8856-M-100

## EQUIPMENT NUMBERING SYSTEM

SAMPLE: 1P 101 A
(1-P-101-A)

A. THIS NUMBER IDENTIFIES THE UNIT SERVED BY THE EQUIPMENT AS FOLLOWS:

0 - EQUIPMENT COMMON TO UNITS 1 AND 2
1 - UNIT 1 EQUIPMENT
2 - UNIT 2 EQUIPMENT

B. THIS LETTER CLASSIFIES EQUIPMENT ITEMS BY BASIC TYPES AS FOLLOWS:

A - AIR & GAS HANDLING
B - ELECTRICAL DISTRIBUTION PANELS
CB - CONTROL BOARDS AND LOCAL PANELS
D - DC EQUIPMENT
E - HEAT EXCHANGERS
F - FILTERS AND CLEANING EQUIPMENT (DEMINERALIZERS)
G - GENERATORS (TURBINE, DIESEL) AND ASSOCIATED EQUIPMENT
H - HOISTS, CRANES
HC - HEAT TRACING UNITS
J - JOCKEY PUMPS
K - REFRIGERATING CHILLER COMPRESSORS
L - LUBRICATION EQUIPMENT
M - MOTORS
V - TANKS AND PRESSURE VESSELS
W - PUMPS (INCLUDING VACUUM PUMPS)
X - TRANSFORMERS
Y - 120V AC POWER DISTRIBUTION PANELS
Z - COMPUTER EQUIPMENT

C. THIS 3-DIGIT NUMBER DISTINGUISHES IDENTICAL EQUIPMENT ITEMS IN THE SAME SERVICE FROM OTHERS IN THE BASIC EQUIPMENT GROUP. FOR EXAMPLE, ALL CIRCULATING WATER PUMPS WILL HAVE THE SAME NUMBER TO IDENTIFY THEIR UNIQUE SERVICE AND DISTINGUISH THEM FROM ALL OTHER PUMPS.

NUMBERS ARE ASSIGNED ACCORDING TO PLANT AREAS OR NSSS CLASSIFICATION AS FOLLOWS:

| | |
|---|---|
| 001-099 | NSSS LOOPS, PANELS & RACKS |
| 101-199 | TURBINE BUILDING & CONTROL STRUCTURE |
| 201-299 | REACTOR BUILDING |
| 301-399 | RADWASTE BUILDING |
| 401-499 | PRIMARY CONTAINMENT VESSEL |
| 501-599 | MISCELLANEOUS LOCATIONS |
| 601-699 | (OR, FOR BOP EQUIPMENT, UNCLASSIFIED AS DEFINED IN EQUIPMENT LIST) |

UNIT 2 EQUIPMENT WILL HAVE THE SAME 3-DIGIT NUMBER AS UNIT 1 EQUIPMENT IN SIMILAR SERVICE. EQUIPMENT COMMON TO UNIT 1 AND UNIT 2 WILL BE, IN THE UNIT 1 EQUIPMENT LIST, AND WILL NOT BE DUPLICATED IN THE UNIT 2 EQUIPMENT LIST.

D. THIS LETTER DISTINGUISHES ONE ITEM FROM OTHER DUPLICATE ITEMS OF EQUIPMENT IN THE SAME SERVICE. FOR EXAMPLE, CIRCULATING WATER PUMPS WILL BE DESIGNATED AS A, B, C OR D TO DISTINGUISH THEM FROM EACH OTHER.

EXCEPT WHERE DESIGN CONSIDERATIONS TAKE PRECEDENCE, E.G., TO MAINTAIN THE CONTINUITY OF FLOW THROUGH AN "A", "B", OR "C" FEEDWATER HEATER TRAIN, EQUIPMENT ITEMS ARE LISTED IN ALPHABETICAL ORDER AS FOLLOWS:

1. IN ELEVATION FROM TOP TO BOTTOM
2. FROM EAST TO WEST
3. FROM SOUTH TO NORTH
4. FROM NORTH TO SOUTH (UNIT 1 TURBINE BLDG ONLY)

## PIPING NUMBERING SYSTEM

LINE CLASS

PIPE AND VALVE CLASSES ARE DESIGNATED BY A THREE-LETTER CODE. THE FIRST LETTER INDICATES THE PRIMARY VALVE AND FLANGE PRESSURE RATING, THE SECOND LETTER, THE TYPE OF MATERIAL AND THIRD LETTER, THE CODE TO WHICH THE PIPING IS DESIGNED.

EXAMPLE:

FIRST LETTER

PRIMARY PRESSURE RATING
(Pressure class, ANSI B16.5 unless noted, all valves and fittings in accordance with this class)

A - SPECIFIC PRESSURE RATING
B - 2500#
C - 1500#
D - 900#
E - 600#
F - 300#
G - 150#
H - 150# ANSI B16.5
I - 150# MSS, C.I.
J - 250# ANSI B16.5
K - SPECIFIC RATING

SECOND LETTER

MATERIAL

A - ALLOY STEEL
B - CARBON STEEL
C - AUSTENITIC STAINLESS STEEL
D - COPPER, BRASS OR BRONZE
E - CARBON STEEL-COPPER BEARING
F - CARBON STEEL-LINED
G - CAST IRON
H - CAST STEEL
I - VITRIFIED CLAY
J - CPVC(CARBON STEEL-IMPACT TESTED)
K - CAST IRON-HIGH SILICON
L - CARBON STEEL-GALVANIZED
M - CAST IRON-CEMENT LINED
N - CAST IRON-CEMENT
O - CARBON STEEL-RUBBER LINED
P - STAINLESS STEEL
Q - CARBON STEEL-RUBBER LINED
R - CARBON STEEL-CEMENT LINED
S - CARBON STEEL-RUBBER LINED
T - CHROMAX USE AS DESIGNATED ON PIPING CLASS SHEETS.

THIRD LETTER

APPLICABLE CODE

A - ASME BOILER CODE, SECT. III, CLASS 1*
B - ASME BOILER CODE, SECT. III, CLASS 2
C - ASME BOILER CODE, SECT. III, CLASS 3
D - POWER PIPING CODE, ASME B31.1.0
F - MANUAL FOR WELDING ASSOCIATION CODE
G - UNIFORM PLUMBING CODE
H - ASME BOILER CODE, SECT. I
J - AMERICAN WATER WORKS ASSOCIATION STANDARDS

* PRIMARY PRESSURE RATING IN ACCORDANCE WITH ASME BOILER CODE, SECTION III

SERVICE BORDER

PIPE LINE IDENTIFICATION NUMBERS (SERVICE NUMBERS) ARE AS FOLLOWS:

| | |
|---|---|
| PIPING COMMON TO BOTH UNITS | 0-999 AND 3000-3999 |
| PIPING FOR UNIT 1 | 100-199 AND 1000-1999 |
| PIPING FOR UNIT 2 | 200-299 AND 2000-2999 |

## DUCT NUMBERING SYSTEM

| FIRST LETTER GROUP | SECOND LETTER GROUP MATERIAL | THIRD LETTER GROUP |
|---|---|---|
| LV - LOW VELOCITY | GS - GALVANIZED STEEL | G-GAS TIGHT |
| HVM - HIGH VELOCITY, MEDIUM PRESSURE | SS - STAINLESS STEEL | |
| HVH - HIGH VELOCITY - HIGH PRESSURE | AL - ALUMINUM | |
| HVNP - HIGH VELOCITY - NEGATIVE PRESSURE | | |

NOTE: FIRST LETTER GROUP REPRESENTS DUCT CONSTRUCTION STANDARDS AS DEFINED BY SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA).

EXAMPLE:
HVM - GS - G
- GAS TIGHT
- GALV STEEL
- HIGH VELOCITY, MEDIUM PRESSURE

## VALVE NUMBERING SYSTEMS

A. FOR MANUAL VALVES - SECTION 1 SYSTEMS

SAMPLE: 1 - 51 - 010
(1-51-010)
BOX
SEE NOTE 27
SEE M-10 SH 1 G-8

- VALVE SEQUENCE NO.
- LAST TWO DIGITS OF P&ID NO.
- UNIT DESIGNATION: 0: COMMON, 1: UNIT 1, 2: UNIT 2

B. GT-NSSS SYSTEMS

MANUAL VALVES USE GT NUMBERING SYSTEM AND ARE SHOWN DIRECTLY WITH THE VALVE

SAMPLE: 1 - SEE NOTE 27
BOX

C. REMOTE OR SELF-ACTUATED VALVES

SELF-ACTUATED VALVES AND VALVES WITH OPERATORS WILL HAVE THE SAME NUMBER AS THEIR CORRESPONDING ACTUATOR OR OPERATOR, AND WILL FOLLOW THE INSTRUMENT NUMBERING SYSTEM. SEE H-3 THIS SHEET.

D. FOR VALVE NUMBERS OF MANUAL VALVES INCLUDED IN VENDOR SUPPLIED PACKAGES REFER TO APPROPRIATE VENDOR DRAWINGS

- CLASS I
- CLASS I EXEMPT[1]
- CLASS II
- CLASS II EXEMPT[2]
- CLASS III

[1]Refers to EX-1 unless otherwise noted.

[2]Refers to EX-6 unless otherwise noted.

## REACTOR PRIMARY CONTAINMENT PENETRATION NUMBERING SYSTEM

(INCLUDES CONNECTIONS TO CRD & SPHERE (BOLTED & BOX).

X-240A-3

- ID NUMBER OF INSTRUMENT UNIT PASSING THROUGH PENETRATION (FOR INSTRUMENT PENETRATIONS ONLY)
- PENETRATION ID NUMBER
- SPHERE PRIMARY CONTAINMENT PENETRATION

### EXEMPTION FROM SURFACE AND VOLUMETRIC EXAMINATION FOR CLASS I & II COMPONENTS

| EXEMPTION | | REFERENCE | CODE EDITION AND ADDENDA |
|---|---|---|---|
| EX-1 | All components ≤ 1" nominal pipe size | IWB-1220(b) | 77S78 |
| EX-2) | RPV head connections and associated piping ≤ 2" nominal pipe size made inaccessible by CRD penetrations | IWB-1200(c) | 77S78 |
| EX-3) | All components ≤ 2" nominal pipe size that are below the normal RPV water line | IWB-1200(a) | 77S78 |
| EX-4) | All components ≤ 4" nominal pipe size that are above the normal RPV water line | IWB-1200(a) | 77S78 |
| EX-5) | All pressure retaining welds in piping, pumps, and valves in systems or portions of systems, other than ECCS, which do not function during normal reactor operation | IWC-1220(b) | 74S75 |
| EX-6) | All pressure retaining welds in piping, pumps, and valves ≤ 4" nominal pipe size | IWC-1220(d) | 74S75 |

### EXEMPTIONS FROM HYDROS FOR CLASS II & III COMPONENTS

| | | | |
|---|---|---|---|
| EX-7) | Open-ended portions of systems exempt from hydro | IWC-5222(c) | 77S78 |
| EX-8) | Open-ended portions of systems exempt from hydro | IWD-5000(c) | 77S78 |

## INSTRUMENT NUMBERING SYSTEM

BOP SYSTEMS - SEE TABLE ON SHEET 1

- INSTRUMENT FUNCTIONS SIMILAR TO NSSS ANALOG COMPONENTS
- BANK 2 SHARED LOOP SCHEME
- BANK 2 SHARED ON PAID N-1077
- LOOP NO. - PER PAID N-1077
- UNIT DESIGNATION:
  - 1 - UNIT 1
  - 2 - UNIT 2

GT-NSSS SYSTEMS (COVERS ONLY INSTRUMENTS LISTED IN MOD. ORDER INSTRUMENTS ARE NUMBERED SAME AS BOP SYSTEMS)

- SEE TABLE ON SHEET 1
- SYSTEM DESIGNATOR SIMILAR TO NSSS ANALOG COMPONENTS
- G.E. NUMBER PER MOD. (SEE DOCUMENT NO. 286E195GAE)
- UNIT DESIGNATION:
  - 1 - UNIT 1
  - 2 - UNIT 2
- G.E. SYSTEM IDENTIFICATION THIS NUMBER APPEARS IN THE MOTOR OF EACH PAID AND ALSO ON EACH INSTRUMENT OR GE MOD.

## HEATING AND VENTILATING AIR FLOW AND CONTROL DIAGRAM DUCT & INSTRUMENTATION SYMBOLS

- SEE SHEET FOR MEASURED VARIABLE (TYPICAL)
- AIR OPERATED DAMPER FAIL-OPEN ILLUSTRATED
- MOTOR OPERATED DAMPER FAIL-CLOSED ILLUSTRATED
- HAND CONTROLLED DAMPER
- BACKDRAFT ISOLATION DAMPER
- Q-LISTED DUCT
- TERMINATION POINT OF Q LISTED DUCT
- DUCTWORK CLASS AND/OR MATERIAL CHANGE
- AIR FLOW - NOT DUCTED
- SUPPLY AIR
- RETURN OR EXHAUST AIR
- AIR FLOW THRU LIGHT FIXTURE
- CONSTANT VOLUME REGULATORS
- BAFFLE PLATE
- BALANCING DAMPER (BD)
- BACK DRAFT DAMPER (BDD)
- FPD FIRE PROTECTION DAMPER
- MCD MOTOR OPERATED DAMPER
- ADD AIR OPERATED DAMPER
- ISOLATION DAMPER
- PRESSURE RELIEF DAMPER

| | |
|---|---|
| CFM | CUBIC FEET PER MINUTE |
| OA | OUTSIDE AIR |
| SA | SUPPLY AIR |
| RA | RETURN AIR |
| EA | EXHAUST AIR |

NOTES

1. ALL DATA INDICATED SHALL HAVE PILOT LIGHT INDICATION WITH THE EXCEPTION OF: NO SYMBOL IS REQUIRED ON THE P&ID TO INDICATE THIS REQUIREMENT.
2. ALL MANUAL VALVES ARE CONSIDERED SEDIMENT-GENERATED PROCESS VALVES UNLESS OTHERWISE INDICATED. ALL ARE CONSIDERED CLASS III OR LOWER. ALL ARE CONSIDERED ACCESSIBLE. MANUAL VALVES AND ANALOG SENSORS ARE SHOWN ON THE LOOPS WHERE THEY ARE PART OF THE LOOP. ALL OTHER MANUAL VALVES ARE NOT SHOWN. (WITH EXCEPTIONS)
3. THE LOOP NUMBER ASSIGNED WILL BE DESIGN AND IDENTIFIED IN THE INSTRUMENT LOOP LIST.
4. THE INSTRUMENT EQUIPMENT ARE "SPECIFIED" WHERE ARE NOT ON DEMAND AS DEFINED IN DESIGN. EXAMPLES: RE-MAIN FEEDWATER, ALL SAFETY RELIEF VALVES.
5. WHEN "Q" IS USED AS A SECOND OR SUCCEEDING LETTER, IT DESIGNATES SEPARATING MODIFIER. FOR EXAMPLE, TSH IS A SEPARATE INDICATOR FOR HIGH TEMPERATURE, TE IS SCANNING.
6. SETPOINTS WILL BE FUTURE MODIFIED BY THE OPERATOR AND "A" FOR ALARM, "SD" FOR SHUTDOWN, "SP" FOR SPEED CONTROL.
7. BUTTERFLY VALVES WILL BE DESIGNED "TV" FOR CONTROL & SHUTOFF AND ASSOCIATED TEMPERATURE ELEMENT (THERMOCOUPLE, RTD OR BULB SENSOR).
8. MOTOR AND SOLENOID OPERATED VALVES ARE POWERED FROM 120 VOLT AC, 125 VOLT DC, WHEN SPECIFICALLY DESIGNATED AS 120 VAC OR DC. POWER SUPPLY IS DETAILED. WHEN DESIGNATED AS "D" ETC.
9. ALT IS USED FOR ALL ANALYTICAL VARIABLES, E.G., $O_2$, $CO_2$, pH, ETC.
10. FOR ORIFICE-MAT VALVE POSITION FOR SOLENOID VALVES, SEE DWG. NO. M-112, SHEET 1 & 2 FOR CONTROL NOTE.
11. FOR FIRE PROTECTION SYSTEMS, SEE DWG. NO. M-122, SHEET 1.
12. ALL PNEUMATIC VALVES SHOWN ARE SHOWN FOR FAIL TO CONTAINMENT INSTRUMENT GAS SYSTEM (SEE DWG. NO. M-114).
13. ALL INSTRUMENT LINES CONNECTED TO Q-LISTED PIPING & PROCESS LINES ARE ALSO Q-LISTED. Q DESIGNATION FOR INSTRUMENT LINES IS NOT SHOWN ON P&ID'S.
14. KEY SYMBOL [illegible] IS ON DOCUMENTS THAT CLIENT WISHES TO REVIEW.
15. ROOT VALVES ARE NOT SHOWN ON P&ID - SEE PIPING DETAIL ON SHEET 1 OF P&ID N-123.
16. ELECTRONIC INSTRUMENTATION IS POWERED AS SHOWN ON INSTRUMENT LOOP DIAGRAMS, EXCEPT NSSS INSTRUMENTATION, WHICH IS SHOWN ON ELECTRICAL SCHEMATIC DIAGRAMS.
17. "E(X)" IS A FINAL CONTROL ELEMENT, I.E. TZ, HEATER ELEMENT, ETC.
18. "E(X)" IS USED FOR A CURRENT DEVICE, I.E. ISH - HIGH CURRENT SWITCH.
19. FOR POWER SUPPLY ASSIGNMENTS FOR THE BALANCE OF PLANT ANALOG LOOPS REFER TO DRAWING 8856-J-851.
20. P&IDS ARE NUMBERED AS FOLLOWS: M-XXX FOR UNIT 1 & COMMON SYSTEMS AND M-2XXX FOR UNIT 2 SYSTEMS. HVAC CONTROL DIAGRAMS ARE NUMBERED VC-XX ON UNITS. UNIT 2 DRAWINGS ARE LISTED IN THE DRAWING CONTROL.
21. REFER TO J-157 FOR TABULATION OF EXCESS FLOW CHECK VALVES AND ASSOCIATED COMPONENTS.
22. SHIFTH HS-15008 AND INDICATOR XI-15008 ARE FOR TEST AND ALARM INDICATION OF DIV. 2. (SH. 1, B-9)
23. MANUAL VALVES NUMBERED BY THIS SYSTEM, WHICH ARE LOCATED IN "Q" LINES, ARE Q. FURTHER "Q" DESIGNATION OF THE NUMBER IS NOT NEEDED.
24. REFER TO 7-000 FOR SPECIFICATION OF INSTRUMENT VALVES, FIELD VALVE MANIFOLDS, TUBING AND TUBE FITTINGS.
25. DERIVED ALARMS ARE SHOWN ON LOGIC DIAGRAMS AND NOT ON THE P&IDS UNLESS NOTED OTHERWISE ON THE P&ID.

UNCONTROLLED DOCUMENT FOR REFERENCE ONLY

| HVAC CONTROL DIAGRAMS | |
|---|---|
| VC-173 | CIRCULATING WATER PUMPHOUSE |
| VC-174 | TURBINE BUILDING |
| VC-175 | REACTOR BUILDING ZONE III, SHEETS 1 & 3 |
| VC-176 | REACTOR BUILDING ZONES I |
| VC-177 | DEFINED |
| VC-178 | CONTROL STRUCTURE SHEET 1 & 2 |
| VC-179 | RADWASTE BUILDING |
| VC-180 | CANCELLED |
| VC-181 | MISCELLANEOUS BUILDINGS |
| VC-182 | DIESEL GENERATOR BLDG, ESSW PUMPHOUSE |

| REV. | DESCRIPTION | BY | CHK | APPD |
|---|---|---|---|---|
| A | REVISED PER CHANGE SHEET | JS | | |
| A | REVISED PER COMMENTS | | | |
| A | ISSUED FOR CONSTRUCTION | | | |
| A | REVISED AND REISSUED | | | |
| A | REVISED AND REISSUED | DH | | |
| A | ISSUED FOR CONSTRUCTION | | | |
| A | ISSUED FOR CLIENT APPROVAL | JS | | |

PENNSYLVANIA POWER & LIGHT COMPANY
ALLEGHENY ELECTRIC COOPERATIVE, INC.
SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 AND 2
BERWICK - SHAMOKIN

P & ID
LEGEND & SYMBOLS

8856 | M-100 SHEET 3 OF 3 | REV. A
E-106205-2

ISI CLASSIFICATION
Date: December, 1980

REVISION

8102050163

RCDS

8102050163