

VALVE & SPECIALTY SYMBOLS

LINE CODING

Diagram showing various valve and specialty symbols with their corresponding line coding and descriptions. Symbols include Gate Valve, Needle Valve, Plug Valve, Diaphragm Valve, Butterfly Valve, Reverse Current Valve, Check Valve, Motor Operated Valve, Piston Operated Valve, Solenoid Operated Valve, Three-Way Solenoid Operated Valve, Air Diaphragm Operated Valve, Self Contained Regulator, Post Indicator, Valve with Leakoff Conn, Extension Stem Operator, Safety and Relief Valve, Angle Valve, Three Way Valve, Four Way Valve, Process Actuated Operator with Valve Positioner, Instrument Actuated Operator with Valve Positioner, Normally Closed Valve, Normally Open Valve, Valve Installed with Flow Over Seat, Packless Valve, Ball Valve, Flexible Connection, Mechanical Containment Penetration, Temporary Strainer, Flow Limiter, Drain Pot, Pulsation Damper, Break-Down Orifice, Pump Bedplate Drain, and Sensor (Bellows Type Seal).

Diagram showing line coding symbols for flow lines, shield wall penetration, instrument lines, filled bulb temperature detector tube, split of responsibility, material transition, piping furnished with equipment, and electrical heat tracing.

VALVE & SPECIALTY DESIGNATIONS

GATE VALVES
GLOBE VALVES
CHECK VALVES
REVERSE CURRENT VALVES
BUTTERFLY VALVES
PLUG VALVES
SAFETY AND RELIEF VALVES
EXPANSION JOINTS
TRAPS
STRAINERS
STRAINERS - SELF-CLEANING
NEEDLE VALVES
BALL VALVES
ANGLE VALVES
DIAPHRAGM VALVES
LEVEL CONTROL VALVES
PRESSURE CONTROL VALVES
TEMPERATURE CONTROL VALVES
FLOW CONTROL VALVES
RESTRICTION ORIFICES
FLOW LIMITERS
MISCELLANEOUS

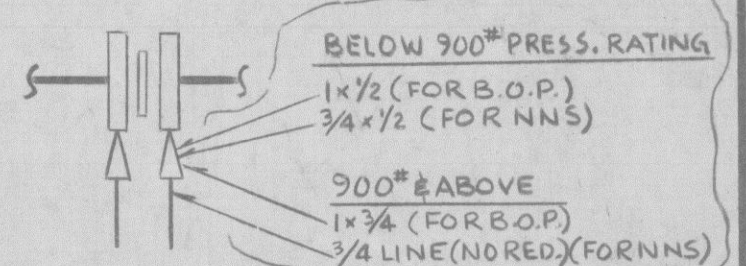
V
V
G
W
B
G
R
J
T
S
H
A
D
L
P
M
F
U
K
X

MEASURED VARIABLE (FIRST LETTER)	CONTROLLING (SECOND AND THIRD LETTER)																MEASURING (SECOND AND THIRD LETTER)									
	RECORDING	INDICATING	NON-INDICATING	CONTROL VALVE	SUMMER	SOLENOID	FUNCTION GENERATOR	RECORDING	INDICATING	OBSERVATION GLASS	PRIMARY ELEMENT	TEST POINT	TRANSMITTER	INTEGRATOR (TRANSMITTER)	AMPLIFIER	SAMPLER	INDICATING SWITCH	NON-INDICATING SWITCH	ALARMS							
CONDUCTIVITY	C	CR	CI	CC	CCV			CR	CI		CE	CCX														
DENSITY	D	DR	DI	DD	DDV			DR	DI		DE	DDX														
DIFF PRESS	PD	PDR	PDI	PDD	PDDV			PDR	PDI		PE	PDX														
FLOW	F	FR	FI	FF	FFV			FR	FI		FE	FFX														
MOISTURE	M	MR	MI	MM	MMV			MR	MI		ME	MMX														
HYDROGEN ION CONC	PH	PHR	PHI	PHH	PHHV			PHR	PHI		PHL	PHX														
LEVEL	L	LR	LI	LL	LLV			LR	LI		LE	LLX														
OXYGEN	O	OR	OI	OO	OOV			OR	OI		OE	OXX														
PRESSURE	P	PR	PI	PP	PPV			PR	PI		PE	PXX														
POSITION	Z	ZR	ZI	ZZ	ZZV			ZR	ZI		ZL	ZXX														
RADIATION	R	RR	RI	RR	RRV			RR	RI		RE	RXX														
SPEED	S	SR	SI	SS	SSV			SR	SI		SE	SXX														
TEMPERATURE	T	TR	TI	TT	TTV			TR	TI		TE	TXX														
HYDROGEN	H	HR	HI	HH	HHV			HR	HI		HE	HXX														
NITROGEN	N	NR	NI	NN	NNV			NR	NI		NE	NXX														
VIBRATION	V	VR	VI	VV	VVV			VR	VI		VE	VXX														
HAND	H		HIC		HCV				HSE																	
WEIGHT OR FORCE	W		WIC		WCV				WSE																	
ANALYSIS	A										AE	AX	AT													
TIME	K																									
SELF REGULATING VALVE								RCV																		
DIFFERENTIAL LEVEL	LD																			LDS						

REFERENCE DRAWINGS

LIST OF DRAWINGS
PIPING LINE LIST
VALVE & SPECIALTY LIST
INSTRUMENT LIST
INSTRUMENT INSTALLATION DETAILS

CAR-1364-B-125
CAR-1364-B-070
CAR-1364-B-069
CAR-2165-B-432
CAR-2166-B-431



TYPICAL ORIFICE FLANGE CONNECTION FOR LINE & VALVE. NO'S SEE RESPECTIVE DIAGRAMS

MISCELLANEOUS ABBREVIATIONS

T - CONTAINMENT ISOLATION TRIP SIGNAL PHASE A (NORMAL TO MANUAL)
CA - CONTAINMENT AIR
LAI - LOCKED AS IS
ECC - EMERGENCY COOLING CONNECTION
BD - THERMAL REGENERATION SIGNAL
BOP - BALANCE OF PLANT
NR - NOT RELEASED
NTS - NOT TO SCALE
BY OTHERS

ATM - ATMOSPHERE
F.A.I. - FAIL AS IS
F.C. - FAIL CLOSED
F.O. - FAIL OPEN
L.C. - LOCKED CLOSED
L.O. - LOCKED OPEN
N.O. - NORMALLY OPEN
N.C. - NORMALLY CLOSED
M - VENT HEADER
V-VENT TO ATMOSPHERE
P.V. - PLANT VENT

SSS - SAFE SHUTDOWN EARTHQUAKE
MFSI - MAIN FEED WATER ISOLATION SIGNAL
MSIS - MAIN STEAM ISOLATION SIGNAL
S - SAFETY INJECTION SIGNAL PLACED AT EQUIPMENT & VALVE
IMB - INSIDE MISSILE BARRIER
OM - OUTSIDE MISSILE BARRIER
RR - REACH ROD REQUIRED
P - CONTAINMENT ISOLATION TRIP PHASE B (HI-HI CONTAINMENT PRESS)
IRC - INSIDE REACTOR CONTAINMENT
ORC - OUTSIDE REACTOR CONTAINMENT
DC - VITAL BATTERY SOURCE OF POWER

EQUIPMENT ABBREVIATIONS

RWST - REPELLING WATER STORAGE TANK
SRST - SPENT RESIN STORAGE TANK
PRT - PRESSURIZER RELIEF TANK
WHT - WASTE HOLDUP TANK
CS - CONTAINMENT SUMP
RHT - RECYCLE HOLDUP TANK
CCD - CONDENSATE COOLING DRAIN TANK
FDT - FLOOR DRAIN TANK
BRP - BORON RECYCLE PANEL
HX - HEAT EXCHANGER

BIT - BORON INJECTION TANK
RPS - REACTOR CONTROL & PROTECTION SYSTEM
RCDT - REACTOR COOLANT DRAIN TANK
RMWST - REACTOR MAKE-UP WATER STORAGE TANK
CST - CONDENSATE STORAGE TANK
MSR - MOISTURE SEPARATOR REHEATER
CRDM - CONTROL ROD DRIVE MECHANISM
GSC - GLAND STEAM CONDENSER
RCP - REACTOR COOLANT PUMP

PIPING SYSTEM DESIGNATIONS

SYSTEM LETTER	SYSTEM DESCRIPTION	SYSTEM LETTER	SYSTEM DESCRIPTION
AC	AUXILIARY STEAM CONDENSATE	IA	INSTRUMENT AIR
AE	AIR EVACUATION	LO	LURE OIL
AF	AUXILIARY FEED WATER	LT	LEAK RATE TESTING
AG	AUXILIARY STEAM	MD	MISCELLANEOUS DRAINS
AIC	ACID-CAUSTIC DRAIN	MS	MAIN STEAM
BD	BLOWDOWN	MP	MAKE-UP PLANT WATER
BR	BORON RECYCLE	NI	NITROGEN
CA	CAUSTIC & ACID	OK	OXYGEN
CC	CONDENSATE	OW	PRIMARY MAKEUP WATER
CE	COMPONENT COOLING WATER	PW	PENETRATION PRESSURIZATION
CF	CHEMICAL FEED	PW	POTABLE WATER
CG	CARBON DIOXIDE	RC	REACTOR COOLANT
CL	CHLORINATION	RH	RESIDUAL HEAT REMOVAL
CO	COMPRESSED AIR		
CS	CHEMICAL AND VOLUME CONTROL		
CT	CONTAINMENT SPRAY		
CW	CIRCULATING WATER		
CH	CHILLED WATER SUPPLY (HVAC)		
CX	CHILLED WATER RETURN (HVAC)		
CCD	COMPONENT COOLING DRAIN		
CB	CONTAINMENT BLDG. VACUUM RELIEF (HVAC)	SP	SAMPLING (NUCLEAR), RADIATION MONITORING
CP	CONTAINMENT BLDG. PURGE (HVAC)	SA	SERVICE AIR
		SC	SCREEN WASH
		SF	SPENT FUEL POOL COOLING AND CLEANUP
		SI	SAFETY INJECTION
		SW	SERVICE WATER
		TS	TOWER BLOWDOWN (COOLING TOWER)
		VL	VALVE LEAKOFF
		WC	WASTE PROCESSING (GAS)
		WG	WASTE PROCESSING (LIQUID)
		WL	WASTE PROCESSING (LIQUID)
		WS	SECONDARY WASTE TREATMENT
		WCD	WASTE PROCESSING BLDG. COOLING WATER DRAIN
		WSD	SECONDARY WASTE TREATMENT DRAIN
DW	DEMINEALIZED WATER		
EA	EMERGENCY AIR		
ED	EQUIPMENT DRAIN		
ES	EXTRACTION STEAM		
FD	FLOOR DRAIN		
FM	PRIMARY FILTER MAKE-UP WATER		
FO	FUEL OIL		
FP	FIRE PROTECTION FEED WATER		
FW	FEED WATER		
HY	HYDROGEN		
HD	HEATER DRAIN		
HV	HEATER VENTS		

EQUIPMENT, VALVES, SPECIALTIES, PIPING & INSTR. NUMBERS

Diagram explaining numbering systems for Equipment, Valves and Specialties, Piping, and Instrumentation. It includes examples of system symbols and line numbers, and explains the meaning of various letters and numbers used in the designations.

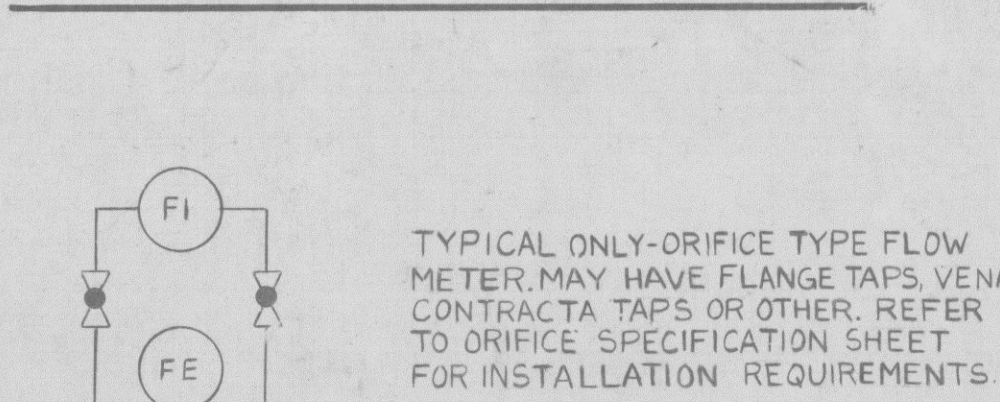
EQUIPMENT
UNIT NUMBER: IA-SA
EQUIPMENT MULTIPLICITY DESIGNATION LETTER (X DESIGNATES ONE ONLY)
TRAIN (SAFETY RELATED EQUIPMENT ONLY) 'N' DESIGNATES NON-SAFETY TRAIN
SAFETY RELATED EQUIPMENT WILL BE DESIGNATED BY AN 'S'. NON-NUCLEAR SAFETY EQUIPMENT WILL BE DESIGNATED BY 'NNS'.

VALVES AND SPECIALTIES
VALVE OR SPECIALTY SYMBOL
VALVE OR SPECIALTY UNIQUE NUMBER
TRAIN (SAFETY RELATED VALVES AND SPECIALTIES ONLY) 'N' DESIGNATES NON-SAFETY TRAIN
UNIT NUMBER
SAFETY RELATED VALVES AND SPECIALTIES WILL BE DESIGNATED BY AN 'S'.

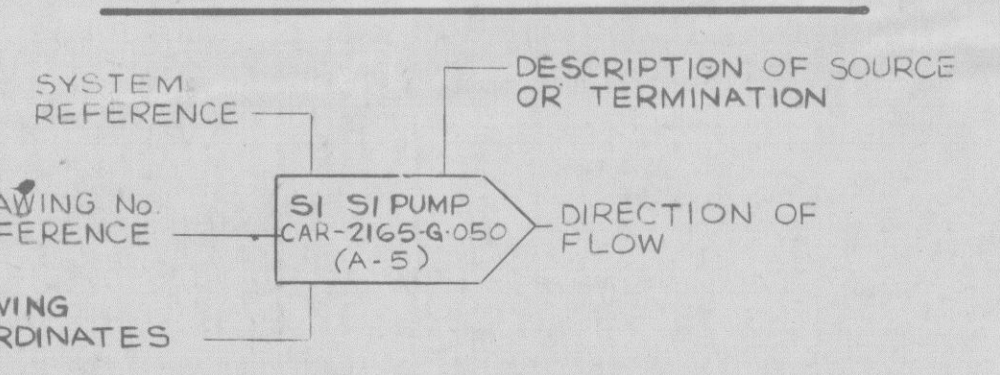
PIPE
LINE NUMBER
TRAIN (SAFETY RELATED LINES ONLY) 'N' DESIGNATES NON-SAFETY TRAIN
UNIT NUMBER
SAFETY RELATED PIPE WILL BE DESIGNATED BY AN 'S'.

INSTRUMENTATION
INSTRUMENT TYPE
INSTRUMENT IDENTIFICATION NUMBER
PARALLEL DESIGNATION
SUPPLIED BY WESTINGHOUSE (NSS) (IF APPLICABLE)
SAFETY TRAIN OR CHANNEL DESIGNATION (A, B, AB, OR I, II, III, IV)
SAFETY DESIGNATION (PLACED AT I & C INSTR.)
SUB-PARALLEL DESIGNATION
BALLOON REPRESENTATION (OMITS UNIT NUMBER AND SYSTEM SYMBOL)

INSTRUMENTATION SYMBOL



REFERENCE BLOCK



GENERAL NOTES

- ALL VENTS, DRAINS, AND TEST CONNECTIONS SHALL BE VALVED AS SHOWN ON FLOW DIAGRAM.
- ALL VALVES PURCHASED WITH LEAKOFF CONNECTIONS SHALL BE PERMANENTLY PIPED TO THE APPROPRIATE DRAIN POINT OR CAPPED (AS REQUIRED).
- THE SAFETY CLASS BOUNDARIES FOR PIPING AND VALVES ARE DESIGNATED BY THE FOLLOWING FLAGS:
SAFETY CLASS 1
SAFETY CLASS 2
SAFETY CLASS 3
NON-NUCLEAR SAFETY CLASS (NNS)
- SAFETY CLASS EQUIPMENT SHALL BE SHOWN WITH HATCH LINES ON GENERAL ARRANGEMENT DRAWINGS.

Diagram showing a PRC Aperture Card and a document control stamp.

PRC APERTURE CARD
DOCUMENT CONTROL
JUN 22 1981
SHEARON HARRIS N. P. P.

5. IN SAFETY CLASS 1 PIPING, A FLOW RESTRICTION IS REQUIRED (WATER LINES) AT LOCATIONS SPECIFICALLY INDICATED ON THE FLOW DIAGRAMS IN 3/4 INCH PIPING, TO ALLOW TRANSITION FROM SAFETY CLASS 1 TO SAFETY CLASS 2.

3/4" SOCKET WELD CONNECTION EQUIV. TO 6000 LB. ASA HALF COUPLING DRILLED FOR 0.875" I.D.
TYPICAL FLOW RESTRICTOR

6. TRANSITION PIECES MUST BE PROVIDED IF A SCHEDULE DIFFERENCE EXISTS BETWEEN SYSTEM PIPING AND COMPONENTS. IT IS NOT ACCEPTABLE TO USE COMPONENTS AS THE TRANSITION. THE HEAVIER WALL SCHEDULE MUST BE USED FOR THE TRANSITION PIPE AND ONE END SHALL BE MACHINED TO MATCH THE LESSER WALL SCHEDULE.

7. INSTRUMENTATION SHOWN ON FLOW DIAGRAMS REPRESENT ONLY THE INSTRUMENT PRIMARY ELEMENT FOR THE COMPLETE INSTRUMENT LOOP AND INTERLOCKS SEE THE CORRESPONDING FLOW DIAGRAM OR APPROPRIATE INSTRUMENT INSTALLATION DETAILS - CAR-2166-B-431

Table with 5 columns: No., Date, Revision, By, Ch., Approved. Includes a stamp for 'Uncontrolled Copy' and 'APPROVED FOR CONSTRUCTION'.

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CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
FLOW DIAGRAM LEGEND
PIPING & INSTRUMENTATION SYMBOLS
UNITS 1,2,3&4
EBASCO SERVICES INCORPORATED NEW YORK

SCALE 1:ONE
APPROVED
DATE
DIV. MECH
DR. S. AHMAD
CH. S. AHMAD
CAR-2165
G-041