START

0017646

Mr. John Grantham
State of Washington
Department of Ecology (PV-11)
Olympia, WA 98504-8711

FLUOR DANIEL, INC.

Date: DECEMBER 3, 1991

Reference: Hanford Waste Vitrification Plant
DOE Contract DE-AC06-86RL10838
Fluor Contract 8457

Transmittal No.: WDOE-078

Dear Mr. Grantham:

TRANSMITTAL

We enclose 2 copies of the items listed below. These are issued per US-DOE request.

Response due to Fluor: N/A
Responds to: CWBS 3201

9212163015

	Rev.	Date	
SEE TRANSMITTAL ATTACHMENT			PIPING AND INSTRUMENTATION DIAGRAMS AND TABLE OF CONTENTS
CONTROLLED COPIES 25 & 26			PLEASE REMOVE OLD REVISIONS AND TABLE OF CONTENTS FROM YOUR P&ID MANUAL AND REPLACE WITH THE ATTACHED REVISIONS

Distribution:
Reference:FRP-317, FUP-079
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Environmental Data Management Center (MSIN H4-44)w/1 #31
D. Duncan, US EPA, Region X w/O

RNG: DVB:rc
DVB

Very truly yours,

R. N. Gibbons
Project Director

DEC 1991
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TRANSMITTAL ATTACHMENT

DRAWING NUMBER	SHT NO.	REV	DATE	DRAWING TITLE
H-2-123001	01	3	12/02/91	LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS
H-2-123001	02	3	12/02/91	LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS
H-2-123001	03	3	12/02/91	LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS
H-2-123001	04	3	12/02/91	LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS
H-2-123001	05	3	12/02/91	LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS

9212163116

PROCESS PIPING AND INSTRUMENT DIAGRAMS
VOLUME 1A
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9 2 1 2 1 0 3 0 1 5 1

ABBREVIATIONS & ACRONYMS

(MIN. THREE CHARACTERS • SPECIFIC EXCEPTIONS NOTED BELOW)

ADCT = ACID DRAIN CATCH TANK
AHU = AIR HANDLING UNIT
AMB = AMBIENT
ARP = ATMOSPHERIC REFERENCE PRESSURE
ATMOS = ATMOSPHERE
AWHT = ACID WASTE HOLD TANK
BLDG = BUILDING
BMC = BUSBAR MAINTENANCE CORRIDOR
CCR = CENTRAL CONTROL ROOM
CCTV = CLOSED CIRCUIT TELEVISION
CDC = CANISTER DECONTAMINATION CELL
CDFT = CRANE DECONTAMINATION FEED TANK
CDMC = CONTACT DECONTAMINATION MAINTENANCE CELL
CHW = CHILLED WATER
CLG = COOLING
CMA = CRANE MAINTENANCE AREA
CMM = CANISTER MANIPULATING MECHANISM
CMR = CONTACT MAINTENANCE ROOM
COND = CONDENSATE
CPC = CHEMICAL PROCESS CELL
CWHT = CAUSTIC WASTE HOLD TANK
CWNT = CAUSTIC WASTE NEUTRALIZATION TANK
DAS = DATA ADUISITION SYSTEM
DCS = DISTRIBUTED CONTROL SYSTEM
DECON = DECONTAMINATION
DFSFT = DECONTAMINATION FRIT SLURRY FEED TANK
DWTT = DECONTAMINATION WASTE TREATMENT TANK
DXR = DIRECT EXPANSION REFRIGERANT
EFF = EFFICIENCY
ELEC = ELECTRICAL
EXH = EXHAUST
FCDC = FINAL CANISTER DECONTAMINATION CHAMBER
FDCT = FLOOR DRAIN CATCH TANK
FDST = FLOOR DRAIN SAMPLING TANK
FFT = FILTER FEED TANK
FLTR = FILTER
FOS = FIELD OPERATING STATION
FSMT = FRIT SLURRY MAKEUP TANK
FURN = FURNISHED
GLR = GLYCOL RETURN
GFC = GOVERNMENT FURNISHED CONCEPT
GFE = GOVERNMENT FURNISHED EQUIPMENT
GLS = GLYCOL SUPPLY
GLX = GLYCOL
HCCT = HVAC CONDENSATE CATCH TANK
HEGA = HIGH EFFICIENCY GAS ADSORBER
HEME = HIGH EFFICIENCY MIST ELIMINATOR
HEPA = HIGH EFFICIENCY PARTICULATE AIR
HLL = HIGH LIQUID LEVEL
HHLL = HIGH-HIGH LIQUID LEVEL
HPCS = HEALTH PROTECTION COMPUTER SYSTEM
HPS = HEALTH PROTECTION SYSTEM
HPT = HIGH POINT
HRX = HEAT RECOVERY
HTG = HEATING
HTR = HEATER
HVAC = HEATING, VENTILATION & AIR CONDITIONING
IAS = INSTRUMENT AIR SUPPLY
ICC = INNER CANISTER CLOSURE
IMS = INFORMATION MANAGEMENT SYSTEM
IWH = INTERMEDIATE WASTE HEADER
I&C = INSTRUMENTATION AND CONTROLS
LEL = LOWER EXPLOSIVE LIMIT
LLL = LOW LIQUID LEVEL
LLLL = LOW-LOW LIQUID LEVEL
LPT = LOW POINT
MAINT = MAINTENANCE (3)
MFT = MELTER FEED TANK
MCC = MOTOR CONTROL CENTER (3)
MSM = MASTER SLAVE MANIPULATOR
NLL = NORMAL LIQUID LEVEL
OAK = OUTSIDE AIR
OACT = ORGANIC ACID DRAIN CATCH TANK
OWHT = ORGANIC ACID WASTE HOLD TANK
OWNT = ORGANIC ACID WASTE NEUTRALIZATION TANK
PFT = PRECOAT FEED TANK
PFSFT = PROCESS FRIT SLURRY FEED TANK
PCDSR = PRELIMINARY CANISTER DECONTAMINATION SPRAY RING
RDCT = REGULATED DRAINS CATCH TANK
REDC = REMOTE EQUIPMENT DECONTAMINATION CELL
RHG = REFRIGERANT HOT GAS
RLL = REFRIGERANT LIQUID LINE
(3)
RSL = REFRIGERANT SUCTION LINE
RWCT = RECYCLE WASTE COLLECTION TANK
SBS = SUBMERGED BED SCRUBBER
SCT = SHIELDED CANISTER TRANSPORT
SC1 = SAFETY CLASS 1
SC2 = SAFETY CLASS 2
SC3 = SAFETY CLASS 3 (NON SAFETY)
SCX = SAMPLE CONNECTION
SCRX = SILICON CONTROLLED RECTIFIER
SET = SOLAR EVAPORATION TANK
SME = SLURRY MIX EVAPORATOR
SMECT = SLURRY MIX EVAPORATOR CONDENSATE TANK
SPLY = SUPPLY
SRAT = SLURRY RECEIPT AND ADJUSTMENT TANK
SST = SBS SURGE TANK
STA = SMEAR TEST AREA
STS = SMEAR TEST STATION

TBD = TO BE DETERMINED
TNL = TUNNEL
TRU = TRANSURANIC
T/T = TANGENT-TO-TANGENT
U/G = UNDERGROUND
VIT = VITRIFICATION
WAT = WASTE ADJUSTMENT TANK
WHT = WASTE HOLD TANK
VPVV = WHT PROCESS VESSEL VENT (3)
XFR TNL = TRANSFER TUNNEL

SPECIFIC EXCEPTIONS TO THREE CHARACTER MINIMUM

CO = CLEAN OUT
EL = ELECTRIC (HVAC HEATERS ONLY)
ET = ELECTRIC TRACED HOT
ET(W) = ELECTRIC TRACED WINTERIZATION
(F) = FURNISHED (3)
FC = FAIL CLOSED
FI = FAIL INDETERMINATE
FL = FAIL IN LAST POSITION
FO = FAIL OPEN
GA = GAGE
HH = HANDHOLE
HP = HORSE POWER
HR = HOUR
IA = INSULATE ACOUSTIC
IC = INSULATE COLD
ID = INSIDE DIAMETER
IH = INSULATE HOT
IS = INSULATE SAFETY
LC = LOCK CLOSED
LO = LOCK OPEN
MC = MELTER CELL
MW = MANWAY
NC = NORMALLY CLOSED
NO = NORMALLY OPEN
OV = OPERATING VALVE
PE = PIPING EMBED
RM = ROOM
SP = SET POINT
ST = STEAM TRACED
WC = WATER COLUMN

NOTE:

BEFORE AN ABBREVIATION IS ADDED, THE FOLLOWING REFERENCE MATERIAL AND GUIDELINES MUST BE REVIEWED.

1. THE HANFORD ENGINEERING DEVELOPMENT LABORATORY DRAFTING MANUAL, SECTION 7, PAGES 7-1 THRU 7-122.
2. APPENDIX B, PIPING AND INSTRUMENT DIAGRAMS, TASK 5.1.4.6.
3. PROJECT MANAGEMENT/CONTROL MANUAL LIST OF ACRONYMS, SECT. 1.
4. IN ORDER TO PREVENT DUPLICATION OF ABBREVIATIONS:
   - EQUIPMENT IDENTIFICATION CODE SYMBOL SHALL HAVE TWO CHARACTERS.
   - PIPE LINE SERVICE ABBREVIATION SHALL HAVE THREE CHARACTERS.
   - ABBREVIATIONS WILL HAVE A MINIMUM OF THREE CHARACTERS. EXCEPTIONS MUST BE APPROVED.

EXCEPTIONS TO THIS PROCEDURE MUST BE APPROVED

PIPE LINE SERVICE ABBREVIATIONS

(THREE CHARACTERS)

AIR

ATA = ATMOSPHERIC AIR
BAX = BREATHING AIR
CDA = CANISTER DECONTAMINATION AIR
IAC = CRITICAL INSTRUMENT AIR
IAX = INSTRUMENT AIR
PAX = PLANT AIR
PAC = CRITICAL PLANT AIR
VAX = VACUUM AIR
CAX = COMPRESSED AIR

WATER

DWX = DEMINERALIZED WATER
FWX = FIREWATER
HPW = HIGH PRESSURE WATER
HWX = HOT PROCESS WATER
LPW = PROCESS WATER
MRW = MELTER COOLING WATER RETURN
MSW = MELTER COOLING WATER SUPPLY
PRW = PROCESS COOLING WATER RETURN
PSW = PROCESS COOLING WATER SUPPLY
RWX = RAW WATER
SWX = SANITARY WATER
TRW = TOWER WATER RETURN
TSW = TOWER WATER SUPPLY
TWX = TEMPERED WATER (3)

HEAT RECOVERY FLUID

HRF = HEAT RECOVERY FLUID

CHILLED WATER

CHWR = CHILLED WATER RETURN
CHWS = CHILLED WATER SUPPLY

STEAM AND CONDENSATE

BFA = BOILER FEED WATER ADDITIVES (3)
HPC = HIGH PRESSURE CONDENSATE
HPS = HIGH PRESSURE STEAM
MPC = MEDIUM PRESSURE CONDENSATE
MPS = MEDIUM PRESSURE STEAM
PRC = PROCESS CONDENSATE
PRS = PROCESS STEAM

PRESSURIZED GAS

ACT = ACETYLENE
ARX = ARGON
C3X = PROPANE
HEX = HELIUM
LCL = LOWER EXPLOSIVE LIMIT CALIBRATION GAS
NH3 = ANHYDROUS AMMONIA (GAS) (3)
NOX = NITROGEN OXIDES
N2O = NITROUS OXIDE
N2X = NITROGEN
P10 = P-10 GAS
O2X = OXYGEN

PROCESS

MOG = MELTER OFF-GAS
PRO = PROCESS
PVV = PROCESS VESSEL VENT
SPL = SAMPLE LINE

(3) COLD CHEMICAL SOLUTIONS

AFS = ANTI-FOAM SOLUTION
CIS = CORROSION INHIBITOR SOLUTION
DES = DIATOMACEOUS EARTH SLURRY
DFA = DILUTE FORMIC ACID
DNK = DILUTE SODIUM HYDROXIDE
DOP = DIOCTYL PHTHALATE
DMS = DECONTAMINATION MIXTURE SOLUTION
DSS = CAUSTIC DECONTAMINATION SOLUTION
FAK = FORMIC ACID
FGK = DRY FRIT
FSK = COLD FRIT SLURRY
FSP = SPENT FRIT SLURRY
KFM = KOH/FRIT MODIFIER
NAK = 50% CAUSTIC
NDS = NITRIC ACID DECON SOLUTION
NH3 = ANHYDROUS AMMONIA (LIQUID)
NIK = 50% NITRIC ACID
ODS = OXALIC ACID DECON SOLUTION
OTC = OFF-GAS TREATMENT CHEMICAL
OXA = OXALIC ACID
PPK = POTASSIUM PERMANGANATE SOLUTION
RAS = REDUCING AGENT (SUGAR)
SNK = SODIUM NITRITE SOLUTION
TSP = TRI-SODIUM PHOSPHATE SOLUTION
ZES = ZEOLITE SLURRY

VENTS AND DRAINS

CDX = CHEMICAL DRAIN
CFC = COLD FEED FRIT STORAGE/CHEMICAL BUILDING VENT
CFO = ORGANIC COLD FEED VITRIFICATION BUILDING VENT
CFV = COLD FEED VITRIFICATION BUILDING VENT
DRX = CLEAN DRAIN
FAV = FRIT AIR VENT
JVV = JET GANG VALVE VENT
RDZ = REGULATED DRAINS
SSX = SANITARY SEWER
STV = STORAGE TANK VENT
SVV = SOLENOID VALVE VENT
VVV = WHT VESSEL VENT (3)

(3) MISCELLANEOUS

DFO = DIESEL FUEL OIL
ECS = ELECTRICAL CONTROL SYSTEMS SIGNAL LINES IN-CELL AND IN CELL WALLS.
ELE = ELECTRICAL LINES IN-CELL AND IN CELL WALLS
GRX = GREASE (3)
HYD = HYDRAULIC FLUID
OIL = OIL (3)

EQUIPMENT IDENTIFICATION

XX-XXX-XXXXX-XXX

- COMPONENT OF A VENDOR PACKAGE
- ALPHA DESIGNATOR FOR SPARE EQUIPMENT
- "V" TO DESIGNATE A VENDOR PACKAGE (PROCESS) OR ALPHA CHARACTER ASSOCIATED WITH EQUIPMENT COMPONENT (HVAC)
- EQUIPMENT NUMBER (001-999)
- ALPHA SUBSYSTEM DESIGNATOR OR 0
- SYSTEM NUMBER
- EQUIPMENT TITLE

EQUIPMENT IDENTIFICATION CODE

(TWO CHARACTERS)

SYMBOL — EQUIPMENT

AC = AIR CONDITIONING UNIT
AB = ADSORBER
AE = AIR EXHAUST
AG = AGITATOR
AH = AIR HANDLING UNIT
AI = AIR INTAKE
AN = ANALYZER (3)
AV = AUTO VENT
BA = BATTERY
BB = BUS BAR, BUS COMPONENT (3)
BC = BATTERY CHARGER
BD = BACKDRAFT DAMPER
BF = WHOLE BODY FRISKER
BL = BLOWER, FAN
BV = BUTTERFLY VALVE DAMPER
CA = CONTAINER
CC = CANISTER TRANSFER CAR
CD = CONDENSER
CH = WATER CHILLER
CM = CRANE
CO = COOLING COIL
CP = CENTRAL PROCESSOR STATION (COMPUTER ROOM)
CR = CONTROL ROOM/STATION
CS = CANISTER STATION
CT = COOLING TOWER
CU = AIR COOLED CONDENSING UNIT
CX = COMPRESSOR
DA = AC DISTRIBUTION PANEL
DC = DECONTAMINATION CHAMBER
DD = DISCONNECT SWITCH
DE = DEMISTER
DH = DESUPERHEATER
DI = AUTOMATIC ISOLATION DAMPER
DM = DEMINERALIZER
DN = CONTROL DAMPER
DP = DISTRIBUTED OR DISPLAY PROCESSOR (DCS)
DR = DRYER
DS = DP DISPLAY/PERIPHERAL STATION
DT = DISTRIBUTED CONTROL SYSTEM TERMINATION CABINET
DX = DC DISTRIBUTION PANELS
EC = EVAPORATIVE COOLER
EH = ELECTRIC DUCT HEATER
EL = ELEVATOR
EM = ELECTROMECHANICAL MANIPULATOR
EP = EMERGENCY PANEL
EX = COOLER/HEAT EXCHANGER/DUCT COIL
FB = FACE BYPASS DAMPER
FC = FILM COOLER
FD = FIRE DAMPER
FG = HEGA FILTER
FH = HEPA FILTER
FL = FILTER
FM = FILTER MONITOR
FN = COOLING TOWER FAN
FP = PREFILTER
FS = FIELD OPERATING STATION DISPLAY
GB = GLOVE BOX
GS = GENERATOR (STEAM)
GX = GENERATOR (ELECTRIC)
HA = HATCH
HC = HOOK WELL
HD = HANDLING DEVICE
HF = HAND AND FOOT MONITOR
HG = HEATING COIL
HP = HEALTH PROTECTION SENSORS AND SYSTEM
HR = HEAT RECOVERY COIL
HT = HEATER
HU = HUMIDIFIER
ID = MANUAL ISOLATION DAMPER
IR = INSTRUMENT RACK
JX = EJECTOR,EDUCTOR,JET,QUENCHER
KD = CRYOGENIC DETECTOR
LC = LOAD CENTER
LE = LABORATORY EQUIPMENT
LH = LABORATORY HOOD
LO = LOCAL OPERATING STATION
LP = LOCAL PANEL/PROCESSOR
LT = CEILING LIGHT ASSEMBLY
LY = LIGHTING PANEL
MA = MULTICHANNEL ANALYZER
MC = MOTOR CONTROL CENTER
MD = MANUAL DAMPER
ME = MELTER
MP = MASTER SLAVE MANIPULATOR PLUG
MR = MONORAIL HOIST
MS = MASTER SLAVE MANIPULATOR
MT = MOTOR
MU = MULTIPLEXER
MX = MIXER
MY = MECHANICAL ASSEMBLY (3)
PF = FILTER PLENUM
PO = SHIELD WINDOW PLUG

EQUIPMENT IDENTIFICATION CODE CONTINUATION

SYMBOL — EQUIPMENT

PH = PREHEAT COIL
PM = PORTAL MONITOR
PP = POWER PACK
PS = PRESS STATION
PX = PUMP
RA = REMOTE ASSEMBLY
RH = REHEAT COIL
SA = SAMPLER
SB = SWITCHBOARD (3)
SC = SCRUBBER
SE = SEPARATOR,CENTRIFUGE,CYCLONE,DUST COLLECTOR
SG = SWITCHGEAR
SH = SHOP EQUIPMENT
SP = SPRAY RING
SR = STORAGE RACK
ST = STACK MONITORING EQUIPMENT
SU = SUMP
SW = SWITCH
SX = SHIELDING WINDOW, SAMPLING/ANALYTICAL CELL
SY = IN-CELL WINDOW REPAIR SHIELD
SZ = SHIELDING WINDOW, PROCESS CELL
TC = TELEPHONE CABINET (3)
TG = TURBINE GENERATOR
TK = TANK
TL = TOOLS
TM = TORNADO DAMPER
TR = TRANSPORTER
TS = CANISTER TEST STATION EQUIPMENT
TU = TURNTABLE
TV = CLOSED CIRCUIT TELEVISION
TX = TRANSMITTER CABINET
UH = UNIT HEATER
UP = UNINTERRUPTIBLE POWER SUPPLY EQUIPMENT
VP = VACUUM BLOWER
VV = VARIABLE INLET VANE
VI = VARIABLE AIR VOLUME BOX
VX = VESSEL,ACCUMULATOR,COLUMN,HUMPOT, RECEIVER,TOWER
WB = WORK BENCH
WE = WELDER
WI = WINCH
XE = PNEUMATIC TRANSFER EQUIPMENT
XT = TRANSFORMER

RELEASED PROJECT BASELINE CONTROL
DEC - 2 1991

PIPE LINE, JUMPER & LINE VALVE IDENTIFICATION

PIPE LINE IDENTIFICATION

XXX-XXXXXX-XXX-XXX-XX-XXXX
XX

- INSULATION REQUIREMENT
- PIPING SPECIFICATION*
- PIPELINE SEQUENCE NUMBER
- SYSTEM/SUBSYSTEM
- NOMINAL PIPE SIZE
- EMBEDDED PIPING (USE FOR LINES EMBEDDED IN CONCRETE) REPLACES LINE SERVICE
- PIPELINE SERVICE

*NOTE: FOR A LINE THAT PROCESS REQUIRES TUBING INSTEAD OF PIPE, A "T" WILL BE ADDED TO THE SPEC. EXAMPLE: "AB" SPEC WILL BE SHOWN AS "ABT".

JUMPER IDENTIFICATION

TBD

LINE VALVE IDENTIFICATION

HEAT TRACING IDENTIFICATION

TBD

IN-CELL JUMPER NOZZLE IDENTIFICATION

TBD

SPECIALTY ITEMS

(SEE GENERAL NOTE D)

SP / — TYPICAL ITEM

SYSTEM NUMBERS

00 TEMPORARY CONSTRUCTION
01 STRUCTURES
03 CENTRAL REFRIGERATION
04 FIRE PROTECTION AND DETECTION
05 HVAC
06 SUPPORT EQUIPMENT REPAIR AND MAINTENANCE
11 FEED RECEIPT
12 FEED PREPARATION
13 MELTER/TURNTABLE
14 MELTER OFF-GAS
15 PROCESS VESSEL VENT
16 CANISTER DECONTAMINATION
17 CANISTER CLOSURE
18 INTERIM CANISTER STORAGE
20 RADIOACTIVE PROCESS WASTE COLLECTION AND TREATMENT
21 PROCESS EQUIPMENT DECONTAMINATION REPAIR AND MAINTENANCE
22 MELTER FEED
23 CANISTER HANDLING AND INSPECTION
31 PRIMARY ELECTRICAL SUPPLY
32 NORMAL ELECTRICAL DISTRIBUTION
33 STANDBY ELECTRICAL DISTRIBUTION
34 UNINTERRUPTIBLE POWER SUPPLY
35 DIRECT CURRENT
41 COMPRESSED AIR AND GAS
42 SITE STEAM AND MEDIUM PRESSURE STEAM
43 PROCESS STEAM AND CONDENSATE
44 COOLING TOWER
45 PROCESS COOLING WATER
46 MELTER COOLING WATER
47 PROCESS CHILLED WATER
48 PROCESS WATER
49 SANITARY WATER
50 RAW WATER & FIRE WATER
51 SANITARY SEWER
52 POTENTIALLY RADIOACTIVE LIQUID WASTE COLLECTION
53 NON-RADIOACTIVE LIQUID WASTE COLLECTION, TREATMENT AND DISPOSAL
54 CHEMICAL RECEIPT, MAKE-UP AND DISTRIBUTION
55 COLD FEED SERVICE BUILDING VENT
56 COLD FEED VITRIFICATION BUILDING VENT
57 CANISTER RECEIPT AND HANDLING
58 FRIT RECEIPT AND MAKE-UP
61 DISTRIBUTED CONTROL SYSTEM
62 HEALTH PROTECTION AND RADIATION MONITORING
63 PROCESS SAMPLING
64 ANALYTICAL FACILITIES
65 COMMUNICATIONS
66 MANAGEMENT INFORMATION SYSTEM
71 REMOTE HANDLING EQUIPMENT
72 LOCAL HANDLING EQUIPMENT

GENERAL NOTES

A. THESE NOTES WILL APPLY TO ALL SYMBOLOGY DRAWING SHEETS, UNLESS OTHERWISE NOTED ON THE INDIVIDUAL DRAWING SHEET.
B. TO SIMPLIFY ROUTING OF PROCESS FLOW LINES, SOME PIECES OF EQUIPMENT MAY APPEAR IN MORE THAN ONE PLACE ON THE FLOW DIAGRAM. EQUIPMENT SO DUPLICATED WILL BE INDICATED BY PHANTOM LINES.
C. WHEN NECESSARY, PIPING AND/OR EQUIPMENT SYMBOLS MAY BE INCLUDED AS PART OF AN INSTRUMENT LOOP.
D. PIPING SPECIALTY ITEMS, PIPING COMPONENTS NOT IDENTIFIED BY INSTRUMENT OR MECHANICAL EQUIPMENT NUMBERS, ETC. AND NOT COVERED BY THE PIPING MATERIAL SPECIFICATION, ARE IDENTIFIED BY A SPECIALTY ITEM NUMBER.
E. FOR ELECTRICAL DRAFTING SYMBOLS AND ABBREVIATIONS, SEE DRAWING TO BE ADDED LATER.
F. MOTORIZED VALVES INSIDE CELLS ARE EQUIPPED WITH IMPACT WRENCH CONNECTION.
G. INDEX OF LEGEND OF SYMBOLOGY SHEETS.
   - SHEET #1 ABBREVIATIONS
   - SHEET #2 PIPING AND VALVE SYMBOLS
   - SHEETS #3 AND #4 INSTRUMENTS
   - SHEET #5 EQUIPMENT SYMBOLS

REV	DATE	REVISION DESCRIPTION	APPROVAL INITIALS			
3	[illegible]	GENERAL REVISION RELEASED FOR PROJECT BASELINE CONTROL PER CR-0615	[illegible]	[illegible]	[illegible]	[illegible]
2	11/30/91	GENERAL REVISION RELEASED FOR PROJECT BASELINE CONTROL PER CR-0480	BGJ / CRP	MF / FGB	RGT / DPC	BGJ / RNG
1	2/7/91	"RELEASED FOR PROJECT BASELINE CONTROL" WITHDRAWN PER CR-465	MF / CRP	VP / FGB	RGT / DPC	MFJ / RNG
0	10/5/90	RELEASED FOR PROJECT BASELINE CONTROL PER CR HWVP-0443	BGJ / CRP	MF / FGB	RGT / DPC	BGJ / RNG
03	6/27/90	RELEASED FOR DETAILED DESIGN PER HWVP-0429, REV. 1	BGJ / [illegible]	ED / FGB	RGT / DMPC	BGJ / RNG
02	9/2/89	GENERAL UPDATE PER ECR 110	JMJ / [illegible]	SDS / RNG	GAP / RTS	BGJ / RNG
01	12/15/88	GENERAL UPDATE PER ECR 064	RHM / RHM	RHM / FGB	GAP / RNG	RHM / RTS
00	7/5/88	RELEASED FOR DETAILED DESIGN				

ENGINEERING RELEASE
REV. ______ DATE ______

SIGNATURE	DATE
R.N. GIBBONS	7-8-88
R.T. SWIFT	7-11-88
F.G. BROOKS	7-8-88
H. WITTE	7-7-88
H. WITTE	7-7-88
G.A. PRELL	7-7-88
R.M. MCCARTHY	7-6-88
K.M. CRABB	7-6-88
W. BARRIGA	7-5-88

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE-AC06-86RL10838

FLUOR DANIEL INC.
ADVANCED TECHNOLOGY DIVISION

LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS

HANFORD WASTE VITRIFICATION PLANT

B-595 | 8457 | 3201

SCALE: NONE

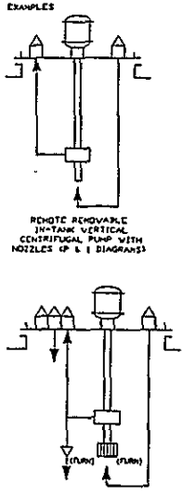
NONE | NOT REQ'D | H-2-123001 | 1 | 5 | 3

AA7FD353 / ER
26 NOV 91

REMOTE JUMPER CONNECTORS

- REMOTE CONNECTOR
- MANIPULATOR OPERATED, REMOTE CONNECTOR
- SPARE-REMOTE CONNECTOR
- SPARE-MANIPULATOR OPERATED, REMOTE CONNECTOR
- REMOTABLE FLANGE (REMOTE CONNECTOR SHOWN)
- THREE-WAY REMOTE CONNECTOR (ONE OR MORE PORTS MAY BE SPARE) SPARE PORTS NOT DARKENED LIKE SPARE REMOTE CONNECTORS
- REMOTE ELECTRICAL CONNECTOR
- MANIPULATOR OPERATED, REMOTE ELECTRICAL CONNECTOR
- SPARE-REMOTE ELECTRICAL CONNECTOR
- SPARE-MANIPULATOR OPERATED, REMOTE ELECTRICAL CONNECTOR
- THERMOWELL CONNECTOR
- PURGE CONNECTOR WITH REMOVABLE DIP TUBE
- MANIPULATOR OPERATED
- CRANE OPERATED
- REMOTABLE FLANGE
- REMOTABLE PIPE FLANGE
- RH XXX / RH XXX — PIPE SLEEVE
- PENETRATION IDENTIFICATION — BELLOWS SEAL AT LINED CELL PENETRATION — AREA NUMBER
- PENETRATION IDENTIFICATION — EMBEDDED PIPE — AREA NUMBER
- TYPICAL CELL PENETRATION
- PENETRATION IDENTIFICATION — ANCHORED CONTAINMENT PENETRATION — CONTAINMENT AREA — AREA NUMBER
- PENETRATION IDENTIFICATION — BELLOWS SEAL AT CONTAINMENT PENETRATION — CONTAINMENT AREA — AREA NUMBER
- GRAYLOCK CONNECTOR

EXAMPLES



REMOTE REMOVABLE IN-TANK VERTICAL CENTRIFUGAL PUMP WITH NOZZLES (P & I DIAGRAMS)

REMOTE REMOVABLE SAMPLE PUMP

PIPING & MISCELLANEOUS SYMBOLS

- REDUCER
- WELD CAP
- SCREWED CAP
- HOSE CONNECTION
- BLIND FLANGE
- LOCAL VENT
- INSULATING FLANGE
- SINGLE BASKET STRAINER
- DUPLEX STRAINER
- Y-TYPE STRAINER
- CONICAL STRAINER
- SUCTION STRAINER
- EXPANSION JOINT OR BELLOWS
- MIXING TEE
- JET EJECTOR OR EDUCTOR
- EXHAUST HEAD
- DRAIN FUNNEL (SEE LINE SERVICE ABBREVIATIONS FOR VENTS AND DRAINS)
- VORTEX BREAKER
- JET LANCE
- GRADE
- SPRAY NOZZLE
- SPARGER
- INTERFACE TIE-IN POINT
- HORN
- FLAME ARRESTOR
- BUS BAR
- FILTER
- FLANGE CONNECTION
- QUICK DISCONNECT
- SPECTACLE BLIND
- CIRCULAR OR HANGER BLIND
- FLEXIBLE CONNECTION
- STEAM OR DRAIN TRAP
- OILER
- MUFFLER
- CABLE REEL
- PULSATION DAMPENER
- MULTI-PURPOSE PENETRATION
- SHIELDED CELL WINDOW
- BUG SCREEN & RAINHOOD
- COLLECTION POT
- LABORATORY FAUCET
- SPARE VESSEL NOZZLE OR MANWAY OR HANDHOLE
- AUTO VENT
- MANUAL VENT
- HYDRONIC BALANCING VALVE
- DELUGE SAFETY SHOWER
- PIPING SPECIALTY (TCH (FLOOR DRAIN, VVC STRAINER HOSE CONNECTIONS, FLANGES, ETC) SEE GENERAL NOTES
- GAS OR AIR RELEASE
- CONCRETE
- VENT OVERFLOW DEVICE
- LINE TURNING DOWN (FLOOR PENETRATION)
- LINE TURNING UP (CEILING PENETRATION)
- DRY CHEMICAL ADDITION PORT
- CLOSED SEAL POT FOR BACKFLOW PREVENTION

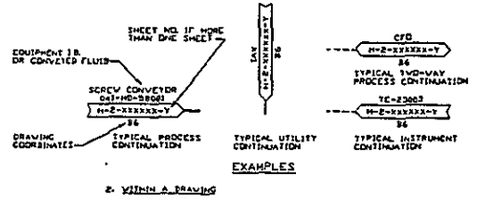
LINE SIZE	SEAL POT DIMENSIONS
1/2"	3" ø X 6 1/2" H
3/4"	3" ø X 7 1/2" H
1"	4" ø X 8" H
1 1/2"	6" ø X 9" H
2"	6" ø X 14 1/2"H
3"	8" ø X 22 1/2"H

- SINK
- DISCHARGE RESTRICTION NOZZLE
- SHIELD PENETRATION SHIELD PLUG WITH MULTI-PORT FOR UTILITY SERVICES AND INSTRUMENTATION
- AUTOMATIC DRAIN VALVE
- WALL ANCHOR SEAL
- RABBIT STOP-ROD GATE

CONTINUATION OF PIPING AND SIGNAL LINES

1. BETWEEN DRAWINGS

PROCESS LINE, UTILITY LINE AND INSTRUMENT CONTINUATION ARROWS MAY BE HORIZONTAL OR VERTICAL AND SHOULD BE LOCATED ON OUTER EDGES OF DRAWING AREA, IF POSSIBLE.



EXAMPLES

2. WITHIN A DRAWING

INSTRUMENTATION LINES WILL CONTINUE IF NECESSARY FOR REDUCTION OF CONGESTION ON DRAWING. MATCHING ARROWS WILL BE INDICATED UP-DOWN OR LEFT-RIGHT.

EXAMPLES

VALVE, CONTROL VALVE & ACTUATOR SYMBOLS

FOR INSTRUMENT TYPE SYMBOLS, SEE SHEET #3

VALVES

- BALL
- NEEDLE
- PLUG
- ANGLE
- BELLOWS SEAL
- DIAPHRAGM
- FIRE HYDRANT
- DIVERTER
- RAM TYPE DRAIN
- ROTATING DISC
- GATE
- REMOTE OPERATED MANUAL
- GLOBE
- CHECK — FREE FLOW DIRECTION
- BUTTERFLY OR DAMPER
- POST INDICATOR
- ENCLOSED EXTENDED STEM
- FIRE HOSE VALVE WITH CHAINED CAP
- OUTSIDE SCREW & YOKE VALVE (FIRE PROTECTION)
- BACKFLOW PREVENTOR ASSEMBLY
- THREE WAY
- IRIS
- VALVE WITH PLUG **

* BY ADDING AN ACTUATOR TO SUCH VALVE SYMBOL THE VALVE BECOMES A CONTROL VALVE.
** VALVE CAN BE ANY TYPE

RELEASED FOR PROJECT BASELINE CONTROL

CONTROL VALVE AND DAMPER ACTUATORS

- DOUBLE ACTING CYLINDER ACTUATED VALVE
- PRESSURE REGULATOR SELF CONTAINED
- SOLENOID OPERATED
- DIAPHRAGM OPERATED
- MANUAL OVERRIDE (MOV) FOR PNEUMATICALLY ACTUATED BELLOWS SEAL VALVE
- DIAPHRAGM OPERATED VALVE WITH ATTACHED CURRENT-TO-PNEUMATIC RELAY
- THREE WAY SOLENOID OPERATED VALVE FAIL OPEN A-C
- FOUR-WAY SOLENOID OPERATED VALVE FAIL OPEN TO PATHS A-C & D-B
- THREE-WAY PILOT SOLENOID VALVE FAIL OPEN TO VENT
- EXTENSION HANDLE
- ON-OFF PILOT OPERATED (PILOT VALVE NOT SHOWN)
- FAIL INDETERMINATE
- FAIL IN LAST POSITION
- FAIL CLOSED
- FAIL OPEN
- MOTOR OPERATED
- MANUAL ACTUATOR
- CYLINDER OPERATED VALVE WITH REMOTE I/P RELAY AND ATTACHED PNEUMATIC POSITIONER
- ELECTRO-HYDRAULIC OPERATED
- VALVE WITH POSITION SWITCHES
- IMPACT WRENCH OPERATED MANUAL OVERRIDE WITH ON-OFF PILOT OPERATED VALVE

NOTE: ACTUATORS SHOWN ARE TYPICAL FOR DAMPERS.

DEC - 2 1991

LINE WEIGHT AND SYMBOL IDENTIFICATION

- PRINCIPAL FLOW/PROCESS LINE (WT 4)
- ALTERNATE FLOW/UTILITY LINE (WT 2)
- INSTRUMENT LINE (WT 1)
- MECHANICAL TRANSFER PATH (USED ON PFD'S) (WT 6)
- REFERENCE SYSTEM/PHANTOM LINE. TO CLARIFY OR SIMPLIFY ROUTING OF PROCESS FLOW LINES. SOME PIECES OF EQUIPMENT MAY APPEAR IN MORE THAN ONE PLACE ON THE DIAGRAM. EQUIPMENT SO DUPLICATED WILL BE INDICATED BY PHANTOM LINE.
- PROCESS STREAM NUMBER (XX=SYSTEM NUMBER, YYY=STREAM NUMBER)
- * * * * ALTERNATE OR SPARE ROUTE
- HEATED PIPE (T= ELECTRICAL TRACING)
- PIPE CLASS CHANGE
- RESPONSIBILITY — OTHERS | FLUOR
- SAFETY CLASS CHANGE
- BOUNDARY OF FURNISHED EQUIPMENT
- EXISTING PIPING
- BOUNDARY OF REPLICATED EQUIPMENT
- EMBEDDED PIPING
- BURIED PIPE (UNDERGROUND)
- ENCASED LINES
- PIPE LINE SLOPE DIRECTION

XX OR TBD — TO BE DETERMINED IN DETAILED DESIGN

INSTRUMENT AND ELECTRICAL LINES

- ELECTRICAL SIGNAL
- PNEUMATIC SIGNAL
- PNEUMATIC SUPPLY
- CAPILLARY TUBING (FILLED SYSTEM)
- HYDRAULIC SIGNAL
- ELECTROMAGNETIC, SONIC OR OPTICAL SIGNAL
- PURGE INSTRUMENTATION
- INTERNAL SYSTEM LINK (SOFTWARE)

GENERAL NOTES

A. FOR GENERAL NOTES REFER TO DRAWING H-2-123001-1

REV	DATE	REVISION DESCRIPTION	ENGINEERING				CPO			
3	2/2/91	GENERAL REVISION RELEASED FOR BASELINE CONTROL CONTROL PER CR-0613.	RJS	HF	RGT	BGJ				
2	12/20/90	GENERAL REVISION RELEASED FOR BASELINE CONTROL CONTROL PER CR-0480	RJS	HF	RGT	BGJ				
1	6/1/90	RELEASED FOR PROJECT BASELINE	HF	VP	RGT	HFJ				
		CONTROL* WITHDRAWN PER CR-465.	ERP	FGB	DPC	PHG				
0	12/21/90	RELEASED FOR PROJECT BASELINE CONTROL PER CR HVVP-0463	BGJ	HF	RGT	BGJ				
			ERP	FGB	DPC	RHG				
03	8/23/90	RELEASED FOR DETAILED DESIGN PER HVVP-0429 REV. 1	ERP	LE	RGT	BGJ				
			ER	FGB	DPC	RHG				
02	2/23/89	GENERAL UPDATE PER ECR 118	JMJ	SDS	GAP	BGJ				
			ER	RHG	RTS	RHG				
01	12/13/88	GENERAL UPDATE PER ECR 064	RHM	RHM	GAP	PHM				
			RHM	FGB	RHG	RTS				
00	2/2/88	RELEASED FOR DETAILED DESIGN								

ENGINEERING RELEASE
REV. ____ DATE ____
CPO

		DATE
PRINCIPAL ENGINEER	P.H. GIBBONS	7-3-86
PROJECT ENGINEER	R.J. SWIFT	7-21-86
CHIEF ENGINEER	F.G. BROOKS	7-8-86
PROJECT MGR.	M. WITTE	7-7-86
PROJECT DIRECTOR	M. WITTE	7-7-86
DIV. DIRECTOR	G.A. PRELL	7-7-86
DEPUTY DIRECTOR	R.M. CARTHY	7-8-86
QA/QC	K.M. CRABB	7-8-86
DESIGNED BY	V. BARRIGA	7-3-86
ACTIVITY	NONE	NOT REQ'D

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-86RL10838

FLUOR DANIEL INC.
ADVANCED TECHNOLOGY DIVISION

LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
8-595	B/57	3201	

SCALE: NONE

DRAWING NO. H-2-123001 — 2 5 3

AA7F0349 / ER
26 NOV 91

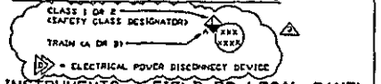
INSTRUMENT TAG NUMBER

FFFF - SS B XXX Z

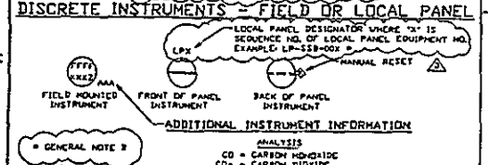
- ITEM NO. (ALPHA) OPTIONAL
- INSTRUMENT/LOOP NO.(001-999)
- SUBSYSTEM(S) = NO SUBSYSTEM, A-Z = SUBSYSTEM(S)
- SYSTEM NUMBER (00-99) SEE SHEET 1
- INSTRUMENT IDENTIFICATION LETTERS (1 TO 5 ALPHA CHARACTERS) (SEE TABLE)

NOTE: SYSTEM NUMBER SHALL APPEAR OUTSIDE BALLOON AS SHOWN AT LEFT OR BE COVERED BY PAID NOTE.
= SAME NUMBER IS USED FOR EACH INSTRUMENT IN A LOOP.

SAFETY CLASS INSTRUMENTS



DISCRETE INSTRUMENTS - FIELD OR LOCAL PANEL

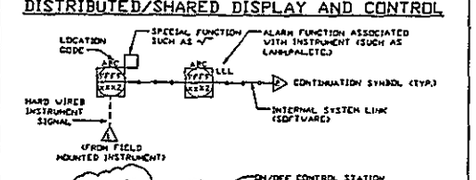


ADDITIONAL INSTRUMENT INFORMATION

= GENERAL NOTE 2

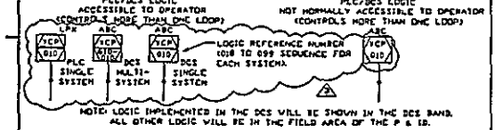
ANALYSIS
- CO = CARBON MONOXIDE
- CO_2 = CARBON DIOXIDE
- COHB = COMBUSTIBLES
- H_2 = GASEOUS HYDROGEN
- HCOOH = FORMIC ACID
- I_2 = IODINE
- NOX = NITROGEN OXIDE
- O_2 = GASEOUS OXYGEN
- pH = pH

DISTRIBUTED/SHARED DISPLAY AND CONTROL



- = C/MOD = CLOSED/MODULATE
- = F/F = FEED/FLUSH
- = F/R = FORWARD/REVERSE
- = H/L = HIGH/LOW
- = L/R = LOCAL/REMOTE
- = M/A = MANUAL/AUTOMATIC
- = N/F = ON/OFF
- = O/C = OPEN/CLOSE
- = S/S = START/STOP(MOTORS)
- = U/D = UP/DOWN

COMPUTER FUNCTIONS



NOTE: LOGIC IMPLEMENTED IN THE DCS WILL BE SHOWN IN THE DCS BAND. ALL OTHER LOGIC WILL BE IN THE FIELD AREA OF THE P & ID.

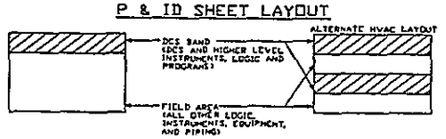
LOCATION CODE (FOR DCS INSTRUMENTS)

A B C
- C = FDS NUMBER (1-9)
- NORMAL SITE OF CONTROL:
  - C = CENTRAL CONTROL ROOM (CCR)
  - F = FIELD OPERATING STATION (FDS)
  - S = SUPERVISOR'S CONTROL CONSOLE (SCC)
- AUXILIARY SITE:
  - N = NO AUXILIARY DISPLAY
  - C = CCR
  - F = FDS
  - S = SCC
  - A = SCC + FDS
  - B = SCC + CCR

DEDICATED LOGIC FUNCTIONS

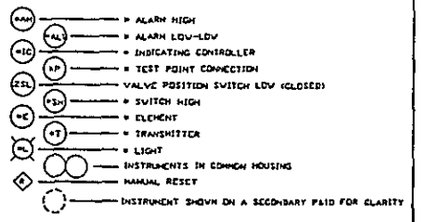
HARDWIRED OR DEDICATED LOGIC CONTROL

P & ID SHEET LAYOUT

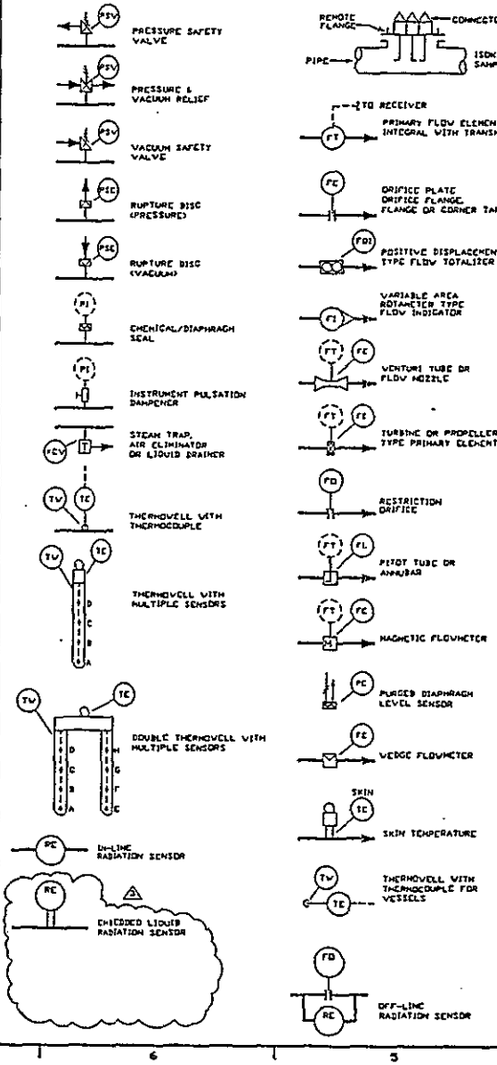


TYPICAL INSTRUMENT SYMBOLS

= SELECT FIRST LETTER(S) FROM INSTRUMENT IDENTIFICATION TABLE



MISCELLANEOUS INSTRUMENTS



INSTRUMENT IDENTIFICATION LETTERS

INSTRUMENT IDENTIFICATION AND SYMBOLS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA STANDARDS S5.1-1984 AND S5.3-1983.

	FIRST-LETTER (4)		SUCCEEDING-LETTERS (3)		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS(5)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE(1)	USER'S CHOICE(1)	USER'S CHOICE(1)
C	CONDUCTIVITY			CONTROL(1,2)	
D	DENSITY	DIFFERENTIAL(4)			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)(1)		
F	FLOW RATE(25)	RATIO (FRACTION)(4)			
G	GAGING		GLASS, VIEWING DEVICE(9)		
H	HAND				HIGH(7,15,16)
I	CURRENT(ELECTRICAL)		INDICATE(10)		
J	POWER	SCAN(7)			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE(4,19)		CONTROL STATION(20)	
L	LEVEL		LIGHT(11)		LOW(7,15,16)
M	MOISTURE OR HUMIDITY	MOMENTARY(4)			MIDDLE, INTERMEDIATE(7,15)
N	USER'S CHOICE(1)		USER'S CHOICE(1)	USER'S CHOICE(1)	USER'S CHOICE(1)
O	USER'S CHOICE(1)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE(4)			
R	RADIOACTIVITY(29)		RECORD(17)		
S	SPEED, FREQUENCY	SAFETY(8)		SWITCH(13)	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE(6)		MULTIFUNCTION(12)	MULTIFUNCTION(12)	MULTIFUNCTION(12)
V	VISCOSITY(34)			VALVE, DAMPER, LOUVER(13)	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED(2)		UNCLASSIFIED(2)	UNCLASSIFIED(2)	UNCLASSIFIED(2)
Y	EVENT, STATE OR PRESENCE(10)			RELAY, COMPUTE, CONVERT(13,14)	
Z	POSITION, DIMENSION			DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

NOTE: NUMBERS IN PARENTHESES REFER TO SPECIFIC EXPLANATORY NOTES ON SHEET 4.

RELEASED FOR PROJECT BASELINE CONTROL

DEC - 2 1991

GENERAL NOTES

A. FOR GENERAL NOTES REFER TO DRAWING H-2-123001-1.
B. THE COMPLETE LP EQUIPMENT NUMBER MAY BE USED ON INDIVIDUAL INSTRUMENT SYMBOLS OR INSIDE A BOX AROUND A GROUP OF INSTRUMENTS. THIS METHOD IS USUALLY USED WHEN THE LP SYSTEM NUMBER IS DIFFERENT THAN THE SYSTEM DEPICTED ON THE P&ID SHEET.

REV.	DATE	REVISION DESCRIPTION	ORIGINATOR	CHECKED	APPROVED	APPROVAL DETAILS
3	11/26/91	GENERAL REVISION. RELEASED FOR PROJECT BASELINE CONTROL PER CR-0610.	[illegible]	[illegible]	[illegible]	[illegible]
2	8/30/91	GENERAL REVISION. RELEASED FOR PROJECT BASELINE CONTROL PER CR-0480.	BGJ	MF	RGT	BGJ
1	5/17/91	*RELEASED FOR PROJECT BASELINE	MF	VP	RGT	MFJ
		CONTROL* WITHDRAWN PER CR-465.	ERP	FGB	DPC	RNG
0	10/23/90	RELEASED FOR PROJECT BASELINE CONTROL PER CR HNVP-0443	BGJ	MF	RGT	BGJ
			ERP	FGB	DPC	RNG
03	8/15/90	RELEASED FOR DETAILED DESIGN PER HNVP-0429, REV. 1	BGJ	FD	RGT	RGT
			[illegible]	FGB	DPC	RNG
02	4/23/89	GENERAL UPDATE PER ECN 110	JMJ	TGS	GAP	BGJ
			BJR	RNG	RTS	RNG
01	12/7/88	GENERAL UPDATE PER ECN 064	RHM	RNG	GAP	RHM
			RHM	FGB	RNG	RTS
00	7/6/88	RELEASED FOR DETAILED DESIGN				

ENGINEERING RELEASE
REV. ____ DATE ____
EPG

P.N.GIBBONS	7-6-88	
R.T.SWIFT	7-21-88	
F.G.BROOKS	7-6-88	
H.WITTE	7-7-88	
H.WITTE	9-2-88	
C.A.PRELL	7-7-88	
R.M.MCCARTHY	7-6-88	
K.H.CRABB	7-6-88	
V.BARRIGA	7-5-88	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-86RL10838

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT
PROJECT: E-595 | PROJECT NO. 8457 | SUBPROJECT NO. 3001
SCALE: NONE | DWG NO. H-2-123001 | SHEET 3 | REV. 3

CLASSIFICATION: NONE | KEY: NOT REQ'D

AA7F8330 / CR
26 NOV 91

NOTES:

(THESE NOTES APPLY TO THIS TABLE AND/OR THE "INSTRUMENT IDENTIFICATION LETTERS" TABLE ON SHEET 3)

1. A USER'S CHOICE LETTER IDENTITY IS INTENDED TO COVER A MEANING THAT WOULD BE USED REPETITIVELY IN A PARTICULAR PROJECT. WHEN USED THE LETTER MAY HAVE ONE MEANING AS A FIRST LETTER AND ANOTHER MEANING AS A SUCCEEDING LETTER. THE MEANINGS NEED BE DEFINED ONLY ONCE IN A LEGEND, OR OTHERWISE FOR THAT PROJECT. FOR EXAMPLE, THE LETTER "N" MAY BE DEFINED AS TURBIDITY AS A FIRST LETTER AND TELEVISION MONITOR AS A SECOND LETTER. "BN" WOULD BE A BURNER FLAME TELEVISION MONITOR.

2. THE UNCLASSIFIED LETTER "X" IS INTENDED TO COVER UNLISTED MEANINGS THAT WILL BE USED ONLY ONCE OR USED TO A LIMITED EXTENT. IF USED, "X" MAY HAVE ANY NUMBER OF MEANINGS AS A FIRST-LETTER AND ANY NUMBER OF MEANINGS AS A SUCCEEDING-LETTER. EXCEPT FOR ITS USE WITH DISTINCTIVE SYMBOLS, IT IS EXPECTED THAT THE MEANINGS WILL BE DEFINED OUTSIDE A TAGGING BUBBLE ON A FLOW DIAGRAM. FOR EXAMPLE, XR-2 MAY BE A "STRESS RECORDER" AND XX-4 MAY BE A "STRESS OSCILLOSCOPE."

3. THE GRAMMATICAL FORM OF THE SUCCEEDING-LETTER MEANINGS MAY BE MODIFIED AS REQUIRED. FOR EXAMPLE, "INDICATE" MAY APPLY AS "INDICATOR" OR "INDICATING," "TRANSMIT" AS "TRANSMITTER" OR "TRANSMITTING," ETC.

4. ANY FIRST-LETTER, IF USED IN COMBINATION WITH MODIFYING LETTERS D (DIFFERENTIAL), F (RATIO), M (MOMENTARY), K (TIME RATE OF CHANGE) Q (INTEGRATE OR TOTALIZE), OR ANY COMBINATION OF THESE IS INTENDED TO REPRESENT A NEW AND SEPARATE MEASURED VARIABLE, AND THE COMBINATION IS TREATED AS A FIRST-LETTER ENTITY. THUS, INSTRUMENTS TDI AND TI INDICATE TWO DIFFERENT VARIABLES, NAMELY, DIFFERENTIAL-TEMPERATURE AND TEMPERATURE. MODIFYING LETTERS ARE USED WHEN APPLICABLE.

5. FIRST-LETTER A (ANALYSIS) COVERS ALL ANALYSES NOT DESCRIBED BY A "USER'S CHOICE" LETTER. IT IS EXPECTED THAT THE TYPE OF ANALYSIS WILL BE DEFINED OUTSIDE A TAGGING BUBBLE (SEE LIST AT LOCATION BC ON SHEET 3).

6. USE OF FIRST-LETTER U FOR "MULTIVARIABLE" IN LIEU OF A COMBINATION OF FIRST-LETTERS IS OPTIONAL. IT IS RECOMMENDED THAT NONSPECIFIC VARIABLE DESIGNATORS SUCH AS U BE USED SPARINGLY.

7. THE USE OF MODIFYING TERMS "HIGH," "LOW," "MIDDLE" OR "INTERMEDIATE" AND "SCAN" IS OPTIONAL.

8. THE TERM "SAFETY" APPLIES TO EMERGENCY PROTECTIVE PRIMARY ELEMENTS AND EMERGENCY PROTECTIVE FINAL CONTROL ELEMENTS ONLY. THUS, A SELF-ACTUATED VALVE THAT PREVENTS OPERATION OF A FLUID SYSTEM AT A HIGHER-THAN-DESIRED PRESSURE BY BLEEDING FLUID FROM THE SYSTEM IS A BACK-PRESSURE-TYPE PCV, EVEN IF THE VALVE IS NOT INTENDED TO BE USED NORMALLY. HOWEVER, THIS VALVE IS DESIGNATED AS A PSV IF IT IS INTENDED TO PROTECT AGAINST EMERGENCY CONDITIONS, I.E., CONDITIONS THAT ARE HAZARDOUS TO PERSONNEL AND/OR EQUIPMENT AND ARE NOT EXPECTED TO ARISE NORMALLY.
THE DESIGNATION PSV APPLIES TO ALL VALVES INTENDED TO PROTECT AGAINST EMERGENCY PRESSURE CONDITIONS REGARDLESS OF WHETHER THE VALVE CONSTRUCTION AND MODE OF OPERATION PLACE THEM IN THE CATEGORY OF THE SAFETY VALVE, RELIEF VALVE, OR SAFETY RELIEF VALVE. A RUPTURE DISC IS DESIGNATED PSE.

9. THE PASSIVE FUNCTION G APPLIES TO INSTRUMENTS OR DEVICES THAT PROVIDE AN UNCALIBRATED VIEW, SUCH AS SIGHT GLASSES AND TELEVISION MONITORS.

10. "INDICATE" NORMALLY APPLIES TO THE READOUT--ANALOG OR DIGITAL--OF AN ACTUAL MEASUREMENT. IN THE CASE OF A MANUAL LOADER, IT MAY BE USED FOR THE DIAL OR SETTING INDICATION, I.E., FOR THE VALUE OF THE INITIATING VARIABLE.

11. A PILOT LIGHT THAT IS PART OF AN INSTRUMENT LOOP SHOULD BE DESIGNATED BY A FIRST-LETTER FOLLOWED BY THE SUCCEEDING-LETTER L. FOR EXAMPLE, A PILOT LIGHT THAT INDICATES AN EXPIRED TIME PERIOD SHOULD BE TAGGED KL. IF IT IS DESIRED TO TAG A PILOT LIGHT THAT IS NOT PART OF A INSTRUMENT LOOP, THE LIGHT IS DESIGNATED IN THE SAME WAY. FOR EXAMPLE, A RUNNING LIGHT FOR AN ELECTRIC MOTOR MAY BE TAGGED EL, ASSUMING VOLTAGE TO BE THE APPROPRIATE MEASURED VARIABLE, OR YL, ASSUMING THE OPERATING STATUS IS BEING MONITORED. THE UNCLASSIFIED VARIABLE X SHOULD BE USED ONLY FOR APPLICATIONS WHICH ARE LIMITED IN EXTENT. THE DESIGNATION XL SHOULD NOT BE USED FOR MOTOR RUNNING LIGHTS, AS THESE ARE COMMONLY NUMEROUS IT IS PERMISSIBLE TO USE THE USER'S CHOICE LETTERS M, N OR O FOR A MOTOR RUNNING LIGHT WHEN THE MEANING IS PREVIOUSLY DEFINED. IF M IS USED IT MUST BE CLEAR THAT THE LETTER DOES NOT STAND FOR THE WORD "MOTOR," BUT FOR A MONITORED STATE.

12. USE OF A SUCCEEDING-LETTER U FOR "MULTIFUNCTION" INSTEAD OF A COMBINATION OF OTHER FUNCTIONAL LETTERS IS OPTIONAL. THIS NONSPECIFIC FUNCTION SHOULD BE USED SPARINGLY.

13. A DEVICE THAT CONNECTS, DISCONNECTS, OR TRANSFERS ONE OR MORE CIRCUITS MAY BE EITHER A SWITCH, A RELAY, AN ON-OFF CONTROLLER, OR A CONTROL VALVE, DEPENDING ON THE APPLICATION.
IF THE DEVICE MANIPULATES A FLUID PROCESS STREAM AND IS NOT A HAND-ACTUATED ON-OFF BLOCK VALVE, IT IS DESIGNATED AS CONTROL VALVE. IT IS INCORRECT TO USE THE SUCCEEDING-LETTERS CV FOR ANYTHING OTHER THAN A SELF-ACTUATED CONTROL VALVE. FOR ALL APPLICATIONS OTHER THAN FLUID PROCESS STREAMS, THE DEVICE IS DESIGNATED AS FOLLOWS:

A SWITCH, IF IT IS ACTUATED BY HAND.

A SWITCH OR AN ON-OFF CONTROLLER, IF IT IS AUTOMATIC AND IS THE FIRST SUCH DEVICE IN A LOOP. THE TERM "SWITCH" IS GENERALLY USED IF THE DEVICE IS USED FOR ALARM, PILOT LIGHT, SELECTION, INTERLOCK, OR SAFETY.

THE TERM "CONTROLLER" IS GENERALLY USED IF THE DEVICE IS USED FOR NORMAL OPERATING CONTROL.

A RELAY, IF IT IS AUTOMATIC AND IS NOT THE FIRST SUCH DEVICE IN A LOOP, I.E., IT IS ACTUATED BY A SWITCH OR AN ON-OFF CONTROLLER.

14. IT IS EXPECTED THAT THE FUNCTIONS ASSOCIATED WITH THE USE OF SUCCEEDING-LETTER "Y" WILL BE DEFINED OUTSIDE A BUBBLE ON A DIAGRAM WHEN FURTHER DEFINITION IS CONSIDERED NECESSARY. THIS DEFINITION NEED NOT BE MADE WHEN THE FUNCTION IS SELF-EVIDENT, AS FOR A SOLENOID VALVE IN A FLUID SIGNAL LINE.

15. THE MODIFYING TERMS "HIGH," AND "LOW," AND "MIDDLE" OR "INTERMEDIATE" CORRESPOND TO VALUES OF THE MEASURED VARIABLE, NOT TO VALUES OF THE SIGNAL, UNLESS OTHERWISE NOTED. FOR EXAMPLE, A HIGH-LEVEL ALARM DERIVED FROM A REVERSE-ACTING LEVEL TRANSMITTER SIGNAL SHOULD BE A LAH, EVEN THOUGH THE ALARM IS ACTUATED WHEN THE SIGNAL FALLS TO A LOW VALUE. THE TERMS MAY BE USED IN COMBINATIONS AS APPROPRIATE.

16. THE TERMS "HIGH" AND "LOW," WHEN APPLIED TO POSITIONS OF VALVES AND OTHER OPEN-CLOSE DEVICES, ARE DEFINED AS FOLLOWS: "HIGH" DENOTES THAT THE VALVE IS IN OR APPROACHING THE FULLY OPEN POSITION, AND "LOW" DENOTES THAT IT IS IN OR APPROACHING THE FULLY CLOSED POSITION.

17. THE WORD "RECORD" APPLIES TO ANY FORM OF PERMANENT STORAGE OF INFORMATION THAT PERMITS RETRIEVAL BY ANY MEANS.

18. FIRST-LETTER "Y" IS INTENDED FOR USE WHEN CONTROL OR MONITORING RESPONSES ARE EVENT-DRIVEN AS OPPOSED TO TIME-OR TIME SCHEDULE-DRIVEN. THE LETTER "Y," IN THIS POSITION, CAN ALSO SIGNIFY PRESENCE OR STATE.

19. MODIFYING-LETTER "K," IN COMBINATION WITH A FIRST-LETTER SUCH AS "L," "T," OR "W," SIGNIFIES A TIME RATE OF CHANGE OF THE MEASURED OR INITIATING VARIABLE. THE VARIABLE "WKIC," FOR INSTANCE, MAY REPRESENT A RATE-OF-WEIGHT-LOSS INDICATING CONTROLLER.

TYPICAL INSTRUMENT IDENTIFICATION COMBINATIONS

FIRST LETTER: MEASURED VARIABLE (SEE NOTE 4)	FIRST LETTER: SYMBOL FOR MEASURED VARIABLES	DISPLAY FUNCTIONS (SEE NOTES 31, 33): INDICATE	DISPLAY FUNCTIONS: RECORD OR PRINT	DISPLAY FUNCTIONS: INTEGRATION INDICATION (SEE NOTES 4,21)	DISPLAY FUNCTIONS: SCAN (SEE NOTE 23)	ALARM (SEE NOTES 15,27): LOW	ALARM: HIGH	ALARM: LOW HIGH	CONTROL FUNCTIONS (SEE NOTE 33): INDICATE (SEE NOTES 10,31)	CONTROL FUNCTIONS: RECORD OR PRINT	CONTROL FUNCTIONS: BLIND	CONTROL DEVICES: CONTROL VALVE (SEE NOTE 30)	CONTROL DEVICES: SELF ACTUATED VALVE	CONTROL DEVICES: FINAL CONTROL ELEMENT (SEE NOTE 26)	CONTROL DEVICES: SWITCH (SEE NOTES 16,22,28)	SENSING DEVICES: PRIMARY ELEMENT	SENSING DEVICES: BLIND TRANSMITTER	SENSING DEVICES: INDICATING TRANSMITTER	LOCAL OBSERVATION GLASS	TEST CONNECTION (SEE NOTE 32)	RELAY OR CONVERTER (BLIND) (SEE NOTES 13,14)
TYPICAL SYMBOL	( )	( )I	( )R	( )QI	( )J ( )	( )AL	( )AH	( )AHL	( )IC	( )RC	( )C	( )V	( )CV	( )Z	( )S ( )	( )E	( )T	( )IT	( )G	( )P	( )Y
ANALYSIS (SEE NOTE 5)	A	AI	AR		AJ ( )	AAL	AAH	AAHL	AIC	ARC	AC	AV		AZ	AS( )	AE	AT	AIT		AP	AY
BURNER FLAME	B	BI	BR		BJ ( )	BAL					BC	BV			BS( )	BE	BT		BG	BP	BY
CONDUCTIVITY	C	CI	CR		CJ ( )	CAL	CAH	CAHL	CIC	CRC		CV		CZ	CS( )	CE	CT	CIT		CP	CY
DENSITY	D	DI	DR		DJ ( )	DAL	DAH	DAHL	DIC	DRC		DV		DZ	DS( )	DE	DT	DIT		DP	DY
VOLTAGE (EMF)	E	EI	ER		EJ ( )	EAL	EAH	EAHL	EIC	ERC	EC			EZ	ES( )	EE	ET	EIT			EY
FLOW (SEE NOTE 25)	F	FI	FR	FQI	FJ ( )	FAL	FAH	FAHL	FIC	FRC	FC	FV	FCV	FZ	FS( )	FE	FT	FIT	FG	FP	FY
FLOW RATIO	FF	FFI	FFR		FFJ ( )				FFIC	FFRC	FFC	FFV		FFZ							
GAGING (DIMENSIONAL)	G	GI	GR		GJ ( )	GAL	GAH	GAHL	GIC	GRC	GC	GV		GZ	GS( )	GE	GT	GIT			
HAND	H								HIC		HC	HV	HCV	HZ	HS( )						
CURRENT	I	II	IR	IQI	IJ ( )	IAL	IAH	IAHL	IIC	IRC	IC			IZ	IS( )	IE	IT	IIT			IY
POWER	J	JI	JR	JQI	JJ ( )	JAL	JAH	JAHL	JIC	JRC	JC			JZ	JS( )	JE	JT	JIT			JY
TIME	K	KI	KR	KQI	KJ ( )	KAL	KAH	KAHL	KIC	KRC	KC			KZ	KS( )		KT	KIT			KY
LEVEL	L	LI	LR		LJ ( )	LAL	LAH	LAHL	LIC	LRC	LC	LV	LCV	LZ	LS( )	LE	LT	LIT	LG	LP	LY
MOISTURE	M	MI	MR		MJ ( )	MAL	MAH	MAHL	MIC	MRC	MC	MV		MZ	MS( )	ME	MT	MIT		MP	MY
USERS CHOICE (SEE NOTE 1)	N																				
USERS CHOICE (SEE NOTE 1)	O												(SEE NOTE 8)								
PRESSURE OR VACUUM	P	PI	PR		PJ ( )	PAL	PAH	PAHL	PIC	PRC	PC	PV	PCV	PZ	PS( )	PE	PT	PIT		PP	PY
PRESSURE DIFFERENTIAL	PD	PDI	PDR			PDAL	PDAH	PDAHL	PDIC	PDRC	PDC	PDV	PDCV	PDZ	PDS( )		PDT	PDIT			
QUANTITY OR EVENT	Q	QI	QR	QQI	QJ ( )	QAL	QAH	QAHL	QIC	QRC	QC	QV		QZ	QS( )		QT	QIT			QY
RADIOACTIVITY (SEE NOTE 29)	R	RI	RR	RQI	RJ ( )	RAL	RAH	RAHL	RIC	RRC	RC			RZ	RS( )	RE	RT	RIT		RP	RY
SPEED OR FREQUENCY	S	SI	SR	SQI	SJ ( )	SAL	SAH	SAHL	SIC	SRC	SC			SZ	SS( )		ST	SIT			SY
TEMPERATURE	T	TI	TR		TJ ( )	TAL	TAH	TAHL	TIC	TRC	TC	TV	TCV	TZ	TS( )	TE	TT	TIT		TW	TY
TEMPERATURE DIFFERENTIAL	TD	TDI	TDR			TDAL	TDAH	TDAHL	TDIC	TDRC	TDC	TDV	TDCV	TDZ	TDS( )	(SEE NOTE 24)				(SEE NOTE 24)	
MULTI-VARIABLE	U	UI	UR		UJ ( )	UAL	UAH	UAHL	UIC	URC	UC	UV		UZ	US( )						UY
VISCOSITY (SEE NOTE 24)	V	VI	VR		VJ ( )	VAL	VAH	VAHL	VIC	VRC	VC	VV		VZ	VS( )	VE	VT	VIT			VY
WEIGHT	W	WI	WR	WQI	WJ ( )	WAL	WAH	WAHL	WIC	WRC	WC	WV		WZ	WS( )	WE	WT	WIT			WY
UNCLASSIFIED (SEE NOTE 2)	X	XI	XR		XJ ( )	XAL	XAH	XAHL	XIC	XRC	XC	XV		XZ	XS( )	XE	XT	XIT			XY
EVENT,STATE OR PRESENCE (SEE NOTE 18)	Y	YI	YR		YI ( )	YAL	YAH	YAHL	YI	YRC	YC	YV		YZ	YS( )	YE	YT	YIT			YY
POSITION	Z	ZI	ZR		ZJ ( )	ZAL	ZAH	ZAHL	ZIC	ZRC	ZC			ZZ	ZS( )	ZE	ZT	ZIT			ZY

20. SUCCEEDING-LETTER "K" IS A USER'S OPTION FOR DESIGNATING A CONTROL STATION, WHILE THE SUCCEEDING-LETTER C IS USED FOR DESCRIBING AUTOMATIC OR MANUAL CONTROLLERS.

21. WHEN "Q" IS USED AS A SECOND OR SUCCEEDING LETTER IT DENOTES AN INTEGRATING MODIFIER. FOR EXAMPLE: "FQI" IS AN INDICATING FLOW INTEGRATOR (OR TOTALIZER). NOTE THAT THE INTEGRATING FUNCTION SHALL BE SHOWN WITH SEPARATE IDENTIFICATION FOR EXAMPLE: FQI/FRS OR FR/FQIS.

22. STARTUP AND SHUTDOWN DEVICES ARE USUALLY BLIND, BUT MAY BE INDICATING OR RECORDING. IF SO, ADD "I" OR "R" AFTER MEASURED VARIABLE. FOR EXAMPLE: FIS, TRS. IF THE SWITCH PERFORMS AN ON-OFF CONTROL FUNCTION, REPLACE "S" BY "C". FOR EXAMPLE: "FS" BECOMES "FC". SWITCH FUNCTIONS SHALL BE FURTHER MODIFIED BY "L" FOR LOW AND "H" FOR HIGH.

23. FOR EXAMPLE, THE DESIGNATION "AJ( )" MAY DENOTE A SCANNING ANALYZER INDICATOR, RECORDER, & TRANSMITTER, BY USING THE DESIGNATION AJI, AJR, AJT, ETC. RESPECTIVELY.

24. "TW" DENOTES AN EMPTY THERMOWELL. "TE" DENOTES A THERMOWELL WITH THERMOCOUPLE OR RESISTANCE BULB AND HEAD SUITABLE FOR USE WITH A SECONDARY INSTRUMENT.

25. "FO" IS USED TO DESIGNATE A RESTRICTION ORIFICE.

26. FOR DEVICES OTHER THAN CONTROL VALVES, SUCH AS HYDRAULIC COUPLINGS, & VARIABLE SPEED DRIVERS.

27. HIGH-HIGH ALARMS WILL BE DESIGNATED "( )AHH" AND LOW-LOW ALARMS "( )ALL". FOR EXAMPLE: LAHH DENOTES "HIGH-HIGH LEVEL ALARM". ALARMS WITH NO MODIFIERS (H, L, HH, LL) ARE THOSE NOT RELATED TO ABSOLUTE VALUE OF MEASURED VARIABLE. THESE INCLUDE DEVIATION, RATE OF CHANGE, STATUS, OUTPUT, OR SET POINT ALARMS. DESCRIPTION SHOULD BE NOTED ON THE P&ID OUTSIDE THE INSTRUMENT SYMBOL.

28. HAND SWITCHES WHICH ARE AN INTEGRAL PART OF A LOOP WILL BE DESIGNATED BY SAME INSTRUMENT TAG NUMBER AS THE BALANCE OF THE LOOP. FOR EXAMPLE, AN INPUT SELECTOR SWITCH MAY BE NOTED "HS-102" IS PART OF THE SAME LOOP AS "FE-102", "FIC-102", AND "FV-102".

29. "R" IS USED FOR ALL RADIATION-RELATED PROCESS INSTRUMENTATION. THE SYMBOL OR A DESCRIPTION DENOTING TYPE OF RADIATION SHOULD BE NOTED ON THE P&ID OUTSIDE THE INSTRUMENT SYMBOL. FOR EXAMPLE α, β, γ, NEUTRON.

3

30. A HAND VALVE (HV) IS AN OPEN-CLOSED VALVE. A HV IS NOT USED TO MODULATE. A HAND CONTROL VALVE (HCV) IS MODULATED BY OPERATOR PERSONNEL. A HAND ADJUSTABLE ORIFICE (HO) MAY CONTROL THE STROKING TIME OF A PISTON OPERATED VALVE.

31. A CONTROL OR SENSING DEVICE OR RELAY HAVING A DISPLAY FUNCTION SHOULD HAVE THE APPROPRIATE DISPLAY LETTERS ADDED AFTER THE MEASURED VARIABLE DESIGNATION (E.G. AIC DESIGNATES ANALYSIS INDICATING CONTROL STATION).

32. A TEST POINT IS A PROCESS CONNECTION TO WHICH NO INSTRUMENT IS PERMANENTLY CONNECTED, BUT WHICH IS INTENDED FOR TEMPORARY, INTERMITTENT, OR FUTURE CONNECTION OF AN INSTRUMENT.

33. FOR FUNCTIONAL IDENTIFICATION, CONTROL AND DISPLAY FUNCTIONS MAY BE COMBINED FOLLOWING THE FIRST LETTER FOR EXAMPLE, "FICAH" DENOTES "FLOW INDICATION AND CONTROL WITH HIGH ALARM". IF COMPLEX LOOPS REQUIRE MORE THAN FIVE LETTERS, MULTIPLE TOUCHING SYMBOLS SHOULD BE USED ON P&ID'S.

34. NOT IN ACCORDANCE WITH ISA S5.1-1984.

RELEASED FOR PROJECT BASELINE CONTROL

DEC - 2 1991

GENERAL NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING H-2-123001-1.

REV	DATE	REVISION DESCRIPTION	APPROVALS			
3	[illegible]	GENERAL REVISION RELEASED FOR PROJECT BASELINE CONTROL PER CR-0615	[illegible]	[illegible]	[illegible]	[illegible]
2	1/30/91	RELEASED FOR PROJECT BASELINE CONTROL PER CR-0480.	BGJ / CRP	MF / FGB	RGT / DPC	BGJ / RNG
1	2/7/91	"RELEASED FOR PROJECT BASELINE CONTROL" WITHDRAWN PER CR-465.	MF / CRP	VP / FGB	RGT / DPC	MFJ / RNG
0	10/31/90	RELEASED FOR PROJECT BASELINE CONTROL PER CR HWVP-0443	BGJ / CRP	MF / FCB	RGT / DPC	BGJ / RNG
03	8/21/90	RELEASED FOR DETAILED DESIGN PER HWVP-0429, REV. 1	BGJ / BJR	LG / FGB	RGT / DPC	BGJ / RNG
02	6/21/89	GENERAL UPDATE PER ECR 110	JAJ / BJR	SDS / RNG	GAP / RTS	BGJ / RNG
01	12/13/88	GENERAL UPDATE PER ECR 064	RMM / RMM	RMM / FCB	GAP / RNG	RMM / RTS
00	7/7/88	RELEASED FOR DETAILED DESIGN				

ENGINEERING RELEASE
REV. ______ DATE ______
CRD ______

R N GIBBONS	7-8-88
R T SWIFT	7-11-88
F G BROOKS	7-8-88
H WITTE	7-7-88
H WITTE	7-7-88
G A PRELL	7-7-88
R M MCCARTHY	7-6-88
K N CRASS	7-6-88
W BARRIGA	7-5-88

U.S.DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-86RL10838

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

LEGEND OF SYMBOLOGY FOR PROCESS FLOW PIPING AND INSTRUMENT DIAGRAMS

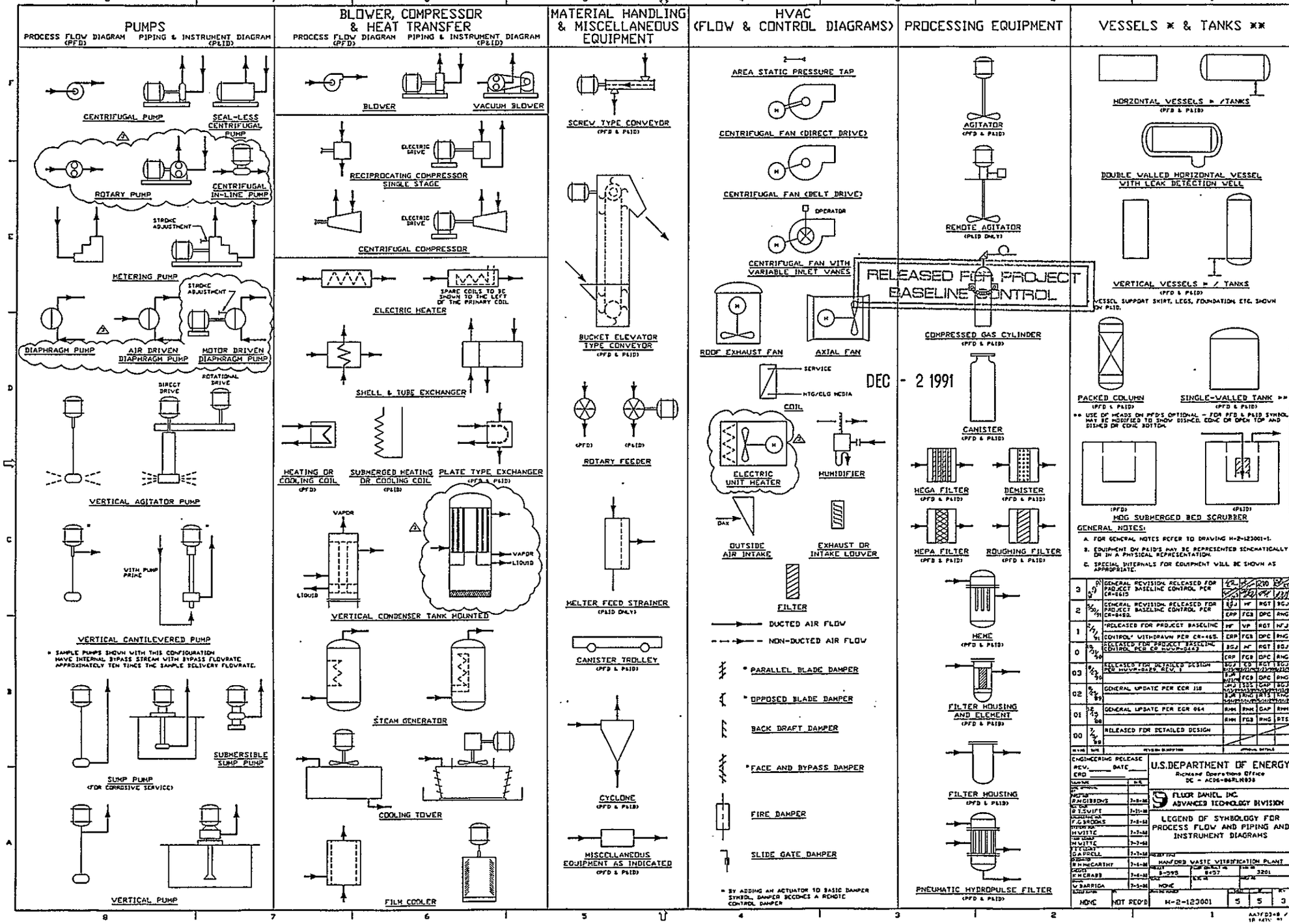
HANFORD WASTE VITRIFICATION PLANT

B-595 | 8457 | 3201

NONE

NONE | NOT REQ'D | H-2-123001 | 4 | 5 | 3

AA7FD351 /DAM 08 NOV 91


PUMPS
PROCESS FLOW DIAGRAM (PFD) PIPING & INSTRUMENT DIAGRAM (P&ID)
CENTRIFUGAL PUMP
SEAL-LESS CENTRIFUGAL PUMP
ROTARY PUMP
CENTRIFUGAL IN-LINE PUMP
STROKE ADJUSTMENT
METERING PUMP
DIAPHRAGM PUMP
AIR DRIVEN DIAPHRAGM PUMP
MOTOR DRIVEN DIAPHRAGM PUMP
DIRECT DRIVE
ROTATIONAL DRIVE
VERTICAL AGITATOR PUMP
WITH PUMP PRIME
VERTICAL CANTILEVERED PUMP
* SAMPLE PUMPS SHOWN WITH THIS CONFIGURATION HAVE INTERNAL BYPASS STREAM WITH BYPASS FLOWRATE APPROXIMATELY TEN TIMES THE SAMPLE DELIVERY FLOWRATE.
SUBMERSIBLE SUMP PUMP
SUMP PUMP (FOR CORROSIVE SERVICE)
VERTICAL PUMP
BLOWER, COMPRESSOR & HEAT TRANSFER
PROCESS FLOW DIAGRAM (PFD) PIPING & INSTRUMENT DIAGRAM (P&ID)
BLOWER
VACUUM BLOWER
ELECTRIC DRIVE
RECIPROCATING COMPRESSOR SINGLE STAGE
CENTRIFUGAL COMPRESSOR
SPARE COILS TO BE SHOWN TO THE LEFT OF THE PRIMARY COIL
ELECTRIC HEATER
SHELL & TUBE EXCHANGER
HEATING OR COOLING COIL (PFD)
SUBMERGED HEATING OR COOLING COIL (P&ID)
PLATE TYPE EXCHANGER (PFD & P&ID)
VAPOR
LIQUID
VERTICAL CONDENSER TANK MOUNTED
STEAM GENERATOR
COOLING TOWER
FILM COOLER
MATERIAL HANDLING & MISCELLANEOUS EQUIPMENT
SCREW TYPE CONVEYOR (PFD & P&ID)
BUCKET ELEVATOR TYPE CONVEYOR (PFD & P&ID)
(PFD) (P&ID)
ROTARY FEEDER
MELTER FEED STRAINER (P&ID ONLY)
CANISTER TROLLEY (PFD & P&ID)
CYCLONE (PFD & P&ID)
MISCELLANEOUS EQUIPMENT AS INDICATED (PFD & P&ID)
HVAC (FLOW & CONTROL DIAGRAMS)
AREA STATIC PRESSURE TAP
CENTRIFUGAL FAN (DIRECT DRIVE)
CENTRIFUGAL FAN (BELT DRIVE)
OPERATOR
CENTRIFUGAL FAN WITH VARIABLE INLET VANES
ROOF EXHAUST FAN
AXIAL FAN
SERVICE
HTG/CLG MEDIA
COIL
ELECTRIC UNIT HEATER
HUMIDIFIER
OAX
OUTSIDE AIR INTAKE
EXHAUST OR INTAKE LOUVER
FILTER
DUCTED AIR FLOW
NON-DUCTED AIR FLOW
* PARALLEL BLADE DAMPER
* OPPOSED BLADE DAMPER
BACK DRAFT DAMPER
* FACE AND BYPASS DAMPER
FIRE DAMPER
SLIDE GATE DAMPER
* BY ADDING AN ACTUATOR TO BASIC DAMPER SYMBOL, DAMPER BECOMES A REMOTE CONTROL DAMPER
PROCESSING EQUIPMENT
AGITATOR (PFD & P&ID)
REMOTE AGITATOR (P&ID ONLY)
COMPRESSED GAS CYLINDER (PFD & P&ID)
CANISTER (PFD & P&ID)
HEGA FILTER (PFD & P&ID)
DEMISTER (PFD & P&ID)
HEPA FILTER (PFD & P&ID)
ROUGHING FILTER (PFD & P&ID)
HEME (PFD & P&ID)
FILTER HOUSING AND ELEMENT (PFD & P&ID)
FILTER HOUSING (PFD & P&ID)
PNEUMATIC HYDROPULSE FILTER (PFD & P&ID)
VESSELS * & TANKS **
HORIZONTAL VESSELS * /TANKS (PFD & P&ID)
DOUBLE WALLED HORIZONTAL VESSEL WITH LEAK DETECTION WELL
VERTICAL VESSELS * / TANKS (PFD & P&ID)
VESSEL SUPPORT SKIRT, LEGS, FOUNDATION ETC. SHOWN ON P&ID.
PACKED COLUMN (PFD & P&ID)
SINGLE-WALLED TANK ** (PFD & P&ID)
** USE OF HEADS ON PFD'S OPTIONAL - FOR PFD & P&ID SYMBOL MAY BE MODIFIED TO SHOW DISHED, CONE OR OPEN TOP AND DISHED OR CONE BOTTOM.
(PFD) (P&ID)
MOG SUBMERGED BED SCRUBBER
GENERAL NOTES:
A. FOR GENERAL NOTES REFER TO DRAWING H-2-123001-1.
B. EQUIPMENT ON P&ID'S MAY BE REPRESENTED SCHEMATICALLY OR IN A PHYSICAL REPRESENTATION.
C. SPECIAL INTERNALS FOR EQUIPMENT WILL BE SHOWN AS APPROPRIATE.
RELEASED FOR PROJECT BASELINE CONTROL
DEC - 2 1991
3 GENERAL REVISION RELEASED FOR PROJECT BASELINE CONTROL PER CR-6613
2 GENERAL REVISION RELEASED FOR PROJECT BASELINE CONTROL PER CR-6450.
1 *RELEASED FOR PROJECT BASELINE
CONTROL WITHDRAWN PER CR-4655.
0 RELEASED FOR PROJECT BASELINE CONTROL PER CR
03 RELEASED FOR DETAILED DESIGN PER HNWR-0285, REV. 1
02 GENERAL UPDATE PER ECR 118
01 GENERAL UPDATE PER ECR 064
00 RELEASED FOR DETAILED DESIGN
ENGINEERING RELEASE
REV. DATE
CRD
U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DC - ACR4-86RLN038
FLUOR DANIEL INC.
ADVANCED TECHNOLOGY DIVISION
LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS
R.N.GIBBONS
R.T.SWIFT
F.G.BROOKS
H.WITTE
H.WITTE
G.A.PRELL
R.H.McCARTHY
K.H.CRABB
W.BARRIGA
HANFORD WASTE VITRIFICATION PLANT
NONE
NOT REQ'D
H-2-123001
5
5
3

9 2 1 2 7 3 3 1 7 6