VALVES

- GATE — B = W/BYPASS
- GLOBE — G = GEARED HANDWHEEL
- BALL
- DIAPHRAGM
- PLUG
- NEEDLE
- ANGLE
- ANGLE CHECK
- BUTTERFLY
- THROTTLING
- SAFETY OR RELIEF
- SWING CHECK
- STOP CHECK
- TILTED DISC CHECK
- RISTON LIFT CHECK
- ISOLATING CHECK (A AND M TYP - CHECK, OR EQUAL)
- 3-WAY
- FOOT
- VACUUM BREAKER
- AUTOMATIC AIR VENT
- BACK PRESSURE CONTROL VALVE

VALVE OPERATORS

- DIAPHRAGM — FO = OPEN ON AIR FAILURE; FC = CLOSE ON AIR FAILURE
- DIAPHRAGM WITH POSITIONER
- DIAPHRAGM WITH SOLENOID AND HANDWHEEL TO - ENERGIZE TO OPEN MAIN VALVE, EC - ENERGIZE TO CLOSE MAIN VALVE
- ELECTRIC MOTOR WITH LANTERN RING LEAKOFF OF INJECTION
- AIR MOTOR
- SOLENOID IDE-ENERGIZED AS SHOWN
- PISTON L= LOCK IN PLACE ON AIR FAILURE
- INSTRUMENT AIR REGULATOR

MISCELLANEOUS

- EQUIPMENT COMPARTMENT RADIATION OR MISSILE SHIELD WALL (OUTSIDE / INSIDE)
- EMERGENCY DIESEL GENERATOR MAJOR LOAD
- TEST CONNECTION LOCATION (TC)
- TEST VENT LOCATION (TV)
- REACTOR BLDG. PENETRATION (PENETRATION #)

SYSTEM COMPONENTS

- HEAT EXCHANGERS
- PUMPS — HORIZONTAL OR VERTICAL; VERTICAL WET-PIT
- GEAR
- FAN BLOWER OR COMPRESSOR
- POSITIVE DISPLACEMENT PUMP
- EXPANSION JOINT — T = WITH TIE RODS
- MOTOR DRIVEN MIXER
- ACCUMULATOR
- WYE STRAINER
- CARTRIDGE OR CUNO TYPE FILTER
- BASKET OR BATHTUB STRAINER
- DUAL BASKET STRAINER
- STEAM TRAP
- IN LINE FLOW INDICATOR
- SELF-CLEANING STRAINER
- TARGET PLATE WITH TELKYALE
- FLAME ARRESTOR

PIPING

- DRAIN
- REDUCER OR INSERT (12" × 4")
- HEAT TRACING
- FLANGED CONNECTION
- THERMAL SLEEVE
- EJECTOR OR EDUCTOR
- RUPTURE DISC
- BREAKDOWN ORIFICE
- FLOW RESTRICTOR
- HOSE CONNECTOR
- INSTRUMENT AIR SUPPLY
- CONTROL AIR
- CAPILLARY TUBING
- ELECTRIC SIGNAL
- ORIFICE UNION
- VENTURI OR FLOW NOZZLE
- ORIFICE
- TEMPORARY OR START-UP STRAINER

DESIGN FLAGS

- AND EQUIPMENT, PIPING, AND DUCTWORK SAFETY CLASS MARKER (AND)
- QUALITY RELATED (A)
- NON-SAFETY CLASS MARKER (CONVENTIONAL)
- DESIGN CONDITION MARKER — DESIGN CONDITIONS TABULATED ON FLOW DIAGRAMS LEFT MARGIN (E 2)
- LINE SPECIFICATION NUMBER — NOMINAL SIZE (3M 1" / 1M)
- STEAM NUMBER FOR TABULATING FLOW, PRESSURE, AND TEMPERATURE (4)
- REGULATED INSTRUMENT AIR
- UNREGULATED INSTRUMENT AIR
- MATCH MARK, SAME DRAWING — MATCHING DRAWING COORDINATE (B-3K1)
- MATCH MARK — MATCHING FLOW DIAGRAM (LAST 3 DIGITS ONLY) SYSTEM (IF APPROPRIATE)
- WESTINGHOUSE MATCH MARK (W WEST DWG SYSTEM)
- BILL OF MATERIAL VALVE NUMBERING (RO-37 3BMS)

VESSELS

- IN-TANK HEATER
- MANWAY — MANUFACTURER'S CONNECTION NUMBER OR LETTER (A, H)

HVAC

- CC — COOLING WATER COIL
- CW — CHILLED WATER COIL
- HC — ELECTRIC HEATING COIL
- RF — ROUGHING FILTER
- HEPA — HEPA FILTER
- CHAR — CHARCOAL FILTER
- ROOM OR AREA
- FAN
- DUCTWORK AND AIR FLOW
- GRAVITY OPERATED (G)
- PNEUMATIC OPERATOR (P)
- ELECTRIC OPERATOR (E)
- MANUAL BALANCING OR SHUTOFF DAMPER
- AUTOMATIC DAMPER
- FIRE DAMPER, LOCAL SENSING (L)
- FIRE DAMPER, REMOTE SENSING (R)
- STEAM PACKAGED HUMIDIFIER
- ELECTRIC UNIT HEATER
- LOUVER
- LOW PRESSURE DUCT (L)
- HIGH PRESSURE DUCT (H)

FIRE SERVICE

- POST INDICATOR VALVE
- SPRINKLER ALARM CHECK VALVE
- DELUGE VALVE
- DRY PIPE SPRINKLER VALVE
- YARD HYDRANT HOUSE WITH HOSE
- HOSE REEL
- FIRE HOSE CABINET

INSTRUMENTATION

- TE 1041 — CC — SS — LOCAL MOUNTED
- PI 1430 — CS — SS — LOCAL PANEL MOUNTED — PANEL NO. (EXAMPLE P4-XCP0814)
- FI 1087 — CS — SS — MAIN CONTROL ROOM PANEL MOUNTED — PANEL NO. (EXAMPLE C14-XCP0814)
- LS 4798 — A — H HIGH / L LOW — ALARM ANNUNCIATOR
- ZS 1545 — L — O OPEN / C CLOSED — STATUS LIGHT; ESF — ESF MONITOR LIGHT
- TE 1642 — C — TSC — COMPUTER INPUT TECHNICAL SUPPORT CENTER
- FUNCTION DESIGNATOR — SEE LIST BELOW
- FT 6084 — B — USE MATCH MARKS TO DESCRIBE INTERLOCKS OR SIGNALS

INSTRUMENT IDENTIFICATION

MEASURED VARIABLE — FIRST LETTER	INSTRUMENT FUNCTION — SECOND LETTER
A - ANALYSIS	A - ALARM
C - CONCENTRATION	B - BISTABLE
D - DENSITY	C - CONTROLLER
E - VOLTAGE	E - ELEMENT
F - FLOW	G - GLASS (OBSERVATION)
H - HAND	I - INDICATOR
I - CURRENT	M - MONITOR
K - TIME	P - TEST POINT
L - LEVEL	Q - POWER SUPPLY
M - MOISTURE, HUMIDITY	R - RECORDER
P - PRESSURE	S - SWITCH
R - RADIATION	T - TRANSMITTER
S - SPEED	V - CONTROL VALVE
T - TEMPERATURE	W - THERMOWELL
U - MULTIVARIABLE	X - TEST CONNECTION
W - WEIGHT	Y - SIGNAL MODIFIER
X - SMOKE	
Y - VIBRATION, SEISMIC	
Z - POSITION	

FUNCTION DESIGNATORS

I/P - CURRENT - PNEUMATIC CONVERTER
E/P - ELECTRO - PNEUMATIC CONVERTER
R/I - RESISTANCE - TO - CURRENT CONVERTER
P/E - PNEUMATIC - TO - ELECTRIC CONVERTER
R/E - RESISTANCE - TO - VOLTAGE CONVERTER
I/I - CURRENT - TO - CURRENT CONVERTER
A/D - ANALOG - DIGITAL CONVERTER
A/M - AUTO - MANUAL STATION
F(X) - FUNCTION GENERATOR
F(T) - TIME FUNCTION (DELAY FILTER)
> - HIGH SIGNAL AUCTIONEER
< - LOW SIGNAL AUCTIONEER
Σ - SUMMER
∫ - TOTALIZING (QUANTITY)
X - GAIN OR ATTENUATION
REV - REVERSE SIGNAL
± - BIAS
Δ - DIFFERENTIAL
X - MULTIPLIER
√ - SQUARE ROOT EXTRACTOR
P - PROPORTIONAL ACTION
I - RESET ACTION
D - RATE ACTION
I - I/P INDICATION
C - CONDUCTIVITY
H_2 - HYDROGEN
PH_2 - HYDROGEN ION CONCENTRATION

SCHEDULE OF FLOW DIAGRAMS

SIZE	DWG. NO.	TITLE	SYSTEM IDENTIFICATION
D	302-811	MAIN STEAM (NUCLEAR)	MS
D	302-812	MAIN STEAM (NON-NUCLEAR)	MS
D	302-814	MAIN AND REHEAT STEAM (NON-NUCLEAR)	MS AND RS
D	302-831	MAIN STEAM DUMP SYSTEM	MD
D	302-841	EXTINCTION STEAM	EX
D	302-851	AUXILIARY STEAM	AS
D	302-881	FEEDWATER (NON-NUCLEAR)	FW
D	302-882	FEEDWATER (NON-NUCLEAR)	FW
D	302-883	FEEDWATER (NUCLEAR)	FW
D	302-885	EMERGENCY FEEDWATER (NUCLEAR)	EF
D	302-681	CONDENSATE	CD
D	302-682	CONDENSATE - AUXILIARY CONDENSERS AND BLOWDOWN HEAT EXCHANGERS	CD
D	302-683	CONDENSATE POLISHERS, KIDNEY LOOP OPERATION	CD
D	302-111	HIGH PRESSURE HEATER DRIPS, VENTS, AND RELIEFS	HD AND HY
D	302-112	HIGH PRESSURE HEATER DRIPS, VENTS, AND RELIEFS	HD AND HY
D	302-113	LOW PRESSURE HEATER DRIPS, VENTS, AND RELIEFS	HD AND HY
D	302-121	MAIN STEAM DRAINS	MS
D	302-122	FEED PUMP START - UP, EXTRACTION, AND MISCELLANEOUS STEAM DRAINS	EX, MS, AND FW
D	302-123	MISCELLANEOUS STEAM DRAINS	RS, AND MS
D	302-124	EXTINCTION STEAM DRAINS	EX
D	302-131	CONDENSER AIR REMOVAL	AR
D	302-141	TURBINE GLAND STEAM	GS
D	302-161	WATER TREATMENT SYSTEM	WT
D	302-162	FILTERED WATER	FI
D	302-163	DEMINERALIZED WATER	DW
D	302-164	DEMINERALIZED WATER	DW
D	302-165	CONDENSATE POLISHING	WI
D	302-166	MODIFICATION TO CONSTRUCTION FILTERED WATER SYSTEM	FI
D	302-167	DOMESTIC WATER SYSTEM	DO
D	302-171	CHEMICAL FEED CONDENSATE - STEAM GENERATOR STANDBY	WC
D	302-172	CHEMICAL FEED AUXILIARY BOILER AND AMMONIA STORAGE AND TRANSFER	WC
D	302-181	TURBINE CYCLE - SAMPLING	WA
D	302-182	STEAM GENERATOR SAMPLING AND TURB CYCLE SAMPLE RACK AND RECORDER-ANALYZER PANEL	WA
D	302-191	CHEMICAL CLEANING	WM
D	302-081	CIRCULATING WATER COOLING	CW
D	302-085	CONDENSER CLEANING	AT
D	302-087	CONDENSER WATER BOX VENTS AND DRAINS TRIMMING SYSTEM	AR
D	302-221	SERVICE WATER COOLING	SW
D	302-222	SERVICE WATER COOLING	SW
D	302-223	TURBINE BUILDING CLOSED CYCLE COOLING WATER	TC
D	302-224	TURBINE BUILDING CLOSED CYCLE COOLING WATER	TC
D	302-225	TURBINE BUILDING CLOSED CYCLE COOLING WATER	TC
D	302-226	TURBINE BUILDING CLOSED CYCLE COOLING WATER	TC
D	302-231	FIRE SERVICE	FS
D	302-232	FIRE SERVICE - HALON AND LOW PRESSURE CO_2	FS
D	302-233	FIRE SERVICE EOF BUILDING	FS
D	302-241	STATION SERVICE AIR	SA
D	302-242	STATION AIR SUPPLY TO PERSONNEL, EMERGENCY PERSONNEL, AND EQUIPMENT HATCHES	SA
D	302-271	INSTRUMENT AIR	IA
D	302-273	REACTOR BUILDING INSTRUMENT AIR SERVICES	IA
D	302-274	INSTRUMENT AIR BACKUP	IA
D	302-281	FUEL OIL	FO
D	302-291	TURBINE LUBRICATING OIL	LO
D	302-293	HYDRAULIC POWER UNIT	EH
D	302-381	GENERATOR GAS AND VENTS	HM, HY, AND CO
D	302-331	NITROGEN BLANKETING	NG
D	302-351	DIESEL GENERATOR - FUEL OIL	DG
D	302-352	NON-NUCLEAR PLANT DRAINS	MD
D	302-353	DIESEL GENERATOR - MISCELLANEOUS SERVICES	DG
D	302-361	PLANT INDUSTRIAL AND SANITARY WASTE	WP
D	302-362	LIQUID EFFLUENTS FROM NUCLEAR PLANT TO FAIRFIELD PENSTOCKS	LW
E	302-681	REACTOR COOLANT	RC
E	302-682	REACTOR COOLANT	RC
E	302-683	REACTOR COOLANT	RC
E	302-684	REACTOR COOLANT	RC
E	302-685	REACTOR COOLANT	RC
D	302-686	REACTOR COOLANT PUMPS OIL COLLECTION SYSTEM	RC
D	302-611	COMPONENT COOLING	CC
D	302-612	COMPONENT COOLING INSIDE REACTOR BUILDING	CC
D	302-613	COMPONENT COOLING SYSTEM NON-ESSENTIAL COOLING	CC
D	302-614	COMPONENT COOLING SYSTEM TO NSSS PUMPS	CC
E	302-641	RESIDUAL HEAT REMOVAL	RH
D	302-651	SPENT FUEL COOLING	SF
D	302-661	REACTOR BUILDING SPRAY SYSTEM	SP
E	302-671	CHEMICAL AND VOLUME CONTROL	CS
E	302-672	CHEMICAL AND VOLUME CONTROL	CS
E	302-673	CHEMICAL AND VOLUME CONTROL	CS
E	302-674	CHEMICAL AND VOLUME CONTROL	CS
E	302-675	CHEMICAL AND VOLUME CONTROL	CS
E	302-676	CHEMICAL AND VOLUME CONTROL	TQ
E	302-677	CHEMICAL AND VOLUME CONTROL	CS
E	302-691	SAFETY INJECTION	SI
E	302-692	SAFETY INJECTION	SI
E	302-693	SAFETY INJECTION	SI
D	302-715	DEMINERALIZED WATER, NUCLEAR SERVICES	DN
D	302-717	NSSS CARBON DIOXIDE AND NITROGEN SUPPLY	NN
D	302-718	NSSS HYDROGEN AND OXYGEN SUPPLY	HN AND ON
D	302-732	SOLID WASTE DISPOSAL	WD
D	302-734	EXCESS LIQUID WASTE PROCESSING AND STORAGE SYSTEM	WL
E	302-735	WASTE PROCESSING	WL
E	302-736	WASTE PROCESSING	WD
E	302-737	WASTE PROCESSING	WD
E	302-738	WASTE PROCESSING	WD
E	302-741	WASTE PROCESSING	
E	302-742	WASTE PROCESSING	
E	302-743	WASTE PROCESSING	
E	302-744	CATALYTIC HYDROGEN RECOMBINER A	
E	302-745	CATALYTIC HYDROGEN RECOMBINER B	
E	302-751	BORON RECYCLE	
D	302-771	NUCLEAR SAMPLING	SS
D	302-772	NORMAL AND ACCIDENT SAMPLING	SS

FLOW DIAGRAM INTERFACE TAG NUMBERS

THE PREFIX LETTERS OF AN INTERFACE VALVE TAG NUMBER DO NOT APPEAR ON THE FLOW DIAGRAMS. TO COORDINATE THESE VALVES WITH THE EQUIPMENT LIST, THE FOLLOWING PREFIXES APPLY TO THE VARIOUS TYPE VALVES.

YPA - BALL VALVE	YPW - NEEDLE VALVE
YPB - BUTTERFLY VALVE	YPP - PLUG VALVE
YPC - CHECK VALVE	YPR - RELIEF VALVE
YPD - DIAPHRAGM VALVE	YPS - SAFETY VALVE
YPG - GATE VALVE	YPT - THROTTLING (GLOBE) VALVE
YPK - STOP CHECK VALVE	YPY - VACUUM BREAKER VALVE
YPM - SPECIAL VALVE	YPX - SOLENOID VALVE

DRAWING LEGIBILITY CLASS 1
SOLVE CAD ENHANCED

NO.	DATE	BY	REVISION	CHKD. BY	APPROVAL
22	6/98	JMR	CADD ENHANCED PER ECR-50238	MGR	
21	3/97	DDJ	REVISED PER CGSS-97-0170	MGR	RAT
20	8/96	DDJ	REV. PER MRF-90105 & MRF-22385	MGR	JLL/AJC
19	1/96	DDJ	REVISED PER MRF-90009	MGR	RGH
24	3/98	JTS	REVISED PER ECR-50409	MGR	JEG
23	8/98	JMR	REVISED PER ECR-50284	MGR	JEG

FSAR FIGURE 1.2-28

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

SYSTEM FLOW DIAGRAM

PIPING DIAGRAM SYMBOLS AND SCHEDULE

SYSTEM AND INSTRUMENT IDENTIFICATION

DESIGN ENGINEERING

A.S.MANN COMPANY — V. C. SUMMER NUCLEAR STATION, ADMINISTRATIVE & S.C. OFFICES — N.E. ATLANTA

DESIGNED: A.V.N. — CHECKED: M.G.R. — APPROVED: J.M.W.

PROJ. NO. 9040 — D-302-001 — SHT. NUMBER 24

DRAWING NUMBER

D-55

1/4" = 1'-0"