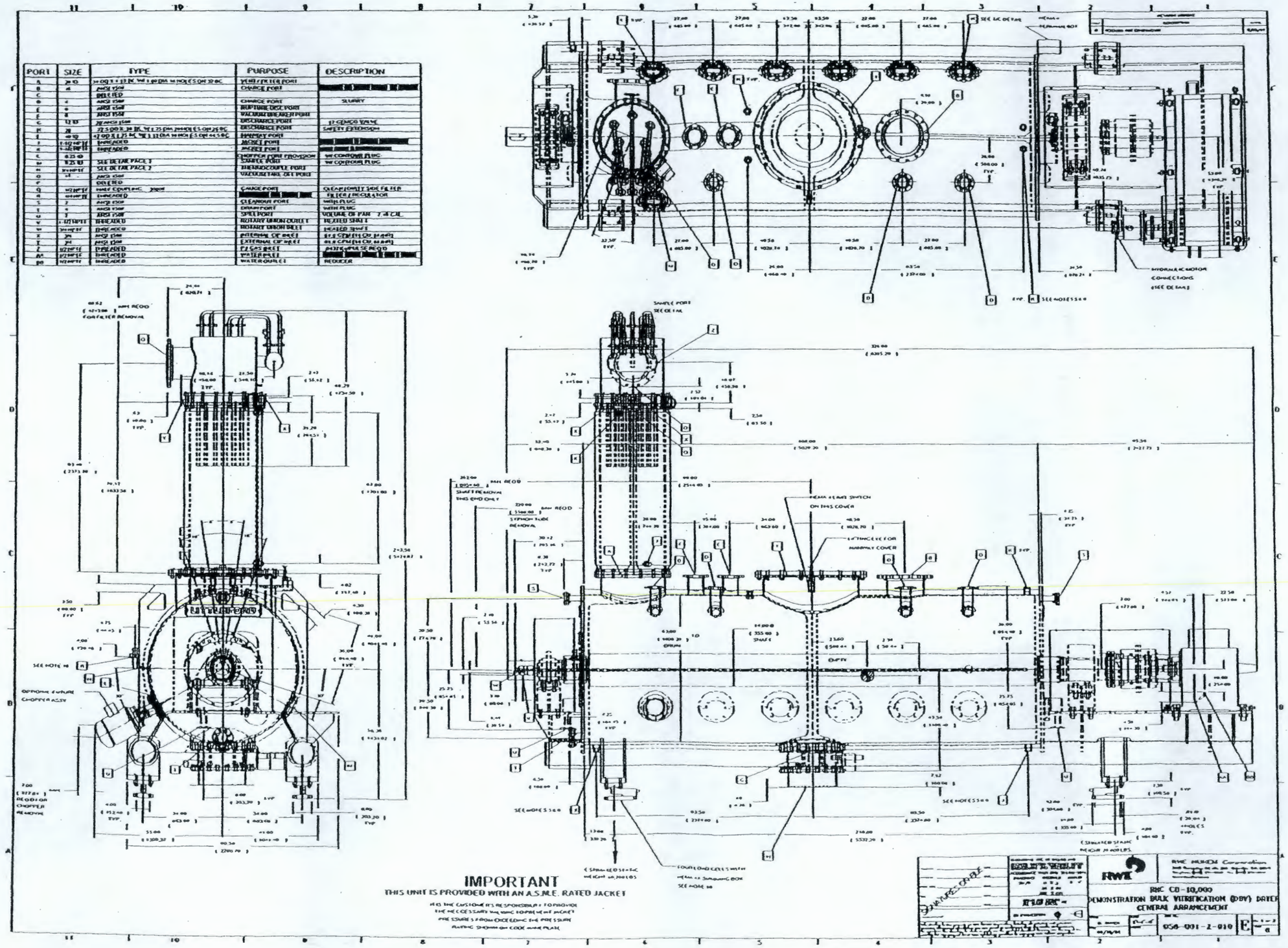
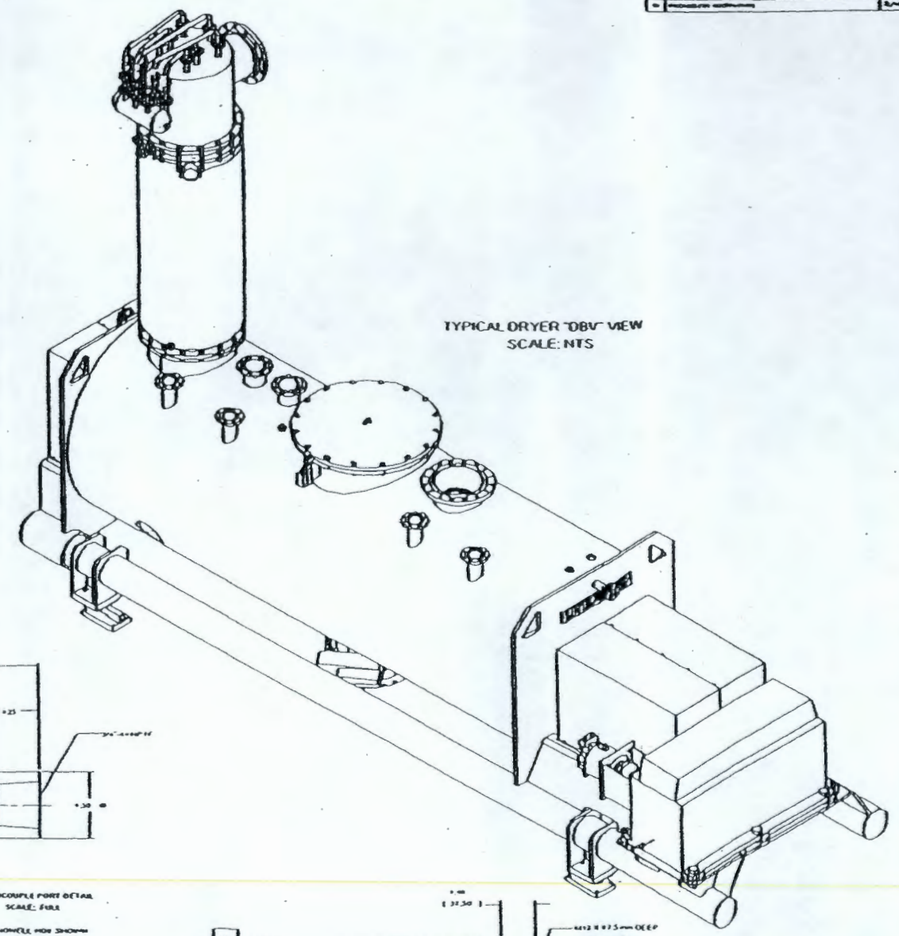
PORT	SIZE	TYPE	PURPOSE	DESCRIPTION
A	20 ID	[illegible]	VENT/FILTER PORT	
B	[illegible]	[illegible]	CHARGE PORT	
C		BELLEED		
D	[illegible]	[illegible]	CHARGE PORT	SLURRY
E	[illegible]	[illegible]	RUPTURE DISC PORT	
F	[illegible]	[illegible]	VACUUM BREAKER PORT	
G	12 ID	[illegible]	DISCHARGE PORT	12 GRAGO VALVE
H	[illegible]	[illegible]	DISCHARGE PORT	SAFETY EXHAUST
I	[illegible]	[illegible]	INMISET PORT	
J	[illegible]	THREADED	MOISET PORT	
K	[illegible]	THREADED	MOISET PORT	
L	0.25 ID		CHAMPAGNE THOMSON	W/ CONTROL PLUG
M	0.25 ID	SEE DETAIL PAGE 7	CHARGE PORT	W/ CONTROL PLUG
N	[illegible]	SEE DETAIL PAGE 7	THERMOCOUPLE PORT	
O	[illegible]	[illegible]	VACUUM TAKE OFF PORT	
P		BELLEED		
Q	[illegible]	[illegible]	GAUGE PORT	CLEAN/DIRTY SIDE FILTER
R	[illegible]	THREADED		FILTER/REGULATOR
S	[illegible]	[illegible]	CLEANOUT PORT	[illegible]
T	[illegible]	[illegible]	DRAIN PORT	[illegible]
U	[illegible]	[illegible]	SPILL PORT	VOLUME OF PAN 7.4 CU.
V	[illegible]	THREADED	ROTARY UNION OUTLET	HEATED SHAFT
W	[illegible]	THREADED	ROTARY UNION INLET	HEATED SHAFT
X	[illegible]	[illegible]	INTERNAL OR INLET	[illegible]
Y	[illegible]	[illegible]	EXTERNAL OR INLET	[illegible]
Z	[illegible]	THREADED	FLUSH INLET	[illegible]
AA	[illegible]	THREADED	WATER INLET	
BB	[illegible]	THREADED	WATER OUTLET	REDUCER

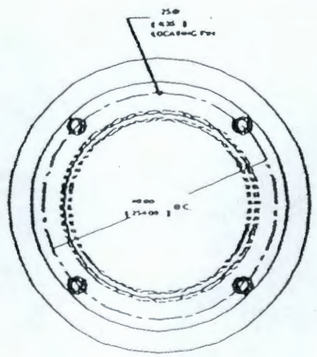


ENGINEERING DATA:

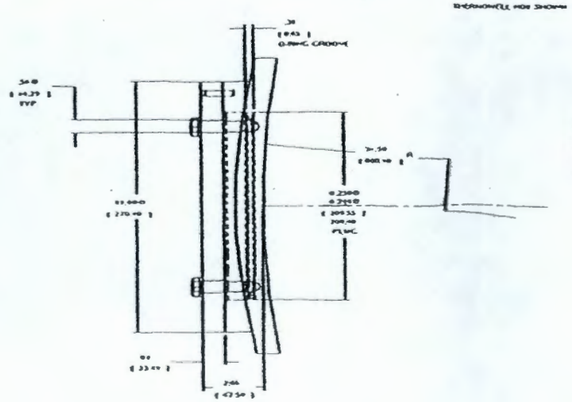
1. SPECIFICATION PER RFO 03-006 REV. 1 (ES-024) AND CLIENT LETTER 20843-LDS-029
2. AT RISK ITEMS ARE: PLOWS, HYDRAULIC OIL, CLEAN IN PLACE ON PULSE BACK FILTER.
3. INTERIOR OF DRYER AND ALL PRODUCT CONTACT SURFACES CONSTRUCTED OF TYPE 304L STAINLESS STEEL AND STANDARD UNPOLISHED INTERIOR (WELDS CLEANED UP ONLY)
   VALIDATION DOCUMENTATION ON PRODUCT CONTACT MATERIALS.
   NON STAINLESS EXTERIOR IS PAINTED AMERICOAT 220 (COLOR T.B.D.), 5 MIL THICKNESS
   DRYER SHELL IS 64.25 OD(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 @ 328°F.
5. 75 PSIG (320 °F MAX. / 32 °F MIN.) ASME CODE TYPE 304 STAINLESS STEEL DIMPLE JACKET
   2001 CODE SECTION VIII, DIVISION 3, 2003 ADDENDA WITHOUT THERMAL SHOCK
   INSTALLED ON DRYER DRUM. JACKET THICKNESS IS #12 GA. (.105). JACKET SHELL IS 65.00 OD.
6. 2" THICK FOAMGLASS INSULATION INSTALLED AROUND JACKET OF VESSEL, COVERED WITH ALUMINUM SHEATHING, RIVETED & CAULKED IN PLACE. SHEATHING IS 69.00 OD.
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 RNC REVIEW.
8. ESTIMATED STATIC WEIGHT 40,000 LBS (WITH PULSE-BACK FILTER)
   DYNAMIC LOADING PER RNC CALCULATIONS 04-017
9. FLOW RATE 30 GPM PER INLET 70 °F WATER REQD TO PRODUCE TURBULENT FLOW AT 5 PSI MAX. PRESSURE DROP.
10. BECKER STYLE WITH FINGERS MIXING 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 RNC 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 INLET FLANGES. IT IS THE CLIENT'S RESPONSIBILITY TO CONNECT TO A CLOSED SYSTEM.
16. 1/4" NPTF FILTER/REGULATOR FOR PNEUMATIC ACTUATORS:
    1.4 CU. FT. FREE AIR FOR DISCHARGE VALVE
    @ 80 PSIG PER CYCLE REQD.
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.
    75 PSIG (320°F MAX. / 32°F MIN.) ASME CODE
    TYPE 304 STAINLESS STEEL DIMPLE JACKET
    2001 CODE SECTION VIII, DIVISION 3, 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 "MICROFILTREX" 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"L X 108" W X 90" H.
    THREE (3) 200 HP MOTORS 1800 RPM, TEFC, MILL AND CHEMICAL DUTY WITH SPACE HEATERS, 460V, 3 PH, 60HZ
    CONNECTED TO THREE (3) PRESSURE COMPENSATED PISTON PUMPS, 85 GPM EACH
    WITH ELECTRONIC DISPLACEMENT CONTROL AMPLIFER.
    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 - 0358-01420-2
    B) SUMMING BOX - TB400355
    C) HOME RUN CABLE - 54062 0370-107.
    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 RNC AND THE SCALE INSTRUMENT WHICH IS SUPPLIED BY THE CLIENT.

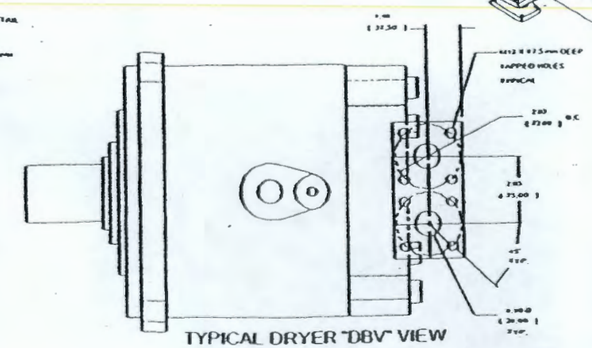


TYPICAL DRYER "DBV" VIEW
SCALE: NTS



DETAIL SAMPLE PORT PLUG
SCALE: 1 : 2

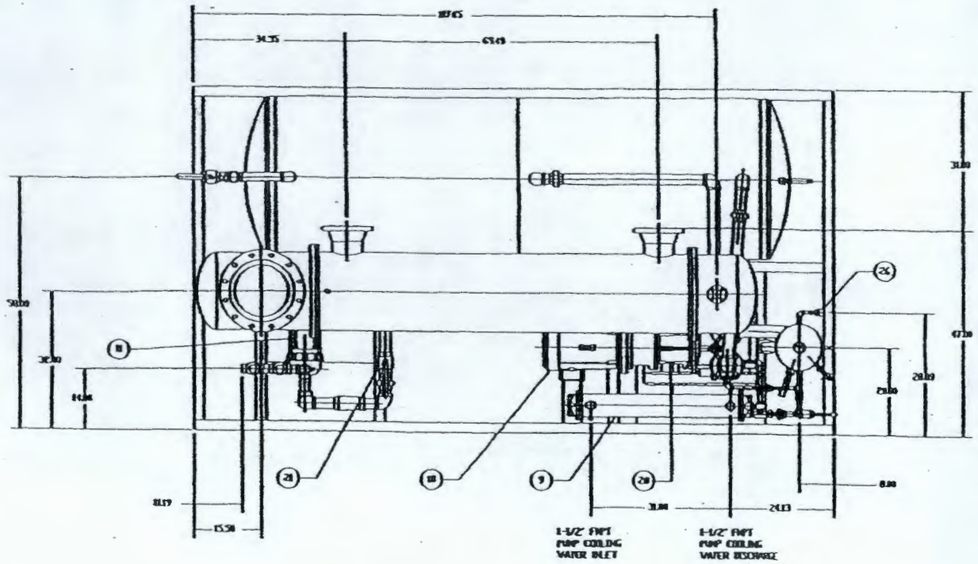




TYPICAL DRYER "DBV" VIEW
1:2

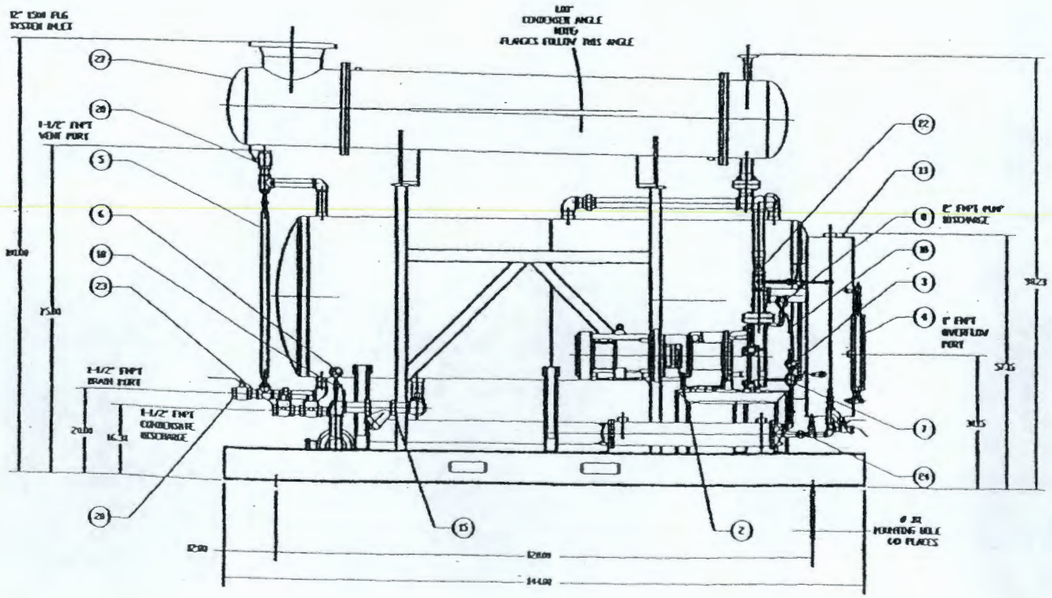
RNC CO-10,000
DEMONSTRATION BULK VITRIFICATION (DBV) DRYER
GENERAL ARRANGEMENT

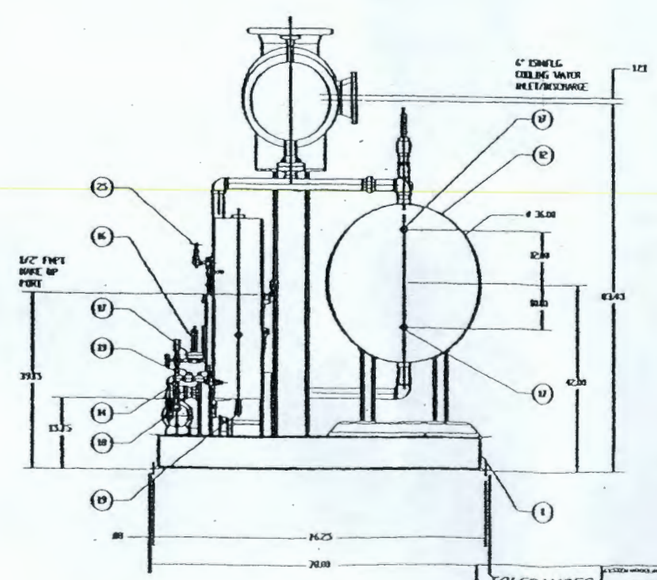
056-001-2-010 E



NOTES
1 VAPOR REMOVED
120 LB/HR WATER
23 SCFM AIR
25 DRYT INLET TEMPERATURE
121 MBH OPERATING VACUUM LEVEL
13 COOLING WATER REQUIRED FOR CONDENSER
365 GPM @ 30°F
10 TRANSFER PUMP 23 GPM @ 27' TDH
59 CONDENSER FLANGES ARE AT ANGLE FOR PIPE BASE
10 CONDENSER HOUSING
304L SS/CARBON STEEL, 75 PSIG @ 366°F
TUBE SIDE 304SS 75 PSIG/FULL VACUUM @285°F
73 BASEPLATE MATERIAL IS STRUCTURAL STEEL ASTM A36 CS
10 ALL PRESSURE/VACUUM GAUGES ARE BOTTOM CONNECTED
GLYCERINE FILLED
39 CONDENSATE RECEIVER IS
NOT CODE RATED 145 PSIG/FULL VACUUM @ 285°F
103 PIPING MATERIAL IS 304SS WITH BUTTON GASKETS

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	BASEPLATE 96" X 30" CS	[illegible]
2	1	VALVE BALL 304SS 3/4NPT(F) CLOSE	[illegible]
3	1	GAUGE TEMP 0-200F/0-93F/0-100C 3/4"	[illegible]
4	1	GAUGE LVL 3" 1NPT 304SS LG 12/0-8/1	[illegible]
5	1	GAUGE LVL 3" 1NPT 304SS LG 12/0-8/1	[illegible]
6	1	GAUGE PRES 0-60PSI 1/4NPT 304SS 2.5"DIAL FILLED	[illegible]
7	1	GAUGE TEMP 3" 2NPT/4FT 3" DIAL	[illegible]
8	1	GAUGE VAC 0-30INHG 1/4NPT 304SS 2.5"DIAL FILLED	[illegible]
9	1	[illegible] GLASS/SS [illegible]	[illegible]
10	1	[illegible] 1/2" 2SOC 2300# SS	[illegible]
11	1	PIPE [illegible] 1 1/2" 2" 150C 316/316	[illegible]
12	1	CONDENSATE RECEIVER 39 GAL 304SS	[illegible]
13	1	STRAINER 1/2" 600 FIG SS	[illegible]
14	1	STRAINER Y 3/4" 1NPT 316/316 SS	[illegible]
15	1	STRAINER Y 2"1NPT 316/316	[illegible]
16	1	SWITCH FLOW 3/4" 1NPT 150 SS LS 4/4	[illegible]
17	3	SWITCH LEVEL 1" 1NPT 150 304SS/304SS	[illegible]
18	1	VLV BALL 2/4" 1NPT 150 2-PC 304SS/FE	[illegible]
19	2	VLV BALL 3/4" 1NPT 150 2-PC 316/FE	[illegible]
20	2	VLV BALL 1/2"1NPT 150 2-PC 304SS/FE	[illegible]
21	1	VLV BALL 2/4" 1NPT 150 2-PC 304SS/FE	[illegible]
22	1	VLV CK 1NC 2" 1NPT 150/SS/BUNA	[illegible]
23	2	VLV SOLNOID 1/2" 1NPT 316/FE	[illegible]
24	1	VLV GATE 3/4" 1NPT 304SS 2500	[illegible]
25	1	VLV GLOBE 3/4" 1NPT 304SS Rated	[illegible]
26	1	VLV BAL 2/4NT 1/2" 150/FNT 1250/ 1"	[illegible]
27	1	CONDENSER 304 1NPT 12"X12" IN	[illegible]
28	1	PUMP IN 1 15G 150 GPM 316/316/FE	[illegible]





CHECK PRINT

REV	DESCRIPTION	DATE	APPROVALS
A	Approved/Release (released to mfg)	3/26/04	

REVISIONS

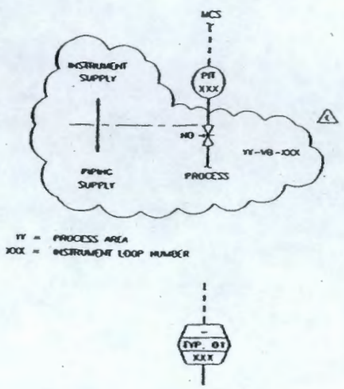
TOLERANCES
DECIMAL ± 0.005"
FRACTIONAL ± 1/32"
ANGULAR ± 0° 30'
UNLESS OTHERWISE SPECIFIED IN DRAWING

C353B500ss-WS3-150V-FFRas
#10884-2004195
VO | PW | 4/1/04
5150

WINTEK CORPORATION
Water Recovery Vacuum System
353 B2500 Cap 150 GPM Unpaid Pkg

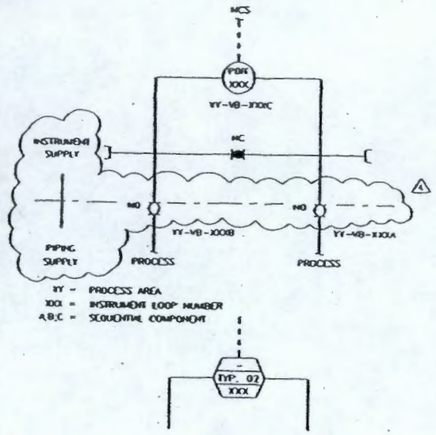
RPP-24544 REV 1a

TYPICAL # 01
PRESSURE TRANSMITTER



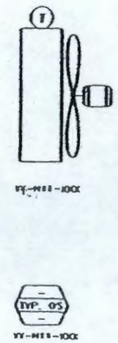
YY = PROCESS AREA
XXX = INSTRUMENT LOOP NUMBER

TYPICAL # 02
DIFFERENTIAL PRESSURE TRANSMITTER

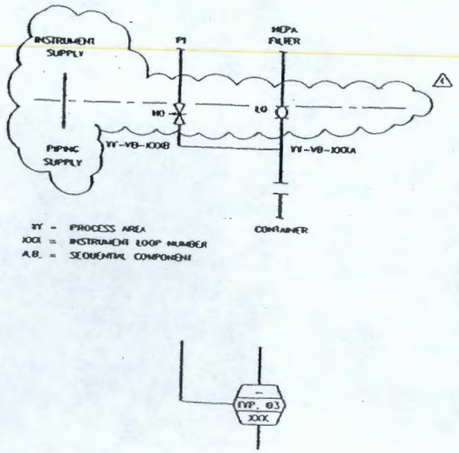


YY = PROCESS AREA
XXX = INSTRUMENT LOOP NUMBER
A,B,C = SEQUENTIAL COMPONENT

TYPICAL # 05
ISO TRAILER SPACE HEATER

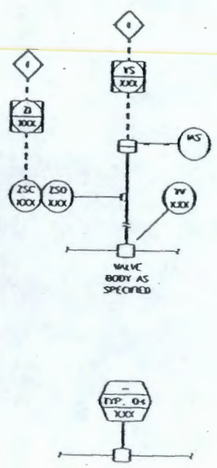


TYPICAL # 03
FILTERED CONTAINER BREATHER WITH PRESSURE MONITORING

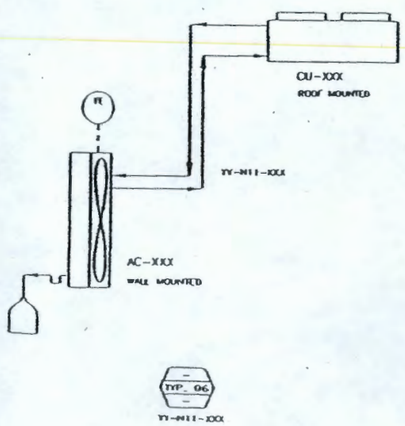


YY = PROCESS AREA
XXX = INSTRUMENT LOOP NUMBER
A,B, = SEQUENTIAL COMPONENT

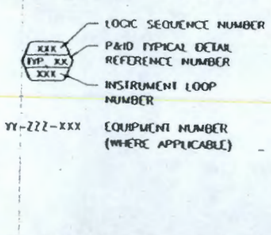
TYPICAL # 04
SEQUENCE CONTROLLED VALVE/GATE ACTUATOR



TYPICAL # 06
ISO TRAILER AIR CONDITIONING



TYPICAL SYMBOL FOR LEGEND



~~DOE-OWNED CONTAINS PROCESS INFORMATION THAT IS CONFIDENTIAL AND ACCESS/USE OF THIS INFORMATION ARE CONTROLLED BY CONTRACT BETWEEN AMEC AND DOE. NO HANDLING GROUP~~

MWL 5/4/05

E	ISSUED FOR COMMENT UPDATES & INFORMATION	03 NOV 04	AK	BH	RWS	BH
D	ISSUED FOR REVIEW INFORMATION	4 OCT 04	MW	CDH	RWS	JBC
C	ISSUED FOR APPROVAL	27 AUG 04	RDB	CDH	RWS	BH
B	INTERIM ISSUED FOR INFORMATION DRAWING NUMBER REVISED, WAS F-145643-00-A-0095	13 JUL 04	JBM	CDH	RWS	JBC
A	ISSUED FOR BCR & REPORT	2 APR 04	RDB	CDH	RWS	BH
No.	REVISION DESCRIPTION	Drawn	Des	Chk'd	Appd	Appd

F-145579-00-A-0099

E

amec

145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY
Office of River Protection

BULK VITRIFICATION
P&ID
"TYPICALS" LEGEND

F

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	

REVISIONS

G2-556

EQUIPMENT

- CENTRIFUGAL PUMP
- METERING PUMP
- EXHAUST FAN
- MIXER/DRYER
- CONDENSER
- STORAGE BIN
- SELECTIVE CATALYTIC REDUCTION BED
- MIST ELIMINATOR
- VACUUM PUMP
- AIR COMPRESSOR
- SEALED TANK
- VENTURI SCRUBBER
- CCTV
- HEPA FILTER
- HEATER
- MOTOR
- FILTER
- VACUUM FILTER
- DOUBLE WALL TANK
- QUENCHER/SPRAY TOWER

EQUIPMENT (CONT'D)

- VANE SEPARATOR
- SINTERED METAL FILTER OR RECEIVER FILTER
- HYDRAULIC MOTOR
- LOAD CELL
- MIXER/AGITATOR
- CARTRIDGE FILTER
- HEAT EXCHANGER
- AIR DRYER
- FLEX CHUTE
- AIR DRIVEN DIAPHRAM PUMP

VALVE TYPES:

- GATE
- GLOBE
- CHECK
- BALL
- BUTTERFLY VALVE
- 3-WAY BALL
- PRESSURE REDUCING REGULATOR
- BACKPRESSURE REGULATOR
- CONTROL VALVE
- DISCRETE VALVE
- ANGLE VALVE (90°)
- SAFETY RELIEF VALVE (SRV)
- INSTRUMENT PLUG VALVE
- 3-WAY ANGLE
- PRESSURE RELIEF (PRV)
- SPHERICAL DISK VALVE
- STAR/ROTARY
- NEEDLE VALVE
- TURBINE TYPE FLOW ELEMENT
- DIVERGENCE VALVE (BY-PASS)
- DIVERGENCE VALVE (SINGLE)
- HAND KNIFE GATE
- EXTENSION HANDLE

MANUAL VALVE NOMENCLATURE

32-V-012
- SEQUENTIAL NUMBER
- PROCESS VALVE
- PROCESS AREA

32-VB-0128 (USED IN "TYPICALS")
- SEQUENTIAL COMPONENT LOOP
- INSTRUMENT LOOP NUMBER
- INSTRUMENT BLOCK VALVE
- PROCESS AREA

LINE NOMENCLATURE

- NOMINAL LINE SIZE (INCHES)
- FLUID ABBREVIATION
- AREA WHERE LINE ORIGINATES
- SEQUENTIAL NUMBER

4-SIC-33-0152

ACTUATORS:

- SOLENOID
- CYLINDER (DISCRETE)
- DIAPHRAGM (ANALOG)
- AIR
- MOTOR

HVAC SYMBOLS

- AIR OPERATED DAMPER
- MANUAL OPERATED DAMPER
- MOTOR OPERATED DAMPER
- BACKDRAFT DAMPER

MEASURING ELEMENTS:

- FLOW ORIFICE
- FC — FLOW SIGHT GLASS
- LC — LEVEL SIGHT GLASS
- FI — FLOW INDICATOR (ROTAMETER)
- FM — FLOW INDICATOR VALVED (ROTAMETER WITH ATTACHED VALVE)
- TE — TEMPERATURE ELEMENT (PENETRATION)
- TE — TEMPERATURE ELEMENT (SURFACE MOUNT)
- FCV — FLOW CONTROL VALVE
- FS — FLOW SWITCH

NOTATIONS:

NNF	NORMALLY NO FLOW
LO	LOCKED OPEN
LC	LOCKED CLOSED
AOV	AIR OPERATED VALVE
AS	AIR SUPPLY
BB	BLOCK & BLEED
CA	COMPRESSED AIR
FC	FAIL CLOSED
FO	FAIL OPEN
FL	FAIL LAST
MOV	MOTOR OPERATED VALVE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
SOV	SOLENOID OPERATED VALVE
V	HAND VALVE
FW	FLUSH WATER
RCFD	REPLACEABLE CORE FILTER DRYER

LINE TYPES:

- MAJOR PROCESS LINE
- MINOR PROCESS LINE
- PNEUMATIC INSTRUMENT SIGNAL
- ELECTRICAL POWER OR SIGNAL
- DOUBLE CONTAINED LINES
- 217 — ELECTRIC HEAT TRACED OR INSULATED LINE @ TEMPERATURE
- PNEUMATIC CONVEYANCE BOOST LINES
- ELECTRIC HEAT TRACED (FREEZE PROTECTION, INSULATED)
- HIT — HOSE IN HOSE CONTAINMENT LINE (HEAT TRACED, INSULATED)
- SKID BOUNDARY
- CONTROL (LOGIC) SIGNAL

MISCELLANEOUS SYMBOLS:

- X — PROCESS STREAM LABEL
- FLANGED CONNECTION
- SPRAY NOZZLE
- ANNUBAR
- SAMPLE C/W BOTTLE
- VORTEX SHEDDING FLOW ELEMENT
- T — STEAM TRAP
- LIQUID TRAP
- EXPANSION JOINT
- QUICK DISCONNECT
- M — MAG FLOW METER ELEMENT
- QUICK DISCONNECT WITH INTERNAL CHECK
- C — CORIOLIS MASS FLOW ELEMENT
- SLIDING JOINT
- TDV — TRIPLE DUTY VALVE
- STRAINER
- REDUCER (SIZE DEFINED ON P&ID)
- DIAPHRAM SEAL
- BACK FLOW PREVENTER
- FLEX HOSE
- RADIATION SENSING ELEMENT
- ALARM HORN
- RUPTURE DISK (PRESSURE RELIEF)
- FLOW ORIFICE
- INTERLOCK
- SCR — SILICON CONTROLLED RECTIFIER
- CONTAINED - PIPE CONNECTION PORT
- PIPING OR EQUIPMENT BOUNDARY MARKERS

INSTRUMENT IDENTIFICATION:

CURRENT MCS ROM — CASS XXXX

- ASSOCIATED EQUIPMENT NO. — XX XXX
  - CASS OCTAL NUMBER
  - INSTRUMENT ISA IDENTIFICATION
  - MCS SHARED CONTROL OR DISPLAY YY-ZZZ-XXX
- ASSOCIATED EQUIPMENT NO. — XX XXX
  - INSTRUMENT ISA IDENTIFICATION
  - PANEL MOUNTED INSTRUMENT
- ELECTRICAL OR CONTROL SIGNAL
  - LOCAL MOUNTED INSTRUMENT
- ASSOCIATED EQUIPMENT NO. — XX XXX
  - INSTRUMENT ISA IDENTIFICATION
  - ALPHA SUFFIX USED IN ASSOCIATED MELI SYSTEMS

- PRIMARY ELEMENT OR LOCALLY MOUNTED INSTRUMENT
- FRONT PANEL MOUNTED INSTRUMENT
- INSTRUMENT MOUNTED ON BACK OF PANEL
- INSTRUMENT FRONT PANEL MOUNTED AT AN AUXILIARY LOCATION
- LOCAL CONTROL
- COMPUTER FUNCTION
- MONITOR AND CONTROL SYSTEM (MCS) SHARED DISPLAY (VIDEO SCREEN) THROUGH PLC IN CONTROL ROOM
- PROGRAMMABLE LOGIC CONTROLLER PRIMARY LOCATION
- PROGRAMMABLE LOGIC CONTROLLER FIELD MOUNTED

CONVEYING FLUID — SHEET 2 — Z XX
- DRAWING CONTINUATION ARROW USED ONLY FOR LINES ENTERING OR LEAVING THE FACE OF THE DRAWING
- CONTINUATION DRAWING AND SHEET NUMBER
- DWG ZONE LOCATION

"TYPICAL" IDENTIFICATION:

XXXX / TYP XX / XXX
- LOGIC SEQUENCE NUMBER
- P&ID TYPICAL DETAIL REFERENCE NUMBER
- INSTRUMENT LOOP NUMBER
- EQUIPMENT NUMBER (WHERE APPLICABLE)

K — RELAY

INTERLOCK LEGEND:

- UNDEFINED INTERLOCK
- PROCESS AREA
- AREA TABLE
- TABLE MEMBER
- <XBC>
- STOP (CLOSE)
- DESIGNATES SOURCE
- START (OPEN)

ISA IDENTIFICATION LETTERS

	FIRST-LETTER		SUCCEEDING-LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY	CONTROLLER		CONTROL	
D	DENSITY	DIFFERENTIAL/DETECTOR			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	SAMPLER
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	MOTOR STARTER —	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED	

EQUIPMENT NOMENCLATURE

32-D61-014
- EQUIPMENT NUMBER
- EQUIPMENT CODE
- PROCESS AREA

THIS DRAWING CONTAINS PROCESS INFORMATION AND IS PROPRIETARY TO AMEC. RESTRICTIONS ON USE OF THIS INFORMATION ARE CONTAINED IN CONTRACT 23401 BETWEEN AMEC AND DOE-HQ. MANFORD CROOK

MNL 5/4/05

REV	REVISION DESCRIPTION					
C	ISSUED FOR GENERAL COMMENTS & INFORMATION	03 NOV 04	JMT	DHJ	RWS	BW
F	ISSUED FOR VENDOR INFORMATION	8 OCT 04	MW	CCH	RWS	JBS
E	ISSUED FOR APPROVAL	27 AUG 04	MDB	CCH	RWS	BW
D	ADDITIONAL ISSUED FOR INFORMATION DRAWING NUMBER REVISED, WAS F-145543-00-A-0100	23 JUL 04	ABW	CCH	RWS	JBS
C	ISSUED FOR RISK & REPORT	7 APR 04	MDB	CCH	RWS	BW
B	ISSUED FOR COMMENT	27 FEB 04	JMT	CCH	RWS	JBS
A	ISSUED FOR INTERNAL REVIEW	9 FEB 04	MDB		RWS	

F-145579-00-A-0100 — G

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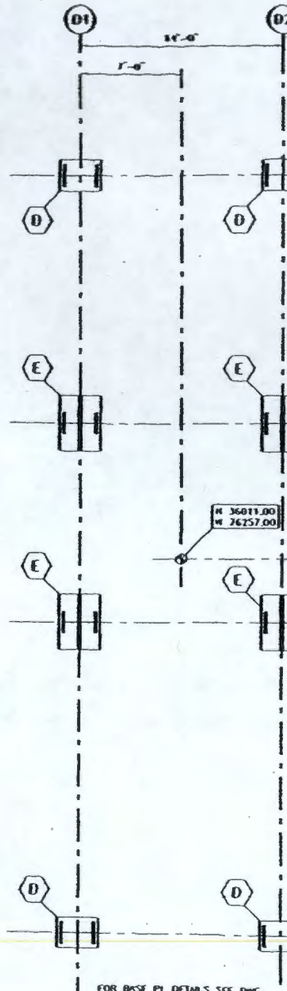
145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY
Office of River Protection

BULK VITRIFICATION
P&ID
SYMBOL LEGEND

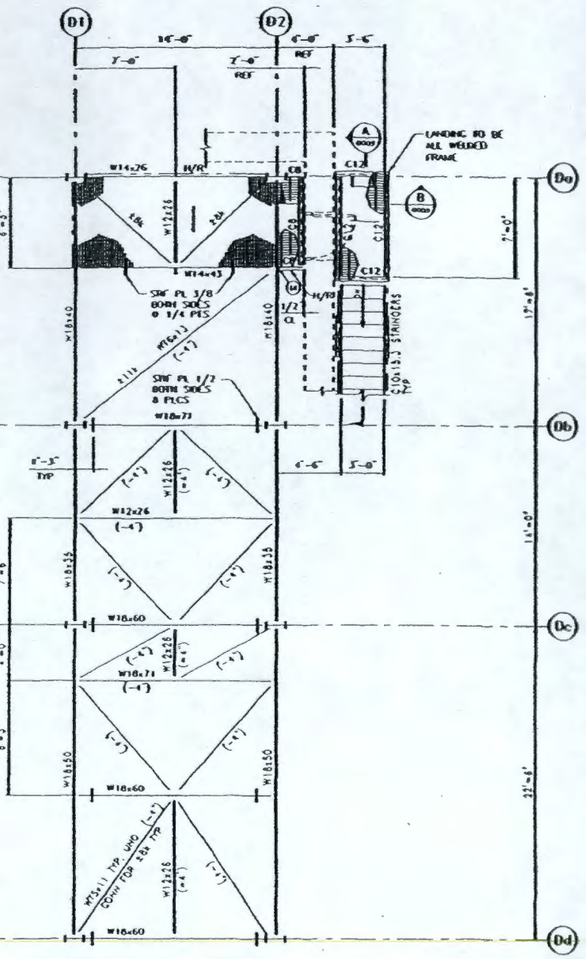
DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		NOT USED ON	REFERENCES

REVISIONS



BASE PLATE PLAN

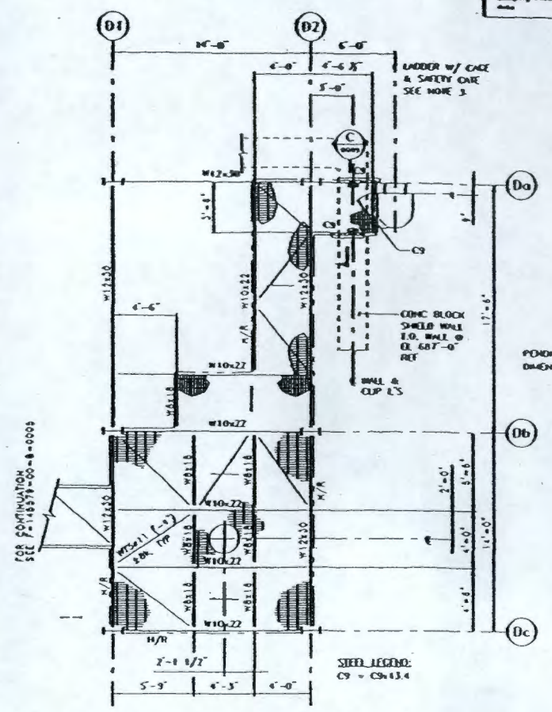
U/S OF BASE PL EL 663'-0"



PLAN – TOS EL 675'-0"

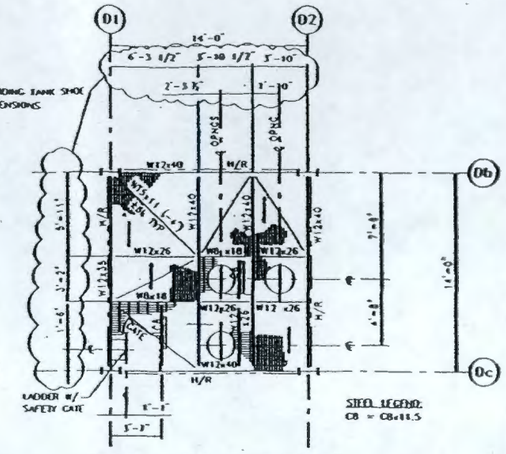
UNLESS NOTED THUS: (x") TOC EL 675'-1 1/4"

ISO BOX SUPPORT BEAMS & DIAGONAL BRACE PATTERN TO FINALIZED WITH EQUIPMENT FRAMING DETAIL



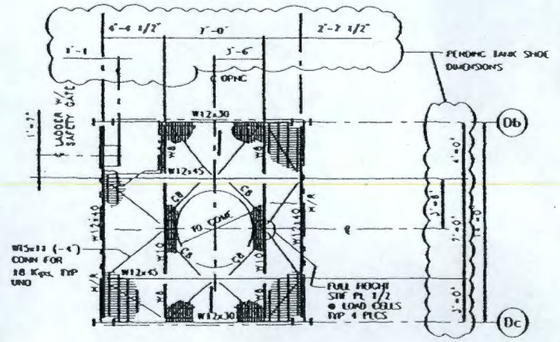
PLAN – TOS EL 687'-9"

UNLESS NOTED THUS: (x") TOC EL 687'-10 1/4"



PLAN – TOS EL 700'-6"

UNLESS NOTED THUS: (x") TOC EL 700'-7 1/4"



PLAN – TOS EL 709'-6"

UNLESS NOTED THUS: (x") TOC EL 709'-7 1/4"

NOTES:

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

TO COME

GRATING OPENINGS

B	ISSUED FOR INTERNAL APPROVAL	19 NOV 04	EC		PM	BN
A	ISSUED FOR INTERNAL REVIEW	28 OCT 04	EC		PM	JDS
No.	REVISION DESCRIPTION	Date	By	Chk'd	Eng Ldr	Proj Mgr

F-145579-00-B-0008 | B

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NAME

145579-FINAL DBVS DESIGN

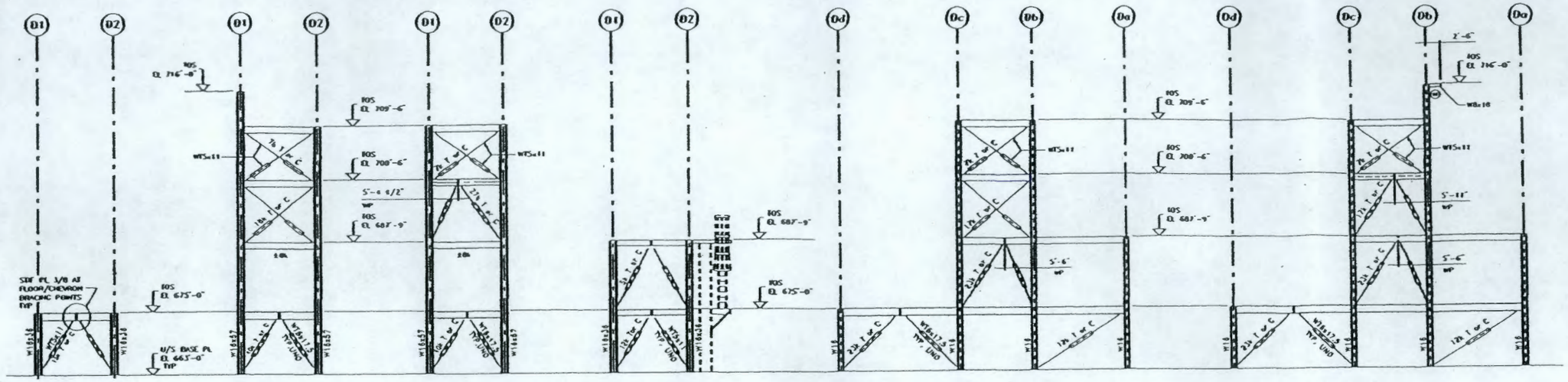
U.S. DEPARTMENT OF ENERGY
Office of Waste Production

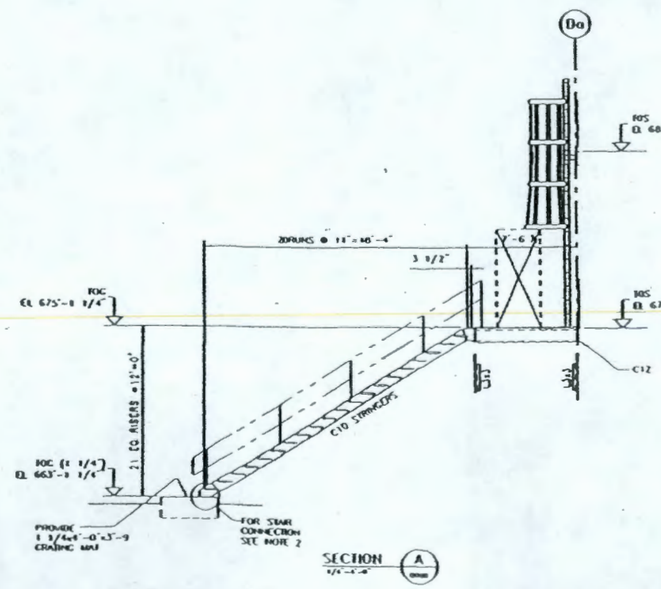
BULK VITRIFICATION DRYER STRUCTURAL STEEL PLANS & DETAILS

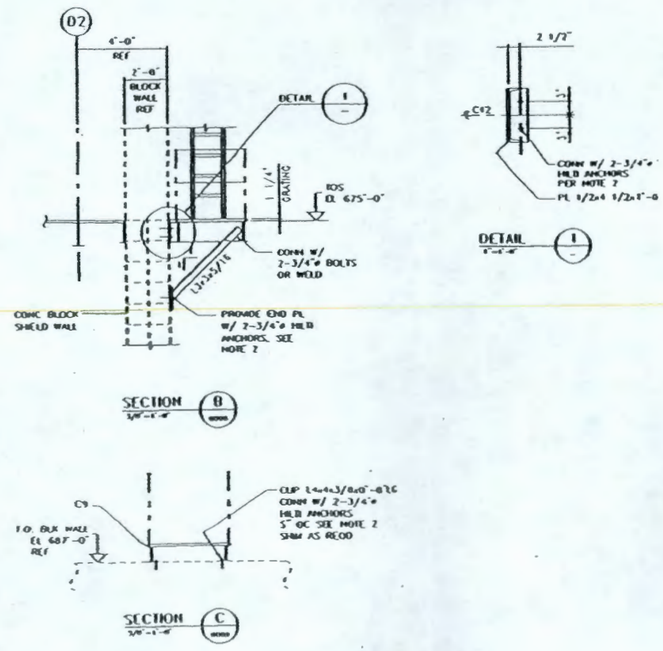
DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
NEXT USED ON	REFERENCES

REVISIONS







NOTES:

1. FOR NOTES SEE F-145579-00-B-0005.
2. CONNECT USING HILTI HIT RE-500 ADHESIVE ANCHORS WITH 3/4"ø "HILTI HAS" ROD MATERIAL MEETING THE REQUIREMENTS OF ASTM F593 (AISI 304). ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

B	ISSUED FOR AMENDING APPROVAL	19 NOV 04	TC		PM	BA
A	ISSUED FOR AMENDING REVIEW	29 OCT 04	TC		PM	JDS
No.	REVISION DESCRIPTION	Date	By	Chk'd	Appr	Appr

F-145579-00-B-0009 | B

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145579-FINAL DBVS DESIGN

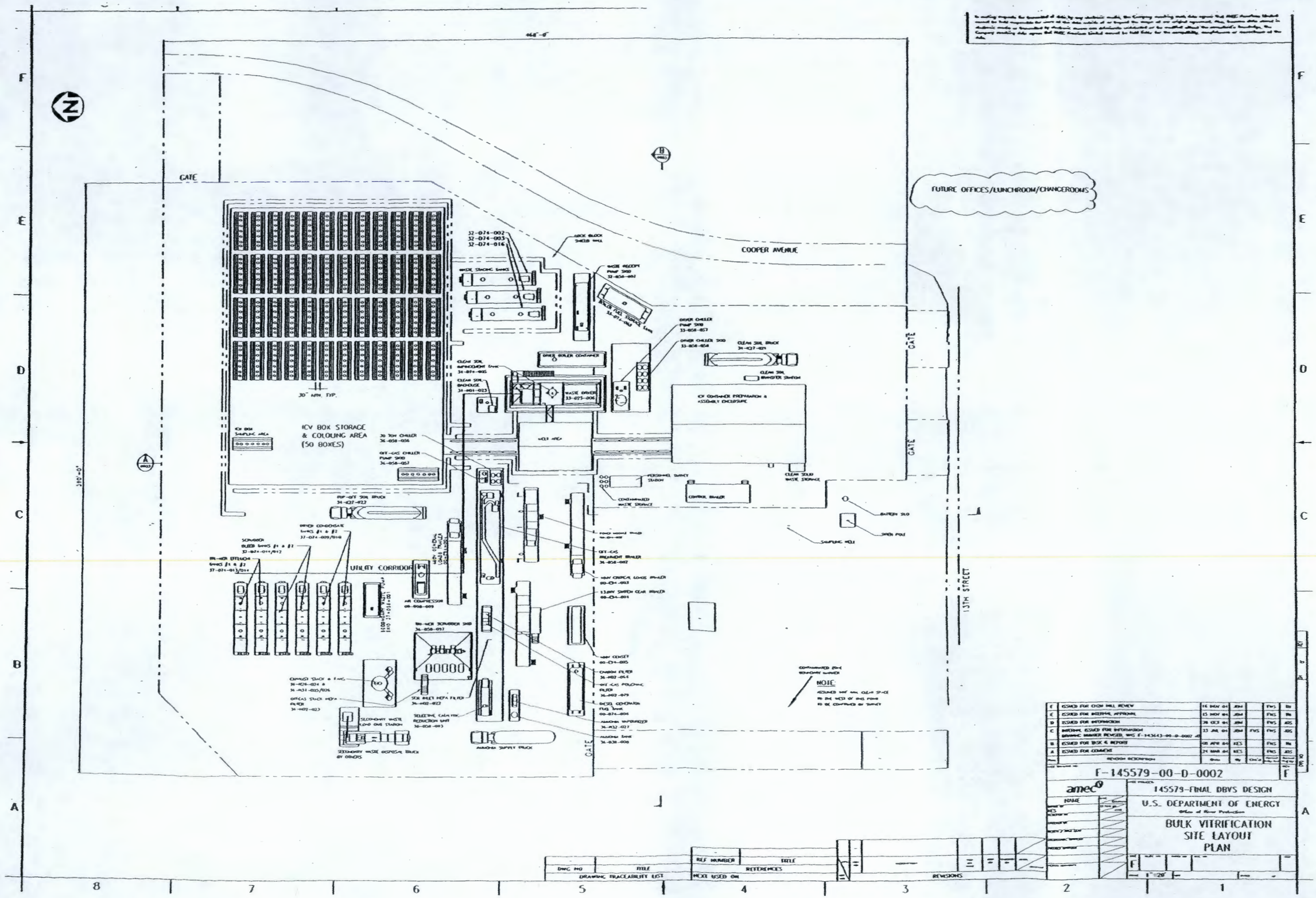
U.S. DEPARTMENT OF ENERGY
Office of River Protection

BULK VITRIFICATION
DRYER STRUCTURAL STEEL
ELEVATIONS & DETAILS

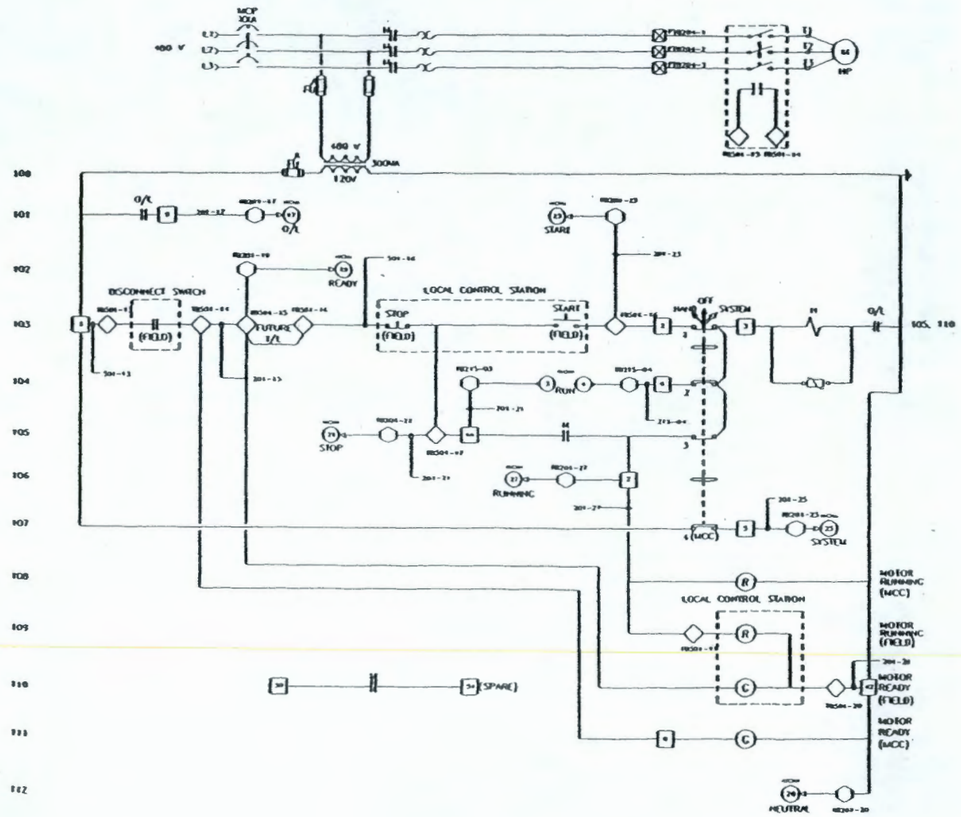
DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	

REVISIONS


COOPER AVENUE
13TH STREET
GATE
FUTURE OFFICES/LUNCHROOM/CHANGEROOMS
ICV BOX STORAGE & COLOURING AREA (50 BOXES)
UTILITY CORRIDOR
NOTE
F-145579-00-D-0002
145579-FINAL DBVS DESIGN
U.S. DEPARTMENT OF ENERGY
BULK VITRIFICATION SITE LAYOUT PLAN
DRAWING TRACEABILITY LIST
REFERENCES
REVISIONS

EIN: 33-D81-007



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
- H — STARTER
- STARTER CONTACT
- C — GREEN INDICATING LIGHT
- R — RED INDICATING LIGHT
- START — MOMENTARY PUSH BUTTON SWITCH
- STOP — MOMENTARY PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- SURGE SUPPRESSOR
- TB 201 = XXA
- TB 215 = XXB
- TB 501 = XXC
- 480V EXTERNAL TRANSITION J.B. TERMINAL
- 120V EXTERNAL TRANSITION J.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
- O/L — MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- OFF HAND SYSTEM — THREE POSITION SELECTOR SWITCH

F-145579-00-E-0103 A

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U.S. DEPARTMENT OF ENERGY

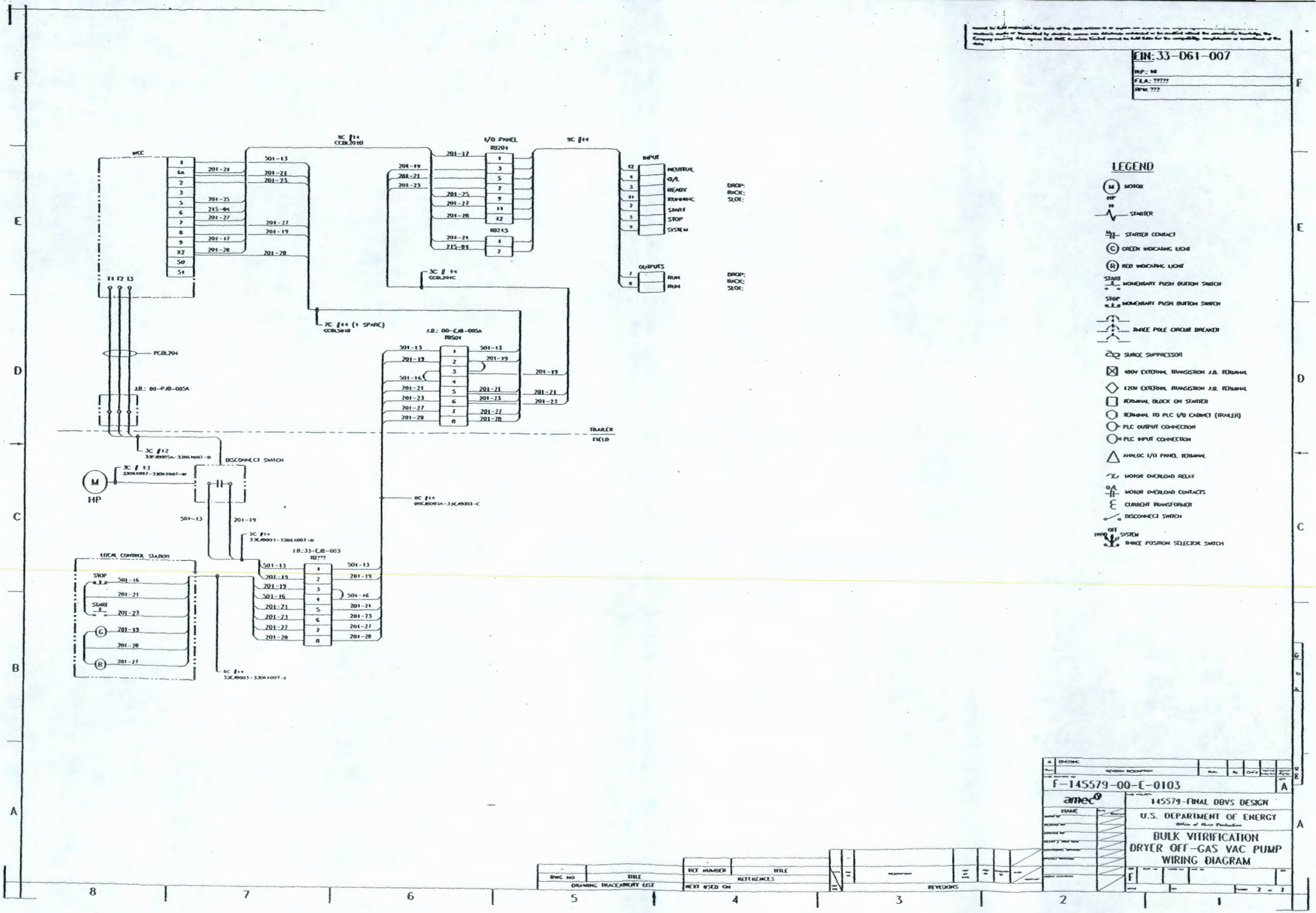
Office of River Protection

BULK VITRIFICATION
DRYER OFF-GAS VAC PUMP
SCHEMATIC DIAGRAM

DWG NO | TITLE — DRAWING TRACEABILITY LIST

REF NUMBER | TITLE — REFERENCES (NOT USED ON)

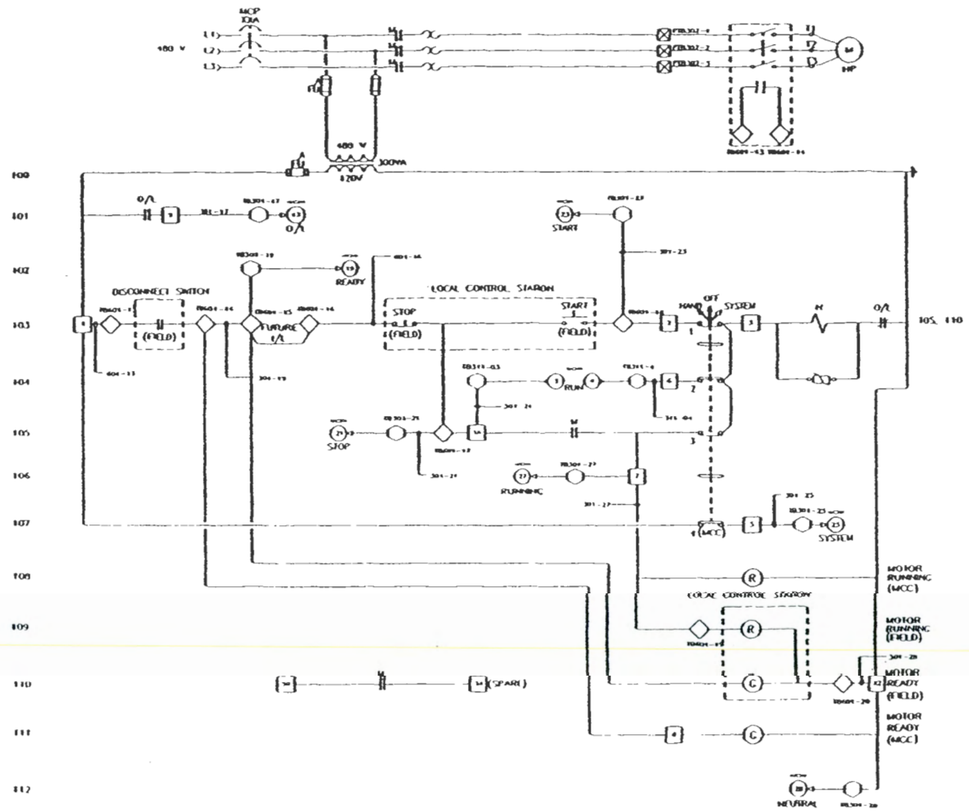
REVISIONS



RPP-24544 REV 1a

G2-562

EIN: 33-E91-006A



SWITCH DEVELOPMENT

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

X = CLOSED

O = OPEN

LEGEND

- MOTOR
- HP N — 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
- TB 201 = 100A
- TB 215 = 100B
- TB 501 = 100C
- 480V EXTERNAL TRANSITION J.B. TERMINAL
- 120V EXTERNAL TRANSITION J.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
- O/L — MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- HAND OFF SYSTEM — THREE POSITION SELECTOR SWITCH

F-145579-00-E-0127

amec

145579-FINAL DDVS DESIGN

U.S. DEPARTMENT OF ENERGY

BULK VITRIFICATION
WASTE DRYER CHOPPER
SCHEMATIC DIAGRAM

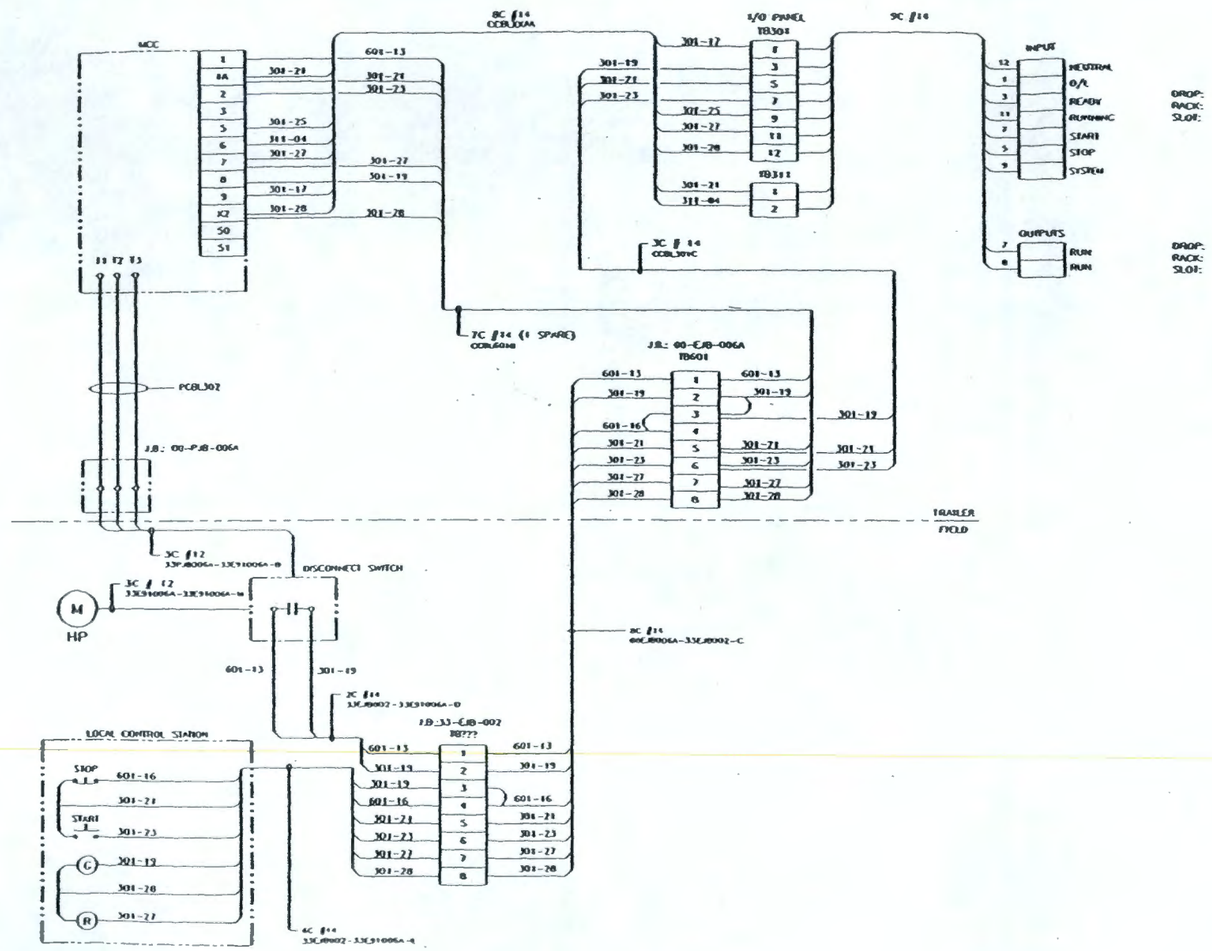
DWG NO | TITLE | DRAWING TRACEABILITY LIST

REF NUMBER | TITLE | REFERENCES | NEXT USED ON

REVISIONS

EIN: 33-E91-006A

H.P.: 25
F.L.A.: ?????
RPM: ???



LEGEND

- MOTOR
- STARTER
- STARTER CONTACT
- GREEN INDICATING LIGHT
- RED INDICATING LIGHT
- MOMENTARY PUSH BUTTON SWITCH
- MOMENTARY PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- SURGE SUPPRESSOR
- 480V EXTERNAL TRANSISTION J.B. TERMINAL
- 120V EXTERNAL TRANSISTION J.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
- HAND OFF AUTO SYSTEM THREE POSITION SELECTOR SWITCH

F-145579-00-E-0127 A

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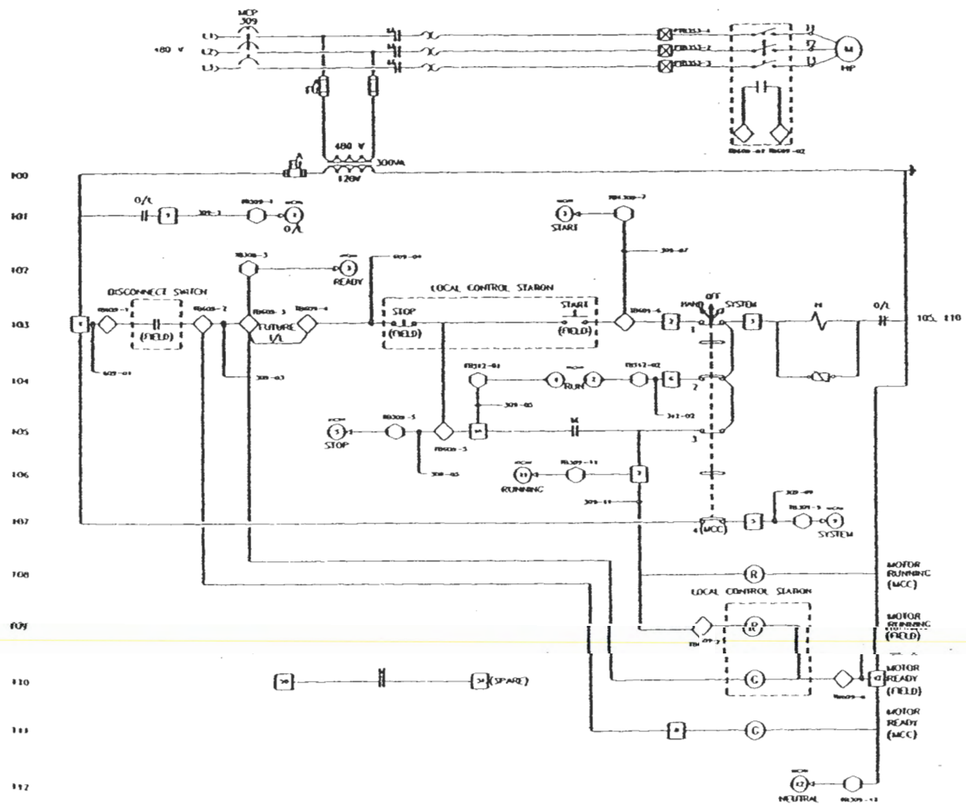
145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY
Office of River Protection

BULK VITRIFICATION
WASTE DRYER CHOPPER
WIRING DIAGRAM

DWG NO | TITLE — DRAWING TRACEABILITY LIST
REF NUMBER | TITLE — REFERENCES — MODEL BASED ON
REVISIONS

EIN: 33-061-023
HP: 3
FLA: ??
RPM: ??



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

- MOTOR
- 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
- TB 701 = 309
- TB 715 = 308
- TB 501 = 609
- 480V EXTERNAL TRANSITION J.B. TERMINAL
- 120V EXTERNAL TRANSITION J.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
- HAND OFF SYSTEM THREE POSITION SELECTOR SWITCH

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
NEXT USED ON	REFERENCES

REVISIONS

E-145579-00-E-0168 A

amec

145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY

BULK VITRIFICATION
WASTE DRYER CONDENSATE
SCHEMATIC DIAGRAM

RPP-24544 REV 1a

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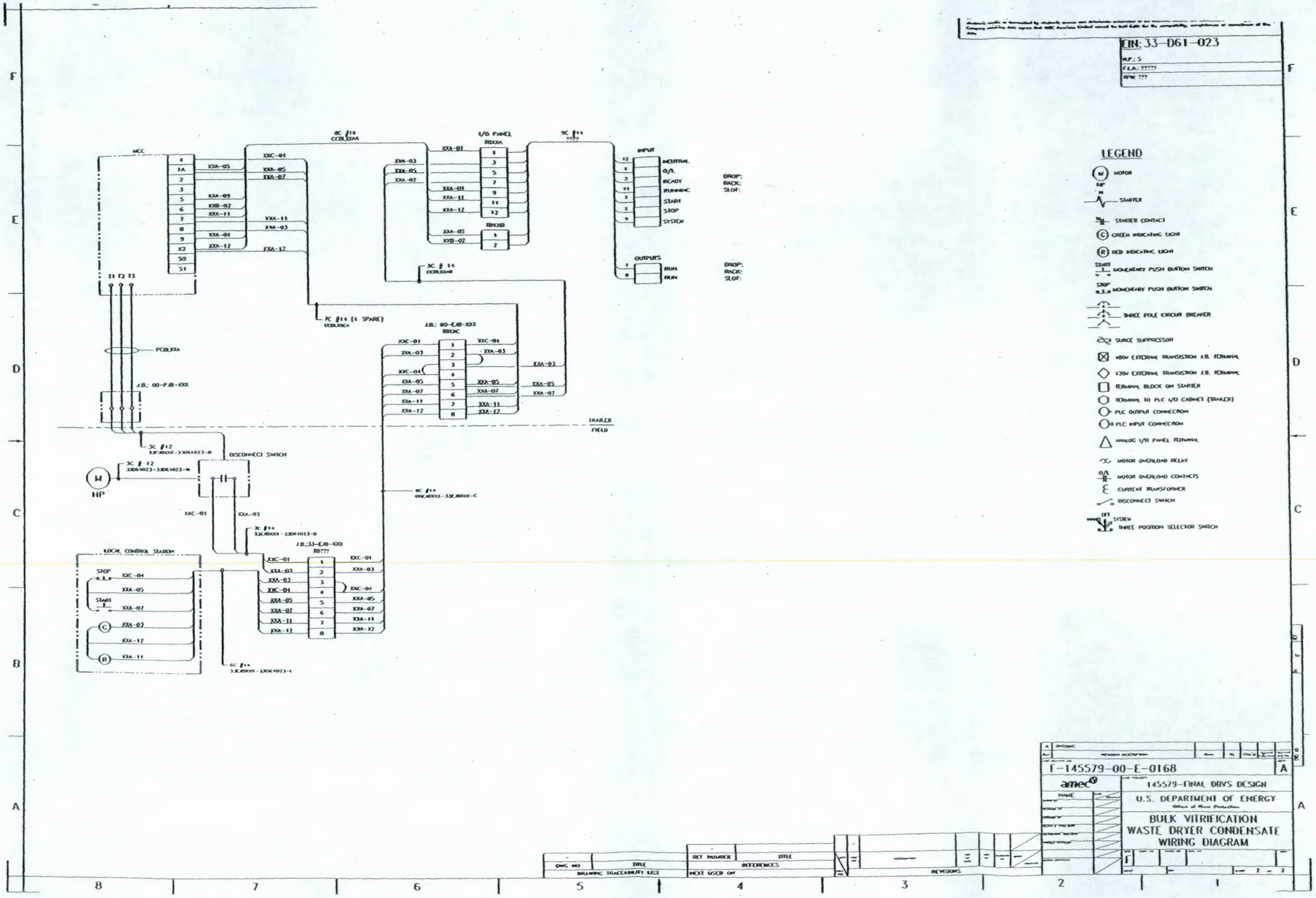
EIN: 33-D61-023



F-145579-00-E-0168

A

amec

145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY

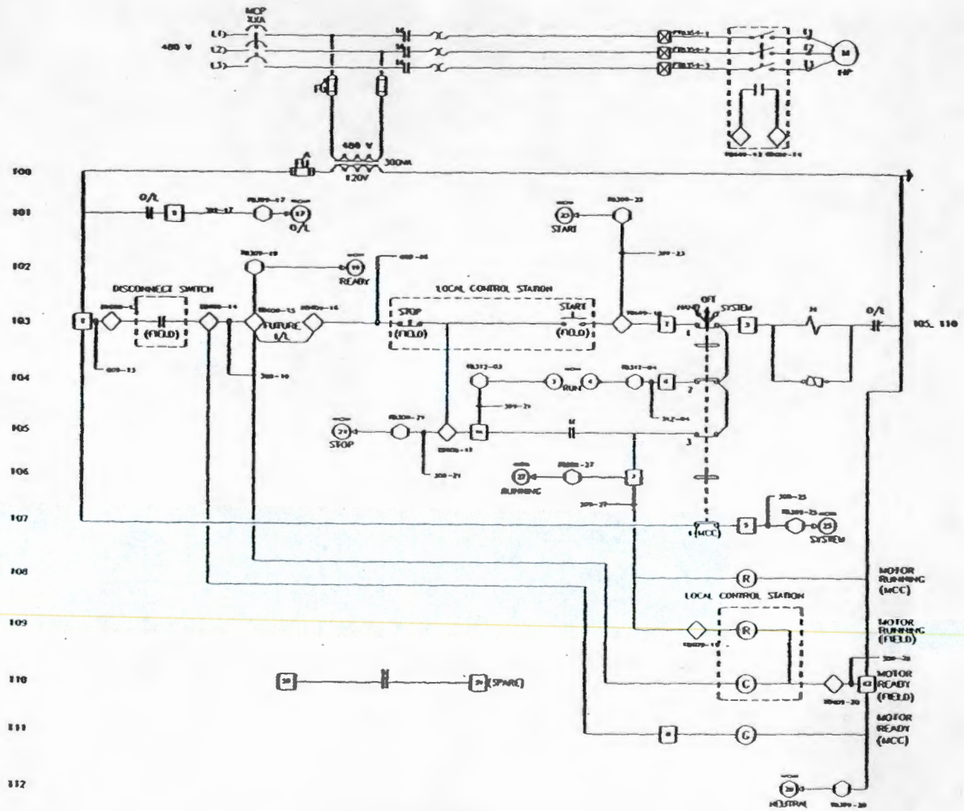
BULK VITRIFICATION
WASTE DRYER CONDENSATE
WIRING DIAGRAM

DWG NO | TITLE | DRAWING TRACEABILITY LIST

REF NUMBER | TITLE | REFERENCES | NEXT USED ON

REVISIONS

EIN: 33-D61-016
HP: 5
FLA: ??
RPM: ??



SWITCH DEVELOPMENT

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

X = CLOSED
O = OPEN

LEGEND

- MOTOR
- 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
- FB 201 = 10A
- FB 215 = 10B
- FB 501 = 10C
- 480V EXTERNAL TRANSISTION J.B. TERMINAL
- 120V EXTERNAL TRANSISTION J.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
- O/L — MOTOR OVERLOAD CONTACTS
- CURRENT TRANSFORMER
- DISCONNECT SWITCH
- HAND OFF SYSTEM — THREE POSITION SELECTOR SWITCH

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
MOST USED ON	

REVISIONS

REVISION DESCRIPTION	Date	By	Chk'd	Approved	Approved
DWG NO E-145579-00-E-0169					A

amec

NAME

145579-FINAL DBVS DESIGN

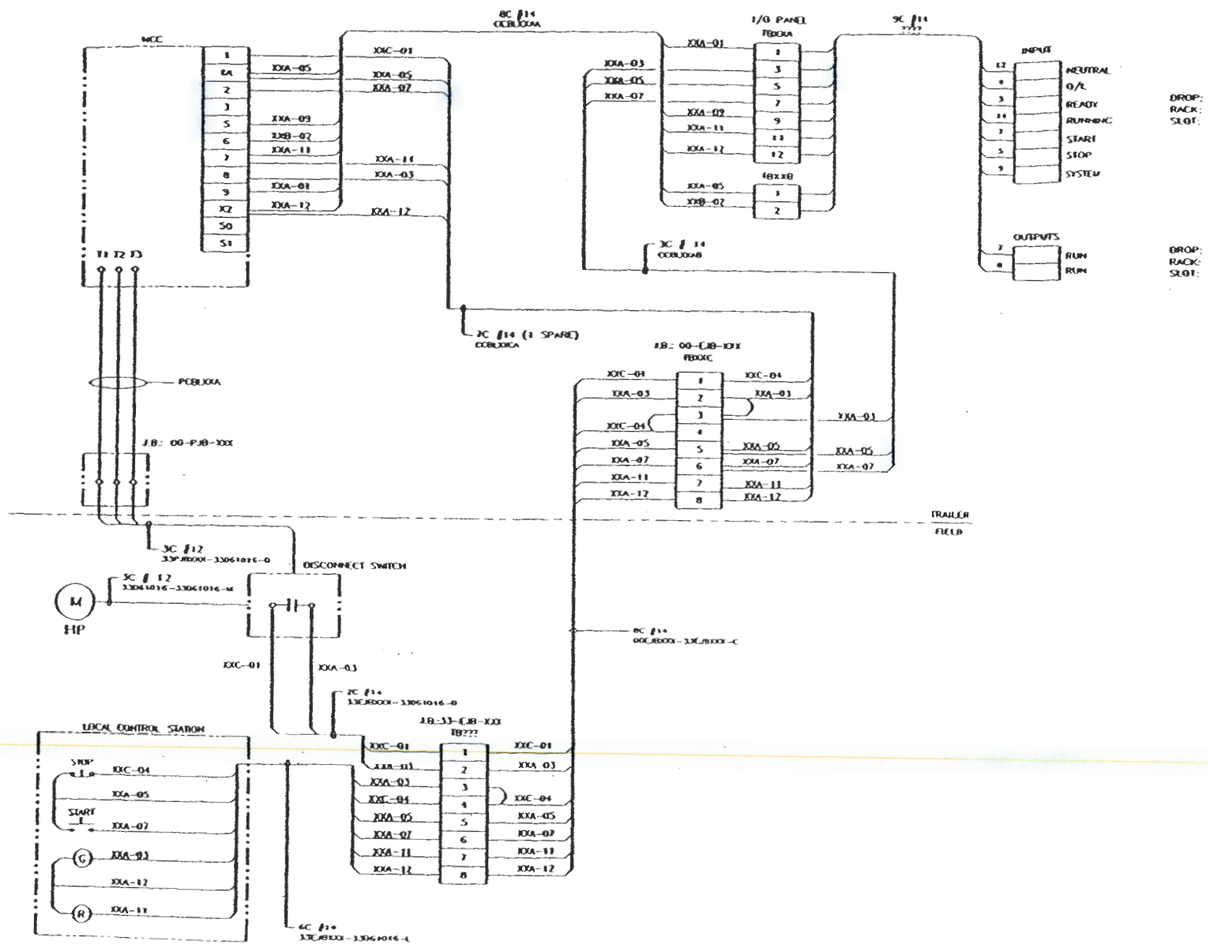
U.S. DEPARTMENT OF ENERGY
Office of River Protection

BULK VITRIFICATION
DRYER OFFGAS CONDENSATE
SCHEMATIC DIAGRAM

SIZE F

DBVS\P-145579-00-E-0169.dwg, 12/7/2004 8:23:17
M:\Engineer

EIN: 33-D61-016



LEGEND

- MOTOR
- STARTER
- STARTER CONTACT
- GREEN INDICATING LIGHT
- RED INDICATING LIGHT
- MOMENTARY PUSH BUTTON SWITCH
- MOMENTARY PUSH BUTTON SWITCH
- THREE POLE CIRCUIT BREAKER
- SURGE SUPPRESSOR
- 460V EXTERNAL TRANSITION J.B. TERMINAL
- 120V EXTERNAL TRANSITION J.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
- THREE POSITION SELECTOR SWITCH

F-145579-00-E-0169 A

amec

145579-FINAL DBVS DESIGN

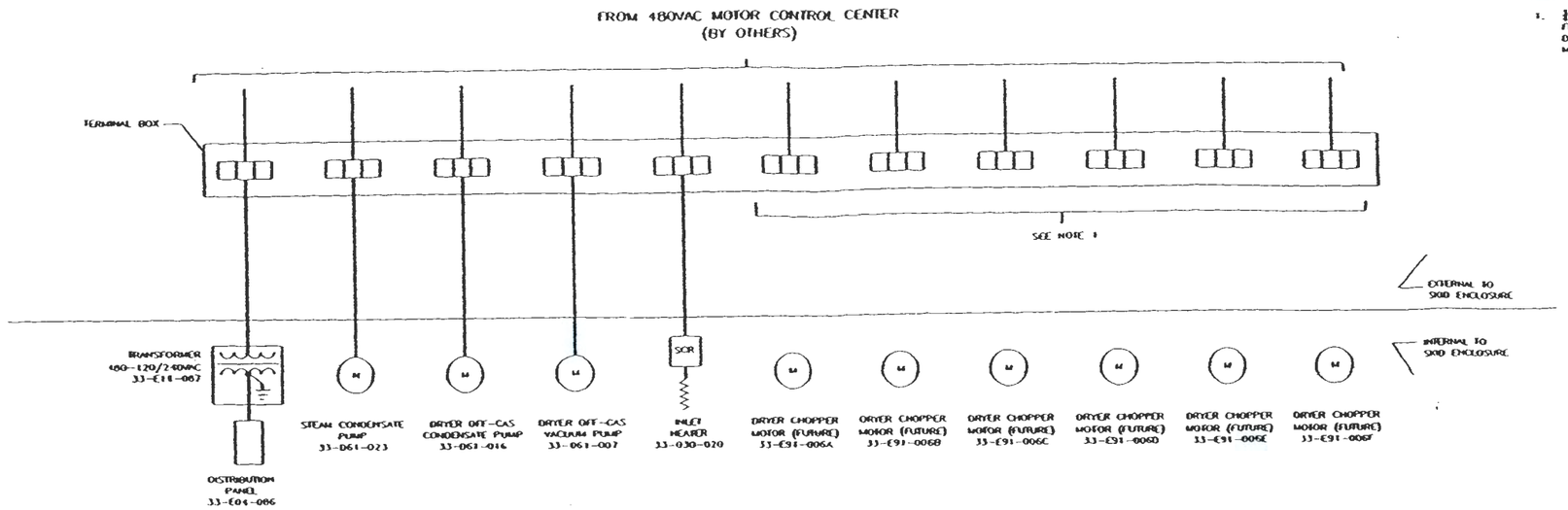
U.S. DEPARTMENT OF ENERGY

BULK VITRIFICATION
DRYER OFF-GAS CONDENSATE
WIRING DIAGRAM

DRAWING TRACEABILITY LIST | REFERENCES | REVISIONS

NOTES:

1. 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

DCRS
ONE-LINE AND GROUNDING
DIAGRAM

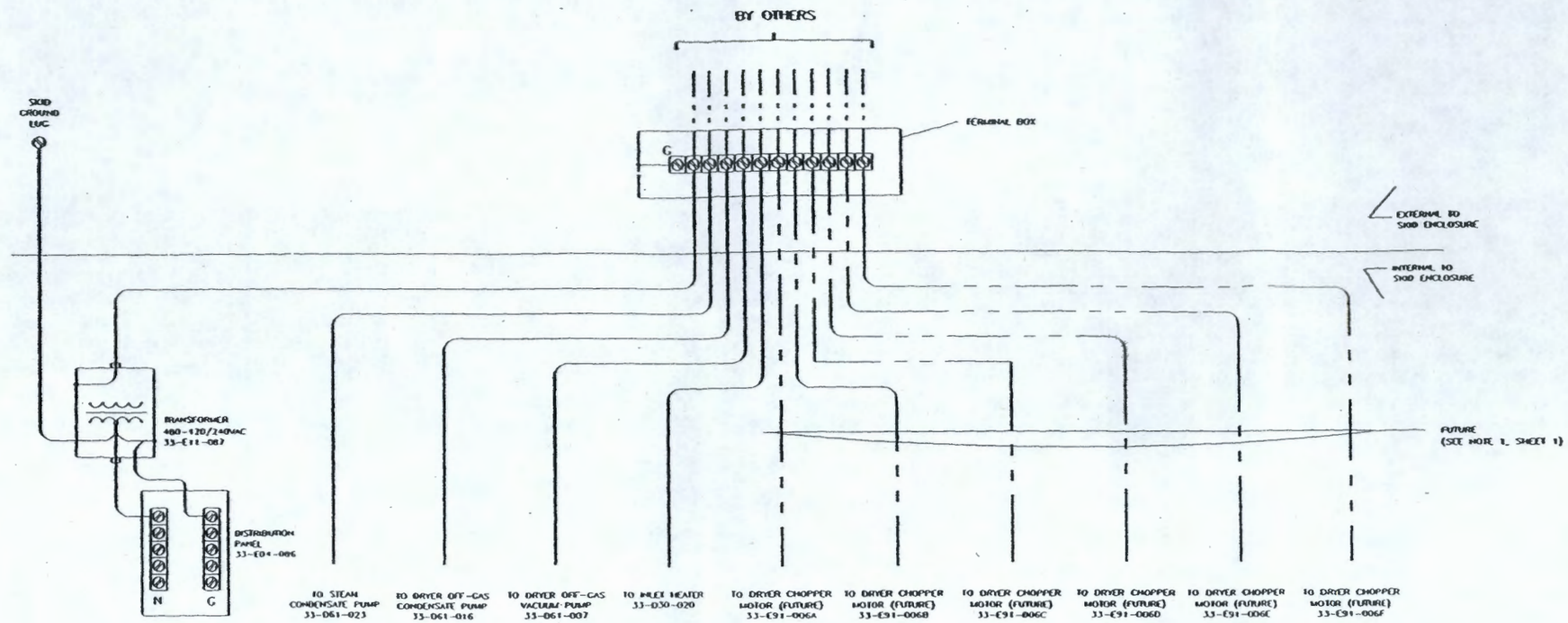
F	200W	7201	DBVS-SK-E003	A

REVISIONS

REFERENCES

DRAWING TRACEABILITY LIST

M:\Designart \\IOTIV\Alworksbec\DBVS.SK.E003.1_A_003798



DCRS GROUNDING DIAGRAM

DMJM Technology

amec

145579-FINAL DBVS DESIGN

U.S. DEPARTMENT OF ENERGY

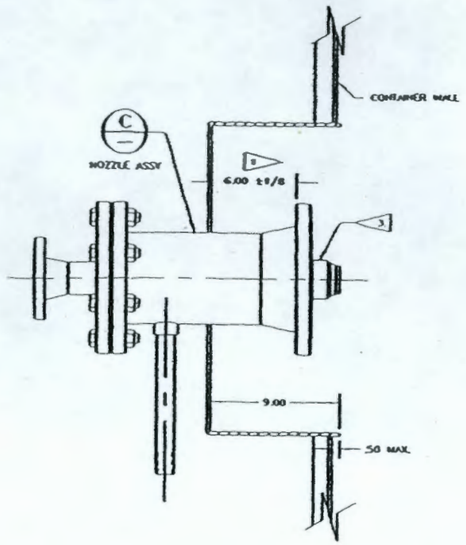
DCRS
ONE-LINE AND GROUNDING
DIAGRAM

F | 200W | 7201 | DBVS-SK-E003 | A

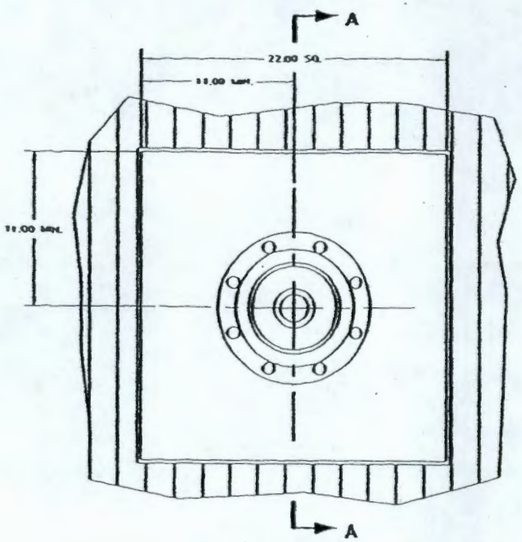
NONE

DWG NO | TITLE | REF NUMBER | TITLE

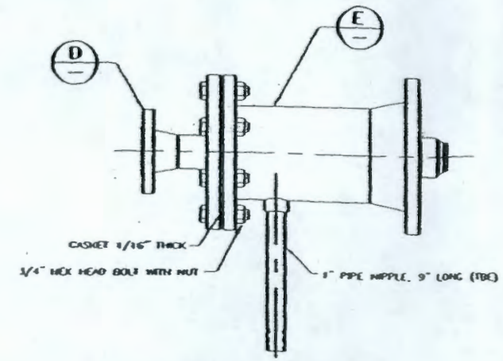
BRAWING TRACEABILITY USE | REFERENCES | NEXT USED ON END ITEM | REVISIONS



SECTION A-A



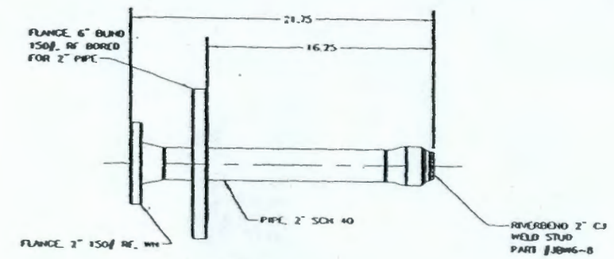
ELEVATION VIEW TYPE I



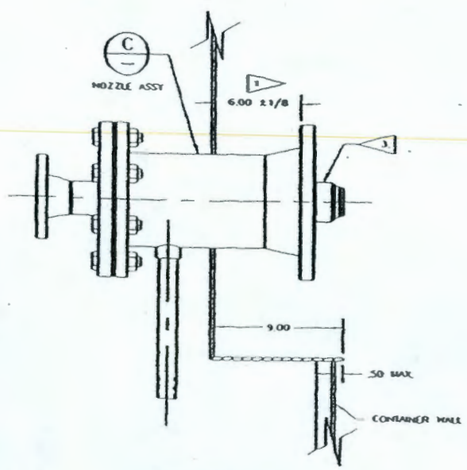
C NOZZLE ASSEMBLY

GENERAL NOTES:

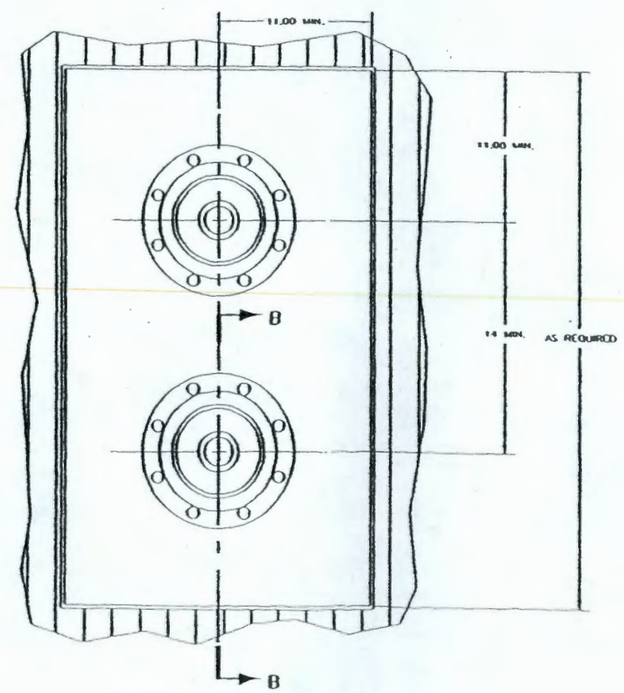
1. CRITICAL DIMENSIONS
2. SEE PROCUREMENT SPECIFICATIONS FOR COMPONENT MATERIAL
3. COVER AND PROTECT RIVERBOND CONNECTORS THROUGHOUT CONSTRUCTION, TRANSPORT AND STORAGE



D DETAIL

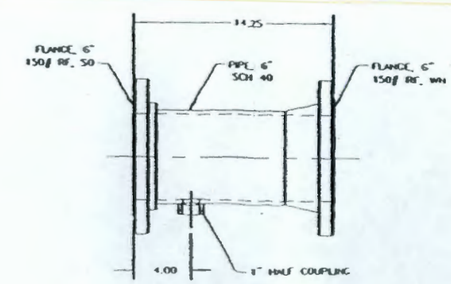


SECTION B-B



ELEVATION VIEW TYPE II

MULTIPLE HIHTL CONNECTIONS IN VERTICAL ORIENTATION
MAINTAIN MINIMUM CONNECTION SPACING



E DETAIL

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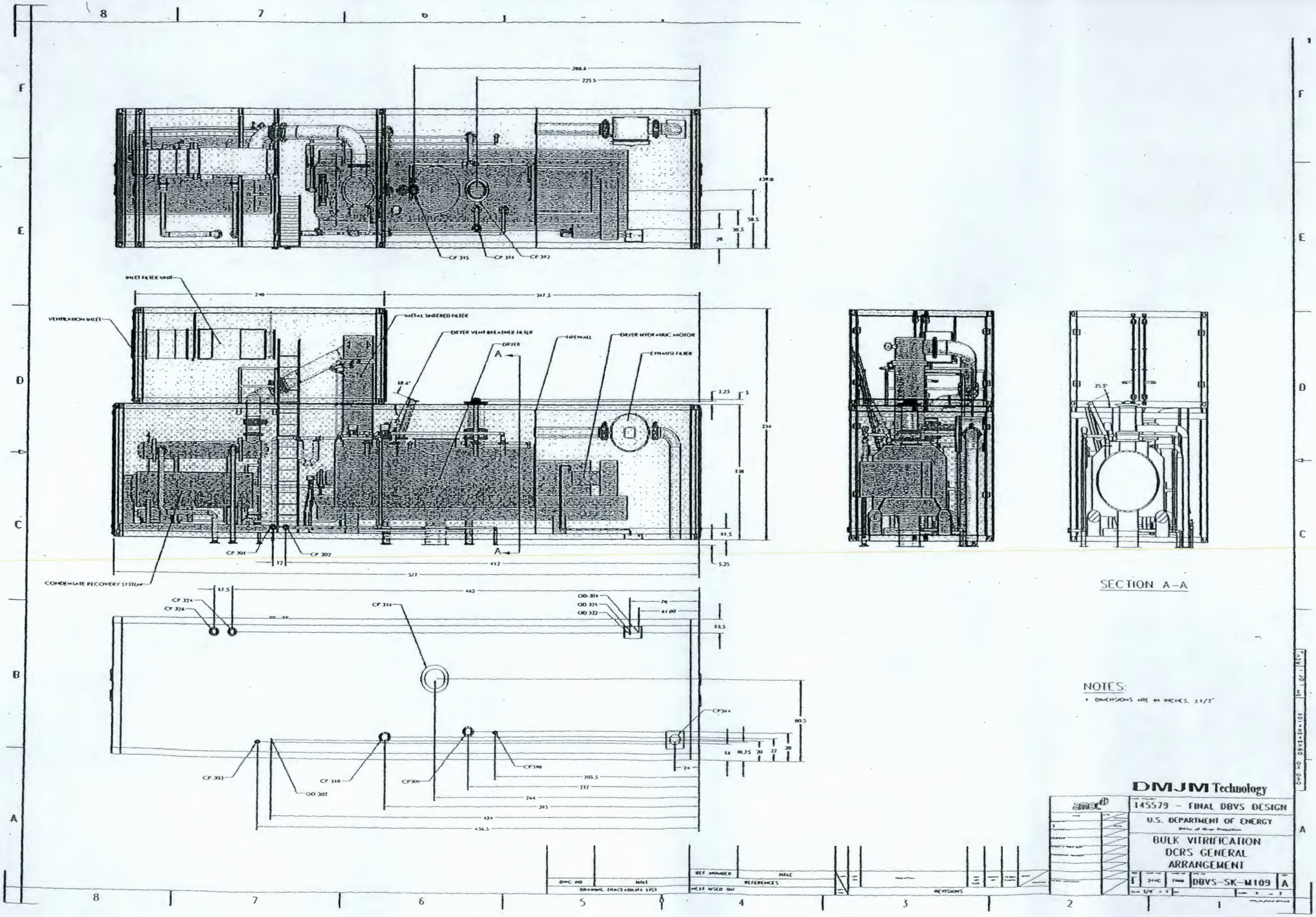
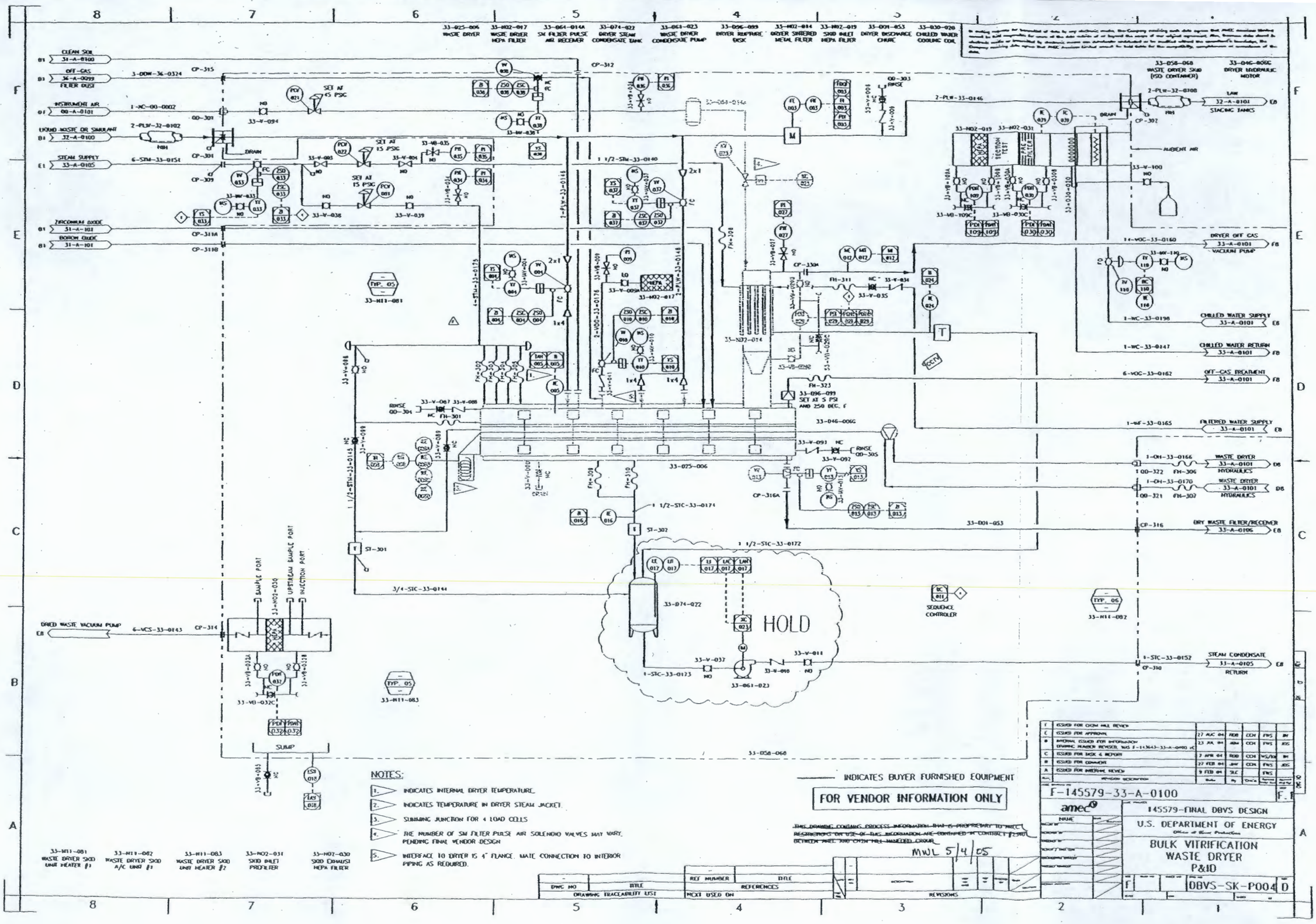
145579-FINAL DBVS DESIGN	
U.S. DEPARTMENT OF ENERGY	
BULK VITRIFICATION HIHTL PENETRATION DETAILS	
F 2004	DBVS-SK-M103 B

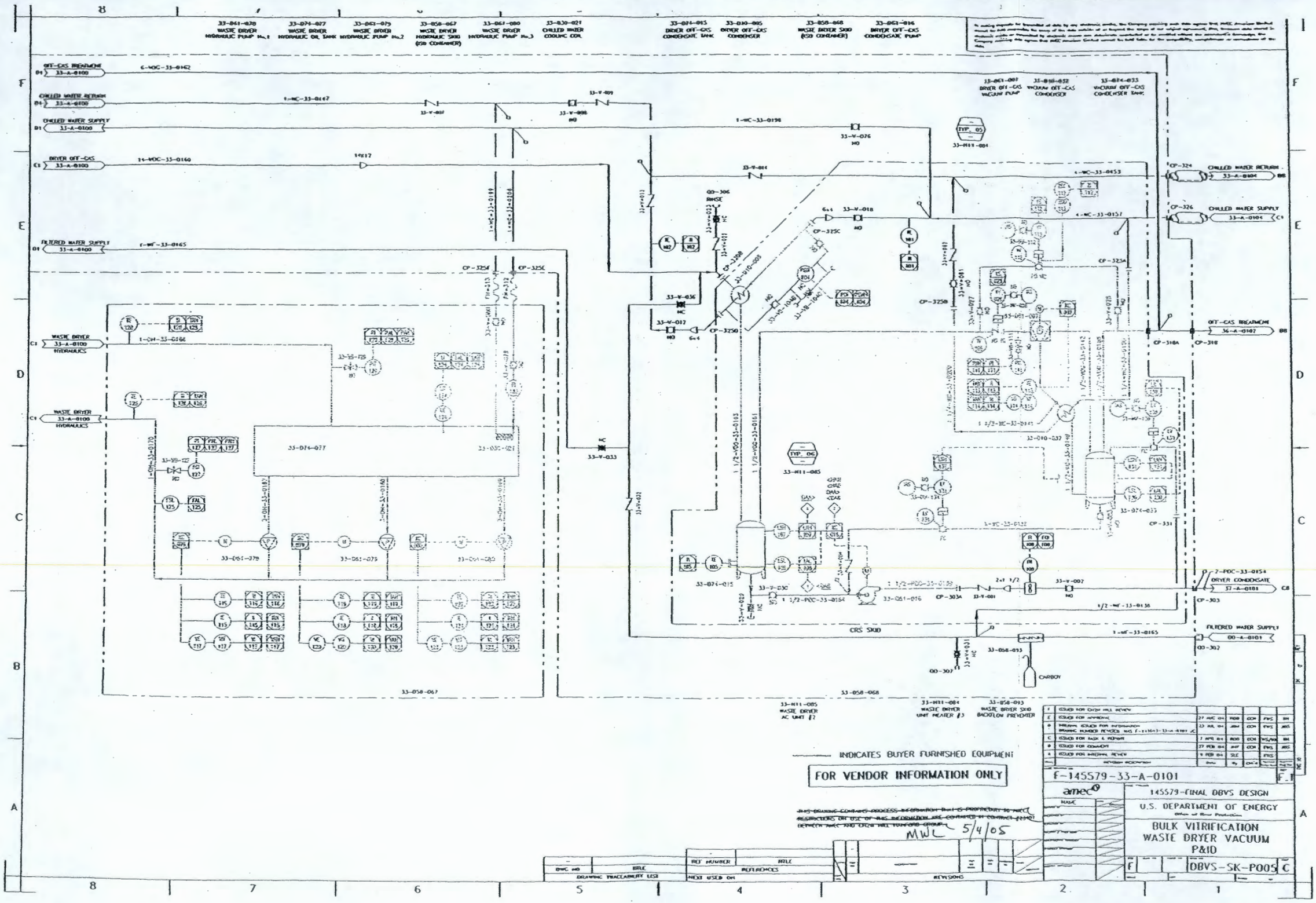
DWG NO | TITLE — DRAWING TRACEABILITY USE

REF NUMBER | TITLE — REFERENCES — NEXT USED ON END ITEM

REVISIONS


INLET FILTER UNIT
VENTILATION INLET
METAL SINTERED FILTER
DRYER VENT BREATHER FILTER
DRYER
FIREWALL
DRYER HYDRAULIC MOTOR
EXHAUST FILTER
CONDENSATE RECOVERY SYSTEM
CP 301
CP 302
CP 303
CP 304
CP 305
CP 306
CP 307
CP 308
CP 309
CP 310
CP 311
CP 312
CP 314
CP 324
OD 301
OD 321
OD 322
OD 307
A
SECTION A-A
NOTES:
1. DIMENSIONS ARE IN INCHES. ±1/2"
DMJM Technology
145579 - FINAL DBVS DESIGN
U.S. DEPARTMENT OF ENERGY
BULK VITRIFICATION
DCRS GENERAL
ARRANGEMENT
DBVS-SK-M109
A


33-025-006 WASTE DRYER
33-H02-017 WASTE DRYER HEPA FILTER
33-061-014A SW FILTER PULSE AIR RECEIVER
33-074-022 DRYER STEAM CONDENSATE TANK
33-061-023 WASTE DRYER CONDENSATE PUMP
33-096-099 DRYER RUPTURE DISK
33-H02-014 DRYER SINTERED METAL FILTER
33-H02-019 SKID INLET HEPA FILTER
33-001-053 DRYER DISCHARGE CHUTE
33-030-020 CHILLED WATER COOLING COIL
CLEAN SOIL 31-A-0100
OFF-GAS 36-A-0099 FILTER DUST
INSTRUMENT AIR 00-A-0101
LIQUID WASTE OR SIMULANT 32-A-0100
STEAM SUPPLY 33-A-0105
ZIRCONIUM OXIDE 31-A-101
BORON OXIDE 31-A-101
DRIED WASTE VACUUM PUMP
6-VCS-33-0143
CP-314
SAMPLE PORT
UPSTREAM SAMPLE PORT
INJECTION PORT
SUMP
33-058-068
33-H11-081 WASTE DRYER SKID UNIT HEATER #1
33-H11-082 WASTE DRYER SKID A/C UNIT #1
33-H11-083 WASTE DRYER SKID UNIT HEATER #2
33-H02-031 SKID INLET PREFILTER
33-H07-030 SKID EXHAUST HEPA FILTER
33-058-068 WASTE DRYER SKID (SSD CONTAINER)
33-046-006G DRYER HYDRAULIC MOTOR
LAW 32-A-0101 STAGING TANKS
AMBIENT AIR
DRYER OFF GAS 33-A-0101 VACUUM PUMP
CHILLED WATER SUPPLY 33-A-0101
CHILLED WATER RETURN 33-A-0101
OFF-GAS TREATMENT 33-A-0101
FILTERED WATER SUPPLY 33-A-0101
WASTE DRYER 33-A-0101 HYDRAULICS
DRY WASTE FILTER/RECEIVER 33-A-0106
STEAM CONDENSATE 33-A-0105 RETURN
HOLD
SEQUENCE CONTROLLER
33-074-022
33-061-023
33-075-006
33-D01-053
33-H11-082
33-H11-083
NOTES:
1. INDICATES INTERNAL DRYER TEMPERATURE.
2. INDICATES TEMPERATURE IN DRYER STEAM JACKET.
3. SUMMING JUNCTION FOR 4 LOAD CELLS
4. THE NUMBER OF SW FILTER PULSE AIR SOLENOID VALVES MAY VARY, PENDING FINAL VENDOR DESIGN
5. INTERFACE TO DRYER IS 4" FLANGE. MATE CONNECTION TO INTERIOR PIPING AS REQUIRED.
INDICATES BUYER FURNISHED EQUIPMENT
FOR VENDOR INFORMATION ONLY
F-145579-33-A-0100
amec
145579-FINAL DBVS DESIGN
U.S. DEPARTMENT OF ENERGY
BULK VITRIFICATION WASTE DRYER P&ID
DBVS-SK-P004 D
DRAWING TRACEABILITY LIST
REFERENCES
REVISIONS


33-A-0100
OFF-GAS BREAKOUT
CHILLED WATER RETURN
CHILLED WATER SUPPLY
DRYER OFF-GAS
FILTERED WATER SUPPLY
WASTE DRYER
HYDRAULICS
DRYER CONDENSATE
CRS SKID
CARBOY
INDICATES BUYER FURNISHED EQUIPMENT
FOR VENDOR INFORMATION ONLY
F-145579-33-A-0101
145579-FINAL DBVS DESIGN
U.S. DEPARTMENT OF ENERGY
BULK VITRIFICATION
WASTE DRYER VACUUM
P&ID
DBVS-SK-P005
C

CH2M technology

amec

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.

EDPM = ethylene propylene diene monomer.

N/A = not applicable

* Registered trademark of Dixon Valve and Coupling Company.

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DE&S technology

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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

technology

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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		

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

amec

Air Conditioner				SPEC. No.		
				145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET	OF	DATE
A	KJM	9/12/2004		1	1	12/9/200
				BY	CHK'D	APPR.
				KJM		
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification

1. Fluid	Air	16. MFR.*	
2. Temperature Dry Bulb	85 F	17. Model No.*	
3. Temperature Wet Bulb	65 F		
4. Outdoor Temp. Dry Bulb	115 F		
5. Total Capacity*			
6. Sensible Capacity	24,618 Btuh		
7. Air Flow*			
8. Fan RPM*			
9. Voltage	115 V		
10. Hertz	60 A		
11. Phase	1		
12. Full Load Amps	1.0		
13. Minimum Ampacity	2.0		
14. Max Fuse Size	15		
15. Thermostat	Remote	18. Supplier	Thermal Supply Inc.
		19. Address	Kennewick, WA
		20. Phone	(509) 783-0140
		21. Fax	(509) 783-1223

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia. Seal Matrl	T* Max.	Temperature Norm.	Max.	Range	Service	Notes
A	33-N11-082		33-A-0100						Comfort Cooling	
A	33-N11-085		33-A-0101						Comfort Cooling	

NOTES

Suggested Manufacturer: Mitsubishi

Suggested Model Number: PK30FL

S20.41

* information supplied by manufacturer unless already specified

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

amec

Breather Filter

NO.	BY	DATE	REVISION
A	KJM	9/12/2004	

SPEC. No. 145579-D-SP-006

SHEET 1 OF 1 — DATE 12/9/2004

BY KJM — CHK'D — APPR.

P.O.

REQ.

Project: 145579 Demonstration Bulk Vitrification

1. Fluid: Air
2. Temperature Dry Bulb: 85 F
3. Temperature Wet Bulb: 65 F
4. Outdoor Temp. Dry Bulb: 115 F
5. Total Capacity*
6. Sensible Capacity
7. Air Flow*: 40 CFM
8. Fan RPM*
9. Voltage
10. Hertz
11. Phase
12. Full Load Amps
13. Minimum Ampacity
14. Max Fuse Size
15. Thermostat
16. MFR.*: Flanders
17. Model No.*: 0-007-1-12-RF-NU-00-E3-204059 w/ weather cap F-0622997
18. Supplier: Flanders
19. Address: Bath, N.C.
20. Phone
21. Fax

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia. Seal Matr'l	T* Max.	Temperature Norm.	Temperature Max.	Temperature Range	Service	Notes
A	33-N02-017		33-A-0100						Ventilation Air	

NOTES

Order with pre-filter, test section and HEPA filter housings as a unit

Manufacturer to ship housing packaged for overseas delivery

S20.41

* information supplied by manufacturer unless already specified

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

amec

Condenser				SPEC. No.		
				145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1 OF 1		DATE 12/9/2004
A	KJM	9/12/2004		BY KJM	CHKD	APPR.
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification

1. Fluid	Air	16. MFR.*	
2. Temperature Dry Bulb	115 F	17. Model No.*	
3. Temperature Wet Bulb	68 F		
4. Capacity	22,929 Btuh		
5. Air Flow*			
6. Fan RPM*			
8. Voltage	240 V		
9. Hertz	60 A		
10. Phase	1		
11. Minimum Ampacity	18.9		
12. Fan Motor	0.5 hp		
13. Compressor RLA	14.7		
14. Crankcase Heater			
15. Max Fuse Size	30	18. Supplier	Thermal Supply Inc.
		19. Address	Kennewick, WA
		20. Phone	(509) 783-0140
		21. Fax	(509) 783-1223

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia Seal Matrl	T* Max.	Temperature Norm.	Max.	Range	Service	Notes
A	33-N11-082		33-A-0100							
A	33-N11-085		33-A-0101							

NOTES

Suggested Manufacturer: Mitsubishi

Suggested Model Number: PUG30AYB

S20.41

* information supplied by manufacturer unless already specified

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

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Exhaust Filter Housing

NO.	BY	DATE	REVISION
A	KJM	9/12/2004	

SPEC. No. 145579-D-SP-006

SHEET 1 OF 1

DATE 12/9/2004

BY KJM | CHK'D | APPR.

P.O.

REQ.

Project: 145579 Demonstration Bulk Vitrification

1. Fluid: Air
2. Temperature Dry Bulb: 85 F
3. Temperature Wet Bulb: 65 F
4. Outdoor Temp. Dry Bulb: 115 F
5. Total Capacity*
6. Sensible Capacity
7. Air Flow*: 650 CFM
8. Fan RPM*
9. Voltage
10. Hertz
11. Phase
12. Full Load Amps
13. Minimum Ampacity
14. Max Fuse Size
15. Thermostat
16. MFR.*: Flanders
17. Model No.*: G1 Series Housing w/007 series filter
18. Supplier: Flanders
19. Address: Bath, N.C.
20. Phone
21. Fax

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia.Seal Main	1* Max.	Temperature Norm.	Temperature Max.	Temperature Range	Service	Notes
A	33-N02-030		33-A-0100						Ventilation Air	

NOTES

Order with pre-filter, test section and HEPA filter housings as a unit

Manufacturer to ship housing packaged for overseas delivery

S20.41

* information supplied by manufacturer unless already specified

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

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Heater				SPEC. No. 145579-D-SP-006	
NO.	BY	DATE	REVISION	SHEET 1 OF 1	DA 12/9/2
A	KJM	9/12/2004		BY KJM / CHK'D	APPR.
				P.O.	
				REQ.	

Project: 145579 Demonstration Bulk Vitrification

1. Fluid	Air	14. MFR.*	
2. Flow		15. Model No.*	
3. Capacity	19,404 Btuh		
4. Fan RPM			
5. Fan HP*			
6. Temp. Rise	65 F		
7. Voltage	480 V		
8. Hertz	60 Hz		
9. Phase	3		
10. Full Load Amps	9.9		
11. Thermostat	Internal		
12. Transformer	24 V Internal		
13. Disconnect Switch	40 A	16. Supplier	Valin Northwest
		17. Address	Bellevue, WA
		18. Phone	(800) 634-5573
		19. Fax	(425) 885-5579

Rev.	Tag. No.	Line no. /Equip.	P&ID	Dia.Seal Matr'l	T* Max.	Temperature Norm.	Max.	Range	Service	Notes
A	33-N11-064		33-A-0101				115	-25 to 40 F	Freeze Protection	

NOTES

Suggested MFR Chromalox

Model No KUH-05-43-30-40-1

S20.41

* information supplied by manufacturer unless already specified

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

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Project: 145579 Demonstration Bulk Vitrification

Heater

NO.	BY	DATE	REVISION
A	KJM	9/12/2004	

SPEC. No. 145579-D-SP-006

SHEET 1 OF 1

DATE 12/9/2004

BY KJM

CHK'D

APPR.

P.O.

REQ.

1. Fluid	Air
2. Flow	
3. Capacity	29,480 Btuh
4. Fan RPM	
5. Fan HP*	
6. Temp. Rise	65 F
7. Voltage	480 V
8. Hertz	60 Hz
9. Phase	3
10. Full Load Amps	9.9
11. Thermostat	Internal
12. Transformer	24 V Internal
13. Disconnect Switch	40 A
14. MFR.*	
15. Model No.*	
16. Supplier	Valin Northwest
17. Address	Bellevue, WA
18. Phone	(800) 634-5573
19. Fax	(425) 885-5579

Rev.	Tag. No.	Line no. /Equip.	P&ID	Dia. Seal Matr'l	T* Max.	Temperature Norm.	Max.	Range	Service	Notes
A	33-N11-001		33-A-0100				115	-25 to 40 F	Freeze Protection	
A	33-N11-003		33-A-0100				115	-25 to 40 F	Freeze Protection	

NOTES

Suggested MFR. Chromalox

Model No. KUH-07-43-30-40-1

S20.41

* information supplied by manufacturer unless already specified

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

amec

Inlet Air Filter Housing				SPEC. No.	
				145579-D-SP-006	
NO.	BY	DATE	REVISION	SHEET 1 OF 1	DATE 12/9/20
A	KJM	9/12/2004		BY KJM / CHK'D	APPR.
				P.O.	
				REQ.	

Project: 145579 Demonstration Bulk Vitrification

1. Fluid	Air	16. MFR.*	Flanders
2. Temperature Dry Bulb	85 F	17. Model No.*	T1 Series Housing w/007 series filter and 45% ASHRAE Pre-Filter
3. Temperature Wet Bulb	65 F		
4. Outdoor Temp. Dry Bulb	115 F		
5. Total Capacity*			
6. Sensible Capacity			
7. Air Flow*	650 CFM		
8. Fan RPM*			
9. Voltage			
10. Hertz			
11. Phase			
12. Full Load Amps			
13. Minimum Ampacity			
14. Max Fuse Size			
15. Thermostat		18. Supplier	Flanders
		19. Address	Bath, N.C.
		20. Phone	
		21. Fax	

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia. Seal Matr'l	T* Max.	Temperature Norm.	Max.	Range	Service	Notes
A	33-N02-019		33-A-0100						Ventilation Air	
A	33-N02-031		33-A-0100							

NOTES

Order with pre-filter, test section and HEPA filter housings as a unit

Manufacturer to ship housing packaged for overseas delivery

S20.41

*information supplied by manufacturer unless already specified

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

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Quick Disconnects				SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/9/2004
A	KJM	9/12/2004		BY KJM	CHK'D	APPR.
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification

1. Type: "Air Chief" Industrial Interchange Quick-Connect Plugs
2. Material: SS

Coupling

3. Body Size: 1/2 in
4. NPT Thread Size: 1/2 in
5. Flow at 100 psi: 20 CFM
6. MFR.: DIXON VALVE & COUPLING
7. Model No.: DCP18S (Female), DC10S (Male)
8. Supplier: DIXON VALVE & COUPLING
9. Address: PORTLAND, OR
10. Phone: (503) 289-0400
11. Fax: -

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia.Seal Mat'l	T°F Max.	Pressure Norm.	Pressure Max.	Pressure Range	Service	Notes
A	33-TB000-301		P005-1		150	100	125		Compressed Air	

NOTES

S20.41

* information supplied by manufacturer unless already specified

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

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Quick Disconnects				SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/9/2004
A	KJM	9/12/2004		BY KJM	CHK'D	APPR.
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification

1. Type: "Andrews" / "Boss-Lock" Type A Adapters
2. Material: SS

Coupling

3. Body Size: 1 in
4. NPT Thread Size: 1 in
5. Flow at 100 psi: 40 gpm

4. MFR. DIXON VALVE & COUPLING
5. Model No. 100-A-SS / 100-D-SS

6. Supplier: DIXON VALVE & COUPLING
7. Address: PORTLAND, OR
8. Phone: (503) 289-0400
9. Fax: -

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia.Seal Mat'l	T°F Max.	Pressure Norm.	Pressure Max.	Pressure Range	Service	Notes
A	CD-302		33-A-0100		115	90	180	psig	Filtered Water	
A	CD-307		33-A-0102		115	90	180	psig	Filtered Water	

NOTES

S20.41

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Quick Disconnects				SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/9/2004
A	KJM	9/12/2004		BY KJM	CHK'D	APPR.
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification

1. Type: "Andrews" / "Boss-Lock" Type A Adapters
2. Material: SS

Coupling

3. Body Size: 2 in
4. NPT Thread Size: 2 in
5. Flow at 100 psi: 40 gpm

4. MFR: DIXON VALVE & COUPLING
5. Model No.: 200-A-SS / 200-D-SS

6. Supplier: DIXON VALVE & COUPLING
7. Address: PORTLAND, OR
8. Phone: (503) 289-0400
9. Fax: -

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia Seal Mat'l	T°F Max.	Pressure Norm.	Pressure Max.	Pressure Range	Service	Notes
A	OD-303		33-A-0101		115	90	180	psig	Filtered Water	
A	OD-304		33-A-0100		115	90	180	psig	Filtered Water	
A	OD-305		33-A-0100		115	90	180	psig	Filtered Water	
A	OD-306		33-A-0101		115	90	180	psig	Filtered Water	

NOTES

S20.41

* information supplied by manufacturer unless already specified

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Rupture Discs

NO.	BY	DATE	REVISION
A	KJM	9/13/2004	

SPEC. No. 145579-D-SP-006

SHEET	OF	DATE
1	1	9/13/2004
BY	CHKD	APPR.
KJM		

P.O.
REQ.

Project 145579 Demonstration Bulk Vitrification

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	
SERVICE CONDITIONS	5	Design Code		B31.3	
	6	Basis for selection			
	7	Primary / Secondary Relief		5 psig	
	8	Fluid Code / Description			
	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.			
	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			
DISC	*24	Model no.			
	*25	Size			
	*	Type	Non-fragmentation		
	*26	Material			
	*27	Coating: Inlet	Coating: Outlet		
	28	Quantity per Assembly			
	29				
VACUUM SUPPORT	*30	Model no.			
	31,33	Material	Attached to Disc		
FLANGES	*34	Assembly no.			
	*35	Base material			
	36	Hold down Material			
	37	I.D. of Connecting Pipe			
	38	Flange Rating	Facing		
	39	0.5" NPT tap in bolt-down flange			
OPTIONS	40,44	Studs & Nuts	Jackscrews		
	41	Preassembly screws			
	42	Excess flow valve			
	43	Pressure Switch / Pressure Gauge			
	*45	Manufacturer			

NOTES

S20.54

* information supplied by manufacturer unless already specified

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amec

Steam Condensate Pump					SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION		SHEET 1	OF 1	DATE 12/9/2004
A	KJM	9/12/2004			BY KJM	CHK'D	APPR.
					P.O.		
					REQ.		

Project: 145579 Demonstration Bulk Vitrification

1. Impeller Material: 316 SS
2. Motor: NEMA, C-face
3. Manufacturing Std: ISO 9001
4. Casing: Cast Iron or 316 SS
5. Portplate: Cast Iron or 316 SS
6. Shaft: 316 SS
7. Nominal Capacity: 5 GPM
8. Motor HP*:
9. Frequency: 60 Hz
10. Speed*:
11. Weight*:
12. Max Vacuum: 29 in Hg
13. Max Inlet Temp: 300 deg F
14. Required Head:
15. MFR.*:
16. Model No.*:
17. Supplier:
18. Address:
19. Phone:
20. Fax:

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Dia. Seal Mat'l	T° Max.	Pressure Norm.	Pressure Max.	Pressure Range	Service	Notes
A	33-061-023		33-A-0100			15	125	psig	Steam Condensate	

S20.41

* information supplied by manufacturer unless already specified

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

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Control Valves				SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/9/2004
A	KJM	9/13/2004		BY KJM	CHKD	APPR
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification P

1 #Tag No.: YV-004, YV-037, YV-010 Service: LAW P&ID: 33-A-0100/0101
Fluid Code: Desc.: Line no.:

			Units	Max Flow	Norm Flow	Min Flow	Shut Off	
2	SERVICE CONDITIONS	Flow rate	gpm	80	20		-	
3		Inlet Pressure P1	psig	375	175	0		
4		Outlet Pressure P2	psig	0	0			
		Differential Pressure dP = P1 - P2	psid	375	175			
5		Inlet Temperature	F	150	120	40		
6		Spec.Weight / Spec.Gravity / Mol. Weig		1.3	1.3	1.0	-	
7		Viscosity / Specific Heats Ratio	cp		10		-	
8		Vapor Pressure Pv / Crit Press PC					-	
9		* Required Cv			600		-	Flow Thru
10		* Travel	%				0	
11		* Predicted Sound press. level (at 1 m.)	dBA				-	Max. 85 dbA
12		Compressibility (Z)						
		Solids conc. / Particule size			0%			

13	LINE	Pipe Line Size In 1" Out 1"	53	ACTUATOR	*Type Pneumatic/Spring Return
14		Pipe Sch./W thick In 80 Out 80	54		*Manufacturer Bray Series 93
15		Mater'l A53 ANSI S/Gr B Ins.			*Model
16	VALVE BODY / BONNET	*Type Ball Valve *Std / Full port Std	55		*Size *Eff Area
17		*Size 1" ANSI class 600#	57		Action Open / Close / Lock
18		*Valve max P / T*	58		*Max Allowable Press.
19		*Manufacturer Flowtek Triad Series	59		*Min Required Press.
		*Model	60		Available Air Supply Pressure See Note 1
20		*Body / Bonnet Mater'l TBD (2)	61		Max 125 psig Min 100 psig
21		*Liner Mater'l / In.Diam.	62		*Bench Range /
22		End In 1" Extended BW or Flange	63		*Actuator Orientation
23		Connection Out 1" Extended BW or Flange	64		Handwh'l Type
24		Flange Face Finish	65		Air Failure Valv Closed Set at
		*Face to Face dim.	66		
25		End Ext / Mater'l	67	POSITIONER	Input Signal
26		*Flow Direction	68		*Type 120 VAC Solenoid (3)
27		*Type of Bonnet			Smart Communic
28		*Lube & Iso Valve *Lube	69		*Mfr & Model (5) Bray Series 55
29		*Packing Material UHWMPE	70		*On Incr. Signal, Output Incr. / Decr.
30		*Packing Type	71		Gauges By pass
32	TRIM	*Type	72		*Cam Charact's.
33		*Size *Rated Travel	73		*Air Port size *Boosters
34		*Characteristic	74	SWITCHES	Type 24VDC Proximity (3) Quantity 2
35		*Balanced / Unbalanced	75		*Mfr & Model Bray Series 52
36		*Rated *Cv *FL *Xt	76		Nb. contacts / rating
37		*Plug/Ball/Disk Mat'l 316 SS	77		Actuation Points
38		*Seat Material UHMWPE w/ Cavity Filled Seats	78		
39		*Cage/Guide Mt'l	79	AIR SET	*Mfr & Model
40		*Stem Material 316 SS	80		*Set Press
41			81		Filter Gauge
43	ACCESS	NEC Class Group Div	83	TESTS	*Hydro Pressure per ASME B16.34 @ 265 psig, min.
44			84		ANSI / FCI Leak Class MSS SP-72 and SP-82
45			85		Test Results submittals required

47	NOTES	UNIT PROCESS COMPANY	1) 100 to 125 psig Compressed air is available
48		Royal City, WA	2) CMTRs Required if Available
49		(509) 346 9920	3) The solenoid valve and proximity sensor shall be NEMA 4 enclosures
		(509) 346 9951	4) FCI 70 2, Class VI is an acceptable substitute
50			5) speed cntl & manual override 570.50

* : Information supplied by manufacturer unless already specified

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Control Valves

NO.	BY	DATE	REVISION
A	KJM	9/13/2004	

SPEC. No.		
145579-D-SP-006		
SHEET 1	OF 1	DATE 12/10/2004
BY KJM	CHK'D	APPR.
P.O.		
REQ.		

Project: 145579 Demonstration Bulk Vitrification P

1 &Tag No.: YV-033 Service: Steam Supply P&ID : 33-A-0100
Fluid Code: Desc. : Line no.:

SERVICE CONDITIONS

		Units	Max Flow	Norm Flow	Min Flow	Shut Off	
2	Flow rate	lb/hr	2500	2000		-	
3	Inlet Pressure P1	psig	25	15	0		
4	Outlet Pressure P2	psig	0	0			
	Differential Pressure dP = P1 - P2	psid	25	15			
5	Inlet Temperature	F	300	250	40		
6	Spec.Weight / Spec.Gravity / Mol. Weig		1	1	1.0	-	Saturated Steam
7	Viscosity / Specific Heats Ratio	cp				-	
8	Vapor Pressure Pv / Crit Press PC					-	
9	* Required Cv			600		-	Flow Thru
10	* Travel	%				0	
11	* Predicted Sound press. level (at 1 m.)	dBA				-	Max. 85 dbA
12	Compressibility (Z)						
	Solids conc. / Particule size			0%			

LINE

13 Pipe Line Size In 6" Out 6"
14 Pipe Sch./W thick.In 80 Out 80
15 Mater'l A53 ANSI S/Gr B Ins.

VALVE BODY / BONNET

16 * Type Ball Valve * Std / Full port Std
17 * Size 6" ANSI class 600#
18 * Valve max P / T°
19 * Manufacturer Flowtek Triad Series
* Model
20 * Body / Bonnet Mater'l TBD (2)
21 * Liner Mater'l / In Diam.
22 End In 6" Extended BW or Flange
23 Connection Out 6" Extended BW or Flange
24 Flange Face Finish
* Face to Face dim.
25 End Ext / Mater'l
26 * Flow Direction
27 * Type of Bonnet
28 * Lube & Iso Valve * Lube
29 * Packing Material RPTFE
30 * Packing Type

TRIM

32 * Type
33 * Size * Rated Travel
34 * Characteristic
35 * Balanced / Unbalanced
36 * Rated * Cv * FL * Xt
37 * Plug/Ball/Disk Mat'l 316 SS
38 * Seal Material RPTFE w/ Cavity Filled Seals
39 * Cage/Guide Mt'l
40 * Stem Material 316 SS
41

ACCESS.

43 NEC Class Group Div.
44
45

ACTUATOR

53 * Type Pneumatic/Spring Return
54 * Manufacturer Bray Series 93
* Model
55 * Size * Eff Area
57 Action Open / Close / Lock
58 * Max Allowable Press.
59 * Min Required Press.
60 Available Air Supply Pressure See Note 1
61 Max 125 psig Min 100 psig
62 * Bench Range /
63 * Actuator Orientation
64 Handwh'l Type
65 Air Failure Valv Closed Set at
66

POSITIONER

67 Input Signal
68 * Type 120 VAC Solenoid (3)
Smart Communic.
69 * Mfr & Model (5) Bray Series 55
70 * On Incr. Signal, Output: Incr. / Decr.
71 Gauges By pass
72 * Cam Charact's.
73 * Air Port size * Boosters

SWITCHES

74 Type 24VDC Proximity (3) Quantity 2
75 * Mfr & Model Bray Series 52
76 No. contacts / rating
77 Actuation Points
78

AIR SET

79 * Mfr & Model
80 * Set Press.
81 Filter Gauge

TESTS

83 * Hydro Pressure per ASME B16.34 @ 265 psig, min.
84 ANSI / FCI Leak. Clas MSS SP-72 and SP-82
85 Test Results submittals required

NOTES

47 UNIT PROCESS COMPANY
48 Royal City, WA
49 (509) 346-9920
(509) 346-9951
50

1) 100 to 125 psig Compressed air is available
2) CMTRs Required if Available
3) The solenoid valve and proximity sensor shall be in NEMA 4 enclosures.
4) FCI 70-2, Class VI is an aceptable substitute
5) speed cntrl & manual overide

S20.50

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Valves				SPEC. No.	
				145579-0-SP-006	
NO.	BY	DATE	REVISION	SHEET 1 OF 1	DATE 12/9/2004
A	KJM	9/12/2004		BY KJM / CHK'D	APPR.
				P.O.	
				REQ.	

Project: 145579 Demonstration Bulk Vitrification

1. Type: BALL VALVES
2. Body Size: See Below
3. Body Material*
4. Port Size*
5. Number of Ports: 2
6. Guiding
7. End Conn/Rating*
8. Packing Material/Type: RTFE *
9. Lubricator
10. Iso Valve
11. Bonnet Type
12. Trim From
13. Trim Material Seat/Plug: RTFE/316 SS *
14. Shaft Material: 316 SS
15. Required Seat Tightne: Class VI
16. Max Allow Sound Level dBA

Design Pressure: 125 psig
Design Temperature: 150 F

17. MFR.: FLOWTEK 7/8000 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: Unit Process Company
31. Address: Everett, WA
32. Phone: (509) 346-9920
33. Fax: (509) 346-9951

Rev.	*Tag. No.	Line no. /Equip.	P&ID	Body Size	T* Max.	Pressure Norm	Pressure Max.	Pressure Range	Service	Notes
A	33-V-031		33-A-0101	1"					Filtered Water	
A	33-V-033		33-A-0101	1"					Filtered Water	
A	33-V-098		33-A-0100	1-1/2"					Steam	
A	33-V-099		33-A-0100	1-1/2"					Steam	
A	33-V-038		33-A-0100	4"					Steam	
A	33-V-039		33-A-0100	4"					Steam	
A	33-V-089		33-A-0100	1-1/2"					Steam	
A	33-V-012		33-A-0100	4"					Chilled Water	
A	33-V-018		33-A-0100	4"					Chilled Water	
A	33-V-036		33-A-0101	1"					Filtered Water	
A	33-V-035		33-A-0100	1"					Filtered Water	
A	33-V-094		33-A-0100	1"					Air	
A	33-V-006		33-A-0100	2"					Filtered Water	
A	33-V-023		33-A-0101	2"					Filtered Water	
A	33-V-009A		33-A-0100	1-1/2"					Off-Gas	
A	33-V-081		33-A-0101	1-1/4"					Chilled Water	
A	33-V-076		33-A-0101	1"					Chilled Water	
A	33-V-002		33-A-0101	2"					Secondary Waste	
A	33-V-087		33-A-0100	2"					Filtered Water	
A	33-V-092		33-A-0100	2"					Filtered Water	
A	33-V-008		33-A-0101	1"					Chilled Water	
A	33-V-037		33-A-0100	1"					Steam	
A	33-VB-085		33-A-0100	1"					Sump	

NOTE

* - check notes for change of standard packing/trim material seat

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* information supplied by manufacturer unless already specified

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Valves

NO.	BY	DATE	REVISION
A	KJM	9/12/2004	

SPEC. No. 145579-D-SP-006

SHEET 1 OF 1 | DATE 12/9/2004

BY KJM | CHKD | APPR.

P.O.

REQ.

Project: 145579 Demonstration Bulk Vitrification

1. Type CHECK VALVE
2. Body Size SEE BELOW
3. Body Material*
4. Port Size
5. Number of Ports 2
6. Guiding
7. End Conn/Rating*
8. Packing Material/Type
9. Lubricator
10. Iso Valve
11. Bonnet Type
12. Trim From
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 HVFO 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
32. Phone (515) 224-2301
33. Fax (515) 224-2326

Rev.	Tag. No.	Line no. /Equip.	P&ID	Body Size	T* Max.	Pressure Norm.	Pressure Max.	Pressure Range	Service	Notes
A	33-V-032		33-A-0101	2"					Filtered Water	
A	33-V-041		33-A-0100	2"					Off-Gas	
A	33-V-022		33-A-0101	2"					Filtered Water	
A	33-V-034		33-A-0100	1"					Filtered Water	
A	33-V-007		33-A-0101	1"					Chilled Water	
A	33-V-082		33-A-0101	1-1/4"					Chilled Water	
A	33-V-005		33-A-0100	2"					Filtered Water	
A	33-V-001		33-A-0101	2"					Secondary Waste	
A	33-V-010		33-A-0100	1"					Steam	
A	33-V-091		33-A-0100	2"					Filtered Water	
A	33-V-088		33-A-0100	2"					Filtered Water	
A	33-V-009		33-A-0101	1"					Chilled Water	
A	33-V-013		33-A-0101	4"					Chilled Water	
A	33-V-014		33-A-0101	4"					Chilled Water	

NOTES

* Prefix all Tag Numbers with "POR-"

S20.41

* information supplied by manufacturer unless already specified

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

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Valves

NO.	BY	DATE	REVISION
A	KJM	9/12/2004	

SPEC. No. 145579-D-SP-006

SHEET 1 OF 1

DATE 12/9/2004

BY KJM | CHKD | APPR.

P.O.

REQ.

Project: 145579 Demonstration Bulk Vitrification

1. Type: Gage Root Valve
2. Body Size: SEE BELOW
3. Body Material: SS
4. Port Size:
5. Number of Ports: 2
6. Guiding:
7. End Conn/Rating: NPT
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:

Design Temperature:

17. MFR: SWAGELOK
18. Model No.: SS-6PNDGM8-1-8
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: Seattle Fluid System Technologies
31. Address: Bellevue, WA
32. Phone: (425) 825-1115
33. Fax: (425) 825-1705

Rev.	*Tag No.	Line no. /Equip.	P&ID	Body Size	T* Max	Pressure Norm	Pressure Max	Pressure Range	Service	Notes
	33-VB-009		33-A-0100	1/2"					Off-Gas	
	33-VB-036		33-A-0100	1/2"					Air	
	33-VB-027		33-A-0100	1/2"					Off-Gas	
	33-VB-033		33-A-0100	1/2"					Steam	
	33-VB-034		33-A-0100	1/2"					Steam	
	33-VB-127		33-A-101	1/2"					Hydraulics	
	33-VB-129		33-A-101	1/2"					Hydraulics	

NOTES

* Prefix all Tag Numbers with "POR"

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* information supplied by manufacturer unless already specified

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Valves				SPEC. No.		
				145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/16/2004
A	KJM	9/14/2004		BY KJM	CHK'D	APPR.
				P.O.		
				REQ.		

Project: 145579 Demonstration Bulk Vitrification Project

1. Type	Reduced Pressure Back Flow Preventer		17. MFR.	Conbraco (40-201-T2S)	
2. Body Size	2"		*18 Model No.		
3. Body Material	316 SS				
4. Port Size	2" NPT		19. Flow Composition	FILTERED WATER	
5. Number of Ports	2		20. Required Cv		
6. Guiding			21. Inlet Press Norm/Max	40 psig	70 psig
7. End Conn/Rating	1/4" NPT		22. Flow Rate Norm/Max	1 gpm	60 gpm
8. Packing Material/Type		Seller Selected (e.g. Glass Filled Celcon)	23. dP/Max Shut Off dP		
9. Lubricator			24. Temp Oper/Max	70 F	150 F
10. Iso Valve			25. Oper sp gr/Visc	1	1
11. Bonnet Type			26. % Superheat/Flash		
12. Trim From			27. Crit Press/% Solids		<1.0% SOLID
13. Trim Material Seat/Plug		Seller Selected (e.g. Silicone Rubber)	28. Mol Wt/Vapor	18	
14. Shaft Material			29. Pred. Sound Level dBA		
15. Required Seal Tightness					
16. Max Allow Sound Level dBA			30. Supplier	Conbraco	
			31. Address	P.O. Box 247	Matthews, NC 28106
Design Pressure	150 PSIG		32. Phone	704-841-6000	
Design Temperature	150 F		33. Fax		

Rev	*Tag. No.	Line no. /Equip.	P&ID	Dia.Seal Matr'l	T° Max.	Pressure Norm.	Pressure Max.	Pressure Range	Service	Notes
	DBVS-FW-RPBP-XX1		32-A-0100						FILTERED WATER	

NOTES

1) Alternate Supplier Wilkins P/N 975XLST, 3/8" (Wilkins/Zurn at 805-238-7100)

2) Provide optional air gap device, P/N 40-200-XA

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* information supplied by manufacturer unless already specified

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

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Pressure Regulating Valves (Self Pilot)

NO.	BY	DATE	REVISION
A	KJM	9/13/2004	

SPEC. No.		
145579-0-SP-006		
SHEET	OF	DATE
1	1	9/13/2004
BY	CHK'D	APPR.
KJM		
P.O.		
REQ.		

Project: 145579 Demonstration Bulk Vi

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	Seat Material				
	15	Required Seat Tightness				
	16	Max.Sound level, dB(A)				
	17					
ACTUATOR	18	Type : Reducing / Relief				
	19	Self / Pilot Oporated				
	20	Self Cont. / Ext. Conn.				
	21	H/Wheel / Adj. Screw				
	22	Diaphragm Material				
	23	Diaphragm Rating				
	24	Spring Range				
	25					
Accessories	26	Filter Regulator				
	27	Line Strainer				
	28	Housing Vent				
	29	Internal Relief				
	30	Gauge				
	31					
SERVICE	32	Fluid				
	33	Phase				
	34	Corrosive 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	Opererating Viscosity				
	43	% Solids				
	44	Vapor Pres. / Crit. Press.				
	45					
	46					
C_V	47	C_V @ Max. Flow				
	48	Wide Open C_V				
	49					
	50					

NOTES

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Distribution Panel				SPEC. No. 145579-D-SP-006	
NO.	BY	DATE	REVISION	SHEET 1 OF 1	DATE 12/9/2004
				BY KJM / CHK'D	APPR.
				P.O.	
				REQ.	

Project: Demonstration Bulk Vitrification Project

1. Volts	120/240V ac, single-phase	9. MFR.	
2. Amps		10. Model No.	
3. Breaker type	Bolt-on		
4. Main Breaker	yes		
4.a. Amps (trip)			
4.b. MFR			
4.c. Model No.			
5. Therm. Mag. breakers	yes		
5.a. MFR			
5.b. Model No.			
6. GFCI breakers	yes		
6.a. MFR			
6.b. Model No.			
7. GFPE breakers	yes		
7.a. MFR			
7.b. Model No.		11. Supplier	
8. Documentation	detailed panel schedule, inside door	12. Address	
		13. Phone	
		14. Fax	

Rev.	*Tag. No.	Line no. /Equip.	P&ID							Notes

NOTES

* Prefix all Tag Numbers with "POR-"

S20.41

* information supplied by manufacturer unless already specified

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

amec

Nonfused Disconnect Switch				SPEC. No. 143643-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/9/2004
				BY JJI	CHKD	APPR.
				P.O.		
				REQ.		

Project: Demonstration Bulk Vitrification Project

1. Volts: 480V ac
2. Amps (frame):
3. Poles: 3
4. Enclosure: NEMA 4
5. Options: 1 NO, 1 NC auxiliary contact (for motor circuits only)
6. MFR.
7. Model No.
8. Supplier
9. Address
10. Phone
11. Fax

Rev.	*Tag. No.	Line no. /Equip.	P&ID							Notes

NOTES

Alternate MFR: HMO-Kontio MMA 1.5x1x6H

Performance and Dimensions shall be in accordance with ANSI B73.M, and HI-3.1 through 3.6.

* Prefix all Tag Numbers with "POR-"

S20.41

amec

Single-Phase Transformer				SPEC. No. 145579-D-SP-006	
NO.	BY	DATE	REVISION	SHEET 1 OF 1	DATE 12/9/2004
				BY KJM	CHK'D / APPR.
				P.O.	
				REQ.	

Project: Demonstration Bulk Vitrification Project

1. Volts: 480-120/240V ac, single-phase
2. kVA:
3. Coil material: copper
4. Temperature rise: 115 deg C (min)
6. MFR.
7. Model No.
8. Supplier
9. Address
10. Phone
11. Fax

Rev.	*Tag. No.	Line no. /Equip.	P&ID							Notes

NOTES

* Prefix all Tag Numbers with "POR-"

S20.41

* information supplied by manufacturer unless already specified

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

amec

Fluorescent Lighting Fixtures

NO.	BY	DATE	REVISION

SPEC. No. 145579-D-SP-006

SHEET 1 OF 1

DAT 12/9/2004

BY KJM | CHK'D | APPR.

P.O.

REQ.

Project: Demonstration Bulk Vitrification Project

1. Volts: 120V ac
2. Watts:
3. Quantity:
4. Fixture type: Fluorescent
5. Lamp Type:
6. Ballast: Electronic, sound rating A, >90%PF, <20% THD
7. Diffuser: High-impact, vapor-tight, hinged or latched to housing
8. Mounting: Wall or ceiling (surface)
9. Operating temp. range: 40-100 deg F

9. MFR.
10. Model No.

11. Supplier
12. Address
13. Phone
14. Fax

Rev.	*Tag. No.	Line no. /Equip.	P&ID							Notes

NOTES

* Prefix all Tag Numbers with "POR"

S20.41

* information supplied by manufacturer unless already specified

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

amec

High-Pressure Sodium Lighting Fixtures				SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1	OF 1	DATE 12/9/2004
				BY JJI	CHK'D	APPR.
				P.O.		
				REQ.		

Project: Demonstration Bulk Vitrification Project

1. Volts: 120V ac
2. Watts:
3. Quantity:
4. Lamp type: High Pressure Sodium (low wattage)
5. Ballast: Integral, rated for temperature range of -15 deg F to 115 deg F
6. Reflector/diffuser: Assymetric, cut-off type (low glare)
7. Mounting: Wall
8. Options: Integral photocell control
9. MFR.:
10. Model No.:
11. Supplier:
12. Address:
13. Phone:
14. Fax:

Rev.	*Tag. No.	Line no. /Equip.	P&ID							Notes

NOTES

* Prefix all Tag Numbers with "POR."

S20.41

amec

TECHNICAL DATA SHEETS

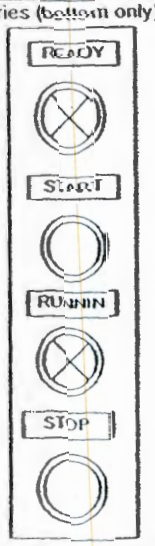
PROJECT:	Final DBVS Design	145579-D-SP-006	
PROJECT NO.:	145579	Local Control Station	
CLIENT:	AMEC E&E - Richland Washington		

No. Required	TBA	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	Die Cast	
Dielectric strength (> 1 minute)	>1000V		Standard Legend Plate	Aluminum	
Push Button-red (1N.O+1N.C.) "Start"	Momentary	800T-A6A			
Push Button-green (1N.O+1N.C.) "Stop"	Momentary	800T-A1A			
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

Air Sampler				SPEC. No. 145579-D-SP-006		
NO.	BY	DATE	REVISION	SHEET 1 OF 1		DATE 12/9/2004
				BY KJM	CHKD	APPR.
				P.O.		
				REQ.		

Project: Demonstration Bulk Vitrification Project

Qty	Model	Description
1. 1ea	AVS-28A	Air sampler, constant airflow to 17" Hg, flow regulation +/- 5%, 0.5 - 3.5cfm, 120V ac
2. 1ea	2500-65	In-line sample filter holder, 47mm, with 3/8" male quick disconnects
3. 1pkg	0750-36	Air sampling filters, 47mm, LB-5211 type

5. MFR. RADeCO
6. Model No. as shown

8. Supplier RADeCO
9. Address 509 Norwich Avenue, Taftville, CT 06380
10. Phone (860) 823-1220
11. Fax (860) 823-1521

Rev.	*Tag. No.	Line no. /Equip.	P&ID							Notes

NOTES

* Prefix all Tag Numbers with "POR-"

S20.41

amec 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 ½" 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 Yokagowa, 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 AMEC E&C Services Limited Trail, BC Canada

Instrumentation Data Sheet

ASSET NUMBER: 145579-D-SP-006 TAG NUMBER: 33-FIT-108

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

		Power Supply:	24V dc
Model No.:	DY040-EAMBS1-2D/MV	Output:	4-20 mA Isolated
Range:	5.7 – 193.7 GPM	Relay Output:	
Calibrated Range:	6 – 50 GPM	Local Indication:	1.0" LCD (3 ½" Digits)
Case Material:	Aluminum alloy	Conduit Connect:	
Enclosure Rating:	NEMA4X	Mounting Bracket:	Integral to transducer

TRANSDUCERS

Model No.:	DY040-EAMBS1-2D/MV
Line Material:	SS
Line Size/Sch'd:	1 ½" 150 psig
Transducer Mat'l.:	SS
Process Connection:	1 ½" 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 ½" 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 Yokagowa, DY040-EAMBS1-2D 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	Chk:	Appd.	Date: 102104	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-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 ½" 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 Yokagowa, 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 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

		Power Supply:	24V dc
Model No.:	EJA130A	Output:	4-20 mA Isolated
Range:	TBD	Relay Output:	N/R
Calibrated Range:	TBD	Local Indication:	1.0" LCD (3 ½" digits)
Case Material:	Low copper cast-aluminum	Conduit Connect:	
Enclosure Rating:	NEMA4X	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 [redacted] 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	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:	Yokagawa	P.O. No.:	
MODEL:	AE205MG Magnetic Flowmeter	P&ID No.:	DBVS-SK-P004

TRANSMITTER

		Power Supply:	24V dc
Model No.:	AE205MG-AA1-LSA-D1DH/HART	Output:	4-20 mA Isolated
Range:	9.6 – 321 GPM	Relay Output:	
Calibrated Range:	20– 120 GPM	Local Indication:	LCD with Backlight
Case Material:	Aluminum alloy	Conduit Connect:	
Enclosure Rating:	NEMA4X	Mounting Bracket:	Integral to transducer

TRANSDUCERS

Model No.:	AE205MG-AA1-LSA-D1DH/HART		
Line Material:	SS		
Line Size/Sch'd:	1 ½" 150 psig		
Transducer Mat'l.:	SS		
Process Connection:	1 ½" 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 ½" 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 Yokagowa, AE205MG-AA1-LSA-D1DH/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 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

		Power Supply:	24V dc
Model No.:	3310MRS Photohelic	Output:	
Range:	0-10 in H_2O	Relay Output:	PAH (TBD)
Calibrated Range:	0-10 in H_2O	Local Indication:	0-10 in H_2O
Case Material:		Conduit Connect:	
Enclosure Rating:		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_2O"
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_2O	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-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

		Power Supply:	24V dc
Model No.:	3310MRS Photohelic	Output:	
Range:	0-10 in H_2O	Relay Output:	PAH (TBD)
Calibrated Range:	0-10 in H_2O	Local Indication:	0-10 in H_2O
Case Material:		Conduit Connect:	
Enclosure Rating:		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_2O"
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_2O	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:	Skid Inlet Prefilter DP		
SUPPLIER:			
MAKE:	Dwyer	P.O. No.:	
MODEL:	Series 3000 Photohelic Pressure Switch/Gage	P&ID No.:	DBVS-SK-P004

TRANSMITTER

		Power Supply:	24V dc
Model No.:	3310MRS Photohelic	Output:	
Range:	0-10 in H_2O	Relay Output:	PDAH (TBD)
Calibrated Range:	0-10 in H_2O	Local Indication:	0-10 in H_2O
Case Material:	Aluminum (hammerloid finish)	Conduit Connect:	
Enclosure Rating:		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_2O"
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_2O	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-PIT-035

SUBJECT:	Bulk Vitrification Waste Dryer System		
SERVICE:	Steam Supply Pressure to Dryer Sintered Metal Filter		
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:	0-29 psig	Relay Output:	N/R
Calibrated Range:	0 to 25 psig	Local Indication:	1.0" LCD (3 ½" Digits)
Case Material:	Low copper cast-aluminum	Conduit Connect:	
Enclosure Rating:	NEMA4X	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 Yokagowa, 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: 101304	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-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

		Power Supply:	24V dc
Model No.:	EJA530A	Output:	4-20 mA Isolated
Range:	0-29 psig	Relay Output:	N/R
Calibrated Range:	0 to 25 psig	Local Indication:	1.0" LCD (3 ½" Digits)
Case Material:	Low copper cast-aluminum	Conduit Connect:	
Enclosure Rating:	NEMA4X	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 Yokogowa, 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: 101304	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-029

SUBJECT:	Bulk Vitrification Waste Dryer System		
SERVICE:	Waste Dryer 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 ½" 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 Yokagowa, 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

D.H.M. technology

TECHNICAL SPECIFICATION

amec

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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USQ #03-1456-S

CH2M HILL Hanford Group, Inc.	Manual	ESHQ
	Document	TFC-ESHQ-Q_C-C-03, REV B
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	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
(7.1.1, 7.1.2, 7.1.3, 7.1.4)

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

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

This procedure applies to:

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

2.0 IMPLEMENTATION

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

3.0 RESPONSIBILITES

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

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

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 TFC-BSM-FPM_MC-C-01.
	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 TFC-ESHQ-Q_ADM-C-02

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 TFC-ESHQ-Q_ADM-C-02. 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

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.

Engineering Personnel	3.	Evaluate S/CI to determine if its use could create a safety hazard in its current/proposed application.
Assigned Company Personnel	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:
		a. Disposition the S/CI to remain in place. 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.
		b. Identify the accepted S/CI by marking with orange paint or other appropriate methods and note its location.
		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.
		d. Engineering must also identify a way to prevent its reuse in an application it may not be suitable for.
		e. If removed, prepare the S/CI for disposal.
	5.	If the engineering evaluation of the S/CI has determined that its use could create a safety hazard in its current/ proposed application:
		a. Contact Waste Feed Operations (WFO) Shift Operations to secure the equipment
		b. Remove the S/CI as soon as practical.
		c. Tag, segregate, or otherwise control the S/CI to prevent inadvertent use.
		d Prepare the S/CI for disposal
S/CI Coordinator	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:
		• Melting • Shredding • Destroying the threads on fasteners.

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.

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).

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 4.1. (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."

2. DOE G 440.1-6, "Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10CFR830.120; and DOE5700.6C, Quality Assurance."

3. NRC Information Notice 89-70: "Possible Indications of Misrepresented Vendor Products."

4. NRC Information Notice 89-70, Supplement 1: "Possible Indications of Misrepresented Vendor Products."

5. TFC-BSM-CP_CPR-C-01, "Purchasing Card (P-Card)."

6. TFC-BSM-CP_CPR-C-03, "Buyer's Technical Representative Process."

7. TFC-BSM-CP_CPR-C-06, "Procurement of Items (Materials)."

8. TFC-BSM-CP_CPR-C-09, "Supply Chain Process."

9. TFC-BSM-CP_CPR-C-11, "Acquisition Planning."

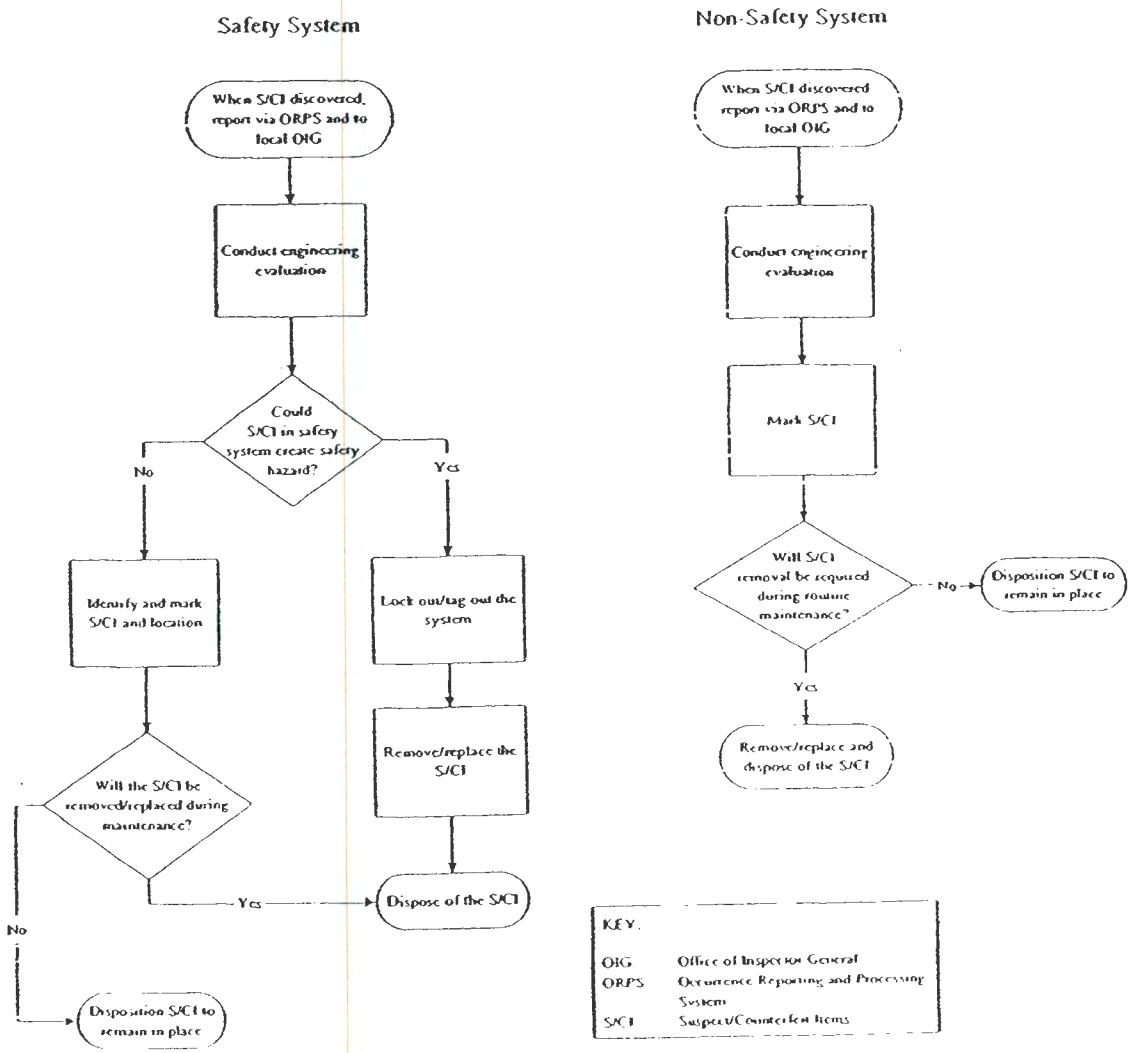
10. TFC-BSM-FPM_MC-C-01, "Material Receipt, Storage, Issuance, Return, and Excess Control."

11. TFC-ESHQ-Q_ADM-C-02, "Nonconforming Item Reporting and Control."

12. TFC-OPS-OPER-C-24, "Occurrence Reporting and Processing of Operations Information."

13. TFC-PLN-03, "Engineering Program Management Plan."

Figure 1. Management of Suspect/Counterfeit Items.



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.

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	General Electric (Component Examples) - AKF-2-25 - EC Trip Types, E-C-1, E-C-2A - AK All Types	Metal clad, low voltage, DC	Satin America & Circuit Breaker Systems Inc.	NRC I.N. 89-45, Supplements and Attachments SENS Report ID #6 5/23/89
Circuit Breakers	General Electric (Component Examples) - AK-3A-25 - KHL-36 125 - THEF 136050 - AK-2-75-3 - AK-2 - AK-1-50 - AK-1-75 - B - TDQ - TCVVFS - TFJ - TEB122015-WL - TEB132090-WL - TE111015 - TED134060-WL - TEB124050-WL - THED136100 WL - TED126050 - THED136060 WL - THGB2120 - TEF134015 - THEF136M1100 - TED134030-WL - AK2A25 - THED-136100-WL - THED 136050-WL - THED-136045-WL - THFK-236070-WL - TE-122070 - THED 136150-WL - THED-13600-WL - TED-113020 - TEC-36050 - THED-124015-WL	1, 2, & 3 pole, various amperages	Bud Ferguson's Industrial Control & Supply, Inc., General Circuit Breaker & Electrical Supply HLC Electric Supply NSSS, Inc California Breakers, Inc. Rosen Electric Equipment PENCON International (DBA) General Magnetics/ Electric Wholesale Lakeland Engineering Equipment Co. ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker Electrical Supply California Breakers Voyter Electric Co	NRC I.N. 88-46 Supplements and Attachments NRC I.N. 90-46 Office of Nuclear Safety 93-5 (#11)

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (Component Examples) - TF136090 - TF361050WL - TED1130070			
	- Not Provided	Commercial Grade	Westinghouse Electric Supply Co. (WESCO)	NRC I.N. 91-48
	- DB-25 & DS-416	Low Voltage	Satin America & Circuit Breaker Systems, Inc.	NRC I.N. 89-45 & Supplement #2
	- 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 HLC Electrical Supply California Breakers, Inc PENCON International (DBA) General Magnetics/Electric Wholesale	NRC I.N. 88-46, Supplements and Attachments Office Of Nuclear Safety 93-9
	- EB 1020 - HDEA 2030 - MCP331100R - MCP431550CR - BAB3060H - 656D14 8G03 - FA-2100 - EH-2050 - HFB 3050 - HFD(B)-3020 - MA3600 - F2020 - EH2100 - EB3050 - HMC3800F - EA2090 - FA3125 - HMCP 150		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	

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples) - HFD - EH2070 - FA2050 - JA2225 - JL3B125 - JL3B070 - JL3B150 - JL3B200 - JL3B090 - JL3B100 - HLM3800T - F3100N - MA3500 - EH2015 - FA3035 - FA2100 - HLA2125OTM - EH2070 - JB3100 - EB2030 - 8MC800 - CAH3200 - EHB3040 - JL3-B150 - JL3-B200 - JL3-B090 - JL3-B1000 - HFA, HFB, FA - JL3-(B)8070 - JL3-B125 - EH-2020 - FA-3035 - EH 2050 - FA 2100 - FA 2050 - HFB 3050 - JA-2225 - HLM3800T - F3100N - MA3500 - EH2015 - LA3200WL - HLA3200T - 2602D58U9	Shunt Trips Aux. Contacts 2 & 3 pole circuit breakers of various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply PENCON International (DBA) General Magnetics/ Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Molded Case Circuit Breakers Co. (MCCB)	NRC I.N. 88-46 Supplements and Attachments

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)			
	- HLB3200T - 262156G19 - 1A & 1B - HL300T - HLA2400TM - HMA3600T - HMA3700T - HKA3225T - HNB2700T	225 amp, 3 pole 3 pole, 20 amp 3 pole, 30 amp 1 pole, 20 & 30 amp 2 pole, 20 & 30 amp 3 pole, 60 amp	Not Provided	NRC I.N. 88-46 Supp. & Attach.
	- MDL#KAF - QNB3020 - QNB3030 - BA			SENS ID #10 3-17-89 SENS ID #11 3 3 89
	- BA - BA - E3060 - F3020	3 pole, 20 amp	Not Provided	SENS Report ID #12 10-19-88 NRC I N 88-46
Circuit Breakers	ITE (Component Examples)			
	- Model - E43B015	3-phase 480 volt	Cal. Breakers/Elect Wholesale Supply Co	SENS Report ID #8, 5-5-89
	- EQ-B - EE-3B030	1 pole, 20 amp 3 pole, 30 amp	Not Provided	SENS ID #10 3-17-89 SENS ID #11 3-3-89
	- EF3B070 - EF3H050 - EF3B125 - FF3B040 - F42B020 - Q32B200 - JL3B400	2 & 3 pole various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply	NRC I N 88-46, Supplements and Attachments

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Fed Pacific (Component Examples) (cont.) • NF63-1100 • NE22-4060 • NE22-4100 • NEF-433030 • 2P12S	1, & 3 pole - 30, 60 & 100 amp breakers	ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc.	SENS ID. #11 3-3-89 NRC I.N. 88-46, Supp. & Attach.
	Jefferson (Component Examples)	Not Provided	PENCON International (DBA) General Magnetics/electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply Mid West Co.	NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers	Superior (Component Examples) • 246U-3	Not Provided	General Circuit Breaker & Electrical Supply Rosen Electric HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46 Supp & Attach

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

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

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Semiconductors	Solid State Devices Inc. (SSDI) SFF 9140	P-Channel MOSFET	SSDI	DOE Albuquerque Letter, 06-25-96 to DOD Inspector General
	SPD 1511-1-11	Pin Diode (SA3059)		
	2A14/18 or 2A14/52	Ion Implanted Diode		
	SSR4045CTTXV	SCHOTTKY Diodes		
	SFF9140TWX	Power Transistors		
	SPMF106ANH	Special Pack MOSFET Switch		
	SPD 5818 or IN5858JTXV	Axial Leaded SCHOTTKY Diode		
	2N797	Transistor		
	Unknown	Diode (SA 3436)		
Static Controls	Westinghouse - (Component Examples)	Not Provided	General Circuit Breaker & Electrical Supply	NRC I.N 88 48
	• A200M1CAC		HLC Electric Supply	
	• A201K1CA		California Breakers, Inc.	
	• A201L2CA			
	• AN13A		PENCON International (DBA) General Magnetics/Electric Wholesale	
			ANTI THEFT Systems, Inc (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Valves	Kerotest	8" Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach
	Pacific	4" Gate Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Lukenheimer	6" Model 1542 20" Model 3013	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
	Crane	All	CMA & IMA Valve Refurbisher	NRC I.N. 88-48 Supp. & Attach.
Flanges	China Ding Zinang Nan Xi Li Flange Co Shou Gang Mach. Eng Co.	Flanges, ASTM A105, ASME SA105	Billiongold Co. LTD. Tain Gong Co. Sanxi Province Overseas Trading Corp	NRC I.N. 92-68 and Attachments Office of Nuclear Safety 92-25, 93-23, and 92-35 National Board of Boiler and Pressure Vessel Inspectors (NBBI) Bulletin: Special Report, 1992, Volume 48, Number 7, The Chinese Flange Investigation
Valve Replacement Parts	Masoneilan-Dresser Industries	Plug stem, stem to plug anti-rotation pin, seat ring, valve plugs, bushings, cages & packing box components	Cor-Val, Control Valve Specialists, H.H. Barnum & M.D. Norwood, Sample Webtrol Controls, Inc.	NRC I.N. 88-97 Supp. & Attach
Pumps & Replacement Parts	Hayward Tyler Pump Co	HTPC ASME Nuclear Code	Hayward Tyler Pump Co.	IEB 83-05 & Attachments
Channel Members	Unistrut Corporation	Continuously slotted channels, structural framing members, fasteners, nuts, fittings, pipe clamps	Unistrut Corporation	NRC I.N. 91-75
Fire Barriers	Thermal Science Inc	Thermo-Lag 330	None Listed	ES&Q Update #8 NRC I.N. 92-55
Valve Actuator	Limitorque	Eyebolts on housing cover	None Listed	Office of Nuclear Safety 93-25 NRC I.N. 93-37

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Steel	Alloy & Carbon Steel Co. Inc., Atlantic Steel Co., Levingston Steel Co., & Copperweld Steel co.	Plate Angle Flat Bar Bar	Meredith Corporation Pressure Vessel Nuclear Alloy & Carbon Steel Co., Inc.	NRC I.N. 89-56, Attachments and Supplements
Fasteners (Bolts, Screws, Nuts, and Washers)	(parentheses designated headmark) Asahi (A) Daiichi (D) Daici (E) Fastener Co. of Japan (FM) Hinomoto Metal (H) Jin Her (J) Kyowa (K) Kosaka Kogyo (KS) Kyoei Minamida Seiybo (M) Mnato Kogyo (MS) Nippon (NF) Takai (RT) Tsukimori (S) Unytte (UNY) Yamadai (Y) Ivaco, Infasco (hollow triangled)	• Those with suppliers or manufacturers • Those that are improperly marked • Those of foreign manufacture that do not meet Public Law 101-592, Fastener Quality Act	Note: Listed suppliers may also be manufacturers Lawrence Engineering & Supply Co. Metal Building Bolts Nichimin Corporation UNICO Acc Corporation E. K. Fasteners, Inc. H. Y. Port Fasteners Co Kobayashi Metals, LTD Takai Screw Mfg. Co. LTD. Yamaguchi Sesakusho Co LTD. Highland Bolt & Nut Poncous Fastener Co Northwest Fasteners Ziegler Bolts & Parts Co. Edgewater Fasteners, Inc Reynolds Fasteners A & G Engineering	Commercial Carrier Journal Articles for: 6/88, 1/90, 2/90, 3/90, 4/90, 6/90, 7/90, 12/90 INEL Suspect Headmark List SENS Report #5 2/6/91 SENS Report #13 2/6/91 HR 3000, U.S. House of Representatives, July 1988 J. A. Jones, Ltr, 9/23/92 Memo from I. Kubicek, 3/28/91 Memo from D. Sanow, 3/8/91 "Fastener Technology International," Feb., April, and June 1993 Rep. J. Dingell Ltr to Comm Dept. & NRC June 18, 1993 Office of Nuclear Safety 93-26, 93-22, 93-11 DOE Quality Alert, Bulletin, Issue No. 92-4, August 1992 FDH Hanford Suspect Headmark List

ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

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

ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT ITEMS

A. ELECTRICAL ITEMS

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

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

B MECHANICAL ITEMS

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

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

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

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

C. PIPING - which requires an ASTM or ASME standard
- Fittings
- Flanges
- Valves
- Pipe
- Components

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

D. FASTENERS - All fasteners 1/4" and above in diameter
- Bolts
- Studs
- Cap screws
- High-strength washers
- Nuts
- Anchors.

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

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

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

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.

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

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

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

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.

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.).

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.

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.

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

Rotating Machinery and Valve Internal Parts

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

Valves

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

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.

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.

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.

ATTACHMENT G - FASTENERS (cont.)

2.0 Stainless Steel fasteners

2.1 Purpose

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

2.2 Background

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

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

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

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

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

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 A193Grade B8 Class 1.

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

ATTACHMENT H - DOE HEADMARK LIST

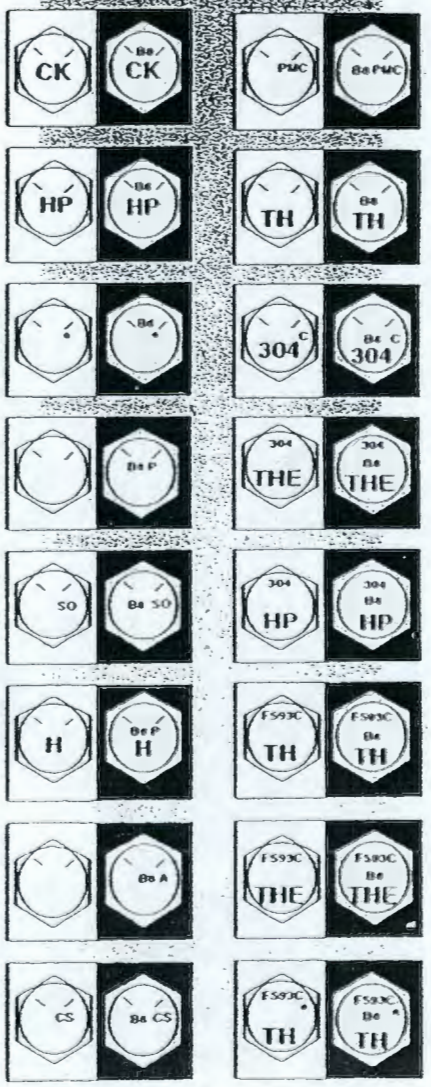
Help Stamp Out Suspects/Counterfeits

Suspect Stainless Steel Fastener Headmark List

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

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

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



ATTACHMENT H - DOE HEADMARK LIST (cont.)

Help Stamp Out Suspects/Counterfeits

Suspect Fastener Headmark List

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

Grade 5

Grade 8

Grade 5 fasteners with the following Manufacturers' headmarks:

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

Grade 8 fasteners with the following Manufacturers' headmarks:

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

Grade 8.2 fasteners with the following headmarks:

Mark	Manufacturer
KS	Kosaka Kogyo (JP)

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

	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.

ATTACHMENT 1 - REFURBISHED MOLDED CASE CIRCUIT BREAKERS

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

1. Recognition Factors

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

A. The quality and safety of refurbished molded-case circuit breakers is questionable since they are not designed to be taken apart and serviced or refurbished. There are no electrical standards established by Underwriters Laboratory (UL) for the refurbishing of molded-case electrical circuit breakers, nor are there any "authorized" refurbishes of molded case circuit breakers. Therefore, "refurbished" molded-case circuit breakers should not be accepted for use in any DOE facility.

B. One source of refurbished molded-case circuit breakers is from the demolition of old buildings. Some refurbishes are junk dealers who may change the amperage labels on the circuit breakers to conform to the amperage ordered and then merely clean and shine the breakers

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

C NRC published information Notice No. 88-46 dated July 8, 1988, on the investigation findings and circulated it to all applicable government agencies, including DOE. On July 20, 1988, DOE notified all field offices that refurbished circuit breakers may have been installed in critical systems. Shortly thereafter, DOE established the Suspect Equipment Notification System (SENS), a sub-module of ES&H Events and News on the Safety Performance Measurement System (SPMS). SENS has since been replaced by the Supplier Evaluation and Suspect Equipment (SESE) sub-module which includes Suspect Equipment Reports

D Some of DOE's older sites have circuit breakers in use that are no longer manufactured. According to the Nuclear Management and Resources Council (NUMARC), examples of such breakers are Westinghouse breakers with frames E, EA, F, and FA. If a DOE contractor has an electrical box that requires a breaker with one of these frame sizes, that contractor would not have been able to purchase it from Westinghouse for several years. If the contractor were to order a replacement breaker from an authorized Westinghouse dealer, the dealer could not get a new replacement breaker from the manufacturer. To fill the order, the dealer had to turn to the secondary or refurbished market.

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.

ATTACHMENT 1 - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

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

3. Testing

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

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

4. Precautions

Follow these precautions regarding suspect or refurbished circuit breakers

A. Require that molded-case breakers be new and unaltered. Proof that they are new and unaltered requires the vendor to show traceability back to the original manufacturer.

B. Do not rely completely on dealing with authorized dealers for protection from purchasing refurbished molded-case circuit breakers.

C. Approve formal procedures for inspecting circuit breakers that are received and installed according to the indicators of refurbished breakers listed above

D. Contact the original manufacturer if any indication of misrepresentation is encountered. There are many original manufacturers of molded-case circuit breakers whose products are being refurbished and sold as new. These manufacturers have the most specific information about how to ensure that their products have not been refurbished.

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

5. Disposition

A. Segregate and retain all circuit breakers found with indications that they may be refurbished. These will be retained as potential evidence until specifically released by the Office of Inspector General and the Office of Nuclear Safety for Price Anderson Enforcement. Circuit breakers that may be refurbished may only be disposed of when the above organizations no longer need them as evidence.

B. Report suspect electrical components to Occurrence Reporting and Processing System (ORPS). The ORPS categorization group should be identified as "Cross-Category items, Potential Concerns or issues." The description of cause section in the ORPS report should included the text "suspect counterfeit parts."

C. Witness and document the destruction of all suspect/counterfeit circuit breakers when approval is given for disposal.

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.

ATTACHMENT J – ASSESSMENT/SURVEILLENCE 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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D&R Technology

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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		

REQUEST FOR INFORMATION

Project # RFI.XXX
Rev. ___
Page 1 of 1

Contract/Project No.

TO BE COMPLETED BY SUBCONTRACTOR

Insert Title of RFI Here

Originator (Name) & Company:

Problem/Deficiency: ☐ Clarification ☐ Change

Proposed Solution:

Basis of Change:

Note: Subcontractor to provide cost and schedule impacts associated with each discrete change line item.
Response: ☐ Clarification ☐ Change COST ☐ Yes ☐ No SCHEDULE ☐ Yes ☐ No
Required Response Date:

Cost Impact	Schedule Impact

Subcontractor (sign/date)

TO BE COMPLETED BY THE BUYER

RFI Approved ☐ Yes ☐ No CN Required: ☐ CN # ____ CN Not Required ☐ As-Built documentation Required ☐ As-Built documentation Not Required ☐ Submittal Data Required ☐ Yes ☐ 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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DMJM technology

amec

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 Vendors name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revison 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

DMJMH+N, Inc.
dba DMJM Technology
3250 Port of Benton Blvd
Richland, WA 99354-1670
Attn: Project Records
Phone: (509) 375-7856
Fax: (509) 375-5331

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal — Bidder shall include this data for each item
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	Submital Number	DESCRIPTION	REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (DAYS)
E+3			DCRS-01	Proof of NQA-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	

DMJM technology

amec

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	
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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

DMJMH+N, Inc.
dba DMJM Technology
3250 Port of Benton Blvd
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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: Required before activity such as fabrication, ordering, testing, shipping etc...
Final: Required within 7 days prior to activity unless otherwise specified

PROPOSAL	REVIEW	FINAL	Submital Number	DESCRIPTION	REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (DAYS)
	E+3	E+3	DCRS-26	Bill of materials	Fab-10	
	E+3	E+6	DCRS-27	System assembly instructions	Fab-14	
	E+3	E+3	DCRS-28	Structural analysis for hoisting and rigging	Fab-14	
	E+3	E+3	DCRS-29	Operation and maintenance manuals	Fab-14	
	E+3	E+1	DCRS-30	Welding procedures, procedure qualification records, and welder procedure qualification records	Fab-10	
	E+3	E+1	DCRS-31	RWS CWT certificate	Fab-10	
	E+3	E+3	DCRS-32	Insulation system	Fab-10	
	E+3	E+3	DCRS-33	Protective coating specifications	Fab-10	
	E+3	E+1	DCRS-34	Fabrication travelers	Fab-10	
	E+3	E+1	DCRS-35	Cleaning procedures	Fab-10	
	E+1	E+1	DCRS-36	Visual weld examination procedure/weld map	Fab-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	CoC's and MTR's	Del	
		E+3	DCRS-47	As-Built drawings	Del	

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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 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 Vendors name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revison 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

DMJMH+N, Inc.
dba DMJM Technology
3250 Port of Benton Blvd
Richland, WA 99354-1670
Attn: Project Records
Phone: (509) 375-7856
Fax: (509) 375-5331

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal — Bidder shall include this data for each item
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	Submital Number	DESCRIPTION	REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (DAYS)
		E+3	DCRS-48	NEC inspection certificate & electromagnetic interference test results	Del	

Legend: E - Electronic Copy PO + - Due within +# calendar days of P.O. issuance; Del + - Due within +# calendar days of delivery; COM + - Due within +# 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 reciept 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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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)"

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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		

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]

CHEMMET, LTD, PC
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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 0f 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

JAMES R. DIVINE
STATE OF WASHINGTON
12231
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 1-01-06

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

Thank you for your corrosion review on the DBVS Waste Dryer System.

Respectfully,

Kurt J. McCracken
Chief Engineer

James R. Fredrickson
DBVS Project Manager

cc: DMJM Technology

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

CH2M HILL Hanford Group, Inc.

Mike Leonard
Dave Shuford

AMEC Earth and Environmental

Leo Thompson
Mark Lucas

An AECOM Company

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.

Table 1. 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.

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 E6).
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.

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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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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