EQUIPMENT

TURBINES: SINGLE FLOW, DOUBLE FLOW

ROTARY, RECIPROCATING

POSITIVE DISPLACEMENT PUMPS: PROGRESSIVE CAVITY, DUPLEX PISTON

VERTICAL CENTRIFUGAL PUMPS: SUMP OR DRY PIT, WET PIT, CANNED, END SUCTION, IN-LINE

HORIZONTAL CENTRIFUGAL PUMP

SUBMERSIBLE SUMP PUMP

CANNED MOTOR PUMP

VACUUM PUMP

AIR COMPRESSOR

DIAPHRAGM COMPRESSOR

BLOWER

HEAT EXCHANGER U-TUBE

HEAT EXCHANGER STRAIGHT TUBE

COOLER W/SEPARATOR

TANKS: CONE ROOF, DOME ROOF, FLOATING TOP, FLAT TOP

WORKING AND TOTAL CAPACITIES SHOULD BE INDICATED FOR TANKS AND PRESSURE VESSELS

(SHOWN WITH INTERNAL DIAPHRAGM)

PRESSURE VESSELS, VERTICAL (SHOWN) OR HORIZONTAL (TANKS, RECEIVERS, DRYERS, SEPARATORS, DEMINERALIZERS, ETC.)

PRESSURIZED GAS BOTTLE

ACCUMULATOR

AGITATOR, MIXER OR BLENDER

VENT STACK FOR MAIN STEAM RELIEF VALVES

STEAM GENERATOR

PROCESS PIPING

MAIN PROCESS LINE
AIR FLOW LINE

SECONDARY PROCESS LINE

REDUCER

PIPE CAP

SCREWED CAP

BREATHER CAP

HOSE CONNECTION
NOTE 3 AND 6

QUICK DISCONNECT COUPLING

REMOVABLE SPOOL

FLEXIBLE CONNECTION

FLANGE CONNECTION
(PIPING OR EQUIP)

IF-INSULATED FLANGE (SHOWN)
DU-DIELECTRIC UNION

BLIND FLANGE

LOOP SEAL (TRAP)

(1/6) DOWNWARD SLOPE (1" PER 6' SHOWN)

(1/6) UPWARD SLOPE (1" PER 6' SHOWN)

ATMOSPHERIC
VENT

BURIED PIPE

HEAT TRACING/FREEZE PROTECTION
E - ELECTRICALLY TRACED (SHOWN)
S - STEAM TRACED

HEAT TRACING/MAINTAINED PROCESS TEMPERATURE
E - ELECTRICALLY TRACED (SHOWN)
S - STEAM TRACED

BY OTHERS

DRAIN LEG

FLOW ORIFICE FIXED

RUPTURE DIAPHRAGM

THERMAL SLEEVE

LINE VALVES

GATE VALVE (OPEN)

GATE VALVE (CLOSED)

GATE VALVE (DOUBLE DISC OPEN)

GATE VALVE (DOUBLE DISC CLOSED)

GLOBE VALVE (OPEN)

GLOBE VALVE (CLOSED)

ANGLE VALVE (OPEN)

ANGLE VALVE (CLOSED)

NEEDLE VALVE (OPEN)

NEEDLE VALVE (CLOSED

PLUG VALVE (OPEN)

PLUG VALVE (CLOSED)

3-WAY PLUG VALVE
(NORMALLY CLOSED PORT SHOWN BLACKENED)

BUTTERFLY VALVE

BALL VALVE (OPEN)

BALL VALVE (CLOSED)

AUTORECIRC VALVE

LINE VALVES (CONT.)

CHECK VALVE

STOP CHECK VALVE

ANGLE STOP CHECK VALVE

XV
POWER-ASSISTED NONRETURN VALVE

BACKFLOW PREVENTER

FOOT VALVE

FLOW LIMITING (OR EXCESS FLOW) VALVE

HOSE VALVE GATE

HOSE VALVE GLOBE

4-WAY VALVE

3-WAY VALVE
(CLOSED PORT SHOWN BLACKENED)

QUICK OPENING VALVE

SAUNDERS OR DIAPHRAGM VALVE

BELLOWS SEAL VALVE

PACKLESS METAL
DIAPHRAGM VALVE

CAPPED STEM VALVE

PINCH VALVE

FLOAT VALVE

RUPTURE DISC

SAFETY OR RELIEF VALVE
(INLET PORT SHOWN BLACKENED)

ELECTROMATIC RELIEF VALVE

DIFFERENTIAL PRESSURE
RELIEF VALVE (INLET
PORTS SHOWN BLACKENED)

AIR SAFETY VALVE

VACUUM RELIEF VALVE

COMBINATION VACUUM & PRESSURE
RELIEF VALVE

AUTO AIR RELIEF VALVE

HAND TEST VALVE (INLET
PORT SHOWN BLACKENED)

OPERATOR
G-GEAR (SHOWN)
A-AIR WRENCH
CH-CHAIN
S-SPECIAL TYPE

LINE VALVE STATUS SYMBOLS

DH
STEM LEAK-OFF
(DH - DRAIN HEADER)

NORMALLY OPEN
(ALL VALVES EXCEPT BUTTERFLY)

NORMALLY CLOSED
(ALL VALVES EXCEPT BUTTERFLY)

NO
BUTTERFLY VALVE (SHOWN) OR DELUGE VALVE
NO - NORMALLY OPEN (SHOWN) (NOTE 5)
NC - NORMALLY CLOSED

LO
LOCKED OPEN AT VALVE

LC
LOCKED CLOSED AT VALVE

LIP
LOCKED IN PLACE AT VALVE

LOCKED
LOCKED, POSITION CONTROLLED BY
PROCEDURE

LINE VALVE/DAMPER FAILURE MODES

FO
TYPICAL VALVE (GATE SHOWN)
FO - FAIL OPEN (SHOWN)
FC - FAIL CLOSED
FL - FAIL LOCKED (POSITION DOES NOT CHANGE)
FI - FAIL INDETERMINATE

MISCELLANEOUS

SPECTACLE BLIND

CIRCULAR OR HAMMER BLIND

BLIND FLANGE WITH SPACER

WASTE CONE

EXHAUST HEAD

FLEXIBLE HOSE

EXPANSION JOINT

SINGLE BASKET STRAINER

TWIN BASKET STRAINER

WYE TYPE STRAINER

TEMPORARY STARTUP STRAINER

TEE TYPE STRAINER

SCREEN TYPE STRAINER

FILTER

PUD
PULSATION DAMPENER

INLET SILENCER

EXHAUST SILENCER

SS
SUCTION STABILIZER

ST
TRAP
ST - STEAM TRAP (SHOWN)
AT - AIR TRAP
DT - DRAIN TRAP
RT - RESIN TRAP
MT - MOISTURE TRAP

RESIN SCREEN

BIRD SCREEN

FLAME ARRESTER

AUTOMATIC VENT

V VENT VALVE (SHOWN WITH CAP)
D DRAIN VALVE
TC TEST CONNECTION VALVE
TV TEST VENT VALVE

OPEN DRAIN (SHOWN)
RD - RADIOACTIVE DRAIN TO DRAIN HEADER
ND - NONRADIOACTIVE DRAIN
AW - ACID WASTE
NW - NORMAL WASTE
OW - OILY WASTE
SW - SANITARY WASTE

HUB DRAIN

SCREW TYPE CLEANOUT

FLANGE TYPE CLEANOUT

WALL CLEANOUT

EJECTOR OR EDUCTOR
OR ATTEMPERATOR

M
STATIC MIXER

IMMERSION HEATER
(STEAM OR ELECTRICAL)

SPRAY NOZZLE HEADER

SPARGER

DIFFUSER

M-XX
MECHANICAL RCB PENETRATION

MUFFLER

ARROW INDICATES LINE NUMBER CHANGE, LINE SYSTEM CHANGE, OR LINE MATERIAL SPEC. CHANGE.

XX REF. X
IDENTIFICATION OF PIPING CONNECTION AT EQUIPMENT OR VENDOR SUPPLIED PIPING

RADIATION SHIELDING

MISCELLANEOUS (CONT.)

CVCS RCP 3 — LINE ORIGIN OR DESTINATION

9F05005 C-6 — LINE BREAK OR RESUMPTION POINT

DWG. (TYP)
ZONE (TYP)
CROSS REFERENCE

DESIGNATION FOR PIPING APPEARING ON OTHER P & ID'S.

EXAMPLE OF ABOVE:
6"XXXXXXXXX
FV XXXX
S
1"XXXXXXXXX
CVCS RCP 3
9F05005 C-6

W
FURNISHED WITH WESTINGHOUSE NSSS EQUIPMENT (INCLUDING INSTRUMENTATION)

FURNISHED WITH VENDOR'S EQUIPMENT

BECHTEL-VENDOR INTERFACE
VENDOR BECHTEL

BUILDING BOUNDARY

ANS SAFETY CLASSIFICATIONS

1 — SAFETY CLASS 1

2 — SAFETY CLASS 2

3 — SAFETY CLASS 3

1/2 — BOUNDARY BETWEEN CLASS 1 AND 2

1 — CLASS 1 CONTINUES

3/N — BOUNDARY BETWEEN SAFETY CLASS AND NON-SAFETY CLASS (IN CONGESTED AREA ROTATE AS APPLICABLE)

D — BOUNDARY BETWEEN DEMA AND NON-SAFETY CLASS

D/3 — BOUNDARY BETWEEN DEMA AND SAFETY CLASS

N1CC02 (EXAMPLE) — N-5 INDICATOR SEE NOTE 8

FIRE PROTECTION EQUIPMENT

PSH — ALARM CHECK VALVE

SPRINKLER

FIRE HYDRANT

HR — FIRE HOSE REEL

HC — FIRE HOSE CABINET

D — FIRE PROTECTION STRAINER

D — DELUGE VALVE

POST INDICATOR VALVE

ANGLE VALVE / ZURN PRESSURTROL VALVE

VICTAULIC COUPLING OR DRESSER COUPLING

FIRE DEPT. CONN. SPRINKLERS OR STAND PIPE

WATER SPRAY FIXED NOZZLE

MISC. ABBREVIATIONS

IRC	INSIDE REACTOR CONTAINMENT
ORC	OUTSIDE REACTOR CONTAINMENT
NNS	NON-NUCLEAR SAFETY
IMB	INSIDE MISSILE BARRIER
OMB	OUTSIDE MISSILE BARRIER
IVC	ISOLATION VALVE CUBICLE

PIPING IDENTIFICATION

THE TOTAL PROJECT NUMBER FOR A TYPICAL PIPE IS:

16" MS 1 001 GA 2

- NOMINAL PIPE SIZE
- SYSTEM DESIGNATOR
- UNIT INDICATOR NO.
- QUALITY CLASS.
- PIPE SPECIFICATION.
- LINE NUMBER

VALVE IDENTIFICATION

THE TOTAL PROJECT NUMBER FOR A TYPICAL VALVE IS:

LOCATION NO. — VALVE NO.

3 R 20 1 T CC 0013 A

- TRAIN IDENTIFIER (OPTIONAL)
- SERIALIZED NUMBER
- SYSTEM DESIGNATOR
- ACTIVITY DESIGNATOR
- UNIT INDICATOR
- SITE SUBCATEGORY
- SITE GENERAL CATEGORY
- QUALITY CLASSIFICATION **

ONLY THE VALVE NO. IS TO BE SHOWN ON P&ID'S EXCEPT WHEN THE ACTIVITY DESIGNATOR IS A "X", IN WHICH CASE THE ACTIVITY DESIGNATOR IS ALSO SHOWN. WHEN THE ACTIVITY DESIGNATOR IS A "K", SHOWING THE ACTIVITY DESIGNATOR ON P&ID'S IS OPTIONAL.

** QUALITY CLASSIFICATION DESIGNATOR MAY NOT REPRESENT THE ACTUAL INSTALLED QUALITY CLASS. REFER TO MASTER EQUIPMENT DATABASE FOR THE INSTALLED QUALITY CLASSIFICATION.

EQUIPMENT IDENTIFICATION

THE TOTAL PROJECT NUMBER FOR A TYPICAL PIECE OF EQUIPMENT IS:

1 R 12 1 N SG 101 D

- TRAIN IDENTIFIER (OPTIONAL)
- SERIALIZED DESIGNATOR (NOTE)
- COMPONENT DETAIL
- ACTIVITY DESIGNATOR
- UNIT INDICATOR
- SITE SUBCATEGORY
- SITE GENERAL CATEGORY
- QUALITY CLASSIFICATION **

NOTE:
REFER TO THE MED TO RESOLVE TPNS NUMBER DISCREPANCIES BETWEEN TAG AND P&ID. IF REQUIRED.

** QUALITY CLASSIFICATION DESIGNATOR MAY NOT REPRESENT THE ACTUAL INSTALLED QUALITY CLASS. REFER TO MASTER EQUIPMENT DATABASE FOR THE INSTALLED QUALITY CLASSIFICATION.

P & ID IDENTIFICATION

THE TOTAL PROJECT NUMBER FOR A TYPICAL P&ID IS:

3R209F05017

- SERIALIZED NUMBER
- ACTIVITY DESIGNATOR
- UNIT INDICATOR (NOTE 4)
- SITE SUBCATEGORY
- SITE GENERAL CATEGORY
- QUALITY CLASSIFICATION

IDENTIFICATION NUMBER NOTES

1. SEE CRITERIA FOR PIPING DESIGN, SL019PS004. FOR DEFINITION AND APPLICATION OF SYSTEM DESIGNATOR AND PIPE SPECIFICATION.
2. SEE STP PROJECT ENGINEERING PROCEDURE EDP-4.43 FOR DEFINITION AND APPLICATION OF COMPONENT DETAIL, ACTIVITY DESIGNATOR, SITE SUBCATEGORY, SITE GENERAL CATEGORY, AND QUALITY CLASSIFICATION.
3. UNIT INDICATORS ARE AS FOLLOWS:
   - 0-SHARED COMPONENT (COMMON TO BOTH UNITS)
   - 1-APPLICABLE TO UNIT 1 ONLY
   - 2-APPLICABLE TO UNIT 2 ONLY
   - 9-APPLICABLE TO BOTH UNITS
4. AN ALTERNATIVE TO A UNIT 1 OR 2 INDICATOR IN THIS LOCATION IS THE ADDITION OF A SUBSCRIPT TO THE END OF THE EXISTING P&ID NUMBER (SUCH AS,"1 FOR UNIT 1 AND "2 FOR UNIT 2).

GENERAL NOTES:

1. VENT AND DRAIN MAY OR MAY NOT BE SHOWN ON P&ID'S. UNLESS OTHERWISE INDICATED ON THE P&ID'S. VENT AND DRAIN SIZES ARE IN ACCORDANCE WITH SPECIFICATION SL019PS004, PARA 2.3.7.2. VENTS AND DRAINS FOR LINE SIZES 1-INCH AND LARGER WILL BE 1-INCH, LINE SIZE VENTS AND DRAINS WILL BE USED FOR " INCH AND SMALLER LINES.
2. INSTRUMENT LINE SIZES ARE NOT ALWAYS PROVIDED ON THE P&ID'S. THE MASTER EQUIPMENT DATABASE (5-A-47-0-K-00001) PROVIDES INSTRUMENT DETAIL DRAWING NUMBERS WHICH CAN BE USED TO FIND PHYSICAL DIMENSIONS AND INSTRUMENT ROOT VALVE SIZES.
3. A SCREWED CAP IS PERMITTED IN PLACE OF A QUICK DISCONNECT HOSE CONNECTION TO ALLEVIATE NUISANCE LEAKAGE OF VALVE PRIOR TO ITS REPAIR.
4. IN ORDER TO DETERMINE EQUIPMENT TPNS TAG NUMBERS FOR UNIT 2 EQUIPMENT REFER TO THE MASTER EQUIPMENT DATABASE (5-A-47-0-K-00001)
5. WHERE VALVE POSITION DESIGNATORS DO NOT APPEAR ON P&ID'S FOR BUTTERFLY VALVES, THE POSITION OF THE VALVES IS SET BY OPERATIONS TO PERMIT PROPER SYSTEM OPERATION.
6. HOSE CONNECTIONS IN THE SA SYSTEM, (AND OTHER NON FLAMMABLE GAS SYSTEMS), MAY HAVE A BLANK END FITTING INSTALLED. THE BLANK END FITTING FORMS A GASKETED PRESSURE BOUNDARY WHEN INSTALLED. IF THERE IS NO LEAKAGE WITH THE BLANK END FITTING INSTALLED ON A HOSE CONNECTION WITH AN ISOLATION VALVE WITH A SEAT LEAK BY, VALVE REPAIR IS NOT REQUIRED. THE BLANK END FITTING SHOULD BE LOCKED IN PLACE WITH A CLIP. THE BLANK END FITTING AND CLIP SHOULD BE ATTACHED TO THE PIPE WITH A LANYARD. IN SEISMIC AREAS THE CLIP SHALL BE USED AND THE CLIP AND BLANK END FITTING SHALL BE ATTACHED TO THE PIPE WITH A LANYARD.
7. HIGH POINT VENT VALVES, LOW POINT DRAIN VALVES AND CALIBRATION/TEST MANIFOLD VALVES ARE INSTALLED IN INSTRUMENT IMPULSE LINES BETWEEN THE PROCESS ROOT VALVE AND THE INSTRUMENT. THESE MANUALLY OPERATED INSTRUMENT VALVES ARE INSTALLED IN ACCORDANCE WITH GENERIC DETAILS AND CONSTRUCTION SPECIFICATIONS TO FACILITATE INSTRUMENTATION MAINTENANCE ACTIVITIES. THE VALVES ARE GENERALLY NOT ASSIGNED TPNS NUMBERS AND ARE NOT SHOWN ON P&ID DRAWINGS.
8. TYPICAL NUMBER IDENTIFICATION:
   1ST CHARACTER - N ('N' CERTIFICATION HOLDER)
   2ND CHARACTER - UNIT DESIGNATOR
   3RD & 4TH CHARACTER - SYSTEM
   5TH & 6TH CHARACTER - SEQUENCE NUMBER

LR BOUNDARY DRAWING NO.	REV.
LR-STP-9A310F00001	0

NO.	ISSUE DATE	REVISION	ORIG	CKR	RE	DV	SE
25		REVISED PER CR 07-84-15.	VJM				
24	9-28-06	INCORP. DCN 0601921.	VJM	ON FILE			
23	3-28-06	REVISED PER CR * 06-3910-2.	JSH	ON FILE			
22	7-8-02	REVISED PER CR 02-7112-3	JGL	ON FILE			
0-21	6-23-82	ISSUED FOR CONSTRUCTION	SIGNATURES ON FILE				

ESEED.DGN

SOUTH TEXAS PROJECT
NUCLEAR OPERATING COMPANY

PIPING AND INSTRUMENTATION DIAGRAM
STANDARD ABBREVIATIONS AND SYMBOLS

PRIORITY	CADD FILE NO.	FSUG. NO.	STI. NO.	SCALE	DWG. NO.	SHT.	REV.
1	FJA034.251	D070928		NONE	9A310F00001		25

D-003