

This document was too large to scan as a single document. It has been divided into smaller sections.

Section 13 of 13

Document Information			
Document #.	RPP-24544	Revision	1D
Title	DEMONSTRATION BULK VITRIFICATION SYS INDEPENDENT QUALIFIED REGISTERED PROFESSIONAL ENGINEER (IQRPE & RCRA DESIGN REVIEW PACKAGE		
Date	05/11/2006		
Originator	SHUFORD DH	ORG CO	CH2M
Recipient		Recipient Co.	
References	ECN-723118-R5, RPP-24544-R0, RPP-24544-R1, RPP-24544-R1A, RPP-24544-R1B, RPP-24544-R1C, EDT-821657, ECN-723118-R0, ECN-723118-R1, ECN-723118-R3, ECN-723118-R4		
Keywords	SUPPL TREATMENT		
Projects			



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-V-SP-017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix C

Example Data Sheets

Title	Number of Pages
Cover Page	1
Control Valves, Example	2
Valves (Full Port Ball), Example	1
Filter DP, Example	1
Off-Gas Bypass Duct Pressure PIT, Example	1
Exhaust Fans	2
Total Data Sheet Pages:	8



Control Valves				SPEC. No.	
NO.	BY	DATE	REVISION	SHEET	OF
A	JCM	12/9/2005	A	1	1
B	KJM	1/9/2006	B		
				BY	CHK'D
				JCM	
					DATE
					1/10/2006
					APPR.

Project: Demonstration Bulk Vitrification Project P.O. Enhanced

1 Tag No.: 36-V-166 through 169 Service: OGTS Bypass System P&ID: F-145579-36-A-0108
 Fluid Code: Desc.: Line no.:

	Units	Max Flow	Norm Flow	Min Flow	Shut Off
2 * Flow rate	ACFM				-
3 * Inlet Pressure P1	in w.g.			0	
4 * Outlet Pressure P2	in w.g.			0	
5 * Differential Pressure dP = P1 - P2	in w.g.			0	
6 * Inlet Temperature	F				
7 Spec. Weight / Spec. Gravity / Mol. Weight		1/18	1/18	1/18	-
8 Viscosity / Specific Heats Ratio	cp	0.02/1.4	0.02/1.4	0.02/1.4	-
9 Vapor Pressure Pv / Crit Press PC					-
10 * Required Cv					Flow Thru
11 * Travel	%				0
12 * Predicted Sound press. level (at 1 m.)	dBa				Max. 85 dbA
13 Compressibility (Z)					
14 Solids conc. / Particulate size			0%		

LINE	VALVE BODY / BONNET	ACTUATOR	POSITIONER	SWITCHES	AIR SET	TESTS
13	Pipe Line Size In 8" Out 8"	53 * Type Manual gear reduction				
14	Pipe Sch./W.thick. In 10 Out 10	54 * Manufacturer Keystone Series				
15	Material A312 ANSI Ins.	55 * Model				
16	* Type Butterfly Valve * Std / Full port Full	56 * Size				
17	* Size 16" 8" ANSI class 150#	57 * Eff Area				
18	* Valve max P / T°	58 Action Open / Close / Lock				
19	* Manufacturer Keystone Series	59 * Max Allowable Press. 125 psig				
20	* Model	60 * Min Required Press. 100 psig				
21	* Body / Bonnet Material Stainless Steel	61 Available Air Supply Pressure:				
22	* Liner Material / In. Diam.	62 Max				
23	End In 8" Flange	63 Min				
24	Connection Out 8" Flange	64 * Bench Range /				
25	Flange Face Finish	65 Actuator Orientation				
26	* Face to Face dim.	66 Handwh'l Type				
27	End Ext / Material	67 Air Failure Valve Set at				
28	* Flow Direction	68 Fail Closed				
29	* Type of Bonnet	69 * Input Signal				
30	* Lube & Iso Valve * ISO	70 * Type				
31	* Packing Material RTFE	71 Smart				
32	* Packing Type	72 * Mfr & Model				
33	* Type	73 * On Incr. Signal, Output: Incr. / Decr.				
34	* Size * Rated Travel	74 Gauges				
35	* Characteristic	75 By pass				
36	* Balanced / Unbalanced	76 * Cam Charact's.				
37	* Rated * Cv * FL * Xt	77 * Air Port size * Boosters				
38	* Plug/Ball/Disk Material 316 SS	78 Type				
39	* Seat Material Buna-N	79 * Mfr & Model				
40	* Cage/Guide Material	80 Nb. contacts / rating				
41	* Stem Material 17-4 Stainless Steel	81 Actuation Points				
42	NEC Class Group Div.	82 * Mfr & Model				
43		83 * Set Press.				
44		84 Filter				
45		85 Gauge				
46		86 * Hydro Pressure MSS SP-68				
47		87 ANSI / FCI Leak. Class VI				
48		88 Test Results submittals required				

47 1) Certificates of Conformance required
 48 2) This is an example data sheet. Fabricator is responsible for form, fit, and function. Areas filled out indicate Buyer preferences.
 49 * Indicates information to be supplied by Seller unless already specified
 50 S20.50

* : Information supplied by Seller unless already specified.



Control Valves

SPEC. No.
145579-V-SP-017

NO.	BY	DATE	REVISION	SHEET	OF	DATE
A	JCM	12/9/2005	A	1	1	1/10/2006
B	KJM	1/9/2006	B	BY	CHK'D	APPR.
				JCM		

P.O.
QA REQ. Enhanced

Project: Demonstration Bulk Vitrification Project

1 Tag No.: 36-V-178 Service: OGTS Bypass System P&ID : F-145579-36-A-0108
Fluid Code: Desc.: Line no.:

LINE	DESCRIPTION	Units	Max Flow	Norm Flow	Min Flow	Shut Off
2	* Flow rate	ACFM				-
3	* Inlet Pressure P1	in w.g.			0	
4	* Outlet Pressure P2	in w.g.			0	
5	* Differential Pressure dP = P1 - P2	in w.g.			0	
6	* Inlet Temperature	F				
7	Spec.Weight / Spec.Gravity / Mol. Weight		1/18	1/18	1/18	-
8	Viscosity / Specific Heats Ratio	cp	0.02/1.4	0.02/1.4	0.02/1.4	-
9	Vapor Pressure Pv / Crit Press PC					-
10	* Required Cv					Flow Thru
11	* Travel	%				0
12	* Predicted Sound press. level (at 1 m.)	dB(A)				Max. 85 dbA
	Compressibility (Z)					
	Solids conc. / Particulate size			0%		

LINE	DESCRIPTION	UNIT	VALUE	UNIT	VALUE
13	Pipe Line Size	In	6"	Out	6"
14	Pipe Sch./W.thick.	In	10	Out	10
15	Mater'l	ANSI	A312	Ins.	
16	* Type	Butterfly Valve		* Std / Full port	Full
17	* Size	16" 8"		ANSI class	150#
18	* Valve max P / T°				
19	* Manufacturer	Keystone Series			
20	* Model				
21	* Body / Bonnet Mater'l	Stainless Steel			
22	* Liner Mater'l / In.Diam.				
23	End	In	6" Flange		
24	Connection	Out	6" Flange		
25	Flange Face Finish				
26	* Face to Face dim.				
27	End Ext / Mater'l				
28	* Flow Direction				
29	* Type of Bonnet				
30	* Lube & Iso Valve			* ISO	
31	* Packing Material	RTFE			
32	* Packing Type				
33	* Type				
34	* Size			* Rated Travel	
35	* Characteristic				
36	* Balanced / Unbalanced				
37	* Rated	* Cv		* FL	* Xt
38	* Plug/Ball/Disk Matr'l		316 SS		
39	* Seat Material		Buna-N		
40	* Cage/Guide Mtr'l				
41	* Stem Material		17-4 Stainless Steel		
42	NEC Class	Group		Div.	
43					
44					
45					
46					
47					
48					
49					
50					

LINE	DESCRIPTION	UNIT	VALUE
53	* Type	Manual gear reduction	
54	* Manufacturer	Keystone Series	
55	* Model	Seller Selected	
56	* Size	Seller	
57	* Eff Area		
58	Action Open / Close / Lock		
59	* Max Allowable Press.	125 psig	
60	* Min Required Press.	100 psig	
61	Available Air Supply Pressure :		
62	Max	Min	
63	* Bench Range	/	
64	Actuator Orientation		
65	Handwh'l Type		
66	Air Failure Valve	Set at	
67		Fail Closed	
68	Input Signal		
69	* Type	Smart	Communic.
70	* Mfr & Model		
71	* On Incr. Signal, Output: Incr. / Decr.		
72	Gauges	By pass	
73	* Cam Charact's.		
74	* Air Port size	* Boosters	
75	Type	Quantity	NA
76	* Mfr & Model		
77	Nb. contacts / rating		
78	Actuation Points		
79	* Mfr & Model		
80	* Set Press.		
81	Filter	Gauge	
82			
83	* Hydro Pressure	MSS SP-68	
84	ANSI / FCI Leak. Class	VI	
85	TESTS	Test Results submittals required	

1) Certificates of Conformance required
 2) This is an example data sheet. Fabricator is responsible for form, fit, and function. Areas filed out indicate Buyer preferences.
 * indicates information to be supplied by Seller unless already specified



Valves

SPEC. No.

145579-V-SP-017

NO.	BY	DATE	REVISION	SHEET	OF	DATE
A	JCM	12/9/2005	A	1	1	1/10/2006
B	KJM	1/9/2006	B			

BY JM CHK'D APPR.

P.O. QA REQ. Enhanced

Project: Demonstration Bulk Vitrification Project

- 1. Type FULL PORT BALL VALVE
 - 2. Body Size 1"
 - 3. Body Material
 - 4. Port Size FULL PORT
 - 5. Number of Ports 2
 - 6. Guiding
 - 7. End Conn/Rating
 - 8. Packing Material/Type
 - 9. Lubricator
 - 10. Iso Valve
 - 11. Bonnet Type
 - 12. Trim From 316 SS Ball
 - 13. Trim Material Seat/Plug
 - 14. Shaft Material 316 SS
 - 15. Required Seat Tightness B16.34
 - 16. Max Allow Sound Level dBA 85 dba
- Design Pressure
Design Temperature

- 17. MFR. FLOWTEK
- 18. Model No.
- 19. Flow Composition Water
- 20. Required Cv 120 (Flow thru)
- 21. Inlet Press Norm/Max
- 22. Flow Rate Norm/Max
- 23. dP/Max Shut Off dP
- 24. Temp Oper/Max
- 25. Oper sp gr/Visc 1 1 cp
- 26. % Superheat/Flash
- 27. Crit Press/% Solids
- 28. Mol Wt/Vapor
- 29. Pred. Sound Level dBA
- 30. Supplier UNIT PROCESS COMPANY
- 31. Address Craig Jannett, Royal City, WA
- 32. Phone (509) 346-9920
- 33. Fax (509) 346-9951

Rev.	Tag. No.	Line no. /Equip.	P&ID	Dia. Seal Matrl	T° Max.	Pressure			Service	Notes
						Norm.	Max.	Range		
B	36-V-171		F-145579-36-A-0108						Filtered Water, Condensate	
B	36-V-173		F-145579-36-A-0108						Filtered Water, Condensate	
B	36-V-174		F-145579-36-A-0108						Filtered Water, Condensate	
B	36-V-175		F-145579-36-A-0108						Filtered Water, Condensate	
B	36-V-176		F-145579-36-A-0108						Filtered Water, Condensate	
B	36-V-177		F-145579-36-A-0108						Filtered Water, Condensate	

NOTES
 1) Shell and seat test required with test report per ASTM B16.4, MSS-SP-61 and MSS-SP-72.
 2) This is an example data sheet. Fabricator is responsible for form, fit, and function. Areas filed out indicate Buyer preferences.
 * indicates information to be supplied by Seller unless already specified


 AMEC E&C Services Limited
 Trail, BC Canada

Instrumentation Data Sheet

ASSET NUMBER: 145579-V-SP-017

TAG NUMBER: 36-PDIT-910 through 915

SUBJECT: Bulk Vitrification HEPA Filter System

SERVICE: Off-Gas Bypass Filter Differential Pressure

SUPPLIER: _____ Quality Level: Enhanced

MAKE: Yokogawa P.I.C. No.: 213

MODEL: EJA110A Series P&ID No.: F-145579-36-A-0108

TRANSMITTER

Type:	Differential Gauge Pressure	Power Supply:	24 Vdc
Range:	*	Output:	4 - 20mA
Calibration:	0 to 10 inches w.c.	Conduit Connect:	½" FNPT
Enclosure Material:	Epoxy Coated Aluminium	Local Indication:	Yes (LCD Display)
Enclosure Class:	NEMA 4	Mounting Bracket:	2" Pipe Bracket
Certification:	UL	I/O Isolation:	Req'D

ELEMENT

Service Type:	Gauge Pressure
Element Type:	Diaphragm
Element Material:	316 SS
Wetted Parts Material:	316 SS
Body Rating:	*
Process Connection	½" NPT

SEAL

Process Connection:	*
Chemical Seal Type:	*
Mdl No.:	*
Capillary Length:	N/A
Armour:	N/A
Flushing Connection:	N/A
Valve Isolation:	N/A

Classification:

316SS Tags permanently affixed to instrument:

SERVICE CONDITIONS:

Line No.:	8"-VOG-36-0319, 0406	Max. Velocity:	N/A
Fluid:	Off-Gas	Spec. Gravity:	0.001
Flow Oper.:	N/A	Acidity:	N/A
Flow Max.:	N/A	Percent Solids:	N/A
Temp Oper.:	70°F	Material Build-Up:	None
Temp Max.:	200°F	Vibration:	Minimal
Press Oper.:	5 inches w.c.	Line Material:	Stainless Steel (See Note 3)
Press Max.:	- 20 inches w.c.	Agitator:	None

NOTES:

- All items with an * shall be filled in by the VENDOR
- The buyer has reviewed the transmitters offered and found that the following ordering information from Yokogawa, Model EJA110A may be suitable. The final selection the component is the responsibility of the Seller as this is provided for information only.
- Instrument line material
- This is an example data sheet. Fabricator is responsible for form, fit, and function

By: RW

Chk:

Appd.

Date: 01/09/06

Project: DBVS

Rev: 0

		AMEC E&C Services Limited Trail, BC Canada		Instrumentation Data Sheet		
ASSET NUMBER: 145579-V-SP-017			TAG NUMBER: 36-PIT- 904, 905			
SUBJECT: <u>Bulk Vitrification HEPA Filter System</u>						
SERVICE: <u>Off-Gas Bypass Duct pressure</u>						
SUPPLIER: _____		Quality Level: <u>Enhanced</u>				
MAKE: <u>Yokogawa</u>		P.I.C. No.: <u>213</u>				
MODEL: <u>EJA110A Series</u>		P&ID No.: <u>F-145579-36-A-0108</u>				
TRANSMITTER						
Type: <u>Gauge Pressure</u>		Power Supply: <u>24 Vdc</u>				
Range: <u>*</u>		Output: <u>4 -- 20mA</u>				
Calibration: <u>0 to -20 inches w.c.</u>		Conduit Connect: <u>½" FNPT</u>				
Enclosure Material: <u>Epoxy Coated Aluminium</u>		Local Indication: <u>Yes (LCD Display)</u>				
Enclosure Class: <u>NEMA 4</u>		Mounting Bracket: <u>2" Pipe Bracket</u>				
Certification: <u>UL</u>		I/O Isolation: <u>Req'D</u>				
ELEMENT						
Service Type: <u>Gauge Pressure</u>		SEAL				
Element Type: <u>Diaphragm</u>		Process Connection: <u>*</u>				
Element Material: <u>316 SS</u>		Chemical Seal Type: <u>*</u>				
Wetted Parts Material: <u>316 SS</u>		Mdl No.: <u>*</u>				
Body Rating: <u>*</u>		Capillary Length: <u>N/A</u>				
Process Connection: <u>½" NPT</u>		Armour: <u>N/A</u>				
		Flushing Connection: <u>N/A</u>				
		Valve Isolation: <u>N/A</u>				
Classification: 316SS Tags permanently affixed to instrument:						
SERVICE CONDITIONS:						
Line No.: <u>8"-VOG-36-0319, 0406</u>		Max. Velocity: <u>N/A</u>				
Fluid: <u>Off-Gas</u>		Spec. Gravity: <u>0.001</u>				
Flow Oper.: <u>N/A</u>		Acidity: <u>N/A</u>				
Flow Max.: <u>N/A</u>		Percent Solids: <u>N/A</u>				
Temp Oper.: <u>70°F</u>		Material Build-Up: <u>None</u>				
Temp Max.: <u>200°F</u>		Vibration: <u>Minimal</u>				
Press Oper.: <u>- 15 inches w.c.</u>		Line Material: <u>Stainless Steel (See Note 3)</u>				
Press Max.: <u>- 20 inches w.c.</u>		Agitator: <u>None</u>				
NOTES:						
1. All items with an * shall be filled in by the VENDOR						
2. The buyer has reviewed the transmitters offered and found that the following ordering information from Yokogawa, Model EJA110A may be suitable. The final selection the component is the responsibility of the Seller as this is provided for information only.						
3. Instrument line material						
4. This is an example data sheet. Fabricator is responsible for form, fit, and function						
By: RW		Chk:	Appd.	Date: 01/09/06	Project: DBVS	Rev: 0



TECHNICAL DATA SHEETS

Data sheet 2 of 2

Motor		Rev			Rev
Manufacturer	*		Pull-up torque % of locked rotor torque	*	
Power	(HP) *		Speed	(RPM) *	
Frame size	*		Efficiency	*	
NEMA Design	*		Torque	(ft-lbs) *	
Service Factor	*		Current	(A) *	
Duty		Continuous	Paint Finish	*	
Corrosion protection	*		Weight	(lb) *	
Enclosure Type and Rating		TEFC	Position	*	
Voltage	(V)	460	Soft Start capable		yes
Frequency	(Hz)	60	Insulation Class (NEMA MG-1)		F
Phases		3	RTD (3 phases)	(ohms)	

Materials of Construction

Housing	*		Motor Enclosure	*	
Fan Shaft	*		Guards	*	
Fan Base	*		Bearing Pedestal	*	
Spacer Ring	*				

Bearings

Manufacturer	*		Bolting Material		
Size	*		Bolts		
Number	*		- size	(in) *	
Type	*		- number	*	
L ₁₀ Life	(hrs)	50,000	Nuts		
Vibration Transducer/Switch	**		- size	(in) *	
			- number	*	

Surface Preparation and Finish

By VENDOR (Yes/No)		Yes	Weight		
Surface Preparation System	*	-	Total Shipping Weight	(lb) *	
Finish type	*	-			
Finish Dry Film Thickness	(in) *	-			

Comments:

1. Items marked with an * shall be filled in by VENDOR
 ** Vendor to recommend type
 The fan is to meet applicable requirements of the ASME AG-1 Sections AA and BA.

Date	9-Jan-06				
By	KJM				
Chked					
Rev.	0				


TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-V-SP-017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

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



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-V-DS-017.1	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

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)

<p>SEND ALL DOCUMENTS TO:</p> <p>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</p>	<p>DMJM+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</p>
--	---

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			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	E+6	90% Design and Fabrication Package including: - Drawings - Calculations - Completed Equipment Data Sheets - Vendor Cut Sheets/Technical Brochures - Bill of materials	PO+21	
	E+3	E+1	Test Plan/Test Procedure	PO+21	
	E+1	E+1	NDE personnel certifications	PO+21	
	E+1	E+1	Visual Weld/NDE procedures	PO+21	
	E+1	E+1	Visual weld examination procedure/weld map	Fab-10	
	E+3	E+1	Welding procedures, procedure qualification records, and welder procedure 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+3	Protective coating specifications	Fab-10	
	E+3	E+1	Fabrication travelers	Fab-10	
	E+3	E+1	Cleaning procedures	Fab-10	
			Spare Parts List		

OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS
 BLEED SKID ASSEMBLIES DESIGN AND FABRICATION
 10-Jan-06


TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-V-DS-017.1	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION EQUIPMENT NOS.: 36-D58-138, 139, AND 140	
CLIENT:	AMEC E&E - Richland, Washington		

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:				DMJMH+N, 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	VENDOR COMMITMENT
	Review	Required before ordering or start of fabrication			
		Final	Required within 7 days prior to shipment and before final payment	(DAYS)	(DAYS)
PROPOSAL	REVIEW	FINAL	DESCRIPTION		
	E+3	E+6	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+21	
	E+3	E+1	NCR's	When identified +3	
	E+3	E+3	Fabrication red-line changes	When identified	
	E+3	E+1	Preliminary Data Package Including: - As-Built Drawings and Weld Maps - Fabrication Traveler Closeout - Recommended spare parts and frequency of replacement - Rigging sketches - System assembly instructions - Operation and maintenance manuals - Completed Test results (document and video records) - Packing list and identification of shipping supports - Field Calibration Procedures and Reports - Inspection Reports - CoC's / CMTRs - NEC inspection certificate & electromagnetic interference test results	Prior to FAT	

OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS
 BLEED SKID ASSEMBLIES DESIGN AND FABRICATION
 10-Jan-06



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-V-SP-017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix E

TFC-ESHQ-Q_C-C-03, Revision C-2, Control of Suspect/Counterfeit Items

(54 pages including cover)

CH2M HILL Hanford Group, Inc.	Manual	ESHQ
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	1 of 53
	Issue Date	October 5, 2005
	Effective Date	October 5, 2005
APPROVAL AUTHORITY:		G. M. Grant
DOCUMENT OWNER:		J. L. Logston

TABLE OF CONTENTS

1.0	PURPOSE AND SCOPE.....	2
2.0	IMPLEMENTATION.....	2
3.0	RESPONSIBILITIES.....	2
3.1	Procurement Personnel.....	2
3.2	Inspection Personnel.....	2
3.3	Quality Assurance Engineer.....	2
3.4	S/CI Coordinator.....	2
3.5	Assigned Engineering Personnel.....	3
3.6	Responsible Managers and Supervisors.....	3
4.0	PROCEDURE.....	3
4.1	Introduction.....	3
4.2	Procurement.....	3
4.3	Inspection for Potential S/CI.....	4
4.4	Control of Material Identified as S/CI.....	4
4.5	Reporting of S/CI.....	5
4.6	Acceptance, Removal, and Disposition of S/CI.....	5
4.7	Surplus/Excess Material.....	7
4.8	Assessments.....	7
4.9	Training.....	7
5.0	DEFINITIONS.....	8
6.0	RECORDS.....	9
7.0	SOURCES.....	9
7.1	Requirements.....	9
7.2	References.....	10

TABLE OF FIGURES

Figure 1. Management of Suspect/Counterfeit Items.....	11
--	----

TABLE OF ATTACHMENTS

ATTACHMENT A - SUSPECT COMPONENTS LIST.....	12
ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT ITEMS.....	30
ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST.....	32
ATTACHMENT D - CHARACTERISTICS THAT MAY MAKE PRODUCTS VULNERABLE TO MISREPRESENTATION, FRAUDULENT PRACTICES, AND COUNTERFEITING.....	34
ATTACHMENT E - WHERE TO LOOK FOR SUSPECT/COUNTERFEIT ITEMS.....	35
ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION.....	36
ATTACHMENT G - FASTENERS.....	41
ATTACHMENT H - DOE HEADMARK LIST.....	45
ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS.....	47
ATTACHMENT J - ASSESSMENT/SURVEILLANCE LINES OF INQUIRY.....	51
ATTACHMENT K - RECENTLY IDENTIFIED S/CI ISSUES.....	53

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	2 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

1.0 PURPOSE AND SCOPE
(7.1.1)

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	3 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	4 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

- | | |
|----------------------------|--|
| 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 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. |

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	5 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

4.5 Reporting of S/CI

- | | |
|-------------------------------|--|
| Assigned Company
Personnel | <p>1. Report all items identified as potential S/CI in accordance with <u>TFC-OPS-OPER-C-24</u>. (7.1.1)</p> <p>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.</p> |
| S/CI Coordinator | <p>2. Notify the DOE S/CI coordinator of all occurrence reports associated with S/CIs. As appropriate, transmit copies of NCRs and applicable documentation.</p> <p>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:</p> <ul style="list-style-type: none"> • 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 | <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> 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. |
|------------------|--|

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	6 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

- | | |
|-------------------------------|---|
| 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. |

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	7 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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

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

Performance
Assurance

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 414.1B, DOE O 440.1A, DOE G 414.1-3, 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

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."
 - 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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	8 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

- S/CI Coordinator
3. Collect, maintain, disseminate, and use the most accurate, up-to-date information on S/CIs and suppliers using all available sources, including:
- Government-Industry Data Exchange Program (www.gidep.org)
 - Institute of Nuclear Operators (www.inpo.org)
 - DOE Occurrence Reporting and Processing System
 - DOE Suspect/Counterfeit web site (<http://tis.eh.doe.gov/paa/sci/>).

NOTE: Information identified during this review that may be applicable to CH2M HILL's on-site suspect/counterfeit program will be provided to the appropriate personnel using one of the following methods: lessons learned, required reading, briefings, training, or changes to this procedure.

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.

Fastener (regardless of the safety classification).

- 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

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	9 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

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.

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.

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.

6.0 RECORDS

No records are generated during the performance of this procedure.

7.0 SOURCES

7.1 Requirements

1. TFC-PLN-02, "Quality Assurance Program Description."

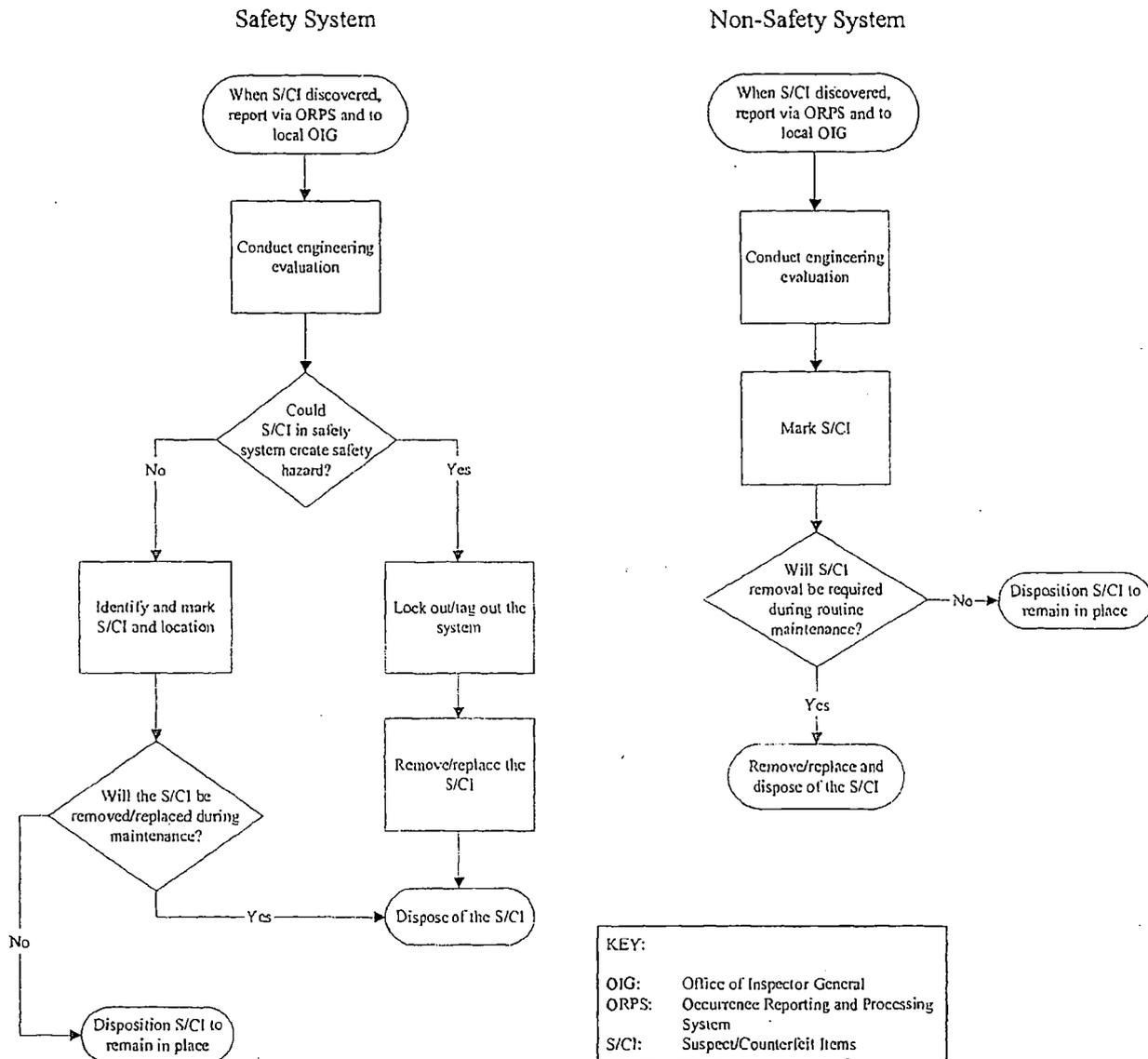
ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	10 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

7.2 References

1. DOE G 414.1-3, "Suspect/Counterfeit Items Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1B, Quality Assurance."
2. HNF-SD-MP-SRID-001, "Standards/Requirements Identification Document for the Tank Farm Contractor."
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.



ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	12 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ

Document
Page
Effective Date

TFC-ESHQ-Q_C-C-03, REV C-2
13 of 53
October 5, 2005

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	General Electric (Component Examples) <ul style="list-style-type: none"> • AKF-2-25 • EC Trip Types, E-C-I, E-C-2A • AK All Types 	Metal clad, low voltage, DC	Satin America & Circuit Breaker Systems Inc.	NRC I.N. 89-45, Supplements and Attachments SENS Report ID #6 5/23/89
Circuit Breakers	General Electric (Component Examples) <ul style="list-style-type: none"> • AK-3A-25 • KHL-36 125 • THEF 136050 • AK-2-75-3 • AK-2 • AK-1-50 • AK-1-75 • B • TDQ • TCVVFS • TFJ • TEB122015-WL • TEB132090-WL • TE111015 • TED134060-WL • TEB124050-WL • THED136100 WL • TED126050 • THED136060 WL • THGB2120 • TEF134015 • THEF136M1100 • TED 134030-WL • AK2A25 • THED-136100-WL • THED-136050-WL • THED-136045-WL • THFK-236070-WL • TE-122070 • THED-136150-WL • THED-13600-WL • TED-113020 • TEC-360S0 • THED-124015-WL 	1, 2, & 3 pole, various amperages	<p>Bud Ferguson's Industrial Control & Supply, Inc.,</p> <p>General Circuit Breaker & Electrical Supply</p> <p>HLC Electric Supply</p> <p>NSSS, Inc.</p> <p>California Breakers, Inc.</p> <p>Rosen Electric Equipment</p> <p>PENCON International (DBA) General Magnetics/ Electric Wholesale</p> <p>Lakeland Engineering Equipment Co.</p> <p>ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker Electrical Supply</p> <p>California Breakers</p> <p>Voyter Electric Co.</p>	<p>NRC I.N. 88-46 Supplements and Attachments</p> <p>NRC I.N. 90-46</p> <p>Office of Nuclear Safety 93-5 (#11)</p>

ESHQ

Document
Page
Effective Date

TFC-ESHQ-Q_C-C-03, REV C-2

14 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

October 5, 2005

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		

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	15 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ESHQ

Document
Page
Effective Date

TFC-ESHQ-Q_C-C-03, REV C-2

16 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

October 5, 2005

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 • MDL#KAF • QNB3020 • QNB3030 • BA • BA • BA • E3060 • F3020 	<p>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</p> <p>3 pole, 20 amp</p>	<p>Not Provided</p> <p>Not Provided</p>	<p>NRC I.N. 88-46 Supp. & Attach.</p> <p>SENS ID #10 3-17-89 SENS ID #11 3-3-89</p> <p>SENS Report ID #12 10-19-88 NRC I.N. 88-46</p>
Circuit Breakers	ITE (Component Examples)			
	<ul style="list-style-type: none"> • Model - E43B015 • EQ-B • EE-3B030 • EF3B070 • EF3H050 • EF3B125 • EF3B040 • E42B020 • QJ2B200 • JL3B400 	<p>3-phase 480 volt</p> <p>1 pole, 20 amp 3 pole, 30 amp</p> <p>2 & 3 pole various amperages</p>	<p>Cal. Breakers/Elect. Wholesale Supply Co.</p> <p>Not Provided</p> <p>General Circuit Breaker & Electrical Supply</p> <p>HLC Electrical Supply</p>	<p>SENS Report ID #8, 5-5-89</p> <p>SENS ID #10 3-17-89</p> <p>SENS ID #11 3-3-89</p> <p>NRC I.N. 88-46, Supplements and Attachments</p>

ESHQ

Document
Page
Effective Date

TFC-ESHQ-Q_C-C-03, REV C-2

17 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

October 5, 2005

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

ESHQ

Document
Page
Effective DateTFC-ESHQ-Q_C-C-03, REV C-2
18 of 53
October 5, 2005CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

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 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

ESHQ

Document

TFC-ESHQ-Q_C-C-03, REV C-2

Page

19 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

October 5, 2005

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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.

ESHQ

Document

TFC-ESHQ-Q_C-C-03, REV C-2

Page

20 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

October 5, 2005

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.

ESHQ

Document
Page
Effective Date

TFC-ESHQ-Q_C-C-03, REV C-2

21 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

October 5, 2005

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	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

ESHQ

Document
Page
Effective DateTFC-ESHQ-Q C-C-03, REV C-2
22 of 53
October 5, 2005CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

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		

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	23 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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

ESHQ

Document
Page
Effective DateTFC-ESHQ-Q_C-C-03, REV C-2
24 of 53
October 5, 2005CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Semiconductors	Solid State Devices Inc. (SSDI) SFF 9140 SPD 1511-1-11 2A14/18 or 2A14/52 SSR4045CTTXV SFF9140TWX SPMF106ANH SPD 5818 or IN5858JTXV 2N797 Unknown	P-Channel MOSFET Pin Diode (SA3059) Ion Implanted Diode SCHOTTKY Diodes Power Transistors Special Pack MOSFET Switch Axial Leaded SCHOTTKY Diode Transistor Diode (SA 3436)	SSDI	DOE Albuquerque Letter, 06-25-96 to DOD Inspector General
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

ESHQ

Document
Page
Effective DateTFC-ESHQ-Q C-C-03, REV C-2
25 of 53
October 5, 2005CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

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

ESHQ

Document

TFC-ESHQ-Q_C-C-03, REV C-2

Page

26 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

October 5, 2005

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.

ESHQ

Document
Page
Effective DateTFC-ESHQ-Q_C-C-03, REV C-2
27 of 53
October 5, 2005CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

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	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.	Thereno-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

ESHQ

Document

TFC-ESHQ-Q_C-C-03, REV C-2

Page

28 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

October 5, 2005

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) Kyocci 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. Kubicck, 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

ESHQ

Document

TFC-ESHQ-Q_C-C-03, REV C-2

Page

29 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

October 5, 2005

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

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	30 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

**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

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	31 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

**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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	32 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	33 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	34 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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).

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	35 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	36 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.).

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	37 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	38 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	39 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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).

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	40 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	41 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	42 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	43 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	44 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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. 07-6

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/hlanec/hlanec.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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Page Effective Date	47 of 53 October 5, 2005

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.

ESHQ

Document

TFC-ESHQ-Q_C-C-03, REV C-2

Page

48 of 53

CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	49 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	50 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	51 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.

ESHQ	Document	TFC-ESHQ-Q C-C-03, REV C-2
	Page	52 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

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.).

ESHQ	Document	TFC-ESHQ-Q_C-C-03, REV C-2
	Page	53 of 53
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Effective Date	October 5, 2005

ATTACHMENT K – RECENTLY IDENTIFIED S/CI ISSUES

- I. Suspect/Counterfeit Fasteners not Listed on Attachment H.
 - A. Several metric bolts with head markings of 8.8 have been identified without manufacturer's head markings. Although metric bolts are not included on the DOE Headmark List, a suspect item is defined as 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. ASTM F 568M-04, "Standard Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners," states the following: "Bolts and screws, except those...(smaller than M5), shall be marked permanently and clearly to identify the property class and the manufacturer. The manufacturer's identification symbol shall be of his design." The property class symbols for metric bolts include 4.6, 4.8, 5.8, 8.8, 9.8, 10.9, and 12.9.

When metric bolts marked with property class symbols that do not have the manufacturer's identification symbol in accordance with ASTM F 568M-04 are identified, these bolts shall be treated as suspect.
 - B. "J," "KS," and "K" manufacturers head markings are still being received. These items still remain S/CI regardless of the position of the suspect manufacturer head markings (e.g., centered vs. off to the side).

**TECHNICAL SPECIFICATION**

PROJECT:	Final DBVS Design	145579-V-SP-017017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix F**Request for Information**

(2 pages including cover)



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-V-SP-017017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
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	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

OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS
BLEED SKID ASSEMBLIES DESIGN AND FABRICATION
10-Jan-06


TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-V-SP-017017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix G
Instrumentation Naming and Tagging Convention

(3 pages including cover)

**TECHNICAL SPECIFICATION**

PROJECT:	Final DBVS Design	145579-V-SP-017017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

G1 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.

G2 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"

G3 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)"



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-V-SP-017017	REV. 0
PROJECT NO.:	145579	OFF-GAS TREATMENT SYSTEM BYPASS FILTER/FAN AND BYPASS BLEED SKID ASSEMBLIES DESIGN AND FABRICATION	
CLIENT:	AMEC E&E - Richland, Washington		

G4 NOTES

1. 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

2. Cables will be tagged on both ends with the same cable tag number.
3. Equipment, motor, and instrument tag numbers shown are for illustration purposes only. Use project specific equipment, motor, and instrument tags.

Appendix H5

APPENDIX H5

MAIN OFF-GAS TREATMENT SYSTEM

Title	Page
Technical Specifications: <i>Sintered Metal Filter</i> (143643-V-SP-002, Rev 2), <i>Exhaust Fans</i> (145579-V-SP-004, Rev 4), <i>HEGA Filter Skid</i> (145579-V-SP-010, Rev 1), <i>Wet Scrubber Skid Assembly Design and Fabrication</i> (145579-D-SP-037, Rev 1), <i>Off-Gas Treatment System Bypass Filter/Fan and Bypass Bleed Skid Assemblies</i> (145579-V-SP-017, Rev 0) – A Corrosion Review (dated March 24, 2006)	H5-2
A77977-COMM-002, <i>Response to March 24, 2006 Corrosion Review for the Main Off-Gas Treatment System Updated Information</i> (dated April 19, 2006)	H5-4
Technical Specifications: <i>Steel Exhaust Stack</i> (145579-V-SP-005, Rev 3) – A Corrosion Review (dated April 29, 2005)	H5-6
Technical Specifications: <i>Sintered Metal Filter</i> (143643-V-SP-002, Rev 0), <i>Wet Scrubber Skid Assembly Design and Fabrication</i> (145579-D-SP-037, Rev 0), <i>Off-Gas Treatment System HEPA Filter Skid Assembly Design and Fabrication</i> (145579-D-SP-036, Rev 1), <i>HEGA Filter Skid</i> (145579-V-SP-010, Rev 0), <i>Specification for Selective Catalytic Reduction Unit (SCR)</i> (145579-V-SP-001, Rev 2), <i>Exhaust Fans</i> (145579-V-SP-004, Rev 3, and <i>Steel Exhaust Stack</i> (145579-V-SP-005, Rev 2) – A Corrosion Review (dated March 13, 2005)	H5-7
DBVS-LDS-016, <i>Response to Corrosion Review for the Main Off-Gas Treatment System</i> (dated April 21, 2005)	H5-9

Corrosion Review
03/24/06

CHEM MET, LTD., PC
POB 4068
West Richland, WA 99353

(509) 967-2309 or (800) 570-2309 Fax (509) 967-2459

March 24, 2006

Ja-Kael Luey, PE
DMJM Technologies
3250 Port of Benton Blvd
Richland, WA 99354-1670

Dear Mr Luey

Technical Specifications: Sintered Metal Filter (143643-V-SP-002, Rev 2), Exhaust Fans (145579-V-SP-004, Rev 4), HEGA Filter Skid (145579-V-SP-010, Rev 1), Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 1), Off-Gas Treatment System Bypass Filter/Fan and Bypass Bleed Skid Assemblies (145579-V-SP-017, Rev 0) – A Corrosion Review

This document presents a limited number of general remarks about corrosion in the specifications and recommendations. Some remarks pertain to more than one system and are included in this introductory section.

- It is often stated in the documentation that the various 300 series stainless steels may be interchanged at will. Generally, for this system, this is true but it is strongly recommended that the stainless steel off-gas/process lines be 316L unless they remain above the dew-point.
- The off-gas typically contains much more NO_x than SO_x, HCl, or HF and therefore condensate is expected to be rather inert towards stainless steel because it should contain an excess of HNO₃.
- In many specifications, it is stated that stainless steel nuts are required with stainless steel bolts. Unless an anti-galling compound is used, it is worth considering the use of Nitronic 60 for one of the components, probably the nut, to prevent galling.
- If any of the particulates are hygroscopic at a system's operating temperature, there is a possibility of deposits and localized corrosion – no information is available about this.
- No stainless steel component should have carbon steel braces or supports welded directly to it if the interior of the stainless steel is exposed to process fluids.

Sintered Metal Filter (143643-V-SP-002, Rev 2)

- In Table 2-2, where the ASME B&PV code is referenced, mention is made of brazing. Many brazes for stainless steel contain copper or silver. This is absolutely prohibited if there is any opportunity for condensate liquids to be present. These brazes dissolve rapidly in nitric acid!
- Section 3.3.1.11.1: Where 304/304L and 316/316L stainless steels and carbon steel are used in the same system, Positive Material Identification (PMI) is strongly recommended to ensure the wrong alloys are not used during welding.

Exhaust Fans (145579-V-SP-004, Rev 4)

- Any of the appropriate comments above apply here also. If condensate forms, there is some possibility of corrosion fatigue, but that does not appear too likely under the given conditions.

HEGA Filter Skid (145579-V-SP-010, Rev 1)

- Section 3.3.1.1 – As mentioned in the letter report last year, is there any chance of the NO_x reacting with the carbon to form a fire hazard? If so, what is the maximum temperature attainable? Is there a fire suppression system that could cause water to be present which would lead to the formation of carbon monoxide and hydrogen through the reaction of water with the carbon? This question is raised again because of a fire in a similar operation at Hanford this year.

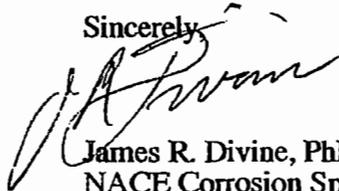
Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 1)

- Most of the ducting is resistant to the environment. However, at the entry to quencher, 36-N83-034, condensate conditions are expected to be more corrosive. (Based on Table 3-2 information and also area E7 on drawing F-145579-36-A-0100, Rev L.) Because the temperature there is less than 135 °F, and there is a high NO_x content relative to the HCl, SO_x , and HF, the corrosion is expected to be minimal.

Off-Gas Treatment System Bypass Filter/Fan and Bypass Bleed Skid Assemblies (145579-V-SP-017, Rev 0)

- Section 3.2.1.1 – it appears that if the temperature drops from the inlet value, nitric acid could condense. The stainless steel ducting and fans will accommodate this condition.
- Section 3.3.1.3.4 – If the heating coils are exposed to the off-gas, they may suffer some corrosion, particularly under off-normal conditions; the literature does not indicate a major problem but the coils should be monitored.
- Drawing 145579-36-V-0007, Rev G – shows the use of mild steel ducting/pipe after the SCR. If the temperature remains above the dew-point of the off-gas, bare mild steel would be acceptable for the 2-y design life of the system – particularly if it is schedule 10 pipe, or better. With off-normal conditions, it is possible that significant NO_x would be present and additional corrosion should be expected at temperatures below the dew-point. If un-coated pipe is used, the bottom of the line should be checked for corrosion whenever operation below the dew-point is conducted. In accordance with Section 3.3.6, however, coating the interior of the pipe with an acid resistant coating is recommended.
- Miscellaneous mild steel vent lines – some water will condense in the lower sections of the lines and result in corrosion. Corrosion rates will probably be less than about 5-mpy (0.005-inch/y) but definitely less than 10-mpy. Thus for a 2-y design life, a minimum corrosion allowance of about 0.02-inch should be used. The other consideration is that corrosion products will fall into the associated vessels.

Sincerely,



James R. Divine, PhD, PE
NACE Corrosion Specialist, #867
Chief Engineer



DMJM Technology

3250 Port of Benton Boulevard, Richland, Washington 99354-1670
T 509.375.7774 F 509.375.5331 www.dmjmhnaecom.com

April 19, 2006

A77977-COMM-002

Mr. James R. Divine
ChemMet, Ltd. PC
P.O. Box 4068
West Richland, Washington 99353

Reference: Technical Specifications: Sintered Metal Filter (143643-V-SP-002, Rev 2), Exhaust Fans (145579-V-SP-004, Rev 4), HEGA Filter Skid (145579-V-SP-010, Rev 1), Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 1), Off-Gas Treatment System Bypass Filter/Fan and Bypass Bleed Skid Assemblies (145579-V-SP-017, Rev 0) - A Corrosion Review

SUBJECT: RESPONSE TO MARCH 24, 2006 CORROSION REVIEW FOR THE MAIN OFF-GAS TREATMENT SYSTEM UPDATED INFORMATION

Dear Mr. Divine,

DMJM H&N, Inc. (dba DMJM Technology) recently contracted with ChemMet, Ltd. to conduct a corrosion review on various systems and components for the Demonstration Bulk Vitrification System (DBVS) Project. This review was a follow up to a review provided by ChemMet in 2005 for the Main Off-gas Treatment System.

The introductory remarks will be addressed through review of system component fabrication submittals and implementation for future site installation and construction activities. Given the short operating duration for the DBVS Project, areas of both carbon steel and stainless steel lines may be measured for wall thickness to provide field data on corrosion for this application.

Planned actions to specific systems are provided below:

- Sintered Metal Filters – Fabrication information will be reviewed for the areas of concern.
- Exhaust Fans – Field inspections will be considered once in operation to determine if corrosion fatigue conditions are present.
- HEGA Filter Skid – The projected design conditions have not changed since 2005. Prior disposition still applies (e.g., conditions for a reaction do not exist in the HEGA filter skid and this skid is not equipped with a fire suppression system).
- Wet Scrubber Skid – Field measurements of wall thickness will be considered as part of operations to assess level of corrosion at the noted location.

Mr. James Divine
A77977-COMM-002
April 19, 2006
Page 2 of 2

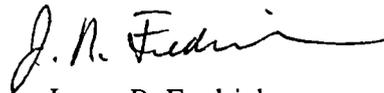
- Off-gas Treatment System Bypass System - Field inspections will be considered once in operation to evaluate noted areas.
- Line after the SCR - Field measurements of wall thickness will be considered as part of operations to assess level of corrosion at the noted location.
- Miscellaneous Lines - Field measurements of wall thickness will be considered as part of operations to assess level of corrosion at the noted locations.

Thank you for your corrosion review on the DBVS Main Off-Gas Treatment System.

Respectfully,



Ja-Kael Luey
Project Engineer



James R. Fredrickson
DBVS Project Manager

cc: DMJM Technology

James Frederickson
Ja-Kael Luey
Kurt McCracken
DMJM File/LB

CH2M HILL Hanford Group, Inc.

Michael Fish
Dave Shuford

AMEC Earth and Environmental

Jeff Jeffers
Joy Wilson

Corrosion Review
04/29/05



Your single source for Chemical, Materials, and Environmental Technology

April 29, 2005

Charles E. Grenard
DMJM Technologies
3250 Port of Benton Blvd
Richland, WA 99354-1670

Dear Mr Grenard

Technical Specifications: Steel Exhaust Stack (145579-V-SP-005, Rev 3) – A Corrosion Review

This document presents a limited number of general remarks about corrosion in the specifications and recommendations. It concerns itself only with the newly added Inlet Air Stack.

The Inlet Air Stack is normally only exposed to incoming ambient air. There is, nevertheless, a potential for blowback from the melter which will result in a gas containing about 12% by volume of NO_x and at a temperature of 875 °F (drawing F-145579-00-A-0021, Rev 0G). It is assumed that the off-normal condition, if it occurs, will last several hours.

Steel Exhaust Stack (145579-V-SP-005, Rev 3)

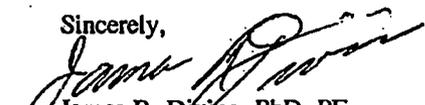
- o Section 3.3.5 – The construction of the stack from mild steel is not a panacea for corrosion. However, a coating of a standard industrial grade exterior coating will be satisfactory for mitigating corrosion problems.
- o Section 3.3.6 – It is anticipated the Inlet Air Stack will be coated assuming normal operation. There is no known organic-based coating that will withstand a temperature of 875 °F for several hours as anticipated during off-normal conditions. The presence of the NO_x is not expected to be a concern during the off-normal operation.

If the Inlet Air Stack is not coated on the interior, then during normal operation with the wide range of expected humidities, some surface corrosion will occur, estimated at a rate of less than 1 mpy (0.001 inch/year). During an off-normal occurrence, no significant effect on the stack is expected. After an off-normal occurrence, the corrosion rate may accelerate due to the presence of adsorbed NO_x/HNO₃, unless the acid is neutralized and rinsed off.

General Recommendations

Corrosion does not appear to be a major concern. Even after an off-normal occurrence, minor measures can be taken to mitigate corrosion.

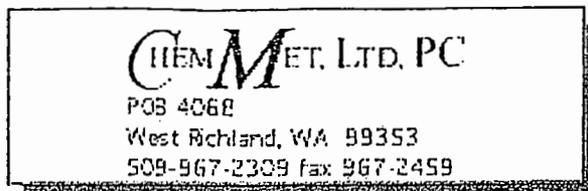
Sincerely,


James R. Divine, PhD, PE
NACE Corrosion Specialist, #867
Chief Engineer



EXPIRES: 3-4-06

Corrosion Review
03/13/05



Your single source for Chemical, Materials, and Environmental Technology

March 13, 2005

Charles E. Grenard
DMJM Technologies
3250 Port of Benton Blvd
Richland, WA 99354-1670

Dear Mr Grenard

Technical Specifications: *Sintered Metal Filter (143643-V-SP-002, Rev 0), Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 0), Off-Gas Treatment System HEPA Filter Skid Assembly Design and Fabrication (145579-D-SP-036, Rev 1), HEGA Filter Skid (145579-V-SP-010, Rev 0), Specification for Selective Catalytic Reduction Unit (SCR) (145579-V-SP-001, Rev 2), Exhaust Fans (145579-V-SP-004, Rev 3), and Steel Exhaust Stack (145579-V-SP-005, Rev 2) – A Corrosion Review*

This document presents a limited number of general remarks about corrosion in the specifications and recommendations.

Sintered Metal Filter (143643-V-SP-002, Rev 0)

- Unless the operation will always be dry, 316L stainless steel is recommended. If it is assured the system will be dry, effectively bone-dry, 304L is acceptable.

Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 0)

- Section 3.1 – it is best to keep the components wet or, if allowed to dry, flush with water first; prepare an operating procedure for its operation. (Based on Table 3-2 information.)

Off-Gas Treatment System HEPA Filter Skid Assembly Design and Fabrication (145579-D-SP-036, Rev 1)

- Unless the operation will always be dry, 316L stainless steel is recommended. If it is assured the system will be dry, effectively bone-dry, 304L is acceptable. (Based on Table 3-2 information.)
- Section 3.3.1.1.9 and Section 3.3.6.2 – the application of thermal insulation must consider expected temperatures of the underlying metal. If the metal operates at between about 32 °F and 212 °F, it shall be coated with a submersible coating. Coating stainless steel should be considered under these conditions because of the potential for the concentration of halides from impurities in the insulation.
- Section 3.3.1.6.5, item 1 – substitutions may be made if the components are dry. If wet, 316L stainless steel is recommended.

- Section 4.2 – Hydrottest water shall meet chloride limits specified elsewhere and shall not be left in the component being tested more than 72 h – mopping or other drying is recommended.
- Section 5.3, item 18 – desiccants placed in components shall be removed prior to use of the system.

HEGA Filter Skid (145579-V-SP-010, Rev 0)

- Section 3.3.1.1 – is there any chance of the NOx reacting with the carbon to form a fire hazard? If so, what is the maximum temperature attainable? Is there a fire suppression system that could cause water to be present?

Specification for Selective Catalytic Reduction Unit (SCR) (145579-V-SP-001, Rev 2)

- Is the SOx concentration sufficiently small not to poison the catalyst?
- Section 3.3.1.4 – Although parts of the SCR will be hot, areas around the ammonia vaporizer may be cold. Components under insulation that may see condensed water and corrode. Such components need to be coated with a submersible coating.

Exhaust Fans (145579-V-SP-004, Rev 3)

No comments

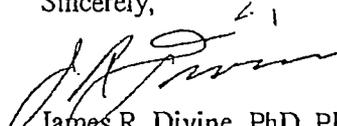
Steel Exhaust Stack (145579-V-SP-005, Rev 2)

- Section 3.1.2, Figure 3-1 – the sample ports must be resistant to condensed acids. Past experience shows 304L is expected to be satisfactory.
- Section 3.3 – The stack shall be coated with an acid resistant "high" temperature coating.
- Section 3.3.1, paragraph 4 – will the false bottom be drainable or will liquid build up on it? The drainage port appears to be on the side above the bottom.

General Recommendations

Corrosion under insulation appears to be a major consideration in these systems. Metal surface temperatures and their coatings should be evaluated.

Sincerely,


James R. Divine, PhD, PE
NACE Corrosion Specialist, #867
Chief Engineer



EXPIRES: 7-11-04

**Corrosion Review
Response**



April 21, 2005

DBVS-LDS-016

Mr. James R. Divine
ChemMet, Ltd. PC
P.O. Box 4068
West Richland, Washington 99353

Reference: Technical Specifications: *Sintered Metal Filter* (143643-V-SP-002, Rev 0), *Wet Scrubber Skid Assembly Design and Fabrication* (145579-D-SP-037, Rev 0), *Off-Gas Treatment System HEPA Filter Skid Assembly Design and Fabrication* (145579-D-SP-036, Rev 1), *HEGA Filter Skid* (145579-V-SP-010, Rev 0), *Specification for Selective Catalytic Reduction Unit (SCR)* (145579-V-SP-001, Rev 2), *Exhaust Fans* (145579-V-SP-004, Rev 3), and *Steel Exhaust Stack* (145579-V-SP-005, Rev 2)- A Corrosion Review

SUBJECT: RESPONSE TO CORROSION REVIEW FOR THE MAIN OFF-GAS TREATMENT SYSTEM

Dear Mr. Divine,

DMJM+N, Inc. (dba DMJM Technology) recently contracted with ChemMet, Ltd. to conduct a corrosion review on various systems and components for the Demonstration Bulk Vitrification System (DBVS) Project.

Table 1 denotes our planned actions to address your comments, issues, and concerns stated in your review of the DBVS equipment specifications.

Thank you for your corrosion review on the DBVS Main Off-Gas Treatment System.

Respectfully,

Kurt J. McCracken
Chief Engineer

James R. Fredrickson
DBVS Project Manager

cc: DMJM Technology

CH2M HILL Hanford Group, Inc.

James Frederickson
Kurt McCracken
Ja-Kael Luey
DMJM File/LB

Mike Leonard
Dave Shuford

AMEC Earth and Environmental

Leo Thompson
Mark Lucas

Table 1. Main Off-Gas Treatment System. (4 sheets)

Item	Section	Comment or Recommendation	Disposition or Planned Action
Technical Specification 145579-V-SP-002, Rev. 0, Sintered Metal Filter			
1.	General	Unless operation will always be dry, 316L stainless steel is recommended. If it is assured the system will be dry, effectively bone-dry, 304L is acceptable.	<p>The process conditions from the ICV process will also result in an effectively bone-dry gas stream, less than 5% relative humidity (note that almost all of the moisture in the ICV box feed is removed by the waste dryer).</p> <p>System will be dry since the Sintered Metal Filter assembly is purged with compressed air. The compressed air is conditioned (oil and moisture removed) and then is heated while in contact with a hot filter media. These conditions will result in an effectively bone – dry air stream.</p>
Technical Specification 145579-D-SP-037, Rev. 0, Wet Scrubber Skid Assembly Design and Fabrication			
2.	Section 3.1	It is best to keep the components wet or, if allowed to dry, flush with water first; prepare an operating procedure for its operation. (Based on Table 3-2 information).	<p>The design of the wet scrubber unit will include provisions for flushing process lines with filtered water.</p> <p>Recommended action will be incorporated into DBVS Project operating procedures developed based on vendor Operations and Maintenance Manual.</p>

Table 1. Main Off-Gas Treatment System. (4 sheets)

Item	Section	Comment or Recommendation	Disposition or Planned Action
Technical Specification 145579-D-SP-037, Rev. 0, Off-Gas Treatment System HEPA Filter Skid Assembly Design and Fabrication			
3.	General	Unless operation will always be dry, 316L stainless steel is recommended. If it is assured the system will be dry, effectively bone-dry, 304L is acceptable.	The processing conditions have been reviewed with the vendor. Use of 316L was an option evaluated, but this would have resulted in a delay in the fabrication schedule and delivery to the DBVS Project Site. Based on the presence of insulation on the HEPA Skid gas stream components, upstream heater in the Wet Scrubber Skid, and project duration (less than five years), the HEPA housings will be fabricated from 304L. Should it be noted during full-scale operations that condensation and/or higher concentrations of constituents of concern are found in the gas stream entering the HEPA Skid, the capability exists to periodically rinse the housings to prevent build-up of material.
4.	Section 3.3.1.1.9 and Section 3.3.6.2	The application of thermal insulation must consider expected temperatures of the underlying metal. If the metal operates at between about 32 °F and 212 °F, it shall be coated with a submersible coating. Coating stainless steel should be considered under these conditions because of the potential for the concentration of halides from impurities in the insulation.	The specific thermal insulation to be used by the vendor will be reviewed to determine potential level of impurity content
5.	Section 3.3.1.6.5, item 1	Substitutions may be made if the components are dry. If wet, 316L stainless steel is recommended.	The vendor plans on using 316L for the condensate collection system piping and components. Use of these materials instead of 304L do not impact fabrication schedule.
6.	Section 4.2	Hydrotest water shall meet chloride limits specified elsewhere and shall not be left in the component being tested more than 72 h – mopping or other drying is recommended.	Fabrication traveler and Test Plans will be reviewed to ensure that this condition is met.

Table 1. Main Off-Gas Treatment System. (4 sheets)

Item	Section	Comment or Recommendation	Disposition or Planned Action
7.	Section 5.3; item 18	Desiccants placed in components shall be removed prior to use of the system.	This item will be addressed as part of the Installation Plan for the HEPA Skid at the DBVS Site. The Packing Plan will be reviewed to ensure that material is removed prior to complete fit-up and assembly of the HEPA Filter Skid into the DBVS processing system.
Technical Specification 145579-D-SP-010, Rev. 0, HEPA Filter Skid			
8.	Section 3.3.1.1	Is there any chance of the NOx reacting with the carbon to form a fire hazard? If so, what is the maximum temperature attainable? If so, what is the maximum temperature attainable? Is there a fire suppression system that could cause water to be present?	Conditions for the reaction of NOx with the carbon filter media do not exist in the HEPA Filter Skid. This skid is not equipped with a fire suppression system.
Technical Specification 145579-V-SP-001, Rev. 2, Specification for Selective Catalytic Reduction Unit (SCR)			
9.	General	Is the SOx concentration sufficiently small not to poison the catalyst?	Removal of SOx is accomplished in the upstream Wet Scrubber Skid. The projected outlet concentration of SOx from the skid, along with the addition of dilution air prior to the SCR, reduces the concentration to levels that are not of concern for the SCR unit.
10.	Section 3.3.1.4	Although parts of the SCR will be hot, areas around the ammonia vaporizer may be cold. Components under insulation that may see condensed water and corrode. Such components need to be coated with a submersible coating.	The fabrication and assembly drawings will be reviewed for the areas noted in the comment. Areas of concern will be recommended to not use insulation or be provided with a coating as recommended.
Technical Specification 145579-V-SP-004, Rev. 3, Exhaust Fans			
11.	N/A	No comments.	Accepted.

Mr. James R. Divine
 DBVS-LDS-016
 April 21, 2005
 Page 5 of 5

Table 1. Main Off-Gas Treatment System. (4 sheets)

Item	Section	Comment or Recommendation	Disposition or Planned Action
Technical Specification 145579-V-SP-005, Rev. 2, Steel Exhaust Stack			
12.	Section 3.1.2, Figure 3-1	The sample ports must be resistant to condensed acids. Past experience shows 304L is expected to be satisfactory.	The design team has elected to use a protective coating. Fabrication travelers submitted by the Seller, and approved by the Buyer, will be reviewed to ensure that sample ports are welded and not "brazed."
13.	Section 3.3	The stack shall be coated with an acid resistant "high" temperature coating.	A protective coating is not planned due to the short duration for operations. A corrosion allowance will be estimated and used in the structural analysis of the component.
14.	Section 3.3.1, paragraph 4	Will the false bottom be drainable or will liquid build up on it? The drainage port appears to be on the side above the bottom.	The bottom will be elevated and drainable.
General Recommendations			
15.	N/A	Corrosion under insulation appears to be a major consideration in these systems. Metal surface temperatures and their coatings should be evaluated.	Since most of the off-gas system is not thermally insulated, corrosion under insulation is not considered to be a major concern for the current design. Metal surface temperatures will be evaluated for insulated parts of the system (HEPA and HEGA filter skids and SCR unit).

CHEMMET, LTD., PC
POB 4068
West Richland, WA 99353

(509)967-2309 or (800) 570-2309 Fax (509) 967-2459

March 24, 2006

Ja-Kael Luey, PE
DMJM Technologies
3250 Port of Benton Blvd
Richland, WA 99354-1670

Dear Mr Luey

Technical Specifications: Sintered Metal Filter (143643-V-SP-002, Rev 2), Exhaust Fans (145579-V-SP-004, Rev 4), HEGA Filter Skid (145579-V-SP-010, Rev 1), Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 1), Off-Gas Treatment System Bypass Filter/Fan and Bypass Bleed Skid Assemblies (145579-V-SP-017, Rev 0) – A Corrosion Review

This document presents a limited number of general remarks about corrosion in the specifications and recommendations. Some remarks pertain to more than one system and are included in this introductory section.

- It is often stated in the documentation that the various 300 series stainless steels may be interchanged at will. Generally, for this system, this is true but it is strongly recommended that the stainless steel off-gas/process lines be 316L unless they remain above the dew-point.
- The off-gas typically contains much more NO_x than SO_x, HCl, or HF and therefore condensate is expected to be rather inert towards stainless steel because it should contain an excess of HNO₃.
- In many specifications, it is stated that stainless steel nuts are required with stainless steel bolts. Unless an anti-galling compound is used, it is worth considering the use of Nitronic 60 for one of the components, probably the nut, to prevent galling.
- If any of the particulates are hygroscopic at a system's operating temperature, there is a possibility of deposits and localized corrosion – no information is available about this.
- No stainless steel component should have carbon steel braces or supports welded directly to it if the interior of the stainless steel is exposed to process fluids.

Sintered Metal Filter (143643-V-SP-002, Rev 2)

- In Table 2-2, where the ASME B&PV code is referenced, mention is made of brazing. Many brazes for stainless steel contain copper or silver. This is absolutely prohibited if there is any opportunity for condensate liquids to be present. These brazes dissolve rapidly in nitric acid!
- Section 3.3.1.11.1: Where 304/304L and 316/316L stainless steels and carbon steel are used in the same system, Positive Material Identification (PMI) is strongly recommended to ensure the wrong alloys are not used during welding.

Exhaust Fans (145579-V-SP-004, Rev 4)

- Any of the appropriate comments above apply here also. If condensate forms, there is some possibility of corrosion fatigue, but that does not appear too likely under the given conditions.

HEGA Filter Skid (145579-V-SP-010, Rev 1)

- Section 3.3.1.1 – As mentioned in the letter report last year, is there any chance of the NO_x reacting with the carbon to form a fire hazard? If so, what is the maximum temperature attainable? Is there a fire suppression system that could cause water to be present which would lead to the formation of carbon monoxide and hydrogen through the reaction of water with the carbon? This question is raised again because of a fire in a similar operation at Hanford this year.

Wet Scrubber Skid Assembly Design and Fabrication (145579-D-SP-037, Rev 1)

- Most of the ducting is resistant to the environment. However, at the entry to quencher, 36-N83-034, condensate conditions are expected to be more corrosive. (Based on Table 3-2 information and also area E7 on drawing F-145579-36-A-0100, Rev L.) Because the temperature there is less than 135 °F, and there is a high NO_x content relative to the HCl, SO_x , and HF, the corrosion is expected to be minimal.

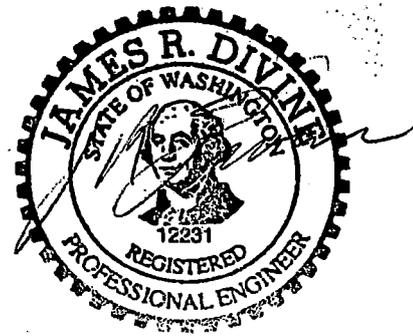
Off-Gas Treatment System Bypass Filter/Fan and Bypass Bleed Skid Assemblies (145579-V-SP-017, Rev 0)

- Section 3.2.1.1 – it appears that if the temperature drops from the inlet value, nitric acid could condense. The stainless steel ducting and fans will accommodate this condition.
- Section 3.3.1.3.4 – If the heating coils are exposed to the off-gas, they may suffer some corrosion, particularly under off-normal conditions; the literature does not indicate a major problem but the coils should be monitored.
- Drawing 145579-36-V-0007, Rev G – shows the use of mild steel ducting/pipe after the SCR. If the temperature remains above the dew-point of the off-gas, bare mild steel would be acceptable for the 2-y design life of the system – particularly if it is schedule 10 pipe, or better. With off-normal conditions, it is possible that significant NO_x would be present and additional corrosion should be expected at temperatures below the dew-point. If un-coated pipe is used, the bottom of the line should be checked for corrosion whenever operation below the dew-point is conducted. In accordance with Section 3.3.6, however, coating the interior of the pipe with an acid resistant coating is recommended.
- Miscellaneous mild steel vent lines – some water will condense in the lower sections of the lines and result in corrosion. Corrosion rates will probably be less than about 5-mpy (0.005-inch/y) but definitely less than 10-mpy. Thus for a 2-y design life, a minimum corrosion allowance of about 0.02-inch should be used. The other consideration is that corrosion products will fall into the associated vessels.

Sincerely,



James R. Divine, PhD, PE
NACE Corrosion Specialist, #867
Chief Engineer



EXPIRES: 3-11-08