practice of using suspect bolts for any application should be discontinued.

1.6 Keep Bolts in Original Packages

All bolts purchased should be kept in the original packages, not emptied into bins. The packages should have labels or other markings that would permit them to be associated with a particular procurement action and a specific vendor. Approved supplier lists should be checked to assure that fastener suppliers on that list have been recently qualified/audited for adequacy of their quality programs.

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ATTACHMENT G - FASTENERS (cont.)

2.0 Stainless Steel fasteners

2.1 Purpose

To provide follow-up information to the previous notification sent to the DOE field and contractor organizations in late 1996.

2.2 Background

In November 1993, the Industrial Fastener Institute (IFI) issued a Fastener Advisory regarding 18-8 stainless steel bolts. The advisory warned about a "bait and switch" tactic in which a distributor takes an 18-8 bolt (indicated by two radial lines 90 degrees apart), but no manufacturer's marking, and sells them as ASTM A320 Grade B8 bolts after hand-stamping B8 on to the heads.

As a result of this IFI Advisory, DOE sites conducted a search of facility stores for stainless steel fasteners with hand-stamped B8 grade marks. Hundreds of stainless steel bolts with hand-stamped B8 grade markings, along with a variety of other raised and depressed head and manufacturer's markings were identified in facility stores throughout the DOE complex.

For example, an inspection of shop stock at a Hanford Site facility revealed bolts with three different raised grade markings, 18-8, 304, and F593C, along with raised manufacturer's identifications of CK, H, HP, C, SO, CS, PMC, TH, THE, and a STAR. The majority of the remaining samples found at Hanford exhibited raised grade markings of 18-8 and 304, with a B8 grade marking and manufacturer's identification hand-stamped into the head of the bolt.

Finally, a few samples did not display any manufacturer's markings. Most of the bolts discovered were purchased with the specification to meet a national consensus standard, American Society for Testing and Materials (ASTM) A193, B8 Class 1 rather than the ASTM A320 standard discussed in the IFI warning.

The Savannah River Site also conducted a site-wide search of facility stores with similar results. A total of 159 stainless steel fasteners with hand-stamped B8 grade marks and raised or hand-stamped manufacturer's symbols were found. Fifteen stainless steel fasteners that had no manufacturer's symbol were also found.

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ATTACHMENT G - FASTENERS (cont.)

2.3 Issue

The requirements of the ASTM A193 standard regarding fastener marking and certification are very similar those required by the ASTM A320 standard discussed in the IFI advisory. The ASTM A193 standard requires that grade and manufacturer's identification symbols be applied to the heads of bolts that are larger than 1/4" in diameter. The standard, however, does not specifically differentiate between raised and depressed headmarkings, but states only that "for the purposes of identification marking, the manufacturer is considered the organization that certifies the fastener was manufactured, sampled, tested, inspected in accordance with this specification." In other words, the standard allows for some of the required markings to be formed into the head of the bolt (either raised or lowered) during manufacturing, and the rest to be applied later on via hand-stamping.

Since ASTM A193 does not differentiate between raised and depressed markings, these fasteners can be counterfeited in the same way as the ASTM A320 fasteners discussed in the November 1993 IFI warning. For example, distributors can procure 18-8 stainless steel bolts that were manufactured by an anonymous party, and without conducting the necessary upgrading process or certification testing, a second party could hand-stamp B8 and a manufacturer's marking into the heads to indicate that the fasteners exhibit the mechanical and chemical properties required of ASTM A193 Grade B8 Class 1.

Unless the certification documentation is specifically requested, and in most cases it is not, there is no way to determine by visual inspection whether these fasteners were properly certified and tested to meet the requirements of the ASTM standard.

ATTACHMENT H - DOE HEADMARK LIST



Help Stamp Out Suspects/Counterfeits

Suspect Stainless Steel Fastener Headmark List

Examples of stainless steel fasteners that have been upgraded from 1B-8 to ASTM A320 or ASTM A193 Grade B8 after hand stamping. The last three examples show samples of fasteners to indicate conformance to two non-compatible standards, ASTM A193 and ASTM F 593C.

Any bolt on this list should be treated as defective without further testing and process in accordance with HNF-PRO-301. Note: This list was originally Published by DOE /EH-0196, Issue No. 97-6

If any of these fasteners are located, contact your facility S/CI Point of Contact (POC) for instructions. The POC list is on the Hanford Intranet at: <http://docs.ri.gov/han.info/hlansci/hlansci.doc>. Scroll to the end of the document for the list.

	Surrounding White Color Illustrates Head Markings Before Hand Stamping
	Surrounding Black Color Illustrates Head Markings After Hand Stamping
Suspect	

ATTACHMENT H - DOE HEADMARK LIST (cont.)

Help Stamp Out Suspects/Counterfeits



Suspect Fastener Headmark List

All Grade 5 and Grade 8 fasteners of foreign origin which do not bear any manufacturers' headmarks:



Grade 5



Grade 8

Grade 5 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
	J Jinn Her (TW)		KS Kosaka Kogyo (JP)

Grade 8 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
	A Asahi Mfg (JP)		KS Kosaka Kogyo (JP)
	NF Nippon Fasteners (JP)		RT Takai Ltd (JP)
	H Hinomoto Metal (JP)		FM Fastener Co. of Japan (JP)
	M Minamida Sieybo (JP)		KY Kyohei Mfg (JP)
	MS Minato Kogyo (JP)		J Jinn Her (TW)
	Hollow Triangle Infasco (CA, TW, JP, YU) (Greater than 1/2-inch diameter Grade 8 Hollow Triangle only)		
	E Daiei (JP)		UNY Unytite (JP)

Grade 8.2 fasteners with the following headmarks:



Mark	Manufacturer
KS	Kosaka Kogyo (JP)

Grade A325 fasteners (Bennett Denver target only) with the following headmarks:

Type	Mark	Manufacturer
Type 1		A325 KS Kosaka Kogyo (JP)
Type 2		
Type 3		

Key: CA-Canada, JP-Japan, TW-Taiwan, YU-Yugoslavia

Any bolt on this list should be treated as defective without further testing.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS

Investigations thus far of electrical components at DOE facilities uncovered over 700 suspect/ counterfeit molded-case circuit breakers that were previously used, refurbished and sold to DOE contractors.

1. Recognition Factors

The following factors should be recognized regarding suspect or refurbished circuit breakers:

- A. The quality and safety of refurbished molded-case circuit breakers is questionable since they are not designed to be taken apart and serviced or refurbished. There are no electrical standards established by Underwriters Laboratory (UL) for the refurbishing of molded-case electrical circuit breakers, nor are there any "authorized" refurbishes of molded case circuit breakers. Therefore, "refurbished" molded-case circuit breakers should not be accepted for use in any DOE facility.
- B. One source of refurbished molded-case circuit breakers is from the demolition of old buildings. Some refurbishes are junk dealers who may change the amperage labels on the circuit breakers to conform to the amperage ordered and then merely clean and shine the breakers.

This situation was brought to DOE's attention by the Nuclear Regulatory Commission (NRC), which, in turn, had been informed of the practice by the company that manufactures circuit breakers. In early 1988, a sales representative identified "refurbished" circuit breakers at Diablo Canyon Nuclear Power Plant. A subsequent investigation confirmed that circuit breakers sold to the power plant as new equipment were actually refurbished. The managers of the two firms that refurbished and sold these breakers have been convicted of fraud and have paid a substantial fine.

- C. NRC published information Notice No. 88-46 dated July 8, 1988, on the investigation findings and circulated it to all applicable government agencies, including DOE. On July 20, 1988, DOE notified all field offices that refurbished circuit breakers may have been installed in critical systems. Shortly thereafter, DOE established the Suspect Equipment Notification System (SENS), a sub-module of ES&H Events and News on the Safety Performance Measurement System (SPMS). SENS has since been replaced by the Supplier Evaluation and Suspect Equipment (SESE) sub-module which includes Suspect Equipment Reports.
- D. Some of DOE's older sites have circuit breakers in use that are no longer manufactured. According to the Nuclear Management and Resources Council (NUMARC), examples of such breakers are Westinghouse breakers with frames E, EA, F, and FA. If a DOE contractor has an electrical box that requires a breaker with one of these frame sizes, that contractor would not have been able to purchase it from Westinghouse for several years. If the contractor were to order a replacement breaker from an authorized Westinghouse dealer, the dealer could not get a new replacement breaker from the manufacturer. To fill the order, the dealer had to turn to the secondary or refurbished market.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

Dealing with an authorized distributor does not preclude ending up with refurbished circuit breakers. Westinghouse has announced that it is considering satisfying this market by manufacturing circuit breakers that will fit in these applications.

The solution, as recommended by NUMARC, is not to focus on the credentials of the distributor but on the traceability of the circuit breaker itself. A purchaser can be assured of having a new circuit breaker only if the breaker can be traced back to the original manufacturer.

2. Indicators of Refurbished Breakers

Typically, refurbished circuit breakers sold as new equipment have one or more of the following characteristics:

- The style of breaker is no longer manufactured.
- The breakers may have come in cheap, generic-type packaging instead of in the manufacturer's original boxes.
- Refurbished circuit breakers are often bulk-packaged in plastic bags, brown paper bags, or cardboard boxes with handwritten labels. New circuit breakers are packed individually in boxes that are labeled with the manufacturer's name, which is usually in two or more colors, and are often date stamped.
- The original manufacturer's labels and/or the Underwriter's Laboratory (UL) or Factory Mutual (FM) labels may have been counterfeited or removed from the breaker. Refurbishing operations have been known to use copying machines to produce poor quality copies of the original manufacturer's and the certifying body's labels.
- Breakers may be labeled with the refurbisher's name rather than the label of a known manufacturer.
- The manufacturer's seal (often multicolored) across the two halves of the case of the breaker is broken or missing.
- Wire lugs (connectors) show evidence of tampering.
- The surface of the circuit breaker may be nicked or scratched yet have a high gloss. Refurbishers often coat breakers with clear plastic to produce a high gloss that gives the casual observer the impression that the breaker is new. The plastic case of new circuit breakers often have a dull appearance.
- Some rivets may have been removed and the case may be held together by wood screws, metal screws, or nuts and bolts.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

- Contradictory amperage ratings may appear on different parts of the same refurbished breaker. On a new breaker, the amperage rating is stamped into, raised from, or machine-painted on the handle of the circuit breaker. In order to supply a breaker with a hard-to-find rating, refurbishers have been known to file down the surface of the handle to remove the original rating and hand-paint the desired amperage rating.

3. Testing

In a news release dated February 6, 1989, the National Electrical Manufacturers Association (NEMA) announced the cancellation of its Publication AB-2-1984 entitled, "Procedures for Field Inspection and Performance Verification of Molded-Case Circuit Breakers used in Commercial and Industrial Applications," and stated the following:

"These procedures were intended for use with breakers that had been originally tested and calibrated in accordance with NEMA Standards Publication AB 1 or Underwriters Laboratories Standard UL 489, and not subsequently opened, cleaned or modified...Therefore, the Standards Publication contained none of the destructive test procedures...necessary to verify the product's ability to withstand such conditions as full voltage overload or short circuit. Without such tests, even if a rebuilt breaker had passed the tests specified in AB-2, there would be no assurance that it would not fail under overload or short circuit conditions. It is NEMA's position that regardless of the results of electrical testing, refurbished electrical circuit breakers are not reliable and should not be used."

4. Precautions

Follow these precautions regarding suspect or refurbished circuit breakers.

- Require that molded-case breakers be new and unaltered. Proof that they are new and unaltered requires the vendor to show traceability back to the original manufacturer.
- Do not rely completely on dealing with authorized dealers for protection from purchasing refurbished molded-case circuit breakers.
- Approve formal procedures for inspecting circuit breakers that are received and installed according to the indicators of refurbished breakers listed above.
- Contact the original manufacturer if any indication of misrepresentation is encountered. There are many original manufacturers of molded-case circuit breakers whose products are being refurbished and sold as new. These manufacturers have the most specific information about how to ensure that their products have not been refurbished.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)**5. Disposition**

- A. Segregate and retain all circuit breakers found with indications that they may be refurbished. These will be retained as potential evidence until specifically released by the Office of Inspector General and the Office of Nuclear Safety for Price Anderson Enforcement. Circuit breakers that may be refurbished may only be disposed of when the above organizations no longer need them as evidence.
- B. Report suspect electrical components to Occurrence Reporting and Processing System (ORPS). The ORPS categorization group should be identified as "Cross-Category items, Potential Concerns or issues." The description of cause section in the ORPS report should include the text "suspect counterfeit parts."
- C. Witness and document the destruction of all suspect/counterfeit circuit breakers when approval is given for disposal.

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ATTACHMENT J - ASSESSMENT/SURVEILLANCE LINES OF INQUIRY

1. S/CI processes and other S/CI related processes are effective in addressing the safety-related aspects of S/CI.
2. Formal supplier qualification and re-qualification processes are established and implemented, including routine collection of evaluations of feedback on vendor performance.
3. Controls are established on a graded basis that considers the risks involved and historical experience with S/CIs.
4. Controls are implemented for segregation and separate storage of material identified as suspect/counterfeit
5. Subcontractors have established and implemented sufficient controls to preclude an introduction or use of S/CIs. These controls address construction materials, maintenance or modification equipment and components, and the use subcontractor owned or rented equipment (cranes, hoists, etc.) on site.
6. S/CI processes, requirements, and controls are fully integrated into Integrated Safety Management (ISM) and quality assurance programs and procedures, e.g. training, procurement, maintenance, and assessment) to ensure adequate linkage to S/CI elements.
7. Expectations are established for timeliness in determining whether nonconforming items are S/CI.
8. Protocols are established for clearly identifying S/CIs that are determined to be acceptable for use
9. Inspections for S/CI materials are incorporated into routine maintenance activities, and clear guidance is provided for the disposition of installed S/CI materials identified during routine inspections and maintenance activities.
10. Expectations for S/CI controls are integrated within existing processes, such as routine and special inspections for S/CIs in site procedures, and guidance is provided for performing such inspections.
11. Roles and responsibilities and interfaces for management of S/CIs are clearly assigned, including provisions for the handling of sensitive information and interfacing with the local Office of the Inspector General (IG), to ensure effective, consistent, and timely communication of S/CI information.
12. S/CI reporting requirements are effectively integrated into the site contractors' processes for disposition of non-conforming items, such as NCR processes, as required by appropriate DOE directives.
13. Lessons learned processes are evaluated to determine whether all available and relevant information resources, such as the Government Industry Data Exchange Program (GIDEP), are being utilized for screening S/CI and other relevant information for potential applicability to site activities.

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ATTACHMENT J – ASSESSMENT/SURVEILLANCE LINES OF INQUIRY (cont.)

14. Lessons learned processes are evaluated to ensure that significant requirements and performance expectations have been established for the documentation of applicability reviews, needed actions, and actions taken for lessons learned that require line management attention and action.
15. Lessons learned requiring line management actions are integrated with the site's corrective action management processes to ensure formal tracking, feedback, and closure of actions taken.
16. Corrective actions and management procedures include formal linkage to S/CI reporting requirements for the site office, Occurrence Reporting System (ORPS), contractor General Counsel, and the IG.
17. Site mechanisms, such as a controlled product list, are established and used to maintain current and accurate information on S/CIs. Provisions are available for making this list readily available to site personnel who have S/CI responsibilities for procurement, inspection, and other areas associated with the implementation of S/CI controls.
18. S/CI training programs include the identification of positions and associated personnel required to receive training, the processes for designating those personnel who must receive initial and refresher training, and the required frequencies for refresher training.
19. All personnel involved in design, system engineering, procurement, inspection, maintenance, and other functions involving potential S/CI materials receive S/CI process and hands-on training.
20. Training programs place special emphasis on ensuring that system engineers involved in the design, procurement, and inspection of materials and components with the potential for S/CI receive such training.
21. Subcontractors involved in the procurement or handling of potential S/CI materials and components receive initial and refresher training and are knowledgeable of site S/CI processes, procedures, requirements, and controls.
22. S/CI training addresses site-specific processes and procedures for identifying, dispositioning, and reporting S/CIs, including reporting to the IG.
23. S/CI processes are subject to regular self-assessment, consistent with site self-assessment protocol.
24. Assessments are performed for S/CI processes to evaluate significant changes to the S/CI processes and to establish a baseline for implementation where appropriate. Based on that baseline review, further assessments are tailored to the maturity of the S/CI processes.
25. S/CI lines of inquiry are considered and evaluated, as appropriate, during assessments of areas that interface with S/CI processes (procurement process, NCR process, etc.).



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Appendix G

Request for Information

(2 pages including cover)



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REQUEST FOR INFORMATION		Project #.RFI.00X Rev. ____ Page 1 of 1
Contract/Project No. _____		
TO BE COMPLETED BY SUBCONTRACTOR		
Insert Title of RFI Here		
Originator (Name) & Company: _____		
Problem/Deficiency: <input type="checkbox"/> Clarification <input type="checkbox"/> Change		
Proposed Solution:		
Basis of Change:		
Note: Subcontractor to provide cost and schedule impacts associated with each discrete change line item. Response: <input type="checkbox"/> Clarification <input type="checkbox"/> Change COST <input type="checkbox"/> Yes <input type="checkbox"/> No SCHEDULE <input type="checkbox"/> Yes <input type="checkbox"/> No Required Response Date: _____		
<u>Cost Impact</u>	<u>Schedule Impact</u>	
Subcontractor (sign/date) _____		
TO BE COMPLETED BY THE BUYER		
RFI Approved <input type="checkbox"/> Yes <input type="checkbox"/> No	COMMENTS	
CN Required: <input type="checkbox"/> - CN # _____		
CN Not Required: <input type="checkbox"/>		
As-Built documentation Required: <input type="checkbox"/> As-Built documentation Not Required: <input type="checkbox"/>		
Submittal Data Required: <input type="checkbox"/> Yes <input type="checkbox"/> No	Design Lead / Proj Mgr / Date _____	

RFI.Feb 2004

WASTE TRANSFER PUMP SKID
16-Dec-04



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Appendix H

Instrumentation Naming and Tagging Convention

(3 pages including cover)



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H1 EQUIPMENT IDENTIFICATION NUMBER

The equipment identification number (EIN) is comprised of three fields, SYSTEM-COMPONENT-SEQUENCE. Where SYSTEM is the plant Area 00,31-37, COMPONENT is the ISA-loop function code, and SEQUENCE is the device number within the Area.

Example: Waste dryer Area 33 Instrument Junction Box 33-IJB-001.

Note: The Hanford FARM and LOCATION fields do not apply to the Demonstration Bulk Vitrification System and have been dropped from this convention.

H2 CABLE TAGGING

Cables shall be tagged using From Source & To Destination information. The format will be "FROM-TO" or "FROM-TO-##" if more than one cable run.

Example:

Two Cables: From 36-CAB-123 to 36-IJB-123
 Cable Tag: "36CAB123-36IJB123-C1"
 Cable Tag: "36CAB123-36IJB123-C2"

H3 WIRE TAGGING

Wires will be tagged using the equipment tag and polarity.

Example 1: Wires connected from instrument 36-FIT-123 (24V dc)

Positive Tag "36FIT123(+)"
 Negative Tag "36FIT123(-)"

Example 2: Wires connected from instrument 36-LSH-123 (110V ac)

Positive Tag "36LSH123(H)"
 Negative Tag "36LSH123(N)"


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H4 NOTES

- Cables shall be identified with cable tag number "source-destination-type."
Types will be as follows:

M = Motor Feeder Cable; L = Local Control Station Cable; MH = Motor Stator Heater; RTD = Motor Winding Temperature Detector; MA = Motor Armature Cable; MF = Motor Field Cable; C = Control Cable; F = General Feeder Cable; A = Ammeter Cable; T = Tachometer Cable; COM = Communications Cable; RS484, Ethernet, Fibre.

Analog cables from junction box to field instrument will only be tagged with the instrument tag number.
- Cables will be tagged on both ends with the same cable tag number.
- Equipment, motor, and instrument tag numbers shown are for illustration purposes only. Use project specific equipment, motor, and instrument tags.



TECHNICAL SPECIFICATION

The document revision number is indicated below. Please replace all revised pages of this document and destroy the superseded copies.

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REV No.	ISSUED FOR	ORIGIN	DATE	INITIAL
0	Approval	C. Grenard	21-Oct-04	CG
1	Approval - Incrp'd comments received on 10-29-04	C. Grenard	09-Nov-04	CG

DOCUMENT APPROVAL

<p>CLIENT APPROVAL (AMEC RICHLAND) Original Approvals On File</p> <p>Project Manager: <u>[Signature]</u> Date: <u>11/10/04</u> <i>per phone call with Lloyd Mcclure</i></p> <p>Q.A. Rep.: <u>[Signature]</u> Date: <u>11/10/2004</u></p>	<p>DMJM (RICHLAND) Original Approvals On File</p> <p>Project Manager: <u>[Signature]</u> Date: <u>11/10/04</u></p> <p>Discipline Lead: <u>[Signature]</u> Date: <u>11/10/04</u></p>
<p>CLIENT APPROVAL (CH2M HILL)</p> <p>Project Manager: <u>[Signature]</u> Date: <u>11/10/04</u></p>	<p>Originator: <u>[Signature]</u> Date: <u>11/10/04</u></p>



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ABBREVIATIONS AND ACRONYMS

AISC	American Institute for Steel Construction
ANSI	American National Standards Institute, Inc.
API	American Petroleum Institute
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society of Nondestructive Testing
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
B&PV	Boiler and Pressure Vessel
CFR	Code of Federal Regulations
CMTR	Certified Material Test Reports
CoC	Certificate of Conformance
CWI	Certified Welding Inspector
DOE	U.S. Department of Energy
DBVS	Demonstration Bulk Vitrification System
FAT	Factory Acceptance Test
NCR	nonconformance report
NDE	nondestructive examination
QA	Quality Assurance
SAE	Society of Automotive Engineers
TBD	to be determined
UL	Underwriters Laboratories, Inc.
WAC	Washington Administrative Code

TRADEMARKS

AutoCAD	Registered trademark of AutoDesk, Inc.
Loctite	Registered trademark of Henkel Loctite.
Viton	Registered trademark of DuPont DOW Elastomers.



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1 SCOPE

The Sketch (2 sheets) provided in Appendix A of this specification represent a minimum set of Buyer expectations for the assembled system. The Seller shall use this information, along with additional material in the specification, to generate a set of design and fabrication drawings with sufficient detail for construction. Examples of information to be developed by the Seller includes, but is not limited to, dimensioning and associated tolerances, mounting details, weld details, and material types and quantities.

This specification provides the minimum requirements for design, fabrication, inspection, testing, documentation, packaging, and shipping of tanks for storage of waste from Tank 241-S-109, hazardous chemicals and potentially contaminated, process condensate. The material to be stored in these tanks is considered hazardous and radioactive waste that is regulated under the requirements of 40 CFR 264, Subpart J; WAC 173-303-640; and 10 CFR 830.

Throughout this specification:

1. The tanks will be referred to as staging tanks;
2. Waste from Tank 241-S-109 and the potentially hazardous chemicals used to "spike" the waste feed will be referred to as waste;
3. The Contract Responder shall be referred to as the Seller, and AMEC Earth and Environmental, Inc. shall be referred to as the Buyer.

1.1 INCLUDED IN SCOPE

The Seller shall provide staging tanks including the vacuum/pressure relief devices, work platforms, and stairways to access tank nozzles located on top of the tanks. The Seller shall provide all submittals and perform all inspections and tests required by this specification.



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1.2 NOT INCLUDED IN SCOPE

The following are not in the Seller's work scope and will be performed/provided by the Buyer:

1. Perform the structural and natural phenomena hazard analysis;
2. Provide the valve secondary containment housings and the associated valving for the top and front of the tanks (Appendix A);
3. Provide the instrumentation and controls;
4. Provide the piping jumpers and/or hose-in-hose transfer lines connecting the tanks to each other, the pump skid and the ventilation system;
5. Perform the integration testing with other systems and subsystems using a simulant;
6. Procure the tank heaters, insulation, and flushing hardware;
7. Install at the Buyer's Site, and
8. Provide the Breather filters.



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2 APPLICABLE DOCUMENTS

The codes, standards, and other documents listed in Table 2-1 and Table 2-2 are of the latest issue and addenda in effect at the time of procurement (unless otherwise specified). These documents form a part of the basis of design for this procurement to the extent specified in the applicable sections of this specification. All conflicts between documents referenced herein and the requirements of this specification, recommendations of alternative standards, or identification of omissions shall be brought to the attention of the Buyer for resolution.

2.1 GOVERNMENT DOCUMENTS

Table 2-1: Government Documents

Government Documents	Title
10 CFR 830	"Nuclear Safety Management," <i>Code of Federal Regulations</i> , as amended.
29 CFR 1910	"Occupational Safety and Health Standards," <i>Code of Federal Regulations</i> , as amended.
40 CFR 264	"Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart J, <i>Code of Federal Regulations</i> , as amended.
DOE/RL-92-36	<i>Hanford Site Hoisting and Rigging Manual</i> , U.S. Department of Energy, Richland, Washington.
WAC 173-303-640	"Tank Systems," <i>Washington Administrative Code</i> , as amended.

2.2 NON-GOVERNMENT DOCUMENTS

Table 2-2: Non-Government Documents (4 sheets)

Code/Standard	Title
AISC	<i>Manual of Steel Construction—Allowable Stress Design</i> , Ninth Edition, American Institute of Steel Construction, Chicago, Illinois.
ANSI/AWWA D100	<i>AWWA Standard for Welded Steel Tanks for Water Storage</i> , American Water Works Association, Denver, Colorado.



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Table 2-2: Non-Government Documents (4 sheets)

Code/Standard	Title
ASNI Y14.5M	<i>Dimensioning and Tolerancing</i> , American National Standards Institute, New York, New York.
API 620	<i>Design and Construction of Large, Welded, Low-Pressure Storage Tank</i> , Tenth Edition, American Petroleum Institute, Washington, D.C.
ASHRAE Fundamentals Handbook	<i>2001 ASHRAE Handbook – Fundamentals</i> , American Society of Heating, Refrigerating, and Air Conditioning Engineers, Atlanta, Georgia.
ASME B&PV Code	<i>ASME Boiler and Pressure Vessel Code</i> , American Society of Mechanical Engineers, New York, New York. Section VIII, "Rules for Construction of Pressure Vessels" Division 1 or 2
ASME B16.5	<i>Pipe Flanges and Flanged Fittings</i> , American Society of Mechanical Engineers, New York, New York.
ASME B18.2.1	<i>Square and Hex Bolts and Screws Inch Series</i> , American Society of Mechanical Engineers, New York, New York.
ASNT SNT-TC-1A	<i>Recommended Practice</i> , American Society of Nondestructive Testing, Columbus, Ohio.
ASTM A 36/A 36M	<i>Standard Specification for Carbon Structural Steel</i> , American Society of Testing and Materials, New York, New York.
ASTM A 53/A 53M	<i>Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless</i> , American Society of Testing and Materials, New York, New York.
ASTM A 105/A 105M	<i>Standard Specification for Carbon Steel Forgings for Piping Applications</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A 106	<i>Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A 108	<i>Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A 193/A 193M	<i>Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.



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Table 2-2: Non-Government Documents (4 sheets)

Code/Standard	Title
ASTM A 307	<i>Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 325	<i>Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 354	<i>Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and other Externally Threaded Fasteners, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 500	<i>Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 563	<i>Standard Specification for Carbon and Alloy Steel Nuts, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 569	<i>Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM D 5162	<i>Standard Practice for Discountability (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASME PCC-1	<i>Guidelines for Pressure Boundary Bolted Flange Joint Assembly, American Society of Mechanical Engineers, New York, New York.</i>
AWS D1.1/D1.1M	<i>Structural Welding Code—Steel, American Welding Society, Miami, Florida.</i>
AWS QC-1	<i>Standard for AWS Certification of Welding Inspectors, American Welding Society, Miami, Florida.</i>
SAE J429	<i>Mechanical and Material Requirements for Externally Threaded Fasteners, Society of Automotive Engineers, Warrendale, Pennsylvania.</i>



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Table 2-2: Non-Government Documents (4 sheets)

Code/Standard	Title
UL 142	<i>Standard for Safety-Steel Aboveground Tanks for Flammable and Combustible Liquids</i> , Underwriters Laboratories, Inc., Northbrook, Illinois.

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3 TECHNICAL REQUIREMENTS

The following sections define the minimum technical requirements for the design, fabrication, and testing of the staging tanks.

3.1 ITEM DEFINITION

The staging tanks are designed to double-contain wastes.

3.1.1 Item Diagram

The liquid waste staging tank interfaces are shown in Figure 3-1.

3.1.2 Interface Definition

The minimum set of nozzles and fittings, and the associated physical requirements are identified in Table 3-1. The secondary containment housings for the inlet and outlet valves are not within the Seller's work scope; however, the flanged connections for the Buyer-installed secondary containment housings on the top and front of the tank are included in the Seller's work scope. A conceptual nozzle layout is shown in Appendix A for a rectangular tank. The nozzle layout for a horizontal, cylindrical tank would be similar. The actual nozzle layout shall be recommended by the Seller and shall be approved by the Buyer.

1. The waste and hazardous material inlet nozzles and the vacuum/pressure protection nozzle shall be located inside the valve secondary containment riser on top of the tank. See Section 3.2.2 for details.
 - a. If the valve secondary containment covers the top of the tank, the riser shall provide unrestricted drainage to the secondary containment tank.
 - b. If the valve secondary containment does not cover the top of the tank, a 2-in. drain pipe shall be provided inside the tank from the top secondary containment housing to the tank secondary containment.



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- The waste outlet nozzle shall be located inside a valve secondary containment riser on the front of the tank. The riser shall provide unrestricted drainage from the secondary containment tank into the housing flange. See Section 3.2.2 for details.

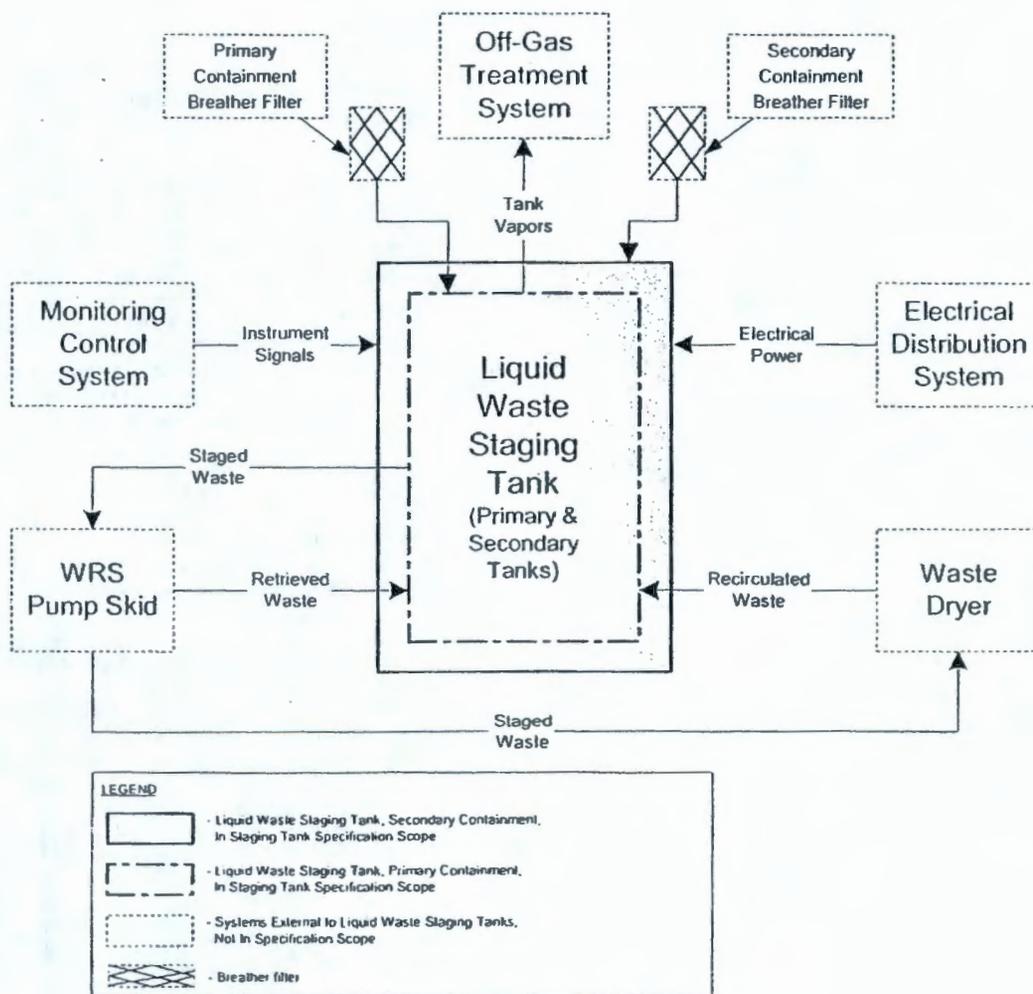


Figure 3-1: Waste Staging Tank Interfaces



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Table 3-1: Liquid Waste Staging Tank Nozzles (3 sheets)

CP No. (DBVS-WRS-ST-)	Nozzle Description	Nozzle Type/Size	Location
F1	Secondary Containment Body Flange (Top)	See Sketch DBVS-SK-M104 (Appendix A)	See Sketch DBVS-SK-M104 (Appendix A)
F2	Secondary Containment Body Flange (Front)	See Sketch DBVS-SK-M104 (Appendix A)	See Sketch DBVS-SK-M104 (Appendix A)
M1	Manway	30 in.	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)
M2	Manway	30 in.	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)
N1	Waste Receipt	2-in.-diameter class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of the tank inside the valve secondary containment housing flange near the back of the tank. See Sketch DBVS-SK-M104 (Appendix A) for dimensional requirements.
N2	Waste Outlet	2-in.-diameter class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on front of the tank (see Section 3.2.1.2). The length and shape of the stub will be determined by the Seller. See Sketch DBVS-SK-M104 (Appendix A) for dimensional requirements
N3	Waste Return	2-in.-diameter class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of the tank inside the valve secondary containment housing flange near the back of the tank. See Sketch DBVS-SK-M104 (Appendix A) for dimensional requirements.
N4	Spare Equipment	4-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located at top of the tank. See Sketch DBVS-SK-M104 (Appendix A)
N5	Primary Containment Ventilation Outlet	2-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)



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Table 3-1: Liquid Waste Staging Tank Nozzles (3 sheets)

CP No. (DBVS-WRS-ST-)	Nozzle Description	Nozzle Type/Size	Location
N6	Primary Containment Ventilation Inlet	2-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)
N7	Vacuum/Pressure Relief Valve	TBD ^(c) . The nozzle shall not be less than 2 in. diameter	Located on top of the tank inside the valve secondary containment housing flange near the back of the tank. See Sketch DBVS-SK-M104 (Appendix A) The device shall vent into valve secondary containment housing.
N8	Secondary Containment Atmospheric Ventilation	2-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)
N9	Heater	10-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank within 5 ft of front end. See Sketch DBVS-SK-M104 (Appendix A)
N10	Heater	10-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank within 5 ft of back end. See Sketch DBVS-SK-M104 (Appendix A)
N11	Heater (Spare)	10-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank within 5 ft of center. See Sketch DBVS-SK-M104 (Appendix A)
N12	Tank Level Detection	2-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)
N13	Tank High Level Switch	2-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)



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Table 3-1: Liquid Waste Staging Tank Nozzles (3 sheets)

CP No. (DBVS-WRS-ST-)	Nozzle Description	Nozzle Type/Size	Location
N14	Temperature Instrument	2-in. class 150 RF flange, ASTM A 105/A 105M ^(a) or ASTM A 106 ^(b)	Located on top of tank. See Sketch DBVS-SK-M104 (Appendix A)
N15	Primary Tank Flush	TBD ^(d)	Top of tank, Quantity and locations TBD ^(d)
N16	Annulus Flush	TBD ^(d)	Top of tank, Quantity and locations TBD ^(d)

RF = raised-face.

^(a)ASTM A 105/A 105M, *Standard Specification for Carbon Steel Forgings for Piping Applications*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(b)ASTM A 106, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(c)The Seller shall submit a recommended vacuum/pressure relief device for approval by the Buyer.

^(d)The Seller shall submit a recommendation of the quantity, location, and size of the nozzles; and recommended hardware for flushing the primary tank and annulus space. Procurement of the flushing hardware is not part of this contract.

3.2 CHARACTERISTICS

The characteristics (e.g., functional, physical, performance, and environmental requirements) that the staging tanks must satisfy are described below.

3.2.1 Functional Characteristics

The functional characteristics of the staging tanks are identified below.

3.2.1.1 Receive Waste

Each staging tank shall be capable of receiving up to 15,000-gal batches of waste at a maximum flow rate of 70 gal/min. The waste shall be discharged above the maximum liquid level (see definition below). The physical and chemical properties of the tank waste are listed in Table 3-2 and Table 3-3. Nominal sodium concentration of the waste is 5M.



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Table 3-2: Waste Physical Properties

Properties	Data
Temperature:	50 to 150 °F
Density:	1.2 to 1.3 g/mL
Viscosity:	10 cP Maximum at 77 °F
pH:	7 to 13

Table 3-3: Waste Chemical Composition

Analyte	Average Analyte to Na Mole Ratio
Al ⁺³	9.32E-03
Ca ⁺²	2.43E-04
Cl ⁻¹	1.50E-03
Cr (TOTAL)	2.96E-03
F ⁻¹	1.13E-03
Fe ⁺³	9.57E-04
K ⁺	8.73E-04
Mn ⁺⁴	2.85E-05
Ni ⁺²	2.13E-05
NO ₂ ⁻¹	1.31E-02
NO ₃ ⁻¹	9.29E-01
Pb ⁺²	2.78E-05
PO ₄ ⁻³	1.16E-02
Si ⁺⁴	1.13E-03
SO ₄ ⁻²	7.79E-03
Sr ⁺²	6.53E-06
TIC as CO ₃ ⁻²	3.58E-02
Total Organic Carbon (TOC)	5.26E-03
U (Total)	2.34E-05

3.2.1.2 Store Waste

Each staging tank shall have a usable capacity of at least 15,000 gal. The maximum capacity of each tank shall not exceed 18,000 gal. The usable capacity is the total tank volume minus the minimum heel minus the minimum gas space (see Section 6 for definitions). The waste physical and chemical properties are listed in Table 3-2 and Table 3-3.



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1. The staging tanks shall be designed for 4 psig over fully loaded condition, or the minimum code or standard design pressure, whichever is greater, at 150 °F.
2. Each staging tank shall have vacuum/pressure relief devices capable of limiting the tank gas pressure/vacuum. The relief setpoints shall be as specified by the design code, if it so specifies; however, the relief pressure shall not be greater than 2 psig and the vacuum relief pressure shall not be less than -0.4 psig.

3.2.1.3 Supply Waste

The tank shall be designed to provide an outlet flow rate of 75 gal/min without drawing air into the piping with 1,000 gal of waste in the tank. The design shall include vortex breakers or other devices as necessary to limit vortexing near the outlet nozzle.

3.2.1.4 Receive Recirculated Waste

The staging tanks shall be capable of receiving waste recirculated from an interfacing system at a flow rate of 50 to 75 gal/min. The waste shall be discharged approximately 1 ft above the maximum liquid level. The waste physical and chemical properties for waste from Tank 241-S-109 are listed in Table 3-2 and Table 3-3.

3.2.1.5 Contain Waste Leakage

The staging tanks shall include a secondary containment capable of containing leaks from the primary containment and the associated hoses at or below the maximum expected liquid level of the tank. The secondary containment shall be capable of holding the maximum contents of the tank (assuming the primary tank liquid level will equalize with the liquid in the secondary confinement enclosure).

1. Secondary containment is not required more than 6 in. above the maximum liquid level.



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2. The annulus between the primary and secondary containments shall be at least 1 in. wide and shall not impede the flow of waste leaked from the primary tank to the annulus low point.
3. The primary and secondary containment shall be sloped to a minimum of 1/8 in. per foot toward the front, so that leaked waste will flow to the annulus low point.

3.2.2 Physical Characteristics

1. The staging tank dimensions, including the support structure, shall not exceed 9 ft wide by 16 ft high when sitting on the ground (not including easily removed hardware) by 50 ft long.
2. The size and nozzle spacing requirements for both valve secondary containment risers are shown in Sketch DBVS-SK-M104 (Appendix A). The secondary containment riser flanges shall be at least 3 in. beyond the surrounding surfaces.
3. The staging tank soil/floor loading shall limit be less than or equal to 3,000 lb/ft² when filled with waste.

3.2.3 Reliability

1. The staging tank minimum service life shall be 2 years without maintenance. The service life of each tank begins when the tank is first filled with waste.
2. The staging tanks shall be designed for a design life of five years without maintenance. The design life of each tank begins when delivered to the Buyer.

3.2.4 Maintainability

Maintainability for the waste staging tanks is defined as accessibility to the nozzles, tank interior, and supply of any special tools necessary for maintenance.



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3.2.4.1 Accessibility**3.2.4.1.1 Access to Top of Tank**

Personnel access to the top of the staging tanks shall be provided by a stairway. The stairway may be shipped separate from the tanks.

3.2.4.1.2 Access to Tank Nozzles

The staging tanks shall have a work platform with handrail, kickplate, and access gate that provides safe access and travel to nozzles and manways on top of the tank in addition to providing radiation protection to workers.

3.2.4.1.3 Access to Tank Interior

The staging tanks shall have at least two, 30-in. manways to provide access for inspection, maintenance, and decontamination. The centerline spacing between the two manways must be greater than 50 percent of the tank length.

3.2.4.1.4 Access to Annulus

The staging tank, secondary containment housing flanges, and nozzles shall provide access for visual inspection of the annulus (i.e., tank integrity assessment) using normal inspection tools.

3.2.4.2 Special Tools

The staging tanks should be designed for relocation and/or maintenance using commercially-available tools and equipment. If required, the Seller shall submit a list identifying recommended special tools and equipment (including a justification of why and when the tool is required), shall be provided to the Buyer for approved special tools and lifting devices, and shall provide all the information needed to replace the tools (e.g., detailed drawings or procurement information). Special tools and lifting devices provided by the Seller shall become the property of the Buyer.



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3.2.5 Environment¹

The staging tanks shall be designed for ambient air temperatures -25 to 115 °F. The Buyer will provide tank heaters to maintain the waste above 50 °F. The tanks are operated in an outdoor environment. Tanks shall be designed to minimize the potential for standing water on the outside of the tank.

3.2.6 Transportability and Storage

1. The staging tanks shall be designed to be transported to the site by truck.

The empty tanks shall be designed to withstand a 0.75-gravity (forward), hard-braking stop and a rearward acceleration of 0.25 gravity, as well as shock and vibration loads associated with transportation.

2. The tanks shall be designed for outdoor storage (see Sections 3.2.5 and 3.3.6).

3.2.7 Safety

The Seller shall provide all necessary safety equipment and access for safe operation as required under 29 CFR 1910.

3.3 DESIGN AND CONSTRUCTION

3.3.1 Parts/Materials/Processes

The minimum requirements for material and fabrication processes for the staging tanks are specified below.

1. The Seller shall not use suspect/counterfeit parts in accordance with the *Control of Suspect/Counterfeit Items* (Appendix B).

¹ Other environmental requirements will be evaluated by the Buyer while performing the structural and natural phenomena hazard analysis.

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3.3.1.1 Parts

The vacuum/pressure relief valve design will be determined by the Seller and shall be submitted to the Buyer for review and approval.

3.3.1.2 Materials

The Seller shall select materials based on the design life specified in Section 3.2.3, Item 2 of materials subjected to the waste physical and chemical properties described in Section 3.2 with the radiation exposure described in Section 3.3.3 of this specification.

3.3.1.2.1 General

1. All parts and materials shall be new.
2. Material selection shall be identified in the Seller documents to the Buyer. Material type and grade shall be clearly identified on the Bill of Materials.
3. Certified Material Test Reports (CMTR) are required for all materials which will be or may come in contact with the waste or waste vapors (e.g., the secondary containment) and all material provided for structural support. The Seller shall identify any materials for which CMTRs do not exist and shall submit a request for approval to the Buyer before use.

3.3.1.2.2 Material Exclusions

1. No aluminum or "yellow" metals are to be used.
2. No beryllium shall be present.
3. No lead shall be used in the design unless it is fully encapsulated and identified with a permanent tag.
4. No equipment shall use or require the use of polychlorinated biphenyls.



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5. Exposed polymer materials shall be constructed of anti-static materials.
6. No asbestos shall be used.

3.3.1.2.3 Carbon Steel

Carbon-steel products shall comply with the material specifications identified in Table 3-4. The Seller shall identify and submit the appropriate standards for any material not identified in the table.

3.3.1.2.4 Fasteners

The Seller shall select fasteners using the following guidelines:

1. Carbon-steel bolts shall be ASTM A 307, or better, depending on strength and torque requirements. Carbon-steel nuts shall be ASTM A 563A. Bolts and cap screws shall be grade marked.
 - a. All graded fasteners shall conform to ASME B18.2.1, SAE J429, and ASTM A 354.
2. No fasteners shall be capable of vibrating loose under transporting or operating conditions. All such joints should be tack welded or have some equivalent means of ensuring they remain intact. Joints using ASTM A 325 or ASTM A 193/A 193M bolts shall not be tack welded. Double-nutting is not an acceptable method of securing fasteners. Loctite® threadlock may be used where applicable.



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Table 3-4: Staging Tank Material Requirements

	Standard	Other
Plate	ASTM A 36/A 36M ^(a)	General purpose, hot-rolled, low-carbon steel
Sheet	ASTM A 569 ^(b)	--
Structural Shapes	ASTM A 36/A 36M ^(a)	--
Bars and Rods	ASTM A 108 ^(c)	<ul style="list-style-type: none"> • Minimum yield of 36,000 lb/in² • Maximum carbon content 0.35%.
Rectangular Tubing	ASTM A 500 ^(d) , Grade B	--
Pipe	ASTM A 53/A 53M ^(e) , Type S, Grade B	Seamless
Pipe Flange Fittings	ASTM A 105/A 105M ^(f)	Flanges for pipe greater than 1/2 in. shall be standard 150-lb raised-face flanges in accordance with ASME B16.5 ^(g) and shall be made from the same type of steel as the pipe in which it will be welded. Flange assembly and bolting shall be performed in accordance with ASME PCC-1 ^(h) .

^(a)ASTM A 36/A 36M, *Standard Specification for Carbon Structural Steel*, American Society of Testing and Materials, New York, New York.

^(b)ASTM A 569, *Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(c)ASTM A 108, *Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(d)ASTM A 500, *Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(e)ASTM A 53/A 53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*, American Society of Testing and Materials, New York, New York.

^(f)ASTM A 105/A 105M, *Standard Specification for Carbon Steel Forgings for Piping Applications*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(g)ASME B16.5, *Pipe Flanges and Flanged Fittings*, American Society of Mechanical Engineers, New York, New York.

^(h)ASME PCC-1, *Guidelines for Pressure Boundary Bolted Flange Joint Assembly*, American Society of Mechanical Engineers, New York, New York.



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3.3.1.2.5 Gaskets

1. Pipe flange connections shall use PSI Inc., LineBacker® sealing gaskets with stainless steel as the retainer material and Viton® as the sealing element. LineBacker® Type F sealing gaskets shall be used for raised face flanges and LineBacker® Type E sealing gaskets shall be used for flat face flanges. CMTRs are not required for gaskets or seals, copies of Certificates of Conformance (CoC) shall be provided.
 - a. Valve, secondary containment housing flange connections shall use ethylene propylene diene monomer (EDPM) gaskets (minimum of 1/8 in. thick) and shall be water tight. Water tightness shall be verified during Factory Acceptance Testing (FAT). The Seller shall provide a spare set of gaskets for all secondary containment housing flange connections for each tank.

3.3.1.3 Welding

3.3.1.3.1 Welding Standard

Structural welding shall be performed in accordance with AWS D1.1/D1.1M.

3.3.1.3.2 Welding Inspection

1. Fabrication/erection welding inspections shall be performed by the Seller. At a minimum, all welds shall be visually inspected. Welds that form part of the primary containment boundary must receive a 100-percent magnetic particle examination. Additional inspection requirements shall be as specified on the Seller's drawings in accordance with AWS D1.1/D1.1M (Annex C) guidelines based on the stress analysis results.
2. The Buyer retains the right to perform weld verification inspections or have a qualified testing agency perform weld verification inspections.

3.3.1.4 Fabrication Traveler

The Seller shall prepare a fabrication traveler(s) for the fabrication and testing of the above described waste transfer Waste Receipt System pump skid assembly

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equipment. The fabrication traveler(s) shall include detailed procurement, fabrication, assembly, testing, shipping, and handling steps required to properly fabricate, assemble, and test the equipment in accordance with the drawings and specifications.

3.3.2 Industry and Government Standards

The staging tanks shall be designed, fabricated, and tested in accordance with any of the following codes and standards (or another code or standard approved by the Buyer):

1. ANSI/AWWA D100
2. API 620
3. ASME B&PV Code, Section VIII, Division 1 or 2
4. UL 142

The designs shall be modified as required to satisfy the requirements of this specification.

3.3.3 Radiation

The staging tank materials shall operate in a 1 R/h radiation field with a cumulative radiation dose of less than or equal to 5×10^4 R without failure.

3.3.4 Cleanliness

Before assembly, and before preparing for shipment, the tanks shall be cleaned by flushing with clean water and/or blown clean and dried with compressed air to the extent that any extraneous materials, such as those listed below, are not present:

1. Metallic or other dusts (shop dust), chips, turnings, and weld splatter;
2. Abrasive particles;

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3. Rust and other loose corrosion particles;
4. Magnetic/liquid penetrant residues, dye check, etc.;
5. Cutting oils;
6. Excess lubrication, grease, and oil; and
7. Marking dyes.

The staging tank equipment ports and pipe openings shall be temporarily capped following cleaning and drying for shipment.

3.3.5 Corrosion of Parts

Carbon-steel surfaces shall be protected from corrosion by coating or painting the surfaces (see Section 3.3.6).

3.3.6 Protective Coatings

1. Surfaces that are normally in contact with waste and/or waste vapors shall be protected with coating material that is compatible with the waste and the radiation levels specified elsewhere in this specification.
 - a. The surfaces shall be prepared and the coating installed in accordance with the manufacturer's instructions. The procedure for preparing and coating the surfaces shall be submitted to the Buyer for review and approval.
2. Exterior surfaces shall be protected from corrosion by protected with paint that is compatible with the waste and the radiation levels specified elsewhere in this specification.
 - a. The surfaces shall be prepared and the coating installed in accordance with the manufacturer's instructions.



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3.3.7 Interchangeability

The staging tanks shall be fully interchangeable (i.e., each tanks shall have the same form, fit, and function).

3.3.8 Identification and Marking

1. All equipment that is designed to be mechanically lifted shall have marked lifting points and be marked with the lifting weight and center of gravity. Lift points shall be identified with yellow paint.
2. All specialized lifting devices shall be marked in accordance with DOE/RL-92-36, as follows.
 - a. Structural and mechanical below-the-hook devices shall be provided with identification displaying the following data, as a minimum:
 - i. Rated load,
 - ii. Manufacturer's name,
 - iii. Lifting device weight (if over 100 lb),
 - iv. Drawing number (if applicable), and
 - v. Serial number (if applicable).

The identification data may be displayed on a nametag, nameplate, metal stamp, or other permanent marker. If the lifting device comprises several lifting devices that can be detached from the assembly, these individual lifting devices shall be marked with their individual load rating also.

3. Nozzle numbers shall be labeled with paint in accordance with Table 3-1.

3.3.9 Nameplate

The assembled system shall have a Seller provided nameplate with the following minimum information: project number, purchase order number, assembly name and number (provided by the Buyer), assembly weight, and this specification number (including revision).



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3.3.10 Human Engineering

Human factors engineering principles and criteria shall be integrated into the design of systems and the facilities that house and support these systems. Operator movements and accessibility of equipment and controls in the work area shall be considered, and practical access to each system component for operation and maintenance shall be provided.

3.3.11 Qualification

3.3.11.1 Structural Analyses

1. The staging tanks shall be capable of being moved by crane.
 - a. The staging tanks shall be designed to be lifted in accordance with *AISC Manual of Steel Construction—Allowable Stress Design* using a safety factor of 3 based on yield strength and a safety factor of 5 based on ultimate strength.
2. The Seller shall submit the design drawings for the staging tanks to the Buyer for review and to support the structural and seismic analysis to be performed by the Buyer. The Buyer will perform the staging tank structural and seismic analyses. The Seller shall allow two weeks for this review. The Seller shall then incorporate the Buyer's comments and submit the final design drawings to the Buyer for approval. The Seller should allow one week for the approval process.

3.3.12 Document Submittal

The following subsections provide the minimum document requirement submittals.

3.3.12.1 General

Information to be supplied with the bid, for review, and as final is shown on the Bidder's Drawing and Data Commitments sheet (Appendix C). The submittals presented on this sheet shall be delivered as separate packages for review and approval.



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Each document submittal shall be identified with this specification number, item number, purchase order number, and Seller's identification number. Submittals shall be transmitted to the Buyer in accordance with the directions found in the Request for Quote.

Data shall be sufficiently clear to allow legible copies to be made on standard reproduction equipment after microfilming.

Approval by the Buyer does not relieve the Seller from the responsibility for accuracy or adequacy of design under this specification.

Submittals are divided into two types: (1) those requiring "approval before proceeding" (i.e., weld procedures or prepurchase evaluation data) and (2) those requiring "approval before shipment" (i.e., vendor information data).

Submittals requiring approval before shipment will be reviewed to verify completeness and adequacy for their intended purposes.

Unacceptable items that require approval before proceeding will be handled as specified below.

A submittal requiring approval that is not approved by the Buyer will be dispositional as:

1. "Not Approved, Revise and Resubmit." The submittal is considered technically deficient, or incomplete, and is therefore unacceptable. Resubmittal is required; hence fabrication, procurement, or performance of procedures shall not proceed.
2. "Approved with Exception." Fabrication, procurement, and performance of procedures may proceed, and resubmittal is required to verify incorporation of the exception. Final acceptance of the item is contingent on the Buyer's receipt and approval of the corrected submittal.

Any changes from the approved documents shall be identified to the Buyer using the Buyer-supplied Request for Informationform (Appendix D) for review and approval of the change. The change shall then be controlled by the Seller to ensure the documents are properly updated to incorporate the change.


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Submittals requiring approval before shipment that are determined to be incomplete or inadequate will be marked "Resubmit" and will be returned. An explanation of the deficiencies will be included for corrective action by the Seller.

A proposed schedule of fabrication, inspection, and testing of all equipment shall be submitted for review with the bid.

3.3.12.2 Fabrication Traveler Submittal

The Seller shall submit the fabrication traveler(s) for review and approval by the Buyer. During the review, the Buyer will insert witness and hold points in the fabrication traveler during their review and approval of the fabrication traveler. Witness points can be waived by the Buyer, but must be documented in writing. Hold points require the Buyer personnel to be present during the fabrication, inspection, or test steps.

3.3.12.3 Quality Assurance Program Manual

The Seller shall submit their Quality Assurance (QA) Program Manual, which addresses the QA Program requirements identified herein, with their proposal to the Buyer for review and approval before contract award.

3.3.12.4 Inspection and Test Reports

The Seller shall deliver an electronic copy and legible and reproducible hard copies of the inspection and test reports. The minimum report content is as follows:

1. Identification of the applicable inspection and or test procedure,
2. Data for all characteristics evaluated as required by the inspection or test procedure,
3. Traceability to the item inspected/tested (e.g., serial number, part number, lot number, etc.), and
4. The signature of an authorized representative of the manufacturer.

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3.3.12.5 Final Data Package

The Seller shall ship the tanks after all the tests and inspections have been performed and the final data package is complete and approved by the Buyer. The final data package shall include all items specified on the Bidder's Drawing and Data Commitments sheet (Appendix C).

3.3.13 Personnel and Training

Records for the following areas shall be prepared and made available for the Buyer. Review of the qualifications may be subject to a surveillance or source inspection by the Buyer.

3.3.13.1 Welder, Nondestructive Examination Personnel, and Weld Inspector Qualifications

See Section 4.1.5.

3.3.13.2 Coating Application Qualification

If required, appropriate training will be provided to personnel applying and performing testing of coatings.

3.3.14 Workmanship

General: Remove all burrs and break all sharp edges.

1. Drawings:

- a. Dimensioning and tolerancing shall be interpreted per ANSI Y14.5M and



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- b. Tolerances not specified on drawings shall be as shown in Table 3-5.

Table 3-5: Standard Drawing Dimension Tolerances

Dimension	Tolerance
One Decimal Place	± 0.1
Two Decimal Places	± 0.06
Three Decimal Places	± 0.030
Angular	$\pm 2^\circ$

2. Components:

- a. Pipe flange, man-way, and flange faces shall be within $\pm 2^\circ$ of vertical or horizontal, whichever is appropriate;
- b. Pipe flange bolt holes shall straddle centerlines;
- c. Material and debris shall be removed from piping and components before welding/assembly; and
- d. Secondary containment housing flanges shall be flat.



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4 QUALITY ASSURANCE REQUIREMENTS

The following subsections provide the minimum QA requirements for this specification.

4.1 GENERAL

The Seller shall document, implement, and maintain a QA Program that is based on a national standard and identifies the activities and items to which it applies. The QA Program must address each of the areas discussed within this QA requirements flowdown. The Subcontractor/Supplier must submit the QA Program to the Buyer for review before award of contract.

The Seller shall assess its QA Program regularly to ensure its effective implementation.

The QA Program shall provide for indoctrination and training, as necessary, of personnel performing activities affecting quality to ensure that suitable proficiency is achieved and maintained. Personnel who conduct inspection and test activities shall be qualified to conduct those activities and certification of the qualification must be submitted to the Buyer on request.

4.1.1 Design

The Seller must define, control, and verify designs developed for this contract. Design inputs must be specified on a timely basis and correctly translated into design documents. Design interfaces must be identified and controlled. Persons who did not design the item must be used to verify design adequacy. Design changes, including field changes, must be reviewed and approved by the same personnel who reviewed and approved the initial designs.

4.1.2 Procurement Document Control

Procurement documents must include or reference sufficient quality and technical requirements in order to describe the items and services requested. Procurement documents must be reviewed and approved by the authorized personnel within the Seller's organization, and changes must be reviewed and


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approved by the same individuals who reviewed and approved the original procurement documents.

The Seller must have a process for accepting procured items. This process must include one or a combination of the following: Certificate of Conformance, source verification, receiving inspection, and post-installation testing.

The Seller shall provide a legible and reproducible CoC. The CoC shall be signed by the Seller's authorized representative responsible for quality assurance.

The CoC shall contain, as a minimum, the following information:

1. Identification of the Buyer's contract or purchase order number under which the materials, equipment, component, or service is being purchased.
2. Provide traceability by means of positive identification from the material, equipment, component, or service to the CoC.
3. Identify the specific procurement requirements met by the material, equipment, component, or service supplied (i.e., codes, standards, or other applicable specification). The procurement requirements shall include any approved changes, waivers, or deviations applicable to the subject materials, equipment, component, or service.
4. Identify any procurement requirements that have not been met, together with an explanation and the means for resolving the nonconformance.

The Seller's certification system, including the procedures to be followed in filling out a certificate and the administrative procedures for review and approval of the certificates, shall be described in the Seller's QA Program.

The certification system shall provide a means to verify the validity of the Seller's certificates and the effectiveness of the certification system (i.e., during the performance of audits of the Seller or independent inspection or test of the items). The Buyer shall conduct this verification at intervals commensurate with the Seller's past quality performance.


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The Seller is required to flowdown all QA requirements from this contract to any sub-tier subcontractor/suppliers. Any access to the sub-tier subcontractor/suppliers' facilities for verification activities will be requested through the Seller before access, and verification activities may be performed jointly.

The Seller shall warrant that all items furnished under the contract are genuine (i.e., new; not refurbished and/or counterfeit) and match the quality, test reports, markings, and/or fitness for intended use as required by the contract. Any materials furnished as part of the contract that the government or other duly recognized agency had been previously found to be suspect/counterfeit shall not be used.

All items are subject to inspection at the Seller's facility or lower-tier subcontractor's facility. The Seller shall notify the Buyer, at least seven working days in advance, of the time when such items or activities will reach the Buyer's identified inspection hold points. As a minimum, final inspection before packaging for shipment shall be considered such a hold point, unless specifically waived by the Buyer.

The Seller shall obtain all materials to be delivered under the contract directly from the original manufacturer or an authorized manufacturer's representative. The Seller shall provide legible and reproducible documentation, with the materials, that provides objective evidence that the items were provided by the original manufacturer. Such documentation may include a copy of the purchase order to the manufacturer and shipping documentation or manufacturer invoice (each of which would identify that the materials were obtained from the original manufacturer).

The Seller shall submit, with or prior to item shipment, a recommended spare parts list. The list shall provide the name and address of the original supplier of the replacement part, and the part's drawings, specification, or catalog identity including applicable change or revision information.

All items and/or services procured under this specification shall be subject to inspection by the Buyer or Buyer's representative throughout the contract. Additionally, procured items and/or services shall be subject to inspection for acceptance.


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The Seller shall grant access to the Seller's facilities and records for inspection or audit by the Buyer, his designated representative, and/or other parties authorized by the Buyer.

4.1.3 Instructions, Procedures, and Drawings

The Seller must document and implement appropriate instructions, procedures, and drawings. Instructions and procedures must include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished.

4.1.4 Identification and Control of Items

The Seller shall establish controls to ensure that only correct and accepted items are used or installed.

All items shall be identified with the applicable part number, model number, or other identifier prescribed in this specification. Identification shall be on the item or the package containing the item. When the identification is on the item, such marking shall not impair the service of the item or violate dimensional, chemical, or physical requirements.

The Seller shall submit a legible and reproducible copy of the product data sheet (e.g., drawing, catalog cut sheet, brochure) that provides adequate information to enable the Buyer to verify the form and function of the articles procured. One copy of such documentation, unless otherwise specified, shall accompany the item.

The Seller shall identify each item, assembly, package, container, or material, having limited shelf life, with the cure date or date of manufacture and the expiration date. The Seller shall specify any storage temperatures, humidity and environmental conditions that should be maintained. Material shall not be furnished having less than 75 percent of the total shelf life available at the time of shipment.

Certified Material Test Reports containing actual chemical analysis and mechanical properties of the material being supplied shall be submitted before or



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with each shipment of material. Each CMTR shall contain the following information as a minimum:

1. Product description [e.g., specification(s), codes, type of material];
2. Actual results of chemical analysis/mechanical testing in accordance with the provisions of the code, standard, and/or specification;
3. The specification and material grade;
4. Traceability to the item tested (e.g., heat number, lot number);
5. Name and address of manufacturer (may be identified by letterhead, logo, etc.);
6. Manufacturer's ASME certificate number and expiration date;
7. Buyer's contract number and item number to which the report applies; and
8. The report shall be signed by an authorized representative of the manufacturer.

In addition to the ASTM/ASME marking, the Seller shall physically identify each item/part furnished to the Buyer with the heat number (or identification number that is traceable to the heat number) and the contract number. Methods and materials used to accomplish required markings shall be compatible with the material being marked. Small items shall be bagged/wrapped and tagged.

4.1.5 Control of Graded Fasteners

The following are minimum requirements for high strength graded fasteners produced in compliance with national consensus standards (i.e., SAE, ASTM, ASME):

1. Fasteners shall exhibit grade marks and manufacturers identification symbols (headmarks) as required in the specifications referenced in the contract.


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2. When requested by the Buyer, the Seller shall provide legible and reproducible copies of the manufacturers CMTRs. These CMTRs shall report the values of the actual chemical and physical tests performed on the represented fastener lot and material heat. Fastener packaging and labeling shall be traceable by lot number or other means to the CMTR.
3. Fasteners shall be inspected and documented to verify compliance with this QA Clause. Additionally, fasteners may also be subject to destructive testing by the Buyer to verify compliance.

4.1.6 Control of Processes

The Seller shall have procedures to control processes, including special processes that control or verify quality [e.g., welding, heat treating, and nondestructive examination (NDE)]. Special processes must be performed by qualified personnel using qualified procedures in accordance with specified requirements.

Seller personnel performing weld inspections shall be certified as a Certified Welding Inspector (CWI) in accordance with the requirements of AWS QC-1. The following documentation shall be submitted for Buyer approval before the start of fabrication:

1. Current AWS CWI certification;
2. Current/valid visual acuity examination (must be given every three years);
and
3. Visual weld inspection procedure(s).

Welding procedures and personnel shall be qualified in accordance with applicable AWS or ASME requirements specified in the contract. The Seller shall submit copies of all welding procedures, procedure qualification records, and welder qualification records to be employed. Buyer review and approval of these documents is required before start of fabrication.



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Nondestructive examination personnel shall be qualified and certified in accordance with the recommended guidelines of ASNT SNT-TC-1A. The Seller is not authorized to begin fabrication until the following documentation has been approved by the Buyer:

1. NDE personnel qualification and certification procedure;
2. Level I, II, and/or III personnel qualification and certification records, including objective evidence of NDE training, formal education, examination, experience, date of hire, and current visual acuity exam; and
3. NDE method procedure(s) compliant with the applicable requirements of the Buyer's contract.

Nondestructive examination reports and radiographs shall be traceable to the item examined, shall include all essential examination parameters, and shall be signed and dated by a qualified/certified NDE examiner. All NDE reports and radiographs shall accompany or precede shipment of the item or component. Radiographs and radiographic technique and examination reports shall be subject to approval by the Buyer before shipment.

These requirements shall be passed to lower-tier subcontractors.

4.1.7 Test Control

The Seller shall have a process (to plan and execute tests) to verify conformance of an item or activity to specified requirements. The process shall document the characteristics to be tested and test methods to be employed. Tests required to collect data, such as for siting or design input, shall be evaluated.

The Seller shall prepare a detailed test plan. Before starting work, the plan shall be submitted to the Buyer for approval and insertion of Buyer's designated source inspection and witness notification points. The test plan shall provide the following, at a minimum:

1. Traceability to the Buyer's purchase/contract order document number;

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2. Name or description of the item to be tested (e.g., components, assemblies, subassemblies);
3. Method/procedure to be used during test; and
4. Subsequent revisions/modifications to the test plan require review and approval by the Buyer before implementation of the changes.

The Seller shall provide test reports that include, as a minimum:

1. Item tested,
2. Date of test,
3. Tester or data recorder,
4. Type of observation,
5. Results and acceptability,
6. Action taken in connection with any deviations noted, and
7. Person evaluating test results.

Test plans and test reports must be submitted to the Buyer for the project records.

4.1.8 Control of Measuring and Test Equipment

The Seller shall control tools, gauges, instruments, and other measuring and testing equipment used for activities affecting quality, and shall calibrate at specified periods and adjust to maintain accuracy within necessary limits.


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The Seller shall maintain legible, reproducible copies of the Certificates of Calibration, traceable to the NIST, for each article contracted. Each Certificate of Calibration shall be signed by the Seller's representative responsible for calibration, attesting to its authenticity, and shall be identified with the following information:

1. Buyer's contract number,
2. Identification of the article to which the Certificate of Calibration applies, and
3. Standards used for calibration.

In addition, the Seller shall submit a report of actual calibration results. The report shall be identifiable to the acceptance criteria of the items submitted and shall meet the contract requirements. The report shall contain the signature of the authorized representative of the agency verifying compliance. One copy of the documentation, unless otherwise specified, shall accompany the applicable item(s) shipped.

The Certification of Calibration will be held on file by the Buyer as objective evidence to support the actual test results and attest to the fact that the calibrated item(s) met requirements.

4.1.9 Handling, Storage, and Shipping

The Seller shall prepare and submit for Buyer review and approval, before use, procedure(s) or plan(s) for the packaging and shipping of materials, equipment, or components to be furnished under the contract. The procedure(s) or plan(s) shall include, as appropriate, cleanliness inspection before packaging, use of preservatives and coatings, descriptions of specially designed shipping containers, handling and rigging data, final inspections, and the type of transfer and shipping vehicles.

4.1.10 Control of Nonconforming Items

The Seller must have a process to control items that do not conform to specified requirements to prevent inadvertent installation or use. These controls must



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provide for identification, documentation, evaluation, segregation (when practical), and disposition of nonconforming items, and for notification to affected organizations.

All nonconforming conditions identified at the Seller's facility, with a proposed disposition of "Accept-As-Is" or "Repair," as defined below, shall be approved by the Buyer before supplier implementation of the nonconformance report (NCR) disposition:

1. Accept-As-Is: Nonconforming materials will perform its intended function.
2. Repair: Nonconforming item can be corrected so that its characteristics meet requirements of the contract.

Nonconforming items identified as "Repair" or "Rework" shall be re-examined in accordance with applicable procedures and with the original acceptance criteria, unless the nonconforming item disposition has established alternate acceptance criteria.

Nonconformances shall be documented by the Seller on their own nonconformance form or one provided by the Buyer. After documenting the nonconformance and providing a proposed disposition and technical justification, the report shall be submitted to the Buyer.

After the proposed disposition has been evaluated, and approved or rejected by the Buyer, the form shall be returned to the Seller. Corrective action may only take place after Buyer approval. Copies of completed, Buyer-approved, NCRs shall be shipped to the Buyer with the affected item.

4.2 QUALIFICATION VERIFICATION

Qualification verification will be performed through review of the record submittals.

Test and inspection plans shall be submitted to the Buyer for review and approval a minimum of ten working days before testing. The Buyer reserves the right to witness all tests and shall be given a minimum of ten working days written

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notice before each test date. The results of these inspections and tests shall be documented and submitted to the Buyer for review and approval.

Key items to be verified include, but are not limited to, the mechanical and electrical function of all equipment and components.

4.3 INSPECTIONS AND TESTS

Factory Acceptance Testing of the equipment is required. Factory Acceptance Test specifications, procedures, and documentation of test results shall be prepared and submitted. All temporary electrical equipment including wiring and instruments necessary to allow component testing will be provided by the Seller.

Water used for hydrostatic testing shall be tested for chlorides before use. The chloride content of the test medium shall not exceed 250 ppm for water temperatures of 149 °F or less.

The Supplier shall maintain legible, reproducible copies of the Certificates of Calibration, traceable to the National Institute of Standards and Technology, for all test equipment. Each Certificate of Calibration shall be signed by the Supplier's representative responsible for calibration, attesting to its authenticity, and shall be identified with the following information:

1. Buyer's contract number,
2. Identification of the article to which the Certificate of Calibration applies, and
3. Standards used for calibration.

Dated calibration labels shall be visible on all test equipment. Measuring and test equipment used for acceptance inspections and tests shall be controlled in accordance with the Seller's QA Program and shall be traceable to a national measurement standard.


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4.3.1 General

The Seller shall qualify Inspection and Test Personnel performing acceptance inspections and testing. In addition, the Seller shall document all qualifications.

The results of these inspections and tests shall be documented and submitted to the Buyer for review and approval before staging tank acceptance. Buyer approval of the inspection and test results indicates concurrence that the inspection and test results verify compliance with the associated design requirements.

4.3.2 In-Process Inspections

Procedures shall be submitted by the Seller to the Buyer for all in-process testing and inspections required by the codes and this specification. The procedures submitted shall address the flushing and drying of residual water from hydrostatic testing, if used. All test procedures and results shall be submitted to the Buyer for review and approval according to the document submittal schedule listed in the Bidder's Drawing and Data Commitments sheet (Appendix C).

4.3.2.1 Nondestructive Examinations

1. All NDE weld examination procedures shall be submitted along with the personnel certifications to the Buyer for review and approval before any NDEs.
2. The structural-steel welds shall be examined in accordance with AWS D1.1/D1.1M and shall meet the acceptance criteria stated in AWS D1.1/D1.1M.
3. Welds for rigging attachments or below the hook-lifting devices shall be 100 percent visual and either Dye-Penetrant Tested or Magnetic Particle Tested.

4.3.3 Final Inspection

A final inspection shall be performed in accordance with the Seller's standard practices. At a minimum the Seller shall verify that the tank skid assembly's

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critical dimensions, as identified in Bidder's Drawing and Data Commitments sheet (Appendix C), are within the specified tolerances. Staging tank as-built drawings shall be produced from this inspection.

4.3.4 Factory Acceptance Testing

The waste tanks shall be hydrostatically tested in accordance with the following subsections. The results shall be recorded and a video record of the hydrostatic tests shall be submitted to the Buyer with test records/documents.

Before performing the FAT, an FAT procedure shall be submitted to the Buyer for review and approval according to the document submittal schedule listed in the Bidder's Drawing and Data Commitments sheet (Appendix C).

The results of the FAT shall be documented and submitted to the Buyer for review and approval before final acceptance of each staging tank.

The FAT performed by the Seller shall include as a minimum, and not limited to, the tests described in the following sections.

4.3.4.1 Primary Containment

The primary containment for each staging tank shall be hydro-tested by filling the tank with water and then pressurizing the tank. The pressure at the bottom of the tank shall be 130 percent of the pressure that will be experienced when filled with waste at the maximum density identified in Table 3-2. The test pressure shall be held for a minimum of 4 hours with no visible/detectable leakage. Components that could prevent performance of this test or that could be damaged during the test shall be isolated or removed and the associated fitting shall be flanged, capped, or plugged. The test results shall be recorded and included in the final data package.

4.3.4.2 Secondary Containment

The secondary confinement for each staging tank shall be hydro-tested by first filling the primary containment with water and then filling the secondary containment with water. Pressure at the bottom of the tank shall be 130 percent of the pressure that will be experienced when filled with waste at the maximum



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density identified in Table 3-2. The test pressure shall be held for a minimum of 4 hours with no visible/detectable leakage and the tank side wall deflection compared to the corner structure shall not be greater than 1/4 in. Components that could prevent performance of this test or that could be damaged during the test shall be isolated or removed and the associated fitting shall be flanged, capped, or plugged. The test results shall be recorded and included in the final data package.

4.3.4.3 Secondary Containment Drain Test

The unobstructed flow of liquid from the top, secondary containment housing flange to the front, secondary containment housing flange shall be verified by test. The test shall consist of slowly pouring 2.4 gal of water at approximately 0.25 gal/min into the top, secondary containment housing as far away from the drain pipe as possible and collecting water draining from the front, secondary containment housing. At least 2.0 gal of water shall be collected within 1 hour after start of the test. The tank must be on level ground with little to no slope when performing this test. The test results shall be recorded and included in the final data package.

4.3.4.4 Lift Tests

1. Each staging tank shall be lifted to determine the actual tank weight, the actual load at each lift point, and to verify the tank center of gravity.
2. The lift points for each staging tank shall be load tested to verify adequacy of the lifting components and accessories. Weight shall be added as required such that each lift point is supporting at least 125 percent of the actual load measured above. The lifting components and accessories shall not incur any damage because of this test. A 100 percent visual and magnetic particle inspection shall be performed for all welds at the lift points or within the load path to the lift points following the lift test. The test results shall be recorded and included in the final data package.

4.3.4.5 Protective Coatings

Interior protective coatings shall be tested for holidays in accordance with ASTM D 5162 or an equivalent national standard.

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5 PRESERVATION AND DELIVERY

The following subsections provide the minimum requirements for packaging, labeling, handling, shipping, and receiving.

5.1 GENERAL

Each staging tank shall arrive at the Buyer's specified site fully assembled and in the same condition it was in when it passed the FAT.

5.2 PRESERVATION AND PACKAGING

Before packaging, the Seller shall remove all residual water using oil-free, dry air. All open pipe ends shall be sealed to prevent ingress of debris and vermin. The tanks shall be cleaned to remove any dirt or dust that may have accumulated during testing. Defects in the paint (including the primary containment coating) shall be touched up or repaired.

5.3 PACKING

1. The tanks shall be inspected for cleanliness before packaging. Dirt, oil, residue, metal chips, or other forms of contamination shall be removed in accordance with Section 3.3.4. Any entrapped water shall be removed.
2. All openings into items shall be capped, plugged, and sealed with materials which perform their intended function without causing deleterious effects on the equipment or its operation. Nozzles within the secondary containment housing flanges shall be plugged before placing a cap or seal on the housing flange.
 - a. Nonmetallic plugs and caps shall be brightly colored. Clear plastic caps or plugs are not to be used except when specified.
 - b. Plugs or caps shall be prevented from falling into or being pushed into openings after packaging, preservative coatings shall be visually inspected after loading. Damaged areas shall be repaired. If shipped with desiccants, the desiccant shall be inspected after loading to verify that seals are intact.


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3. Precautions shall be taken to minimize marring of the finish of painted surfaces during handling and shipping, as practicable.
4. Cables, slings, chain falls, etc., shall not be placed where they can cause damage to any component part.
5. Items not specifically covered by these requirements shall be handled in accordance with sound material handling practices.

5.4 MARKING

The staging tanks shall be properly and clearly marked in accordance with Section 3.3.8.

5.5 HANDLING

If required, the Seller shall lift tanks using the lifting points designed for that purpose. The Seller shall provide rigging sketches and a handling procedure with the first tank. The sketches shall identify the tank weight, sling locations, balance points, methods of attachment, and other information necessary for safe handling. Special rigging required to lift the tanks shall be shipped to the Buyer at the same time the first tank is delivered.

The Seller shall provide any requirements for offloading and installation.

5.6 SHIPPING

The Seller shall prepare the staging tanks for delivery to the Buyer's specified site located near the U.S. Department of Energy's Hanford Site in Richland, Washington in a manner that permits ease of inspection by the Buyer's personnel. The equipment will remain the property of the Seller until the Buyer has completed a receipt inspection at the Buyer's facility. The Seller shall be responsible for the tanks through shipping and site receipt inspection and shall be responsible for any damage that may occur during shipping.

The equipment will remain the property of the Seller until the Buyer has completed a receipt inspection at the Buyer's facility.



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The Seller shall obtain approval to ship from the Buyer before the equipment is prepared for shipment.

5.7 RECEIVING

1. The Buyer's agent will perform a receipt inspection of the tanks at the Buyer's specified site. This receipt inspection shall ensure the tank caps and seals are all in place the interior coating was not damaged during shipping, and there is no physical damage to the tanks.
 - a. If caps and/or seals are missing, the Seller shall clean the tanks, as required, to achieve the same level of cleanness as provided following the FAT.
 - b. If the interior coating was damaged during shipment, the Seller shall repair the damage and test the coating to verify the absence of holidays.


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6 NOTES

1. The minimum heel is defined as the volume left in the tank at the point that air will be sucked into the piping with the outlet flow rate specified for Note 3 below.
2. The minimum gas space is defined as the space required to ensure the tank pressure protection devices will not be activated by temperature fluctuations if the tank is isolated (i.e., not vented) for 24 hours.
3. The maximum liquid level is the liquid level at which the minimum gas space is reached.


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7 APPENDICES

The following appendices make up part of this specification:

Appendices	Description
A	Sketch
B	TFC-ESHQ-Q_C-C-03, Revision B, <i>Control of Suspect/Counterfeit Items</i>
C	Bidder's Drawing and Data Commitments
D	Request for Information



TECHNICAL SPECIFICATION

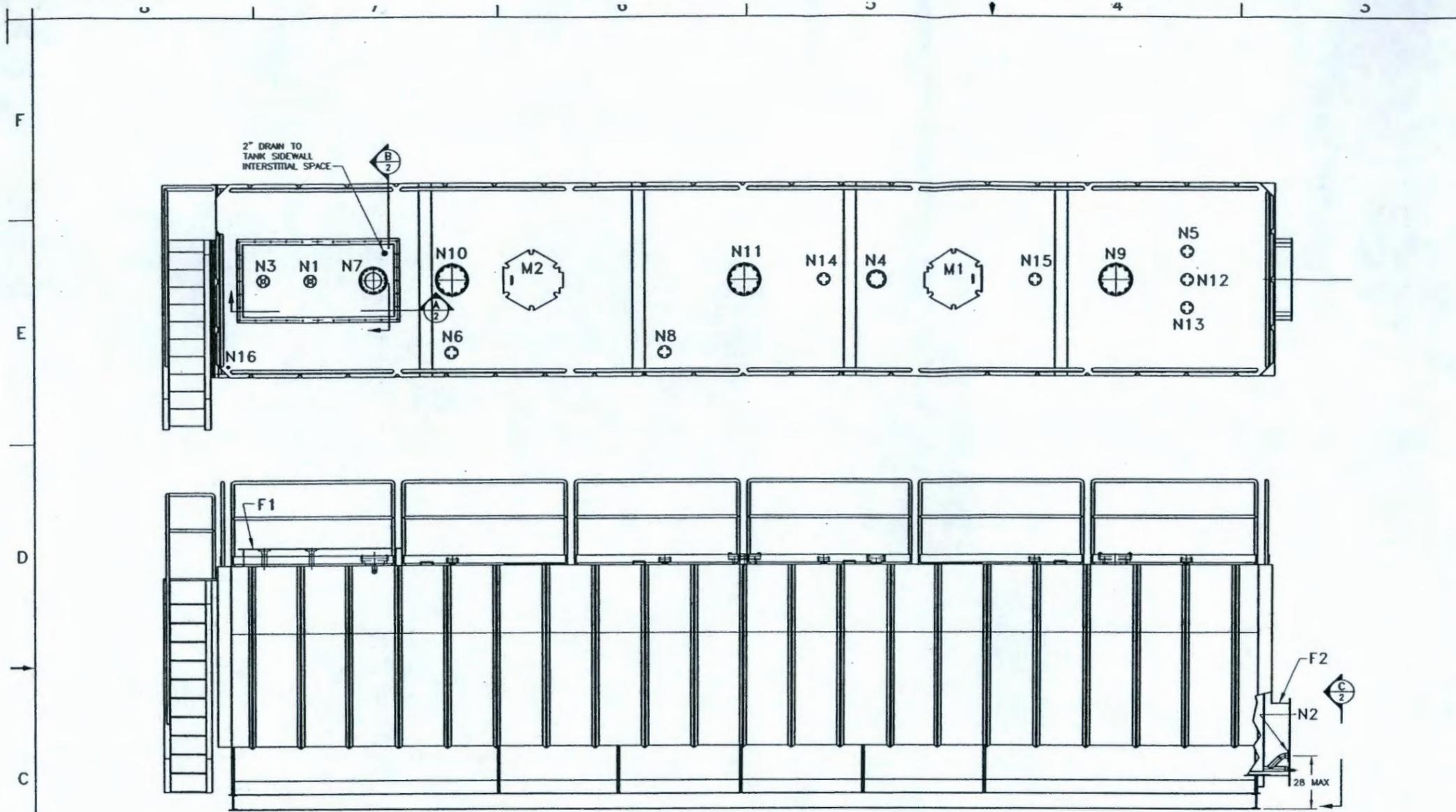
PROJECT:	Final DBVS Design	145579-D-SP-028	REV. 1
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Appendix A

Sketch

Sketch	Revision	Sheet	Title
DBVS-SK-M104	G	1	Bulk Vitrification Staging Tank Nozzle Arrangement
DBVS-SK-M104	G	1	Bulk Vitrification Staging Tank Nozzle Sections & Views
Total Drawing Pages including cover:			3

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LIQUID EFFLUENT TANK NOZZLES			
NOZZLE	NOZZLE FUNCTION	NOZZLE TYPE/SIZE	LOCATION
N1	WASTE RECEIPT	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK INSIDE VALVE SECONDARY CONTAINMENT HOUSING FLANGE NEAR BACK OF TANK
N2	WASTE OUTLET	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON FRONT OF TANK, CONFIGURATION TBD BY SELLER
N3	WASTE RETURN	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK INSIDE VALVE SECONDARY CONTAINMENT HOUSING FLANGE NEAR BACK OF TANK
N4	SPARE EQUIPMENT	4" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N5	PRIMARY CONTAINMENT VENTILATION OUTLET	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N6	PRIMARY CONTAINMENT VENTILATION INLET	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N7	VACUUM/PRESSURE RELIEF	TBD (NOZZLE NOT TO BE LESS THAN 2")	LOCATED ON TOP OF TANK INSIDE VALVE SECONDARY CONTAINMENT HOUSING FLANGE NEAR BACK OF TANK. DEVICE TO VENT INTO VALVE SECONDARY CONTAINMENT HOUSING
N8	SECONDARY CONTAINMENT ATMOSPHERIC VENTILATION	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N9	HEATER	10" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK W/IN 10' OF FRONT END
N10	HEATER	10" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK W/IN 10' OF BACK END
N11	HEATER (SPARE)	10" 150LB RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK W/IN 5' OF CENTER
N12	TANK LEVEL DETECTION	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N13	TANK HIGH LEVEL SWITCH	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N14	TEMPERATURE INSTRUMENT	2" 150 CLASS RF FLANGE ASTM A105/A105M OR ASTM A106	LOCATED ON TOP OF TANK
N15	PRIMARY TANK FLUSH	TBD	TOP OF TANK - QTY & LOCATIONS TBD
N16	ANNULUS FLUSH	TBD	TOP OF TANK - QTY & LOCATIONS TBD
F1	SECONDARY CONTAINMENT BODY FLANGE	AS CONFIGURED	LOCATED ON TOP OF TANK AT THE REAR
F2	SECONDARY CONTAINMENT BODY FLANGE	AS CONFIGURED	LOCATED ON FRONT FACE OF TANK
M1	MANWAY	30"	TOP OF TANK
M2	MANWAY	30"	TOP OF TANK

STAGING TANK NOZZLE ARRANGEMENT
SCALE: 1/2" = 12"

NOTE:
1. SEE PROCUREMENT SPECIFICATION: 145579-D-SP-02B, WASTE RECEIPT SYSTEM LIQUID WASTE STAGING TANKS

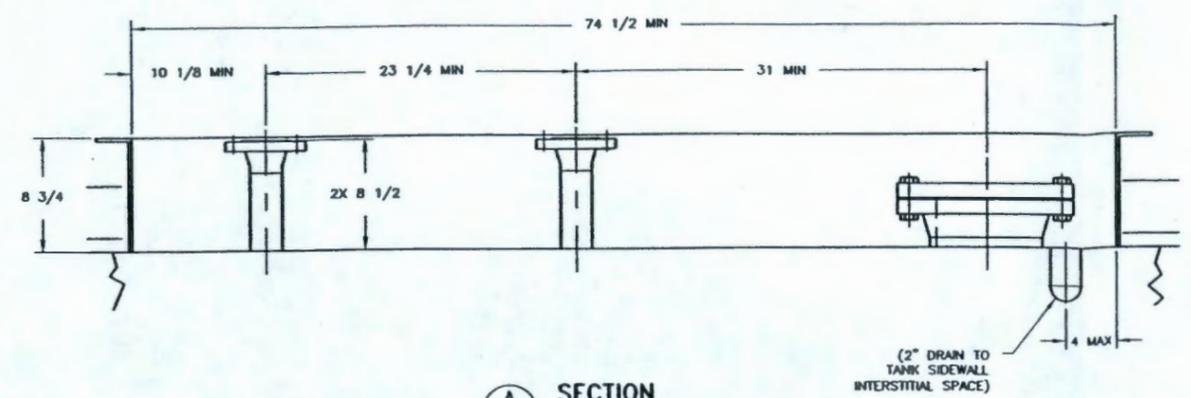
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NOT APPROVED FOR CONSTRUCTION

DMJM Technology

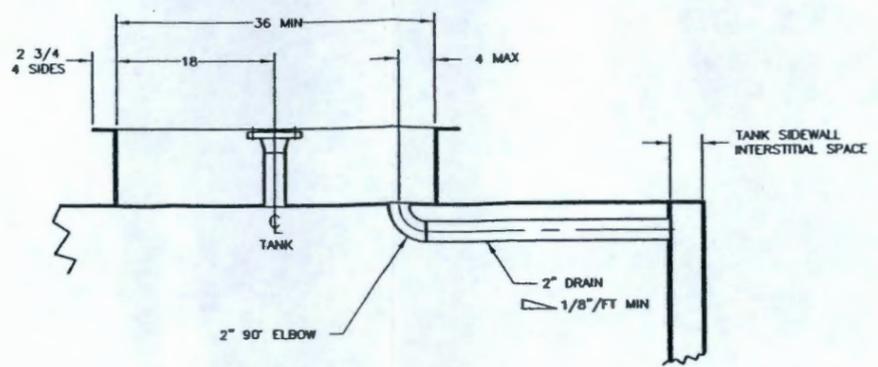
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DWG NO: 241C DATE: 7/10/00	SHEET NO: 7100 OF: 2	PROJECT NO: DBVS-SK-M104	SHEET NO: 1 OF 2

DWG NO	TITLE	REF NUMBER	TITLE

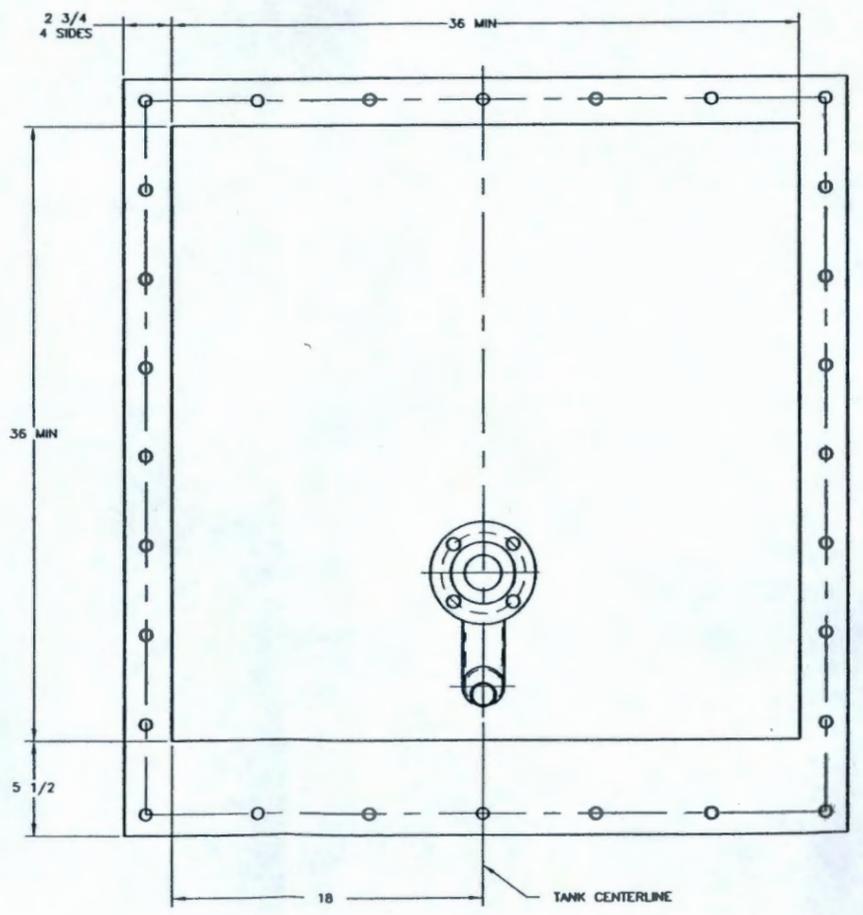
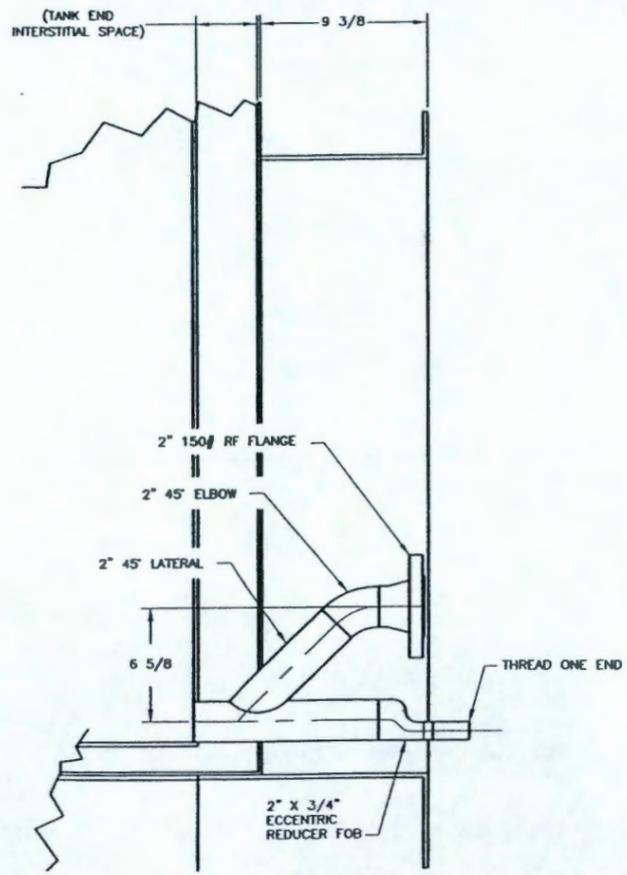
NO.	DATE	BY	CHKD	REVISIONS
G	11-24-04			RELEASED FOR SPEC APPROVAL
F	10-04			RELEASED FOR CLIENT REVIEW



A SECTION
1 SCALE: 3/16" = 1"



B SECTION
1 SCALE: 1/8" = 1"



C VIEW
1 SCALE: 1/4" = 1"

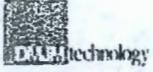
PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

DMJM Technology

		145579-FINAL DBVS DESIGN	
U.S. DEPARTMENT OF ENERGY Office of River Protection		DBVS-SK-M104 G	
BULK VITRIFICATION STAGING TANK NOZZLE SECTIONS & VIEWS		DBVS-SK-M104 G	
SHEET NO. 241C	DRAWING NO. 7100	SHEET NO. 2	OF 2

DWG NO	TITLE	REF NUMBER	TITLE	REFERENCES
	DRAWING TRACABILITY LIST		NEXT USED ON END ITEM	

NO.	DATE	DESCRIPTION	BY	CHKD
G	11-04	RELEASED FOR SPEC APPROVAL		
F	10-04	RELEASED FOR CLIENT REVIEW		



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Appendix B

TFC-ESHQ-Q_C-C-03, Revision B, *Control of Suspect/Counterfeit Items*

(53 pages including cover)

CH2M HILL Hanford Group, Inc.	Manual	ESHQ
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CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Page	1 of 52
	Issue Date	December 31, 2003
	Effective Date	December 31, 2003
APPROVAL AUTHORITY:		R. L. Higgins
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December 31, 2003**CONTROL OF SUSPECT/
COUNTERFEIT ITEMS****1.0 PURPOSE AND SCOPE**
(7.1.1, 7.1.2, 7.1.3, 7.1.4)

This procedure describes the process for the identification, prevention, evaluation, notification, and disposition of suspect/counterfeit items (S/CIs) at CH2M HILL. This procedure applies to items that are:

- In the procurement cycle
- In source or receiving inspection
- In inventory at warehouses and staging areas
- Installed
- In operation.

This procedure applies to:

- Company ordered material
- Material supplied by subcontractors
- Material and test equipment supplied by test sponsors
- Construction
- Fabrication shops
- Laboratory work and experiments
- Surplus/excess property
- Government property
- Material obtained from U.S. Department of Energy (DOE) sources.

2.0 IMPLEMENTATION

This procedure is effective on the date shown in the header.

3.0 RESPONSIBILITIES**3.1 Procurement Personnel**

Maintain awareness of S/CI and support S/CI program implementation.

3.2 Inspection Personnel

Perform inspections for conformance or acceptance of material including verifications that the item(s) being inspected do not exhibit indications attributed to potential suspect/counterfeit items.

3.3 Quality Assurance Engineer

1. Ensures appropriate procurement controls are implemented to preclude entry of S/CI to the site through review of procurement documents.
2. Notifies the S/CI coordinator of nonconformance reports (NCRs) associated with S/CI.

3.4 S/CI Coordinator

Apprises company, DOE, and DOE local Office of the Inspector General personnel of S/CI status and final disposition.

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3.5 Assigned Engineering Personnel

1. Evaluate S/CI information for applicability to design and procurement specifications, system configuration, and operating conditions.
2. Provide technical specifications, critical characteristics, and acceptance methods in support of procurement and inspection activities to prevent introduction of S/CI.

3.6 Responsible Managers and Supervisors

1. Maintain awareness of S/CI.
2. Control potential S/CI.
3. Evaluate training needs based on job classification and ensure individuals receive training in S/CI awareness, prevention, detection, and reporting, as appropriate, to respective assignments.

4.0 PROCEDURE

4.1 Introduction

The two most common S/CIs found at DOE facilities have been threaded fasteners fraudulently marked as high-strength bolts, and refurbished electrical circuit breakers sold and distributed under false certifications. Purchasers have also been misled into accepting S/CIs that do not conform to specified requirements by falsified documentation.

NOTE: Questions about a specific item should be referred to the S/CI coordinator. Attachment A provides a historical listing of suspect components. Equipment/material types or classes have been established to identify those specific items which are classified as potentially misrepresented or S/CI. Attachment B provides a listing of those classifications and items subject to S/CI control at tank farm facilities.

4.2 Procurement

CH2M HILL Personnel

1. Ensure material requirements are specified in subcontracts to preclude the purchase or introduction of S/CI. Use the information in Attachments A, B, C, D, E, F, G, H, and I to identify specific components, characteristics, precautions, and other considerations that are to be addressed during the procurement process to prevent introduction of S/CI.
2. Ensure material requests for quality level 1, 2, and 3 items and services include appropriate technical specifications, procurement quality clauses, documentation, and inspection requirements to prevent introduction of S/CI.
3. In maintenance and construction/fabrication subcontracts, specify appropriate requirements to preclude the purchase or introduction of S/CI.

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- | | |
|----------------------------|--|
| Quality Assurance Engineer | 4. Review procurement documents to ensure they contain the appropriate procurement controls to preclude entry of S/CI to the site. |
| Procurement Personnel | 5. Ensure vendor selection complies with qualification requirements for the quality level of the items and services and is based on the vendor's ability to demonstrate the capability of delivering acceptable items. |

4.3 Inspection for Potential S/CI

- | | |
|-------------------------------|---|
| Bill of Material Preparers | 1. For quality level 0 and P-Card items listed in Attachment B, designate an S/CI inspection in the special instruction of the Bill of Material (BOM) in accordance with the requirements of <u>TFC-BSM-FPM_MC-C-01</u> . |
| | 2. Ensure quality level 0 and P-Card items are inspected prior to material issuance. |
| First Line Manager | 3. Obtain on-site S/CI inspection for quality level 0 and P-Card items prior to material issue and use. |
| Engineering Personnel | 4. Provide technical specifications, critical characteristics, and acceptance methods to facilitate inspection planning for S/CI prevention and detection. |
| Quality Assurance Engineer | 5. Ensure S/CI detection criteria is incorporated into QA inspection planning activities. |
| Assigned Inspection Personnel | 6. Use Attachments G, H, and I as resources for detecting S/CIs during walkdowns and inspections. Specific items are subject to inspection. |
| | 7. Verify and document that the items being inspected do not exhibit indications attributed to potential S/CIs as described in Attachments G through J. |
| | 8. If an S/CI is detected during inspection activities, document and control the S/CI in accordance with <u>TFC-ESHQ-Q_ADM-C-02</u> . |

4.4 Control of Material Identified as S/CI

- | | |
|---------------------------------|--|
| Responsible Manager or Delegate | 1. Ensure items identified as potential S/CI are documented as nonconforming and controlled in accordance with <u>TFC-ESHQ-Q_ADM-C-02</u> . Non conformances identified as S/CI shall be reviewed and processed within four working days to determine whether or not the items are S/CI. |
| | 2. Transfer tagged S/CIs to 2101-HV for storage. |
| Cognizant Quality Engineer | 3. Notify the S/CI coordinator of all NCRs associated with the S/CI. |

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4.5 Reporting of S/CI

Assigned Company
Personnel

1. Report all items identified as potential S/CI in accordance with TFC-OPS-OPER-C-24. (7.1.1)

NOTE: Reporting of S/CIs is required regardless of safety class, where the S/CIs are located (receiving inspection, inventory/storage areas, fabrication and maintenance areas, installed, etc.), or their operating status.

S/CI Coordinator

2. Notify the DOE S/CI coordinator of all occurrence reports associated with S/CIs. As appropriate, transmit copies of NCRs and applicable documentation.
3. Notify the DOE local Office of Inspector General of all S/CIs. Notification should be e-mailed to the DOE local Office of Inspector General points of contact providing information in the following format:

- NCR number
- Date NCR was written
- Purchase order/job control number (if known)
- End use of product
- Name of manufacturer, distributor, supplier
- Safety class (if known)
- Occurrence report number
- Value of item(s)
- Point(s) of contact
- Description of item(s)
- Quantity
- Description of nonconformance
- Any other pertinent information that would help the DOE local Office of Inspector General.

4.6 Acceptance, Removal, and Disposition of S/CI

S/CI Coordinator

1. Notify responsible company personnel that S/CI may not be destroyed or disposed of without written release from the DOE local Office of Inspector General.
2. Prior to destroying or disposing of S/CIs, consult the Inspector General to determine if there is a need to retain the items as evidence for potential litigation. Based on the Office of Inspector General's decision, either:
 - a. Retain S/CI material as evidence for potential litigation, or
 - b. Release S/CI material for final disposition and/or disposal as directed by the S/CI coordinator.

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- | | |
|-------------------------------|---|
| Engineering
Personnel | 3. Evaluate S/CI to determine if its use could create a safety hazard in its current/proposed application. |
| Assigned Company
Personnel | <p>4. If the engineering evaluation of the S/CI has determined that its use could not create a safety hazard in its current/proposed application:</p> <p>a. Disposition the S/CI to remain in place.</p> <p>NOTE: Criteria for dispositioning S/CI is by acceptance, removal, or replacement after an engineering evaluation. This should be based on the deficient characteristic of the particular item.</p> <p>b. Identify the accepted S/CI by marking with orange paint or other appropriate methods and note its location.</p> <p>c. In areas where operating temperatures are 500°F and above or are subject to cyclic loading where fatigue failure is likely to occur, replace all grades 8 and 8.2 S/CI fasteners prior to further use of the equipment.</p> <p>d. Engineering must also identify a way to prevent its reuse in an application it may not be suitable for.</p> <p>e. If removed, prepare the S/CI for disposal.</p> <p>5. If the engineering evaluation of the S/CI has determined that its use could create a safety hazard in its current/ proposed application:</p> <p>a. Contact Waste Feed Operations (WFO) Shift Operations to secure the equipment.</p> <p>b. Remove the S/CI as soon as practical.</p> <p>c. Tag, segregate, or otherwise control the S/CI to prevent inadvertent use.</p> <p>d. Prepare the S/CI for disposal.</p> |
| S/CI Coordinator | <p>6. Ensure that all S/CI material dispositioned for disposal is properly controlled and arranged for the material to be permanently and irrevocably altered so that it cannot be used. Examples of alterations include:</p> <ul style="list-style-type: none"> • Melting • Shredding • Destroying the threads on fasteners. |

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7. If the DOE/Office of Inspector General has approved disposal, arrange for pick-up and disposal of the altered S/CI material on a yearly basis. Burying S/CIs may be acceptable if they do not contain hazardous material or material prohibited by federal, state, or local regulations.

4.7 Surplus/Excess Material

- | | |
|--------------------------|---|
| Responsible
Personnel | <ol style="list-style-type: none"> 1. Remove S/CI from surplus/excess material before they are released for sale or transfer of accountability. 2. Ensure surplus items received from DOE or other facilities are inspected for S/CI prior to installation. |
|--------------------------|---|

4.8 Assessments

- | | |
|-------------------|--|
| Quality Assurance | <ol style="list-style-type: none"> 1. Conduct assessments of the effectiveness of the S/CI program.

NOTE: The assessment should be performance based and designed to determine if company activities are conducted in accordance with this procedure, DOE 414.1A, DOE O 440.1A, DOE G 440.1-6, and 10 CFR 830, Subpart A. 2. Lines of inquiry will be used as appropriate during assessments in areas that interface with the S/CI process. See Attachment J. |
|-------------------|--|

4.9 Training

- | | |
|-----------------------------|---|
| Managers and
Supervisors | <ol style="list-style-type: none"> 1. Evaluate individual training needs of assigned personnel to ensure they are proficient in S/CI identification and control procedures within their areas of responsibility. 2. All personnel involved in the following specific areas will receive S/CI process and hands-on training, whether it be formal, continuing training, or required reading. The formal training course that is available is Module #1, Course 170720, "Suspect/Counterfeit Items." <ul style="list-style-type: none"> • Quality Assurance/technicians • Engineers (design, systems, etc.) who procure materials/equipment • Maintenance personnel (electricians, pipefitters, millwrights, instrument technicians) • Warehouse personnel who handle and process materials/equipment • Tool Crib attendants. |
|-----------------------------|---|

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5.0 DEFINITIONS

Counterfeit part. A part made or altered so as to imitate or resemble an "approved part" without authority or right, and with the intent to mislead or defraud by passing the imitation as original or genuine. (Source: U. S. Department of Transportation Federal Aviation Administration Advisory Circular 21-29B, Detecting and Reporting Suspected Unapproved Parts).

Fastener (regardless of the safety classification). (Source: Fastener Quality Act, Public Law 101-592 as amended by Public Law 104-113).

- A screw, nut, bolt, or stud with internal or external threads or a load-indicating washer with a nominal diameter of 5 millimeters or greater in the case of such items described in metric terms; or 1/4 inch or greater in the case of such items in terms of the English system of measurement which contains any quantity of metal and held out as meeting a standard or specification which requires through-hardening; or
- A screw, nut, bolt, or stud having internal or external threads which bears a grade identification marking required by a standard or specification; or
- A washer to the extent that it is subject to a standard or specification applicable to a screw, nut, bolt, or studs described above, except that such term does not include any screw, nut, bolt, or stud that is produced and marked as American Society for Testing and Materials (ASTM) A 307 Grade A or produced in accordance with ASTM F432.

Grade identification. Any symbol appearing on a fastener purporting to indicate that the fastener's base material, strength properties, or performance capabilities conform to a specific standard of a consensus standards organization or government agency.

Graded classifications. System used to determine minimum requirements for structures, systems and components (e.g., design, operation, procurement, and maintenance requirements). The graded classifications in order of precedence are safety class, safety significant, and enhanced quality general services.

High strength graded fastener. Fasteners having a minimum tensile strength of 75 ksi, including those produced and procured in accordance with the Society of Automotive Engineers Standard J429, Grades 5, 5.2, 8, and 8.2; ASTM Standard A325, Types 1, 2, and 3; ASTM A490, ASTM A354, ASTM A449 (I&II), and some ASTM F468.

Item. An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, or unit. (Source: ASME-NQA-1-1989, Quality Assurance Requirements for Nuclear Facilities).

An all-inclusive term used in place of any of the following: appurtenance, facility, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, documented concept, or data. (Source: DOE G 440.1-6, Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10 CFR 830.120; and DOE 5700.6C, Quality Assurance).

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Substantial safety hazard. A loss of safety function to the extent that there is a major reduction in the degree of protection to the public or employee health and safety. (Source: U.S. Department of Energy (DOE) M 232.1-1A, "Occurrence Reporting and Processing of Operations Information").

Suspect/counterfeit items. A suspect item is one in which there is an indication by visual inspection, testing, or other information that it may not conform to established Government or industry-accepted specifications or national consensus standards. A counterfeit item is a suspect item that is a copy or substitute without legal right or authority to do so or one whose material, performance, or characteristics are knowingly misrepresented by the vendor, supplier, distributor, or manufacturer. An item that does not conform to established requirements is not normally considered S/CI if the nonconformity results from one or more of the following conditions, which should be controlled by site procedures as nonconforming items:

- Defects resulting from inadequate design or production quality control
- Damage during shipping, handling, or storage
- Improper installation
- Deterioration during service
- Degradation during removal
- Failure resulting from aging or misapplication, or
- Other controllable causes.

(Source: DOE G 440.1-6, Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, "Worker Protection Management;" 10 CFR 830.120; and DOE 700.6C, "Quality Assurance").

6.0 RECORDS

No records are generated during the performance of this procedure.

7.0 SOURCES

7.1 Requirements

1. DOE-O-232.1A Part 4.f. (1), "Occurrence Reporting and Processing of Operations Information." (S/RID)
2. DOE O 414.1A, "Quality Assurance."
3. 10 CFR 830, Subpart A, "Quality Assurance Requirements."
4. DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees."

7.2 References

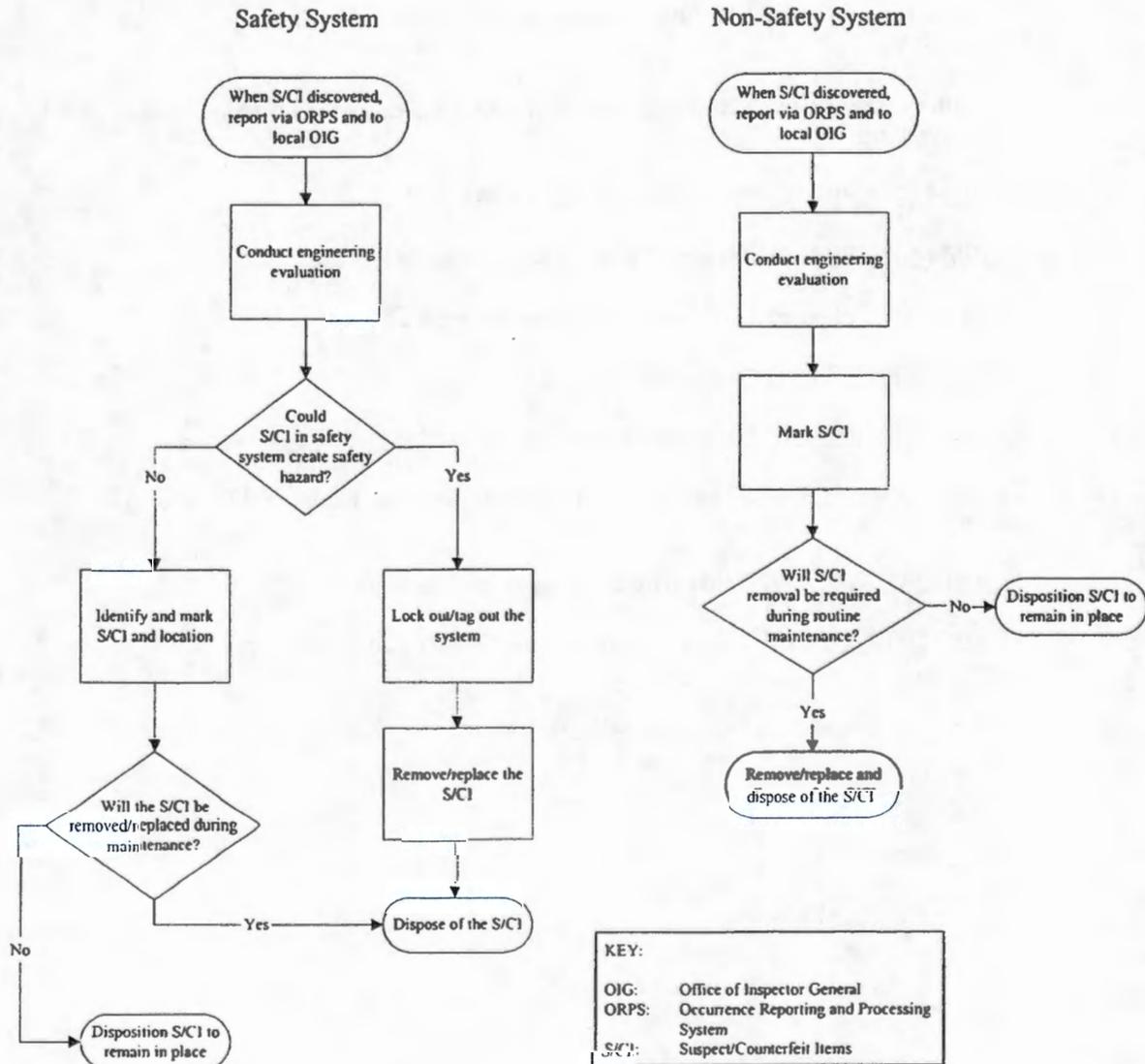
1. HNF-SD-MP-SRID-001, "Standards/Requirements Identification Document for the Tank Farm Contractor."

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2. DOE G 440.1-6, "Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10CFR830.120; and DOE5700.6C, Quality Assurance."
3. NRC Information Notice 89-70: "Possible Indications of Misrepresented Vendor Products."
4. NRC Information Notice 89-70, Supplement 1: "Possible Indications of Misrepresented Vendor Products."
5. TFC-BSM-CP CPR-C-01, "Purchasing Card (P-Card)."
6. TFC-BSM-CP CPR-C-03, "Buyer's Technical Representative Process."
7. TFC-BSM-CP CPR-C-06, "Procurement of Items (Materials)."
8. TFC-BSM-CP CPR-C-09, "Supply Chain Process."
9. TFC-BSM-CP CPR-C-11, "Acquisition Planning."
10. TFC-BSM-FPM MC-C-01, "Material Receipt, Storage, Issuance, Return, and Excess Control."
11. TFC-ESHQ-Q ADM-C-02, "Nonconforming Item Reporting and Control."
12. TFC-OPS-OPER-C-24, "Occurrence Reporting and Processing of Operations Information."
13. TFC-PLN-03, "Engineering Program Management Plan."

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Figure 1. Management of Suspect/Counterfeit Items.



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ATTACHMENT A - SUSPECT COMPONENTS LIST

This list was extracted from the U.S. Department of Energy Quarterly Reports on the "Analysis and Trending of Suspect/Counterfeit Items at Department of Energy Facilities," July 1997.

NOTE: It is not necessarily a negative reflection on a supplier or manufacturer if S/CIs are reported regarding its particular product. Reputable manufacturers and suppliers have a vital interest in preventing the manufacture or distribution of S/CI associated with themselves. It may be that the supplier or manufacturer was victimized and is pursuing S/CI associated with its products in an aggressive, prudent, and professional manner in order to get such items off the market. Therefore, each particular case regarding the manufacture or supply of S/CI must be examined on its own merit without making premature conclusions regarding fault or culpability of the manufacturer or supplier whose name is associated with the S/CI. In short, what follows is a "suspect components list" and not a "suspect manufacturer or supplier list." The manufacturer or supplier identified in the following table should not be considered to have engaged in any wrongdoing without additional information.

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (Component Examples)			
	<ul style="list-style-type: none"> • TF136090 • TF361050WL • TED1130020 	Commercial Grade	Westinghouse Electric Supply Co. (WESCO)	NRC I.N. 91-48
	<ul style="list-style-type: none"> • Not Provided 			
	<ul style="list-style-type: none"> • DB-25 & DS-416 	Low Voltage	Satin America & Circuit Breaker Systems, Inc.	NRC I.N. 89-45 & Supplement #2
	<ul style="list-style-type: none"> • FSN-5925-628-0641 • DB-25 • DB-50 • HKB3150T • FB3020 • FB3070 • FB3050 • EHB3025 • LBB3125 • HKA31250 • JA3200 • EHB2100 • 225N 	Trip units; Navy Trip units; 1, 2, & 3 pole various amp. ratings	General Circuit Breaker & Electrical Supply	NRC I.N. 88-46, Supplements and Attachments
	<ul style="list-style-type: none"> • EB 1020 • HDEA 2030 • MCP331100R • MCP431550CR • BAB3060H • 656D14 8G03 • FA-2100 • EH-2050 • HFB-3050 • HFD(B)-3020 • MA3600 • F2020 • EH2100 • EB3050 • HMC3800F • EA2090 • FA3125 • HMCP 150 		HLC Electrical Supply	Office Of Nuclear Safety 93-9
			California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	
			ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
			Molded Case Circuit Breakers	
			NSSS, Inc.	
			Spectrum, Tech.	
			Rosen Electric	
		Luckow Circuit Breaker		

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)	Shunt Trips Aux. Contacts 2 & 3 pole circuit breakers of various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply PENCON International (DBA) General Magnetics/ Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Molded Case Circuit Breakers Co. (MCCB)	NRC I.N. 88-46 Supplements and Attachments
	<ul style="list-style-type: none"> • HFD • EH2070 • FA2050 • JA2225 • JL3B125 • JL3B070 • JL3B150 • JL3B200 • JL3B090 • JL3B100 • HLM3800T • F3100N • MA3500 • EH2015 • FA3035 • FA2100 • HLA2125OTM • EH2070 • JB3100 • EB2030 • 8MC800 • CAH3200 • EHB3040 • JL3-B150 • JL3-B200 • JL3-B090 • JL3-B1000 • HFA, HFB, FA • JL3-(B)8070 • JL3-B125 • EH-2020 • FA-3035 • EH-2050 • FA-2100 • FA-2050 • HFB-3050 • JA-2225 • HLM3800T • F3100N • MA3500 • EH2015 • LA3200WL • HLA3200T • 2602D58U9 			

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)			
	<ul style="list-style-type: none"> • HLB3200T • 262156G19 • 1A & 1B • HL300T • HLA2400TM • HMA3600T • HMA3700T • HKA3225T • HNB2700T 	225 amp, 3 pole 3 pole, 20 amp 3 pole, 30 amp 1 pole, 20 & 30 amp 2 pole, 20 & 30 amp 3 pole, 60 amp	Not Provided	NRC I.N. 88-46 Supp. & Attach.
	<ul style="list-style-type: none"> • MDL#KAF • QNB3020 • QNB3030 • BA 	3 pole, 20 amp	Not Provided	SENS ID #10 3-17-89 SENS ID #11 3-3-89
	<ul style="list-style-type: none"> • BA • BA • E3060 • F3020 			SENS Report ID #12 10-19-88 NRC I.N. 88-46
Circuit Breakers	JTE (Component Examples)			
	<ul style="list-style-type: none"> • Model - E43B015 	3-phase 480 volt	Cal. Breakers/Elect. Wholesale Supply Co.	SENS Report ID #8, 5-5-89
	<ul style="list-style-type: none"> • EQ-B 	1 pole, 20 amp 3 pole, 30 amp	Not Provided	SENS ID #10 3-17-89 SENS ID #11 3-3-89
	<ul style="list-style-type: none"> • EE-3B030 			
	<ul style="list-style-type: none"> • EF3B070 • EF3H050 • EF3B125 • EF3B040 • E42B020 • QJ2B200 • JL3B400 	2 & 3 pole various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply	NRC I.N. 88-46, Supplements and Attachments

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	ITE (cont.) (Component Examples) <ul style="list-style-type: none"> • HE9B040 • EE3B050 • BQ2B030 • EE3B070 • EE2B100 • EE2B050 • EE2B030 • FJ3B225 • ET • KA • EH-313015 • JL-3B070 • JL-3B150 • E43B015 • EF2-B030 • EH3B100 • QP1B020 • QJ3B200 • EF3B100 • 1193 		California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ATS Circuit Breakers, Inc. Panel Board Specialties Rosen Electric Equipment	
Circuit Breakers	ITE, Gould & ITE Imperial Brown Boveri Elect. (BBE) ASEA Brown Boveri (Component Examples) <ul style="list-style-type: none"> • Type HK • 5 HK • 7.5 HK • 15 HK • 38 HK • ITE 62-6 	Not Provided ID-4KV Not Provided Not Provided Not Provided	Brown Boveri ASEA Brown Boveri	NRC I.N. 89-86 NRC I.N. 87-41 Office of Nuclear Safety, 92-25
Circuit Breakers	Square "D" Co. Component Examples <ul style="list-style-type: none"> • KHL 36125 (Any Type) 	Molded Case	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale	NRC I.N. 88-46 Supp. & Attach. NRCB 88-10 NRC I.N. 90-46

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Square "D" Co. Component Examples (cont.)		ANTI THEFT Systems Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
	• QOB220	1 pole, 15 amp	Not Provided	SENS ID #10 3-17-89
	• QO220 • LO-3	2 & 3 pole 20 & 50 amp breakers	General Circuit Breaker & Electrical Supply	NRC I.N. 89-45 & Supplement #2
	• SBW-12 • 989316 • FAL3650-16M or • FAL36050-16M • KA36200	3 pole - 200 amp breaker 30A/600V	HLC Electric Supply California Breakers, Inc.	
	• 999330	Not Provided	PENCON International (DBA) General Magnetics/Electric Wholesale	
	Manufacturer not Provided	Not Provided	Stokely Enterprises Molded Case Circuit Breakers	DOE Letter 8-26-91 Reprinted NuVEP: Bulletin 7-26-91
Circuit Breakers	Fed. Pacific (Component Examples)		General Circuit Breaker & Electrical Supply	
	• NEF431020R • NE111020 • NE	3 pole, 20 amp 1 pole, 20 amp 1 pole, 15 amp	HLC Electric Supply California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	SENS ID. #10 3-17-89

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Fed. Pacific (Component Examples) (cont.) <ul style="list-style-type: none"> • NF63-1100 • NE22-4060 • NE22-4100 • NEF-433030 • 2P125 	1, & 3 pole - 30, 60 & 100 amp breakers	ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc.	SENS ID. #11 3-3-89 NRC I.N. 88-46, Supp. & Attach.
	Jefferson (Component Examples)	Not Provided	PENCON International (DBA) General Magnetics/electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Mid West Co.	NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers	Superior (Component Examples) <ul style="list-style-type: none"> • 246U-3 	Not Provided	General Circuit Breaker & Electrical Supply Rosen Electric HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46 Supp. & Attach.

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Manufacturer Not Provided (Component Examples) 50DHP250	2 pole - 50 amp	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers Heaters	Cutler Hammer (Component Examples) • 10177H13 • 10177H21 • 10177H32 • 10177H036 • 10177H1049	Not Provided	AAKER General Circuit Breaker & Electrical Supply HLC Electrical Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.

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Component	Manufacturer/Type	Description	Supplier	References
Switches	(Component Examples) Crouse Hinds #EDSC2129 Sq. D Type G. Class 9012, 9025, 9016	Tumbler, ft. op	Platt Electric Supply Co. Gen. Motors, Electro-Motive Design	SENS ID #16 1-27-92 Office of Nuclear Safety 93-24 & 93-27
Transmitters	Rosemount	(Component Examples) • Model 1151 GP • Model 1151 DP	Venetech	E.L. Wilmot letter dated 8-1-91 H. Richardson letter HR-81-91 dated 8-15-91
Motors	Siemen & Allis (Component Examples) INP 143 T 215 T	10 H.P.	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Rosen Electric Equipment	NRC I.N. 88-46, Supplements and Attachments

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Component	Manufacturer/Type	Description	Supplier	References
Relays	Potter & Brumfield (Component Examples) MDR-138, 173-1 134-1, 142-1	Not-latching rotary	Stokely Enterprises Spectronics, Inc. Nutherm International The Martin Co.	NRC I.N. 90-57 & Attach.
	Teledyne	All qualified to MIL-R-28776 and MIL-R-39016	Not Provided	DOE-ID Wilmot letter, 7-16-91
	G.E. & Exide (Component Examples) • 12HGA-11S52 • NX 400	Overload & Aux.	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
	Manufacturer not provided • FSC-5945	Not Provided	Stokely Enterprises	DOE Letter 8-26-91 Reprinted NuVEP: Bulletin 7-26-91
	Amerace (or Agastat) (Component Examples) Models: E7024 E7022	Electro Pneumatic Timing Relays	Amerace Control Components Supply	SENS ID #1 11-1-91 NRC I.N. 92-24
	A through L Series Model 7032	PRB		

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Component	Manufacturer/Type	Description	Supplier	References
Fuses	Bussman Co. (Component Examples) REN 15 & NOS-30 Class 1E	15A-250V & 30A-600V All Supplied by PMS	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Preventive Maintenance Systems (PMS)	NRC I.N. 88-46, Supp. & Attach. NRC I.N. 88-19
Controllers	Manufacturer Not Listed (Component Examples)	Motor Controllers	Stokely Distributors & Stokely Enterprises, Inc.	DOE letter 8-26-91 & NUVEP Bulletin 7-26-91
Starters	Westinghouse (Component Examples) 626B187G17 626B187G13	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-45 Supp. & Attach.
Resistors	Unknown	All	Impala Electronics	NRC I.N. 91-01

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Component	Manufacturer/Type	Description	Supplier	References
Semiconductors	Solid State Devices Inc. (SSDI) SFF 9140	P-Channel MOSFET	SSDI	DOE Albuquerque Letter, 06-25-96 to DOD Inspector General
	SPD 1511-1-11	Pin Diode (SA3059)		
	2A14/18 or 2A14/52	Ion Implanted Diode		
	SSR4045CTTXV	SCHOTTKY Diodes		
	SFF9140TWX	Power Transistors		
	SPMF106ANH	Special Pack MOSFET Switch		
	SPD 5818 or IN5858JTXV	Axial Leaded SCHOTTKY Diode		
	2N797	Transistor		
	Unknown	Diode (SA 3436)		
Starter Controls	Westinghouse (Component Examples) • A200MICAC • A201KICA • A201L2CA • AN13A	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-48

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Component	Manufacturer/Type	Description	Supplier	References
Gauge Glasses	Siemen & Allis (Component Examples) #00-737-637-118 215 T	Not Provided	Rosen Electric Co.	NRC I.N. 88-46 Supp. & Attach.
Mercury Lamps	Spectro Inc. (Component Examples) V00014	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46
Electrical Frames	Westinghouse (Component Examples) LA2600F LA3600F MA2800F	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46
Push button station	Crouse Hinds (Component Examples) #00-737-637-118	Single gang, pushbutton	Platt Electric Supply Co.	SENS Report ID #16 1-27-92

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Component	Manufacturer/Type	Description	Supplier	References
Overload Relay Thermal Unit	Square D (Component Examples) B19.5, B22	Not Provided	Not Provided	NRC I.N. 88-46
Piping, Fittings, Flanges, and Components	Tube-line Corp. Ray Miller, Inc.	Subassemblies, fittings, flanges, & other components (Carbon and Stainless Steel components)	Tube-line Ray Miller, Inc.	NRC IEB 83-06 NRC I.N. 89-18 NRC IEB 83-07 NRC I.N. 83-01
Piping, Fittings, Flanges, and Components	Piping Supplies, Inc. & West Jersey Mfg. & Chews Landing Metal Mfg.	Carbon and Stainless Steel Fittings and Flanges	Piping Supplies, Inc. & West Jersey Mfg. & Chews Landing Metal Mfg.	NRC Bulletin 88-05 & Supplements
Valves	VOGT	Full port design 2-inch Model SW-13111 & 1023	CMA International IMA Valve Refurbisher	NRC I.N. 88-48 & Supplements
	Crane	4"-1500psi, pressure sealed	Southern Cal. Valve Maintenance co., Amesse Welding Service & CMA Int.	NRC I.N. 91-09
	ITT Grinnell Valve Co., Inc	Diaphragm valves	ITT Grinnell Valve Co. Inc. Div. of Diaflo & ITT Engineered Valves	NRC Comp. Bulletin 87-02
	Crane, Pacific, Powell, Walworth & Lunkenheimer	Gate Valves	Coffeyville Valve Inc.	NRC I.N. 92-56
	Pacific	8" & 3" Globe Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Crane Chapman	24" Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Pacific	Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.

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Component	Manufacturer/Type	Description	Supplier	References
Valves	Kerotest	8" Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Pacific	4" Gate Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Lukenheimer	6" Model 1542 20" Model 3013	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Crane	All	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
Flanges	China Ding Zinang Nan Xi Li Flange Co. Shou Gang Mach. Eng. Co.	Flanges, ASTM A105, ASME SA105	Billiongold Co. LTD. Tain Gong Co. Sanxi Province Overseas Trading Corp	NRC I.N. 92-68 and Attachments Office of Nuclear Safety 92-25, 93-23, and 92-35 National Board of Boiler and Pressure Vessel Inspectors (NBBI) Bulletin: Special Report, 1992, Volume 48, Number 2, The Chinese Flange Investigation
Valve Replacement Parts	Masoncilian-Dresser Industries	Plug stem, stem to plug anti-rotation pin, seat ring, valve plugs, bushings, cages & packing box components	Cor-Val, Control Valve Specialists, H.H. Barnum & M.D. Norwood, Sample Webtrol Controls, Inc.	NRC I.N. 88-97 Supp. & Attach.
Pumps & Replacement Parts	Hayward Tyler Pump Co.	HTPC ASME Nuclear Code	Hayward Tyler Pump Co.	IEB 83-05 & Attachments
Channel Members	Unistrut Corporation	Continuously slotted channels, structural framing members, fasteners, nuts, fittings, pipe clamps	Unistrut Corporation	NRC I.N. 91-25
Fire Barriers	Thermal Science Inc.	Thermo-Log 330	None Listed	ES&Q Update #8 NRC I.N. 92-55
Valve Actuator	Limitorque	Eyebolts on housing cover	None Listed	Office of Nuclear Safety 93-25 NRC I.N. 93-37

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Steel	Alloy & Carbon Steel Co. Inc., Atlantic Steel Co., Livingston Steel Co., & Copperweld Steel co.	Plate Angle Flat Bar Bar	Meredith Corporation Pressure Vessel Nuclear Alloy & Carbon Steel Co., Inc.	NRC I.N. 89-56, Attachments and Supplements
Fasteners (Bolts, Screws, Nuts, and Washers)	(parentheses designated headmark) Asahi (A) Daiichi (D) Daiei (E) Fastener Co. of Japan (FM) Hinomoto Metal (H) Jin Her (J) Kyowa (K) Kosaka Kogyo (KS) Kyoei Minamida Seiybo (M) Mnato Kogyo (MS) Nippon (NF) Takai (RT) Tsukimori (S) Unytte (UNY) Yamadai (Y) Ivaco, Infasco (hollow triangled)	<ul style="list-style-type: none"> • Those with suppliers or manufacturers • Those that are improperly marked • Those of foreign manufacture that do not meet Public Law 101-592. Fastener Quality Act 	Note: Listed suppliers may also be manufacturers Lawrence Engineering & Supply Co. Metal Building Bolts Nichimin Corporation UNICO Ace Corporation E. K. Fasteners, Inc. H. Y. Port Fasteners Co. Kobayashi Metals, LTD. Takai Screw Mfg. Co. LTD. Yamaguchi Sesakusho Co. LTD. Highland Bolt & Nut Porteous Fastener Co. Northwest Fasteners Ziegler Bolts & Parts Co. Edgewater Fasteners, Inc. Reynolds Fasteners A & G Engineering	Commercial Carrier Journal Articles for: 6/88, 1/90, 2/90, 3/90, 4/90, 6/90, 7/90, 12/90 INEL Suspect Headmark List SENS Report #5 2/6/91 SENS Report #13 2/6/91 HR 3000, U.S. House of Representatives, July 1988 J. A. Jones, Ltr, 9/23/92 Memo from L. Kubicek, 3/28/91 Memo from D. Sanow, 3/8/91 "Fastener Technology International," Feb., April, and June 1993 Rep. J. Dingell Ltr to Comm. Dept. & NRC June 18, 1993 Office of Nuclear Safety 93-26, 93-22, 93-11 DOE Quality Alert, Bulletin, Issue No. 92-4, August 1992 FDH Hanford Suspect Headmark List

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Fasteners (Bolts, Screws, Nuts, and Washers)	NUCOR	1-1/4" x 2" Zinc Chromate plated surface Hexhead cap screws	Cordova Bolt, Inc.	SENS ID #13 11-6/91
	Any	Any	Aircom Barnett Bolt Works Bolis & Nuts, Inc. Glasser & Assoc. Knoxville Bolt & Screw Metal Fastener Supply Phoell Mfg. Co. Service Supply Co. Southeastern Bolt & Screw Sure Loc Victory Bolt	NRC Compliance Bulletin 87-02 NRC I.N. 89-59

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**ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT
ITEMS**

A. ELECTRICAL ITEMS

- Molded Case Circuit Breakers
- Motor Control Centers
 - Complete Units
 - Components
 - Starters
 - Starting coils
 - Contactors
 - Overload relays
 - Starter control relays
 - Overload heaters
- Protective/control relays
- DC power supplies/chargers
- AC inverters
- Current/potential transformers
- Exciters/regulators
- Bus transfers/auto bus transfers
- Motor generator sets
- Generators
- Rewindable motors
- Printed circuit boards
- Bulk commodity items
 - Fuses
 - Splices
 - Electrical connectors
- Indicators/controllers
- Panel lights/switches
- Transmitters/instrument switches
- Isolation devices.

The following items are excluded unless required by the applicable program/project: 600V or less: motors; outlets, switches, and plugs; boxes, conduit (i.e., bodies and covers, nipples, fittings, EMT, flex, liquid tight, rigid); wire; miscellaneous wire connections #10 and below; fixtures; lights.

B. MECHANICAL ITEMS

- Welding materials
 - Rod
 - Wire
 - Flux
- Structural members (pipe supports)
- Channel members

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**ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT
ITEMS (cont.)**

- Sheet
- Plate
- Bars
- Round stock
- Other raw material which requires an ASTM or national standard
- All lifting/rigging gear (wire rope shall be made in the United States by a member of the Wire Rope Technical Board (WRTB) or the Associated Wire Rope Fabricators (AWRF) (except stainless steel, and unless recommended otherwise by a crane or hoist manufacturer); stainless steel wire rope shall be made in the United States and shall be 302 or 304 grade stainless steel unless otherwise recommended by a crane or hoist manufacturer)
- Ratchet tie-downs/strapping devices and come-a-longs, with fasteners.

The following materials are excluded unless required by the applicable program/project:
ASTM-A36, brass, copper, sheet metal 7 GA or less, and aluminum.

C. PIPING - which requires an ASTM or ASME standard

- Fittings
- Flanges
- Valves
- Pipe
- Components.

The following materials are excluded unless required by the applicable program/project:
ASTM-A-53, Swagelock; cast iron, galvanized, copper, bronze, and brass; PVC; and gaskets.

D. FASTENERS - All fasteners 1/4" and above in diameter

- Bolts
- Studs
- Cap screws
- High-strength washers
- Nuts
- Anchors.

NOTE: Attachment I identifies headmarkings for stainless steel and carbon steel high strength fasteners that are considered counterfeit. Fasteners exhibiting these headmarks are counterfeit and no further testing is required.

The following items are excluded, unless required by the applicable program/project: sheetmetal screws, wood screws, stove bolts, pan heads, machine screws, lag bolts, threaded rod, rivets, and carriage bolts.

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST

A wide variety of industry and Government sources publish information relative to suspect/counterfeit products. The following sources provide information which is available on a continuing basis:

Industrial Fasteners Institute (IFI)

The following information is available from IFI via subscription:

- "Fastener Application Advisory" (Published Monthly)
- "North American Manufacturers Identification Markings for Fasteners"
- Fastener-related video cassettes.

The National Board of Pressure Vessel Inspectors (NBBI)

The NBBI publishes "National Board Bulletins" to alert manufacturers and users of misrepresented products as they are discovered.

National Highway Traffic Safety Administration (NHTSA)

The NHTSA's Office of Defects Investigation issued a "Suspect Bolt List" in late 1990 identifying numerous fasteners, which they determined to be misrepresented.

Trade Journals and Magazines

There are numerous trade-oriented magazines which have carried articles identifying incidents of failure of substandard parts in industry applications which have caused personal injury and death, as well as serious property damage.

Newspaper and Television Reports

Another good source of information are news reports, which provide current accounts of problems encountered as a result of misrepresented products.

U.S. Nuclear Regulatory Commission (NRC)

The NRC issues bulletins, notices, and regulatory guidance on a continuing basis to alert nuclear power utilities of potential intrusion of misrepresented products into the operations environment of operating nuclear power plants.

U.S. Department of Defense (DOD) and U.S. Department of Commerce publications are also monitored by the DOE to assure that the deficiencies identified do not contaminate DOE facilities.

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST (cont.)

Government Industry Data Exchange Program (GIDEP)

The mission of this program, established by the Office of Management and Budget, is to support government systems readiness, logistics effectiveness, productivity, and cost reduction through timely retrieval, storage, and distribution of data among government and industry organizations.

U.S. Department of Energy

The following documents are issued by the DOE to provide information and guidance relative to the suspect/counterfeit parts issue:

- DOE Orders
- Letters of Direction
- Bulletins and Quality Alerts

(In addition, the DOE periodically sponsors seminars/workshops relative to the detection and control of suspect/counterfeit parts).

U.S. Customs Service

The U.S. Customs Service has published the Suspect Headmark List (Figure 1) identifying graded fasteners determined to be of indeterminate quality, which has been adopted by DOE and, ultimately, Project Hanford, as a formal guide for use when evaluating currently installed and newly procured graded fasteners to assure their fitness for use on the Hanford Site.

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ATTACHMENT D - CHARACTERISTICS THAT MAY MAKE PRODUCTS VULNERABLE TO MISREPRESENTATION, FRAUDULENT PRACTICES, AND COUNTERFEITING

The following information has been extracted from the NRC Information Notice 89-70, Supplement 1, Attachment 3:

- High-turnover usage rate.
- No easy or practical way to uniquely mark the component itself.
- Critical characteristics, including environmental qualification not easily discernable in external visual inspection, or characteristics that are difficult to verify through receipt testing.
- May be widely used in non-critical and critical applications.
- Use may not result in used appearance.
- Often marketed through a supplier and dropped shipped from locations other than that of the original supplier.
- Special processes for ASME materials may be subcontracted (heat treating, testing, and inspections).
- Easily copied by secondary market suppliers.
- Viable salvage market.
- Reduced number of original equipment manufacturers.
- Obsolete or hard-to-get components.
- Components manufactured by a company that is no longer in business.
- Items with documentation from a plant where construction has been suspended, canceled, or deferred.
- Moderate or low cost.
- High potential for profit (rejected heats of material are purchased and decertified).

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ATTACHMENT E - WHERE TO LOOK FOR SUSPECT/COUNTERFEIT ITEMS

The following areas should receive increased scrutiny to assure that suspect/counterfeit items are not evident:

Items in Supply

- Company supply stock
- Wagon stock
- Other sources of supply contamination.

Items in Use

- Plant facilities, components, and systems
- Equipment
- Operations and maintenance.

Items Being Procured

- "Known" critical items
- Critical equipment and assemblies
- Non-critical "known" purchases.

Operations Decisions

- Major disaster risks
- Personnel safety risks
- Program/mission risks (cost and schedule).

Cost of Implementation

- Potential consequential costs
- Management risk assessment
- Cost of focusing established controls
- Impact on schedule and program mission.

Cost of Focus on Known Suspect/Counterfeit Parts

- Uses existing procurement program
- Focuses on "known parts first"
- Reduction in major disaster potential
- Program costs low/benefits high.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION

It is very important to remember that just because an item is identified as being "suspect/counterfeit" it may not be appropriate to simply reject it. A review should be performed prior to formal disposition of the item to assure that it is indeed unfit for the intended application.

DETECTION METHODS

Visual Inspection

Items may be substandard or fraudulent when:

- Nameplates, labels, or tags have been altered, photocopied, painted over, are not secured well, show incomplete data, or are missing (e.g., preprinted labels normally show typed entries).
- Obvious attempts at beautification have been made, e.g., excess painting or wire brushing, evidence of hand painting (touch-up), or stainless steel is painted.
- Handmade parts are evident, gaskets are rough cut, shims and thin metal part edges show evidence of cutting or dressing by hand tools (filing, hacksaw marking, use of tin snips or nippers).
- Hand tool marks on fasteners or other assembly parts (upset metal exists on screw or bolt heads) or dissimilar parts are evident (e.g., seven or eight bolts are of the same material and one is a different material).
- Poor fit between assembled items.
- Configuration is not consistent with other items from the same supplier or varies from that indicated in supplier literature or drawings.
- Unusual box or packing of component or item.
- The supplier is not a factory-authorized distributor.
- Dimensions of the item are inconsistent with the specifications requested on the purchase order and/or those provided by the supplier at the time of shipment.
- The item or component matches the description of one that is on a suspect items list (e.g., U.S. Customs Service "Suspect Headmark List," National Board of Boiler and Pressure Vessel Inspectors (NBBI) "Special Bulletin," etc.).

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Documentation

Documents may be suspect/counterfeit when:

- The use of correction fluid or correction tape is evident. Type or pitch change is evident.
- The document is not signed or initialed when required, is excessively faded or unclear (indicating multiple, sequential copying), or data are missing.
- The name or title of the document approved cannot be determined.
- Technical data is inconsistent (e.g., chemical analysis indicates one material and physical tests indicate another).
- Certification or test results are identical between items when normal variations should be expected.
- Document traceability is not clear. The document should be traceable to the item(s).
- Technical data are not consistent with code or standard requirements (e.g., no impact test results provided when impact testing is required or CMTRS physical test data indicate no heat treatment and heat treatment is required).
- Documentation is not delivered as required on the purchase order or is in an unusual format.
- Lines on forms are bent, broken, or interrupted indicating data has been deleted or exchanged (cut and paste).
- Handwritten entries of data are on the same document where typed or preprinted data exists.
- Data on a single line located at different heights indicate the possibility of retyping.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Fasteners

- Headmarkings are marred, missing, or appear to have been altered.
- Threads show evidence of dressing or wear (threads should be of uniform color and finish).
- Headmarkings are inconsistent with a heat lot.
- Headmarkings matching one of those identified on the U.S. Customs Service, "Suspect Headmark List" (Figure QP 3.2-1).
 - Headmarkings which depict both raised and hand-stamped markings, such as those described in WHC Quality Assurance Bulletin # 94-01, "Discrepant Dual Head Stamped Stainless Steel Bolts." This bulletin documents the results of internal inspections and independent testing of stainless steel bolts purchased to ASTM A193, Grade B8, which were found to be substandard.
 - Only manufacturers listed on the "Suspect Fastener Headmark List" (Figure QP 3.2-1) are known to produce substandard graded fasteners. If graded fasteners are discovered which exhibit headmarks matching those on the Suspect/Fastener Headmark List, they shall be considered to be defective without further testing, unless traceable manufacturer's certifications are received which provide documented evidence that the fasteners were not produced by the manufacturer listed on the Suspect Fastener Headmark List.
 - Interpretation of headmark/manufacturers listed on the "Suspect Fastener Headmark List," including newly discovered variations thereto, shall only be provided by the designated S/CI coordinator based on guidance received from the DOE.

Electrical Devices

- Connections show evidence of previous attachment (metal upset or marring).
- Connections show arcing or discoloration.
- Fasteners are loose, missing, or show metal upset.
- Molded case circuit breakers are not consistent with manufacturer-provided checklists for detecting substandard/fraudulent breakers.
- Missing or photocopied Underwriters Laboratories (UL) labels on products requiring such.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Rotating Machinery and Valve Internal Parts

- Shows marring, tool impressions, wear marks, traces of Prussian blue or lapping compound, or other evidence of previous attempts at fit up or assembly.
- Heat discoloration is evident.
- Evidence of erosion, corrosion, wire-drawing or "dimples" (inverted cone-shaped impressions) on valve discs, seats, or pump impellers.

Valves

- Paint
 - Valve appears to be freshly painted and valve stem has paint on it
 - Wear marks on any painted surface
 - Valve stem is protected, but protection has paint on it
 - Paint does not match standard Original Equipment Manufacturer (OEM) color.
- Valve Tags
 - Tags attached with screws instead of rivets
 - Tags attached in a different location than normal
 - Tags appear to be worn or old
 - Tags with paint on them
 - Tags that look newer than the valve
 - Tags with no part numbers
 - Tags with irregular stamping.
- Hand Wheels
 - Old looking hand wheels on new looking valves
 - Hand wheels that look sand blasted or newer than the valve
 - Different types of hand wheels on valves of the same manufacturer.
- Bolts and Nuts
 - Bolts and nuts have a used appearance (excessive wrench marks on flats)
 - Improper bolt/nut material (e.g., a bronze nut on a stainless stem).

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

- Valve Body
 - Ground off casting marks with other markings stamped in the area (OEM markings are nearly always raised, not stamped)
 - Signs of weld repairs
 - Incorrect dimensions
 - Freshly sand-blasted appearance, including eye bolts, grease fittings, stem, etc.
 - Evidence of previous bolt head scoring on backsides of flanges, or evidence that this area has been ground to remove such marks
 - On a stainless valve, a finish that is unusually shiny indicates bead-blasting. A finish that is unusually dull indicates sand-blasting. The finish on a new valve is in-between.

Manufacturer's Logo

- Missing.
- Logo plate looks newer than the valve.
- Logo plate shows signs of discoloration from previous use.

Other

- Foreign material inside the valve (e.g., metal shavings).
- Valve stem packing that shows all the adjustments have been run out.
- In gate valves, a gate that is off-center when checked through the open end of the valve.
- Obvious differences between valves in the same shipment.

Price

- Price is significantly less than that of the competition.

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ATTACHMENT G - FASTENERS

1.0 Counterfeit/Substandard High-Strength Bolts

1.1 General Background

Counterfeit bolts have been found in military and commercial aircraft, surface ships, submarines, nuclear weapon production facilities, bridges, buildings, and the space shuttle. These bolts often do not possess the capabilities of the genuine bolts they counterfeit and can threaten the reliability of industrial and consumer products, National Security, or lives. At Congressional hearings in 1987, the Army testified that they had purchased bolts that bore the headmarks of Grade 8 high-strength bolts, but that were actually inferior Grade 8.2 bolts.

The International Fasteners Institute (IFI) reported finding substandard, mis-marked, and/or counterfeit high-strength Grade 8 bolts in the United States commercial marketplace. In 1988, IFI reported that counterfeit medium-strength Grade 5 bolts had also been found.

Foreign bolts dominate the American marketplace due to their price advantage, and the majority of suspect/counterfeit bolts are imported. Identifying, testing, and replacing these bolts has proven expensive and difficult, both mechanically and technically. Not finding and replacing these bolts, however, has proven fatal in some instances.

1.2 Headmarks

Attachment I may be removed and photocopied, as needed, for use as a poster and reference to known suspect fastener headmarks. Bolts with the headmarkings shown have a significant likelihood of being found to be inferior to standards. Generally, the cost of replacement of these bolts is less than the cost of chemical, hardness, and tensile strength testing. Note also that counterfeit bolts can be delivered with counterfeit certificates. Documentation alone is insufficient to demonstrate compliance with standards.

1.3 Consensus Standards

There are several consensus organizations that have published standards for the properties of fasteners. One of these is the Society of Automotive Engineers (SAE). The SAE grade (or alleged grade on a suspect item) of a bolt is indicated by raised or indented radial lines on the bolt's head, as shown in Attachment I. These markings are called headmarks. DOE is currently concerned with two different grades of fasteners: one has three equally spaced radial lines on the head of a bolt which indicate that it should meet the specifications for a Grade 5 bolt; the other has six equally spaced radial lines which indicate a Grade 8 bolt. Letters or symbols on the head of a bolt indicate the manufacturer.

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ATTACHMENT G - FASTENERS (cont.)

Attachment I is a Suspect/Counterfeit Headmark List that was prepared by the United States Customs Service after extensive testing of many samples of bolts from around the nation. Any bolts anywhere in the DOE community that are currently in stock, in bins, or installed that are on the Customs Headmark List should be considered suspect/counterfeit. The headmarks on this list are those of manufacturers that have often been found to have sold bolts that did not meet the indicated consensus standards. Sufficient testing has been done on the bolts on this list to presume them defective without further testing.

1.4 Precautions: Selective Testing

Some facilities (manufacturers, distributors, etc.) perform selective testing of sample bolts rather than have an independent testing laboratory run all the tests required by consensus standards. In many cases, a new counterfeit bolt has roughly the same physical strength as the graded bolt it mimics, but does not have either the chemical composition or the heat treatment specified by the consensus standards. As a result, it will stretch, exhibit metal fatigue, or corrode under less harsh service than the genuine bolt. Simple tensile strength tests cannot be used to identify substandard high-strength fasteners and should not be solely relied upon in performing acceptance test.

1.5 Using Suspect/Counterfeit Grade 5 Bolts in Grade 2 Applications

Some sites use suspect/counterfeit Grade 5 bolts in applications that only call for Grade 2 bolts. Eventually, the suspect/counterfeit Grade 5 bolts may find its way into an application that requires a genuine Grade 5 bolt and that application may fail. In some cases, cheap imported graded bolts have been purchased in place of upgraded bolts because the small price differential made the extra quality seem to be a bargain. Given the expense of removing suspect bolts from DOE facilities, the practice of using suspect bolts for any application should be discontinued.

1.6 Keep Bolts in Original Packages

All bolts purchased should be kept in the original packages, not emptied into bins. The packages should have labels or other markings that would permit them to be associated with a particular procurement action and a specific vendor. Approved supplier lists should be checked to assure that fastener suppliers on that list have been recently qualified/audited for adequacy of their quality programs.

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ATTACHMENT G - FASTENERS (cont.)

2.0 Stainless Steel fasteners

2.1 Purpose

To provide follow-up information to the previous notification sent to the DOE field and contractor organizations in late 1996.

2.2 Background

In November 1993, the Industrial Fastener Institute (IFI) issued a Fastener Advisory regarding 18-8 stainless steel bolts. The advisory warned about a "bait and switch" tactic in which a distributor takes an 18-8 bolt (indicated by two radial lines 90 degrees apart), but no manufacturer's marking, and sells them as ASTM A320 Grade B8 bolts after hand-stamping B8 on to the heads.

As a result of this IFI Advisory, DOE sites conducted a search of facility stores for stainless steel fasteners with hand-stamped B8 grade marks. Hundreds of stainless steel bolts with hand-stamped B8 grade markings, along with a variety of other raised and depressed head and manufacturer's markings were identified in facility stores throughout the DOE complex.

For example, an inspection of shop stock at a Hanford Site facility revealed bolts with three different raised grade markings, 18-8, 304, and F593C, along with raised manufacturer's identifications of CK, H, HP, C, SO, CS, PMC, TH, THE, and a STAR. The majority of the remaining samples found at Hanford exhibited raised grade markings of 18-8 and 304, with a B8 grade marking and manufacturer's identification hand-stamped into the head of the bolt.

Finally, a few samples did not display any manufacturer's markings. Most of the bolts discovered were purchased with the specification to meet a national consensus standard, American Society for Testing and Materials (ASTM) A193, B8 Class 1 rather than the ASTM A320 standard discussed in the IFI warning.

The Savannah River Site also conducted a site-wide search of facility stores with similar results. A total of 159 stainless steel fasteners with hand-stamped B8 grade marks and raised or hand-stamped manufacturer's symbols were found. Fifteen stainless steel fasteners that had no manufacturer's symbol were also found.

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ATTACHMENT G - FASTENERS (cont.)**2.3 Issue**

The requirements of the ASTM A193 standard regarding fastener marking and certification are very similar those required by the ASTM A320 standard discussed in the IFI advisory. The ASTM A193 standard requires that grade and manufacturer's identification symbols be applied to the heads of bolts that are larger than 1/4" in diameter. The standard, however, does not specifically differentiate between raised and depressed headmarkings, but states only that "for the purposes of identification marking, the manufacturer is considered the organization that certifies the fastener was manufactured, sampled, tested, inspected in accordance with this specification." In other words, the standard allows for some of the required markings to be formed into the head of the bolt (either raised or lowered) during manufacturing, and the rest to be applied later on via hand-stamping.

Since ASTM A193 does not differentiate between raised and depressed markings, these fasteners can be counterfeited in the same way as the ASTM A320 fasteners discussed in the November 1993 IFI warning. For example, distributors can procure 18-8 stainless steel bolts that were manufactured by an anonymous party, and without conducting the necessary upgrading process or certification testing, a second party could hand-stamp B8 and a manufacturer's marking into the heads to indicate that the fasteners exhibit the mechanical and chemical properties required of ASTM A193 Grade B8 Class 1.

Unless the certification documentation is specifically requested, and in most cases it is not, there is no way to determine by visual inspection whether these fasteners were properly certified and tested to meet the requirements of the ASTM standard.

ATTACHMENT H - DOE HEADMARK LIST



Help Stamp Out Suspects/Counterfeits

Suspect Stainless Steel Fastener Headmark List

Examples of stainless steel fasteners that have been upgraded from 18-8 to ASTM A320 or ASTM A193 Grade B8 after hand stamping. The last three examples show samples of fasteners to indicate conformance to two non-compatible standards, ASTM A193 and ASTM F 593C.

Any bolt on this list should be treated as defective without further testing and process in accordance with HNF-PRO-301. Note: This list was originally Published by DOE /EH-0196, Issue No. 97-6

If any of these fasteners are located, contact your facility S/CI Point of Contact (POC) for instructions. The POC list is on the Hanford Intranet at: <http://docs.rl.gov/han.info/hiansc/hiansc1.doc>. Scroll to the end of the document for the list.

	Surrounding White Color Illustrates Head Markings Before Hand Stamping
	Surrounding Black Color Illustrates Head Markings After Hand Stamping

Suspect

ATTACHMENT H - DOE HEADMARK LIST (cont.)

Help Stamp Out Suspects/Counterfeits



Suspect Fastener Headmark List

All Grade 5 and Grade 8 fasteners of foreign origin which do not bear any manufacturers' headmarks:



Grade 5



Grade 8

Grade 5 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
	J Jinn Her (TW)		KS Kosaka Kogyo (JP)

Grade 8 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
	A Asahi Mfg (JP)		KS Kosaka Kogyo (JP)
	NF Nippon Fasteners (JP)		RT Takai Ltd (JP)
	H Hinomoto Metal (JP)		FM Fastener Co. of Japan (JP)
	M Minamida Sieybo (JP)		KY Kyoel Mfg (JP)
	MS Minato Kogyo (JP)		J Jinn Her (TW)
	Hollow Triangle Infasco (CA, TW, JP, YU) (Greater than 1/2-inch diameter Grade 8 Hollow Triangle only)		
	E Daiei (JP)		UNY Unylite (JP)

Grade 8.2 fasteners with the following headmarks:



Mark	Manufacturer
KS	Kosaka Kogyo (JP)

Grade A325 fasteners (Bennett Denver target only) with the following headmarks:

Type	Mark	Manufacturer
Type 1		A325 KS Kosaka Kogyo (JP)
Type 2		
Type 3		

Key: CA-Canada, JP-Japan, TW-Taiwan, YU-Yugoslavia

Any bolt on this list should be treated as defective without further testing.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS

Investigations thus far of electrical components at DOE facilities uncovered over 700 suspect/ counterfeit molded-case circuit breakers that were previously used, refurbished and sold to DOE contractors.

1. Recognition Factors

The following factors should be recognized regarding suspect or refurbished circuit breakers:

- A. The quality and safety of refurbished molded-case circuit breakers is questionable since they are not designed to be taken apart and serviced or refurbished. There are no electrical standards established by Underwriters Laboratory (UL) for the refurbishing of molded-case electrical circuit breakers, nor are there any "authorized" refurbishes of molded case circuit breakers. Therefore, "refurbished" molded-case circuit breakers should not be accepted for use in any DOE facility.
- B. One source of refurbished molded-case circuit breakers is from the demolition of old buildings. Some refurbishes are junk dealers who may change the amperage labels on the circuit breakers to conform to the amperage ordered and then merely clean and shine the breakers.

This situation was brought to DOE's attention by the Nuclear Regulatory Commission (NRC), which, in turn, had been informed of the practice by the company that manufactures circuit breakers. In early 1988, a sales representative identified "refurbished" circuit breakers at Diablo Canyon Nuclear Power Plant. A subsequent investigation confirmed that circuit breakers sold to the power plant as new equipment were actually refurbished. The managers of the two firms that refurbished and sold these breakers have been convicted of fraud and have paid a substantial fine.

- C. NRC published information Notice No. 88-46 dated July 8, 1988, on the investigation findings and circulated it to all applicable government agencies, including DOE. On July 20, 1988, DOE notified all field offices that refurbished circuit breakers may have been installed in critical systems. Shortly thereafter, DOE established the Suspect Equipment Notification System (SENS), a sub-module of ES&H Events and News on the Safety Performance Measurement System (SPMS). SENS has since been replaced by the Supplier Evaluation and Suspect Equipment (SESE) sub-module which includes Suspect Equipment Reports.
- D. Some of DOE's older sites have circuit breakers in use that are no longer manufactured. According to the Nuclear Management and Resources Council (NUMARC), examples of such breakers are Westinghouse breakers with frames E, EA, F, and FA. If a DOE contractor has an electrical box that requires a breaker with one of these frame sizes, that contractor would not have been able to purchase it from Westinghouse for several years. If the contractor were to order a replacement breaker from an authorized Westinghouse dealer, the dealer could not get a new replacement breaker from the manufacturer. To fill the order, the dealer had to turn to the secondary or refurbished market.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

Dealing with an authorized distributor does not preclude ending up with refurbished circuit breakers. Westinghouse has announced that it is considering satisfying this market by manufacturing circuit breakers that will fit in these applications.

The solution, as recommended by NUMARC, is not to focus on the credentials of the distributor but on the traceability of the circuit breaker itself. A purchaser can be assured of having a new circuit breaker only if the breaker can be traced back to the original manufacturer.

2. Indicators of Refurbished Breakers

Typically, refurbished circuit breakers sold as new equipment have one or more of the following characteristics:

- The style of breaker is no longer manufactured.
- The breakers may have come in cheap, generic-type packaging instead of in the manufacturer's original boxes.
- Refurbished circuit breakers are often bulk-packaged in plastic bags, brown paper bags, or cardboard boxes with handwritten labels. New circuit breakers are packed individually in boxes that are labeled with the manufacturer's name, which is usually in two or more colors, and are often date stamped.
- The original manufacturer's labels and/or the Underwriter's Laboratory (UL) or Factory Mutual (FM) labels may have been counterfeited or removed from the breaker. Refurbishing operations have been known to use copying machines to produce poor quality copies of the original manufacturer's and the certifying body's labels.
- Breakers may be labeled with the refurbisher's name rather than the label of a known manufacturer.
- The manufacturer's seal (often multicolored) across the two halves of the case of the breaker is broken or missing.
- Wire lugs (connectors) show evidence of tampering.
- The surface of the circuit breaker may be nicked or scratched yet have a high gloss. Refurbishers often coat breakers with clear plastic to produce a high gloss that gives the casual observer the impression that the breaker is new. The plastic case of new circuit breakers often have a dull appearance.
- Some rivets may have been removed and the case may be held together by wood screws, metal screws, or nuts and bolts.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

- Contradictory amperage ratings may appear on different parts of the same refurbished breaker. On a new breaker, the amperage rating is stamped into, raised from, or machine-painted on the handle of the circuit breaker. In order to supply a breaker with a hard-to-find rating, refurbishers have been known to file down the surface of the handle to remove the original rating and hand-paint the desired amperage rating.

3. Testing

In a news release dated February 6, 1989, the National Electrical Manufacturers Association (NEMA) announced the cancellation of its Publication AB-2-1984 entitled, "Procedures for Field Inspection and Performance Verification of Molded-Case Circuit Breakers used in Commercial and Industrial Applications," and stated the following:

"These procedures were intended for use with breakers that had been originally tested and calibrated in accordance with NEMA Standards Publication AB 1 or Underwriters Laboratories Standard UL 489, and not subsequently opened, cleaned or modified... Therefore, the Standards Publication contained none of the destructive test procedures... necessary to verify the product's ability to withstand such conditions as full voltage overload or short circuit. Without such tests, even if a rebuilt breaker had passed the tests specified in AB-2, there would be no assurance that it would not fail under overload or short circuit conditions. It is NEMA's position that regardless of the results of electrical testing, refurbished electrical circuit breakers are not reliable and should not be used."

4. Precautions

Follow these precautions regarding suspect or refurbished circuit breakers.

- A. Require that molded-case breakers be new and unaltered. Proof that they are new and unaltered requires the vendor to show traceability back to the original manufacturer.
- B. Do not rely completely on dealing with authorized dealers for protection from purchasing refurbished molded-case circuit breakers.
- C. Approve formal procedures for inspecting circuit breakers that are received and installed according to the indicators of refurbished breakers listed above.
- D. Contact the original manufacturer if any indication of misrepresentation is encountered. There are many original manufacturers of molded-case circuit breakers whose products are being refurbished and sold as new. These manufacturers have the most specific information about how to ensure that their products have not been refurbished.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

5. Disposition
- A. Segregate and retain all circuit breakers found with indications that they may be refurbished. These will be retained as potential evidence until specifically released by the Office of Inspector General and the Office of Nuclear Safety for Price Anderson Enforcement. Circuit breakers that may be refurbished may only be disposed of when the above organizations no longer need them as evidence.
 - B. Report suspect electrical components to Occurrence Reporting and Processing System (ORPS). The ORPS categorization group should be identified as "Cross-Category items, Potential Concerns or issues." The description of cause section in the ORPS report should included the text "suspect counterfeit parts."
 - C. Witness and document the destruction of all suspect/counterfeit circuit breakers when approval is given for disposal.

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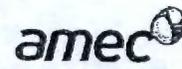
ATTACHMENT J - ASSESSMENT/SURVEILLANCE LINES OF INQUIRY

1. S/CI processes and other S/CI related processes are effective in addressing the safety-related aspects of S/CI.
2. Formal supplier qualification and re-qualification processes are established and implemented, including routine collection of evaluations of feedback on vendor performance.
3. Controls are established on a graded basis that considers the risks involved and historical experience with S/CIs.
4. Controls are implemented for segregation and separate storage of material identified as suspect/counterfeit
5. Subcontractors have established and implemented sufficient controls to preclude an introduction or use of S/CIs. These controls address construction materials, maintenance or modification equipment and components, and the use subcontractor owned or rented equipment (cranes, hoists, etc.) on site.
6. S/CI processes, requirements, and controls are fully integrated into Integrated Safety Management (ISM) and quality assurance programs and procedures, e.g. training, procurement, maintenance, and assessment) to ensure adequate linkage to S/CI elements.
7. Expectations are established for timeliness in determining whether nonconforming items are S/CI.
8. Protocols are established for clearly identifying S/CIs that are determined to be acceptable for use
9. Inspections for S/CI materials are incorporated into routine maintenance activities, and clear guidance is provided for the disposition of installed S/CI materials identified during routine inspections and maintenance activities.
10. Expectations for S/CI controls are integrated within existing processes, such as routine and special inspections for S/CIs in site procedures, and guidance is provided for performing such inspections.
11. Roles and responsibilities and interfaces for management of S/CIs are clearly assigned, including provisions for the handling of sensitive information and interfacing with the local Office of the Inspector General (IG), to ensure effective, consistent, and timely communication of S/CI information.
12. S/CI reporting requirements are effectively integrated into the site contractors' processes for disposition of non-conforming items, such as NCR processes, as required by appropriate DOE directives.
13. Lessons learned processes are evaluated to determine whether all available and relevant information resources, such as the Government Industry Data Exchange Program (GIDEP), are being utilized for screening S/CI and other relevant information for potential applicability to site activities.

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ATTACHMENT J – ASSESSMENT/SURVEILLANCE LINES OF INQUIRY (cont.)

14. Lessons learned processes are evaluated to ensure that significant requirements and performance expectations have been established for the documentation of applicability reviews, needed actions, and actions taken for lessons learned that require line management attention and action.
15. Lessons learned requiring line management actions are integrated with the site's corrective action management processes to ensure formal tracking, feedback, and closure of actions taken.
16. Corrective actions and management procedures include formal linkage to S/CI reporting requirements for the site office, Occurrence Reporting System (ORPS), contractor General Counsel, and the IG.
17. Site mechanisms, such as a controlled product list, are established and used to maintain current and accurate information on S/CIs. Provisions are available for making this list readily available to site personnel who have S/CI responsibilities for procurement, inspection, and other areas associated with the implementation of S/CI controls.
18. S/CI training programs include the identification of positions and associated personnel required to receive training, the processes for designating those personnel who must receive initial and refresher training, and the required frequencies for refresher training.
19. All personnel involved in design, system engineering, procurement, inspection, maintenance, and other functions involving potential S/CI materials receive S/CI process and hands-on training.
20. Training programs place special emphasis on ensuring that system engineers involved in the design, procurement, and inspection of materials and components with the potential for S/CI receive such training.
21. Subcontractors involved in the procurement or handling of potential S/CI materials and components receive initial and refresher training and are knowledgeable of site S/CI processes, procedures, requirements, and controls.
22. S/CI training addresses site-specific processes and procedures for identifying, dispositioning, and reporting S/CIs, including reporting to the IG.
23. S/CI processes are subject to regular self-assessment, consistent with site self-assessment protocol.
24. Assessments are performed for S/CI processes to evaluate significant changes to the S/CI processes and to establish a baseline for implementation where appropriate. Based on that baseline review, further assessments are tailored to the maturity of the S/CI processes.
25. S/CI lines of inquiry are considered and evaluated, as appropriate, during assessments of areas that interface with S/CI processes (procurement process, NCR process, etc.).



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-028	REV. 1
PROJECT NO.:	145579	WASTE RECEIPT SYSTEM LIQUID WASTE STAGING TANKS	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix C

Bidder's Drawing and Data Commitments

(3 pages including cover)



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-028.1	REV. 1
PROJECT NO.:	145579	WASTE RECEIPT SYSTEM LIQUID WASTE STAGING TANKS	
CLIENT:	AMEC E&E - Richland, Washington	EQUIPMENT NO.: 32-D74-002, 003, & 016	

BIDDER'S DRAWING AND DATA COMMITMENTS

Vendor shall supply all drawings, manuals and documentation in the quantities indicated. Approval drawings are due within the listed number of calendar days after issue of the Purchase Order or Letter of Intent. The dates set out for drawing and data submissions are governed by the engineering design schedule of the project. The Vendor shall supply one Autocad/electronic disk file and requested number of copies within the listed number of calendar days. Final drawings must be certified as correct and bear the Vendors name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revision numbers, quantities, status and document types must be included with all submissions (including electronic submittals)

SEND ALL DOCUMENTS TO:	DMJM+H, Inc.
Submit all documents via courier service	dba DMJM Technology
Faxed documents must be followed by the originals.	3250 Port of Benton Blvd
Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control	Richland, WA 99354-1670
Always include a transmittal	Attn: Project Records
	Phone: (509) 375-7856
	Fax: (509) 375-5331

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal	Bidder shall include this data for each item		REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (DAYS)
	Review	Required before ordering or start of fabrication		
PROPOSAL	REVIEW	Final Required within 7 days prior to shipment and before final payment		
E+3		Proof of QA Program or a QA Project Plan	Bid	
E+3		Subcontractor list	Bid	
E+3		Preliminary design, fabrication & delivery schedule	Bid	
	E+3	Final design, fabrication & delivery schedule	PO+7	
	E+3	Preliminary design and fabrication package including: - Preliminary design drawings - Bill of materials - Materials standards	PO+7	
	E+3	E+1 Test plan/test procedure	PO+7	
	E+3	E+3 Protective coating specifications	PO+7	
	E+1	E+1 NDE personnel certifications	Fab-10	
	E+1	E+1 Visual weld/NDE procedures	Fab-10	
	E+3	E+1 Welding procedures, procedure qualification records and welder qualification records	Fab-10	
	E+3	E+1 AWS CWI certificate	Fab-10	
	E+3	E+1 Material control procedures	Fab-10	
	E+3	E+1 Materials without CMTRs for review and approval	Fab-10	
	E+3	Recommended Vacuum/Pressure Relief Valve	Fab-10	
	E+3	Factory Accept Test procedure	Fab-10	
	E+1	E+1 Visual weld examination procedure/weld map	Fab-10	
		E+6 Final design and fabrication package including: - Final design drawings - Bill of materials - Materials standards - Special Tools	Fab-10	

WASTE RECEIPT SYSTEM LIQUID WASTE STAGING TANKS
9-Nov-04



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-028	REV. 1
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CLIENT:	AMEC E&E - Richland, Washington		

Appendix D

Request for Information

(2 pages including cover)



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-028	REV. 1
PROJECT NO.:	145579	WASTE RECEIPT SYSTEM LIQUID WASTE STAGING TANKS	
CLIENT:	AMEC E&E - Richland, Washington		

REQUEST FOR INFORMATION	
Project # .RFI.XXX Rev. ___ Page 1 of 1	
Contract/Project No.	
TO BE COMPLETED BY SUBCONTRACTOR	
Insert Title of RFI Here	
Originator (Name) & Company:	
Problem/Deficiency: <input type="checkbox"/> Clarification <input type="checkbox"/> Change	
Proposed Solution:	
Basis of Change:	
Note: Subcontractor to provide cost and schedule impacts associated with each discrete change line item. Response: <input type="checkbox"/> Clarification <input type="checkbox"/> Change COST <input type="checkbox"/> Yes <input type="checkbox"/> No SCHEDULE <input type="checkbox"/> Yes <input type="checkbox"/> No Required Response Date:	
<u>Cost Impact</u>	<u>Schedule Impact</u>
Subcontractor (sign/date)	
TO BE COMPLETED BY THE BUYER	
RFI Approved <input type="checkbox"/> Yes <input type="checkbox"/> No CN Required: <input type="checkbox"/> - CN # _____ CN Not Required: <input type="checkbox"/> As-Built documentation Required: <input type="checkbox"/> As-Built documentation Not Required: <input type="checkbox"/> Submittal Data Required: <input type="checkbox"/> Yes <input type="checkbox"/> No	COMMENTS _____ Design Lead / Proj Mgr / Date

RFI Feb 2004

WASTE RECEIPT SYSTEM LIQUID WASTE STAGING TANKS
9-Nov-04



		CHANGE NOTICE				CN No. 145579-028-CN-001					
Change Notice (CN) Category (Check One) Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Cancel <input type="checkbox"/> Quality Program Procedure Change <input type="checkbox"/>		Originator's Name and Signature. Charles Grenard				Date 3/9/05					
Affects Cost? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Project Title/ Project No. Demonstration Bulk Vitrification System		Design Verification Required (Independent Review) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Safety Class (If Rqd) N/A					
Affects Schedule? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Primary Document Changed by this CN (Include sheet no. and rev) Waste Receipt System Liquid Waste Staging Tanks, 145579-D-SP-028, Rev. 1		Affected Documents Superseded Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Contract No. 145579					
Other Documents Affected by this CN: None		Reason for Change: Preliminary drawing BM16000ASME, 3 sheets (attached) submitted by Busby Marine and Tank, Inc. specifies A 516, Grade 60 carbon steel plate for both the primary and secondary containment of the liquid waste staging tanks whereas Table 3-4 in the subject specification specified A 36 carbon steel. The A 516, Grade 60 carbon steel is similar to A 36. However, Figure UCS-66 from the ASME Section VIII, Div 1 (attached), shows that impact testing is required for A 36 carbon steel for temperatures below 15°F. In contrast, impact testing isn't required for A 516, grade 60 carbon steel for temperatures above -55°F. Since the minimum design temperature is -25°F, A 516, Grade 60 carbon steel is better suited for the specified design conditions than A 36 carbon steel. This change is also being applied as a option for structural shapes to permit use of the A 516 plate for reinforcement.									
There are no impacts to the Preliminary Design Safety Analysis. This has been confirmed with CH2M HILL Safety.											
Detailed Description of Change (Use Continuation Sheet as Applicable): Change Table 3-4 of 145579-D-SP-028 as shown on the attached markup.											
Review/Approval Authorities: A = Approval, R = Review, I = Information (Check where applicable for change notice)											
Printed Name/Signature		Date	R	A	I	Printed Name/Signature		Date	R	A	I
Originator Charles Grenard		3/9/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Process Technology Manager			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project Manager NA		3/10/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Independent Review* NA			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program Director			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AMEC E&E-PM or designee			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Engineering Manager Ja-Kael Luey		3/9/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AMEC E&E-QA or designee		3/10/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Quality Assurance Ross Truit		3/10/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CH2M HILL Environmental or designee		3/10/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DMJM PM or designee			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CH2M HILL PM or designee		3/10/05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
* Design Verification per EP 3.9 required? Yes <input type="checkbox"/> No <input type="checkbox"/> Assign Independent Reviewer											
CN Incorporated? PM or designee sign and date: _____											



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-028	REV. 1
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CLIENT:	AMEC E&E - Richland, Washington		

Table 2-2: Non-Government Documents (4 sheets^(ccg1))

Code/Standard	Title
ASTM A 307	<i>Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 325	<i>Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 354	<i>Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and other Externally Threaded Fasteners, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 500	<i>Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 516/A 516M	<i>Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower Temperature Service, American Society of Testing and Materials, New York, New York.</i>
ASTM A 563	<i>Standard Specification for Carbon and Alloy Steel Nuts, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A 569	<i>Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM D 5162	<i>Standard Practice for Discountability (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASME PCC-1	<i>Guidelines for Pressure Boundary Bolted Flange Joint Assembly, American Society of Mechanical Engineers, New York, New York.</i>
AWS D1.1/D1.1M	<i>Structural Welding Code—Steel, American Welding Society, Miami, Florida.</i>
AWS QC-1	<i>Standard for AWS Certification of Welding Inspectors, American Welding Society, Miami, Florida.</i>



TECHNICAL SPECIFICATION

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Table 3-4: Staging Tank Material Requirements^(ccg2)

	Standard	Other
Plate	ASTM A 36/A 36M ^(a) A 516/A 516M, Grade 60, Not Normalized ^(d)	General purpose, hot-rolled, low-carbon steel
Sheet	ASTM A 569 ^(c)	--
Structural Shapes	ASTM A 36/A 36M ^(a) or A 516/A 516M, Grade 60, Not Normalized ^(d)	--
Bars and Rods	ASTM A 108 ^(e)	<ul style="list-style-type: none"> • Minimum yield of 36,000 lb/in² • Maximum carbon content 0.35%.
Rectangular Tubing	ASTM A 500 ^(f) , Grade B	--
Pipe	ASTM A 53/A 53M ^(g) , Type S, Grade B	Seamless
Pipe Flange Fittings	ASTM A 105/A 105M ^(h)	Flanges for pipe greater than 1/2 in. shall be standard 150-lb raised-face flanges in accordance with ASME B16.5 ⁽ⁱ⁾ and shall be made from the same type of steel as the pipe in which it will be welded. Flange assembly and bolting shall be performed in accordance with ASME PCC-1 ^(j) .

^(a) ASTM A 36/A 36M, *Standard Specification for Carbon Structural Steel*, American Society of Testing and Materials, New York, New York.

^(b) ASTM A 516/A 516M, *Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service*, American Society of Testing and Materials, New York, New York.

^(c) ASTM A 569, *Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(d) ASTM A 108, *Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(e) ASTM A 500, *Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(f) ASTM A 53/A 53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*, American Society of Testing and Materials, New York, New York.

^(g) ASTM A 105/A 105M, *Standard Specification for Carbon Steel Forgings for Piping Applications*, American Society for Testing and Materials, West Conshohocken, Pennsylvania.

^(h) ASME B16.5, *Pipe Flanges and Flanged Fittings*, American Society of Mechanical Engineers, New York, New York.

⁽ⁱ⁾ ASME PCC-1, *Guidelines for Pressure Boundary Bolted Flange Joint Assembly*, American Society of Mechanical Engineers, New York, New York.

2004 SECTION VIII — DIVISION 1

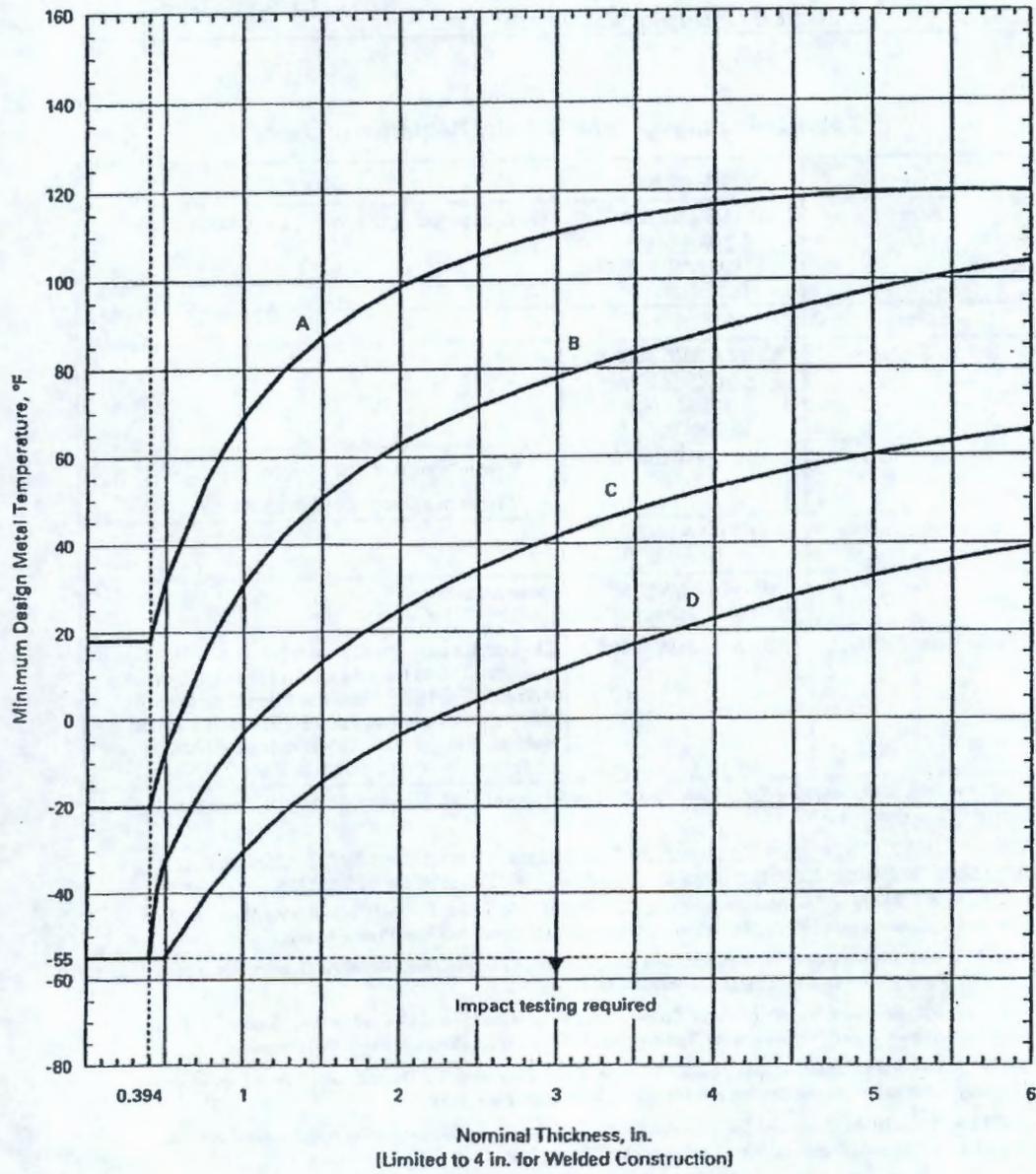


FIG. UCS-66 IMPACT TEST EXEMPTION CURVES [SEE NOTES (1) AND (2)] [SEE UCS-66(a)]

2004 SECTION VIII — DIVISION 1

GENERAL NOTES ON ASSIGNMENT OF MATERIALS TO CURVES (CONT'D):

(e) For bolting and nuts, the following impact test exemption temperature shall apply:

Bolting

Spec. No.	Grade	Diameter, in. (mm)	Impact Test Exemption Temperature, °F (°C)
SA-193	B5	Up to 4 (100 mm), incl.	-20 (-30)
	B7	Up to 2½ in. (64 mm), incl. Over 2½ (64 mm) to 7 (175 mm), incl.	-55 (-48) -40 (-40)
SA-307	B7M	Up to 2½ (64 mm), incl.	-55 (-48)
	B16	Up to 7 (175 mm), incl.	-20 (-30)
SA-320	B	All	-20 (-30)
	L7, L7A, L7M, L43	Up to 2½ (64 mm), incl. Up to 2½ (64 mm), incl. Up to 1 (25 mm), incl.	See General Note (c) of Fig. UG-84.1 See General Note (c) of Fig. UG-84.1 See General Note (c) of Fig. UG-84.1
SA-325	I	½ (13 mm) to 1½ (38 mm)	-20 (-30)
SA-354	BC	Up to 4 (100 mm), incl.	0 (-18)
SA-354	BD	Up to 4 (100 mm), incl.	+20 (-7)
SA-437	B4B, B4C	All diameters	See General Note (c) of Fig. UG-84.1
SA-449	---	Up to 3 (75 mm), incl.	-20 (-30)
SA-540	B21 Cl. All	All	Impact test required
SA-540	B22 Cl. 3	Up to 4 (100 mm), incl.	Impact test required
SA-540	B23 Cl. 1, 2	All	Impact test required
	B23 Cl. 3, 4	Up to 6 (150 mm), incl. Over 6 (150 mm) to 9½ (240 mm), incl.	See General Note (c) of Fig. UG-84.1
SA-540	B23 Cl. 3, 4	Up to 8 (200 mm), incl.	Impact test required
SA-540	B23 Cl. 5	Over 8 (200 mm) to 9½ (240 mm), incl.	See General Note (c) of Fig. UG-84.1
SA-540	B24 Cl. 5	Up to 6 (150 mm), incl.	Impact test required
SA-540	B24 Cl. 1	Over 6 (150 mm) to 8 (200 mm), incl.	See General Note (c) of Fig. UG-84.1
SA-540	B24 Cl. 1	Up to 7 (175 mm), incl.	Impact test required
SA-540	B24 Cl. 2	Over 7 (175 mm) to 9½ (240 mm), incl.	See General Note (c) of Fig. UG-84.1
SA-540	B24 Cl. 2	Up to 8 (200 mm), incl.	Impact test required
SA-540	B24 Cl. 3, 4	Over 8 (200 mm) to 9½ (240 mm), incl.	See General Note (c) of Fig. UG-84.1
SA-540	B24 Cl. 3, 4	Up to 9½ (240 mm), incl.	Impact test required
SA-540	B24 Cl. 5	Up to 9½ (240 mm), incl.	See General Note (c) of Fig. UG-84.1
SA-540	B24V Cl. 3	All	See General Note (c) of Fig. UG-84.1

Nuts

Spec. No.	Grade	Impact Test Exemption Temperature, °F (°C)
SA-194	2, 2H, 2HM, 3, 4, 7, 7M, and 16	-55 (-48)
SA-540	B21/B22/B23/B24/B24V	-55 (-48)

(f) When no class or grade is shown, all classes or grades are included.

(g) The following shall apply to all material assignment notes.

(1) Cooling rates faster than those obtained by cooling in air, followed by tempering, as permitted by the material specification, are considered to be equivalent to normalizing or normalizing and tempering heat treatments.

(2) Fine grain practice is defined as the procedure necessary to obtain a fine austenitic grain size as described in SA-20.

(3) Normalized rolling condition is not considered as being equivalent to normalizing.

NOTES:

(1) Tabular values for this Figure are provided in Table UCS-66.

(2) Castings not listed in General Notes (a) and (b) above shall be impact tested.

FIG. UCS-66 IMPACT TEST EXEMPTION CURVES [SEE NOTES (1) AND (2)] [SEE UCS-66(a)] (CONT'D)

THESE DOCUMENTS ARE THE PROPERTY OF BUSBY MARINE & TANK INC. IT IS TO BE USED ONLY FOR THE PURPOSE OF WHICH IT WAS LENT AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OR USED IN ANY WAY DETRIMENTAL TO THE INTEREST OF THIS COMPANY. IT IS SUBJECT TO RETURN UPON REQUEST.

BASE MATERIAL	
VESSEL SHELL	A516 G60
VESSEL HEAD(S)	A516 G60
THICKNESS	
VESSEL SHELL	3/8 PLATE
VESSEL HEAD(S)	1/4 PLATE
DESIGN & INSPECTION	
SPECIFICATION	PRIMARY VESSEL
ASME CODE DESIGN & STAMP	SECT VIII, DIV 1, A03
DESIGN PRESSURE PSI	4.0
MAX. DESIGN TEMP. °F	+150
MIN. DESIGN TEMP. °F	-25
HYDROTEST PSI	5
RADIOGRAPH	NA
CORROSION ALLOWANCE	0.0625
VESSEL FINISH & ACCESSORY MATERIALS	
INTERNAL:	NONE

EXTERNAL: SECONDARY TANK EXTERNAL ONLY	
SP-6 GRIT BLAST	
TNEC 27 AT 3.0 - 5.0 MILS	
TNEC 73 AT 2.0 - 3.0 MILS	
TDFT 5.0 - 8.0 MILS	
GASKET	-
CAP. RATED	15,000
EST. WEIGHT (EMPTY)	61,000
EST. WEIGHT (PRODUCT)	163,000
CAP. FULL	15,000 GALLONS
EST. WEIGHT FILLED WITH PRODUCT	224,000

DESIGN CHANGES
Customer requested design changes after the design has been completed will incur additional costs and may affect delivery date.
No design changes are allowed after production has begun.

NOTICE:
Tank will be invoiced 30 days after its completion or upon delivery if sooner. Storage fees will also start to accrue 30 days after scheduled delivery.
If tank was not completed on time storage fees will not start accruing until 60 days after completion (For details see our standard terms and conditions)

AUTHORIZED CUSTOMER SIGNATURE _____ TITLE _____ DATE _____

NOTES:

- UNLESS OTHERWISE SPECIFIED:
1) ASME 2:1 ELLIPSOIDAL HEAD: SA 516-60, CERTIFICATION PER UCS 79 REQUIRED
- 2) -
- 3)
- 4)
- 5)

DRAWING INDEX:

SHEET	REV	DESCRIPTION
1	1	TITLE - CUSTOMER AUTHORIZATION
2	1	ORTHO VIEWS
3	1	ORTHO VIEWS - ITEM LIST
4	1	WELD DETAILS
5	1	HANDRAIL DETAILS
6	1	PLATFORM AND SHIP LADDER - DETAILS
7	1	SHIP LADDER - DETAILS
8	1	30" MANHOLE - DETAIL

LTR	REVISION	APP	DATE
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

NATL BD#		-	
CERTIFIED BY BUSBY MARINE & TANK INC.			
MAWP	4	PSI@	+150 °F
W	MDMT	-25 °F@	4 PSI
MFG#		-	
YEAR BUILT		2005	

CUSTOMER:	DMJM
CUSTOMER TANK No.	-
PURCHASE ORDER No.	-
JOB ID No.	292001
ENGG No.	5C002

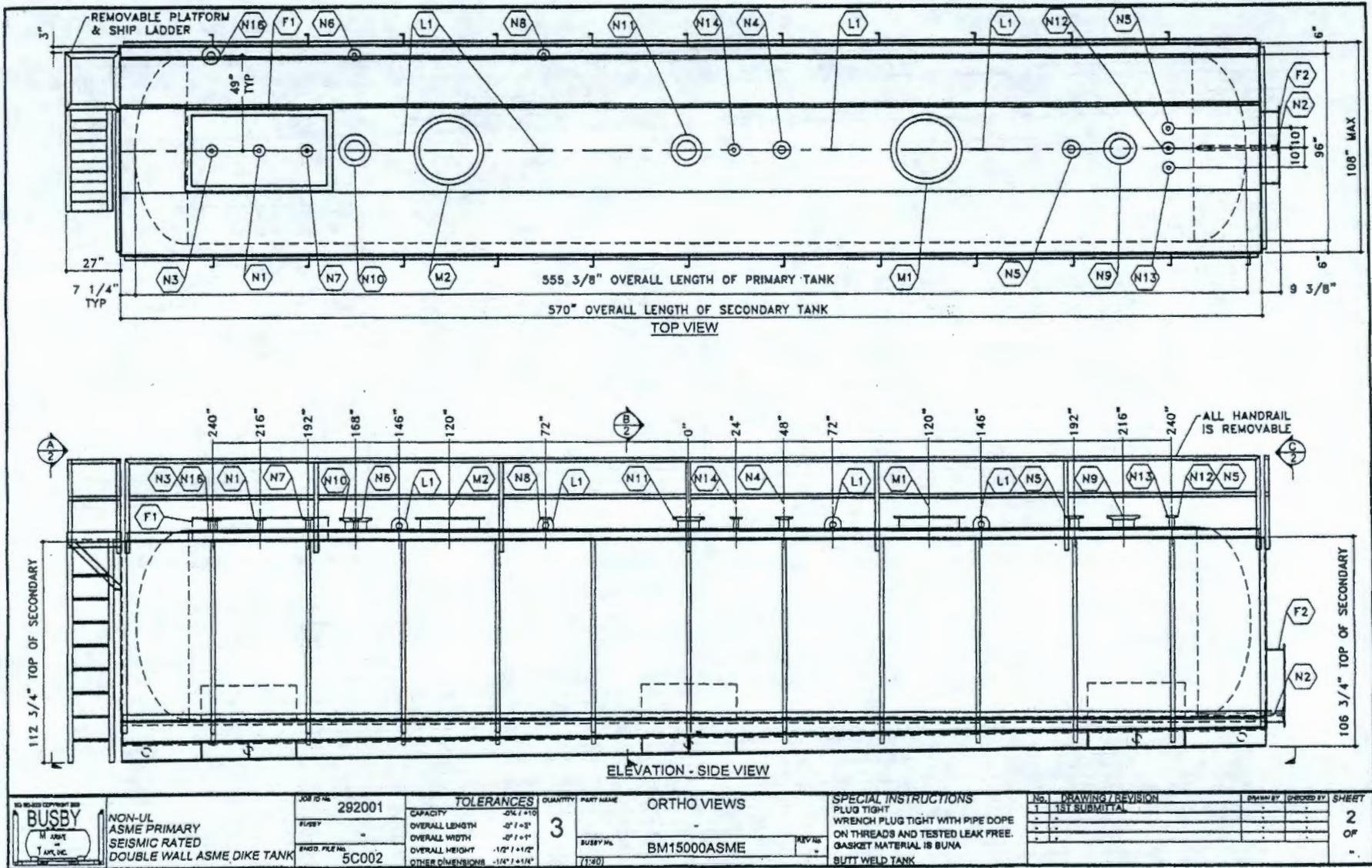
	TACOMA (253) 383-5000
	FAX (253) 593-3742
BUSBY MARINE & TANK INC. 1840 MARINE VIEW DRIVE TACOMA, WA 98422	

COPYRIGHT 2003 BUSBY MARINE & TANK INC.			
DRAWN	DJR	DATE	3-4-05
CHECKED	GN	DATE	-
APPROVED	KO	DATE	-
BUSBY DRAWING No.		BM15000ASME	
SHEET		3 REV - SHEET 1 OF -	

G1-452

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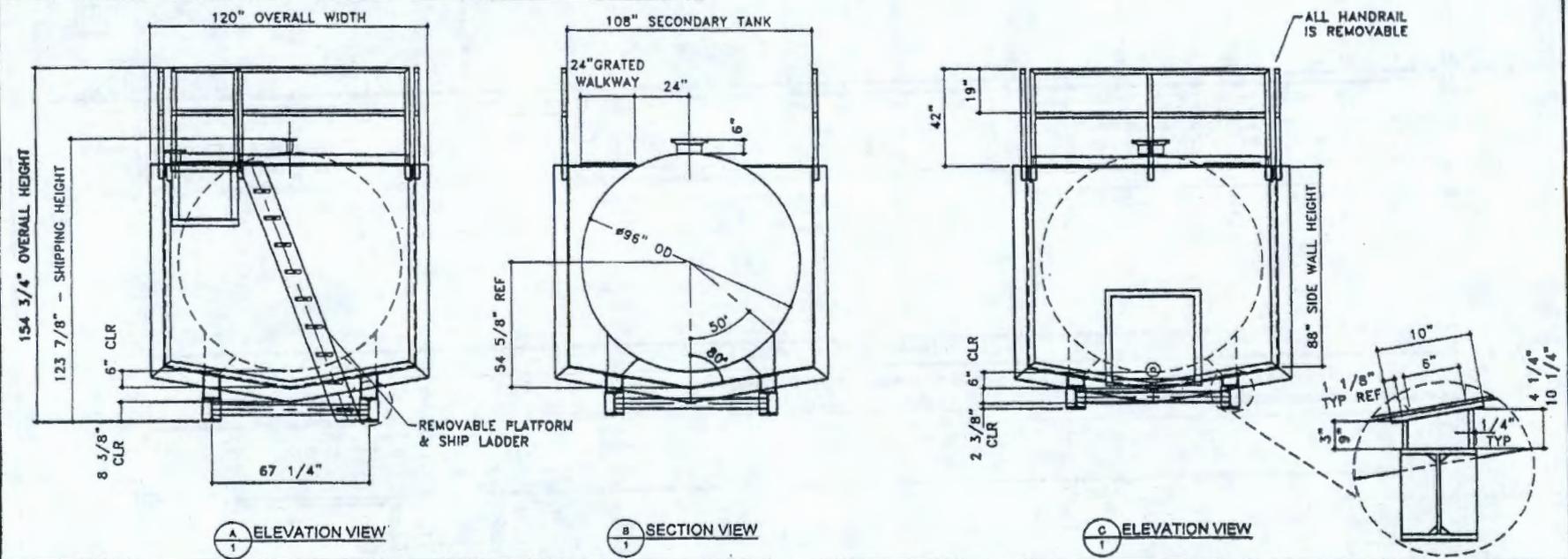


	JOB NO. 292001 PART NAME ORTHO VIEWS BUSSBY No. BM15000ASME REV No. (7:00)	TOLERANCES CAPACITY -0.4 / +1.0 OVERALL LENGTH -0.1 / +0.3 OVERALL WIDTH -0.1 / +0.1 OVERALL HEIGHT -1.0 / +1.0 OTHER DIMENSIONS -1.0 / +1.0	QUANTITY 3	SPECIAL INSTRUCTIONS PLUG TIGHT WRENCH PLUG TIGHT WITH PIPE DOPE ON THREADS AND TESTED LEAK FREE. GASKET MATERIAL IS BUNA BUTT WELD TANK	No. 1 DRAWING / REVISION 1ST SUBMITTAL DRAWN BY CHECKED BY SHEET 2 OF 2
	NON-UL ASME PRIMARY SEISMIC RATED DOUBLE WALL ASME DIKE TANK ENGR. FILE No. 5C002				

RPP-24544 REV 1

G1-454

NOZZLE	FUNCTION	DESCRIPTION	NOZZLE	FUNCTION	DESCRIPTION
F1	SECONDARY CONTAINMENT TANK TOP	PL 1/4 X 8 3/4 H BENT X (36 X 74 1/2 OPEN)	N10	HEATER	10" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
F2	SECONDARY CONTAINMENT TANK END	PL 1/4 X 9 3/8 H BENT X (36 X 36 OPEN)	N11	HEATER (SPARE)	10" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
M1	MANHOLE	30"	N12	TANK LEVEL DETECTION	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
M2	MANHOLE	30"	N13	TANK HIGH LEVEL SWITCH	4" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
N1	WASTE RECEIPT	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106	N14	TEMPERATURE INSTRUMENT	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
N2	WASTE OUTLET	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106	N15	PRIMARY TANK FLUSH	TBD SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
N3	WASTE RETURN	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106	N16	ANNULUS FLUSH	TBD SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106
N4	SPARE EQUIPMENT	4" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106	L1	LIFT LUGS	PL 3/4 X 8 L X 8 H
N5	PRIMARY CONTAINMENT VENT OUT	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106			
N6	PRIMARY CONTAINMENT VENT IN	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106			
N7	VACUUM/PRESSURE RELIEF VALVE	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106			
N8	SECONDARY CONTAINMENT ATMOS VENT	2" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106			
N9	HEATER	10" SCH 40 X 150 # RF FLANGE X ASTM A 105/A/M OR A106			



	JOB NO. 292001	TOLERANCES VIEWS/SECTIONS	QUANTITY 3	PART NAME ORTHO VIEWS - ITEM LIST	No. 1 DRAWING / REVISION 1 1ST SUBMITTAL	DRAWN BY CHECKED BY SHEET 3 OF 3
	BUSBY	SEE DMT 2	BUSBY No. BM15000ASME			
1840 MARINE VIEW DRIVE TACOMA, WA 98422	BNGO. FILE No. 5C002					

RPP-24544 REV 1