

# VALVE ACCESSORIES, DEFINITIONS AND ABBREVIATIONS

# LINE CODING

# LINE SYMBOLS

	DIAPHRAGM VALVE		FOOT VALVE		SPRAY NOZZLES		ABSOLUTE FILTER		LOCALLY MOUNTED INSTRUMENT		MAIN PROCESS LINES (OUT OF SYSTEM DASHED)		P - PRESSURE
	GATE VALVE		VACUUM BREAKER		SPARGER		FILTER, PARTICULATE, AUTOMATIC		PANEL MOUNTED INSTRUMENT		SECONDARY PROCESS FLOW LINES (OUT OF SYSTEM DASHED)		L - LEVEL
	GLOBE VALVE		FLOAT CHECK VALVE		EDUCTOR OR EJECTOR		FILTER, CARBON		LOCALLY MOUNTED TRANSMITTER		PNEUMATIC CONTROL LINES		T - TEMPERATURE OR TRANSMITTER OR TEST
	BUTTERFLY VALVE (OPEN)		QUICK OPENING		MIXER		PREFILTER (AIR OR GAS)		PANEL MOUNTED TRANSMITTER		INSTRUMENT AIR SUPPLY FIXED PRESSURE		C - CONDUCTIVITY OR CONTROL
	BUTTERFLY VALVE (CLOSED)		BELLOWS SEAL		LOOP SEAL (TRAP)		HIGH EFFICIENCY FILTER (AIR OR GAS)		HIGH CONTROL ROOM ANNUNCIATOR LOW		AREA BOUNDARIES		A - ANALYZER OR ALARM
	BALL VALVE		CAPPED STEM		DIAPHRAGM SEAL		BAG FILTER		TRANSITION PIECE (E.G. STAINLESS TO CARBON)		ELECTRICAL CONTROLS LEADS		O - POWER
	PLUG VALVE		REDUCTION		VENT		ROUGHING FILTER		FIRE DAMPER		FIXED BULB TEMPERATURE DETECTOR		R - RADIATION OR RECORDING
	ANGLE VALVE		STRAINER		IMMERSION HEATER (STEAM OR ELECTRICAL)		ROLL FILTER		AIR FLOW FROM OR TO OPEN AREAS WITHOUT DUCTWORK		ELECTRICAL HEAT TRACING		S - SPEED OR SWITCH
	3-WAY VALVE		TRAP		FLEXIBLE CONNECTION		START UP FILTER		CONTROL ROOM ANNUNCIATED ALARM		CONTAINMENT PURGE AIR DUCTWORK		W - WEIGHT
	4-WAY VALVE		FILTER		ACCUMULATOR		DEMISTER		REACTOR TRIP AND CONTROL ROOM ANNUNCIATED ALARM		ELECTRICAL CONTROL LINES		I - INDICATOR
	ANGLE RELIEF OR SAFETY VALVE		FLOW METER		ACCUMULATOR WHICH IS AN INTEGRAL PART OF CONTROL VALVE/OPERATOR		GRAVITY VENT	<p>*H = HIGH ALARM, HH = VERY HIGH ALARM *L = LOW ALARM, LL = VERY LOW ALARM *H = HIGH REACTOR TRIP *L = LOW REACTOR TRIP</p>					G - GAUGE OR GLASS
	FLOW CONTROL VALVE		EXPANSION JOINT		QUICK COUPLING		LOUVER						V - VALVE
	NEEDLE VALVE		ORIFICE		RUPTURE DISC		MOISTURE SEPARATOR AND MEDIA TYPE MIST ELIMINATOR						AO - AIR TO OPEN
	CHECK VALVE (SWING)		MULTI-PRESSURE REDUCING ORIFICE		ROOF EXHAUST FAN		HEATING OR COOLING COIL						AC - AIR TO CLOSE
	ORIFICE VALVE		BREAKDOWN ORIFICE		FRESH AIR INLET (COUNTER WEIGHT OPERATED)		DAMPER, PARALLEL BLADES						HI - HIGH
	CHECK VALVE (LIFT)		THERMAL SLEEVE		FAN, BLOWER, OR COMPRESSOR		DAMPER, OPPOSED BLADES						LO - LOW
	SPRING LOADED CHECK VALVE		BLIND FLANGE		FAN AXIAL BLOWER		VOLUME DAMPER (MANUAL)						Y - MISCELLANEOUS
	STOP CHECK VALVE		HOSE ADAPTOR FLANGE		POSITIVE DISPLACEMENT PUMP		DAMPER WITH FUSE LINK AND SPRING OPENER						E - ELEMENT
	STOP CHECK VALVE HAND OPERATED		CAPPED LINE		CENTRIFUGAL PUMP		DAMPER, COUNTER WEIGHT OPERATED						H - HAND
	NON-REVERSE CURRENT VALVE		TEST CONNECTION		GEAR PUMP		FACE AND BYPASS DAMPER						M - MODIFIER
	NORMALLY CLOSED VALVE		HOSE COUPLING		SMALL CANNED MOTOR PUMP		DAMPER W/FUSE LINK, NORMALLY CLOSED						TW - TESTWELL
	LOCKED CLOSED VALVE		UNION		HEAT EXCHANGER (ANY TYPE)								FAI - FAIL AS IS
	LOCKED OPEN VALVE		TEMPORARY STRAINER		IN-DUCT HEATER								FC - FAIL CLOSED
	SEAL WIRE CLOSED VALVE		STRAINER (FLUSH TYPE)		AIR OR WATER COOLED COIL								FO - FAIL OPEN
	SEAL WIRE OPEN VALVE		STRAINER (Y-TYPE)		TANK ACCESS OPENING								TD - TEMPERATURE DIFFERENCE
	DASHED VALVES ARE OUT OF SYSTEM		SIGHT FLOW INDICATOR		HEATER (ANY TYPE)								PD - PRESSURE DIFFERENCE
	SELF REGULATING VALVE		STRAIGHTENING VANES		REMOTE SAMPLE								PH - PH
	THROTTLE VALVE, MANUAL, GATE, GLOBE, ETC.		RELIEF VALVE DRIP ELBOW & VENT		LOCAL SAMPLE								L.C. - LOCKED CLOSED
	STOP VALVE INSTRUMENT ACTUATED		DIAPHRAGM GLOBE W/POST		FIRE DETECTOR								L.O. - LOCKED OPEN
	STOP VALVE REMOTE MANUAL		VALVE W/POSITION INDICATOR & LIMIT SWITCHES										
	THROTTLE VALVE REMOTE MANUAL		DIAPHRAGM OPERATOR										
	THROTTLE VALVE INSTRUMENT ACTUATED		MOTOR OPERATOR										
	THROTTLE VALVE SELF ACTUATED		PISTON OPERATOR										
			SOLENOID OPERATED VALVE										
			REMOTE MECHANICALLY OPERATED VALVE										
			REMOTE OPERATED VALVE										
			HAND WHEEL OPERATED VALVE										

	TRIP VALVE INTERNAL CHECK VALVE FOR RESUPPLY OF ACCUMULATOR
	CONTROL AIR
	TO OPERATOR

	SAFETY CLASS BOUNDARY BETWEEN SC-1 AND SC-2
	CONTINUATION FLAG MATCH LETTER(S)
	PAGE NUMBER
	DRAWING TO REFER TO FOR CONTINUATION

	SAFETY CLASS	QUALITY ASSURANCE CLASS
1	SAFETY CLASS 1 (SC-1)	COE
2	SAFETY CLASS 2 (SC-2)	COE
3	SAFETY CLASS 3 (SC-3)	COE
4	NON-NUCLEAR SAFETY CLASS 1 (NNS-CL1)	(1)
	NON-NUCLEAR SAFETY CLASS 2 (NNS-CL2)	NON-COE

	PIPING CODE OF CONSTRUCTION	ISI/REPLACEMENT CODE
1	USAS B31.7 CLASS I	ASME III CLASS 1
2	USAS B31.7 CLASS II	ASME III CLASS 2
3	USAS B31.7 CLASS III	ASME III CLASS 3
4	USAS B31.1	ANSI B31.1
	USAS B31.1	ANSI B31.1

	EXAMPLE: SAFETY CLASS BOUNDARY BETWEEN SC-1 AND SC-2	(1) HVAC (LIMITED COE), FIRE PROTECTION OR RADIOACTIVE WASTE DISPOSAL
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RC - REACTOR COOLANT SYSTEM  
SI - SAFETY INJECTION SYSTEM  
AC - AUXILIARY COOLANT SYSTEM  
CH - CHEMICAL & VOLUME CONTROL SYSTEM  
SL - SAMPLING SYSTEM  
WD - WASTE DISPOSAL SYSTEM  
MS - MAIN STEAM  
AS - AUXILIARY STEAM  
BD - BLOWDOWN  
FW - FEEDWATER  
CA - PLANT AIR  
IA - INSTRUMENT AIR  
HG - HYDROGEN  
NG - NITROGEN  
DW - DEMINERALIZED WATER  
CF - CHEMICAL FEED  
V - VENT  
D - DRAIN  
CSR - CONTAINMENT SPRAY & REFUELING - WATER SYSTEM  
RW - RAW WATER  
SD - SANITARY DRAIN & STORM DRAINS  
DWC - DOMESTIC WATER - COLD  
DWH - DOMESTIC WATER - HOT  
DWHR - DOMESTIC WATER HOT RECIRCULATING  
CR - CONDENSATE RETURN (TRAPS)  
GA - GAS ANALYZER  
DH - DRAIN HEADER  
CG - CARBON DIOXIDE GAS  
PW - POTABLE WATER

P - PRESSURE  
F - FLOW  
L - LEVEL  
T - TEMPERATURE OR TRANSMITTER OR TEST  
C - CONDUCTIVITY OR CONTROL  
A - ANALYZER OR ALARM  
O - POWER  
R - RADIATION OR RECORDING  
S - SPEED OR SWITCH  
W - WEIGHT  
I - INDICATOR  
G - GAUGE OR GLASS  
V - VALVE  
AO - AIR TO OPEN  
AC - AIR TO CLOSE  
HI - HIGH  
LO - LOW  
Y - MISCELLANEOUS  
E - ELEMENT  
H - HAND  
M - MODIFIER  
TW - TESTWELL  
FAI - FAIL AS IS  
FC - FAIL CLOSED  
FO - FAIL OPEN  
TD - TEMPERATURE DIFFERENCE  
PD - PRESSURE DIFFERENCE  
PH - PH  
L.C. - LOCKED CLOSED  
L.O. - LOCKED OPEN

**GENERAL NOTES:**

1. PIPING 2" AND SMALLER SHALL BE RUN IN FIELD TO SUIT LOCAL CONDITIONS SUBJECT TO APPROVAL OF THE ENGINEERS.
2. ALL LOCATIONS SHOWN ON DESIGN DRAWINGS ARE FOR PIPE IN THE COLD ERECTED POSITION.
3. NO ALLOWANCE HAS BEEN MADE FOR WELD GAPS OR GASKET THICKNESS.
4. ALL OPEN DRAINS AND FREEBLOWS MUST BE VISIBLE AT POINT OF DISCHARGE.
5. ANY EXCEPTIONS TO THE GENERAL NOTES ARE SHOWN ON THE DESIGN DRAWINGS.
6. ALL IT, TE AND TW INSTRUMENT CONNECTIONS ON PIPING SHALL BE 1" SCREWED UNLESS OTHERWISE NOTED.
7. ALL FT, PA, PC, PT AND PT INSTRUMENT CONNECTIONS ON PIPING SHALL BE 1" S.W. UNLESS OTHERWISE NOTED.
8. ALL ROOT VALVES 2" AND SMALLER ARE SHOWN ON DESIGN DRAWINGS DIAGRAMMATICALLY FOR CLARITY OF VALVE NUMBER AND CONNECTION. EXACT LOCATION AND POSITION OF VALVE TO BE DETERMINED IN FIELD TO SUIT LOCAL OPERATING CONDITIONS.
9. THESE GENERAL NOTES APPLY TO DRAWINGS 11405-M-250 AND UP.
10. ALL PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST ISSUE OF G & H PIPING SPECIFICATION H-1.
11. END PREPARATION FOR STAINLESS STEEL PIPING SHALL BE IN ACCORDANCE WITH DRAWING 10-545-M-158 UNLESS OTHERWISE NOTED.
12. END PREPARATION FOR CARBON STEEL PIPING SHALL BE IN ACCORDANCE WITH ASA B16.25 FIGURES A1B OR S, AS APPLICABLE.
13. PIPING AND EQUIPMENT IN THIS SYSTEM SHALL BE INSULATED IN ACCORDANCE WITH G & H SPECIFICATION H-3.
14. DIMENSIONED LOCATION OF PIPING 2" AND SMALLER IS FOR REFERENCE ONLY. EXACT LOCATION TO BE DETERMINED IN FIELD.
15. LOCATIONS, ELEVATIONS, DIMENSIONS, ETC. SHOWN ON DESIGN DRAWINGS ARE FOR PIPES IN COLD AND ERECTED POSITION. CONSIDERATION HAS BEEN GIVEN AND PROVISIONS HAVE BEEN MADE FOR THERMAL MOVEMENT UNDER OPERATING CONDITIONS.
16. PIPING CONTRACTOR SHALL MAKE ALLOWANCES FOR GASKET THICKNESS AND WELDING GAPS NOT INDICATED ON THESE DRAWINGS.
17. END TO END DIMENSIONS OF VALVES, WHERE SHOWN, ARE TO BE MAINTAINED.
18. PIPING SHALL BE SUPPORTED IN A MANNER THAT PREVENTS UNEQUAL STRESSES ON EQUIPMENT.
19. FIELD RUN PIPING SHALL NOT INTERFERE WITH PLATFORMS AND ACCESS TO VALVES AND OTHER EQUIPMENT.
20. FOR ROOT VALVE NUMBER ON ALL INSTRUMENT CONNECTIONS, SEE APPROPRIATE FLOW DIAGRAM.
21. ALL INSTRUMENT CONNECTIONS ON PIPING HEADERS SHALL BE SOCKET WELD TYPE EXCEPT AS INDICATED IN NOTE #9 AND ON DESIGN DRAWINGS.
22. PIPING FABRICATOR TO PROVIDE COMPANION FLANGES TO AGREE WITH CERTIFIED MANUFACTURERS EQUIPMENT DRAWINGS.
23. FOR VENTILATION NOTES SEE G & H DRAWING 11405-M-76.
24. ALL GLOBE VALVES SHALL BE NORMALLY INSTALLED WITH FLOW UNDER SEAT. FOR EXCEPTIONS, REFER TO NOTES ON PIPING DRAWINGS AND G & H FLOW DIAGRAMS.
25. WHERE PURCHASED EQUIPMENT DIFFERS FROM THAT SHOWN ON DRAWINGS, VENTILATION CONTRACTOR TO MODIFY DUCTWORK TO SUIT FIELD CONDITIONS.
26. WHERE PURCHASED VALVES AND MECHANICAL EQUIPMENT DIFFER FROM THAT SHOWN ON PIPING DRAWINGS, PIPING CONTRACTOR TO MODIFY PIPING TO SUIT FIELD CONDITIONS.
27. CONNECTIONS FOR THERMOWELLS ON ALL PRIMARY PLANT PIPING (AND SECONDARY PLANT PIPING IN THE AUXILIARY BUILDING ONLY) SHALL BE SOCKET WELD TYPE PER DETAIL NO. 2, DRAWING 11405-M-54, SHEET 2, UNLESS OTHERWISE NOTED ON PIPING DRAWINGS.
28. CONNECTIONS FOR THERMOWELLS ON ALL SECONDARY PLANT PIPING, EXCEPT PIPING IN THE AUXILIARY BUILDING, SHALL BE THREADED TYPE PER DETAILS NO. 3 OR 3A, DRAWING 11405-M-54, SHEET 3, UNLESS OTHERWISE NOTED ON PIPING DRAWINGS.
29. ALL VALVE SYMBOLS REFLECT THE RELATIVE PIPING CONFIGURATION; HOWEVER THEY MAY NOT DEPICT ACTUAL VALVE POSITION FOR NORMAL (MODE 1) OPERATION. CONSULT APPLICABLE OPERATING INSTRUCTION FOR ACTUAL VALVE POSITION DURING ANY MODE OF OPERATION.

**FORT CALHOUN STATION**

**SYMBOL LIST**  
**P & ID**

DWG. 11405-MECH-1  
REV. SH. 7627 APVD. REV.

FORT CALHOUN STATION			
SYMBOL LIST			
P & ID			
DWG. 11405-MECH-1	REV. SH. 7627	APVD 3-27-01	REV 24
FILE 16109			