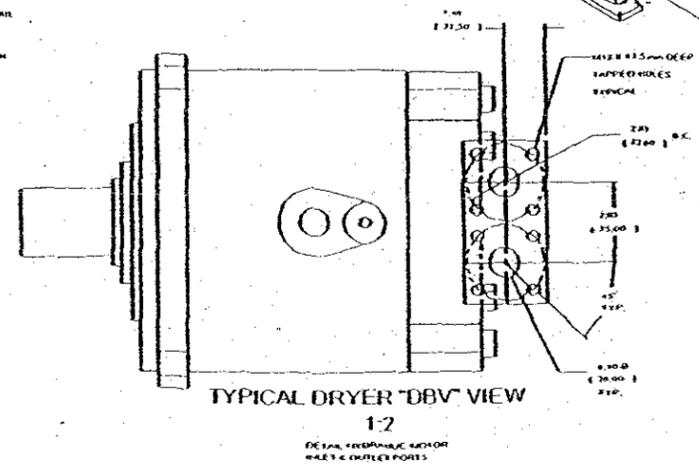
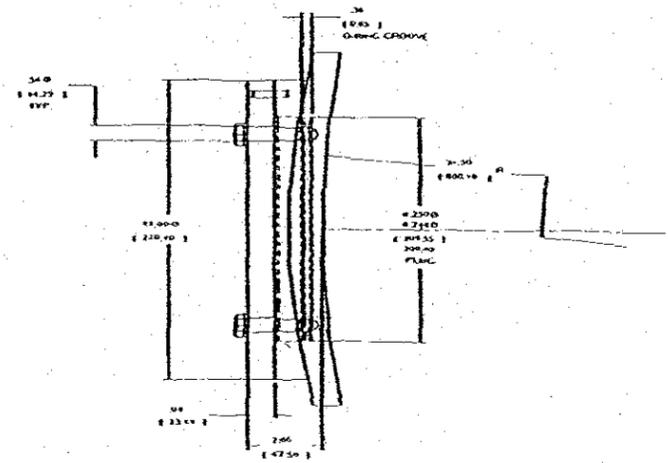
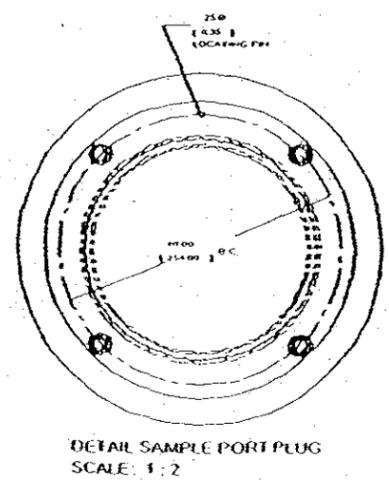
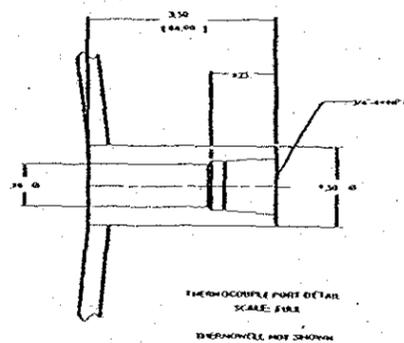
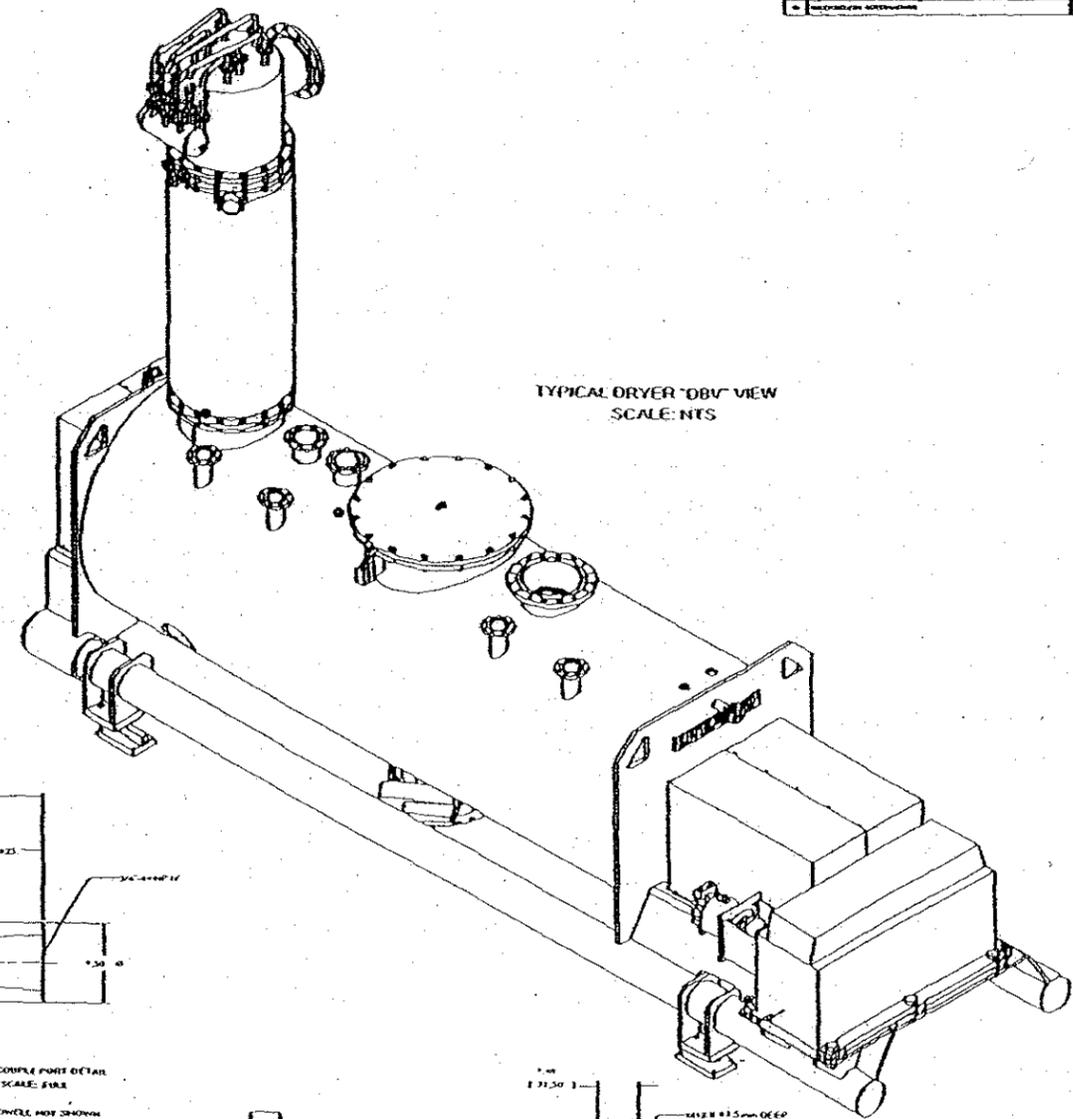
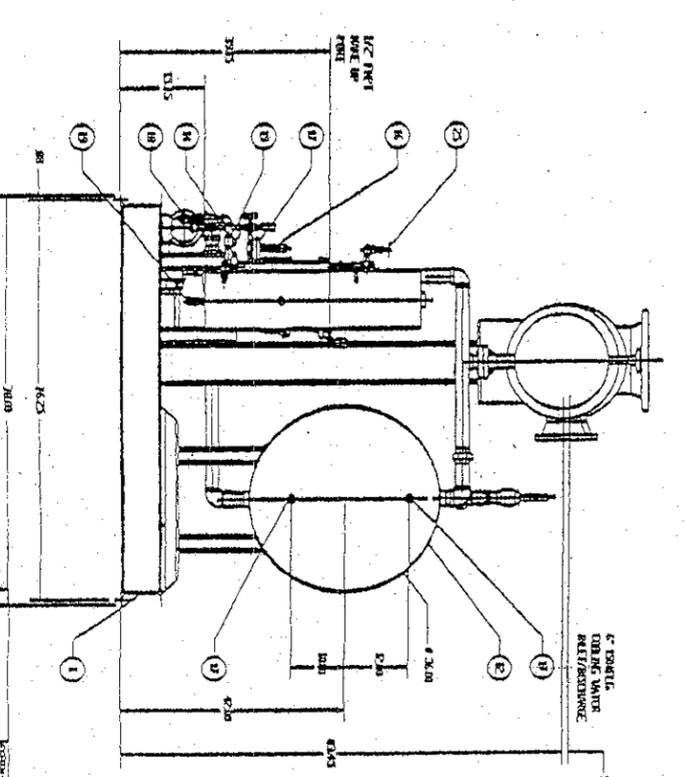
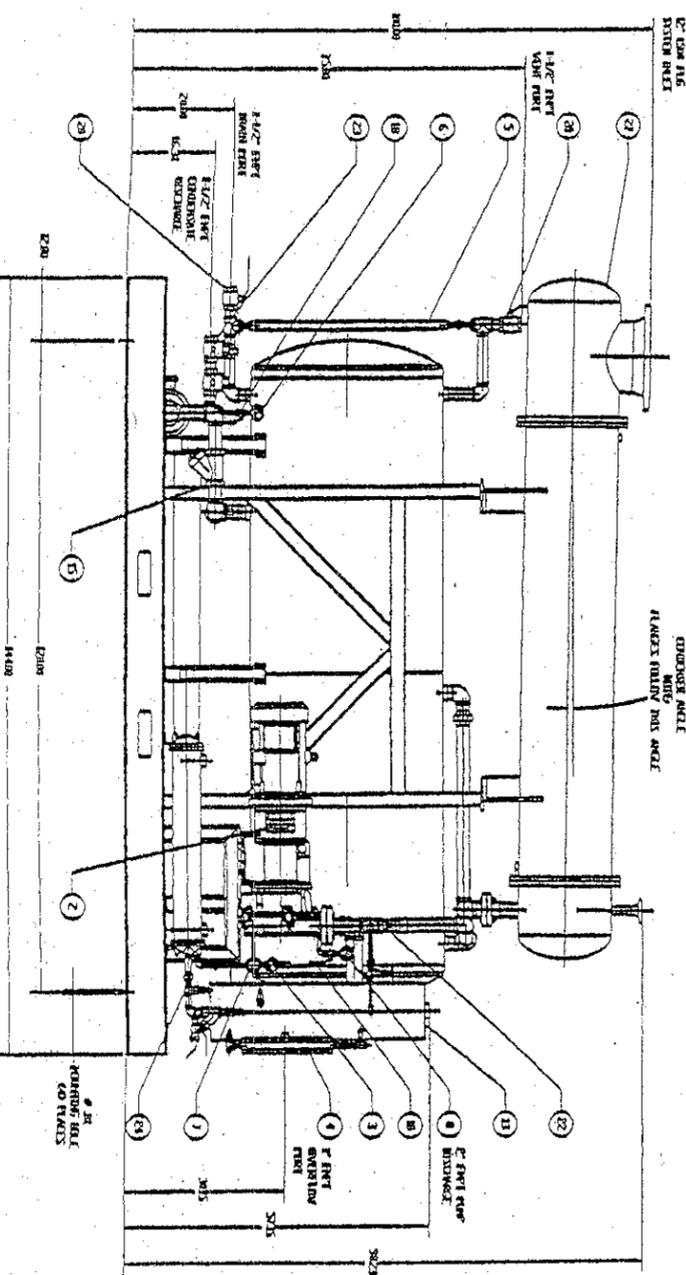
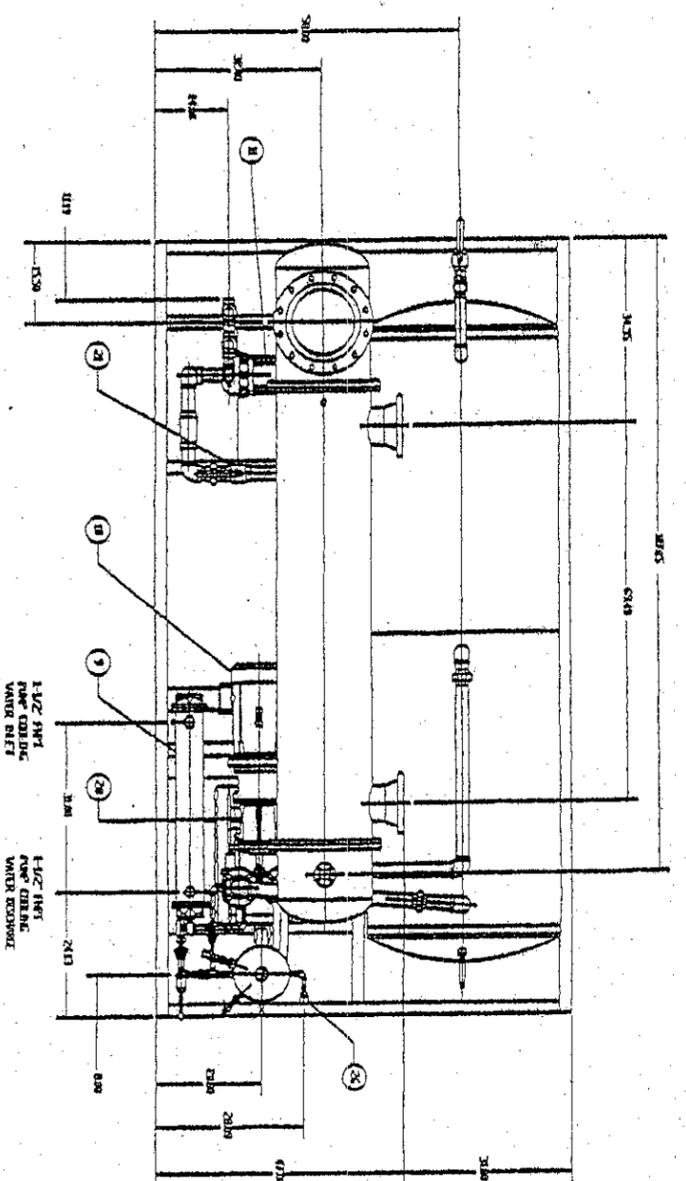


ENGINEERING DATA:

1. SPECIFICATION PER RFD 03-006 REV. 1 (ES-024) AND CLIENT LETTER 20843-LDS-029.
2. AT RISK ITEMS ARE: FLOWS, HYDRAULIC OIL, CLEAN IN PLACE ON PULSE BACK FILTER.
3. INTERIOR OF DRYER AND ALL PRODUCT CONTACT SURFACES CONSTRUCTED OF TYPE 304L STAINLESS STEEL AND STANDARD UNPOLISHED INTERIOR (WELDS CLEANED UP ONLY). VALIDATION DOCUMENTATION ON PRODUCT CONTACT MATERIALS. NON STAINLESS EXTERIOR IS PAINTED AMERCOAT 220 (COLOR T.B.D.), 5 MIL THICKNESS. DRYER SHELL IS 64.25 O.D. (WITHOUT JACKET). 63 DRUM THICKNESS. DYE PENETRANT TESTS ON ALL PRODUCT CONTACT WELDS.
4. VESSEL IS STRUCTURALLY DESIGNED FOR 5 PSIG INTERNAL. IT IS CLIENT'S RESPONSIBILITY TO PROTECT AGAINST OVERPRESSURE. VESSEL DESIGNED AND CERTIFIED FOR FULL VACUUM @ 320° F.
5. 7.5 PSIG (320° F MAX / 32° F MIN) ASME CODE TYPE 304 STAINLESS STEEL Dimple JACKET 2001 CODE SECTION VIII DIVISION 1, 2003 ADDENDA WITHOUT THERMAL SHOCK. INSTALLED ON DRYER DRUM. JACKET THICKNESS IS #12 GA. (.105). JACKET SHELL IS 65.00 O.D.
6. 2" THICK FOAMGLASS INSULATION INSTALLED AROUND JACKET OF VESSEL. COVERED WITH ALUMINUM SHEATHING, RIVETED & CAULKED IN PLACE. SHEATHING IS 63.00 O.D.
7. NO EXTERNAL LOADS CAN BE APPLIED TO THE DRYER. WEIGHT, PRESSURE AND TEMPERATURE EFFECTS MUST BE CONSIDERED. CLIENT TO ADVISE ANY LOADS APPLIED FOR RMC REVIEW.
8. ESTIMATED STATIC WEIGHT 40,000 LBS. (WITH PULSE-BACK FILTER). DYNAMIC LOADING PER RMC CALCULATIONS 04-017.
9. FLOW RATE 30 GPM PER INLET 70° F WATER REQ'D TO PRODUCE TURBULENT FLOW AT 5 PSIG MAX. PRESSURE DROP.
10. BECKER STYLE WITH FINGERS MAKING TOOLS W/ WELDED HEAD SCRAPERS. APPROX. WT. PER PLOW 160 #. FULL COATING INCLUDING FINGERS WITH ABRASION RESISTANT COATING.
11. LIFT DRYER WITH BEAM SPREADER BAR AT THE (4) LIFTING POINTS ON HEADS OR FROM BOTTOM OF EACH HEAD. REFER TO RMC CALCULATIONS 04-019.
12. MAINSHAFT 45 RPM MAX.
13. SEALS - MAINSHAFT - LIP SEALS. THREE SPARE LIP SEALS AT EACH SEAL. THREADED WEAR SLEEVES ON SHAFT.
14. MACHINE WIRING TO NEMA 4 TERMINAL BOX. CONTROL PANEL BY OTHERS.
15. NO SAFETY SCREENS ARE PROVIDED ON WHEEL FLANGES. IT IS THE CLIENT'S RESPONSIBILITY TO CONNECT TO A CLOSED SYSTEM.
16. 1/4" NPT FILTER/REGULATOR FOR PNEUMATIC ACTUATORS. 1.4 CU. FT. FREE AIR FOR DISCHARGE VALVE @ 80 PSIG PER CYCLE REQ'D.
17. PULSE BACK FILTER CONSTRUCTED OF 304L STAINLESS STEEL AND STANDARD UNPOLISHED INTERIOR. (WELDS CLEANED UP ONLY). PULSE BACK FILTER IS STRUCTURALLY DESIGNED FOR 5 PSIG INTERNAL. 7.5 PSIG (320° F MAX / 32° F MIN) ASME CODE TYPE 304 STAINLESS STEEL Dimple JACKET 2001 CODE SECTION VIII DIVISION 1, 2003 ADDENDA, WITHOUT THERMAL SHOCK. JACKET IS INSULATED WITH 2" THICK FOAMGLASS & COVERED WITH ALUMINUM SHEATHING, RIVETED & CAULKED IN PLACE. SHEATHING IS 33.25 O.D. THE FILTER INTERNALS ARE 144 SQ. FT. OF "MICROFIL TREX" METAL FIBER FILTERS. (0.5 MICRON) AND CLEAN IN PLACE WASH SYSTEM. PULSING SYSTEM NOT SHOWN.
18. HYDRAULIC POWER UNIT WITH 800 GAL. ELEVATED RESERVOIR INCLUDING DRIP TRAY/UNIT BASE. OVERALL DIMENSIONS 160" X 108" W X 90" H. THREE (3) 200 HP MOTORS, 1800 RPM, TEFC, MILL AND CHEMICAL DUTY WITH SPACE HEATERS, 460V, 3 PH, 60 HZ. CONNECTED TO THREE (3) PRESSURE COMPENSATED PISTON PUMPS, 85 GPM EACH WITH ELECTRONIC DISPLACEMENT CONTROL AMPLIFIER. PRESSURE CONTROL MANIFOLD ASSEMBLY & PRESSURE FILTRATION (5 MICRON). RECIRCULATION PACKAGE INCLUDING: SHELL & TUBE HEAT EXCHANGER WITH WATER CONTROL VALVES. HYDRAULIC MOTOR CASE COOLING CIRCUIT, & RETURN LINE FILTRATION (LOW PRESSURE 5 MICRON). HYDRAULIC MOTOR ON DRYER GEARBOX HAS 800 CC DISPLACEMENT AT 1200 RPM MAX. MAX. DISTANCE FROM POWER UNIT TO HYDRAULIC MOTOR IS 50 FT. HPU COOLING REQUIREMENT IS 65 GPM WATER @ 45° F. THE COOLER IS SIZED TO MAINTAIN A 125° F OIL TEMPERATURE IN THE RESERVOIR. HEAT DISSIPATED IS APPROXIMATELY 200 HP UNDER FULL LOAD CONDITIONS.
19. LOAD CELLS ARE METTLER-TOLEDO. A) LOAD CELL SYSTEM - 0958-01420-2 B) SUMMING BOX - TD100395 C) HOME RUN CABLE - S4062 0370-1007. ACCURACY WILL BE THE LARGER OF THE FOLLOWING: 0.1% OF APPLIED LOAD OR 1 SCALE GRADUATION MAY BE EXPECTED. SCALE GRADUATIONS ARE A COMBINATION OF THE INSTALLATION, THE EQUIPMENT USED IN THE INSTALLATION SUPPLIED BY RMC AND THE SCALE INSTRUMENT WHICH IS SUPPLIED BY THE CLIENT.



<p>DATE</p> <p>BY</p> <p>APP'D</p> <p>REV</p>	<p>REVISIONS</p> <p>NO. DATE DESCRIPTION</p>	<p>RMC</p> <p>RMC CD-10,000</p> <p>DEMONSTRATION DRYER VERIFICATION (DBV) SYSTEM</p> <p>GENERAL ARRANGEMENT</p>	<p>RMC MURKIN Corporation</p> <p>10000 RMC CD-10,000</p> <p>054-001-2-010</p>
	<p>054-001-2-010</p>		



NOTES:
 1. VALVE OPERATOR IS TO BE SUPPLIED BY THE USER.
 2. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 3. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 4. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 5. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 6. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 7. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 8. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 9. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.
 10. VALVE OPERATOR IS TO BE MOUNTED TO THE VALVE BODY.

NO.	DESCRIPTION	QTY	UNIT
1	VALVE OPERATOR	1	EA
2	VALVE OPERATOR	1	EA
3	VALVE OPERATOR	1	EA
4	VALVE OPERATOR	1	EA
5	VALVE OPERATOR	1	EA
6	VALVE OPERATOR	1	EA
7	VALVE OPERATOR	1	EA
8	VALVE OPERATOR	1	EA
9	VALVE OPERATOR	1	EA
10	VALVE OPERATOR	1	EA

CHECK PRINT

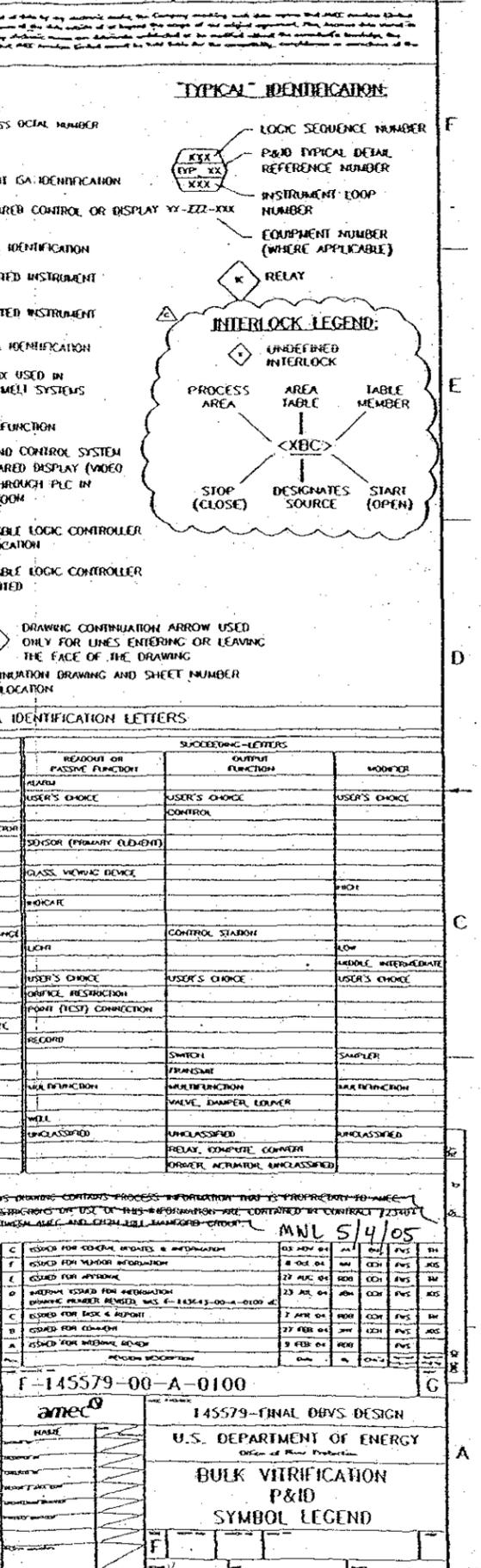
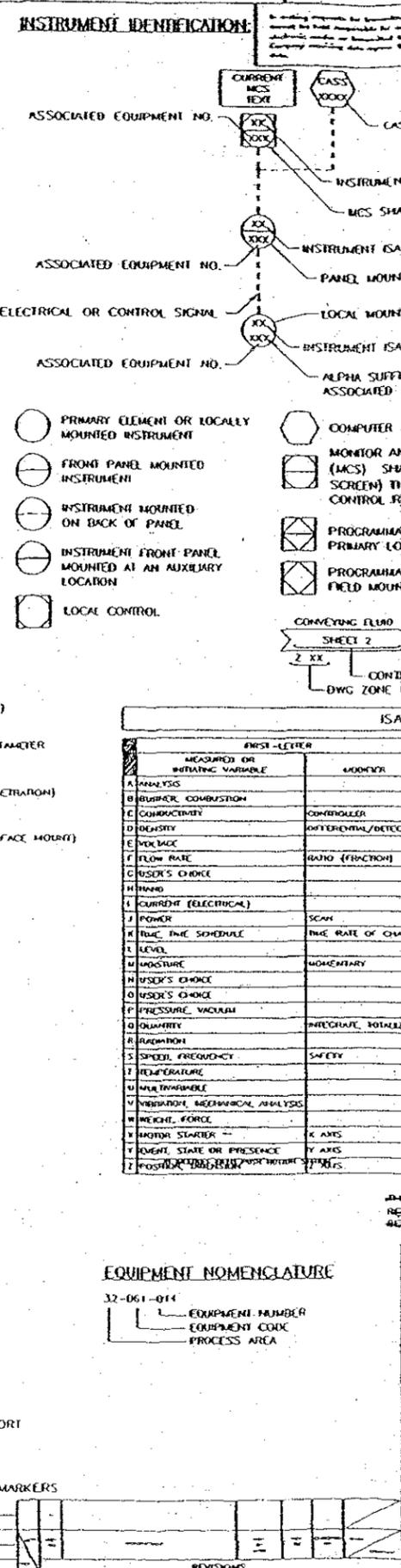
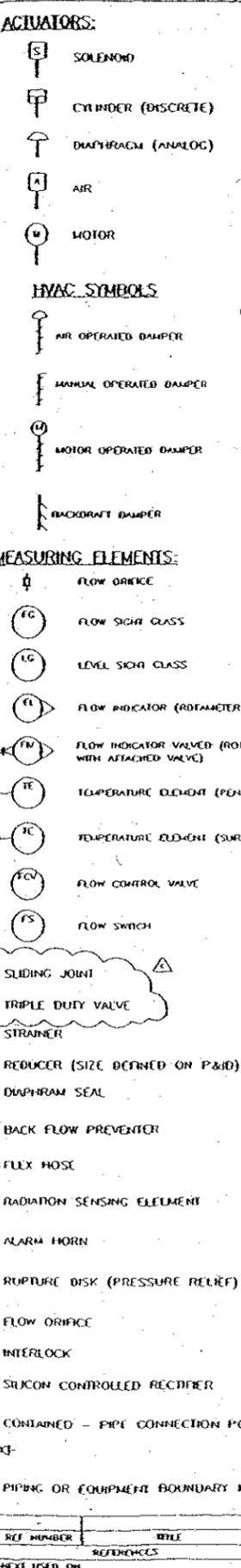
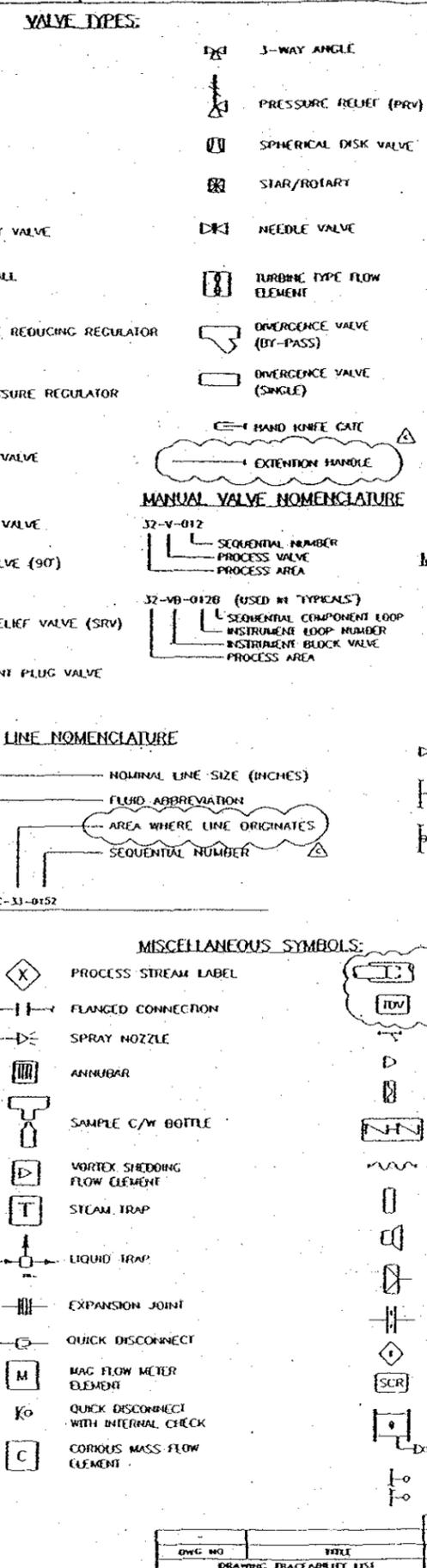
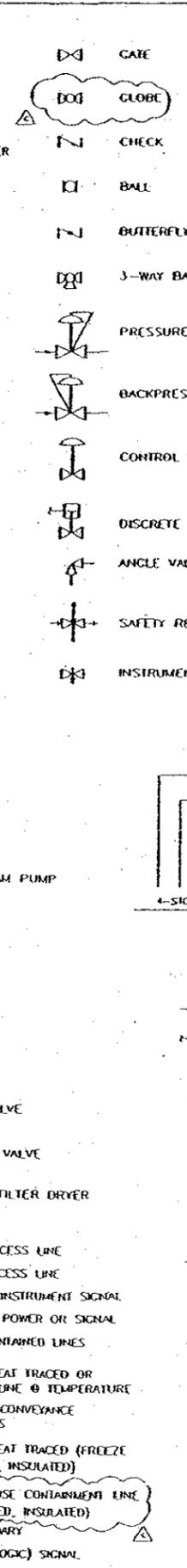
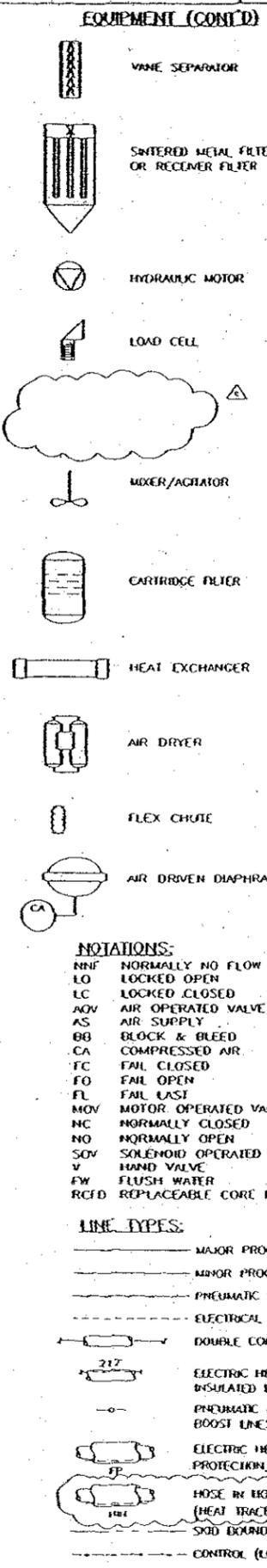
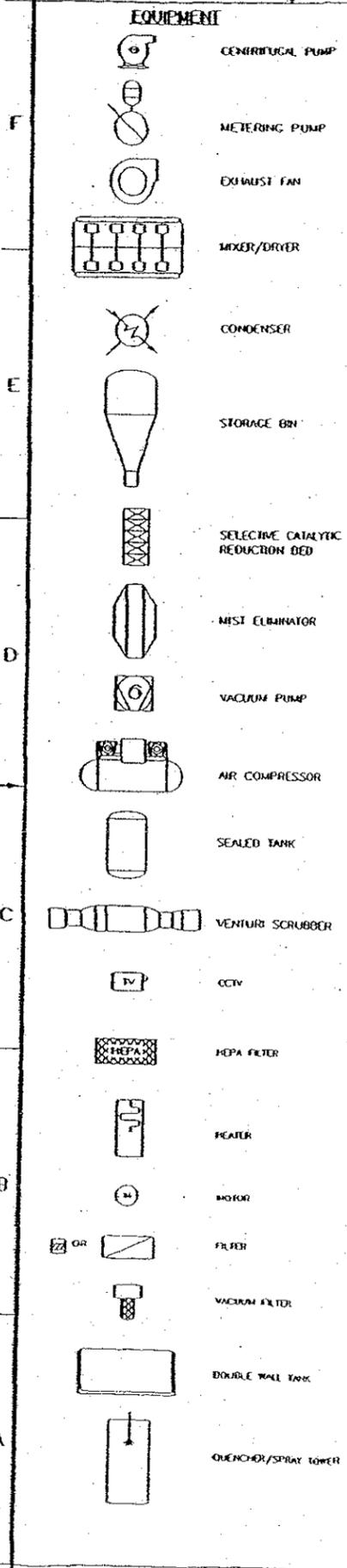
TOLERANCES

UNLESS OTHERWISE SPECIFIED

DECIMAL FRACTIONS: .0005, .001, .002, .005, .010, .015, .030, .050, .075, .100, .150, .200, .300, .500, .750, 1.000, 1.500, 2.000, 3.000, 5.000, 7.500, 10.000, 15.000, 20.000, 30.000, 50.000, 75.000, 100.000, 150.000, 200.000, 300.000, 500.000, 750.000, 1000.000

ANGLES: .0005, .001, .002, .005, .010, .015, .030, .050, .075, .100, .150, .200, .300, .500, .750, 1.000, 1.500, 2.000, 3.000, 5.000, 7.500, 10.000, 15.000, 20.000, 30.000, 50.000, 75.000, 100.000, 150.000, 200.000, 300.000, 500.000, 750.000, 1000.000

WINEEK CORPORATION
 3531 W. 20th St. #100
 Tulsa, Oklahoma 74117

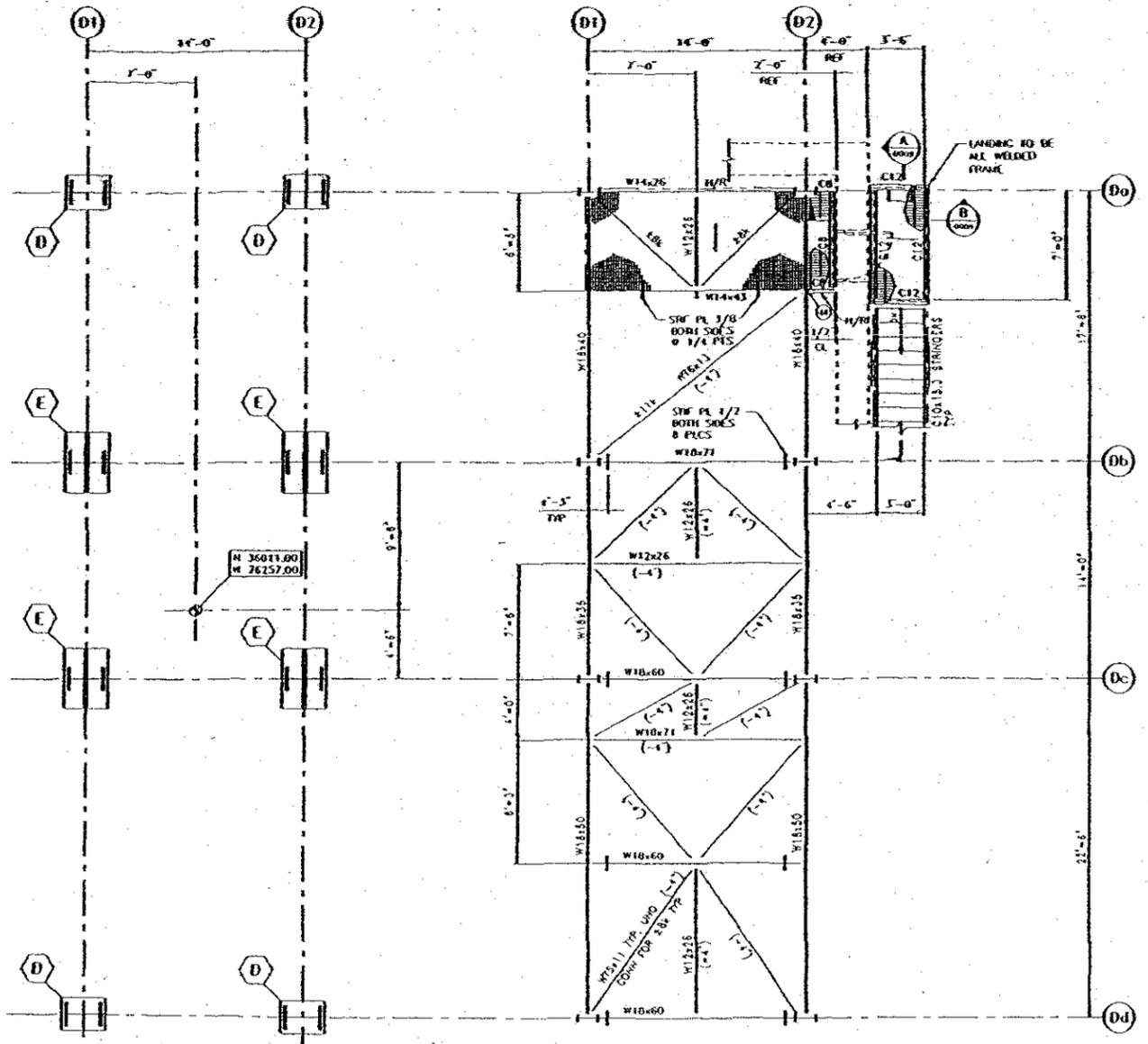


DWG NO	TITLE	REF NUMBER	TITLE	REVISIONS
	DRAWING TRACEABILITY LIST		REFERENCES	

ISSUED FOR GENERAL REVIEW & INFORMATION 03 NOV 04
 ISSUED FOR REVISION INFORMATION 08 OCT 04
 ISSUED FOR APPROVAL 27 DEC 04
 REVISION ISSUED FOR INFORMATION 23 JAN 05
 ISSUED FOR BASK & REPORT 27 APR 04
 ISSUED FOR DESIGN 27 FEB 04
 ISSUED FOR INTERNAL REVIEW 9 FEB 04

F-145579-00-A-0100
145579-FINAL OBVS DESIGN
U.S. DEPARTMENT OF ENERGY
BULK VITRIFICATION P&ID
SYMBOL LEGEND

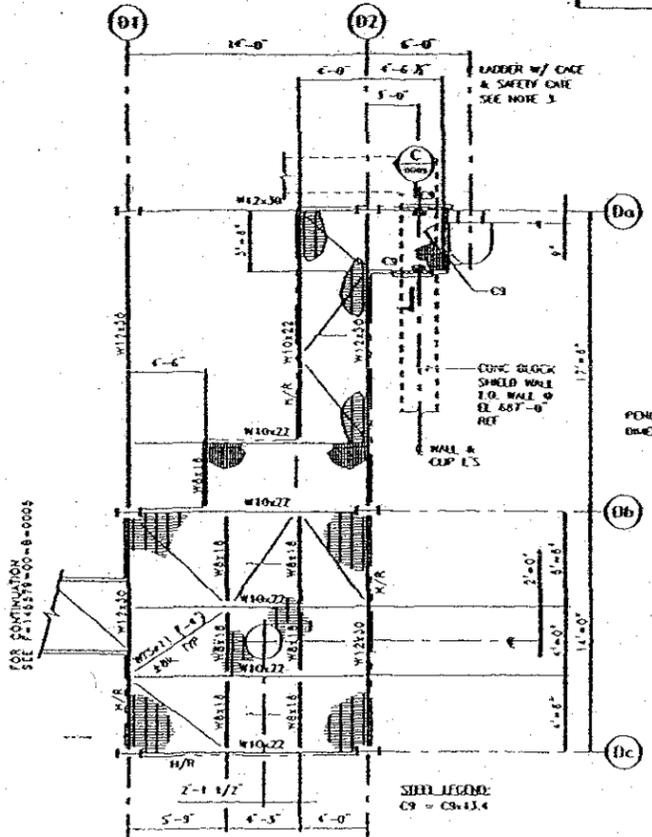
Structural steel is fabricated by electric arc welding unless otherwise indicated or the method used is the conventional knowledge of the Company existing data upon that steel. American Steel should be held liable for the compatibility, compatibility or non-compatibility of the steel.



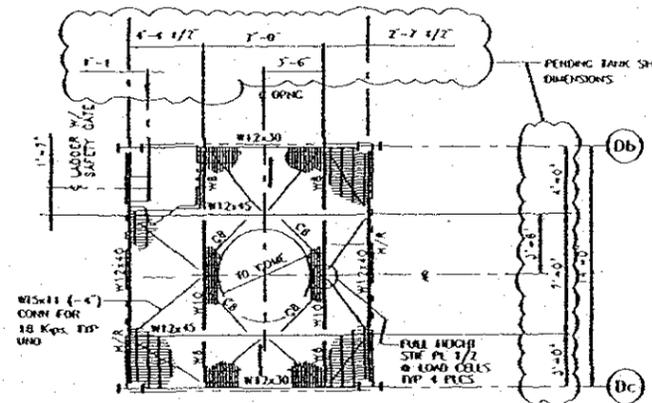
FOR BASE PL. DETAILS SEE DWG F-145579-00-B-0003
BASE PLATE PLAN
 W/S OF BASE PL. EL. 665'-0"

STEEL LEGEND:
 CB = CB-11.5
 C17 = C17x20.7
PLAN - TOS EL 675'-0"
 UNLESS NOTED THIS: (1") TOG EL. 675'-1 1/4"

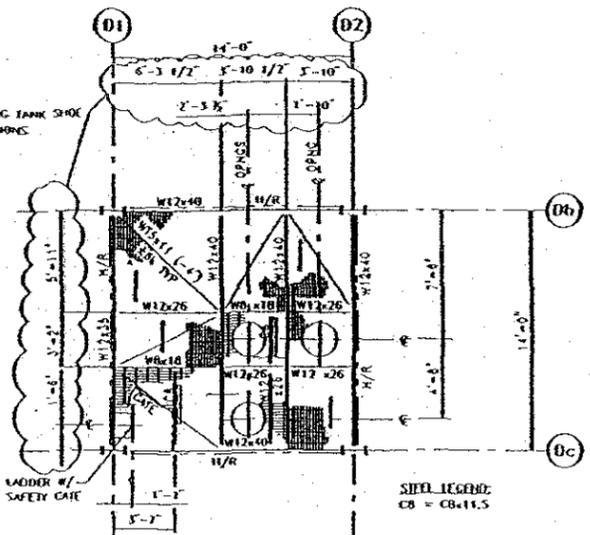
ISO BOX SUPPORT BEAMS & DIAGONAL BRACE PATTERNS TO BE FINISHED WITH EQUIPMENT FRAMING DETAIL



PLAN - TOS EL 687'-9"
 UNLESS NOTED THIS: (1") TOG EL. 687'-10 1/4"



PLAN - TOS EL 709'-6"
 UNLESS NOTED THIS: (1") TOG EL. 709'-7 1/4"



PLAN - TOS EL 700'-6"
 UNLESS NOTED THIS: (1") TOG EL. 700'-7 1/4"

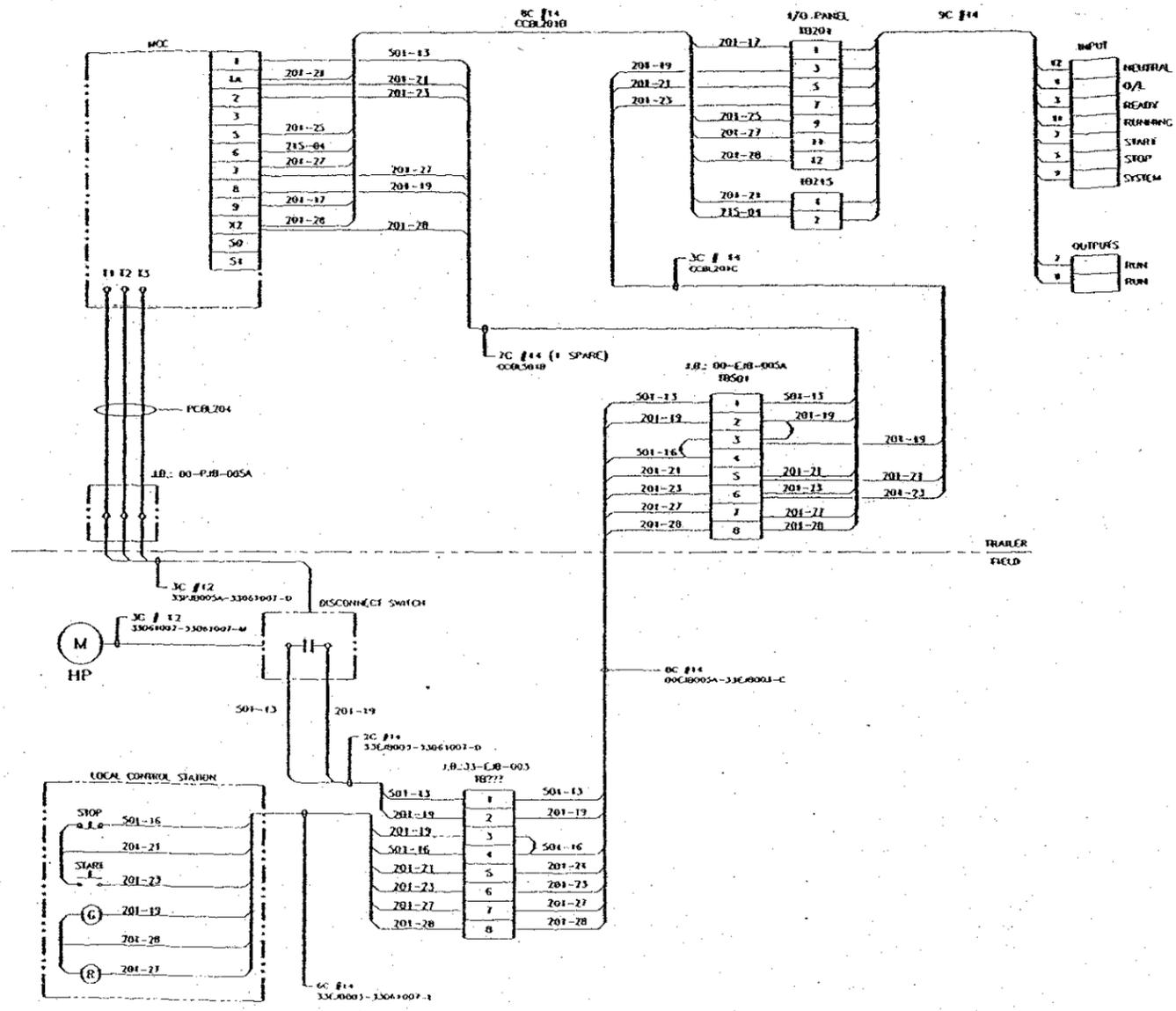
- NOTES:**
1. FOR GENERAL STRUCTURAL STEEL NOTES SEE DWG F-145579-00-B-0001
 2. FOR TYPICAL GRADING DETAILS SEE DWGS F-145579-00-B-0003.
 3. FOR STAIRS, LADDERS AND HANDRAILS (H/R) TYPICAL DETAILS SEE F-145579-00-B-0004.

TO COME
 GRATING OPENINGS

DWG NO	TITLE	REF NUMBER	TITLE	REFERENCES
	DRAWING TRACEABILITY LIST			
		NOT USED OR		
				REVISIONS

ISSUED FOR MEDICAL APPROVAL	19 NOV 04	EC	FM	ARC
ISSUED FOR MEDICAL REVIEW	22 OCT 04	EC	FM	ARC
REVISION DESCRIPTION				
F-145579-00-B-0008				
amec				
145579-FINAL DBVS DESIGN				
U.S. DEPARTMENT OF ENERGY				
Office of River Protection				
BULK VITRIFICATION DRYER STRUCTURAL STEEL PLANS & DETAILS				

CHN-33-061-007
 RPP: 40
 F.I.A.: 77777
 RPM: 777



LEGEND

- MOTOR
- HP
- STARTER
- STARTER CONTACT
- GREEN INDICATING LIGHT
- RED INDICATING LIGHT
- START MOMENTARY PUSH BUTTON SWITCH
- STOP MOMENTARY PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- SURGE SUPPRESSOR
- 480V EXTERNAL TRANSITION J.B. TERMINAL
- 120V EXTERNAL TRANSITION J.B. TERMINAL
- TERMINAL BLOCK OR STARTER
- TERMINAL TO PLC I/O CABINET (TRAILER)
- PLC OUTPUT CONNECTION
- PLC INPUT CONNECTION
- ANALOG I/O PANEL TERMINAL
- MOTOR OVERLOAD RELAY
- MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- OFF SYSTEM
- THREE POSITION SELECTOR SWITCH

F-145579-00-E-0103

amec

145579-FINAL DRVS DESIGN

U.S. DEPARTMENT OF ENERGY
 Office of River Protection

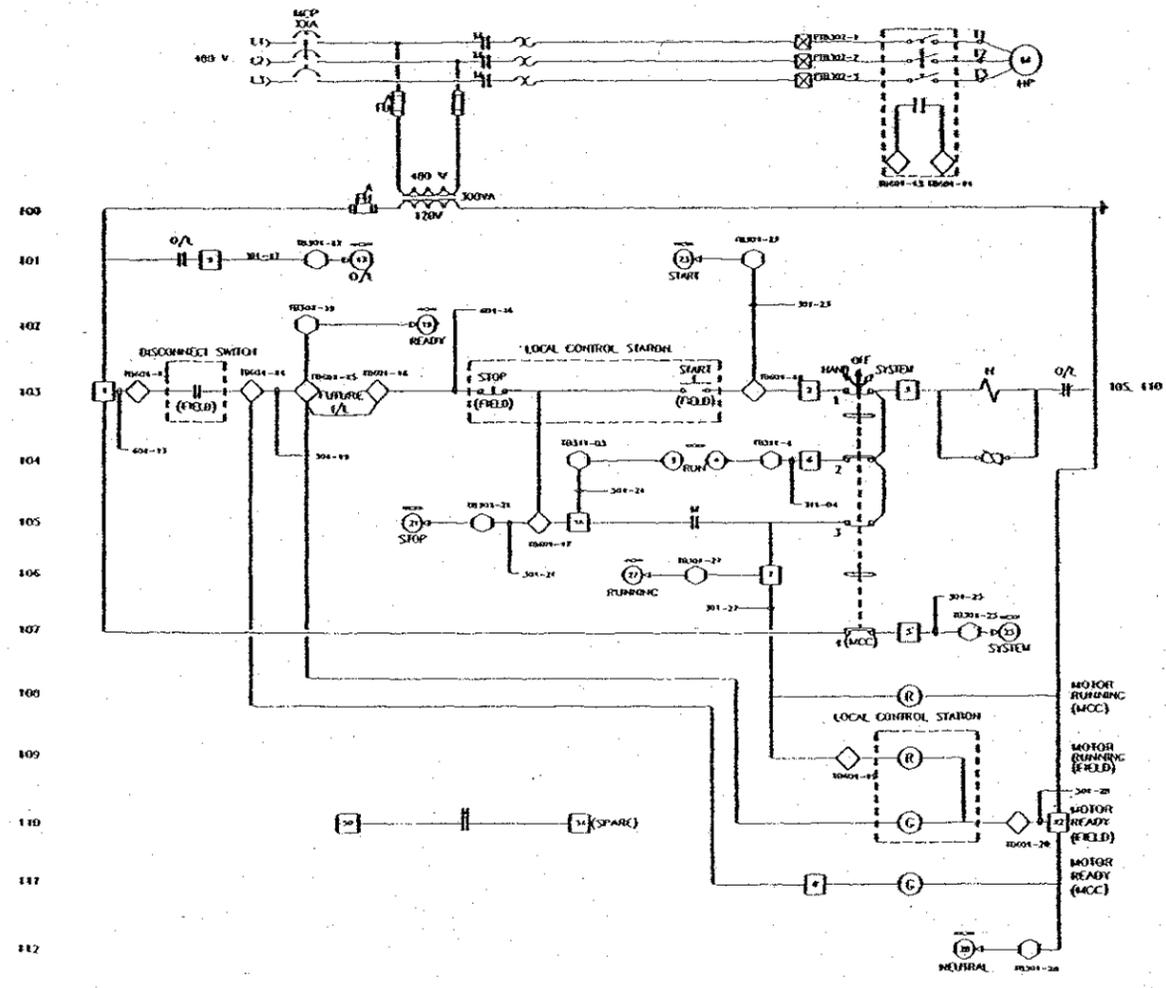
**BULK VITRIFICATION
 DRYER OFF-GAS VAC PUMP
 WIRING DIAGRAM**

NO.	DATE	BY	CHKD.	APP'D.

DWG NO.	TITLE	REF NUMBER	TITLE	REVISED

It is the responsibility of the user of this document to ensure that the information is current and accurate. The user is advised to consult the manufacturer's literature for the most current information. The user is also advised to consult the manufacturer's literature for the most current information. The user is also advised to consult the manufacturer's literature for the most current information.

EIN-33-E91-006A
 REF: 25
 FLA: ??
 RMC: ?????



SWITCH DEVELOPMENT

CONTACT	HAND	OFF	SYSTEM
1	X	0	0
2	0	0	X
3	X	0	0
4	0	0	X

X = CLOSED
 0 = OPEN

LEGEND

- (M) MOTOR
 - HP STARTER
 - STARTER CONTACT
 - (G) GREEN INDICATING LIGHT
 - (R) RED INDICATING LIGHT
 - START MOMENTARY PUSH BUTTON SWITCH
 - STOP MOMENTARY PUSH BUTTON SWITCH
 - THREE POLE CIRCUIT BREAKER
 - SURGE SUPPRESSOR
 - 480V EXTERNAL TRANSITION J.B. TERMINAL
 - 120V EXTERNAL TRANSITION J.B. TERMINAL
 - TERMINAL BLOCK ON STARTER
 - TERMINAL TO PLC I/O CABINET (DRIVER)
 - PLC BUFFER CONNECTION
 - PLC INPUT CONNECTION
 - AMEC I/O PANEL TERMINAL
 - MOTOR OVERLOAD RELAY
 - MOTOR OVERLOAD CONTACTS
 - CURRENT TRANSFORMER
 - DISCONNECT SWITCH
 - OFF SYSTEM
 - THREE POSITION SELECTOR SWITCH
- TB 201 = 20A
 TB 215 = 100
 TB 501 = 100

DWG NO	TITLE	REV NUMBER	TITLE
DRWING TRACE/ARTIST USE		NEXT USED ON	REFERENCES
			REVISIONS

F-145579-00-E-0127

amec

145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY
 Office of Energy Production

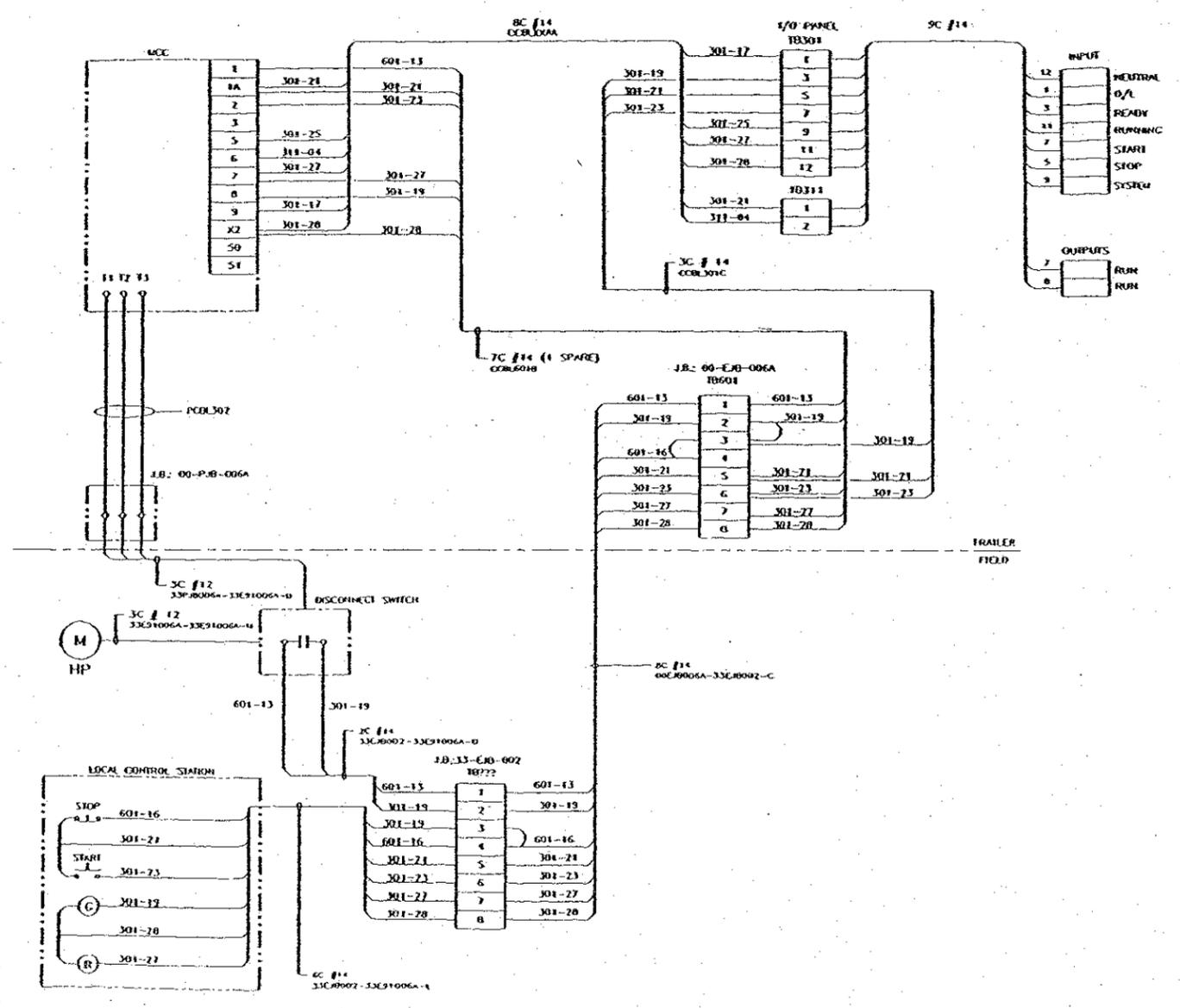
BULK VITRIFICATION
 WASTE DRYER CHOPPER
 SCHEMATIC DIAGRAM

NO	DATE	BY	CHKD	APP'D
1				

Approved by field engineer for use of the new wiring to be installed in the control room. The electrical work is to be installed by electricians under the supervision of the electrical foreman. The Company will be responsible for the safety of the work. The contractor shall be responsible for the safety of the work.

EIN-33-E91-006A
 H.P.: 25
 T.L.A.: 77777
 R.P.M.: 777

RPP-24544 REV 1a



- LEGEND**
- (M) MOTOR
 - HP MOTOR
 - FR STARTER
 - STARTER CONTACT
 - (G) GREEN INDICATING LIGHT
 - (R) RED INDICATING LIGHT
 - STARTER MOMENTARY PUSH BUTTON SWITCH
 - STOP MOMENTARY PUSH BUTTON SWITCH
 - THREE POLE CIRCUIT BREAKER
 - SURGE SUPPRESSOR
 - 100V EXTERNAL TRANSITION J.B. TERMINAL
 - 120V EXTERNAL TRANSITION J.B. TERMINAL
 - TERMINAL BLOCK OF STARTER
 - TERMINAL TO PLC I/O CABINET (TRAILER)
 - PLC OUTPUT CONNECTION
 - PLC INPUT CONNECTION
 - ANALOG I/O PANEL TERMINAL
 - MOTOR OVERLOAD RELAY
 - MOTOR OVERLOAD CONTACTS
 - CURRENT TRANSFORMER
 - DISCONNECT SWITCH
 - OFF SYSTEM
 - THREE POSITION SELECTOR SWITCH

A		B		C		D		E		F	
F-145579-00-E-0127											
amec											
145579-FINAL DBVS DESIGN											
U.S. DEPARTMENT OF ENERGY											
Office of Waste Production											
BULK VITRIFICATION											
WASTE DRYER CHOPPER											
WIRING DIAGRAM											
DATE	BY	CHKD	APP'D	REV	DATE	BY	CHKD	APP'D	REV	DATE	BY

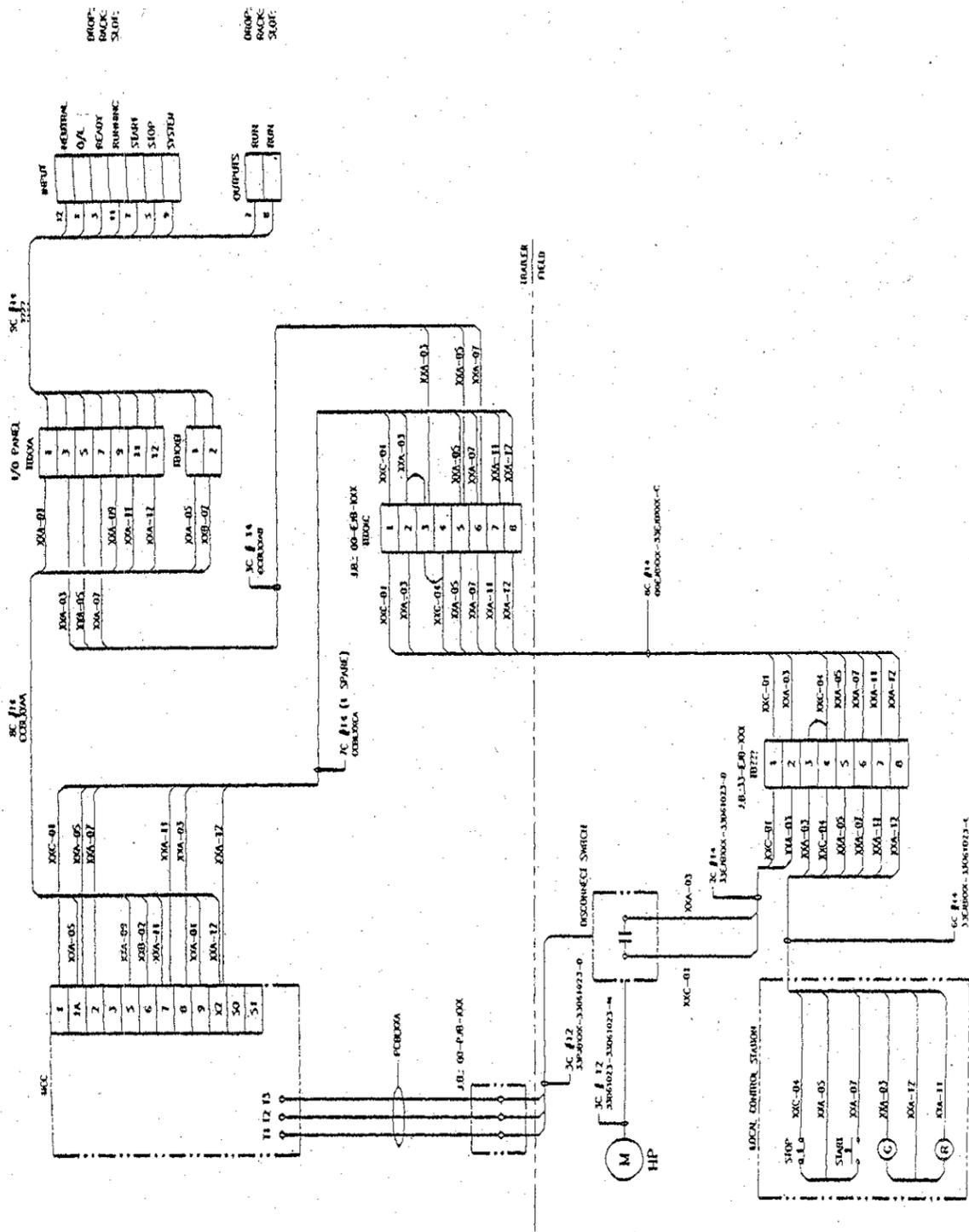
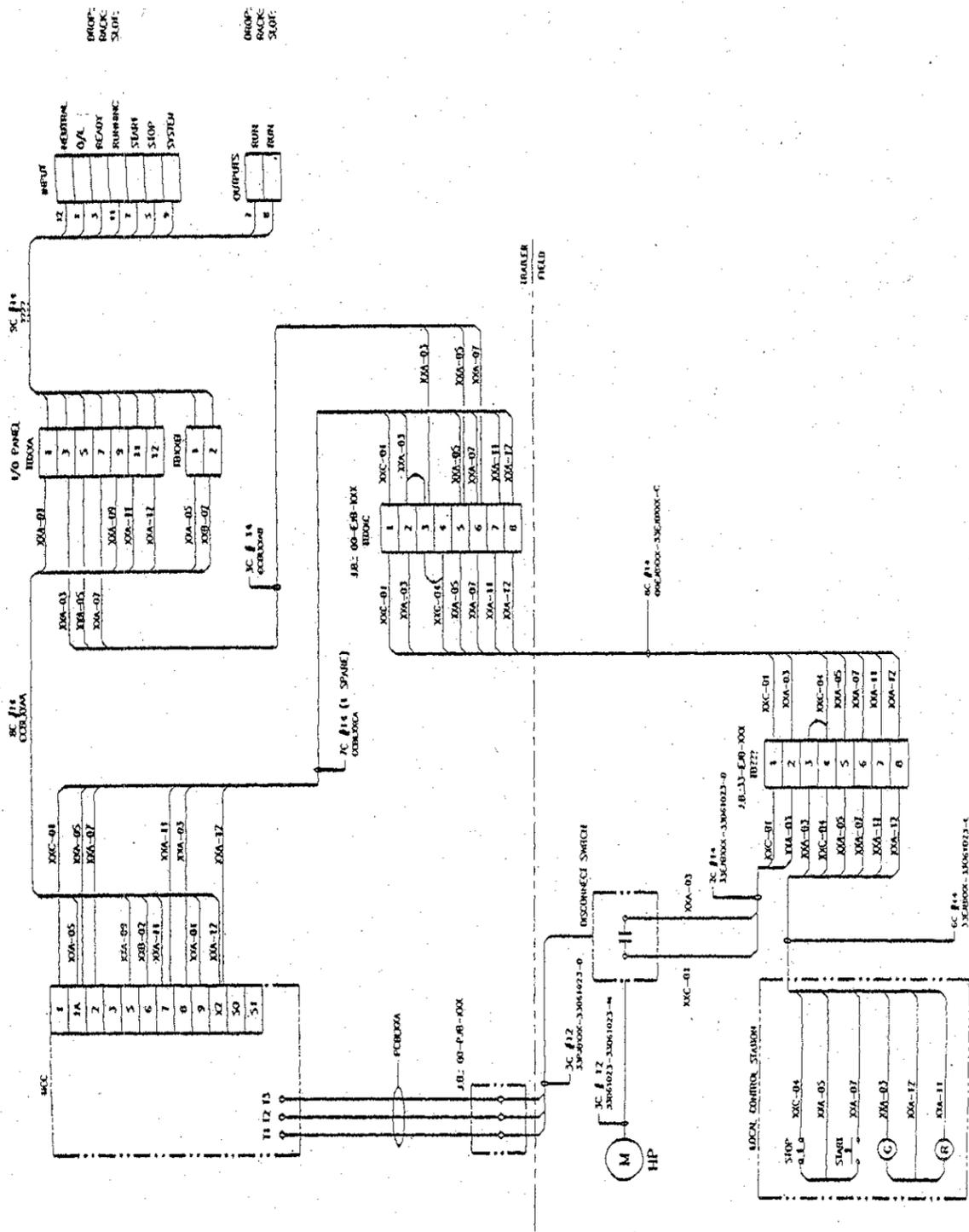
DWG. NO.	TITLE	REV. NUMBER	TITLE	REFERENCES	REVISIONS
	DRAWING TRACEABILITY USE		NOTE USED ON		

EIN: 33-061-023

HP-3
EJA-22277
RPN 277

LEGEND

- (M) MOTOR
- HP HP
- STARTER
- STARTER CONTACT
- (G) GREEN INDICATING LIGHT
- (R) RED INDICATING LIGHT
- START
- STOP
- MOMENTARY PUSH BUTTON SWITCH
- STOP
- MOMENTARY PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- START SUPPRESSOR
- 480V EXTERNAL TRANSITION I.R. RETURN
- 120V EXTERNAL TRANSITION I.R. RETURN
- TERMINAL BLOCK ON STARTER
- TERMINAL TO PLC I/O CABINET (TRUCK)
- PLC OUTPUT CONNECTION
- PLC INPUT CONNECTION
- ANALOG I/O PANEL RETURN
- MOTOR OVERLOAD RELAY
- MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- OFF SYSTEM
- 3-POLE POSITION SELECTOR SWITCH



F-145579-00-E-016B
 145579-FINAL BIDS DESIGN
 U.S. DEPARTMENT OF ENERGY
 BULK VIBRICATION
 WASTE DRYER CONDENSATE
 WIRING DIAGRAM

REV. NO.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	11/15/88
2	REVISED TO REFLECT FIELD CHANGES	12/15/88
3	REVISED TO REFLECT FIELD CHANGES	1/15/89
4	REVISED TO REFLECT FIELD CHANGES	2/15/89
5	REVISED TO REFLECT FIELD CHANGES	3/15/89
6	REVISED TO REFLECT FIELD CHANGES	4/15/89
7	REVISED TO REFLECT FIELD CHANGES	5/15/89

REV. NO.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	11/15/88
2	REVISED TO REFLECT FIELD CHANGES	12/15/88
3	REVISED TO REFLECT FIELD CHANGES	1/15/89
4	REVISED TO REFLECT FIELD CHANGES	2/15/89
5	REVISED TO REFLECT FIELD CHANGES	3/15/89
6	REVISED TO REFLECT FIELD CHANGES	4/15/89
7	REVISED TO REFLECT FIELD CHANGES	5/15/89

EN-33-D61-016

REV 5
 DATE 77
 RPP 77

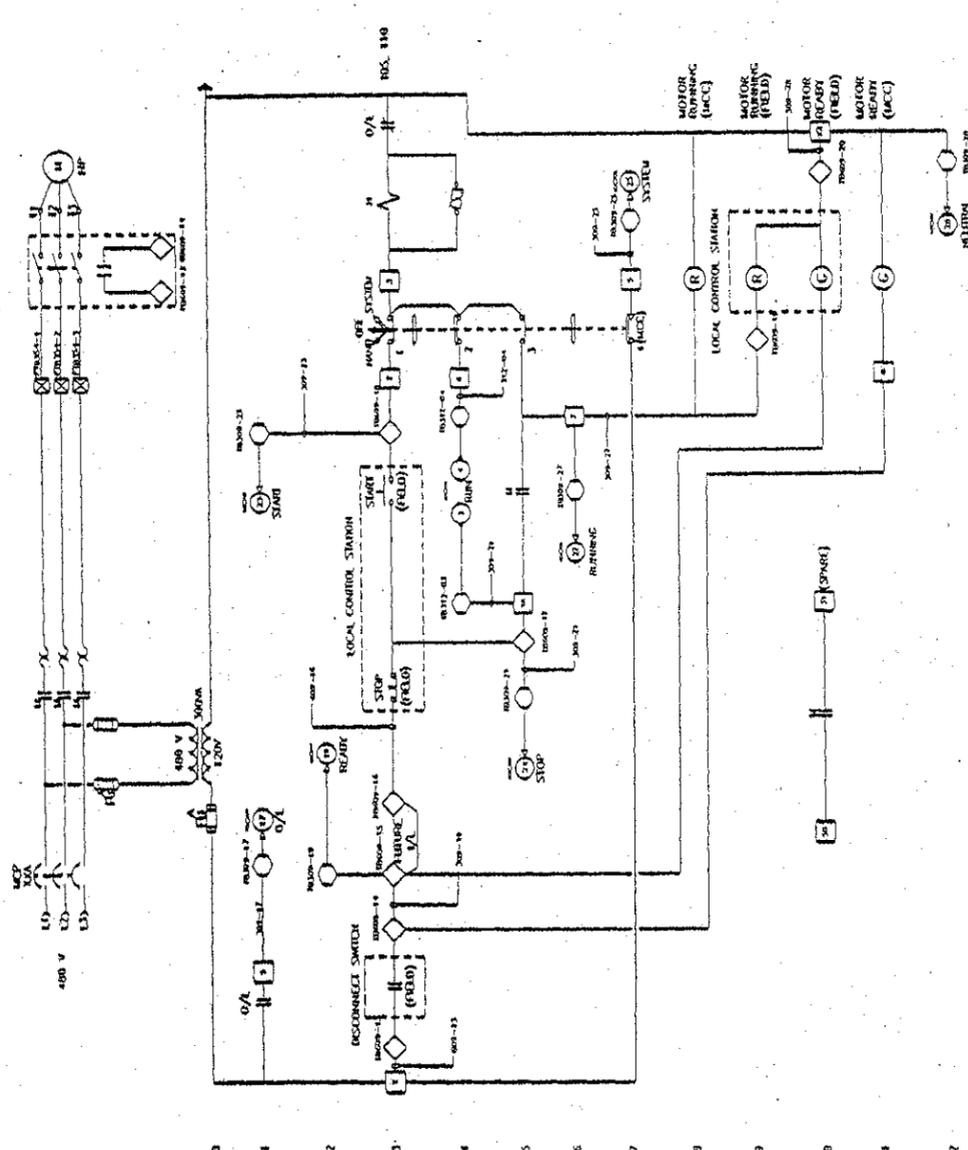
LEGEND

- MOTOR
- START
- STOP
- INTERLOCKING PUSH BUTTON SWITCH
- MAGNETIC PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- SURGE SUPPRESSOR
- 400V EXTERNAL BYPASS
- 170V EXTERNAL BYPASS
- TERMINAL BLOCK
- PLC OUTPUT CONNECTION
- PLC INPUT CONNECTION
- ANALOG I/O PANEL TERMINAL
- MOTOR OVERLOAD RELAY
- MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- OFF SYSTEM
- THREE POSITION SELECTOR SWITCH

SWITCH DEVELOPMENT

CONTACT	HAND	OFF	SYSTEM
1	X	0	0
2	0	0	X
3	X	0	0
4	0	0	X

X = CLOSED
 0 = OPEN



145579-00-E-0169
 145579-FRAME DBVS DESIGN
 U.S. DEPARTMENT OF ENERGY
 BULK VITRIFICATION
 DRYER OFFGAS CONDENSATE
 SCHEMATIC DIAGRAM

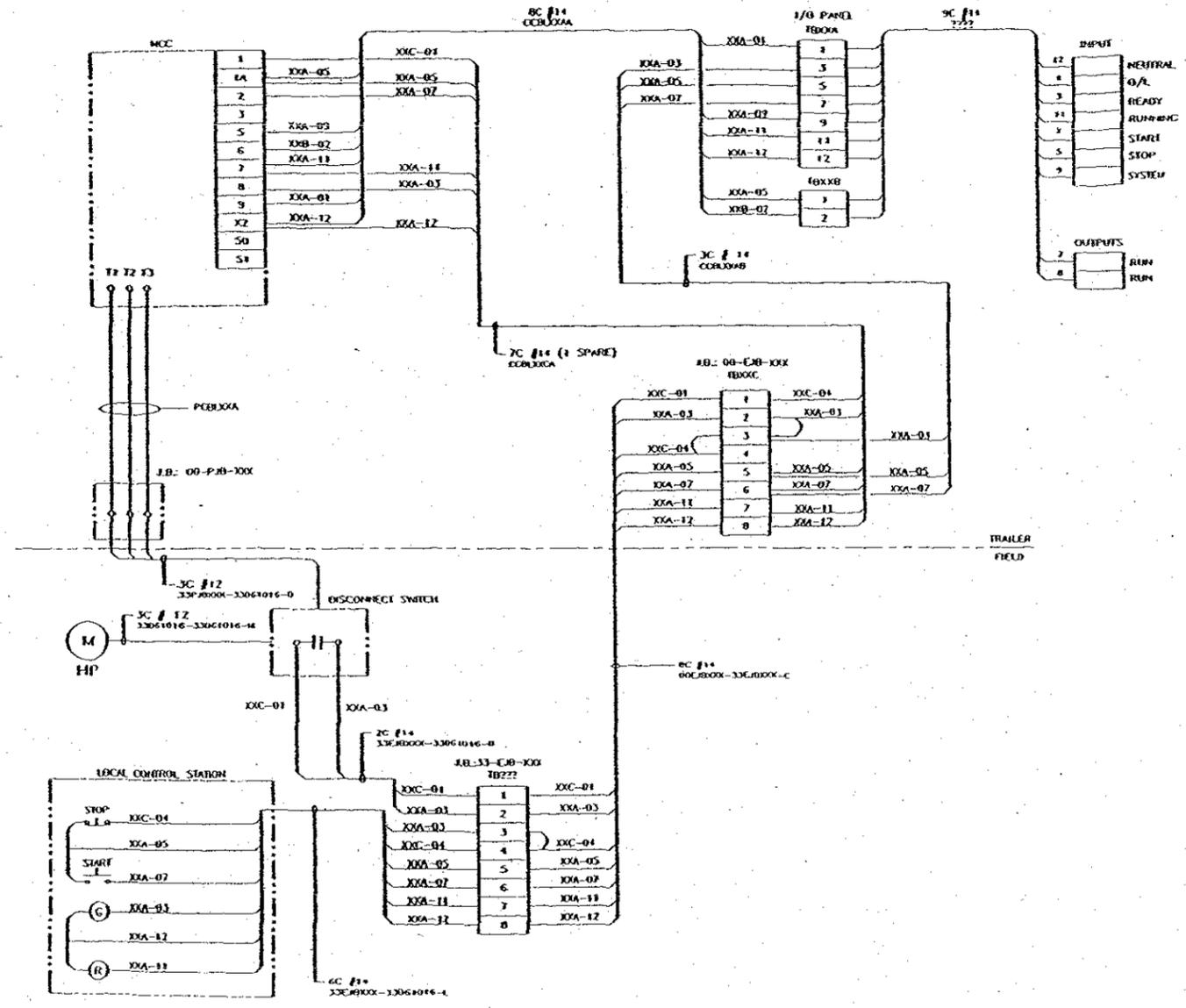
REV	DESCRIPTION	DATE
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2	REVISED	11/17/77
3	REVISED	11/17/77
4	REVISED	11/17/77
5	REVISED	11/17/77

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EIN-33-DG1-016

REP: 5
 F.A.A.: 2222
 RPL: ???

RPP-24544 REV 1A



DROP:
RACK:
SLOT:

DROP:
RACK:
SLOT:

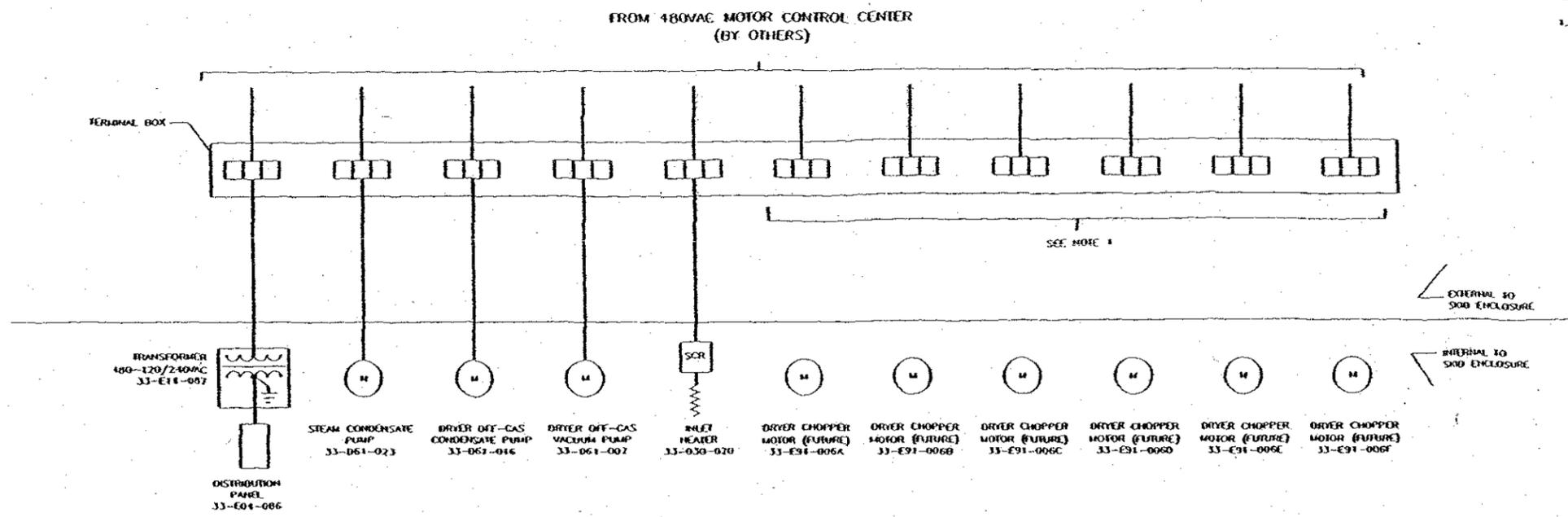
LEGEND

- MOTOR
- HP
- STARTER
- STARTER CONTACT
- GREEN INDICATING LIGHT
- RED INDICATING LIGHT
- START MOMENTARY PUSH BUTTON SWITCH
- STOP MOMENTARY PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- SURGE SUPPRESSOR
- 180V EXTERNAL TRANSITION I.B. TERMINAL
- 120V EXTERNAL TRANSITION I.B. TERMINAL
- TERMINAL BLOCK ON STARTER
- TERMINAL TO PLC I/O CABINET (TRAILER)
- PLC OUTPUT CONNECTION
- PLC INPUT CONNECTION
- ANALOG I/O PANEL TERMINAL
- MOTOR OVERLOAD RELAY
- MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- OFF SYSTEM
- THREE POSITION SELECTOR SWITCH

F-145579-00-E-0169		145579-FINAL DBVS DESIGN	
amec		U.S. DEPARTMENT OF ENERGY	
		Office of Waste Production	
		BULK VITRIFICATION	
		DRYER OFF-GAS CONDENSATE	
		WIRING DIAGRAM	

DWG NO	TITLE	REF NUMBER	FILE	REVISIONS
	DRAWING TRACKABILITY TEST	NEXT USED ON	REFERENCES	

NOTES:
 1. INDIVIDUAL CONDUITS SHALL BE INSTALLED FROM THE POWER TERMINAL BOX THROUGH THE DCRS CONTAINER WALL FOR EACH CHOPPER MOTOR AND CAPPED FOR FUTURE USE.



DCRS ONE-LINE DIAGRAM

DMJMTechnology

amec

145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY

Office of Waste Production

DCRS ONE-LINE AND GROUNDING DIAGRAM

DBVS-SK-E003 A

NAME	
DATE	
BY	
CHECKED	
APPROVED	

200W	7201	DBVS-SK-E003 A
MORE		

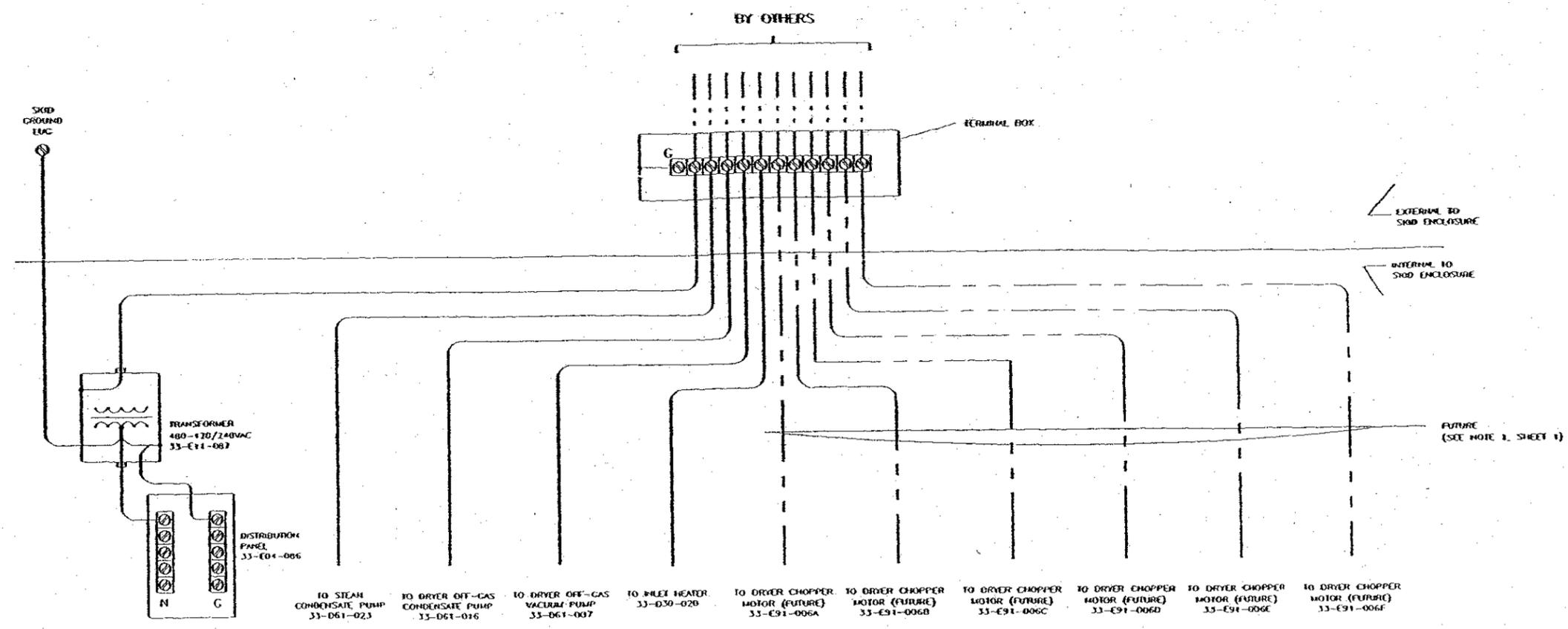
OWC NO	FILE	REV NUMBER	DATE	REVISIONS

BRWING TRACKABILITY USE

NOTE USER ON END ITEM

NOT TO SCALE. DBVS-SK-E003-A_001704E

145579-DBVS-SK-E003-A



DCRS GROUNDING DIAGRAM

DWG NO	TITLE	REF NUMBER	TITLE	REVISIONS
	DRAWING TRACEABILITY LIST		NEXT USED ON DWG REF	

DMJMTechnology

145579-FINAL DBVS DESIGN

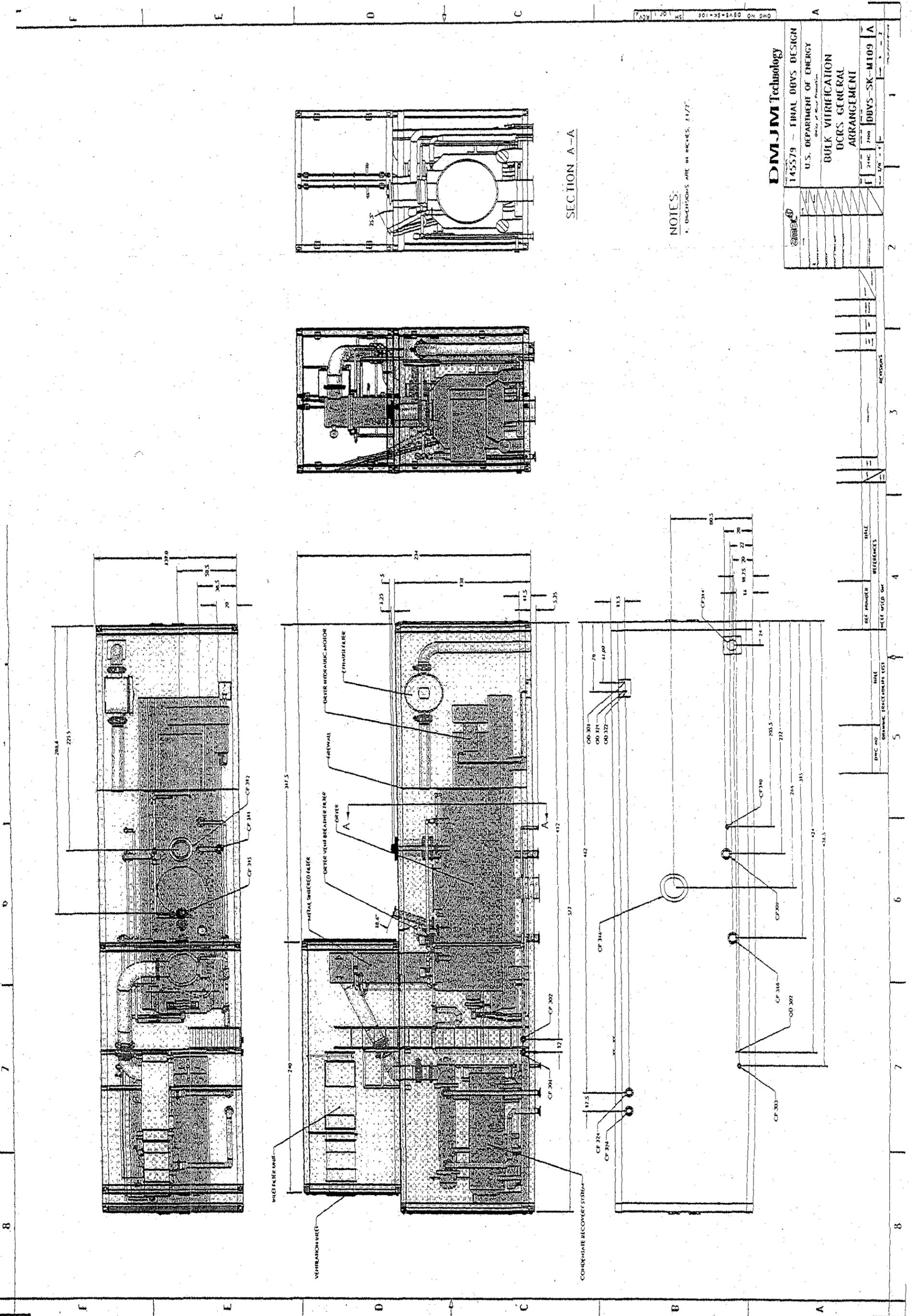
U.S. DEPARTMENT OF ENERGY
Office of River Protection

DCRS
ONE-LINE AND GROUNDING
DIAGRAM

DATE: 2006 7201
DBVS-SK-E003 A

NAME	
DESIGNED BY	
CHECKED BY	
DATE	
SCALE	

T 1 8 1001-19-000 3/06



SECTION A-A

NOTES:
1. DIMENSIONS ARE IN INCHES. 1/16"

DMJM Technology
 145579 - FINAL DBVS DESIGN
 U.S. DEPARTMENT OF ENERGY
 BULK VITRIFICATION
 OCCRS GENERAL
 ARRANGEMENT
 2000 DBVS-SK-M109 A

NO.	DESCRIPTION	DATE	BY	CHKD.
1	ISSUED FOR CONSTRUCTION	11/17/88	DMJM	DMJM
2	REVISED	11/17/88	DMJM	DMJM
3	REVISED	11/17/88	DMJM	DMJM
4	REVISED	11/17/88	DMJM	DMJM
5	REVISED	11/17/88	DMJM	DMJM
6	REVISED	11/17/88	DMJM	DMJM
7	REVISED	11/17/88	DMJM	DMJM
8	REVISED	11/17/88	DMJM	DMJM

8 7 6 5 4 3 2 1

F E D C B A

VENTILATION SHEET

CONDENSATE RECOVERY SYSTEM

REL. PROVIDER

FILE

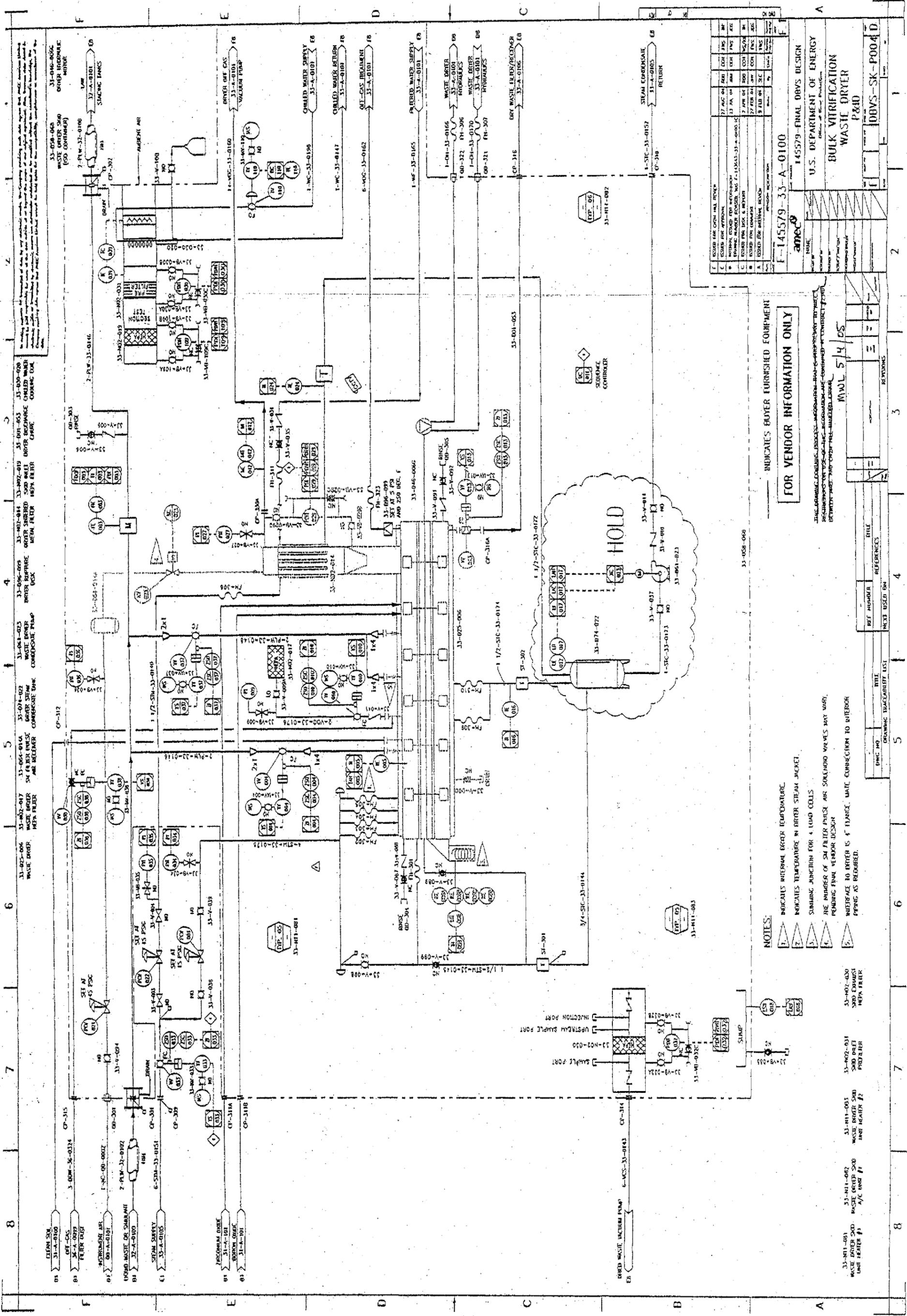
REFERENCES

REVISIONS

DATE

BY

CHKD.



NO.	DESCRIPTION	DATE	BY	CHKD.
1	ISSUED FOR DESIGN REVIEW	11/15/83	JAC	JAC
2	ISSUED FOR APPROVAL	11/15/83	JAC	JAC
3	ISSUED FOR CONSTRUCTION	11/15/83	JAC	JAC
4	ISSUED FOR OPERATION	11/15/83	JAC	JAC
5	ISSUED FOR MAINTENANCE	11/15/83	JAC	JAC
6	ISSUED FOR REVISION	11/15/83	JAC	JAC
7	ISSUED FOR REVISION	11/15/83	JAC	JAC
8	ISSUED FOR REVISION	11/15/83	JAC	JAC

F-145579-33-A-0100
 145579-FINAL DBVS DESIGN
 U.S. DEPARTMENT OF ENERGY
 BULK NITRATION
 WASH DRYER
 P&ID
 DBVS-SK-P004D

INDICATES BUYER FURNISHED EQUIPMENT
 FOR VENDOR INFORMATION ONLY

REF. NO.	REF. NUMBER	REFERENCES	DATE
1	33-001-001	WASTE DRYER	11/15/83
2	33-001-002	WASH DRYER	11/15/83
3	33-001-003	WASTE DRYER	11/15/83
4	33-001-004	WASH DRYER	11/15/83
5	33-001-005	WASTE DRYER	11/15/83
6	33-001-006	WASH DRYER	11/15/83
7	33-001-007	WASTE DRYER	11/15/83
8	33-001-008	WASH DRYER	11/15/83

NOTES:
 1. INDICATES INTERMEDIATE DRYER TEMPERATURE.
 2. INDICATES TEMPERATURE IN DRYER STEAM JACKET.
 3. SUBMERSIBLE JUNCTION FOR 4. LIQUID COLLS.
 4. THE NUMBER OF SM FILTER PULSES ARE SHOWN IN P&ID.
 5. INTERFACE TO ENTER IS 4" FLANGE, W/ATE CONNECTION TO INTERIOR PIPING AS REQUIRED.

33-001-003
 WASTE DRYER SHD
 SHD DRYER
 HEPA FILTER

33-001-004
 WASTE DRYER SHD
 SHD DRYER
 HEPA FILTER

33-001-005
 WASTE DRYER SHD
 SHD DRYER
 HEPA FILTER


TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix B
Dryer and Condensate Recovery System Hydraulic Model Information
(1 page)
Table B-1: Dryer and Condensate Recovery System Hydraulic Model Information

Input Description	Lengths	Elevation at Connection Points	Piping Segment Description
DCRS connection point elevation	N/A	12 ft	1-in. Dixon® Camlok, CP-310
DCRS CP-310 to boiler skid	40 ft	12 ft/est. 7 ft	1-in. EPDM hose
Boiler skid connection point	N/A	est. 7 ft	1-in. Dixon® Camlok
boiler skid connection point to Tank 33-D74-049	10 ft	est. 7 ft/est. 6 ft	1-in. Schedule 40 seamless pipe

CP = connection point

DCRS = Dryer and Condensate Recovery System.

EPDM = ethylene propylene diene monomer.

N/A = not applicable.

*Registered trademark of Dixon Valve and Coupling Company.

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TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix C

Data Sheets

Title	Number of Pages
Cover	2
Air Conditioner	1
Breather Filter	1
Condenser	1
Exhaust Filter Housing	1
Heater (19,404 Btuh)	1
Heater (29,480 Btuh)	1
Inlet Air Filter Housing	1
Quick Disconnects (1/2 in.)	1
Quick Disconnects (1 in.)	1
Quick Disconnects (2 in.)	1
Rupture Discs	1
Steam Condensate Pump	1
Control Valves (Ball Valve - 1 in.)	1
Control Valves (Ball Valve - 6 in.)	1
Valves (Ball Valves)	1
Valves (Check Valve)	1
Valves (Gage Root Valve)	1
Valves (Reduced Pressure Back Flow Preventer)	1
Pressure Regulating Valves (Self Pilot)	1
Distribution Panel	1
Nonfused Disconnect Switch	1
Single-Phase Transformer	1
Fluorescent Lighting Fixtures	1
High-Pressure Sodium Lighting Fixtures	1
Local Control Station	1
Air Sampler	1
Compressed Air SM Filter Air Receiver	1
Dryer Off-Gas Condensate Pump Discharge Flow	1
Dryer Sintered Metal Filter Discharge Pressure	1

DRYER AND CONDENSATE RECOVERY SYSTEM SKID
16-Dec-04



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Title	Number of Pages
Dryer Steam Condenser Tank Level Transmitter	1
Liquid Waste Feed to Waste Dryer	1
Skid Exhaust HEPA Filter DP	1
Skid Inlet HEPA Filter DP	1
Skid Inlet Prefilter DP	1
Steam Supply Pressure to Dryer Sintered Metal Filter	1
Steam Supply Pressure to Waste Dryer	1
Waste Dryer Pressure	1
Total Data Sheet Pages:	39

ameco		Rupture Discs				SPEC. No.		
		NO.	BY	DATE	REVISION	SHEET OF	DATE	
		A	KJM	9/13/2004		1	1 9/13/2004	
						BY KJM	CHKD APPR.	
						P.O.	REQ.	
Project		145579 Demonstration Bulk Validation						
GENERAL	1 Instrument Tag number	33-D96-099						
	2 Service	Vacuum						
	P&ID	33-A-0100						
	3 Line / Equip. no.	6-VOG-33-0162						
	4 Line size	Schedule	6	40				
	Area classification		33					
	5 Design Code	031.3						
	6 Basis for selection							
	7 Primary / Secondary Relief	5 psig						
	8 Fluid Code / Description							
SERVICE CONDITIONS	9 Vapor or Gas	Flow	200 cfm					
	10	Molec. Weight						
	11 Liquid	Flow						
	12	Sp.Gr.@oper.T*						
	13 Corrosive agents							
	14 Operat. Press.	Operat. Temp. °F						
	Max. Allowable Working Pressure		ATM					
	15 Desired Burst Pressure	5 psig						
	16 Flowing Temperature	140 deg F						
	17 Back-pressure Conditions and Press.							
DISC	18 Vacuum: Operat.	Maximum	-26 in Hg	250 deg F				
	19 Pressure: static, pulsating or cyclic	cyclic						
	20 Bursting Pressure Range							
	21 Estimated Burst Pressure @ 22°C							
	22							
	23							
	24 Model no.							
	25 Size							
	26 Material	Non-fragmentation						
	27 Coating: Inlet	Coating: Outlet						
28 Quantity per Assembly								
29								
VACUUM SUPPORT	30 Model no.							
	31 Material	Attached to Disc						
FRANGES	32 Assembly no.							
	33 Base material							
	34 Hold down Material							
	35 F.D. of Connecting Pipe							
OPTIONS	36 Flange Rating	Facing						
	37 0.5" NPT tap in hold down flange							
NOTES	40 Studs & Nuts	Jackscrows						
	41 Preassembly screws							
	42 Excess flow valve							
	43 Pressure Switch / Pressure Gauge							
	44 Manufacturer							

S20.54

* information supplied by manufacturer unless already specified



Control Valves				SPEC. No.	
NO	BY	DATE	REVISION	REVISED BY	DATE
A	KJM	9/13/2004	1	KJM	12/9/2004
				BY CHKD	APPR

Project: 145579 Demonstration Bulk Vitrification
 P&ID: 33A-0106/010
 Fluid Code: W-004 W-432 V-010
 Service: LAW
 Line no.: P&ID

LINE	SERVICE CONDITIONS				ACTUATOR		
	Flow rate	Units	Max Flow	Norm Flow	Min Flow	Shut Off	Flow Thru
2	Flow rate	gpm	80	20			
3	Inlet Pressure P1	psig	375	175	0		
4	Outlet Pressure P2	psig	0	0			
5	Differential Pressure dp = P1 - P2	psid	375	175			
6	Inlet Temperature	F	150	120	40		
7	Spec Weight / Spec Gravity / Mol Wt	cp	1.3	1.3	1.0		
8	Viscosity / Specific Heats Ratio						
9	Vapor Pressure Fv / Gvl Press PC						
10	Required Cv		600		0		Flow Thru
11	Travel	%					
12	Predicted Sound press. level (at 1 m)	dba					Max 85 dbA
13	Compressibility (Z)				0%		
14	Solids conc. / Particle size						
15	Pipe Line Size: In	1"	Out	1"			
16	Pipe Sch./AW Bwd./In	80	Out	80			
17	Material	ASTM A304 B	In	ASTM A304 B			
18	Type	Ball Valve	Std / Full port	Std			
19	Valve max P / T	ANSI class	600#				
20	Manufacturer	Flowline Fluid Services					
21	Model						
22	Body / Bonnet Material	TBD (2)					
23	Liner Material / In. Diam.						
24	End	1" Extended BW or Flange					
25	Connection	Out	1" Extended BW or Flange				
26	Flange Face Finish						
27	Face to Face dim.						
28	End Ext Material						
29	Flow Direction						
30	Type of Bonnet						
31	Lube & Iso Valve						
32	Packing Material	URPMWPE					
33	Packing Type						
34	Type						
35	Size						
36	Characteristic						
37	Balanced / Unbalanced						
38	Rated Cv	FL	X1				
39	Play/Ball/Disk Mat'l	316 SS					
40	Seal Material	URPMWPE w/ Candy Filled Seats					
41	Cage/Guide Mat'l	316 SS					
42	Seal Material						
43	NEC Class	Group	Div.				
44	TESTS						
45	1) 100 to 125 psig Compressed air is available						
46	2) CNA TR-2 Required if available						
47	3) The solenoid valve and proximity sensor shall be a NEKA 4 enclosures						
48	4) FCV 70 Z, Class VI is an acceptable substitute						
49	5) speed control & manual override						
50	UNIT PROCESS COMPANY						
	Royal City, WA						
	(509) 346-9920						
	(509) 346-9951						

Information supplied by manufacturer unless already specified.

amtec		Control Valves				SPEC. NO. 145579-D-SP-006	
NO.	BY	DATE	REVISION	SHEET	OF	DATE	
A	KJM	9/13/2004		1	1	12/10/2004	
				BY	CHKD	APPR.	
				KJM			
				P.O.			
				REQ.			
Project: 145579 Demonstration Bulk Verification P		Service: Steam Supply		P&ID: 33-A-0100		Line no.:	
Fluid Code:		Desc:					
1	Flow rate	lb/hr	Max Flow	2500	Min Flow	2000	Shut Off
2	Inlet Pressure P1	psig	25	15	0		
3	Outlet Pressure P2	psig	0	0			
4	Differential Pressure dP = P1 - P2	psid	25	15			
5	Inlet Temperature	F	300	250	40		Saturated Steam
6	Spec. Weight / Spec. Gravity / Mol. Weight		1	1	1.0		
7	Viscosity / Specific Heats Ratio	cp					
8	Vapor Pressure Pv / Crit Press PC						
9	* Required Cv			600			Flow Thru
10	* Travel	%					Max: 85 dbA
11	* Predicted Sound press. level (at 1 m.)	dBA					
12	Compressibility (Z)						
13	Solids conc. / Particle size			0%			
14	Pipe Line Size	In	6"	Out	6"		
15	Pipe Sch./W. thick./In		80	Out	80		
16	Material A53		ANSI Std Gr B				
17	Type	Ball Valve	Std / Full port	Std			
18	Size	6"	ANSI class	600F			
19	Manufacturer		Flowtek Triad Series				
20	Model						
21	Body / Bonnet Material		100 (2)				
22	Liner Material / In. Diam.						
23	End	In	6" Extended BW or Flange				
24	Connection	Out	6" Extended BW or Flange				
25	Flange Face Finish						
26	Face to Face dim.						
27	End Ext / Mater 1						
28	Flow Direction						
29	Type of Bonnet						
30	Lube & Iso Valve						
31	Packing Material		RPTFE				
32	Packing Type						
33	Type						
34	Size						
35	Characteristic						
36	Balanced / Unbalanced						
37	Rated Cv		FL				
38	Plug/Ball/Disk/Mat 1		316 SS				
39	Seat Material		RPTFE w/ Cavity Filled Seals				
40	Coper/Guide Mat 1		316 SS				
41	Stem Material						
42	NEC Class		Group				
43	Div.						
44							
45							
46	UNIT PROCESS COMPANY						
47	Royal City, WA						
48	(509) 346-9920						
49	(509) 346-9953						
50							\$200.50



Valves

NO.	BY	DATE	REVISION	SPEC. No.	DATE
A	KJM	9/12/2004		145579-D-SP-006	12/9/2004
				SHEET OF	APPR
				BY	CHKD
				KJM	
				P.O.	
				REQ.	

Project: 145579 Demonstration Bulk Vibration

- 1. Type CHECK VALVE
- 2. Body Size SEE BELOW
- 3. Body Material
- 4. Port Size
- 5. Number of Ports 2
- 6. Gating
- 7. End Connecting
- 8. Packing Material/Type
- 9. Lubricator
- 10. Iso Valve
- 11. Bonnet Type
- 12. Trim From
- 13. Trim Material Seat/Plug
- 14. Shaft Material
- 15. Required Seat Tightness
- 16. Max Allow Sound Level dBA

Design Pressure 125 psig
Design Temperature 150 F

- 17. MFR CHECK-ALL HVFD Series
- 18. Model No.
- 19. Flow Composition
- 20. Required Cv
- 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
- 26. % Superheat/Flash
- 27. Crit Press/% Solids
- 28. Mol Wt/Vapor
- 29. Pred. Sound Level dBA

30. Supplier CHECK-ALL Valves
31. Address (515) 224-2301
32. Phone (515) 224-2326
33. Fax

Rev.	Tag No.	Line no. Equip.	P&ID	Body Size	Y*	Pressure			Service	Notes
						Norm.	Max.	Range		
A	33-V-002		33-A-0101	2"					Filtered Water	
A	33-V-001		33-A-0100	2"					Oil Gas	
A	33-V-002		33-A-0101	2"					Filtered Water	
A	33-V-003		33-A-0100	1"					Filtered Water	
A	33-V-002		33-A-0101	1"					Chilled Water	
A	33-V-005		33-A-0101	1-1/4"					Chilled Water	
A	33-V-001		33-A-0100	2"					Chilled Water	
A	33-V-010		33-A-0101	2"					Filtered Water	
A	33-V-001		33-A-0100	1"					Secondary Waste	
A	33-V-008		33-A-0100	2"					Steam	
A	33-V-009		33-A-0100	2"					Filtered Water	
A	33-V-013		33-A-0101	1"					Filtered Water	
A	33-V-014		33-A-0101	1"					Chilled Water	
			33-A-0101	4"					Chilled Water	
									Chilled Water	

NOTES

* Prefix all Tag Numbers with "POR."

S20.41

* information supplied by manufacturer unless already specified

		Pressure Regulating Valves (Self Pilot)				SPEC. No. 145579-D-SP-006	
		NO.	BY	DATE	REVISION	SHEET OF	DATE
		A	KJM	9/13/2004		1	9/13/2004
						BY KJM	CHK'D APPR.
Project: 145579 Demonstration Bulk V						P.O. REQ	
GENERAL	1 Tag Number	33-PCV-001 and 33-PCV-022		33-PCV-021			
	2 Service	Steam		Steam			
	3 Manufacturer						
	4 Model No.						
	5 Line No / Vessel No			1" AC-00-0001			
	6 Line Size / Schedule No.	1 1/2 Sch 40		1 Sch 40			
	7 Line / Vessel Material						
	8 P&ID	33-A-0100		33-A-0100			
BODY	9 Type						
	10 Body Size Port Size						
	11 End Conn. & Rating						
	12 Body Material						
	13 Trim Material						
	14 Seal Material						
	15 Required Seat Tightness						
16 Max. Sound level, dB(A)							
ACTUATOR	17						
	18 Type: Reducing / Relief						
	19 Self / Pilot Operated						
	20 Self Cont. Ext. Conn.						
	21 H/Wheel / Adj. Screw						
	22 Diaphragm Material						
	23 Diaphragm Rating						
24 Spring Range							
Accessories	25						
	26 Filter Regulator						
	27 Line Strainer						
	28 Housing Vent						
	29 Internal Relief						
	30 Gauge						
SERVICE	31						
	32 Fluid						
	33 Phase						
	34 Comosive Compounds						
	35 Flow Max Flow Nor.						
	36 Flow Min.						
	37 P ₁ Max P ₁ Nor						
	38 P ₁ Min						
	39 Pressure setting	15 psig		45 psig			
	40 Max. Temp. Nor. Temp.	250 F	250 F	115 F	70 F		
41 Oper. Sp. G. Mol. Wt.							
42 Operating Viscosity							
43 % Solids							
44 Vapor Pres. Crit. Press.							
C _v	45						
	46						
	47 C _v @ Max. Flow						
	48 Wide Open C _v						
	49						
	50						
NOTES							

S20.51



Distribution Panel

NO.	BY	DATE	REVISION	SPEC. No.	DATE
				145579-D-SP-006	12/9/2004
				SHEET OF	
				BY KJM	CHKD
				P.O.	APPR.
				REQ.	

Project: Demonstration Bulk Verification Project 1

1. Volts: 120/240V ac, single-phase

2. Amps:

3. Breaker type:

4. Main Breaker:

4.a. Amps (tip):

4.b. MFR:

4.c. Model No.:

5. Thermal Mag. breakers:

5.a. MFR:

5.b. Model No.:

6. GFCI breakers:

6.a. MFR:

6.b. Model No.:

7. GFIPE breakers:

7.a. MFR:

7.b. Model No.:

8. Documentation:

Bolt-on

yes

yes

yes

yes

detailed panel schedule, inside door

9. MFR:

10. Model No.:

11. Supplier:

12. Address:

13. Phone:

14. Fax:

Rev

Tag No.

Line no. / Equip.

PBID

Notes

NOTES

*Prefix all Log Numbers with "POR"

*Information supplied by manufacturer unless already specified

/S20.41

145579-D-SP-006_(Data_Sheets).xls



TECHNICAL DATA SHEETS

PROJECT:		Final DBVS Design		145579-B-SP-006	
PROJECT NO.:		145579		Local Control Station	
CLIENT:		AMEC E&E - Richland Washington			
No. Required	IBA		Area		
PFD #			Stream No.		
			Quality Assurance Level		Commercial
Operating Conditions:			Rev		Rev
Location (Indoors/Outdoors)		Outdoors	Operation - Days per year		365
Operation (continuous/intermittent)		Continuous	- Hours per day		24
Max. Ambient Air Temp. (°F)		114	Availability		% 90
Min. Ambient Air Temp. (°F)		-23	Elevation (ft)		663
Equipment Numbers		See Note 2	Environment - Radioactive		Yes
			- Toxic		No
			- Corrosive		No
			- Flammable		No
Equipment data		A-B Part #		Materials	
Enclosure (surface mount)		NEMA 4 800T-4TZ		Enclosure	
Dielectric strength (> 1 minute)		> 1000V		Standard Legend Plate	
Push Button-red (1N.O.+1N.C.) "Start"		Momentary 800T-A6A		Die Cast	
Push Button-green (1N.O.+1N.C.) "Stop"		Momentary 800T-A7A		Aluminum	
Pilot light-red (120VAC, LED type with transfo		Running 800T-PH16R			
Pilot light-green (120VAC, LED type with trans		Ready 800T-PH16G			
Standard legend plate - START		800T-X547			
Standard legend plate - STOP		800T-X550			
Voltage (continuous) (v)		120			
Ampere (max continuous rate) (A)		10			
Approvals		UL Listed			
Finish		Enclosure Layout			
By VENDOR (Yes/No)		Yes		Conduit entries (bottom only)	
Painting - External					
- Internal					
Comments/Notes:					
1) All items with an * shall be filled in by the VENDOR					
2) Allen-Bradley Catalog have been indicated. Approved equals may be submitted					
Date	14-Oct-04				
By	GC				
Chked	JDM				
Rev.	A				

 AMEC E&C Services Limited Trail, BC Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-PIT-036	
SUBJECT:	Bulk Vitrification Waste Dryer System		
SERVICE:	Compressed Air SM Filter Air Receiver		
SUPPLIER:			
MAKE:	Yokagawa	P.O. No.:	
MODEL:	EJA Series	P&ID No.:	DBVS-SK-P004
TRANSMITTER			
		Power Supply:	24V dc
Model No.:	EJA530A	Output:	4-20 mA Isolated
Range:	0-290 psig	Relay Output:	N/R
Calibrated Range:	0 to 150 psig	Local Indication:	1.0" LCD (3 1/2" Digits)
Case Material:	Low copper cast-aluminum	Conduit Connect:	
Enclosure Rating:	NEMA4X	Mounting Bracket:	Integral to transducer
TRANSDUCERS			
Model No.:	EJA530A-EBS4N-02DN		
Line Material:	SS		
Line Size/Sch'd:			
Transducer Mat'L:	SS		
Process Connection:			
Signal Cable Length:			
Mounting:	Vertical		
Classification:	Factory Mutual		
316SS Tags permanently affixed to instrument:			
OPTIONS			
	Accuracy 0.25% span or better		
	Display to read 0-150 psig		
SERVICE CONDITIONS:			
Line No./Size/Sch		Max. Velocity:	
Fluid:	air	Spec. Gravity:	
Flow:	none	Acidity:	
Temp Min.:	32 deg F	Percent Solids:	
Temp Oper.:	250 deg F	Material Build-Up:	
Temp Max.:	248 deg F	Vibration:	
Press Oper.:	100 psig	Line Material:	
Press Max.:	290 psig		
NOTES:			
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokagawa, EJA530A-EBS4N-02DN may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.			
By: RW	Chk:	Appd:	Date: 101404
			Project: DBVS
			Rev: 0

		AMEC E&C Services Limited Trail, BC Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006			TAG NUMBER: 33-FIT-103		
SUBJECT: Bulk Vitrification Waste Dryer Vacuum System					
SERVICE: Dryer Off-Gas Condensate Pump Discharge Flow					
SUPPLIER:					
MAKE: Yokagawa		P.O. No.:			
MODEL: DY Vortex Flowmeter		P&ID No.:		DBVS-SK-P005	
TRANSMITTER					
Model No.: DY040-EAMBSI-2D/MV		Power Supply:		24V dc	
Range: 5.7 - 193.7 GPM		Output:		4-20 mA Isolated	
Calibrated Range: 6 - 50 GPM		Relay Output:			
Case Material: Aluminum alloy		Local Indication:		1.8" LCD (3 1/2" Digits)	
Enclosure Rating: NEMA4X		Conduit Connect:			
		Mounting Bracket:		Integral to transducer	
TRANSDUCERS					
Model No.: DY040-EAMBSI-2D/MV					
Line Material: SS					
Line Size/Sch'd: 1 1/2" 150 psig					
Transducer Mat'l: SS					
Process Connection: 1 1/2" 150 psig Raised Flange					
Signal Cable Length:					
Mounting: Horizontal					
Classification: Factory Mutual					
316SS Tags permanently affixed to instrument:					
OPTIONS					
Accuracy 0.25% span or better					
Display to read GPM					
SERVICE CONDITIONS:					
Line No./Size/Sch: 1 1/2" 150 psig		Max. Velocity:			
Fluid: Water (condensate)		Spec. Gravity:		1.0	
Flow: none		Acidity:		NA	
Temp Min.: 32 deg F		Percent Solids:			
Temp Oper.: 85 deg F		Material Build-Up:			
Temp Max.: 176 deg F		Vibration:			
Press Oper.: -14 psig (vacuum)		Line Material:			
Press Max.: atm					
NOTES:					
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokagawa, DY040-EAMBSI-2D may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.					
By: RW	Ck:	Appd.	Date: 102104	Project: DBVS	Rev: 0

 AMEC E&C Services Limited Trail, BC, Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-PIT-027	
SUBJECT:	Bulk Vitrification Waste Dryer System		
SERVICE:	Dryer Sintered Metal Filter Discharge Pressure		
SUPPLIER:			
MAKE:	Yokagawa	P.O. No.:	
MODEL:	EJA Series	P&ID No.:	DBVS-SK-P004
TRANSMITTER			
		Power Supply:	24V dc
Model No.:	EJA510A	Output:	4-20 mA Isolated
Range:	0-29 psi	Relay Output:	N/R
Calibrated Range:	0 to 1000 torr (mmHg)	Local Indication:	1.0" LCD (3 1/2" Digits)
Case Material:	Low copper cast-aluminum	Conduit Connect:	
Enclosure Rating:	NEMA4X	Mounting Bracket:	Integral to transducer
TRANSDUCERS			
Model No.:	EJA510A-EAS4N-02DN		
Line Material:	SS		
Line Size/Sch'd:			
Transducer Mat'l.:	SS		
Process Connection:			
Signal Cable Length:			
Mounting:	Vertical		
Classification:	Factory Mutual		
316SS Tags permanently affixed to instrument:			
OPTIONS			
	Accuracy 0.25% span or better		
	Display to read 0-1000 torr		
SERVICE CONDITIONS:			
Line No./Size/Sch		Max. Velocity:	
Fluid:	air	Spec. Gravity:	
Flow:	none	Acidity:	
Temp Min.:	32 deg F	Percent Solids:	
Temp Oper.:	85 deg F	Material Build-Up:	
Temp Max.:	150 deg F	Vibration:	
Press Oper.:	-14 psig (vacuum)	Line Material:	
Press Max.:	atm		
NOTES:			
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokagawa, EJA510A-EAS4N-02DN may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.			
By: RW	Chk:	Appd.	Date: 101304
			Project: DBVS
			Rev: 0

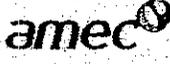
 AMEC E&C Services Limited Trail, BC Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-LIT-017	
SUBJECT: Bulk Vitrification Waste Dryer System			
SERVICE: Dryer Steam Condenser Tank Level Transmitter			
SUPPLIER:			
MAKE:	Yokogawa	P.O. No.:	
MODEL:	EJA Series	P&ID No.:	DBVS-SK-P004
TRANSMITTER			
Model No.:	EJA 130A	Power Supply:	24V dc
Range:	TBD	Output:	4-20 mA Isolated
Calibrated Range:	TBD	Relay Output:	N/R
Case Material:	Low copper cast aluminum	Local Indication:	1.0" LCD (3 1/2" digits)
Enclosure Rating:	NEMA4X	Conduit Connect:	
		Mounting Bracket:	Integral to transducer
TRANSDUCERS			
Model No.:	EJA130A-TBD		
Line Material:	SS		
Line Size/Sch'd:			
Transducer Mat'l.:	SS		
Process Connection:			
Signal Cable Length:			
Mounting:	Horizontal		
Classification:	Factory Mutual		
316SS Tags permanently affixed to instrument:			
OPTIONS			
	Accuracy 0.25% span or better		
	Display to read in "inches"		
SERVICE CONDITIONS:			
Line No./Size/Sch		Max. Velocity:	
Fluid:	air	Spec. Gravity:	
Flow:	none	Acidity:	
Temp Min.:	32 deg F	Percent Solids:	
Temp Oper.:	85 deg F	Material Build-Up:	
Temp Max.:	150 deg F	Vibration:	
Press Oper.:	TBD	Line Material:	
Press Max.:	TBD		
NOTES:			
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokogawa, that XXXXXX may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.			
By: RW	Chk:	Appd.	Date: 102704
			Project: DBVS
			Rev: 0

 AMEC E&C Services Limited Trail, BC, Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-FIT-003	
SUBJECT:	Bulk Vitrification Waste Dryer System		
SERVICE:	Liquid Waste Feed to Waste Dryer		
SUPPLIER:			
MAKE:	Yokogawa	P.O. No.:	
MODEL:	AE205MG Magnetic Flowmeter	P&ID No.:	DBVS-SK-P004
TRANSMITTER			
Model No.:	AE205MG-AA1-LSA-DIDH/HART	Power Supply:	24V dc
Range:	9.6 - 321 GPM	Output:	4-20 mA Isolated
Calibrated Range:	20 - 120 GPM	Relay Output:	
Case Material:	Aluminum alloy	Local Indication:	LCD with Backlight
Enclosure Rating:	NEMA4X	Conduit Connect:	
		Mounting Bracket:	Integral to transducer
TRANSDUCERS			
Model No.:	AE205MG-AA1-LSA-DIDH/HART		
Line Material:	SS		
Line Size/Sch'd:	1 1/2" 150 psig		
Transducer Mat'l:	SS		
Process Connection:	1 1/2" 150 psig Raised Flange		
Signal Cable Length:			
Mounting:	Horizontal		
Classification:	Factory Mutual		
316SS Tags permanently affixed to instrument:			
OPTIONS			
	Accuracy 0.25% span or better		
	Display to read GPM		
SERVICE CONDITIONS:			
Line No./Size/Sch	1 1/2" 150 psig	Max. Velocity:	
Fluid:	Liquid Waste or Simulant	Spec. Gravity:	
Flow:	none	Acidity:	
Temp Min.:	32 deg F	Percent Solids:	
Temp Oper.:	85 deg F	Material Build-Up:	
Temp Max.:	176 deg F	Vibration:	
Press Oper.:	50 psig to -14 psig (vacuum)	Line Material:	
Press Max.:	150 psig		
NOTES:			
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokogawa, AE205MG-AA1-LSA-DIDH/HART may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.			
By: RW	Chk:	Appd.:	Date: 102104
			Project: DBVS
			Rev: 0

 AMEC E&C Services Limited Trail, BC - Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-PDIT-032	
SUBJECT:	Bulk Vitrification Waste Dryer System		
SERVICE:	Skid Exhaust HEPA Filter DP		
SUPPLIER:			
MAKE:	Dwyer	P.O. No.:	
MODEL:	Series 3000 Photohelic Pressure Switch/Gage	P&ID No.:	DBVS-SK-P004
TRANSMITTER			
Model No.:	3310MRS Photohelic	Power Supply:	24V dc
Range:	0-10 in H ₂ O	Output:	
Calibrated Range:	0-10 in H ₂ O	Relay Output:	PAH (TBD)
Case Material:		Local Indication:	0-10 in H ₂ O
Enclosure Rating:		Conduit Connect:	
		Mounting Bracket:	
TRANSDUCERS			
Model No.:	3310MRS-0-10-24VDC		
Line Material:	SS		
Line Size/Sch'd:			
Transducer Mat'l.:			
Process Connection:			
Signal Cable Length:			
Mounting:	Vertical		
Classification:			
316SS Tags permanently affixed to instrument:			
OPTIONS			
	Accuracy 0.25% span or better		
	Display to read in "in H ₂ O"		
	Weather-proof housing		
SERVICE CONDITIONS:			
Line No./Size/Sch		Max. Velocity:	
Fluid:	Air	Spec. Gravity:	
Flow:	None	Acidity:	
Temp Min.:	20 deg F	Percent Solids:	
Temp Oper.:	ambient	Material Build-Up:	
Temp Max.:	120 deg F	Vibration:	
Press Oper.:	0-10 in H ₂ O	Line Material:	
Press Max.:	atm		
NOTES:			
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Dwyer Instruments, Series 3000 Photohelic model 3310MRS-0-10-24VDC may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.			
By: RW	Chk:	Appd:	Date: 101504
			Project: DBVS
			Rev: 0

		AMEC E&C Services Limited Trail, BC Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006			TAG NUMBER: 33-PDIT-109		
SUBJECT: Bulk Vitrification Waste Dryer System					
SERVICE: Skid Inlet HEPA Filter DP					
SUPPLIER:					
MAKE: Dwyer		P.O. No.:			
MODEL: Series 3000 Photohelic Pressure Switch/Gage		P&ID No.:		DBVS-SK-P004	
TRANSMITTER					
Model No.: 3310MRS Photohelic		Power Supply: 24V dc			
Range: 0-10 in H ₂ O		Output:			
Calibrated Range: 0-10 in H ₂ O		Relay Output: PAH (TBD)			
Case Material:		Local Indication: 0-10 in H ₂ O			
Enclosure Rating:		Conduit Connect:			
		Mounting Bracket:			
TRANSDUCERS					
Model No.: 3310MRS-0-10-24VDC					
Line Material: SS					
Line Size/Sch'd:					
Transducer Mat'l:					
Process Connection:					
Signal Cable Length:					
Mounting: Vertical					
Classification:					
316SS Tags permanently affixed to instrument:					
OPTIONS					
Accuracy 0.25% span or better					
Display to read in "in H ₂ O"					
Weather-proof housing					
SERVICE CONDITIONS:					
Line No./Size/Sch		Max. Velocity:			
Fluid: air		Spec. Gravity:			
Flow: none		Acidity:			
Temp Min.: 20 deg F		Percent Solids:			
Temp Oper.: ambient		Material Build-Up:			
Temp Max.: 120 deg F		Vibration:			
Press Oper.: 0-10 in H ₂ O		Line Material:			
Press Max.: atm					
NOTES:					
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Dwyer Instruments, Series 3000 Photohelic model 3310MRS-0-10-24VDC may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.					
By: RW	Chk:	Appd:	Date: 101504	Project: DBVS	Rev: 0

amec		AMEC E&C Services Limited Trail, BC Canada		Instrumentation Data Sheet	
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-PDIT-030			
SUBJECT: Bulk Vitrification Waste Dryer System					
SERVICE: Solid Inlet Prefilter DP					
SUPPLIER:					
MAKE:	Dwyer	P.O. No.:			
MODEL:	Series 3000 Photohelic Pressure Switch/Gage	P&ID No.:	DBVS-SK-P004		
TRANSMITTER					
Model No.:	3310MRS Photohelic	Power Supply:	24V dc		
Range:	0-10 in H ₂ O	Output:	PDAH (TBD)		
Calibrated Range:	0-10 in H ₂ O	Relay Output:	0-10 in H ₂ O		
Case Material:	Aluminum (hammerloid finish)	Local Indication:			
Enclosure Rating:		Conduit Connect:			
		Mounting Bracket:			
TRANSDUCERS					
Model No.:	3310MRS-0-10-24VDC				
Line Material:	SS				
Line Size/Sch'd:					
Transducer Mat'L:					
Process Connection:					
Signal Cable Length:					
Mounting:	Vertical				
Classification:					
316SS Tags permanently affixed to instrument:					
OPTIONS					
Accuracy 0.25% span or better					
Display to read in "in H ₂ O"					
Weather-proof housing					
SERVICE CONDITIONS:					
Line No./Size/Sch		Max. Velocity:			
Fluid:	air	Spec. Gravity:			
Flow:	none	Acidity:			
Temp Min.:	20 deg F	Percent Solids:			
Temp Oper.:	ambient	Material Build-Up:			
Temp Max.:	120 deg F	Vibration:			
Press Oper.:	0-10 in H ₂ O	Line Material:			
Press Max.:	atm				
NOTES:					
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Dwyer Instruments, Series 3000 Photohelic model 3310MRS-0-10-24VDC may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.					
By: RW	Chk:	Appd:	Date: 10/5/04	Project: DBVS	Rev: 0

 <p>AMEC E&C Services Limited Trail, BC Canada</p>	<h3>Instrumentation Data Sheet</h3>
<p>ASSET NUMBER: 145579-D-SP-006 TAG NUMBER: 33-PIT-035</p>	
<p>SUBJECT: Bulk Vitrification Waste Dryer System</p>	
<p>SERVICE: Steam Supply Pressure to Dryer Sintered Metal Filter</p>	
<p>SUPPLIER: _____</p>	
<p>MAKE: Yokagawa</p>	<p>P.O. No.: _____</p>
<p>MODEL: EJA Series</p>	<p>P&ID No.: DBVS-SK-P004</p>
<p>TRANSMITTER</p>	
<p>Model No.: EJA530A</p>	<p>Power Supply: 24V dc</p>
<p>Range: 0-29 psig</p>	<p>Output: 4-20 mA Isolated</p>
<p>Calibrated Range: 0 to 25 psig</p>	<p>Relay Output: N/R</p>
<p>Case Material: Low copper cast-aluminum</p>	<p>Local Indication: 1.0" LCD (3 1/2" Digits)</p>
<p>Enclosure Rating: NEMA4X</p>	<p>Conduit Connect: _____</p>
<p>Mounting Bracket: Integral to transducer</p>	<p>_____</p>
<p>TRANSDUCERS</p>	
<p>Model No.: EJA530A-EAS4N-02DN</p>	<p>_____</p>
<p>Line Material: SS</p>	<p>_____</p>
<p>Line Size/Sch'd: _____</p>	<p>_____</p>
<p>Transducer Mat'l: SS</p>	<p>_____</p>
<p>Process Connection: _____</p>	<p>_____</p>
<p>Signal Cable Length: _____</p>	<p>_____</p>
<p>Mounting: Vertical</p>	<p>_____</p>
<p>Classification: Factory Mutual</p>	<p>_____</p>
<p>316SS Tags permanently affixed to instrument:</p>	
<p>OPTIONS</p>	
<p>Accuracy 0.25% span or better</p>	
<p>Display to read 0-25 psig</p>	
<p>_____</p>	
<p>_____</p>	
<p>SERVICE CONDITIONS:</p>	
<p>Line No /Size/Sch _____</p>	<p>Max. Velocity: _____</p>
<p>Fluid: steam</p>	<p>Spec. Gravity: _____</p>
<p>Flow: none</p>	<p>Acidity: _____</p>
<p>Temp Min.: 32 deg F</p>	<p>Percent Solids: _____</p>
<p>Temp Oper.: 250 deg F</p>	<p>Material Build-Up: _____</p>
<p>Temp Max.: 248 deg F</p>	<p>Vibration: _____</p>
<p>Press Oper.: 15 psig</p>	<p>Line Material: _____</p>
<p>Press Max.: 29 psig</p>	<p>_____</p>
<p>NOTES:</p>	
<p>1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokagawa, EJA530A-EAS4N-02DN may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.</p>	
<p>By: RW</p>	<p>Chk: _____</p>
<p>Appd: _____</p>	<p>Date: 101304</p>
<p>Project: DBVS</p>	<p>Rev: 0</p>

	AMEC E&C Services Limited Trail, BC Canada	Instrumentation Data Sheet
ASSET NUMBER: 145579-D-SP-006		TAG NUMBER: 33-PIT-034
SUBJECT: Bulk Vitrification Waste Dryer System		
SERVICE: Steam Supply Pressure to Waste Dryer		
SUPPLIER: _____		
MAKE: Yokogawa	P.O. No.: _____	
MODEL: EJA Series	P&ID No.:	DBVS-SK-P004
TRANSMITTER		
Model No.: EJA530A	Power Supply:	24V dc
Range: 0-29 psig	Output:	4-20 mA Isolated
Calibrated Range: 0 to 25 psig	Relay Output:	N/R
Case Material: Low copper cast-aluminum	Local Indication:	1.0" LCD (3 1/2" Digits)
Enclosure Rating: NEMA4X	Conduit Connect:	_____
Mounting Bracket:	Integral to transducer.	
TRANSDUCERS		
Model No.: EJA530A-EAS4N-02DN	_____	
Line Material: SS	_____	
Line Size/Sch'd: _____	_____	
Transducer Mat'l: SS	_____	
Process Connection: _____	_____	
Signal Cable Length: _____	_____	
Mounting: Vertical	_____	
Classification: Factory Mutual	_____	
316SS Tags permanently affixed to instrument:		
OPTIONS		
Accuracy 0.25% span or better		
Display to read 0-25 psig		

SERVICE CONDITIONS:		
Line No./Size/Sch	Max. Velocity:	_____
Fluid: steam	Spec. Gravity:	_____
Flow: none	Acidity:	_____
Temp Min.: 32 deg F	Percent Solids:	_____
Temp Oper.: 250 deg F	Material Build-Up:	_____
Temp Max.: 248 deg F	Vibration:	_____
Press Oper.: 15 psig	Line Material:	_____
Press Max.: 29 psig	_____	
NOTES:		
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokogawa, EJA530A-EAS4N-02DN may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.		
By: RW	Chk: _____	Appd: _____
Date: 10/304	Project: DBVS	Rev: 0


 AMEC E&C Services Limited
 Trail, BC Canada

Instrumentation Data Sheet

ASSET NUMBER: I45579-D-SP-006	TAG NUMBER: 33-PDIT-029		
SUBJECT: Bulk Vintification Waste Dryer System			
SERVICE: Waste Dryer Pressure			
SUPPLIER:			
MAKE: Yokogawa	P.O. No.:		
MODEL: EIA Series	P&ID No.:		
	DBVS-SK-P004		
TRANSMITTER			
Model No.:	EIA510A	Power Supply:	24V dc
Range:	0-29 psi	Output:	4-20 mA Isolated
Calibrated Range:	0 to 1000 torr (manHg)	Relay Output:	N/R
Case Material:	Low copper cast-aluminum	Local Indication:	1.0" LCD (3 1/2" Digits)
Enclosure Rating:	NEMA4X	Conduit Connect:	
		Mounting Bracket:	Integral to transducer
TRANSDUCERS			
Model No.:	EIA510A-EAS4N-02DN		
Line Material:	SS		
Line Size/Sch'd:			
Transducer Mat'l:	SS		
Process Connection:			
Signal Cable Length:			
Mounting:	Vertical		
Classification:	Factory Mutual		
316SS Tags permanently affixed to instrument:			
OPTIONS			
	Accuracy 0.25% span or better		
	Display to read 0-1000 torr		
SERVICE CONDITIONS:			
Line No./Size/Sch		Max. Velocity:	
Fluid:	air	Spec. Gravity:	
Flow:	none	Acidity:	
Temp Min.:	32 deg F	Percent Solids:	
Temp Oper.:	85 deg F	Material Build Up:	
Temp Max.:	150 deg F	Vibration:	
Press Oper.:	-14 psig (vacuum)	Line Material:	
Press Max.:	atm		
NOTES:			
1. The Seller has reviewed the transmitters offered and found that the following ordering information from Yokogawa, EIA510A-EAS4N-02DN may be suitable. In any case, the final selection the component is the responsibility of the Seller as this is provided for information only.			
By: RW	CHK	Appd	Date: 101304
		Project: DBVS	Rev: 0



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix D

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

(53 pages including cover)

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CH2M HILL Hanford Group, Inc.	Manual	ESHQ
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Document	TFC-ESHQ-Q_C-C-03, REV B
	Page	1 of 52
	Issue Date	December 31, 2003
	Effective Date	December 31, 2003
APPROVAL AUTHORITY:		R. L. Higgins
DOCUMENT OWNER:		J. L. Logston

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1.0 PURPOSE AND SCOPE (1.1, 1.2, 1.3, 1.4)

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

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

This procedure applies to:

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

2.0 IMPLEMENTATION

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

3.0 RESPONSIBILITIES

3.1 Procurement Personnel

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

3.2 Inspection Personnel

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

3.3 Quality Assurance Engineer

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

3.4 S/CI Coordinator

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

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3.5 Assigned Engineering Personnel

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

3.6 Responsible Managers and Supervisors

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

4.0 PROCEDURE

4.1 Introduction

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

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

4.2 Procurement

CH2M HILL Personnel

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

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

4.3 Inspection for Potential S/CI

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

4.4 Control of Material Identified as S/CI

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

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4.5 Reporting of S/CI

Assigned Company
Personnel

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

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

S/CI Coordinator

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

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

4.6 Acceptance, Removal, and Disposition of S/CI

S/CI Coordinator

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

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

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

4.7 Surplus/Excess Material

Responsible
Personnel

1. Remove S/CI from surplus/excess material before they are released for sale or transfer of accountability.
2. Ensure surplus items received from DOE or other facilities are inspected for S/CI prior to installation.

4.8 Assessments

Quality Assurance

1. Conduct assessments of the effectiveness of the S/CI program.

NOTE: The assessment should be performance based and designed to determine if company activities are conducted in accordance with this procedure, DOE 414.1A, DOE O 440.1A, DOE G 440.1-6, and 10 CFR 830, Subpart A.

2. Lines of inquiry will be used as appropriate during assessments in areas that interface with the S/CI process. See Attachment J.

4.9 Training

Managers and
Supervisors

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.

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5.0 DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

6.0 RECORDS

No records are generated during the performance of this procedure.

7.0 SOURCES

7.1 Requirements

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

7.2 References

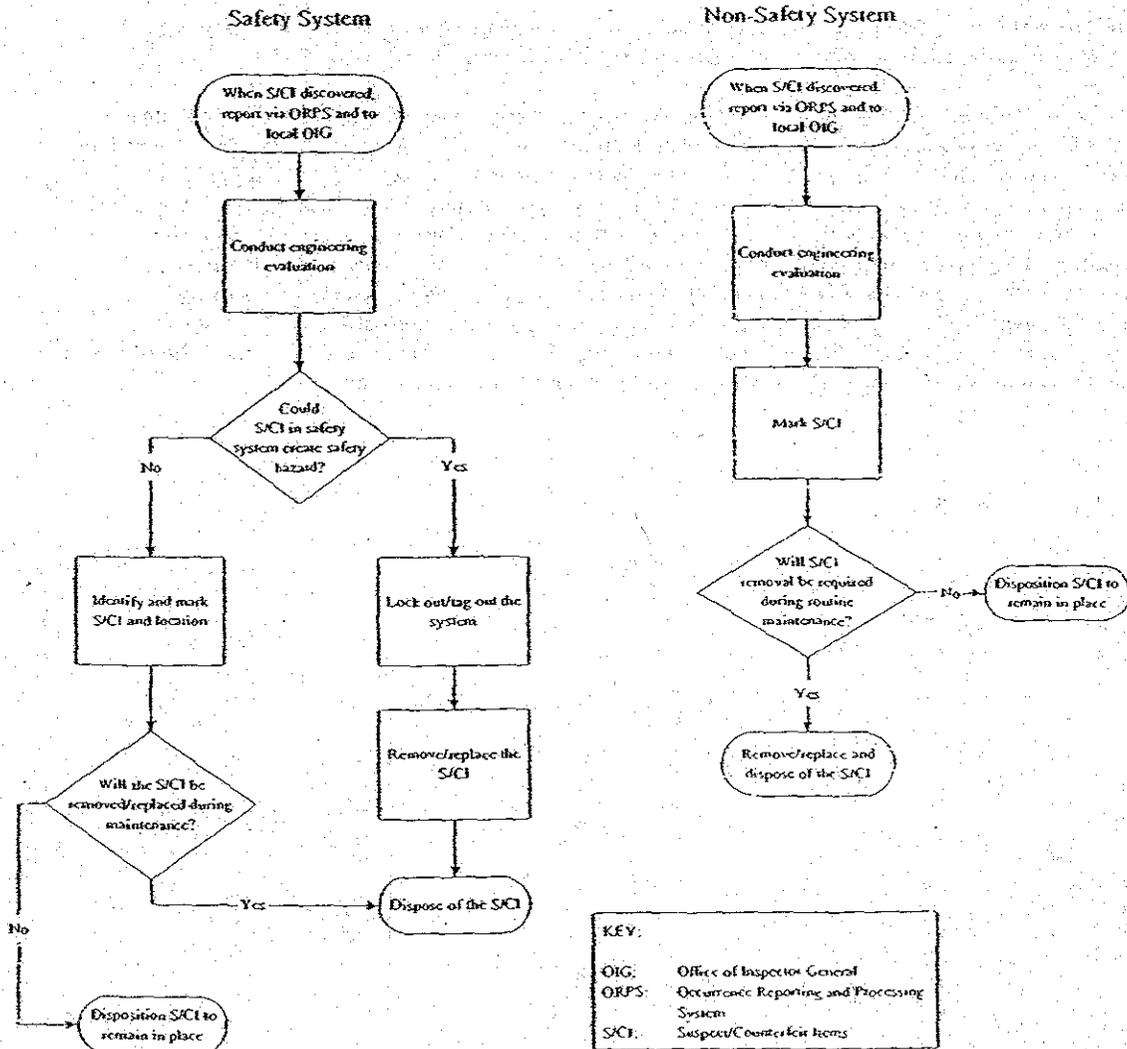
1. HNF-SD-MP-SRID-001, "Standards/Requirements Identification Document for the Tank Farm Contractor."

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

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Figure 1. Management of Suspect/Counterfeit Items.



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ATTACHMENT A - SUSPECT COMPONENTS LIST

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

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

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ATTACHMENT A - SUSPECT COMPONENT'S LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (Component Examples)			
	<ul style="list-style-type: none"> - TF136090 - TF161050WL - TED1130020 - Not Provided 	Commercial Grade	Westinghouse Electric Supply Co. (WESCO)	NRC I.N. 91-48
	<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 - MAJ600 - F2020 - EH2100 - EB3050 - HMC3800F - EA2090 - FA3125 - HMCP 150 		HLC Electrical Supply	Office Of Nuclear Safety 93-9
			California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	
			ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker Electrical Supply	
			Molded Case Circuit Breakers	
			NSSS, Inc.	
			Spectrum, Tech.	
			Rosen Electric	
			Luckow Circuit Breaker	

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)	Shunt Trips Aux. Contacts 2 & 3 pole circuit breakers of various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply PENCON International (DBA) General Magnetics/ Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Moldof Case Circuit Breakers Co. (MCCB)	NRC L.N. 88-46 Supplements and Attachments
	<ul style="list-style-type: none"> - HFD - EH2070 - FA2050 - JA2275 - JL3B125 - JL3B070 - JL3B150 - JL3B200 - JL3B090 - JL3B100 - HLM3800T - F3100N - MA3500 - EH2015 - FA3035 - FA2100 - HLA2125OTM - EH2070 - JB3100 - EB2030 - 8MC800 - CAE2700 - EHB3040 - JL3-B150 - JL3-B200 - JL3-B090 - JL3-B1000 - HFA, HFB, FA - JL3-(B)8070 - JL3-B175 - EH-2020 - FA-3035 - EB-2050 - FA-2100 - FA-2050 - HFB-3050 - JA-2225 - HLM3800T - F3100N - MA3500 - EH2015 - LA3200WL - HLA3200T - 2607DS8U9 			

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturers/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 LN. 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 - EHB3025	Not Provided	Stokely Enterprises Molded Case Circuit Breakers	DOE Letter 8-26-91 Reprinted NuVEP Bulletin 7-26-91
Circuit Breakers	Fed. Pacific (Component Examples)		General Circuit Breaker & Electrical Supply	
	- NEF431020R - NE111020 - NE	3 pole, 20 amp 1 pole, 20 amp 1 pole, 15 amp	HLC Electric Supply California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	SENS ID #10 3-17-89

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Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Fed. Pacific (Component Examples) (cont.)	1, & 3 pole 30, 60 & 100 amp breakers	ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	SENS ID. #11 3-3-89
	Jefferson (Component Examples)	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 Mid West Co.	NRC I.N. 88-46, Supp. & Attach. NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers	Superior (Component Examples)	Not Provided	General Circuit Breaker & Electrical Supply Rosen Electric HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46 Supp. & Attach.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Manufacturer Not Provided (Component Examples) SDDHP 250	2 pole - 50 amp	General Circuit Breaker & Electrical Supply H.C. Electric Supply California Breakers, Inc. PENCON International (DBA) ATS Circuit Breakers and AC Circuit Breaker Electrical Supply	NRC 1N 88-46, Supp. & Attach.
Circuit Breakers	Cutter Hammer (Component Examples) - 10177HI3	Not Provided	AAKER General Circuit Breaker & Electrical Supply H.C. 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 1N 88-46, Supp. & Attach.
Hammers	- 10177H21 - 10177H32 - 10177H036 - 10177HI049			

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Relays	Potter & Brumfield (Component Examples)	Not-latching rotary	Stokely Enterprises Spectronics, Inc. Nuthorn International The Martin Co.	NRC I.N. 90-57 & Attach.
	MDR-138, 173-1 134-1, 142-1			
	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)	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.
	- 12HGA-11SS2 - NX 400			
	Manufacturer not provided	Not Provided	Stokely Enterprises	DOE Letter 8-26-91 Reprinted NuVEP Bulletin 7-26-91
- FSC-5945				
Amerace (or Agastat) (Component Examples)	Electro Pneumatic Timing Relays	Amerace Control Components Supply	SENS ID #1 11-1-91 NRC I.N. 92-24	
Models: E7024 E7022				
A through L Series Model 7032	PRB			

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Component	Manufacturer/Type	Description	Supplier	References
Fuses	Bussman Co. (Component Examples) RCN 15 & NOS 30	15A-250V & 30A-600V	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATIS Circuit Breakers and AC Circuit Breaker - Electrical Supply Preventive Maintenance Systems (PMS)	NRC 1N, 88-46, Supp. & Attach.
Controllers	Manufacturer Not Listed (Component Examples) Westinghouse (Component Examples) 6268187G17 6268187G13	All Supplied by PMS Motor Controllers	Stokely Distributors & Stokely Enterprises, Inc. General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATIS Circuit Breakers and AC Circuit Breaker Electrical Supply	DOE letter 7-26-91 & NUV/EP Bulletin 7-26-91 NRC 1N, 88-45 Supp. & Attach.
Starters	Unknown	Not Provided	Impala Electronics	NRC 1N 91-01

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Semiconductors	Solid State Devices Inc. (SSDI) SFF 9140	P-Channel MOSFET	SSDI	DOE Albuquerque Letter, 06-25-96 to DOD Inspector General
	SPD 1511-1-11	Pin Diode (SA3059)		
	2A14/18 or 2A14/52	Ion Implanted Diode		
	SSR4045CTTXV	SCHOTTKY Diodes		
	SFF9140TWX	Power Transistors		
	SPMF106ANH	Special Pack MOSFET Switch		
	SPD 5818 or INS858JTXV	Axial Leaded SCHOTTKY Diode		
Starter Controls	2N797	Transistor	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
	Unknown	Diode (SA 3436)		
	Westinghouse - (Component Examples)	Not Provided		
	- A200M1CAC			
	- A201K1CA			
	- A201L2CA			
	- AN13A			

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Gauge Glasses	Siemens & Allis (Component Examples) #00-737-637-118 215 F	Not Provided	Rosen Electric Co.	NRC LN 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 LN 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 LN 88-46
Push button station	Crouse Hinds (Component Examples) #00-737-637-118	Single gang pushbutton	Plant Electric Supply Co.	SENS Report ID #16 F-27-92

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Overload Relay Thermal Unit	Square D (Component Examples) B19.S, 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 Diallo & ITT Engineered Valves	NRC Comp. Bulletin 87-02
	Crane, Pacific, Powell, Walworth & Lunkenheimer	Gate Valves	Coffeyville Valve Inc.	NRC I.N. 92-56
	Pacific	8" & 3" Globe Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Crane Chapman	24" Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Pacific	Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Valves	Kerocast	8" Valve	CMA & IMA Valve Refurbisher	NRC IN 88-48 Supp. & Attach.
	Pacific	4" Gate Valve	CMA & IMA Valve Refurbisher	NRC IN 88-48 Supp. & Attach.
	Lakechemer	6" Model 1542 20" Model 3011	CMA & IMA Valve Refurbisher	NRC IN 88-48 Supp. & Attach.
	Crane	All	CMA & IMA Valve Refurbisher	NRC IN 88-48 Supp. & Attach.
Flanges	China Ding Zhiang Nan Xi Li Flange Co. Shou Gang Mach. Eng. Co.	Flanges ASTM A105, ASME SA105	Bilhongold Co. LTD. Tan Gong Co. Sanxi Province Overseas Trading Corp.	NRC IN 92-68 and Attachments Office of Nuclear Safety 92-25, 93-23, and 92-35
	Masongchian-Dresser Industries	Plug stem, steen to plug anti-rotation pin, seal ring, valve plugs, bushings, cages & packing box components	Cor-Val Control Valve Specialists, H.H. Barnum & M.D. Norwood, Sample Weichol Controls, Inc.	National Board of Boiler and Pressure Vessel Inspectors (NBBVI) Bulletin: Special Report, 1992, Volume 48, Number 2, The Chinese Flange Investigation
Valve Replacement Parts	Hayward Tyler Pump Co.	HTPC ASME Nuclear Code	Hayward Tyler Pump Co.	NRC IN 88-97 Supp. & Attach HEB 83-05 & Attachments
Channel Members	Unistral Corporation	Continuously slotted channels, structural framing members, fasteners, nuts, fittings, pipe clamps	Unistral Corporation	NRC IN 91-25
Fire Barriers	Thermal Science Inc.	Thermo-Log J10	None Listed	ES&Q Update #8 NRC IN 92-55
Valve Actuator	Lunitorque	Eyeballs on housing cover	None Listed	Office of Nuclear Safety 93-25 NRC IN 93-37

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Steel	Alloy & Carbon Steel Co. Inc., Atlantic Steel Co., Livingston Steel Co., & Copperweld Steel Co.	Plate Angle Flat Bar Bar	Maccluth Corporation Pressure Vessel Nuclear Alloy & Carbon Steel Co., Inc.	NRC IN 89-56, Attachments and Supplements
Fasteners (Bolts, Screws, Nuts, and Washers)	(parentheses designated headmark) Asahi (A) Daichi (D) Daiichi (E) Fastener Co. of Japan (FJA) Hitomoto Metal (H) In Her (I) Kyowa (K) Kosaka Kogyo (KS) Kyoce Minamida Scribo (M) Mihara Kogyo (MS) Nippon (NF) Takar (RT) Tsubimori (S) Uhyne (UBNY) Yamada (Y) Yoco, Inacco (hollow in angle)	- Those with suppliers or manufacturers - Those that are improperly marked - Those of foreign manufacturer 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 Nedlunm Corporation UNICO Acc Corporation E. K. Fasteners, Inc. H. Y. Post Fasteners Co. Kobayashi Metals, LTD. Takar Screw Mfg. Co. LTD. Yamaguchi Seisakusho Co. LTD. Highland Bolt & Nut Poncoron 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 I. A. Jones, Ltd., 9/23/92 Memo from L. Kubicek, 3/28/91 Memo from D. Saow, 3/8/91 "Fastener Technology International," Feb. April, and June 1993 Rep. J. Diegelli Ltr to Comm. Dept. & NRC June 18, 1993 Office of Nuclear Safety 93-26, 93-22, 93-11 DOE Quality Alert Bulletin, Issue No. 92, 4, August 1992 FDH Hanford Suspect Headmark List

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

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

A. ELECTRICAL ITEMS

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

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

B. MECHANICAL ITEMS

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

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

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

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

C. PIPING - which requires an ASTM or ASME standard

- Fittings
- Flanges
- Valves
- Pipe
- Components

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

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

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

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

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

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST

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

Industrial Fasteners Institute (IFI)

The following information is available from IFI via subscription:

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

The National Board of Pressure Vessel Inspectors (NBBI)

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

National Highway Traffic Safety Administration (NHTSA)

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

Trade Journals and Magazines

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

Newspaper and Television Reports

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

U.S. Nuclear Regulatory Commission (NRC)

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

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

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST (cont.)**Government Industry Data Exchange Program (GIDEP)**

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

U.S. Department of Energy

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

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

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

U.S. Customs Service

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

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

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

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

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ATTACHMENT E - WHERE TO LOOK FOR SUSPECT/COUNTERFEIT ITEMS

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

Items in Supply

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

Items in Use

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

Items Being Procured

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

Operations Decisions

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

Cost of Implementation

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

Cost of Focus on Known Suspect/Counterfeit Parts

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

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION

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

DETECTION METHODS

Visual Inspection

Items may be substandard or fraudulent when:

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

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

Documents may be suspect/counterfeit when:

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

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

Fasteners

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

Electrical Devices

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

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

Rotating Machinery and Valve Internal Parts

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

Valves

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

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

- Valve Body

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

Manufacturer's Logo

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

Other

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

Price

- Price is significantly less than that of the competition.

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ATTACHMENT G - FASTENERS

1.0 Counterfeit/Substandard High-Strength Bolts

1.1 General Background

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

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

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

1.2 Headmarks

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

1.3 Consensus Standards

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

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ATTACHMENT G - FASTENERS (cont.)

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

1.4 Precautions: Selective Testing

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

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

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

1.6 Keep Bolts in Original Packages

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

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ATTACHMENT C - 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 F rather than the ASTM A320 standard discussed in the IFI warning.

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

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ATTACHMENT G - FASTENERS (cont.)

2.3 Issue

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

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

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

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ATTACHMENT II - 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 examples 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 JNF-PRO-301. Note: This list was originally published by DOE/EH-0196, Issue No. 97-5.

If any of these fasteners are located, contact your facility SCS Point of Contact (POC) for instructions. The POC list is on the Hanford Intranet at <http://docs.sl.gov/han/inf/hlsncl/hlsncl.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

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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 Jion 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 Minamidz Sieybo (JP)		KY Kyohei Mfg (JP)
	MS Minato Kogyo (JP)		J Jion Her (TW)
	Hollow Triangle Infasco (CA, TW, JP, YU) (Greater than 1/2 inch diameter Grade 8 Hollow Triangle only)		UNY Unytite (JP)
	E Daiei (JP)		

Grade 8.2 fasteners with the following headmarks:

Mark	Manufacturer
	KS Kosaka Kogyo (JP)

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

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

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

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

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS

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

I. Recognition Factors

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

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

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

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

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

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

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

2. Indicators of Refurbished Breakers

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

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

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

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

3. Testing

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

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

4. Precautions

Follow these precautions regarding suspect or refurbished circuit breakers.

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

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

5. Disposition

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

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ATTACHMENT J - ASSESSMENT/SURVEILLANCE LINES OF INQUIRY

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

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

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



TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix E

Request for Information

(2 pages including cover)

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TECHNICAL SPECIFICATION

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PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

REQUEST FOR INFORMATION		Project # RFI000 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: _____		
Cost Impact	Schedule Impact	
Subcontractor (sign/date): _____		
TO BE COMPLETED BY THE BUYER		
RFI Approved: <input type="checkbox"/> Yes <input type="checkbox"/> No CN Required: <input type="checkbox"/> - CN # _____ CN Not Required: <input type="checkbox"/> As-Built documentation Required: <input type="checkbox"/> As-Built documentation Not Required: <input type="checkbox"/> Submittal Data Required: <input type="checkbox"/> Yes <input type="checkbox"/> No	COMMENTS Design Lead / Proj Mgr / Date: _____	

RFI Feb 2004

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TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix F

Bidder's Drawing and Data Commitments

(4 pages including cover)

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TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-006.1	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington	EQUIPMENT NO.: 33-D58-068	

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 A4/locad 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:	DMJMHN, Inc. dba DMJM Technology 3250 Port of Benton Blvd Richland, WA 99354-1670 Attn: Project Records Phone: (509) 375-7856 Fax: (509) 375-5331
Submit all documents via courier service	
Faxed documents must be followed by the originals.	
Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control	
Always include a transmittal	

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal	Bidder shall include this data for each item			REVIEW	VENDOR
	Review	Final	Required before activity such as fabrication, ordering, testing, shipping etc.	ITEMS DUE WITHIN	COMMITMENT
			Required within 7 days prior to activity unless otherwise specified	(DAYS)	(DAYS)
PROPOSAL	REVIEW	FINAL	Submittal Number	DESCRIPTION	
E+3			DCRS-01	Proof of NOA-1 or equivalent QA program	
E+3			DCRS-02	Experience list and maintainability information	
E+3			DCRS-03	Completed data sheets	
E+3			DCRS-04	Subcontractor list	
E+3	E+3		DCRS-05	Design, fabrication & delivery schedule	PO+7
	E+3	E+6	DCRS-06	Single line block diagram	PO+7
	E+3	E+6	DCRS-07	Outline drawing including weights and dimensions	PO+21
	E+3	E+1	DCRS-08	List of pump materials of construction (with wetted parts noted)	PO+21
	E+3	E+1	DCRS-09	Test plan	PO+21
	E+3	E+6	DCRS-10	Technical brochures on purchased components	PO+21
	E+3	E+3	DCRS-11	Interface drawing	PO+21
	E+3	E+3	DCRS-12	Equipment Dimensional drawings	PO+21
	E+3	E+3	DCRS-13	Electrical wiring diagrams	PO+21
	E+3	E+3	DCRS-14	Control wiring diagrams	PO+21
	E+3	E+3	DCRS-15	Pipe support detail drawings	PO+21
	E+3	E+3	DCRS-16	Pipe support calculations	PO+21
	E+3	E+3	DCRS-17	ISO container modification structural calculation	PO+21
	E+3	E+1	DCRS-18	Preliminary condensate pump performance curve	PO+21
	E+3	E+3	DCRS-19	Pump sizing calculation	PO+21
	E+3	E+3	DCRS-20	Pipe sizing calculation	PO+21
	E+3	E+3	DCRS-21	Motor starting calculation	PO+21
	E+3	E+3	DCRS-22	Motor sizing calculation	PO+21
	E+3	E+3	DCRS-23	Motor specifications and datasheet	PO+21
	E+1	E+1	DCRS-24	NDE personnel certifications	PO+21
	E+1	E+1	DCRS-25	Visual Weld/NDE procedures	PO+21



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-006.1	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		
		EQUIPMENT NO.: 33-058-068	

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 Vendor's name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revision numbers, quantities, status and document types must be included with all submissions (including electronic submittals).

SEND ALL DOCUMENTS TO:				DMJM+N, Inc. dba DMJM Technology 3250 Port of Benton Blvd Richland, WA 99354-1670 Attn: Project Records Phone: (509) 375-7856 Fax: (509) 375-5331			
Submit all documents via courier service Faxed documents must be followed by the originals. Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control Always include a transmittal							
BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS							
Proposal	Bidder shall include this data for each item				REVIEW	VENDOR	
	Review	Required before activity such as fabrication, ordering, testing, shipping etc....				ITEMS DUE	COMMITMENT
		Final	Required within 7 days prior to activity unless otherwise specified			WITHIN	
PROPOSAL	REVIEW	FINAL	Submittal Number	DESCRIPTION	(DAYS)	(DAYS)	
	E+3	E+3	DCRS-26	Bill of materials	Feb-10		
	E+3	E+6	DCRS-27	System assembly instructions	Feb-14		
	E+3	E+3	DCRS-28	Structural analysis for hoisting and rigging	Feb-14		
	E+3	E+3	DCRS-29	Operation and maintenance manuals	Feb-14		
	E+3	E+1	DCRS-30	Welding procedures, procedure qualification records, and welder procedure qualification records	Feb-10		
	E+3	E+1	DCRS-31	AWS CWI certificate	Feb-10		
	E+3	E+3	DCRS-32	Insulation system	Feb-10		
	E+3	E+3	DCRS-33	Protective coating specifications	Feb-10		
	E+3	E+1	DCRS-34	Fabrication travelers	Feb-10		
	E+3	E+1	DCRS-35	Cleaning procedures	Feb-10		
	E+1	E+1	DCRS-36	Visual weld examination procedure/weld map	Feb-10		
	E+3	E+1	DCRS-37	FAT procedures	Test-10		
	E+3	E+1	DCRS-38	NCR's	When identified +3		
	E+3	E+3	DCRS-39	Fabrication red line changes	When identified		
	E+3	E+3	DCRS-40	Recommended spare parts and frequency of replacement	Del-28		
	E+3	E+3	DCRS-41	Rigging sketches	Del-21		
	E+3	E+1	DCRS-42	Final Test results (document and video records)	Del		
		E+1	DCRS-43	Packing list and identification of shipping supports	Del		
		E+3	DCRS-44	Certified material test reports	Del		
		E+3	DCRS-45	Bolt torque inspection	Del		
		E+3	DCRS-46	CoCs and MTR's	Del		
		E+3	DCRS-47	As-Built drawings	Del		



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-006.1	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID EQUIPMENT NO.: 33-D58-068	
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 Vendor's 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: 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	DMJMHN, Inc. dba DMJM Technology 3250 Port of Benton Blvd Richland, WA 99354-1670 Attn: Project Records Phone: (509) 375-7856 Fax: (509) 375-5331
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal	Bidder shall include this data for each item				REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (DAYS)
	Review	Required before activity such as fabrication, ordering, testing, shipping etc...				
	Final	Required within 7 days prior to activity unless otherwise specified				
PROPOSAL	REVIEW	FINAL	Submittal Number	DESCRIPTION		
		E+3	DCRS-48	NEC inspection certificate & electromagnetic interference test results	Del	

Legend: E+3 = Electronic Copy PO; Del = Due within 7 calendar days of PO issuance; Del 7 = Due within 7 calendar days of delivery; COM = Due within 7 calendar days of commissioning

THE TIMELY RECEIPT OF THE VENDOR DOCUMENTS IS CRITICAL TO THIS PROJECT.

Buyer commits to a 10 working day turnaround cycle after receipt of approval documents.

I agree to provide the listed documentation and data and the dates shown above.

Vendor Signature _____ Date _____

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TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
CLIENT:	AMEC E&E - Richland, Washington		

Appendix G

Instrumentation Naming and Tagging Convention

(3 pages including cover)

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TECHNICAL SPECIFICATION

PROJECT:	Final DBVS Design	145579-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
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-D-SP-006	REV. 2
PROJECT NO.:	145579	DRYER AND CONDENSATE RECOVERY SYSTEM SKID	
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.

Permit Attachment LL DBVS

Appendix 3 Waste Dryer System

Section 6 Miscellaneous

Corrosion Review for Technical Specifications: Dryer and Condensate Recovery System (143643-D-SP- 001) and Dryer and Condensate Recovery System Skid (145579-D-SP-006). January 28, 2005^a

Response to Corrosions Review for the Waste Dryer System. March 4, 2005^a

Response to the Response to Corrosion Review for the Waste Dryer System. March 16, 2005^a



Your single source for Chemical, Materials, and Environmental Technology

January 28, 2005

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

Dear Mr Grenard

Technical Specifications: *Dryer and Condensate Recovery System (143643-D-SP-001) and Dryer and Condensate Recovery System Skid (145579-D-SP-006) – A Corrosion Review*

This document presents some comments on specific details in the specifications and recommendations.

Dryer and Condensate Recovery System (143643-D-SP-001)

1. Next to last bullet, section 1.2 – During bench scale tests, corrosion measurements are needed. Preferably use coupons but if not, then visual inspection of the heat transfer surfaces before and after testing.
2. Figure 3-1 – Estimates of the erosion allowance needed for the transfer lines for solids are needed.
3. Table 3-4 – Ensure soil used in dryer tests is representative of the soil to be used during operation. Soil types vary with location, horizontally and vertically.
4. Section 3.3.1.1.3 – The use of 300 series stainless steel for the heat transfer surface of the dryer need close scrutiny during testing. The expected temperatures and solution concentrations are marginally acceptable.
5. Section 3.3.1.1.8 – Abrasion resistant coatings on the plow will determine restrictions on operating conditions. If the deposits contain metallic species, such as nickel or iron, they are susceptible to corrosion if the dryer is cleaned with acids. The same is true for some oxides. Frequently metals are used in brazes and in powder metallurgy. Therefore, unless tests are performed to prove otherwise, acid cleaning is contraindicated.
6. Section 3.3.1.3 – The composition of the condensate is reported to be pH 7 water (145579-D-SP-011, Rev 0, page 24). This solution is compatible with 304L stainless steel; the condenser will not collect liquid and the condensate tank has a bottom drain, Figure 3-1, to permit its being drained.
7. Section 3.3.1.4.3 – The fabrication and operating temperatures should be reviewed. According to NRC Regulatory Guide 7.11, A36 steel has a nil-ductility transition temperature (NDT) above 0 °F. This is critical only if the vessels are fabricated, transported, or operated at temperatures below the NDT. Normalized A516 or A537 steels are alternatives with lower NDTs.
8. Section 3.3.1.4.3, paragraph 4 – Care should be taken to prevent low spots in stainless steel piping to minimize the potential for pitting.
9. Section 3.3.1.8.2 – Care should be taken not to run galvanized conduit where it can be exposed to waste or to acid solutions.

10. Section 3.3.1.9, paragraph 1 – the prohibition of "yellow" metal is assumed to not apply to copper wiring.
11. Section 3.3.1.10.1 – This requirement does not apply to alkaline waste, which may exceed 250 ppm chloride.
12. Section 3.3.5 – The use of 0.06 inch is excessive as a corrosion allowance, especially for stainless steel. On the other hand, the erosion allowance needs to be determined; this is a function of particle size, velocity, and alloy of construction.

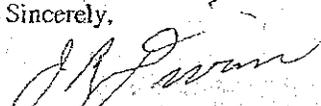
Dryer and Condensate Recovery System Skid (145579-D-SP-006)

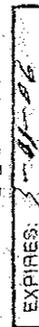
1. Figure 3-1 – The soil and dry waste transfer lines need to be evaluated for the needed erosion/wear allowance.
2. Section 3.2.1.9 – What is the pressure control? Steam at 15 psig yields about 250 °F. If higher temperatures occur, the potential for corrosion in the dryer increases.
3. Section 3.3.1.2.2 – The given corrosion allowances are high and may result in excessively heavy pipe.
4. Section 3.3.1.4.9 – Because of uncertainties in their manufacture, polymers should have an acceptable radiation dose at least ten times greater than anticipated during operation.
5. Section 3.3.1.5.7 – Neither should aluminum plate be used for the floor.
6. Pertinent items in Specification 001 also apply to Specification 006.

Other Comments & Recommendations

1. In addition to general construction practice, surfaces to be coated should not contain sharp corners or edges.
2. If it is anticipated that the service life will exceed 5 y, consideration should be given to coating the bottoms of the tanks whether sitting on-grade or on a pad. Further, consideration should be given to the use of cathodic protection of the bottoms.
3. The fluid in copper lines should be maintained at less than 5 ft/sec to minimize cavitation.

Sincerely,


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





3250 Port of Benton Blvd
MSIN H0-50
Richland, WA 99354-1670
T 509.375.7774
F 509.375.5331

March 4, 2005

DBVS-LDS-004

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

Reference: *Dryer and Condensate Recovery System* (143643-D-SP-001) and *Dryer and Condensate Recovery System Skid* (145579-D-SP-006)—A Corrosion Review, dated January 28, 2005.

SUBJECT: RESPONSE TO CORROSION REVIEW FOR THE WASTE DRYER SYSTEM

Dear Mr. Divine,

DMJMH+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 I 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 Waste Dryer System.

Respectfully,

Kurt J. McCracken
Chief Engineer

James R. Fredrickson
DBVS Project Manager

cc: DMJM Technology CH2M HILL Hanford Group, Inc.
James Frederickson Mike Leonard
Kurt McCracken Dave Shuford
Ja-Kael Luey
DMJM File/LB

AMEC Earth and Environmental

Leo Thompson
Mark Lucas

Mr. James R. Divine
 DBVS-LDS-004
 March 4, 2005
 Page 2 of 5

Table 1. Dryer and Condensate Recover System. (5 sheets)

Item	Section	Corrosion Review Comment or Recommendation	DBVS Project Disposition or Planned Action
Dryer and Condensate Recovery System (143643-D-SP-001) - A Corrosion Review, dated January 28, 2005			
1.	Next to last bullet, section 1.2	During bench scale tests, corrosion measurements are needed. Preferably use coupons but if not, then visual inspection of the heat transfer surface before and after testing.	Corrosion and erosion observations will be made during small-scale dryer testing performed by the Pacific Northwest National Laboratory in support of the DBVS Project.
2.	Figure 3-1	Estimates of the erosion allowance needed for the transfer lines for solids are needed.	An erosion, or wear, allowance will be determined by the fabricator of the noted lines using data from a Jenike and Johanson report (October 2004) that documents bulk material handling properties for the dried waste simulant used in DBVS dryer small-scale testing. The DBVS Project will review vendor submittals for the transfer systems to ensure that an allowance has been incorporated in the design.
3.	Table 3-4	Ensure soil used in dryer tests is representative of the soil to be used during operation. Soil types vary with location, horizontally and vertically.	Once a specific source for the soil has been determined, testing is planned to verify compatibility of the equipment with that soil.
4.	Section 3.3.1.1.3	The use of 300 series stainless steel for the heat transfer surface of the dryer need to close scrutiny during testing. The expected temperatures and solution concentrations are marginally acceptable.	See response to Item #1.
5.	Section 3.3.1.1.8	Abrasion resistant coatings on the plow will determine restrictions on operating conditions. If the deposits contain metallic species, such as nickel or iron, they are susceptible to corrosion if the dryer is cleaned with acids. The same is true for some oxides. Frequently metals are used in brazes and in powder metallurgy. Therefore, unless tests are performed to provide otherwise, acid cleaning is contraindicated.	The dryer is expected to be cleaned only with clean soil and water if necessary. Operation and maintenance procedures will be reviewed to ensure acids are not used for cleaning.

Mr. James R. Divine
 DBVS-LDS-004
 March 4, 2005
 Page 3 of 5

Table L. Dryer and Condensate Recover System. (5 sheets)

Item	Section	Corrosion Review Comment or Recommendation	DBVS Project Disposition or Planned Action
6.	Section 3.3.1.3	The composition of the condensate is reported to be pH 7 water (145579-D-SP-011, Rev 0, page 24). This solution is compatible with 304L stainless steel; the condenser will not collect liquid and the condensate tank has a bottom drain, Figure 3-1, to permit its being drained.	Data for the condensate will not be available until full-scale integrated testing with nonregulated material is performed. Some information may be obtained from small-scale testing with simulant material to determine if there is a potential concern.
7.	Section 3.3.1.4.3	The fabrication and operating temperatures should be reviewed. According to NRC Regulatory Guide 7.11, A36 steel has a nil-ductility transition temperature (NDT) above 0 °F. This is critical only if the vessels are fabricated, transported, or operated at temperatures below the NDT. Normalized A516 or A537 steels are alternatives with lower NDTs.	The dryer and condensate recovery skids will be located inside a temperature controlled container so that the temperature will not be below 40 °F. Transportation and installation plans will be reviewed to ensure that these activities are not performed during temperatures of concern.
8.	Section 3.3.1.4.3, paragraph 4	Care should be taken to prevent low spots in stainless steel piping to minimize the potential for pitting.	The design submittals will be reviewed to ensure that it contains sloped lines and bottom drains in the DCRS to minimize standing liquids and thus the potential for pitting. The condensate system is the component of concern and is required to be drainable per Section 3.3.1.3.1 of the specification.
9.	Section 3.3.1.8.2	Care should be taken not to run galvanized conduit where it can be exposed to waste or to acid solutions.	The specification calls for RGS conduit, which is external to the dryer but inside the secondary containment of the dryer. If any waste leaks are present, they will be detected within 24 hours and removed. The skids will then be water-washed down accordingly.
10.	Section 3.3.1.9, paragraph 1	The prohibition of "yellow" metal is assumed to not apply to copper wiring.	Yellow metal only pertains to waste contacting metals.
11.	Section 3.3.1.10.1	This requirement does not apply to alkaline waste, which may exceed 250 ppm chloride.	The 250 ppm limit of chlorine is for preservation during fabrication only.

Mr. James R. Divine
 DBVS-LDS-004
 March 4, 2005
 Page 4 of 5

Table 1. Dryer and Condensate Recover System. (5 sheets)

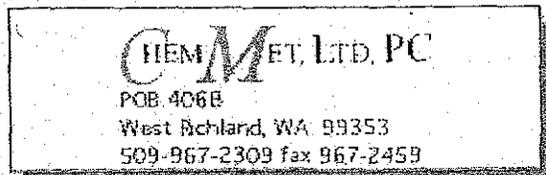
Item	Section	Corrosion Review Comment or Recommendation	DBVS Project Disposition or Planned Action
12.	Section 3.3.5	The use of 0.06 inch is excessive as a corrosion allowance, especially for stainless steel. On the other hand, the erosion allowance needs to be determined; this is a function of particle size, velocity, and alloy of construction.	See Item #1.
Dryer and Condensate Recovery System Skid (145579-D-SP-006)—A Corrosion Review, dated January 28, 2005			
1.	Figure 3-1	The soil and dry waste transfer lines need to be evaluated for the needed erosion/wear allowance.	See Items #1 and #2 above for 143643-D-SP-001.
2.	Section 3.2.1.9	What is the pressure control? Steam at 15 psig yields about 250 °F. If higher temperatures occur, the potential for corrosion in the dryer increases.	The pressure control on the dryer is controlled through pressure control valves (set at 15 lb/in ² gauge) on the DCRS skid system (PCV-001 for the dryer and PCV 022 for the dryer sintered metal filter on Drawing F-145579-33-A-0100 zone B6).
3.	Section 3.3.1.2.2	The given corrosion allowances are high and may result in excessively heavy pipe.	See Item #12 above for 143643-D-SP-001.
4.	Section 3.3.1.4.9	Because of uncertainties in their manufacture, polymers should have an acceptable radiation dose at least ten times greater than anticipated during operation.	The DCRS Skid submittals will be reviewed for this item of concern. If issues are identified, then the material will be changed in the design.
5.	Section 3.3.1.5.7	Neither should aluminum plate be used for the floor.	The bottom pan inside the container assembly is required to be made from stainless steel and will be reviewed accordingly during detailed design.
6.	General	Pertinent items in Specification 001 also apply to Specification 006	Applicable actions for Specification 001 will be applied to the review of design material for Specification 006.

Mr. James R. Divine
 DBVS-LDS-004
 March 4, 2005
 Page 5 of 5

Table 1. Dryer and Condensate Recover System. (5 sheets)

Item	Section	Corrosion Review Comment or Recommendation	DBVS Project Disposition or Planned Action
Other Comments and Recommendations contained in the January 28, 2005 letter			
1.	General	In addition to general construction practice, surfaces to be coated should not contain sharp corners or edges.	The only coated surfaces in the DCRS will be the front face of the dryer plows and plow arms, which will be coated with a flame-spray coating to protect these components from wear during normal processing. Protective coating requirements for the ISO container are called out in Section 3.3.6 of Specification 145579-D-SP-006. Fabrication travelers and design media will be reviewed to address workmanship concern.
2.	General	If it is anticipated that the service life will exceed 5 y, consideration should be given to coating the bottoms of the tanks whether sitting on-grade or on a pad. Further, consideration should be given to the use of cathodic protection of the bottoms.	The anticipated service life is two years per contract documents. In the current design, it is not anticipated that any tanks in the DCRS will be in contact with the ground.
3.	General	The fluid in copper lines should be maintained at less than 5 ft/sec to minimize cavitation.	The current piping design for the DBVS Project does not include copper for chilled water lines or other piping types.

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Your single source for Chemical, Materials, and Environmental Technology

March 16, 2005

Kurt J McCracken, PE
Chief Engineer
James R Fredrickson
DBVS Project Manager
DMJM Technologies
3250 Port of Benton Blvd
Richland, WA 99354-1670

Ref:DBVS-LDS-004; March 4, 2004

Dear Sirs

The responses provided in Table 1 of the Subject Letter are acceptable.

ChemMet is pleased to have been of service.

Sincerely,

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

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