

BLN '82 1112 303

TENNESSEE VALLEY AUTHORITY  
BELLEFONTE NUCLEAR PLANT  
STANDARD OPERATING PROCEDURE

MEU-SOP-616

IDENTIFICATION OF PIPING

Affects: MEU, HEU AND IEU

8508140047 850807  
PDR ADOCK 05000438  
A PDR

MEDS, W5B63 C-K	RO	RI	R2	R3
DATE	8/2/82	11/19/82		
SUBMITTED	F.L. Moses/WLM	<i>[Signature]</i> /WLM		
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APPROVED	D.R. Bridges	<i>[Signature]</i>		

Title: IDENTIFICATION OF PIPING		REVISION LOG
		MEU-SOP-616
Revision No.	DESCRIPTION OF REVISION	Date Approved
1	Minor revision. Revised paragraphs 5.1, 5.2, 6.1.1 and Attachment A. Revision lines are indicated.	11/19/82

## 1.0 PURPOSE

- 1.1 This procedure defines the methods utilized by CONST Mechanical Engineering Unit (MEU), Hanger Engineering Unit (HEU), and Instrumentation Engineering Unit (IEU) in identification of piping systems.

## 2.0 SCOPE

- 2.1 This procedure establishes minimum requirements for the positive identification of materials conveyed in all temporary, portable, or permanent piping systems except for sections buried in the ground or concrete.

## 3.0 REFERENCES

- 3.1 TVA Occupational Safety and Health Standards & Interpretations Part 1910 - Subpart J, Section No. 145.

## 4.0 DEFINITIONS

- 4.1 Piping Systems - Piping or tubing including fittings, valves, pipe coverings, and flexible hoses used for conveying materials, i.e., gas, liquids, and solids. Excluded are air ducting at or below atmospheric pressure and buried piping.

## 5.0 RESPONSIBILITIES

- 5.1 System Engineering (Construction) - The system engineer shall be responsible for initiating pipe marking material request (reference Attachment "D") in a timely manner so that material will be available and installed prior to transfer to NUC PR.
- 5.2 Installation - Pipe marking material shall be installed by the responsible craft with instructions from the responsible Engineering Personnel to ensure systems are marked according to this procedure.
- 5.3 Inspection - Inspection of installed pipe markings shall be performed by the responsible Engineering Personnel using this procedure as criteria.

## 6.0 PROCEDURE

### 6.1 LEGEND

- 6.1.1 Letters and numerals placed on piping systems shall conform to sizes shown in Attachment "A". Positive identification of the content of a piping system shall be by lettered legend giving the name of the contents or abbreviated form and shall use upper case letters and arabic numerals as specified in Attachment B. The legend may be located behind the direction of flow arrow or immediately under the arrow.

- 6.1.2 Piping systems less than 3/4-inch in diameter shall be identified by securely attached tags as specified in Attachment C and positively identified as specified in 6.1.1 with direction of flow clearly etched on the tag. The color code band is not required for pipes less than 3/4-inch in diameter.
- 6.1.3 The definition shall be placed on the pipe or covering within the normal field of view. Lettering placed on the lower quarters of the piping is unlikely to be obscured by dust or obliterated by mechanical damage.
- 6.1.4 Definitions should be clearly visible from operating positions, especially those adjacent to control valves.
- 6.1.5 Letters shall be white on red, green, or blue background, or black letters on yellow background.
- 6.1.6 In offices, shops, laboratories, or other areas where the interior is painted in accordance with TVA painting standards, piping colors for exposed piping may match wall, ceiling, etc., to which the pipelines are affixed or are run adjacent thereto, and shall be labeled and color banded in accordance with this procedure.
- 6.2 COLOR BAND
- 6.2.1 Color bands shall completely encircle the pipe, or the entire piping system may be painted the designated color.
- 6.2.2 The width of a color band may range from 3/4-inch to 4-inches according to the pipe diameter as specified in Attachment A.
- 6.2.3 Color bands may be either painted on the pipe or wrapped with self-sticking colored tape and shall be the same color as the background of the legend.
- 6.2.4 At each color band or identification tag, the direction(s) of the flow of the material within the pipe shall be indicated by an arrow. The arrow shall be the same color as the letters in the legend.
- 6.2.5 At some locations it may be desirable to code pipes only at junctions or distribution points, while on other systems more frequent markings will be required. In any case, the numbers and location of identification markings will be based on the particular needs of each system to ensure the piping system is positively identified.
- 6.2.6 Color bands used for pipe identification shall be located at frequent intervals on straight pipe runs, close to valves and changes-in-directions, and where pipes pass through walls and floors. If desired, the entire piping system may be color coded.
- 6.3 Color Coding and Classification
- 6.3.1 See Attachment B for system designations (legend) and color combinations.
- 6.3.2 Piping that presents a bumping or tripping hazard shall be marked with black and yellow stripes at the point of hazard.

#### 6.4 MATERIAL

- 6.4.1 Carbon steel 3/4-inch and larger (all areas except Reactor Building) shall use Brady material - B946, System II.
- 6.4.2 Stainless steel 3/4-inch and larger (all areas except Reactor Building) shall use Brady material - B361, System II.
- 6.4.3 All pipe in Reactor Building shall be marked using LAMACOID material no less than 3/32-inch thick, to be procured by construction. Legends, letter color and background color shall be upper case letters and arabic numerals as specified in Attachment B. Tags to be attached to pipe using stainless steel aircraft cable. Size of tag and letter height to be determined by construction. Reference Attachment C.
- 6.4.4 Piping systems less than 3/4-inch in diameter shall be identified same as paragraph 6.4.3. Reference Attachment C.

#### 7.0 ACCEPTANCE CRITERIA

- 7.1 None

#### 8.0 RECORDS

- 8.1 None

#### 9.0 ATTACHMENTS

- 9.1 Attachment A, "Legend and Color Band Dimensions"
- 9.2 Attachment B, "Pipe Marker Legend Information"
- 9.3 Attachment C, "Pipe Marker Drawing"
- 9.4 Attachment D, "Pipe Marking Material Request"

## LEGEND AND COLOR BAND DIMENSIONS

OUTSIDE DIAMETER OF PIPE COVERING (INCHES)	WIDTH OF COLOR BAND (INCHES)	SIZE OF LEGEND LETTERS AND NUMERALS (INCHES)
3/4" TO 1-1/4"	3/4"	3/8"
1-1/2" TO 2"	1-1/2"	3/4"
2-1/2" TO 6"	2-1/4"	2"
7" OR GREATER	4"	3-1/2"

PIPE MARKER LEGEND INFORMATION

LEGEND	SYSTEM DESCRIPTION	BACKGROUND COLOR	LETTER COLOR
BA	Auxiliary Boiler	Yellow	Black
CA	Auxiliary Feedwater	Yellow	Black
CD	Hp Htr. Drains & Vents	Yellow	Black
CE	Lp. Htr. Drains & Vents	Yellow	Black
CF	Feedwater	Yellow	Black
CG	Gland Seal Water	Green	White
CI	Feed Pump Injection	Green	White
CM	Condensate	Green	White
CN	Condensate Demin.	Green	White
CR	Startup & Recirculation	Yellow	Black
CS	Condensate Transfer & Storage	Green	White
CT HYDRAZINE	Sec. Chem. Feedwater Treatment	Yellow	Black
CT AMMONIA	Sec. Chem. Feedwater Treatment	Yellow	Black
CV	Condenser Vacuum Removal	Blue	White
FD	Fuel Oil Storage & Transfer	Yellow	Black
FF	Fuel Oil (Diesel Generator Building)	Yellow	Black
GB	Breathing Air	Blue	White
GC	Carbon Dioxide (Fire Protection)	Red	White
GC CO <sub>2</sub> Purge	Carbon Dioxide (Hydrogen Purge)	Yellow	Black
GN	Nitrogen Purge	Blue	White
GS HYDROGEN	Hydrogen	Yellow	Black
KC	Component Cooling	Green	White
KD	Control Rod Drive Cooling Water	Green	White
KE	Essential Raw Cooling Water	Green	White

PIPE MARKER LEGEND INFORMATION

LEGEND	SYSTEM DESCRIPTION	BACKGROUND COLOR	LETTER COLOR
KH	Condenser Cooling Water	Green	White
KW	Raw Cooling Water	Green	White
LE	Insulating Oil	Yellow	Black
LS	Lube Oil Storage & Transfer	Yellow	Black
ML Acetylene C <sub>2</sub> H <sub>2</sub>	Laboratory Compressed Gas	Yellow	Black
ML Argon AR	Laboratory Compressed Gas	Yellow	Black
ML Helium HE	Laboratory Compressed Gas	Yellow	Black
ML Methane CH <sub>4</sub>	Laboratory Compressed Gas	Yellow	Black
ML Nitrous Oxide N <sub>2</sub> O	Laboratory Compressed Gas	Yellow	Black
ML Mounting Gas P-10	Laboratory Compressed Gas	Yellow	Black
NB Boric Acid	Chemical Addition & Boron Recovery	Yellow	Black
NB	Chemical Addition & Boron Recovery	Yellow	Black
NC	Reactor Coolant System	Yellow	Black
ND	Decay Heat Removal	Yellow	Black
NF	Fuel Handling	Yellow	Black
NK	R.C. Drn., Vent & Misc. Piping Reactor Coolant	Yellow	Black
NL	Core Flooding	Yellow	Black
NM	Spent Fuel Cooling	Yellow	Black
NS	Reactor Building Spray	Yellow	Black
NV	Makeup & Purification	Yellow	Black
RC	Condenser Tube Cleaning	Green	White
RE	Demineralized Water	Green	White
Water - Fire	Fire Protection	Red	White
RG	Diesel Generator Starting Air	Blue	White

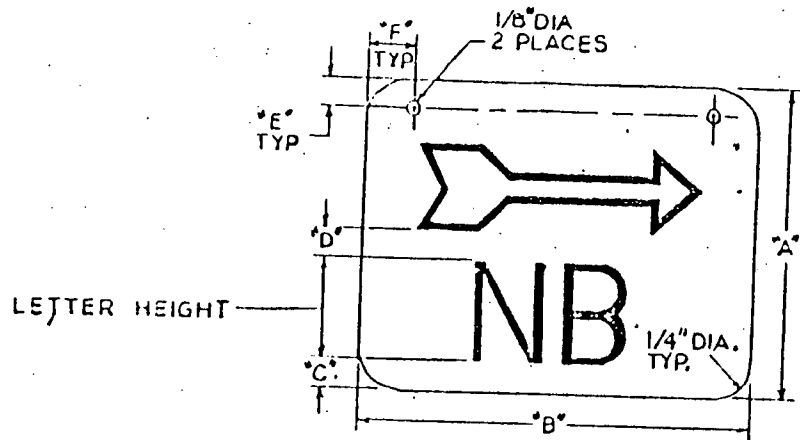


PIPE MARKER LEGEND INFORMATION

LEGEND	SYSTEM DESCRIPTION	BACKGROUND COLOR	LETTER COLOR
RH	Service Air	Blue	White
RI	Control Air	Blue	White
RJ	Essential Air	Blue	White
RK	Compressed Air	Blue	White
RS	Raw Service Water	Green	White
SA	Auxiliary Steam	Yellow	Black
SE	Extraction	Yellow	Black
SM	Main Steam	Yellow	Black
SV	Safety Vents & Misc. Steam	Yellow	Black
TD	Turbine Drains & Misc. Piping	Yellow	Black
TH HYDROGEN	Generator Hydrogen Cooling	Yellow	Black
TJ	Main Turbine Control Fluid	Yellow	Black
TK	Generator Stator Cooling	Green	White
TL	Main Turbine Lube Oil	Yellow	Black
TO	Main Generator Seal Oil	Yellow	Black
TP	Main Turbine Piping	Yellow	Black
TS	Turbine Steam Seal	Yellow	Black
TV	Misc. Turbine Vents	Blue	White
VE	A.B. Trained Area Air Cond.	Green	White
VF	A.B. Common Area Air Cond.	Green	White
VK	C.B. Envir. Control (Piping)	Green	White
VL	C.B. Non-ESF Areas HVAC (Piping)	Green	White
VT	T.B. Ventilation (Piping)	Green	White
VU	Hot Water Heating	Yellow	Black

## PIPE MARKER LEGEND INFORMATION

LEGEND	SYSTEM DESCRIPTION	BACKGROUND COLOR	LETTER COLOR
WE	Drains	Green	White
WC	Gaseous Radwaste Disposal	Blue	White
WL	Liquid Radwaste Disposal	Green	White
WS	Solid Radwaste Disposal	Yellow	Black
WW	Sanitary Waste Disposal	Green	White
YA Hypochlorite	Sodium Hypochlorite	Yellow	Black
YA	Sodium Hypochlorite	Yellow	Black
YM Caustic	Water Treatment	Yellow	Black
YM Acid	Water Treatment	Yellow	Black
YM	Water Treatment	Yellow	Black
YP	Potable Water	Green	White
YQ	Sampling & Water Quality	Yellow	Black
YR	Chemical Cleaning	Green	White
YT	Water Filtration	Green	White
YU	Alum Sludge Dewatering	Green	White
ZT	Reactor Bldg. Leakage Tests	Blue	White



SCALE: NONE

OUTSIDE PIPE DIAMETER	LETTER HEIGHT	"A"	"B"	"C"	"D"	"E"	"F"
LESS THAN 3/4"	3/8"	1 3/4"	2 1/2"	1/4"	1/4"	3/8"	3/8"
3/4" TO 1 1/4"	1/2"	2"	2 3/4"	1/4"	1/4"	3/8"	3/8"
1 1/2" TO 2"	3/4"	2 3/4"	3 1/4"	3/8"	3/8"	3/8"	3/8"
2 1/2" TO 6"	1 1/4"	4"	5 1/2"	3/8"	1/2"	3/8"	3/8"
8" TO 10"	1 3/4"	5"	6 1/4"	1/2"	3/4"	5/8"	6/8"
OVER 10"	2"	5 1/2"	6 1/4"	1/2"	1"	5/8"	5/8"

NAMEPLATES - PIPE MARKER TAG

1. REFERENCE ATTACHMENT "B" FOR MATERIAL COLOR
2. NAMEPLATES SHALL BE NO LESS THAN 3/32 THICK.
3. NAMEPLATES SHALL BE MADE OF LAMACOID, OR EQUAL.
4. NAMEPLATES TO BE ATTACHED WITH STAINLESS STEEL AIRCRAFT CABLE.
5. ALL MATERIALS TO BE PROCURED BY THE FIELD.
6. TAG SIZE (DIMENSIONS "A" & "B") ARE BASED ON THE LEGEND BEING TWO CHARACTERS AND A FLOW ARROW. IF ADDITIONAL INFORMATION IS REQUIRED THE DIMENSIONS SHALL BE CHANGED ACCORDINGLY BY CONSTRUCTION.

PIPE MARKER DRAWING

MEJ-SOP-616 R1  
ATTACHMENT C

PIPE MARKING MATERIAL REQUEST

ACTIVITY NO. \_\_\_\_\_ DATE OF THIS REQUEST: \_\_\_\_\_

UNIT: \_\_\_\_\_ DATE MATERIAL NEEDED: \_\_\_\_\_

INSTRUCTIONS:

1. Prior to completing this form you must read MEU-SOP-616 R1 so that all requirements for your particular system are met.
2. Fill out one form per pipe size, unless it has both insulated and uninsulated pipe involved, then fill out a form for each condition.
3. If the pipe is not insulated, write "none".

CHECK ONE

TYPE MATERIAL

- ( ) Partial Order
- ( ) Complete Order

- ( ) Carbon Steel
- ( ) Stainless Steel
- ( ) Reactor (Inside Primary Containment)
- ( ) Piping less than 3/4" in diameter

LEGEND (REFERENCE ATTACHMENT B) \_\_\_\_\_

COMPLETE SYSTEM DESCRIPTION: \_\_\_\_\_

PIPE DIAMETER: \_\_\_\_\_

THICKNESS OF INSULATION: \_\_\_\_\_

LINEAR FEET OF PIPE, TOTAL: \_\_\_\_\_

LINEAR FEET OF PIPE WHERE FLOW IS IN BOTH DIRECTIONS: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_