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HUMAN FACTORS MANUAL
FOR FUTURE DESIGN CHANGE
REVISION 3
NIAGARA MOHAWK POWER CORPORATION
NMP - UNIT #2

APPROVED BY: A G Vierling 12/31/90
A. G. VIERLING DATE

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

1.1 Purpose

In the design of nuclear power plant control rooms, it is now widely recognized that attention must be given to the operator's requirements in the design of workspace layout, labeling, conventions, annunciators, visual displays, and controls to support efficient, reliable and safe operations. Similarly, when engineering changes are proposed for an operating control room, it is important that human factors principles and guidelines be included in the new designs to ensure an efficient interface. The primary purpose of this manual is to present human factors guidelines for use when modifications are made to Niagara Mohawk Power Corporation's (NMPC) NMP-2 nuclear power plant control room control panels, simulator panels, or remote shutdown panel. The manual is intended to:

- Establish NMP-2 design conventions and practices

- Support the implementation of design enhancements resulting from the Human Factors Detailed Control Room Design Review

- Provide a human factors guideline to maintain the consistency of the NMP-2 control room design throughout future modifications

- Provide a human factors checklist to be completed when changes are made to the control room equipment or operating procedures. This will ensure that plant conventions and human factors principles are being technically and administratively recognized in the modification process.

1.2 Use of This Manual

This manual has been written for use by the NMPC Engineering Department or their designee. It is an engineering tool to be used during the human factors review of all current and future control room modifications or additions.

1.3 Design Modifications

There are a number of reasons for undertaking the modification of the control room. As a result of the NRC-required review of control rooms, it is often necessary to modify components or labels on a panel or change panel demarcations. Other modifications may occur when new panels are installed, a process is modified, or failed components must be replaced. In the latter instance, it may be impossible to find an identical or similar replacement component and it is necessary to determine how the characteristics of the new component may affect operator performance.

1.4 Modification Requests

All control room panel modifications, including labeling, will be accomplished in accordance with the principles of this human factors manual. This will ensure that changes are reviewed from an integrated systems viewpoint and that human factors principles are adhered to in any design change made to the control panels.

1.5 Checklists

To help design engineers use this manual, checklists have been prepared to include items from each section of the manual. The checklists assist designers in identifying appropriate human engineering principles to be considered. A checklist is provided in Section 10; it is to be completed and approved for any changes to control room procedures. A summary checklist to be completed and approved for any equipment modification is provided in Appendix A. Only personnel qualified to evaluate design changes from a human factors engineering standpoint should complete these checklists.

1.6 Responsibility

The update of this human factors design manual is the responsibility of the NMPC Engineering Department which will provide updated information to the document control office for ultimate distribution to all manual recipients.

2.0 CONTROL ROOM LAYOUT AND ORGANIZATION

2.1 Panels and Benchboards

The layout of the control room is shown in Figure 2-1. The center desk is positioned so that the operator sitting at the center desk has a clear and unobstructed view of all benchboards and vertical panels in front and to the right and left. Displays and controls crucial to the operation of the power plant are located on the benchboards and on the front of the associated vertical panels. Other supporting displays and controls are located on back panels.

2.2 Groupings

On the front control panels, most controls are located on the benchboards while visual displays are located on the attached vertical panels. The design engineers have attempted to locate specific systems and their subsystems on the same benchboards and vertical panels, particularly those containing controls and displays critical to operating the plant. Instruments controlling or measuring similar processes should be grouped together. The primary principle to be followed is that the control room panels should be laid out so that the operator will not have to leave the primary operating area to attend to control room instrumentation on the back of panels during periods when monitoring or timing of control actions may be critical. Desks and consoles should be placed to give the operator a full view of all critical control and display panels and annunciators.

Critical operations include all emergency operating conditions, most abnormal operations, and normal operations which are time critical or which could result in significant equipment damage or injury to personnel.

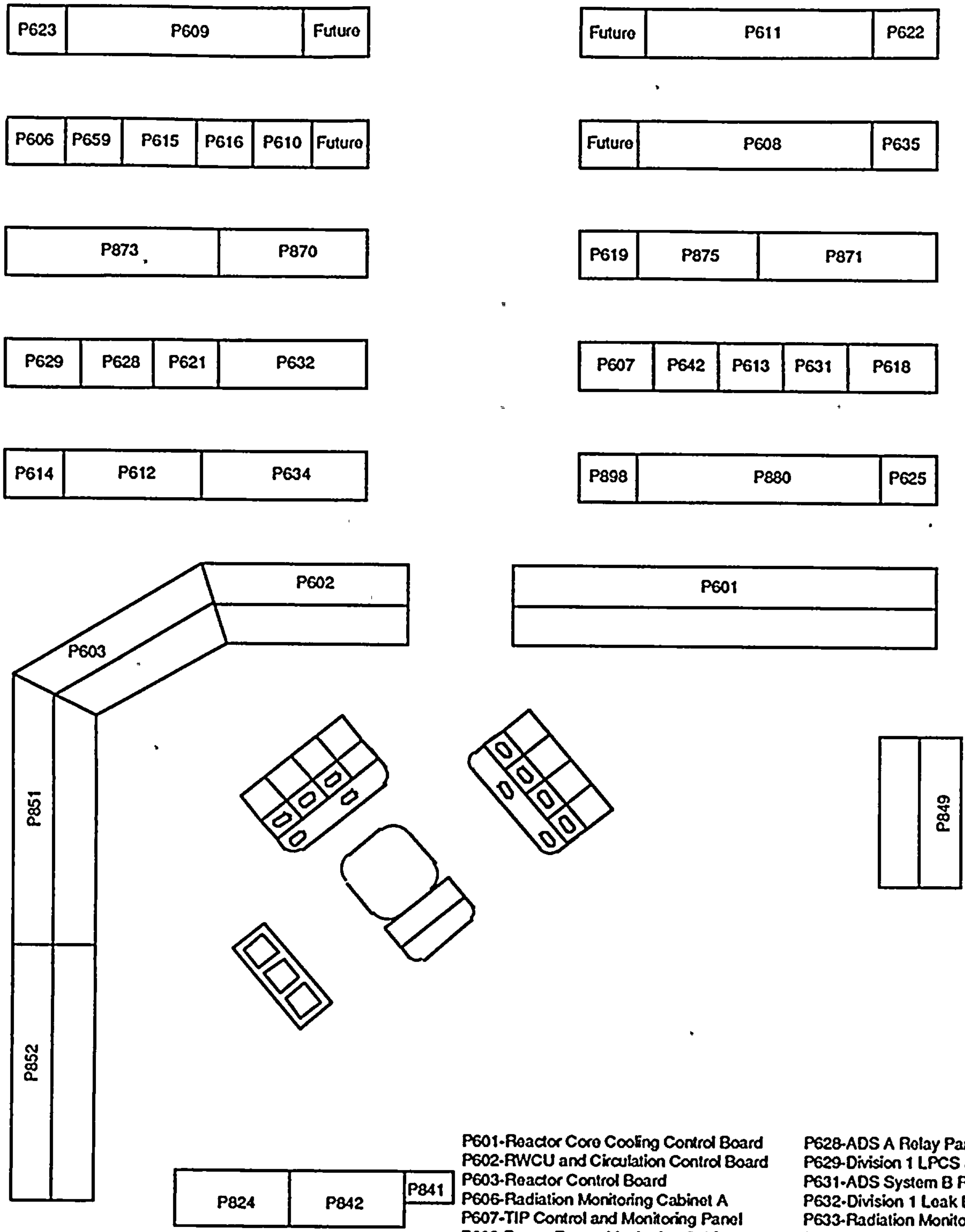
The current system and subsystem grouping, as shown on Figure 2-1, is the primary design convention and is to be strictly maintained in all panel modifications.

2.3 Spacing

Recommended spacing of equipment to accommodate seated operators is shown in Figure 2-2; recommended equipment-to-equipment distances are illustrated in Figure 2-3. These guidelines should be adhered to if new panels or consoles are added or moved.

2.4 Storage

Other needs for the control room include convenient, easily accessible document organization and storage, spare parts, operating expendables, and tools. Whenever the control room layout is altered, these needs should continue to be met without interfering with operator performance of tasks.



P601-Reactor Core Cooling Control Board
P602-RWCU and Circulation Control Board
P603-Reactor Control Board
P606-Radiation Monitoring Cabinet A
P607-TIP Control and Monitoring Panel
P608-Power Range Monitoring Cabinet
P609-Trip System A RPS Veritical Board
P610-Control Rod Drive Test Panel
P611-Trip System B RPS Vertical Board
P612-Feedwater and Recirc Instrument Panel
P613-Process Instrumentation Panel
P614-NSSS Temperature Recorder Panel
P615-Control Rod Position Information Panel
P616-CRD Select Relay Instrument Panel
P618-Division 2 Rhr B&C Relay Panel
P619-Jet Pump Instrumentation Panel
P621-RCIC Relay Panel
P622-Inboard Valve Relay Panel
P625-HPCS Relay Panel
P628-ADS A Relay Panel
P629-Division 1 LPCS & RHR A Relay Panel
P631-ADS System B Relay Panel
P632-Division 1 Leak Detection Panel
P633-Radiation Monitoring Cabinet B
P634-Rx Recorder Anal Flow Control Panel
P642-Division 2 Leak Detection Panel
P659-RSCS Panel
P824-Main Steam Reheat & Turbine Bldg Misc Drain Panel
P841-Turbine Supervisory Instruments Panel
P842-Turbine Test & Recorder Panel
P849-Fire Protection Panel
P851-Steam & Meter Systems & T/G Control Board
P852-Electrical Control Board
P870-HVAC Division 1 Control Panel
P871-HVAC Division 2 Control Panel
P873-Drywell Cooling & Pri Cont Purge Div 1 Control Panel
P875-Primary Containment Purge Division 2 Panel
P880-Process & Area Radiation Monitoring Panel
P898-Post Accident Monitoring Panel

Figure 2-1. Layout of NMP-2 Control Room

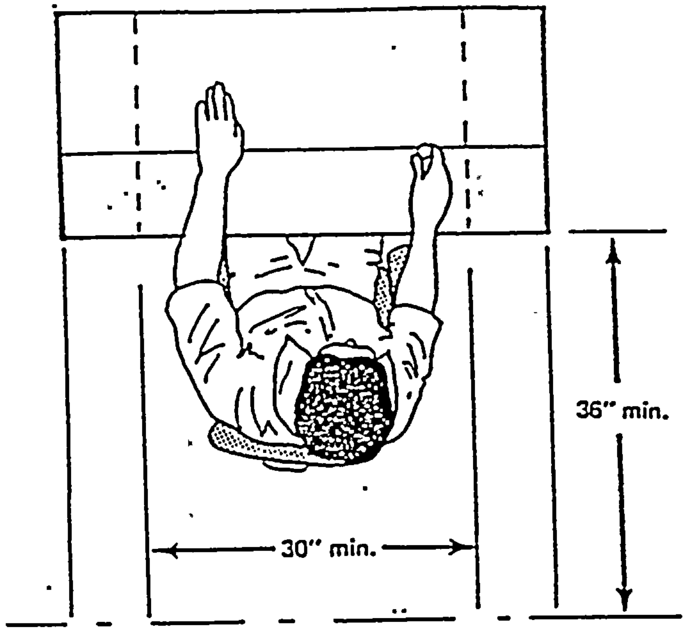


Figure 2-2. Spacing of Equipment to Accommodate Seated Operators (from NUREG-0700)

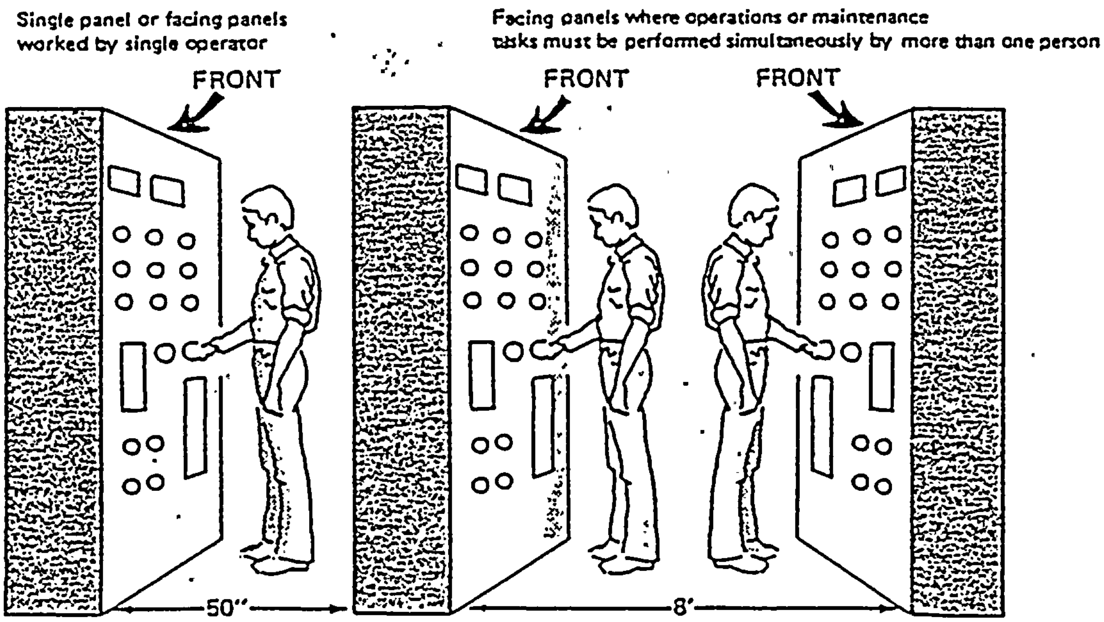


Figure 2-3. Panel-to-Panel Distances (from NUREG-0700)

3.0 WORK STATION DESIGN

3.1 Anthropometrics

Equipment should be designed to meet the requirements of the 5th to 95th percentile of the population; this will accommodate practically all users. In designing new panels or work stations, the measurements given in Table 3-1 may be useful. These encompass most of the useful dimensions of the 5th percentile woman and 95th percentile man.

3.2 Stand-Up Operation of Controls

NMP-2 control panels are designed for stand-up operation. In positioning controls for stand-up operation, the range of suitable control height is within the reach radius (functional reach) of the 5th and 95th percentile user. The controls on a benchboard should be set back a minimum of 3 inches from the front of the benchboard to avoid inadvertent actuation and the maximum distance of controls should be no more than 25 inches, if possible, from the front edge of the benchboard as shown in Figure 3-1. The highest and lowest control on vertical panels should be within the reach of the 5th percentile female without stretching and the 95th percentile male without bending or stooping. For the main panels of the NMP-2 control room, this results in a maximum recommended control height of 70 inches for vertical panels and a recommended minimum of 34 inches control height for vertical panels.

Table 3-1. Anthopometric Data for Equipment Dimensions

	BOUNDING MEASUREMENTS (inches)	
STANDING (without shoes)	5th Percentile Adult Female	95th Percentile Adult Male
Stature	60.0	73.5
Eye height from floor	55.5	68.6
Shoulder height	48.4	60.8
Elbow height	37.4	46.8
Fingertip height	24.2	28.8
Functional reach	25.2	35.0
Extended functional reach	28.9	39.0
Distance from central axis of body to leading edge of console	5.0	5.3
Eye distance forward of central axis of body	3.0	3.4
SEATED		
Popliteal height (bend at back of knee)	15.0	19.2
Sitting height above seat surface		
erect	31.1	38.5
relaxed	30.5	37.6
Eye height above seat, sitting erect	26.6	33.6
Shoulder height above seat surface	19.6	25.8
Elbow height above seat surface	6.4	11.3
Function reach	25.2	35.0
Extended functional reach	28.9	39.0
Thigh clearance height	4.1	7.4
Buttock-popliteal length	17.1	21.5
Knee height	18.5	23.6
Distance from central axis of body to leading edge of console	5.0	5.3
Eye distance forward of central axis of body	3.0	3.4

Source: MIL-STD-1472B, Section 5.6, December 1974, as updated May 1978.

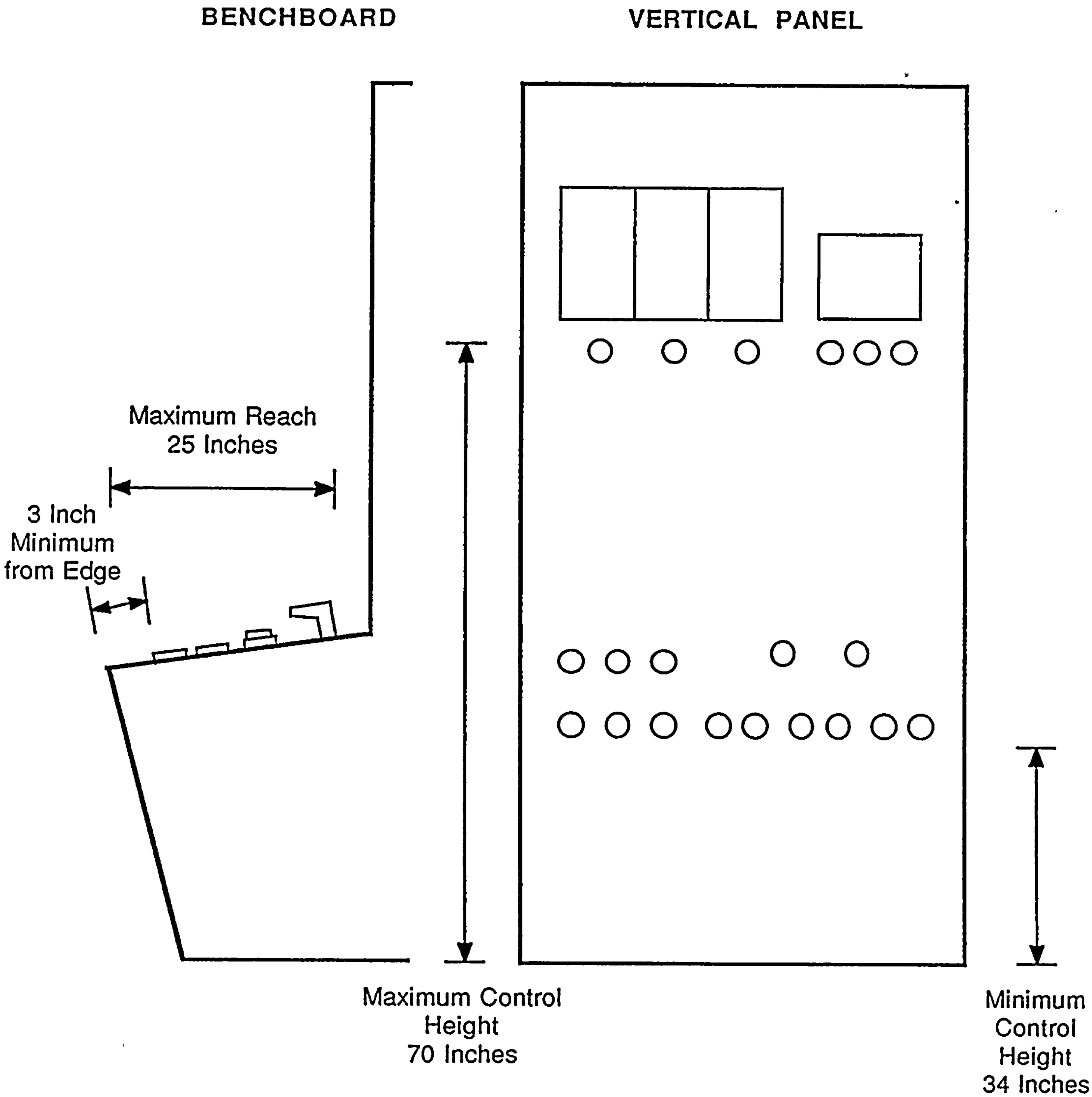


Figure 3-1. Control Location Specifications

3.3 Display Positioning - Stand Up

Some of the factors that affect readability of displays and annunciators are shown in Figure 3-2. These factors include:

- Display height from the operator's Line-of-Sight (LOS) should be considered. All displays, including annunciator tiles, should be mounted so that they are within the upper limit of the visual field defined to be 75° above the horizontal LOS of the 5th percentile female (56.5 inches), as shown in Figure 3-2.

- All displays and annunciators should be mounted so that the angle between the operator LOS and the faceplate is 45° or greater, as shown in Figure 3-2. The 5th percentile female determines the upper limit. The 95th percentile male determines the lower limit.

- The horizontal displacement from the LOS to a display to either side of the working position should subtend an angle between 45° and 90° as shown in Figure 3-3.

3.4 Sit-Down Consoles

NMP-2 control room computer operations are performed at sit-down consoles. For sit-down consoles, the keyboard and any controls should be within a reach radius of 25 inches. These measurements assume a seated shoulder height of 35 inches, with the shoulder in line with the leading edge of the table. Display positioning follows the same guidelines as those for the standing operator, except that they are now measured from the seated position.

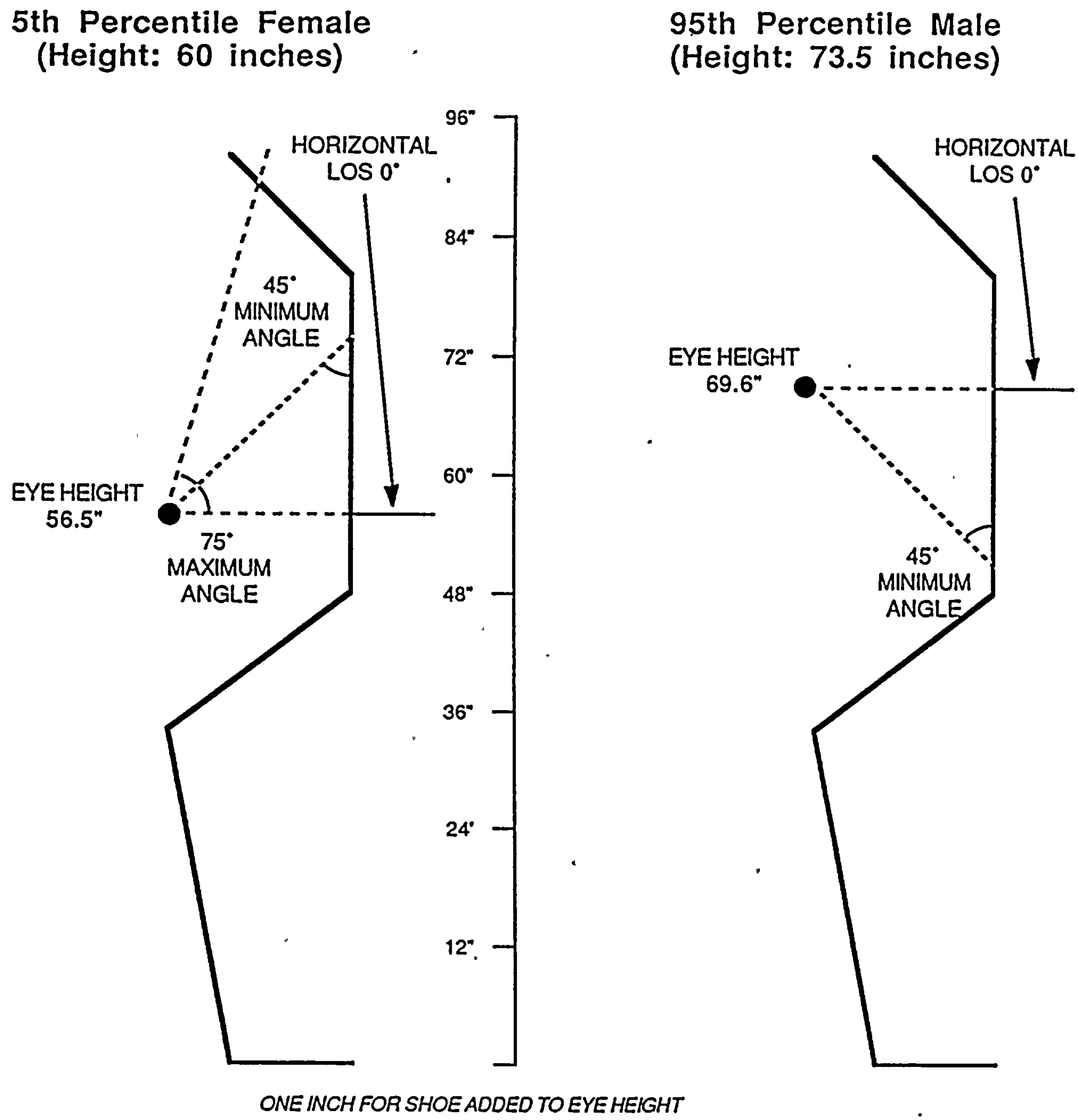


Figure 3-2: Display Height and Orientation Relative to Standing Operator Line of Sight (LOS)

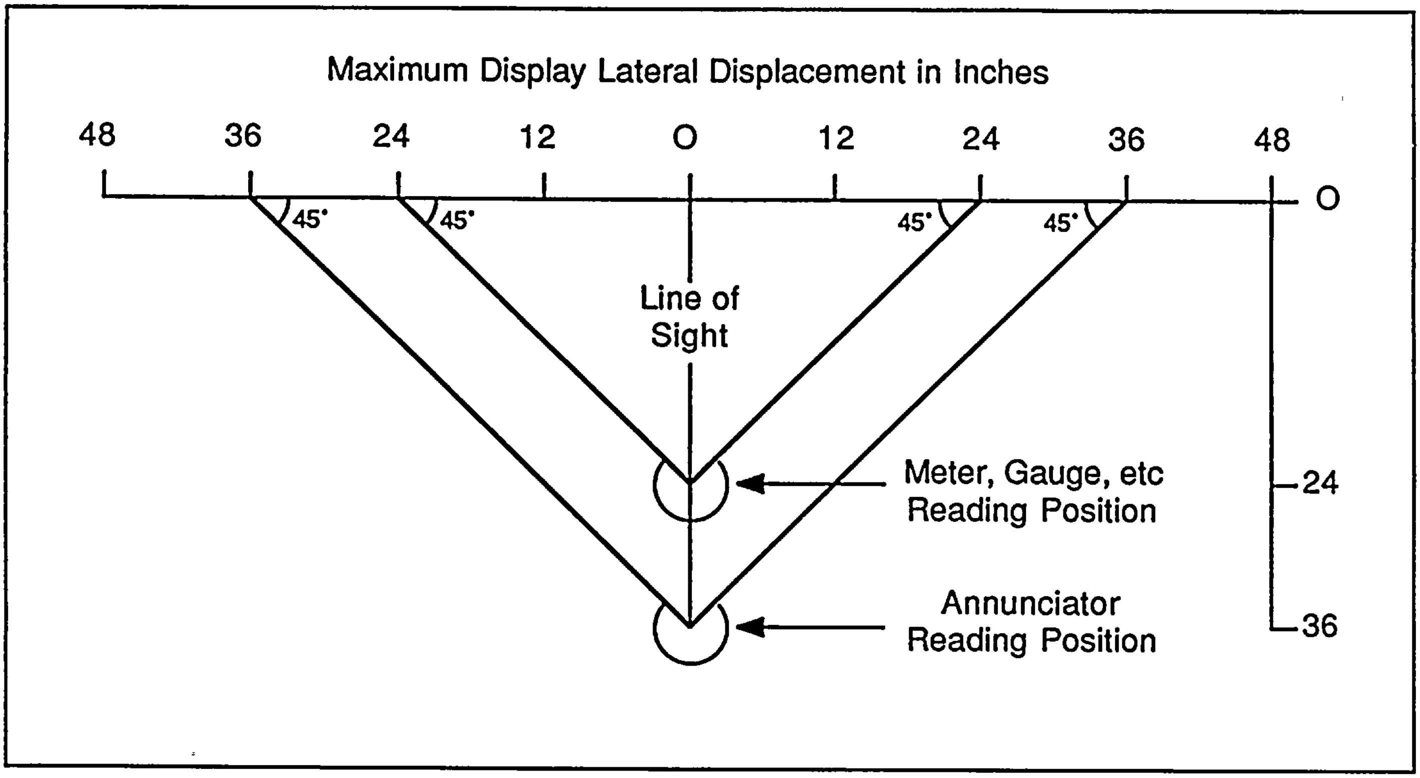


Figure 3-3. Limit on Horizontal Displacement of Displays from Straight-Ahead Line of Sight (LOS) at the Required Reading Position

3.5 Dimensions for Seated Operator

Leg and foot room dimensions and other recommended design measurements for the seated operator are presented in Figure 3-4.

3.6 Other Factors to Consider

Other important considerations for workspace include temperature, humidity, ventilation, air velocity, illumination, glare, reflectance, background noise, reverberation and sound absorption. NMP-2 has undergone a control room review to ensure that the various factors fall within acceptable limits. If, during a control room modification, any of these factors are likely to be affected, NUREG-0700 should be checked to find the acceptable tolerance limits.

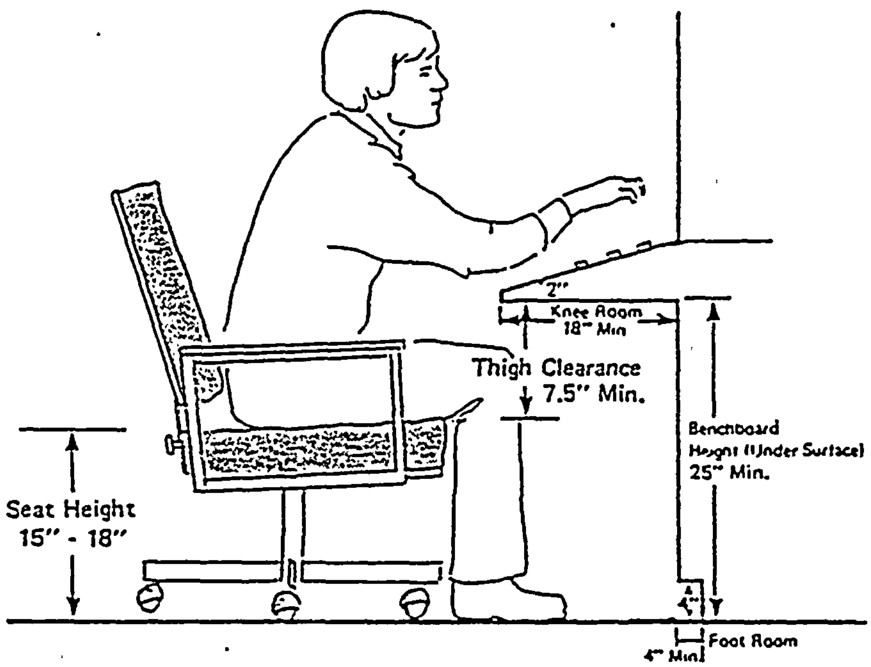


Figure 3-4. Leg and Foot Room Dimensions

4.0 LABELING

4.1 General Characteristics

Proper labeling is essential for equipment identification. Because there are so many controls and displays in the control room, the operators depend on labels for positive identification of components. The character size and style and the materials used to make the labels all affect readability. The labels used in the NMP-2 control room are white lamacoid engraved with black lettering. This presents optimum contrast and the characters are visible when the label is dirty. Any changes to control room labeling should remain consistent with what is presently in the control room. Appendix B lists label size specifications.

The following labeling recommendations should be considered:

1) Labels should describe component function.

2) Multi-pen recorder labels should describe the parameters of each pen.

3) Words should be used which have a commonly accepted meaning for all intended users; unusual terms should be avoided. Words on labels should be concise, yet convey the intended meaning.

4) NMP-2 standard abbreviations and acronyms are provided in Appendices C, D, E, and F. Appendix C is sorted by abbreviation, Appendix D is sorted by definition. Appendices E and F are lists of system numbers and codes. These abbreviations should be used on any labeling, annunciator engraving, computer displays, alarm printers, etc., that are used in the control room. Full spelling is preferred except for those abbreviations listed in Table 4-1, they should be used instead of the full spelling of the word. If it is necessary to abbreviate a term and a choice of abbreviations exists, an abbreviation which is consistent with those currently in place in the associated area, system, or application should be chosen.

Table 4-1. Words That Should Be Abbreviated

Abbreviation	Meaning
BLDG	Building
DIFF	Differential
DISCH	Discharge
HI	High
ISOL	Isolation
LO	Low
PMP	Pump
PRESS	Pressure
STM	Steam
SUCT	Suction
TEMP	Temperature
TK	Tank
VLV	Valve
WTR	Water
XFMR	Transformer

4.2 Label Hierarchy

A hierarchical or system labeling scheme is used at NMP-2 to define systems and discrete panel elements. Each level of system labeling should describe the function of the system or component being labeled. Information presented on system labels may be repeated on component labels if it is essential to component identification and does not clutter the component label. Figure 4-1 illustrates the proper placement of each level of system labeling.

4.3 Component Labels

The information necessary for positive identification of a component should be shown on component labels. NMP-2 has established labeling conventions that should be followed whenever labels are added or modified.

4.3.1 Display Labels

Ensure that the system with which the display is associated is identified either on the component label or with a nearby system label. The component label should specify the parameter being measured (e.g., current, flow, pressure). The units of measurement (e.g., amps, GPM, PSI) should be shown on the display. Ensure that labels for indicator lights are near enough for positive identification. If two sets of indicator lights are associated with a given control, each set of lights should be labeled.

4.3.2 Controls

Ensure that the system with which the control is associated is identified either on the component label or with a nearby system label.

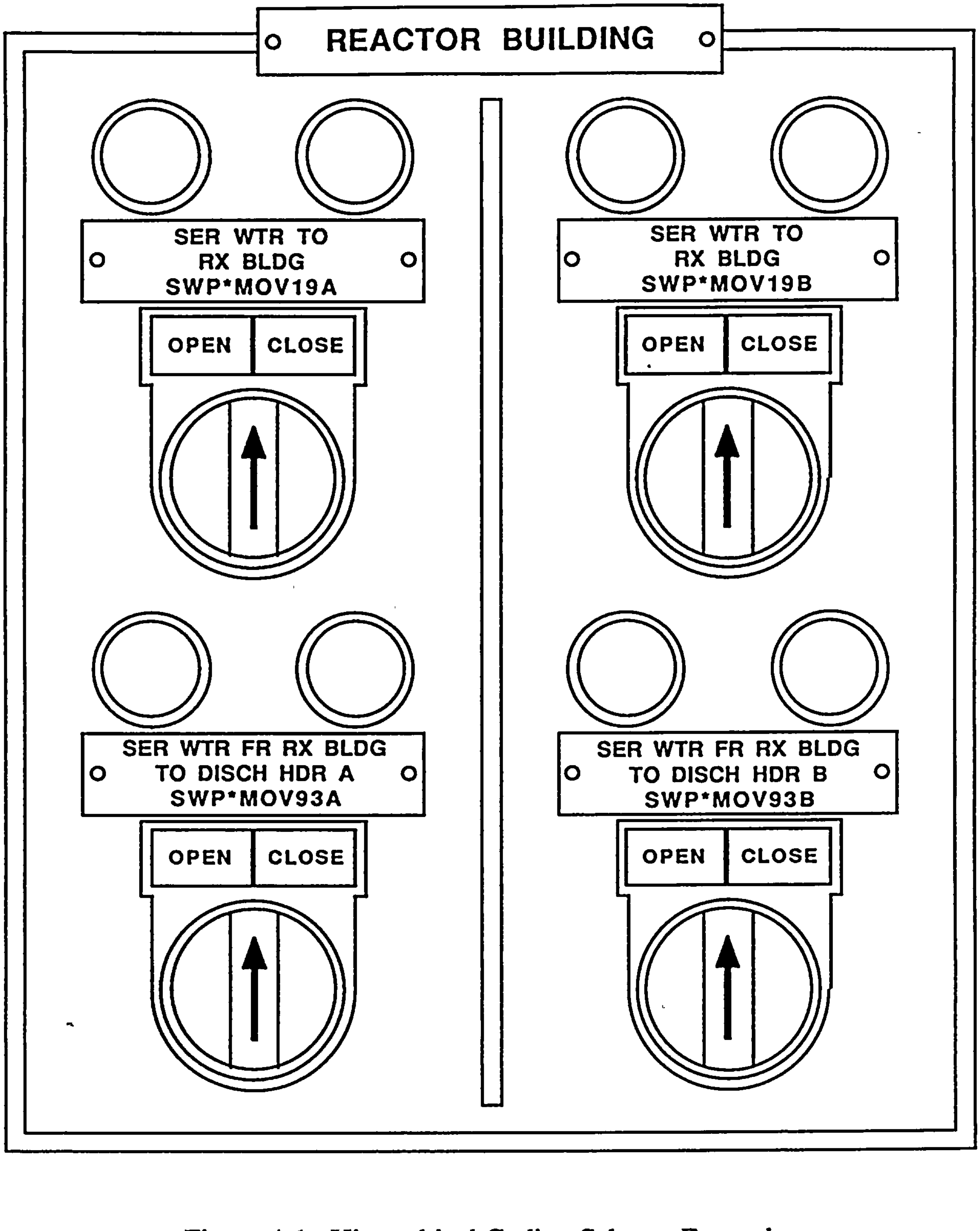


Figure 4-1. Hierarchical Coding Scheme Example.

The NMP-2 convention for valve identification is as follows:

1. Three-letter Stone and Webster system identification code
2. An asterisk to identify safety related components or a hyphen if not safety related
3. An abbreviation to identify the type of valve
4. A valve identification number

An example of proper NMP-2 valve identification is shown in Figure 4-1. Valves with a throttleable capability should be labeled THROTTLE on the last line of the component label.

4.4 Label Specifications

Detailed specifications for the fabrication of system labels, component labels, annunciator tiles, and legend lights/pushbuttons are presented in Appendix B. The appropriate guideline should be used whenever new labels are made.

4.5 Label Placement

System labels should be placed above, and centered over the group of components that they describe. Component labels are to be placed above the component described, with placement and proximity to controls determined by the optimum visibility as shown in Figure 4-2. Placement should also provide sufficient space to allow adequate discrimination from adjacent controls and minimum interference with visibility during adjustment or manipulation of controls. Labels should be placed so that they do not obscure or detract from other information sources.

The following recommendations should be considered:

1) Labels should not appear on the control itself. During adjustment or manipulation, the operator's hand may obscure the label.

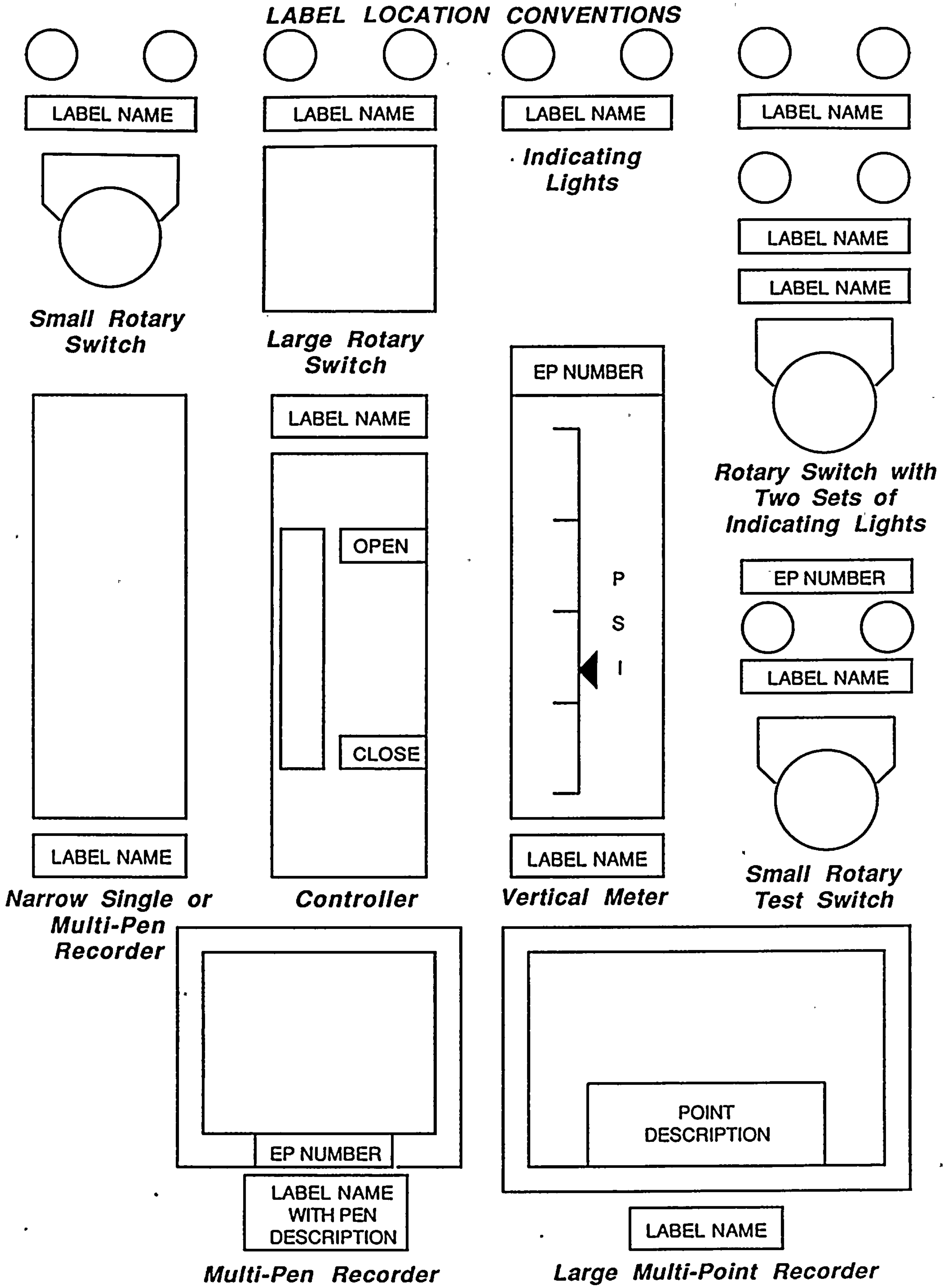


Figure 4-2. Placement of Labels.

2) Adjacent labels should be separated by sufficient space so that they are not read as one continuous label.

3) Labels should be placed below indicators. This convention should be followed except in cases where there are space constraints. Where the indicator or recorder protrudes from the panel and blocks the label during normal operation, the label should be extended out to be flush with the indicator. Consistency within a component area should be maintained, unless not possible.

4) Labels should be placed above controls. This convention should be followed except in cases where there are space constraints or where confusion may occur. Consistency within a component area should be maintained, unless not possible.

5) Labels should be placed so that it is absolutely clear which component they describe.

6) Use horizontally oriented labels.

7) Curved patterns on labels should be avoided.

8) Labels should be mounted to minimize the possibility of accidental detachment.

9) Selected devices and components have an additional label indicating the equipment piece number. This label is used by Instrument and Control personnel or as an additional reference for operators. Placement and legibility of these labels are not critical to immediate operator action. When a device or component has both a GE and a SWEC equipment piece number, use of the GE number is preferred.

4.6 Manufacturers' Names

The names and logos of equipment manufacturers are not recommended to be on the boards but they need not be removed or covered unless they are close to other labels or indicators and may cause distraction when the operator is trying to locate or read instruments.

5.0 CODES AND CONVENTIONS

5.1 Consistency of Use

The effective establishment of a system of codes and conventions depends on consistency of use. This consistency must be maintained when using component and system names on labels, annunciators, procedures, etc. Lists of standard abbreviations are provided in Appendices C, D, E, and F. Color codes should be followed consistently throughout control room design to ensure that the meaning of the codes is understood.

5.2 Color Coding

Color codes are established to provide a consistent use of the colors most suited for a particular application. Color coding of functional relationships can be used to present qualitative information accurately and quickly without requiring the operator to cognitively interpret or relate such information to component or system functions. Color codes can be used to particular advantage in circumstances which require search and location of information. The use of color in the control room may include:

- Locating documents
- Annunciator prioritization
- Relating controls with corresponding displays
- Enhancing layout of multiple controls in a single display
- Indicator zone markings on meters and gauges
- Mimics
- Selected ink colors for pen recorders
- CRT displays

5.3 Color Selection

The following rules should be considered in the selection and use of color and color codes in the control room:

1) The number of colors employed should be kept to a minimum necessary to provide adequate information. Guidelines (NUREG-0700) recommend the use of no more than 11 colors for purposes of coding information. These colors should be selected from those listed in Table 5-1.

2) Consistent use of color should be maintained for indicator lights. Table 5-2 lists the lamp color codes established for NMP-2.

3) Colors should be recognizable in various lighting conditions.

4) To maximize legibility, the color coding should contrast well with the background (Table 5-3).

5) The use of color coding on CRTs provides a higher rate of information processing if done correctly. Selected guides for color coding are given in Table 5-4.

6) Surface color should be visible and recognizable under a variety of normal and emergency conditions.

7) For optimal effectiveness, color codes should represent redundant information. Color should provide a perceptual alerting which meaningfully represents information available in some other form, such as location, orientation, or scale marking.

8) The response benefit inherent in color-coding information depends on the ready discriminability of such codes and the ease with which they can be learned.

Table 5-1. Recommended Colors for Control Room Use (from NUREG-0700)

Color Selection Number	Name	ISCC-NBS Centroid Number	USCC-NBS Name (Abbreviation)	Munsell Renotation ISCC-NBS Centroid Color
1	white	263	white	2.5PB 9.5/0.2
2	black	267	black	N 0.8/
3	yellow	82	v.Y	3.3Y 8.0/14.3
4	purple	218	s.P	6.5P 4.3/9.2
5	orange	48	v.O	4.1YR 6.5/15.0
6	light blue	180	v.l.B	2.7PB 7.9/6.0
7	red	11	v.R	5.0R 3.9/15.4
8	buff	90	gy.Y	4.4Y 7.2/3.8
9	gray	265	med. Gy	3.3GY 5.4/0.1
10	green	139	v.G	3.2G 4.9/11.1
11	purplish pink	247	s.pPk	5.6RP 6.8/9.0
12	blue	178	s.B	2.9PB 4.1/10.4
13	yellowish pink	26	s.yPk	8.4R 7.0/9.5
14	violet	207	s.V	0.2P 3.7/10.1
15	orange yellow	66	v.OY	8.6YR 7.3/15.2
16	purplish red	255	s.pR	7.3RP 4.4/11.4
17	greenish yellow	97	v.gY	9.1Y 8.2/12.0
18	reddish brown	40	s.rBr	0.3YR 3.1/9.9
19	yellow green	115	v.YG	5.4GY 6.8/11.2
20	yellowish brown	75	deep yBr	8.8YR 3.1/5.0
21	reddish orange	34	v.rO	9.8R 5.4/14.5
22	olive green	126	d.OlG	8.0GY 2.2/3.6

Listed are 22 colors of maximum contrast. Each successive color has been selected so that it will contrast maximally with the color just preceding it and satisfactorily with earlier colors in the list. The first 9 colors have been selected to yield satisfactory contrast for red-green-deficient as well as color-normal observers. The remaining 13 colors are useful only for color-normal observers.

Table 5-2. Indicator Lamp Colors and Meaning

THREE LIGHT CONFIGURATION

COLOR			FUNCTION
Green	Blue	Red	
Off Tap	PGCC Controlled	On Tap	Load Tap Changers
Pump Off	PGCC Controlled	Pump Running	Turb Gen Lift Pumps
Green	Amber	Red	
Closed	Ckt Seal-In	Open	LPSI Inject MOVs
Closed	Man Override	Open	HPCS Suct MOVs
Stop	Trip/Reset	Running	Standby Liquid Pumps

TWO LIGHT CONFIGRUATION

COLOR		FUNCTION
Green	Red	
Closed	Open	Various Valves
Closed	Modulate	Various Valves
Closed	Override	Various Valves
Jog Closed	Jog Open	Various Valves
Off	On	Pumps/Motors
Off	Operate	Pumps/Motors
Off	Override	Pumps/Motors
Off	Fan	Pumps/Motors
Stop	Start	Pumps/Motors
Stop	Auto	Pumps/Motors
Stop	Open	Pumps/Motors
Run	Maintain	Pumps/Motors
Manual	Auto	Pumps/Motors
Slow	Fast	Pumps/Motors
Normal	Smoke Rmvl	Pumps/Motors
Trip	Closed	Breakers/Controls
Isolate	Reset	Breakers/Controls
Open	Closed	Breakers/Controls
Reset	Override	Breakers/Controls

Table 5-2. Indicator Lamp Colors and Meanings (cont't)

ONE LIGHT CONFIGURATION

-COLOR/MEANING-	--COMPONENT--
<u>Blue</u>	
Ckt Seal-In	Turb Turning Gear
H_2 Press Alert	H_2 Analyzer
Total Flow	Svce Wtr Hdr Flow
<u>White</u>	
Seal-In/Reset	HPCS Man Init
Seal-In/Reset	High Wtr Lvl
Seal-In/Reset	RCIC Isol Div 1
Seal-In/Reset	RCIC Isol Div 2
Reset	LPCI-A/LPCS
Bypass	Flux Estimator
Failure	Flux Estimator
Needs Maint	Flux Estimator
Ready	H_2 Recombiner
Start-Up	H_2 Recombiner
Operate	H_2 Recombiner
Ready	Squib Valve
Init/Disable	ADS Auto Mode
Energized	Scram Vlv Solenoid
Off-Normal	Contmt Isol Status
<u>Amber</u>	
Ckt Monitor	Station Battery
Position Ind	Auto/Man Volt Adjust
Man Override	RED Rx Cont Sys
Trip/Reset	Feedwtr/Rx Lvl
Inoperability	Various Equip

Table 5-3. Relative Legibility of Color Combinations (from NUREG-0700).

Legibility Rating	Color Combination
Very Good	Black letters on white background
Good	Black on yellow Dark blue on white Grass green on white
Fair	Red on white Red on yellow White on black
Poor	Green on red Red on green Orange on black Orange on white

Table 5-4. General Characteristics of Colors Used in CRT Displays (from NUREG-0700)

COLOR	APPLICATION
Red	Good attention-getting color, associated with danger
Yellow (amber)	Good attention-getting color, associated with caution
Green	Non-attention getting color, easy on the eyes; associated with satisfactory conditions
Black	Normally used as the background color; i.e., the color of blank character spaces. Also used as the action character when reverse field coding is employed
White	Non-attention getting color, It should be used for standard alphanumeric text or tables where the information is contained in the characters and not the color. Might also be used for labels, coordinate axes, dividing lines, demarcation brackets, etc.
Cyan (light blue)	(Same as white) Might be used in conjunction with white to provide some amount of noncritical discrimination (e.g., use cyan for tabular column headings and demarcation lines; use white for alphanumeric text)
Blue (dark)	Poor contrast with dark background, not recommended for attention-getting purposes or for information-bearing data. Use for labels and other advisory type messages
Magenta	A harsh color to the eye, should be used sparingly and for attention-getting purposes
Orange	Good attention-getting color, care must be taken that hue is selected to be readily differentiable from red, yellow, and white

5.4 SPDS Color Conventions

Color coding is used consistently throughout the SPDS displays to indicate parameter status. The SPDS color coding is consistent with color coding used throughout the control room. The color coding conventions used are in accordance with the guidelines in NUREG-0700, Sections 6.5.1.6 and 6.7.2.7. The following describes how each of the SPDS colors are used:

1) Cyan is used for display titles, the outline of the plant mimic, plant mimic labels, borders for Safety Function Status Indicators, borders for trend graphs, and borders of boxes containing parameter status information that is not associated with setpoint information. Cyan is a neutral color, it has no coding significance.

2) White has the following applications:
   - Date and time
   - Labels for those parameters that are not associated with Safety Function Status Indicators
   - Trend graph horizontal axis time values, vertical axis parameter values, and shading for the entire area below the trend line
   - To indicate that parameter values and status indications are valid
   - Parameter labels displayed in inverse-video white with black letters indicate that the parameter input has failed. The word FAIL appears in white below these labels.

3) Green indicates a normal condition, that is, the computed value does not exceed any specified high or low limit setpoint. Green is used in the following applications:
   - Parameter labels displayed in inverse-video green with black letters indicate that the parameter is in a normal condition.
   - Safety Function Status Indicators on the bottom of the screen are green when all parameters associated with that display are in a normal condition.

4) <u>Yellow</u> indicates an abnormal condition, that is, the computed value exceeds a specified high or low limit setpoint but does not exceed a specified high-high or low-low limit setpoint. Yellow is used in the following applications:

- Parameter labels displayed in inverse-video yellow with black letters indicate that the parameter is in an abnormal condition.
- Safety Function Status Indicators on the bottom of the screen are yellow when at least one parameter associated with that display are in an abnormal condition.
- High or low limit setpoint value on vertical axis of trend graph

5) <u>Red</u> indicates an alert or alarm condition, that is, the computed value exceeds a specified high-high or low-low limit setpoint. Red is used in the following applications:

- Parameter labels displayed in inverse-video red with black letters indicate that the parameter is in an alert or alarm condition.
- Safety Function Status Indicators on the bottom of the screen are red when at least one parameter associated with that display is in an alert or alarm condition.
- High-high or low-low limit setpoint value on vertical axis of trend graph

6) <u>Magenta</u> indicates a questionable parameter value, it does not meet specified validation criteria. If a value is magenta the parameter label is still green, yellow, or red to indicate that the questionable value is within the normal, abnormal, or alarm range. The selected mode of operation indication is magenta when various related parameters are not within specified ranges for the selected mode.

6.0 MIMICS AND PANEL DEMARCATION

6.1 <u>Mimics</u>

Mimics are graphic representations of a system or process. These serve to aid the operator in understanding system flow path and valve status. Specifications for mimic design are listed in Table 6-1. Color codes used on the NMP-2 mimics are shown in Table 6-2.

6.1.1 RHR and HPCS Mimics

On these mimics, color is used to show flow path as a function of operational mode.. For a particular mode of operation, a particular color shows the flow path for that mode. Two different colors may be used to denote the same material flow.

6.1.2 SLC, Main Steam, and Nuclear Water Cleanup Mimics

Each color in these mimics is used to show the flow of a particular material through the system.

6.1.3 Primary Containment Mimic

The primary containment mimic shows the flow paths and valve designations to and from primary containment. Color is used to show system flow. The legend indicator lights illuminate to indicate off-normal status.

Table 6-1. Mimic Specifications

Line width	1/4"
Color	Follow color codes (Table 6-2) for specific systems.
Arrows	Should be engraved and filled with white plastic. The engraving is for permanence of the markings and the filling keeps the engraving from being obscured by dirt. Arrows showing direction of flow should be spaced every 5 inches and within 2 inches of junctions and terminations.
Cross-overs	Where mimic lines cross, but the pipes or wires represented do not have a junction; spacing between the continuous line and the discontinuous line should be between 50% and 80% of the width of the mimic line (Figure 6-1).
Symbols	Symbols used in mimics should duplicate P&ID symbols as closely as possible.
Termination	All terminations should be labeled, whether representing the beginning or end of a flow path. The termination can be labeled with an engraved symbol such as a tank, pump, or generator symbol. If the mimic terminates at a control or display, the component label should describe the flow termination or a separate label or symbol should be provided for this purpose.

Table 6-2.
Mimic Color Code

	601					602				824		852		873					875	
	RHR/LPCS	RCIC	HPCS	SLC		OFF NORM	RCS	RWCU		DRAINS		ELEC SYS		DW DRAINS	DW CLG	CMS	HCS		CMS	HCS
SPECTRUM RED - 845						■														
SCARLET (1)	■									■										
SPECTRUM VIOLET - 896						■														
BITTERSWEET (2)										■										
MONET LAVENDER - 863						■														
PERSIMMON (3)										■		■								
FIESTA BISQUE - 857						■														
TAHITI ORANGE (4)	■									■										
SPECTRUM ORANGE - 889						■														
BRICK ORANGE - 841												■								
SPECTRUM YELLOW - 940						■														
LEMON TWIST (5)	■																			
APPLE JACK - 944						■														
SLICED AVACADO (6)										■										
ISLE GREEN - 883						■														
GAELIC GREEN (7)	■																			
LICHEN - 870						■														
SPECTRUM GREEN - 897						■														
FRENCH BLUE (8)	■	■	■							■		■								
SPECTRUM BLUE - 851						■														
CAMELOT BLUE (9)												■								
CHINA BLUE - 884						■														
BANNER BLUE (10)		■	■	■			■	■						■	■	■	■		■	■
BUTTERSCOTCH (11)										■		■								
GINGER BROWN - 906	■					■														
TERRA COTTA - 903						■														
COFFEE BEAN - 959	■	■	■																	
ADOBE GOLD (12)																				
SAND - 900		■	■			■														
JUBILEE - 892						■														
CREAM (13)										■										
WHITE - 949	■		■			■						■								
BLACK - 909										■		■								
CORAL - 442																				
DUSTY JADE - 879																				
PARAKEET - 873																				
WHEAT - 891																				

FOOTNOTES: REFLECTS MANUFACTURER'S DISCONTINUED MATERIAL TO BE REPLACED WITH THE FOLLOWING ENGINEERING APPROVED EQUIVALENTS FOR NEW APPLICATIONS:

(1) SPECTRUM RED - 845 (2) BRICK ORANGE - 841 (3) CORAL - 442 (4) SPECTRUM ORANGE - 889 (5) SPECTRUM YELLOW - 940 (6) DUSTY JADE - 879 (7) ISLE GREEN - 883 (8) CHINA BLUE - 884 (9) PARAKEET - 873 (10) SPECTRUM BLUE - 851 (11) SAND - 900 (12) APPLE JACK - 994 (13) WHEAT - 891

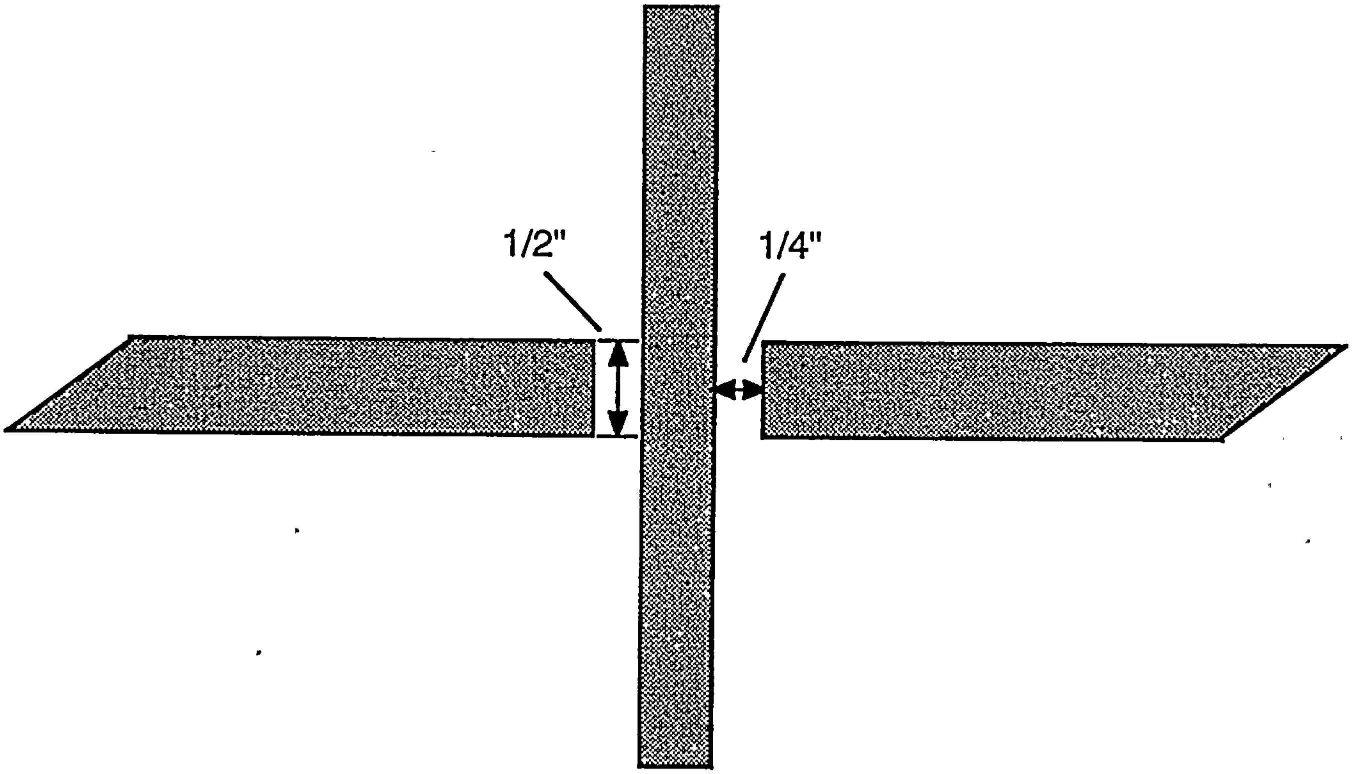


Figure 6-1. Mimic Dimensions for Cross-Overs

6.1.4 Electrical Mimic

The electrical mimic shows the distribution of various station voltages. Each station voltage is designated by a different color.

6.2 Demarcation Lines

Demarcation lines are placed on the control panels to distinguish separate operational systems and subsystems. Demarcation lines facilitate the location of components because they break large control panels into smaller groups of functionally related components. They should be used to separate systems, subsystems, and component groupings where physical space or panel edges do not already visually set apart the related components. Demarcation lines should be black. The width of demarcation lines should be as follows:

1/2 inch wide - Outline system area
1/4 inch wide - Define functions within a system
1/8 inch wide - Redundancy pattern within a function; additional definition within a function

6.3 Background Shading

Background shading is a form of demarcation that is used to highlight selected instruments or controls. Trim plates are used in the NMP-2 control room to draw attention to certain components such as the annunciator controls and post accident monitors. Small trim plates are placed behind the component labels (such as ADS Safety/Relief Valves) to highlight certain components in a group of similar components. The color convention for background shading is as follows:

- Red - Critical controls; post accident monitors
- Blue - Highlight components not part of a particular system (such as annunciator controls)
- Black - Selector switches; CMS sample path

7.0 ANNUNCIATORS

7.1 Annunciator Warning Systems

Annunciator warning systems consist of an audible alarm and a lighted legend tile display. Whenever changes are made to an annunciator, the human factors concerns for the legend tile message, location and engraving should be examined.

7.2 Legend Tile Displays

The legend tile displays inform the operator of a specific event that has occurred, or that a critical setpoint has been exceeded. The design of legend messages should facilitate rapid and accurate interpretation of the alarm condition by the operators. Common inadequacies of annunciator tile legend displays that tend to degrade the presentation of information to operators include:

- Inaccurate content
- Inconsistent legend formats, abbreviations and nomenclature
- Inadequate quality of lettering
- Inconsistent coding schemes
- Disagreement between indicated and actual setpoint
- Inadequate functional grouping of tiles

7.2.1 Legend Content

Annunciator tiles should provide a short concise message, using consistent format, abbreviations and nomenclature. The tile legend messages are designed hierarchically as shown in Table 7-1.

Table 7-1. Annunciator Tile Wording Hierarchy

Line	Message	Examples
1	System or division affected	RCIC, LOAD CENTER, DIVISION II
2/3	Specifics about equipment and/or conditions	PUMP 1, ISOL VALVE, DIFF TEMP
3/4 (last)	Alarm cause or fault	HIGH, HI-HI, TRIP

7.2.2 Multiple Input Tiles

Where tile legends indicate more than one condition (e.g., A or B, HIGH or LOW), the tile wording should clearly indicate to the operators that multiple inputs exist for the alarm. The NMP-2 convention is to place slash marks (/) between the multiple input items (e.g., A/B, HIGH/LOW). In addition, the computer inputs for these alarms are designed so that when a multiple alarm is annunciated, only the input causing the alarm will be highlighted on the computer alarm feedback.

7.2.3 Annunciator Tile Groupings

Human factors concerns regarding the placement of annunciator tiles should be examined whenever annunciator tiles are added or moved. This entails a review of both the location of the tile by box, and the location of the tile within each box. The basis for location of each tile is dependent on the system/equipment cited and the severity (nature) of the alarm.

Whenever possible, tiles are grouped on annunciator boxes according to the systems represented by the controls and displays grouped on the panel beneath each box. Tiles within each box are grouped by system and/or equipment (e.g., all generator emergency oil seal alarms in one area on the box, all turbine lift pump alarms in another area). The most serious alarms are placed at the top of the box, or the top of the appropriate system alarm set. The resulting pattern proceeds vertically from the least serious alarms at the bottom of the panel to the most serious alarms at the top of the panel.

7.2.4 Numbering Scheme

Each annunciator tile has an identification number permanently engraved in the lower left corner. This number corresponds with the identification numbers located on plant documentation (drawings, procedures, etc.).

The numbering system used gives each annunciator box on each panel a 100 series number. For example, panel 603 has four annunciator boxes; therefore, there will be a 100 Box, 200 Box, 300 Box and 400 Box.

Each tile within each box is given a sequential number starting with the hundred series number plus one (e.g., 101, 201, 301). This number is referenced, along with the panel number, in the NMP-2 procedures.

7.2.5 Letter Style and Size

Annunciator tile specifications are shown in Appendix B. The annunciator tiles are 2.8125" wide. The tile height is 2.625". A maximum of 13 characters per line is allowed. The engraving font is to be Condensed Standard (also known as Condensed Gothic). The character height is 0.25" with a maximum width of 0.25". The distance between letters is 0.036", or one stroke width. The distance between legend words is one letter width. The distance between legend lines is 0.125".

The type style is simple and consistent, using only uppercase letters. The legends are engraved with black lettering on a white background. The background material has a dull white finish to minimize glare effects.

Four legend lines are permitted on an individual tile. Two-line legends are engraved on the second and third lines of the tile. Three-line legends are engraved on the first, second and third lines.

7.2.6 Color Coding

Color coding is used to distinguish annunciator tiles. Red and amber annunciator tiles have a red or amber border around the legend and are backlit the appropriate color. The following color codes are used to identify annunciator tiles:

RED	Annunciator tiles which provide Engineered Safeguard Feature/reactor protection signal information in the event of a scram
AMBER	Annunciator tiles which indicate an inoperable condition
WHITE	Annunciator tiles which indicate an off-normal condition

8.0 SWITCHES AND PUSHBUTTONS

8.1 Escutcheon Format

Rotary switches should have escutcheons (switch position labels) with white letters on a black background. To minimize operator error, control movements should conform to the population stereotypes listed in Table 8-1. Some rules for the rotational order of switch positions are as follows:

1) Proceed left-to-right from lowest state to highest state.

   Example: OFF LOW HIGH

2) Avoid passing through conflicting states to go from one state to another.

   Examples: CLOSE OPEN TEST
   FAN 1A OFF FAN 1B

3) To designate valves, "CLOSE" will be to the left and "OPEN" to the right. To designate breakers, "TRIP" is to the left and "CLOSE" is to the right. To designate motor operated disconnect switches, "OPEN" is to the left and "CLOSE" is to the right.

4) Proceed left-to-right from lowest number to highest, or alphabetically.

   Examples: CH.1 CH.2 CH.3
   1A 1B 1C
   LOOP A LOOP B

Table 8-1. Direction of Switch Movement

In general, to minimize operator error, control movements should conform to the following population stereotypes (for U.S. population only):

Function	Possible Control Actions
On, Start, Run, Open	Up, right, forward, clockwise, pull
Off, Stop, Close	Down, left, backward, counterclockwise, push
Right	Clockwise, right
Left	Counterclockwise, left
Raise	Up
Lower	Down
Increase	Forward, up, right, clockwise
Decrease	Backward, down, left, counterclockwise

5) For seldom used combinations, try to apply these rules along with consideration of what would be logical for operation and meet safety constraints (both for equipment and tech specs).

8.2 Moving Pointer, Fixed-Scale Switches

1) When space around the switch permits, words or numerals should be placed horizontally around the switch as shown in Figure 8-1.

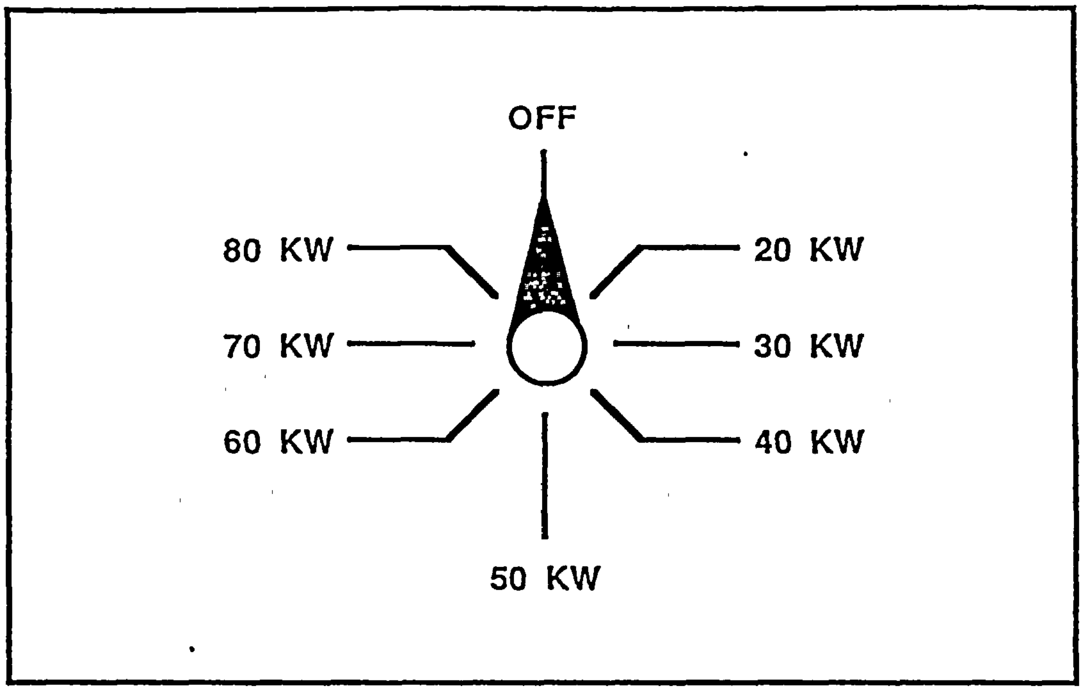


Figure 8-1. Rotary Switch Position Orientation.

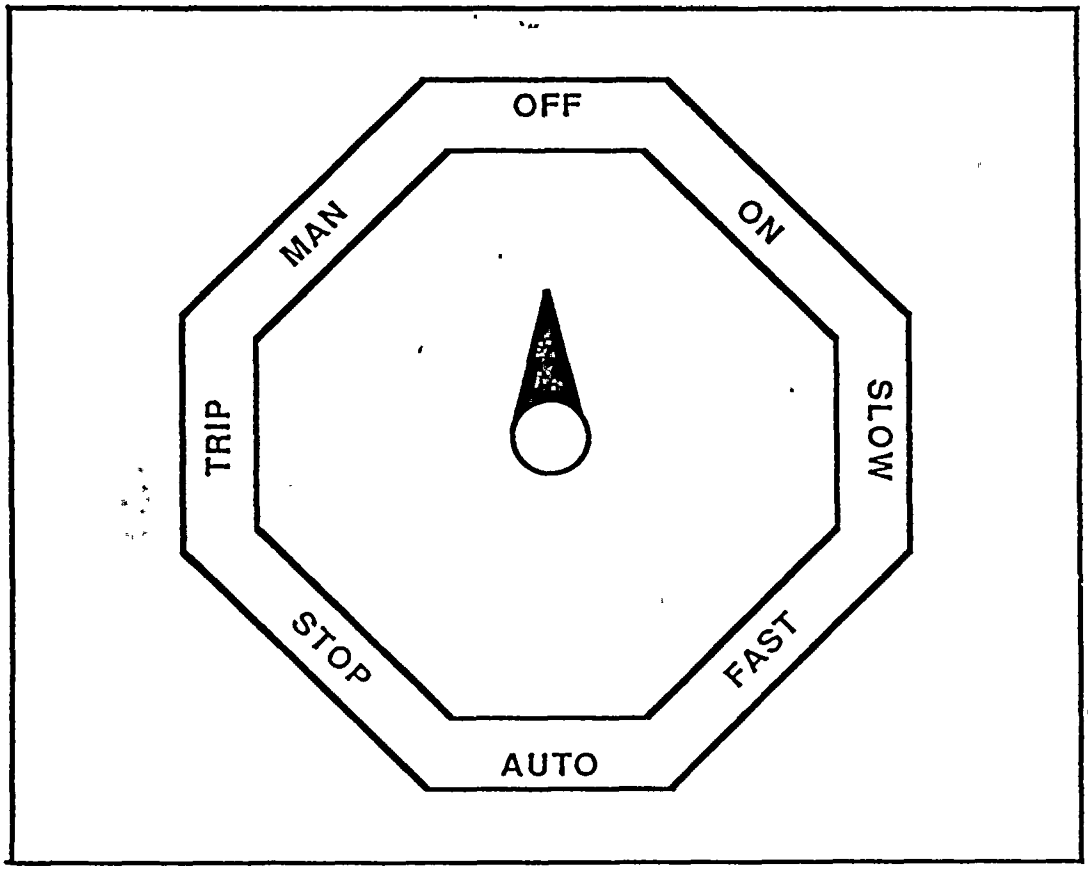


Figure 8-2. Rotary Switch Position Orientation.

2) For molded plastic switches where the switch position designations are an integral part of the switch, designations should be placed so that the tops of the letters and/or numbers face outward from the 9 o'clock position around to the 3 o'clock position and the bottoms of letters facing outward from the 4 o'clock to 8 o'clock position as shown in Figure 8-2.

8.3 Control Handle Type

The conventions for the type of control switch to be used for a certain function are listed in Table 8-2. Consistency of control switch type within groups should be maintained to establish plant standardization. Controls that perform similar functions by similar control actions should have the same control switch type. Controls that are different from others near it, either in function or switch action should have a distinguishing control switch type.

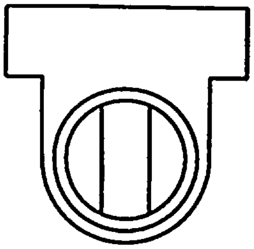
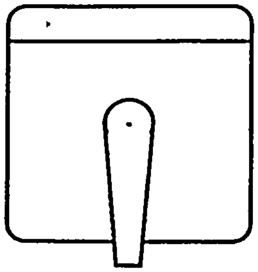
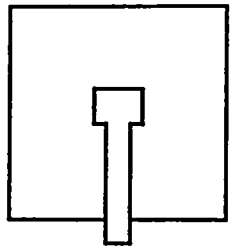
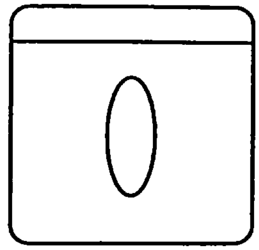
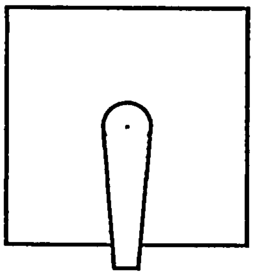
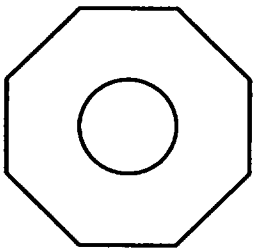
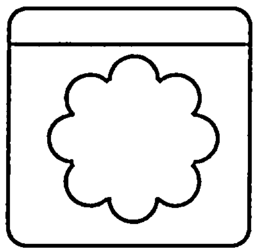
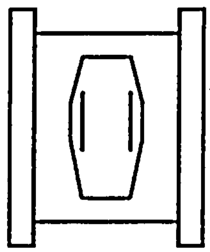
8.4 Pushbutton Switches

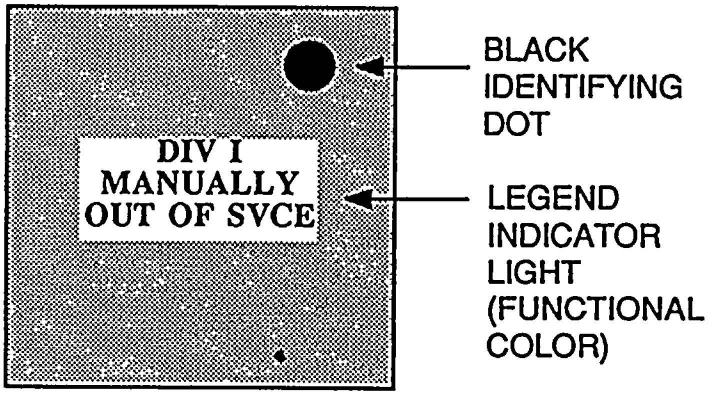
Pushbutton switches should follow conventions for color code and switch position identification. Specifications for engraving pushbutton legend/lights are presented in Appendix B. Pushbutton legend lights are discriminated from indicator lights (with only a push-to-test function) by placing a black dot in the upper right corner of the pushbutton as shown in Figure 8-3.

8.5 Key Operated Switches

When installing a key operated switch, the switch is to be oriented such that the key will be inserted into the lock with the teeth pointing up or forward. When installing a switch operated by a key with teeth on both edges, the key should fit the lock with either row of teeth pointing up or forward.

Table 8-2. Control Switch Type.

CONTROL SWITCH TYPE			
 **G.E. CR2940** **SELECTOR KNOB** MOV AOV SOV FLOW V LEVEL V HCV WTR V STM V BYPASS V TEMP V MOG MOD AOD PUMP FAN TEST BYPASS RESET ISOL CH SELECT CKT INIT OVERRIDE VOLT REG CKT SWITCH H2 ANAL H2 RECOMB	 **G.E. SBM** **PISTOL GRIP** PUMP BRKR INTERLOCK FAN GOVERNOR COMPRESSOR MAN/AUTO VOLT REG MOV LVL SELECT	 **ELECTRO SW-20K** **PISTOL GRIP** PUMP UNIT COOLER FAN MOV AOV WTR V	 **G.E. SBI** **OVAL KNOB** TEMP SELECT COMP SELECT SEAL IN/INTER LOAD TAP CHANGER
 **RUNDELL** **PISTOL GRIP** REACTOR MODE	 **SQUARE-D** **JOYSTICK** BYPASS	 **G.E. SBM** **KNURLED KNOB** VOLTMETER SWITCH SELECTOR SWITCH	 **ELECTRO SW** **CAM ACTUATED** CMS SAMPLE PATH SELECT



SEE APPENDIX B FOR ENGRAVING SPECIFICATIONS

Figure 8-3. Pushbutton/Legend Indicator Light Discriminiation Convention

9.0 METER SCALES AND LEGENDS

9.1 Display Characteristics

Whenever a meter or recorder is changed, the human factors considerations of the new or changed instrument should be examined. The location of the instrument, the appropriateness of the scale, and the legend on the display should be reviewed to ensure that the instrument serves all operational needs.

9.2 Meter and Recorder Legends

Legends identifying meters and recorders should display units of measurement information and scale multiplier, if applicable.

9.3 Meter and Recorder Scales

Consistent meter scales aid in obtaining quick, accurate value readings. Figure 9-1 shows examples of some acceptable meter and recorder scales. The following should be considered in the design of meter and recorder scales:

1) Range of scale is adequate for its use under all operational conditions

2) Scale divisions provide an appropriate level of accuracy

3) Numerical progressions are by 1, 2, or 5, or some multiple of 10 of these numbers

4) Unit graduations are appropriate for numerical progression and scale divisions.

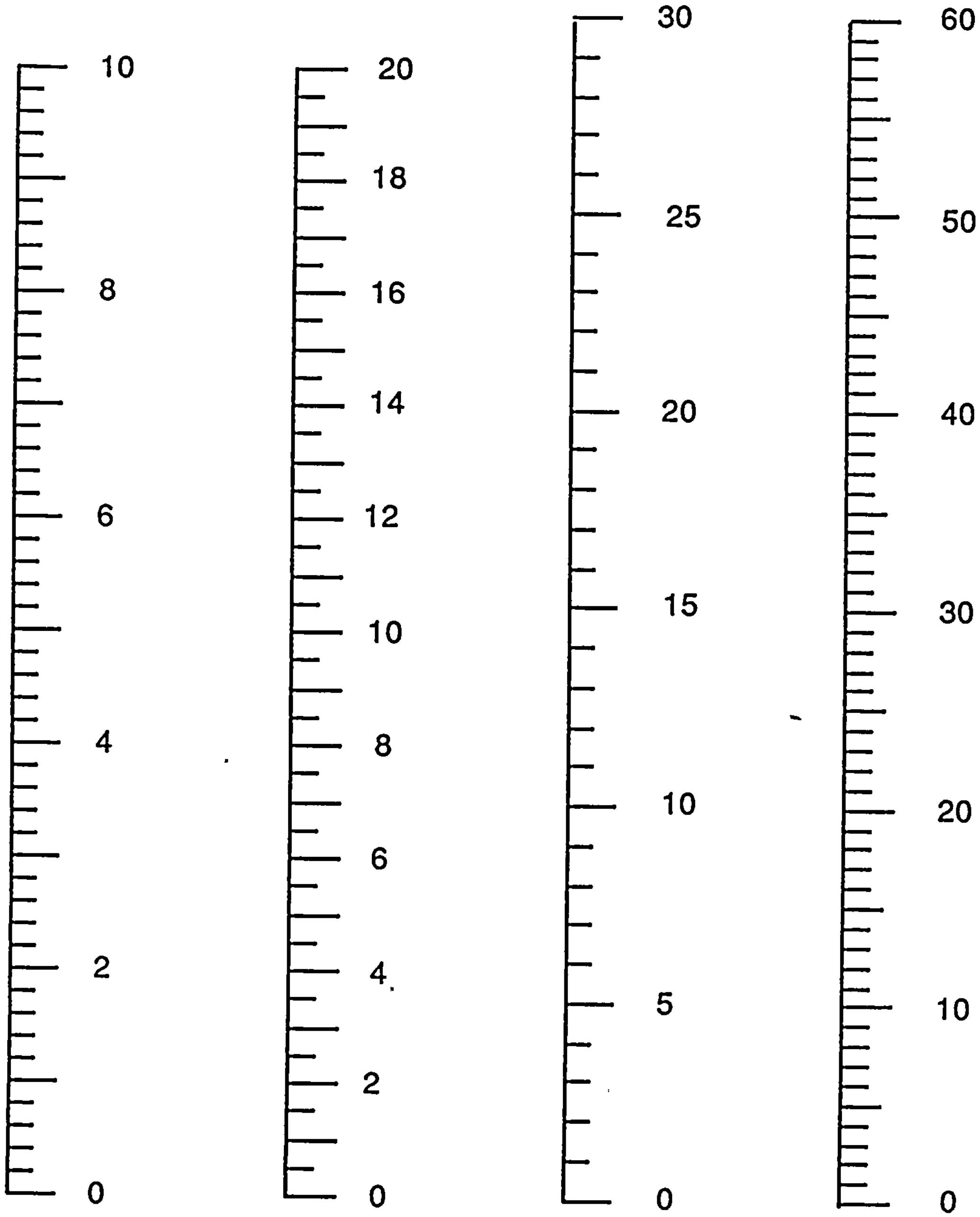


Figure 9-1. Examples of Appropriate Meter Scales

5) No more than nine graduation marks should be used between two numbered marks.

6) Minimum separation between graduation marks should be .05 inch.

7) Letter and number character height should be at least 0.104 inches, with 0.15 inches preferred.

8) Certain control room meters have corresponding meters on the Remote Shutdown Panel. Whenever possible, scales on the Remote Shutdown Panel should be identical to the corresponding scale in the control room.

9.4 Indicator Zone Banding

Indicator zone banding is the marking of a meter with a color zone to show the operational status of various values. Zone banding of meters can enhance operator performance in the monitoring of trends, direction and rates of change. Zone banding should not interfere with visibility of the display pointer, graduations, or numerals. Figure 9-2 shows examples of zone banding. Table 9-1 lists the materials and colors used for zone banding. Zone banding should be applied to the meter surface and not the glass or plastic casing. A black and white cross-hatch zone band may also used in the NMP-2 control room. The black and white cross-hatched zone(s) of the scale signifies that the indicator cannot provide an accurate reading at that range of values. This is sometimes used at the top or bottom of scales to show the maximum range but also indicate that the scale does not measure accurately at the extreme end. This may be the case when a 0-100 foot scale is used to represent the level of a 96 foot tank. The area above 96 feet is meaningless and thus cross-hatched. Due to instrument tap constraints, the lowest useable level may be 8 feet; the scale below 8 feet is cross-hatched also.

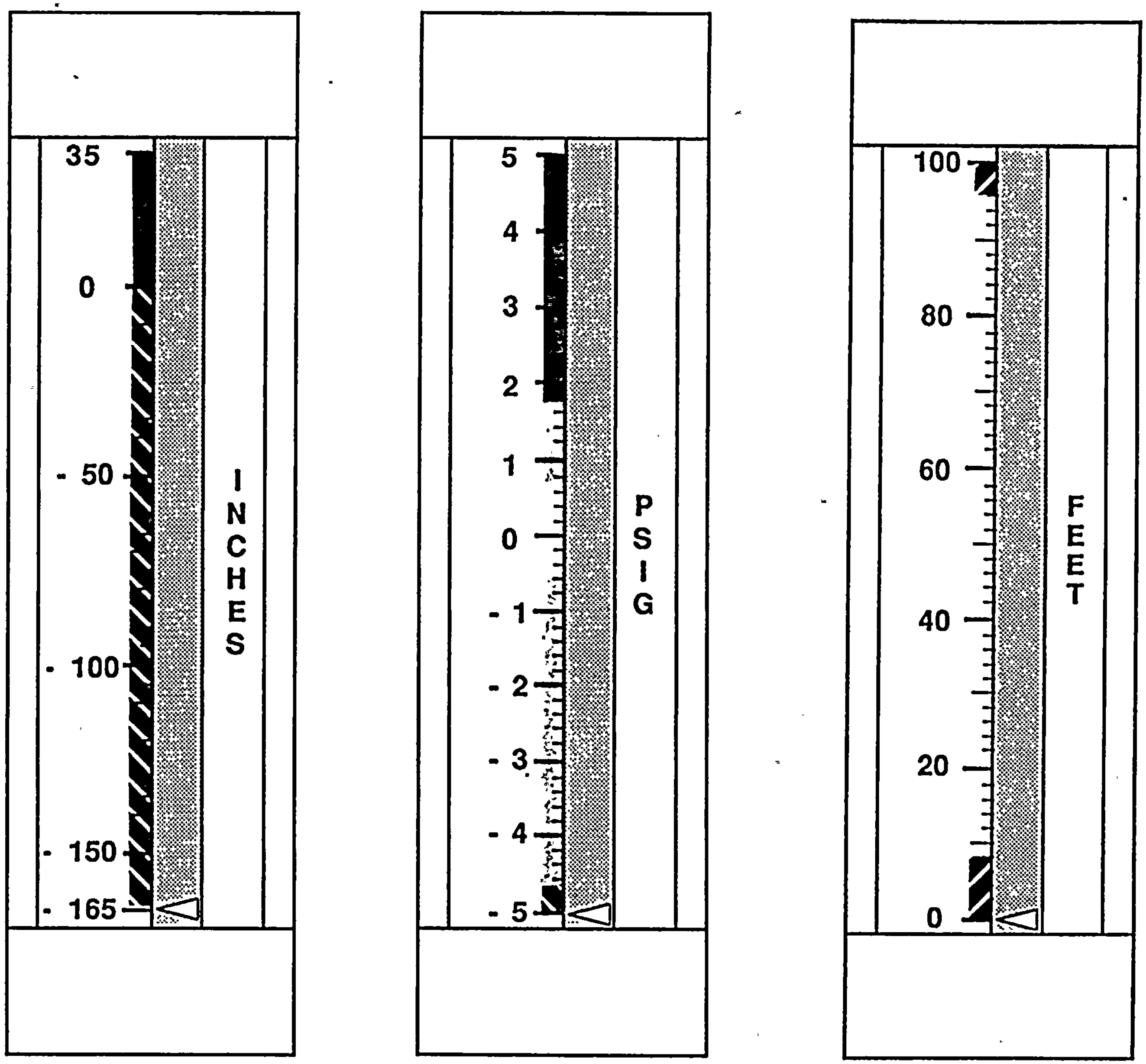


Figure 9-2. Examples of Meter Zone Banding

Table 9-1. Zone Banding Color Guidelines

COLOR	MEANING
Yellow Painted or Formaline[R] gloss model 2574C*	Alarm setpoint or tech spec operational limit has been exceeded.
Red Painted or Formaline[R] gloss model 2514C*	Trip or actuation point has been exceeded.
Red and White Cross-hatch Painted or Formaline[R] matte model 4414E*	Design limit has been exceeded.
Black and White Cross-hatch Painted or Formaline[R] matte model 3404E*	Indicator cannot provide an accurate reading at that range of values.

*Or engineering equivalent

10.0 PROCEDURES

10.1 General Characteristics

Any addition or modification to control room procedures affects how the operators interact with the control room. The capability of the operator to efficiently perform the procedure must be considered when any procedure change is proposed. If the new or modified procedure will be performed using existing control room equipment, this section of the Human Factors Design Manual will provide guidance in the preparation of the procedure. A checklist is provided in Section 10.5 that should be completed to technically and administratively ensure that all human factors concerns have been satisfied. If the change to the procedure includes the addition of new control room equipment, human factors considerations should be applied to the design of the new equipment.

10.2 Displays

Whenever the procedure addition or change requires the operator to monitor any display or annunciator, the human factors considerations of that display should be examined.

10.2.1 Display Location

Ensure that the location of the affected display is appropriate to its use in the procedure. If a display or annunciator must be monitored in conjunction with a control or another display, it should be located close enough to view the display without difficulty.

10.2.2 Meters and Recorders

The characteristics of the affected display instrument should be examined to ensure that it can provide the required information. The following parameters should be examined:

- Type of Display - The display specified in the procedure should provide the appropriate type of information. For example, if trend information is required, the specified instrument should be a recorder.

- Units - The instrument specified in the procedures should measure the parameter in the same units as those specified in the procedure.

- Range - The range of the specified instrument should be adequate to meet the operational requirements of the procedures.

- Divisions - The instrument specified in the procedure should measure the required parameter in divisions appropriate to this task.

10.2.3 Indicator Lights

When the procedure addition or change refers to an indicator light, the characteristics of that light should be examined. The following parameters should be considered:

- Legend Lights - The procedure should use the same nomenclature as that used on the legend light.

- Color Conventions - The color indication described in the procedure should be consistent with the plant color conventions established in this manual.

10.3 Controls

Whenever the procedure change or addition requires the operator to operate a control, the human factors considerations of that control should be examined.

10.3.1 Control Location

Ensure that the location of the affected control is appropriate to its use in the procedure. If a control must be operated in conjunction with another control or a display, the control should be close enough to the associated control(s) or display(s) without causing operational difficulty.

10.3.2 Switch Action

The switch action of the control must be appropriate for the affected procedure step. Some switch-action factors that should be considered when adding or modifying procedures include:

- Throttle/Seal-in - Ensure that the control specified in the procedure step has the proper throttle or seal-in function for the task.

- Auto Function - If the procedure step calls for a control with an automatic function, ensure that the specified control has the appropriate functions.

- Control Position Indication - Ensure that the specified control has all of the control positions specified in the procedure. If the procedure requires that the operator verify a control position target, ensure that the control has the appropriate target.

10.4 Procedure Nomenclature

Nomenclature used when writing procedures should be identical to that used on the control panels. The following human factors concerns with nomenclature should be considered when procedures are added or modified:

- Label Nomenclature - Use the same nomenclature in procedures that is used on component labels.

- Switch Position Nomenclature - Ensure that the switch movement instructions are consistent with escutcheon plate nomenclature of the control.

- Action Description - Procedures should describe control operations in a manner consistent with the nomenclature. For example, if the switch positions on a pump are START and STOP, the procedure referring to that pump should not state "Turn on the pump." The procedure should state "Start the pump."

10.5 Procedure Modification Checklist

Complete the following or similar checklist whenever an addition or modification to NMP-2 procedures is being made. Section B of this checklist is to be completed whenever human factors guidelines and conventions within this section have not been complied with.

SECTION A

1. The procedure steps, added or modified, specify the use of equipment not currently available in the control room?

   No   Yes -> Human factors considerations for equipment design should be consulted for the selection and placement of the new equipment. Ensure that the new equipment meets the remainder of the checklist requirements.

2. The procedure, added or modified, requires the operator to refer to a display?

   No   Yes -> Human factors considerations in Section 10.2 of this manual regarding display location and characteristics have been examined and are adequate for this procedure.

   Yes   No -> Complete Section B of this checklist.

3. The procedure, added or modified, requires the operator to use a control?

   No   Yes -> Human factors considerations in Section 10.3 of this manual regarding location and characteristics of controls have been examined and are adequate for this procedure.

   Yes   No -> Complete Section B of this checklist.

4. The nomenclature used in the added or modified procedure conforms to the guidelines stated in Section 10.4 of this manual.

   Yes   No -> Complete Section B of this checklist.

Procedure Modification Checklist (Continued)

SECTION B

Describe the deviation from the guideline set forth in this section of the Human Factors Manual.

Explain why the procedure modification is suited to NMP-2 needs. Describe alternatives that will be used to take care of the human engineering concern involved.

11.0 REFERENCES

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APPENDIX A

HUMAN FACTORS CHECKLIST

Complete the following checklist whenever a modification to the NMP-2 control room, Remote Shutdown Panel, R.G. 1.97 instrumentation, or computer generated displays is being planned. Complete page A-5 of this checklist whenever the Human Factors (HF) guidelines and conventions within this Human Factors Manual have not been complied with. Completion of this checklist should be in accordance with the latest revision of the NMP-2 Human Factors Review Program (NEL 810).

Note: Completion of any part of this checklist is not required for modifications outside the above scope.

HUMAN FACTORS CHECKLIST

Modification Number: ______________________________

Project Name: ______________________________

Panel Item Number: ______________________________

Completed by: ______________________________

Reviewed by: ______________________________

Approved by: ______________________________

HED Number: ______________________________

1. Will the layout of the control panels (control room or remote shutdown) be modified to some degree, such as a control or display to be added, removed, or modified?

   NO   YES→ HF considerations in SECTION 2 of the Human Factors Manual regarding layout of panels and benchboards, grouping and spacing of components and storage have been examined and are adequate in regard to this design modification.

   YES   NO→ Complete Page A-5.

2. Will the physical layout of the control room or remote shutdown room, such as furniture, control panels or an annunciator box be added, removed or modified?

   NO   YES→ HF considerations in SECTION 3 of the Human Factors Manual regarding anthropometrics (Table 3-1), line-of-sight, and operator comfort have been examined and are adequate in regard to this design modification.

   YES   NO→ Complete page A-5.

3. Will labeling within the control room or remote shutdown room be modified, or a component modified to require a labeling change?

NO YES—> HF considerations in SECTION 4 of the Human Factors Manual regarding size, placement, abbreviations (Appendix B), and general characteristics of labels have been examined and are adequate in regard to this design modification.

YES NO—> Complete page A-5.

4. Will some form of control room or remote shutdown panel convention or color code be added or modified?

NO YES—> HF considerations in SECTION 5 of the Human Factors Manual regarding consistency of use and proper application of color and color codes has been examined and are adequate in regard to this design modification.

YES NO—> Complete page A-5.

5. Will control panel demarcation lines or mimics or mimic components be added, removed or modified?

NO YES—> HF considerations in SECTION 6 of the Human Factors Manual regarding demarcation lines and mimic characteristics have been examined and are adequate in regard to this design modification.

YES NO—> Complete page A-5.

6. Will control room annunciators be added, removed, or modified?

NO YES—> HF considerations in SECTION 7 of the Human Factors Manual regarding placement, abbreviations, and color coding have been examined and are adequate in regard to this modification.

YES NO—> Complete page A-5.

7. Will control room or remote shutdown panel switches, switch position labels, pushbuttons, or control handles be modified?

NO YES—> HF considerations in SECTION 8 of the Human Factors Manual regarding escutcheon format, direction of switch movement, switch position, control handle type, and pushbuttons have been examined and are adequate in regard to this modification.

YES NO—> Complete page A-5.

8. Will control room or remote shutdown panel meter scales or legends be modified?

NO YES -> HF considerations in SECTION 9 of the Human Factors Manual regarding meter scales, units, divisions, numerical progression, orientation, and zone banding have been examined and are adequate in regard to this modification.

YES NO—> Complete page A-5.

9. Will the control room or remote shutdown room labels/displays/controls being changed have a corresponding label/display/control in the remote shutdown room (or control room)?

NO YES—> Ensure that the corresponding devices are consistant between the control room and remote shutdown room.

10. Will the control room change have a corresponding piece of equipment in the simulator?

NO YES—> Order equipment for the simulator.

Modification is in compliance with our human factors commitment.

DISCUSSION OF PROPOSED CHANGES

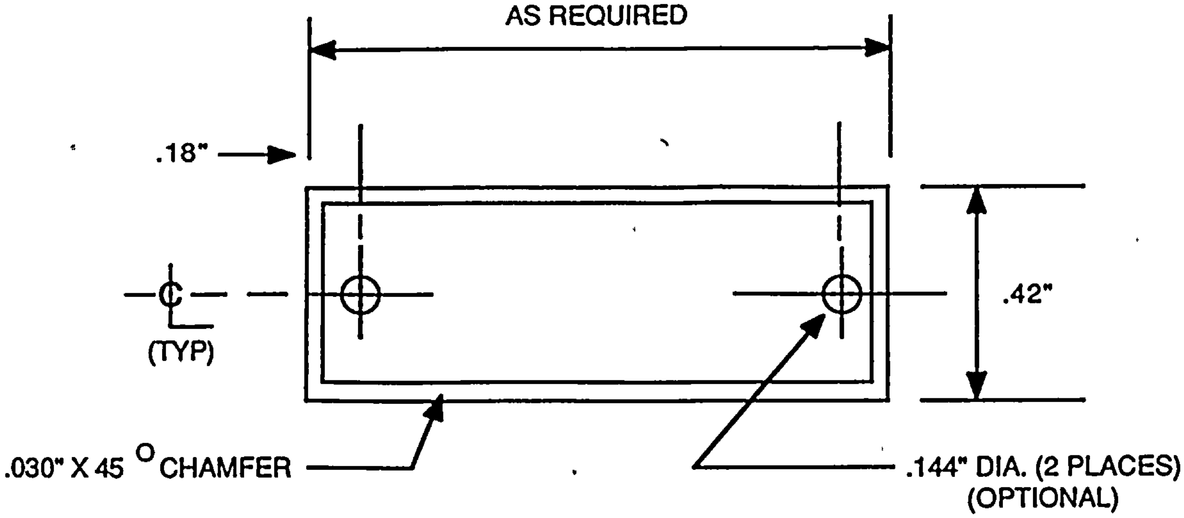
Describe deviation from guidelines set forth in the Human Factors Manual.

Explain why the modification is more suited to NMP-2 needs. Describe alternatives that will be used to take care of the HF concern involved.

Complete and submit a NMP-2 Human Factors Request to the Human Factors Engineer.

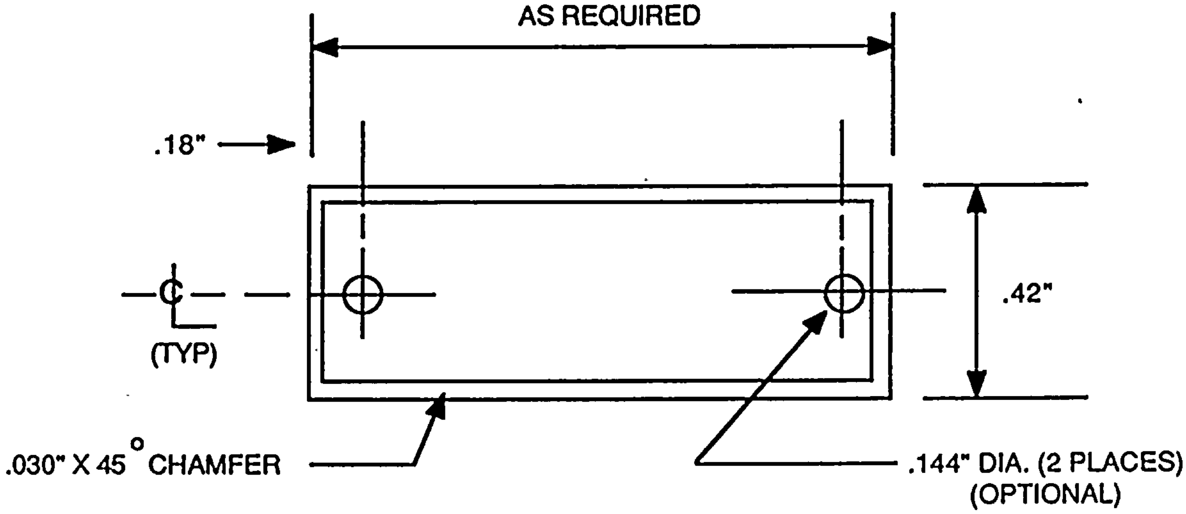
APPENDIX B
ENGRAVING SPECIFICATIONS

1. System Label



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1 line of .31" high characters.
Characters: .04" stroke width, 7 characters (max) per inch.
Type font: condensed helvetica.

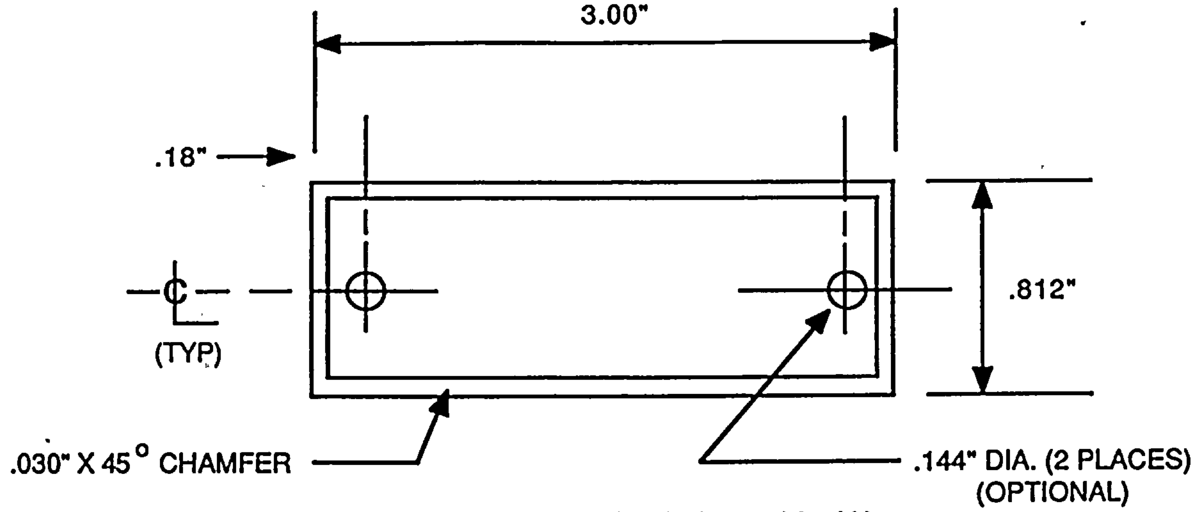
2. System Sub-Function Label



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1 line of .22" high characters.
Characters: .03" stroke width, 9 characters (max) per inch.
Type font: condensed helvetica.

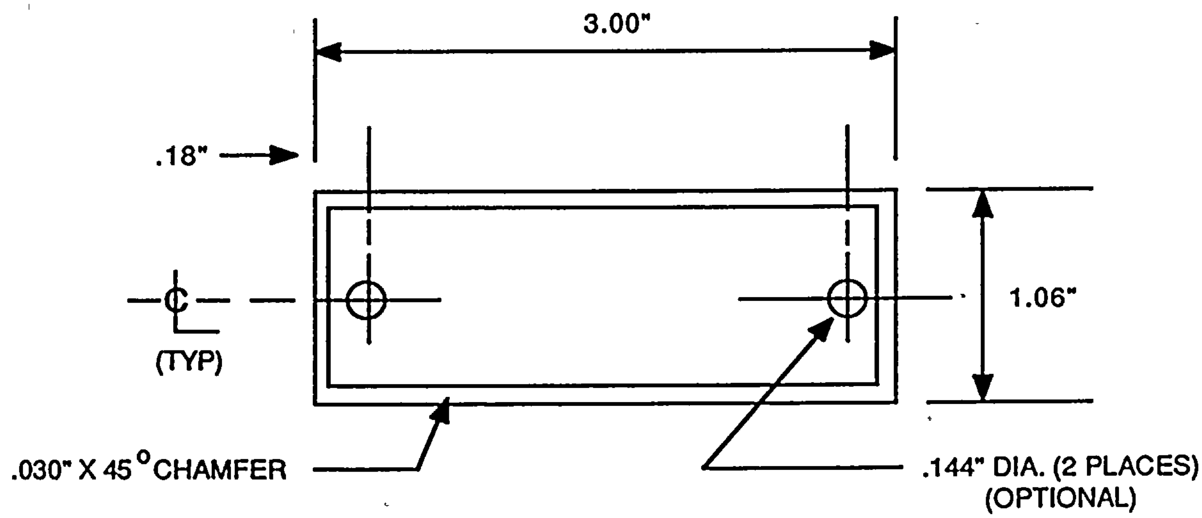
Figure B-1. Label Design Specifications

3. **Switch, Circular Meter, Controller (Standard) Label**



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1, 2, or 3 lines of .156" high characters .
Characters: .02" stroke width, 22 characters (max) per line.
Type font: condensed helvetica.

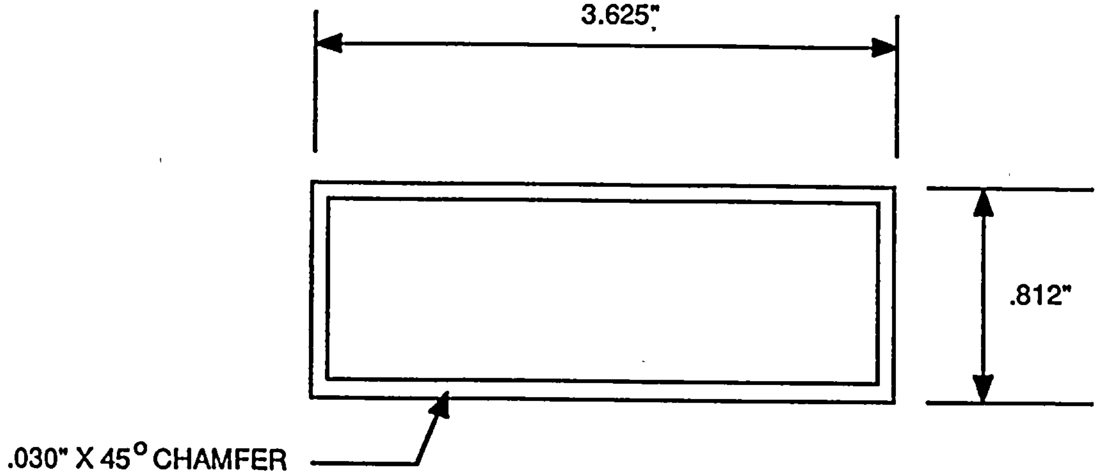
4. **Throttle and Gang Control Switch Label**



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1, 2, 3, or 4 lines of .156" high characters .
Characters: .02" stroke width, 22 characters (max) per line.
Type font: condensed helvetica.
Note: Last line states THROTTLE or GANG CONTROL

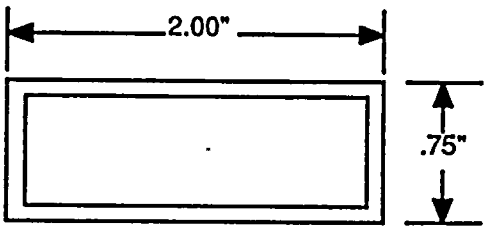
Figure B-1. Label Design Specifications (Cont.)

5. **Kaman Controller Label (for identiying units of measure)**



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1, 2 or 3 lines of .156" high.
Characters: .02" stroke width, 28 characters (max) per line.
Type font: condensed helvetica.

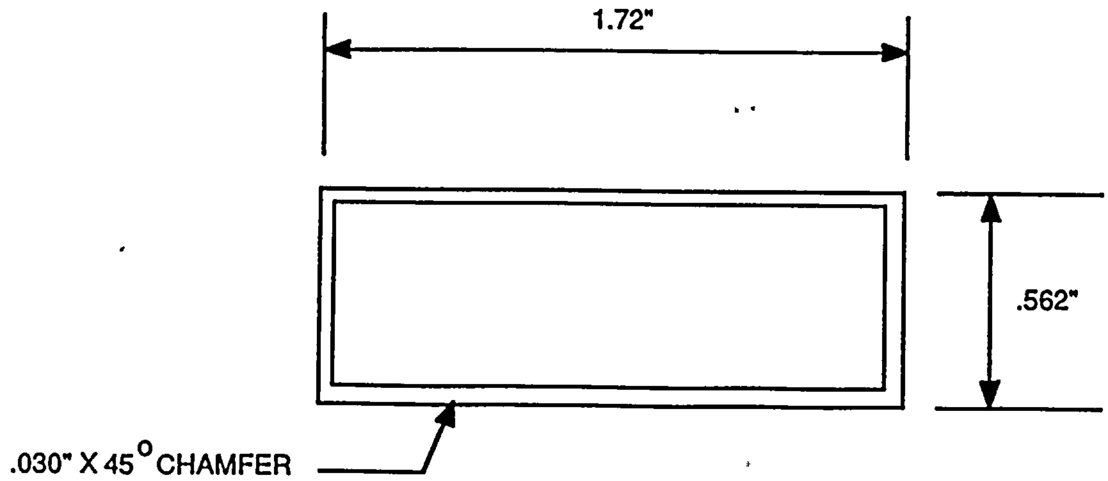
6. **Kaman Controller Label**



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1or 2 lines of .156" high.
Characters: .02" stroke width, 16 characters (max) per line.
Type font: condensed helvetica.

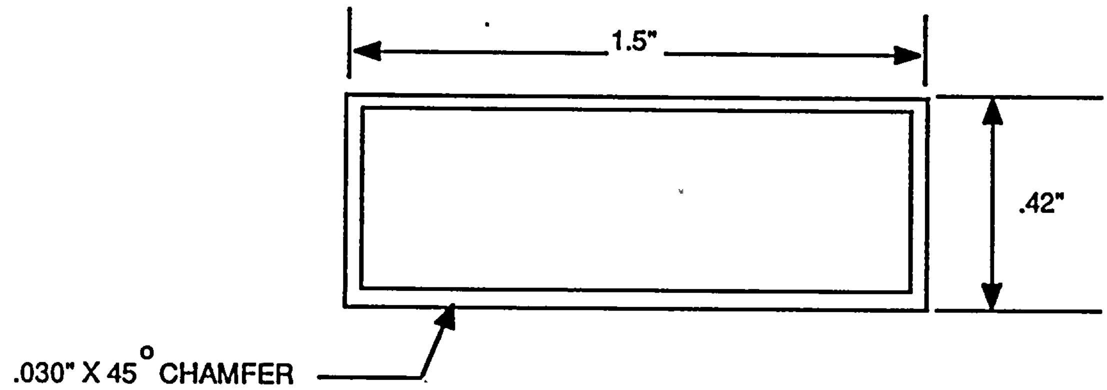
Figure B-1. Label Design Specifications (Cont.)

7. Vertical Meter Label (Parameter)



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1 or 2 lines of .156" high characters.
Characters: .02" stroke width, 15 characters (max) per line.
Type font: condensed helvetica.

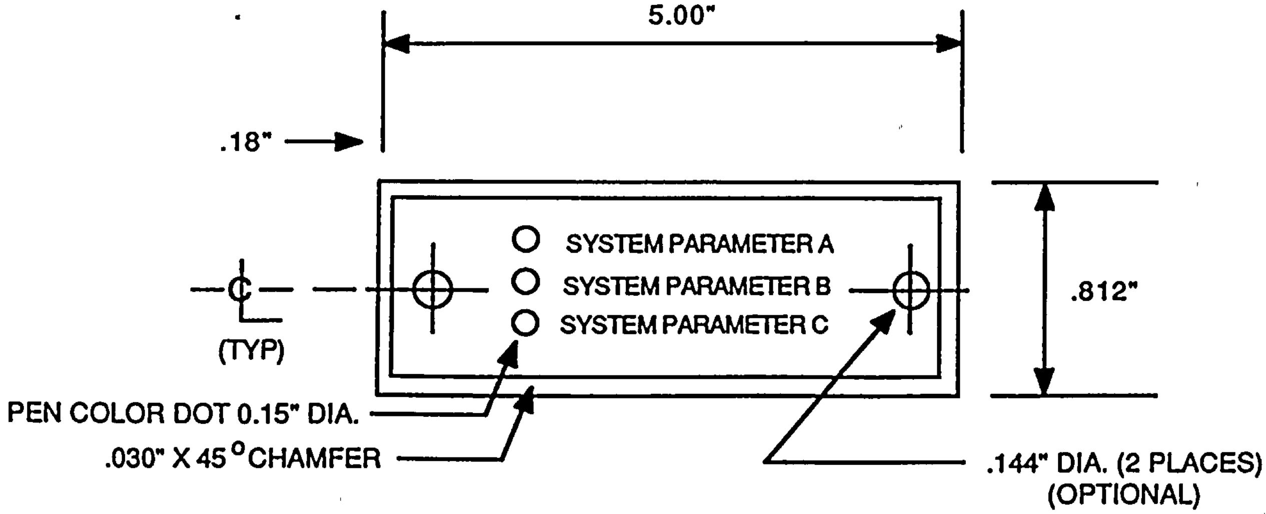
8. Vertical Meter, Recorder Label (Equipment Piece Number)



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1 line of .156" high characters.
Characters: .02" stroke width, 12 characters (max) per line.
Type font: condensed helvetica.

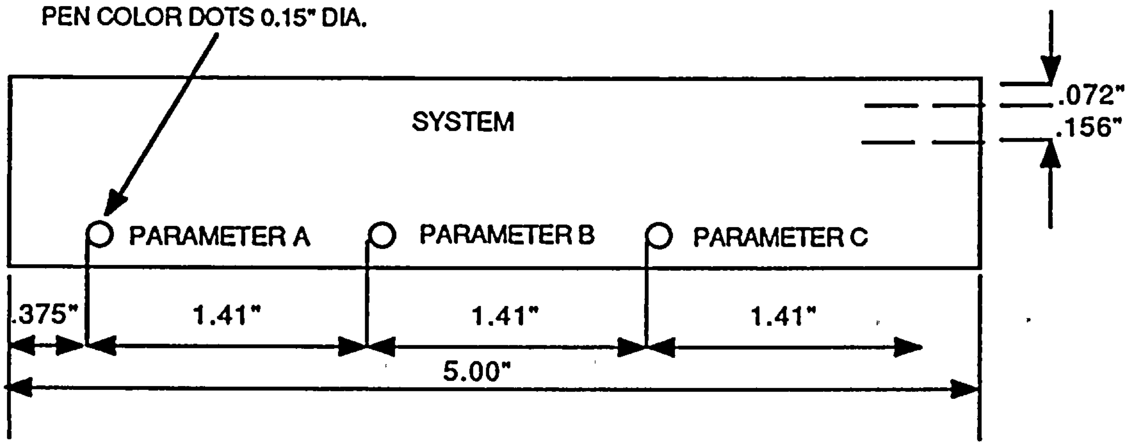
Figure B-1. Label Design Specifications (Cont.)

9. Multipen Recorders



Material: Lamicoid, white with black core (.06 thk).
Engraving: 1, 2 or 3 lines of .156" high characters.
Characters: .02" stroke width, 10 characters (max) per inch.
Type font: condensed helvetica.
Color dots: To be made by counter sinking the marker plate and painting the cavity with colored epoxy.

10. Multipen Recorders (same as above except as noted)



For two pen recorder, begin Parameter B engraving at centerline of nameplate.

Figure B-1. Label Design Specifications (Cont.)

Character height:	0.250"	(1/4)
Character width-max:	0.250"	(1/4)
Stroke width:	0.036"	(1/30)
Space between characters:	0.036"	(1/30)
Space between words:	0.250"	(1/4)
Space between lines:	0.125"	(1/8)
Tile Identification Numeral Height:	0.1875"	(3/16)
Lines max:	4	
Characters / line max:	13	
Tile:	2.8125" X 2.625"	
Font:	Condensed Gothic / Condensed Standard	

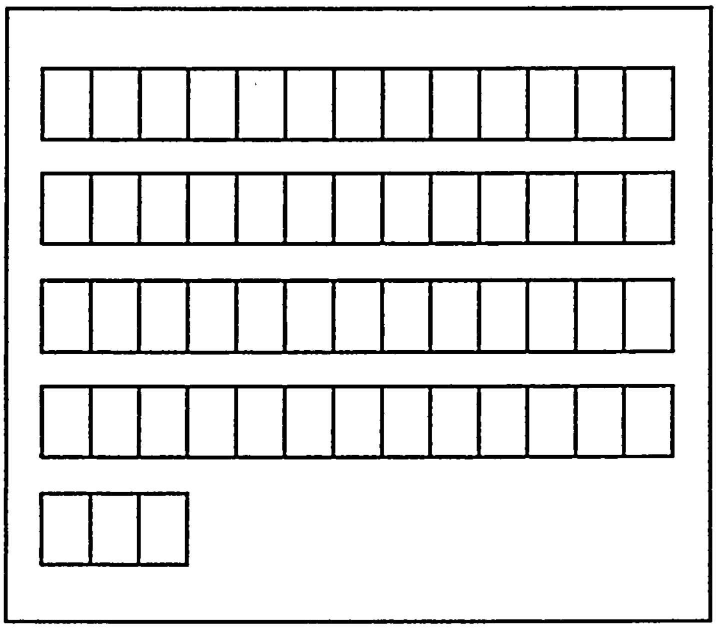
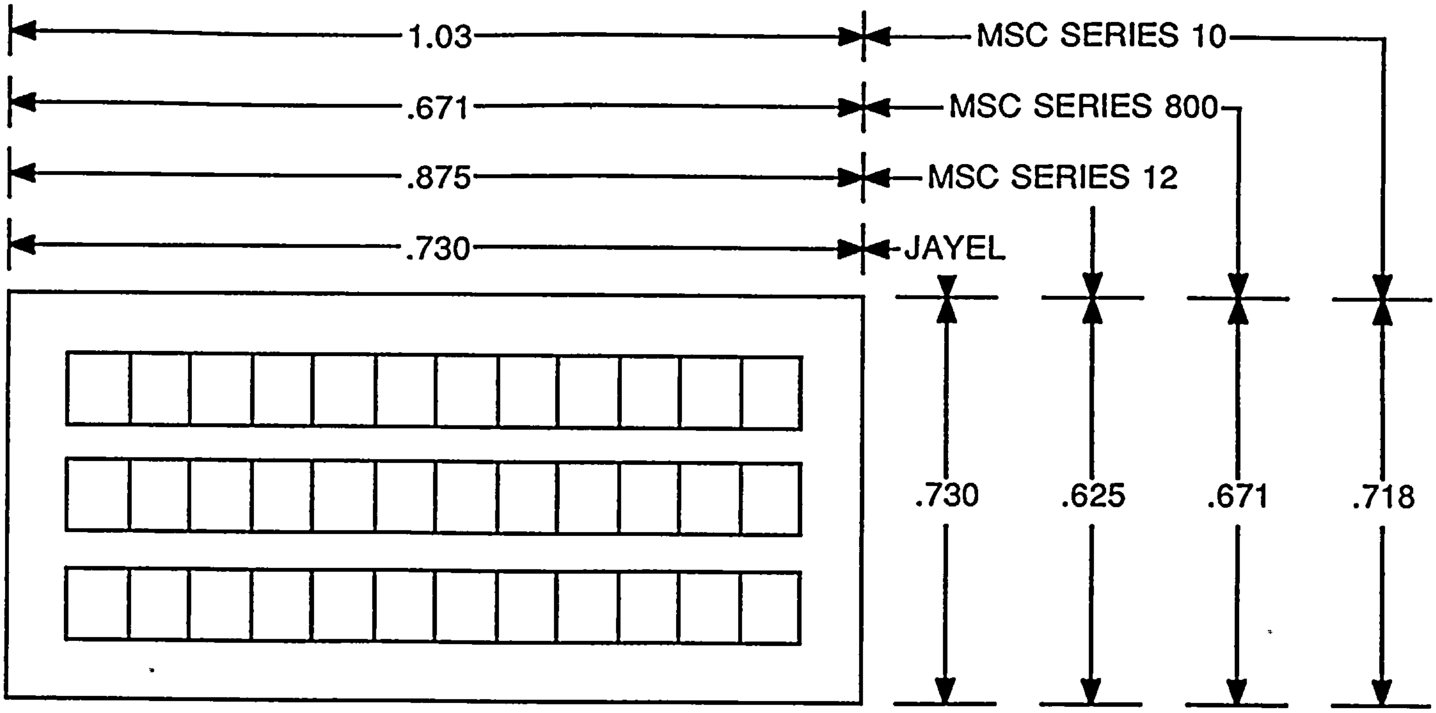


Figure B-2. Annunciator Tile Specifications



	SWITCH MANUFACTURER							
	JAYEL		MSC SERIES 12		MSC SERIES 800		MSC SERIES 10	
CHARACTER HEIGHT	.12	.12	.12	.10	.12	.12	.12	.12
CHARACTER WIDTH (MAX)	.074	.074	.074	.074	.074	.074	.074	.074
SPACE BETWEEN WORDS	.074	.074	.074	.074	.074	.074	.074	.074
SPACE BETWEEN LINES	.062	.050	.066	.038	.077	.038	.089	.047
STROKE WIDTH	.020	.020	.020	.020	.020	.020	.020	.020
* LINES MAX	3	4	3	4	3	4	3	4
CHARACTERS / LINE (MAX)	9	9	10	10	8	8	12	12
CHARACTER FONT	CONDENSED HELVETICA							

* INDICATORS / PUSHBUTTONS MAY HAVE FOUR LINES OF TEXT ONLY WHEN THE WINDOW IS HORIZONTALLY SPLIT - 2 LINES OF TEXT ABOVE THE LINE AND 2 LINES OF TEXT BELOW THE LINE.

Figure B-3. Legend Light/Pushbutton Specifications

APPENDIX C

STANDARD ABBREVIATIONS
Rev 3 8/90

Sorted by Abbreviation

Appendix C is the NMP-2 Standard Abbreviations List. The list is arranged by alphabetical order of the abbreviations (Appendix D is arranged by alphabetical order of the definition).

If multiple abbreviations are given, the first abbreviation listed is preferred. Abbreviations with FSAR in parenthesis beside the definition originate from the Final Safety Analysis Report and are not necessarily for use in the control room.

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	A
ABM	AUXILIARY BOILER - STEAM
ABN ABNORM	ABNORMAL
ABS	AUXILIARY BOILER SYSTEM
ABSOL	ABSOLUTE
ABV	ABOVE
A/C	AIR CONDITIONER
AC	ALTERNATING CURRENT
ACB	AUTOMATIC CIRCUIT BREAKER
ACC	ACCUMULATOR
ACCDNT	ACCIDENT
ACCL	ACCELERATION
ACK	ACKNOWLEDGE
ACT	ACTIVATED
ACTU	ACTUATED
ACU	AIR CONDITIONING UNIT
ACTY	ACTIVITY
ADD	ADDITION ADDITIVE
ADS	AUTOMATIC DEPRESSURIZATION SYSTEM
ADSRB	ADSORBTION
ADSV	AUTOMATIC DEPRESSURIZATION SYSTEM VALVE
AFTERCLR AFTCLR	AFTERCOOLER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
AIT	ANALYZER INDICATING TRANSMITTER
ALARA	AS LOW AS REASONABLY ACHIEVABLE
ALM	ALARM
ALMCLR	ALARM CLEAR
ALT	ALTERNATOR
ALTN	ALTERNATE
ALTNTR	ALTERNATOR
AMB	AMBIENT
AMP	AMPERE
ANAL ANL	ANALYZER
ANN	ANNUNCIATOR
AOD	AIR OPERATED DAMPER
AOV	AIR OPERATED VALVE
AP	ADMINISTRATIVE PROCEDURE ANNULUS PRESSURIZATION (FSAR)
APRM	AVERAGE POWER RANGE MONITOR
ARC	AIR REMOVAL SYSTEM
ARI	ALTERNATE ROD INSERTION
ARM	AREA RADIATION MONITOR
ARMS	AREA RADIATION MONITORING SYSTEM
ASSOC ASC	ASSOCIATED
ASSY	ASSEMBLY
A/START	AUTO START

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
AT	AUTO TRIP
ATMOS ATM	ATMOSPHERE
ATWS	ANTICIPATED TRANSIENT WITHOUT SCRAM
AUX	AUXILIARY
AVAIL	AVAILABLE
AVG	AVERAGE
AZ	AZIMUTH

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	B
BA	BREATHING AIR
BATT BAT	BATTERY
BCD	BINARY CODED DECIMAL
BCP	BOTTOM CENTER PRESSURE (FSAR)
BEL	BELOW
BHTG	BUILDING HEATING
BKWSH BW	BACKWASH
BLDG BLD	BUILDING
BLK	BLOCK
BLOCK	BLOCKING
BLR	BOILER
BLWDN	BLOWDOWN
BLWR	BLOWER
BOC	BEGINNING OF CYCLE
BOP	BALANCE OF PLANT
BOT	BOTTOM
BRG	BEARING
BRKR BKR	BREAKER
BRTHNG	BREATHING
BSMT	BASEMENT

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
BSNG	BUSHING
BSTR BST	BOOSTER
BSW	BIOLOGICAL SHIELD WALL
BTP	BRANCH TECHNICAL POSITION
BU	BACKUP
BV	BYPASS VALVE
BWR	BOILING WATER REACTOR
BWS	+/- 24 DC DISTRIBUTION
BYP	BYPASS
BYS	125 VOLTS DC DISTRIBUTION

Abbreviation	Definition
	C
CAB	CABINET
CAD	CONTAINMENT ATMOSPHERE DILUTION (DEVICE)
CALIB CAL	CALIBRATION
CAM	CONTINUOUS AIR MONITOR
CANCL	CANCEL
CAV	CAVITY
CB	CONTROL BUILDING
CCP	CLOSED LOOP COOLING-WATER-PRIMARY
CCS	CLOSED LOOP COOLING-WATER-SECONDARY
CCW	CLOSED COOLING WATER
CD	CARD
CDR	COOL DOWN RATE
CEC	CONTROL ROOM EQUIPMENT CABINETS
CGCS	COMBUSTIBLE GAS CONTROL SYSTEM
CHAN CH	CHANNEL
CHAR	CHARCOAL
CHEM	CHEMICAL
CHF	CRITICAL HEAT FLUX
CHGR	CHARGER
CHILL CHIL	CHILLED
CHK	CHECK

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
CHL	CHILLER
CHMBR CHAM CHM	CHAMBER
CI	CURIE
CIRC	CIRCULATING/CIRCULATION
CIV	COMBINED INTERMEDIATE VALVE
CIVM	COLLISION-IMPORTED-VELOCITY METHOD (FSAR)
CKT	CIRCUIT
CLCW	CLOSED LOOP COOLING WATER
CLG	COOLING
CLN	CLEAN
CLN-UP CU	CLEANUP
CLPR	CALIPER
CLR	COOLER
CLRS	COOLERS
CLS	CLOSE
CLSD CL	CLOSED
CLSR	CLOSURE
CMFA	COMMON MODE FAILURE ANALYSIS
CMS	CONTAINMENT MONITORING SYSTEM
CNDS	CONDENSATE STORAGE
CNM	MAIN CONDENSATE SYSTEM
CNSR	CONDENSER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
CNST CND	CONDENSATE
CO	CONDENSATION OSCILLATION
COEFF	COEFFICIENT
COLL	COLLECTOR/COLLECTION
COM	COMMON
COMM	COMMUNICATION
COMP CMPTR	COMPUTER
COMPL	COMPLETE
CONC	CONCENTRATION/CONCENTRATE
COND CNDCTY	CONDUCTIVITY
CONDITION	CONDITIONING CONDITIONER
CONN	CONNECT
CONT	CONTROL/CONTROLLER
CONT RM CR CONTRM	CONTROL ROOM
CONTMT CONMT CNMT	CONTAINMENT
CONST CONS	CONSTANT
CONV	CONVERSION
CPLG	COUPLING
CPR	CRITICAL POWER RATIO

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
CPRSR CPSR C	COMPRESSOR
CPS	CONTAINMENT PURGE SYSTEM COUNTS PER SECOND
CRD	CONTROL ROD DRIVE (RDS)
CRDA	CONTROL ROD DROP ACCIDENT
CRDM	CONTROL ROD DRIVE MECHANISM
CRPI	CONTROL ROD POSITION INDICATION (FSAR) (Use RPIS - Rod Position Information System)
CRS	COLD REHEAT STEAM
CRVICS	CONTAINMENT AND REACTOR VESSEL ISOLATION CONTROL SYSTEM
CS	CONTROL SWITCH
CSR	CLEAN STEAM REBOILER
CST	CONDENSATE STORAGE TANK
CTR	CENTER
CUF	CUMULATIVE USAGE FACTOR
CUR	CURRENT
CV	CONTROL VALVE
CWS	CIRCULATING WATER SYSTEM
CW	CIRCULATING WATER
CYC	CYCLE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	D
DAMPR DMPR	DAMPER
DAR	DESIGN ASSESSMENT REPORT FOR HYDRODYNAMIC LOADS
DB	DESIGN BASIS
DBA	DESIGN BASIS ACCIDENT
DBE	DESIGN BASIS EARTHQUAKE
DBFL	DESIGN BASIS FLOOD LEVEL
DC	DIRECT CURRENT
DCDT	DIRECT CURRENT DIFFERENTIAL TRANSDUCER
DCL	DRAIN COOLER LINE
DCNT	DECANT
DEAR	DEAERATOR
DECON	DECONTAMINATION
DEG	DEGREE
DEGF	DEGREES FAHRENHEIT
DEM	DEMAND
DEMIN DMN	DEMINERALIZER/DEMINERALIZED
DEPRESS	DEPRESSURIZE
DER	DRYWELL/REACTOR BUILDING EQUIPMENT DRAINS
DETECT DET	DETECTION/DETECTOR/DETECTED
DEV	DEVIATION
DFR	DRYWELL/REACTOR BUILDING FLOOR DRAIN SYSTEM
DG	DIESEL GENERATOR

Abbreviation	Definition
DGB	DIESEL GENERATOR BUILDING
DIAPH	DIAPHRAGM
DICT	DICTIONARY
DIFF	DIFFERENTIAL
DIG	DIGIT
DIR	DIRECTIONAL
DISAB DSABL	DISABLED
DISCH DIS	DISCHARGE
DISCON	DISCONNECT
DISPL	DISPLAY
DISTR DSTR	DISTRIBUTION
DIV D	DIVISION
DIVERT	DIVERTER
D/P ΔP	DIFFERENTIAL PRESSURE
DN	DOWN
DNSCALE DNSCL DNSC	DOWNSCALE
DOM	DOME
DRMS	DIGITAL RADIATION MONTORING SYSTEM
DRN DR	DRAIN

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
DRNS DRS	DRAINS
DRV	DRIVE
DW DRWL	DRYWELL
DSL	DIESEL
DSTLT DST	DISTILATE
DT	DRAIN TANK
DV	DRAIN VALVE
DWSIPL	DRYWELL SPRAY INITIATION PRESSURE LIMIT
DWT	DRYWELL TEMPERATURE CONTROL

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	E
E	HEAT EXCHANGER/COOLER
EAB	EXCLUSION AREA BOUNDARY
EBOP	EMERGENCY BEARING OIL PUMP
ECA	ENGINEERING CHANGE AUTHORIZATION
ECCS	EMERGENCY CORE COOLING SYSTEM
ECN	ENGINEERING CHANGE NOTICE
EDG	EMERGENCY DIESEL GENERATOR
EFF	EFFICIENCY
EFFL	EFFLUENT
EFV EFCV	EXCESS FLOW CHECK VALVE
EGS	EMERGENCY DIESEL GENERATOR SYSTEM
EH	EXTREME HIGH
EHC	ELECTRO HYDRAULIC CONTROL
EIC	ENERGY INFORMATION CENTER
EJCTR EJCT	EJECTOR
EJS	STANDBY SERVICE SUBSTATION
ELEC ELC	ELECTRIC
ELEV EL	ELEVATION
EMER EM	EMERGENCY
ENCL ENC	ENCLOSURE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
ENG	ENGINE
ENS	EMERGENCY AC DISTRIBUTION 4160 V
ENTH	ENTHALPY
EOC	END OF CYCLE
EOF	EMERGENCY OPERATIONS FACILITY EQUIVALENT OCCURRENCE FACTOR (FSAR)
EP	EQUIPMENT PIECE
EPA	ELECTRIC PROTECTIVE ASSEMBLY
EPZ	EMERGENCY PLANNING ZONE
EQD	ENVIRONMENTAL QUALIFICATION DOCUMENT
EQL	EQUALIZING
EQUIP EQPT EQ	EQUIPMENT
EQ	ENVIRONMENTAL QUALIFICATION
ERF	EMERGENCY RESPONSE FACILITY
ESF	ENGINEERED SAFETY FEATURE
ESK	ELECTRICAL DRAWING NUMBER
ETS	EMERGENCY TRIP SYSTEM
EVAC	EVACUATION
EVAP EV	EVAPORATOR
EXC	EXCITOR
EX/EV	EXTRUDER/EVAPORATOR
EXCH	EXCHANGER
EXEC	EXECUTE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
EXH	EXHAUST
EXP	EXPANSION
EXPTD	EXPECTED
EXTRCTN EXTR	EXTRACTION/EXTRACTOR
EXTRNL	EXTERNAL

Abbreviation	Definition
	F
°F	DEGREES FARENHEIT
F	FUEL
F/D	FILTER DEMINERALIZER
FA	FULL ARC (MODE OF TCV OPERATION) (FSAR)
FACTR	FACTOR
FAIL	FAILURE/FAILED
FAS	FLUID ACTUATOR SYSTEM
FATT	FRACTURE APPEARANCE TRANSITION TEMPERATURE
FCD	FUNCTIONAL CONTROL DIAGRAM
FCV	FLOW CONTROL VALVE
FD	FEED
FDC	FEED COLLECTOR
FD WTR FW FDW	FEEDWATER
FDDR	FIELD DEVIATION DISPOSITION REQUEST
FDR	FEEDER
FDW	FEEDWATER SYSTEM
FL CL	FULL CLOSE
FLD	FIELD
FLDR	FLOOR DRAIN
FLECHT	FULL-LENGTH EMERGENCY COOLING HEAT TRANSFER
FLG	FLANGE
FL IN	FULL IN

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
FLO	FLOW
FLR	FLOOR
FLTR FLT	FILTER
FLTN	FILTRATION
FLU	FLUID
FLX	FLUX
FMEA	FAILURE MODES AND EFFECTS ANALYSIS
FMH	FIXTURE MOUNTING HEIGHT
FN	FAN
FO	(GE VALVE DESIGNATION NUMBER)
FPCC	FUEL POOL COOLING AND CLEANUP
FPS	FIRE PROTECTION SYSTEM
FPW	FIRE PROTECTION WATER
FR	FROM
FREQ	FREQUENCY
FSAR	FINAL SAFETY ANALYSIS REPORT
FSH	FRESH
FT	FEET, FOOT
FTC	FAIL TO CLOSE
FTS	FAIL TO START
FV	FLOW VALVE
FWD	FORWARD
FWS	FEEDWATER SYSTEM
FZ	FUEL ZONE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	G
GAS	GASEOUS
GDC	GENERAL DESIGN CRITERION
GDE	GUIDE
GE	GENERAL ELECTRIC COMPANY
GEN GN	GENERATOR
GEN-L	GENERATOR LEADS
GENL	GENERAL
GETAB	GE THERMAL ANALYSIS BASIS
GLD	GLAND
GOV	GOVERNOR
GPM	GALLONS PER MINUTE
GR	GROSS
GRD	GROUND
GRP GP	GROUP
GTS	GAS TREATMENT SYSTEM

Abbreviation	Definition
	H
H_2	HYDROGEN
HAT	HATCH
HAZ	HEAT AFFECTED ZONE
HCLL	HEAT CAPACITY LEVEL LIMIT
HCS	HYDROGEN RECOMBINER SYSTEM
HCTL	HEAT CAPACITY TEMPERATURE LIMIT
HCU	HYDRAULIC CONTROL UNIT
HCV	HAND CONTROLLED VALVE
HDFM	HEAVY DENSITY FILL MATERIAL (FSAR)
HDR	HEADER
HELB	HIGH ENERGY LINE BREAK (FSAR)
HEM	HOMOGENEOUS EQUILIBRIUM MODEL (FSAR)
HEPA	HIGH-EFFICIENCY PARTICULATE AIR/ABSOLUTE (FILTER)
HEPCO	HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
HG	MERCURY
HI H	HIGH
HI-HI H-H HI/HI H/H	HIGH-HIGH
HI-LO H-L HI/LO H/L	HIGH-LOW
HIST	HISTORICAL

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
HI T	HIGH TEMPERATURE
HLDG	HOLDING
HMDT	HUMIDITY
HP	HIGH PRESSURE HORSEPOWER
HPCS	HIGH PRESSURE CORE SPRAY
HPPR	HOPPER
HPU	HYDRAULIC POWER UNIT
HR	HOUR
HRS	HOT REHEAT STEAM
HT	HEAT
HTG	HEATING
HTR	HEATER
HTRS	HEATERS
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HVC	HEATING AND VENTILATION CONTROL BUILDING
HVR	HEATING AND VENTILATION-REACTOR BUILDING
HVRS	REACTOR BUILDING VENTILATION SYSTEM
HVY	SCREENWELL AND FIRE SYSTEM
HWL	HOTWELL
HX	HEAT EXCHANGER
HYDR	HYDRAULIC
HYDR FL	HYDRAULIC FLUID
HYV	HYDRAULICALLY CONTROLLED VALVE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	I
I/O	INPUT/OUTPUT
IAC	INTERIM ACCEPTANCE CRITERIA (NRC)
IAS	INSTRUMENT AIR SYSTEM
IAW	IN ACCORDANCE WITH
IBA	INTERMEDIATE BREAK ACCIDENT
ICC	INADEQUATE CORE COOLING
ICS	ISOLATION COOLING SYSTEM
IDC	INCIDENT DETECTION CIRCUITRY (FSAR)
IDS	INSTRUMENT DATA SHEET
IED	INSTRUMENT AND ELECTRICAL DRAWING
IGSCC	INTERGRANULAR STRESS CORROSION CRACKING
ILRT	INTEGRATED LEAKAGE RATE TEST
IMBAL	IMBALANCE
IN	INCH, INCHES
INACTV	INACTIVE
IN/OUT	INLET/OUTLET
INBD IB	INBOARD
INCMPL	INCOMPLETE
INCNSR	INTERCONDENSER
IND	INDICATOR
INFL	INFLUENT
INHIB	INHIBIT

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
INIT	INITIATE/INITIATION/INITIATED
INJ INJCTN	INJECT/INJECTION
INL IN	INLET
INLKGE	INLEAKAGE
INNR	INNER
INOP	INOPERABLE
INP	INPUT
INSTR INST	INSTRUMENT
INT	INTAKE
INTLK INLK	INTERLOCK
INTERM INTMD INTD	INTERMEDIATE
INV CIV	INTERCEPT VALVE
IPCEA	INSULATED POWER CABLES ENGINEERS ASSOCIATION (FSAR)
IRM	INTERMEDIATE RANGE MONITOR
ISOL ISO	ISOLATION
ISV	INTERCEPT STOP VALVE (CIV)
IV	ISOLATION VALVE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	J
JAF	J.A. FITZPATRICK STATION
JKT	JACKET
	K
KV	KILOVOLT

Abbreviation	Definition
	L
LB	POUNDS
LBM	POUND MASS
LCO	LIMITING CONDITION OF OPERATION
LCS	LEAKAGE CONTROL SYSTEM
LCV	LEVEL CONTROL VALVE
LD	LOAD
LDS	LEAK-DETECTION SYSTEM
LFMG	LOW FREQUENCY MOTOR GENERATOR
LGC	LOGIC
LHGR	LINEAR HEAT GENERATION RATE
LIM	LIMIT
LIQ	LIQUID
LK	LEAK/LEAKAGE/LEAKING
LKE	LAKE
LKGE	LEAKAGE
LKO L.O. LKOUT	LOCKOUT
LMS	LEAKAGE MONITORING SYSTEM
LN	LINE
LO L	LOW
LO-LO L-L LO/LO L/L	LOW-LOW

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
LOCA	LOSS OF COOLANT ACCIDENT
LOFW	LOSS OF FEEDWATER
LOOP LOP	LOSS OF OFFSITE POWER
LOR	LOWER
LP	LOW PRESSURE
LPAP	LOW POWER ALARM POINT
LPCI	LOW PRESSURE COOLANT INJECTION
LPCS	LOW PRESSURE CORE SPRAY
LPDS	LOOSE PARTS DETECTION SYSTEM
LPRM	LOCAL POWER RANGE MONITOR
LPSP	LOW POWER SET POINT
LPZ	LOW POPULATION ZONE
LSA	LOW SPECIFIC ACTIVITY (BOXES)
LSD	LAKE SURVEY DATUM (OF 1935)
LSSS	LIMITING SAFETY SYSTEM SETTING
LTC	LOAD TAP CHANGING
LUBE	LUBRICATING
LUBO	LUBE OIL
LV	LEVEL VALVE (LCV)
LVL	LEVEL
LVX	LEVEL VALVE X
LWS	LIQUID RADWASTE SYSTEM

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	M
M/A	MANUAL/AUTO
MACH	MACHINE
MAINT	MAINTENANCE
MAN	MANUAL/MANUALLY
MAPLHGR	MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
MAST	MASTER
MAT	MATERIAL
MAX	MAXIMUM
MBA	MISPLACED BUNDLE ACCIDENT (FSAR)
MCC	MOTOR CONTROL CENTER
M/CC	MAINTENANCE AND CALIBRATION COMMUNICATION (SYSTEM) (FSAR)
MCPR	MINIMUM CRITICAL POWER RATIO
MDS	MOTOR DISCONNECT SWITCH
MECH	MECHANICAL
METR	METER
MG	MOTOR GENERATOR
MID	MIDDLE
MIN	MINIMUM MINUTE
MLD	MEAN LOW WATER DATUM
MLHGR	MAXIMUM LINEAR HEAT GENERATION RATE
MN	MAIN
MN SFT	MAIN SHAFT

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
MODS	MOTOR OPERATED DISCONNECT
MODMPR MOD	MOTOR OPERATED DAMPER
MOG	MOTOR OPERATED GATE
MOI	METHOD OF IMAGES (FSAR)
MON	MONITOR
MOT	MOTOR
MOV	MOTOR OPERATED VALVE
MPC	MAXIMUM PERMISSIBLE CONCENTRATION
mr	MILLIREM
MR/HR	MILLIREM PER HOUR
MS	MAIN STEAM
MSI	MAIN STEAM ISOLATION
MSIV	MAIN STEAM ISOLATION VALVE
MSIV-LCS	MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM
MSL	MAIN STEAM LINE
MSLB	MAIN STEAM LINE BREAK
MSR	MOISTURE SEPARATOR REHEATER
MSS	MAIN STEAM SYSTEM
MSTR	MOISTURE
MSV	MAIN STOP VALVE
MTN	MOTION
MTV	MECHANICAL TRIP VALVE
MU MKUP	MAKEUP

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
MWE	MEGAWATT ELECTRIC
MWS	MAKEUP WATER STORAGE AND TRANSFER
MWTH	MEGAWATT THERMAL

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	N
N_2	NITROGEN
N/A	NOT APPLICABLE
NB	NUCLEAR BOILER
NBR	NUCLEAR BOILER RATED (THERMAL POWER)
NBS	NATIONAL BUREAU OF STANDARDS
NDL	NUCLEAR DATA LINK
NDT	NIL DUCTILITY TRANSITION
NDTT	NIL DUCTILITY TRANSITION TEMPERATURE
NED	NUCLEAR ENERGY DIVISION (GE)
NEG	NEGATIVE
NEUT	NEUTRAL
NFL	NO FLOW
N-FILL	NOT FILLED
NIOSH	NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
NMS	NEUTRON MONITORING SYSTEM
NNS	NORMAL AC DISTRIBUTION 4160 V
NO	NUMBER
NOAVLB	NOT AVAILABLE
NOFLCL	NOT FULL CLOSE
NOFLOP	NOT FULL OPEN
NORM NOR	NORMAL
NPRDS	NUCLEAR PLANT RELIABILITY DATA SYSTEM
NPS	NORMAL AC DISTRIBUTION 13.8 KV

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
NPSH	NET POSITIVE SUCTION HEAD
NR	NARROW RANGE
NRHX	NON-REGENERATIVE HEAT EXCHANGER
NRV	NONRETURN VALVE
NSOA	NUCLEAR SAFETY OPERATIONAL ANALYSIS
NSR	NON-SAFETY RELATED
NSS	NORMAL STATION SERVICE
NSSS	NUCLEAR STEAM SUPPLY SYSTEM
NTRN	NEUTRON

Abbreviation	Definition
	O
O_2	OXYGEN
OBE	OPERATING BASIS EARTHQUAKE
OFS	ORIFICED FUEL SUPPORT
OOS	OUT OF SERVICE
OOF	OUT OF FILE
OPER	OPERABLE/OPERATOR
ORE	OCCUPATIONAL RADIATION EXPOSURES
OT	OPERATIONAL TRANSIENT
OUTBD OB	OUTBOARD
OUTL OUT	OUTLET
OUTR	OUTER
OV OVRVLT	OVERVOLTAGE
OVALL	OVERALL
OVCRNT OC	OVERCURRENT
OVLD OL	OVERLOAD
OVRD OR	OVERRIDE

Abbreviation	Definition
	P
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
PA	PUBLIC ADDRESS (SYSTEM)
PAM	POST-ACCIDENT MONITORING
PART	PARTIAL
PARTIC	PARTICULATE
PASNY	NEW YORK POWER AUTHORITY
PC	PRIMARY CONTAINMENT
PCI	PELLET-CLADDING INTERACTION
PCIS PCRVICS	PRIMARY CONTAINMENT AND REACTOR VESSEL ISOL CONTROL SYSTEM (FSAR)
PCP	PRIMARY CONTAINMENT PRESSURE CONTROL
PCPL	PRIMARY CONTAINMENT PRESSURE LIMIT
PCRAT	PEAK POWER/PRECONDITIONED POWER CORE MARGIN
PCS	PROCESS COMPUTER SYSTEM
PCT	PEAK CLADDING TEMPERATURE PERCENT
PCV	PRESSURE CONTROL VALVE
PERM	PERMANENT
PERMIS	PERMISSIVE
PF	POWER FACTOR
PGCC	POWER GENERATING CONTROL CENTER
PGM	PROGRAM
PH	PHASE
pH	pH

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
PIN	PINION
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLU	POWER LOAD UNBALANCE
PMF	PROBABLE MAXIMUM FLOOD
PMP PP P	PUMP
PMPS	PUMPS
PMS	PROBABLE MAXIMUM SURGE (FSAR)
PMWS	PROBABLE MAXIMUM WINDSTORM
PNTRN	PENETRATION
POLISH	POLISHER/POLISHING
POSN POS	POSITION
POT	POTENTIAL
POT XFMER	POTENTIAL TRANSFORMER
PP/PA	PAGE PARTY/PUBLIC ADDRESS SYSTEM (FSAR)
PQL	PRODUCT QUALITY CHECKLIST
PRE-CLR	PRECOOLER
PRE-TRTMT	PRE-TREATMENT
PREHTR	PREHEATER
PRESS PRES PR	PRESSURE
PRG	PROGRESS
PRGE	PURGE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
PRIM PRI	PRIMARY
PRM	POWER RANGE MONITOR
PROT PRT	PROTECTION
PS	POWER SUPPLY
PSAR	PRELIMINARY SAFETY ANALYSIS REPORT
PSD	POWER SPECTRUM DENSITY
PSI	POUNDS PER SQUARE INCH
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAGE
PSP	PRESSURE SUPPRESSION PRESSURE
PSV	PRESSURE SAFETY VALVE
PT	POINT PRESSURE TRANSMITTER
PTL	PULL-TO-LOCK
PTPD	PROJECT TEST PROGRAM OBJECTIVES
PV	PRESSURE VALVE
PVS	PLANT VENT STACK
PWR	POWER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	Q
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
	R
R	RADS
R/HR	REM PER HOUR
RAB	RESTRICTED AREA BOUNDARY
RADN	RADIATION
RADW RW	RADWASTE
RB	REACTOR BUILDING
RBCLC	REACTOR BUILDING CLOSED LOOP COOLING (CCP)
RBCLCW	REACTOR BUILDING CLOSED LOOP COOLING WATER
RBLRS	REBOILERS
RBM	ROD BLOCK MONITOR
RBPC	REACTOR BUILDING POLAR CRANE
RCDR REC	RECORDER
RCIC	REACTOR CORE ISOLATION COOLING
RCPB	REACTOR COOLANT PRESSURE BOUNDARY
RCS	REACTOR COOLANT SYSTEM
RCSCM	RHR CONTAINMENT SPRAY COOLING MODE (FSAR)
RCVG	RECEIVING
RCVR	RECEIVER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
RCVY RCVRY	RECOVERY
RDCS	CONTROL ROD DRIVE SYSTEM
RDL RADL	RADIAL
REAC	REACTION
REBLR RBLR	REBOILER
RECIRC RECIR	RECIRCULATING/RECIRCULATION
RECOMB RBNR	RECOMBINER
RECT	RECTIFIER
RECYC	RECYCLE
RED	REDUCER
REFR REF	REFERENCE
REG	REGULATOR
REGEN RGEN	REGENERATIVE
REGLTD RGLTD	REGULATED
REHT	REHEAT
REHTG	REHEATING
REHTR RHTR	REHEATER
REM	REMOTE
REQ'D	REQUIRED

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
RES	RESERVE
RESID	RESIDUAL
RESTR	RESTORE
RETR	RETRANSMIT
RETRCT	RETRACT
RFP	REACTOR FEED PUMP
RFUL	REFUEL
RH	RELATIVE HUMIDITY
R/HR	REM PER HOUR
RHR	RESIDUAL HEAT REMOVAL SYSTEM
RHRB	RHR LOOP B
RHX	REGENERATIVE HEAT EXCHANGER
RL	RPV WATER LEVEL CONTROL
RLF	RELIEF
RLY	RELAY
RM	ROOM
RMCS	REACTOR MANUAL CONTROL SYSTEM
RMS	ROOT MEAN SQUARE
RMVL	REMOVAL
REM	
RNG	RANGE
RO	RESTRICTING ORIFICE
RP	RPV PRESSURE CONTROL
RPC	ROD PATTERN CONTROLLER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
RPIS	ROD POSITION INFORMATION SYSTEM
RPM	REVOLUTIONS PER MINUTE
RPS	REACTOR PROTECTION SYSTEM
RPT	RECIRC PUMP TRIP
RPV	REACTOR PRESSURE VESSEL
RQ	RPV REACTIVITY CONTROL
RR	RADIOACTIVITY RELEASE CONTROL
RRCS	REDUNDANT REACTIVITY CONTROL SYSTEM
RRP	REACTOR RECIRC PUMP
RRS	REACTOR RECIRCULATION SYSTEM
RSCM	RHR REACTOR SHUTDOWN COOLING MODE (FSAR)
RSCS	ROD SEQUENCE CONTROL SYSTEM
RSD	REMOTE SHUTDOWN
RSN	RESIN
RSO	REACTOR SYSTEM OUTLINE (FSAR)
RSPCM	RHR SUPPRESSION POOL COOLING MODE (FSAR)
RSS	REMOTE SHUTDOWN SYSTEM
RSVR RSV	RESERVOIR
RT	RATE
RTN RET	RETURN
RTRV	RETRIEVAL
RUN	RUNNING

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
RUNBK RUNB	RUNBACK
RWCU WCS	REACTOR WATER CLEANUP SYSTEM
RWB	RADWASTE BUILDING
RWM	ROD WORTH MINIMIZER
RWP	RADIATION WORK PERMIT
RX	REACTOR

Abbreviation	Definition
	S
SACF	SINGLE ACTIVE COMPONENT FAILURE
SAF	SAFE/SAFETY
SAR	SAFETY ANALYSIS REPORT
SAS	SERVICE AIR SYSTEM
SAT	SATURATION
SBA	SMALL BREAK ACCIDENT
SBGTS SBGT GTS	STANDBY GAS TREATMENT SYSTEM
SC	SUPPRESSION CHAMBER
SCA	SINGLE-CHANNEL ANALYZER
SCAV	SCAVENGING
SCBA	SELF-CONTAINED BREATHING APPARATUS
SCDRY	SECONDARY
SCL	REACTOR BUILDING LEVEL CONTROL
SCM	STATION CONTROL 120 V PANEL
SCR	REACTOR BUILDING RADIATION CONTROL
SCRN	SCREEN
SCRNWELL	SCREENWELL
SCT	REACTOR BUILDING TEMPERATURE CONTROL
SDC	SHUTDOWN COOLING
SDIV	SCRAM DISCHARGE INSTRUMENT VOLUME
SDV	SCRAM DISCHARGE VOLUME
SEC	SECOND, SECONDS

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
SEC REL MAT	SECURITY RELATED MATERIAL
SEF	SINGLE EQUIPMENT FAILURE
SEP	SEPARATOR
SEQ	SEQUENCE
SFC	SPENT FUEL POOL COOLING AND CLEANUP SYSTEM
SFP	SPENT FUEL POOL
SFPHX	SPENT FUEL POOL HEAT EXCHANGER
SGNLS SIG	SIGNALS
SHFT SFT	SHAFT
SHL	SHELL
SHR	SHEAR
SHT	SHUT
SHTDN SDN	SHUTDOWN
SIL	SILENCER
SJAE	STEAM JET AIR EJECTOR
SL	SEAL
SLC SBLC	STANDBY LIQUID CONTROL
SLCS	STANDBY LIQUID CONTROL SYSTEM
SLDG	SLUDGE
SMK	SMOKE
SMP	SUMP

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
SMPL SM	SAMPLE
SMPLG	SAMPLING
SMRY	SUMMARY
SMSA	STANDARD METROPOLITAN STATISTICAL AREA
SMT	SAMPLE TANK
SOE	SINGLE OPERATOR ERROR
SOF	SINGLE OPERATOR FAILURE
SOL	SOLID
SORC	SITE OPERATIONS REVIEW COMMITTEE
SORV	STUCK OPEN RELIEF VALVE
SOV	SOLENOID OPERATED VALVE
SOVX	SOV X
SP	SUPPRESSION POOL
SPC	SUPPRESSION POOL COOLING SOUND-POWERED COMMUNICATION (SYSTEM) (FSAR)
SPCL	SPECIAL
SPDS	SAFETY PARAMETER DISPLAY SYSTEM
SPDES	STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM
SPG	SUBSTITUTE POSITION GENERATOR
SPGE	SPARGE
SPL	SUPPRESSION POOL LEVEL CONTROL
SPLL	SUPPRESSION POOL LOAD LIMIT
SPREAD SPRDR	SPREADER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
SPT	SUPPRESSION POOL TEMPERATURE CONTROL
SPT RSN	SPENT RESIN
SRAB	SAFETY REVIEW AND AUDIT BOARD
SRDI	SAFETY-RELATED DISPLAY INSTRUMENTATION
SRGE SG SRG	SURGE
SRM	SOURCE RANGE MONITOR
SRP	STANDARD REVIEW PLAN
SRSS	SQUARE ROOT OF THE SUM OF THE SQUARES
SRV	SAFETY RELIEF VALVE
SRVDL	SAFETY RELIEF VALVE DISCHARGE LINE
SRVTPLL	SAFETY RELIEF VALVE TAIL PIPE LEVEL LIMIT
SS	SAFE SHUTDOWN
SSE	SAFE SHUTDOWN EARTHQUAKE
STA	STATION
STAT	STATUS
STBY SBY	STANDBY
STK	STACK
STM ST	STEAM
STMLINE	STEAMLINE
STOR STG	STORAGE
STR	STARTER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
STRN	STRAINER
STTR	STATOR
SU	STARTUP
SUBSTA	SUBSTATION
SUCT SUC	SUCTION
SUDD	SUDDEN
SUG	STEP UP GEAR
SUPLY SPLY SUP	SUPPLY
SUPPR SUPP SPPR	SUPPRESSION
SUPV	SUPERVISORY
SV	STOP VALVE
SVCE SER	SERVICE
SW	SERVICE WATER SWITCH
SWGR SWG	SWITCHGEAR
SWLP	SCREENWELL BUILDING
SWP	SERVICE WATER SYSTEM
SWT	TRAVELING WATER SCREENS AND WASH SYSTEM
SWYD	SWITCHYARD
SYNC	SYNCHROSCOPE
SYS	SYSTEM

Abbreviation	Definition
T	
TB	TURBINE BUILDING
TBCLC CCS	TURBINE BUILDING CLOSED LOOP COOLING
TBCLCW	TURBINE BUILDING CLOSED LOOP COOLING WATER
TCV TV	TEMPERATURE CONTROL VALVE
TEMP TMP	TEMPERATURE
TG	TURBINE GENERATOR
THERM THRM	THERMAL
THROT THR	THROTTLE
THRST	THRUST
TI	TEMPERATURE INDICATOR
TIP	TRAVERSING INCORE PROBE
TK	TANK
TLD	THERMOLUMINESCENT DOSIMETER
TMR	TIMER
TNL	TUNNEL
TR	TRIP
TRAV	TRAVELING
TRBL	TROUBLE
TRN	TRAIN
TRNGR TG	TURNING GEAR

Abbreviation	Definition
TRTMT	TREATMENT
TRTRY	TERTIARY
TSI	TURBINE SUPERVISORY INSTRUMENTATION
TSS	TEMPERATURE SENSOR/SWITCH
TSV	TURBINE STOP VALVE
TSVC	TURBINE STOP VALVE CLOSURE
T-U	TRIP UNIT
TURB	TURBINE
TURBID	TURBIDITY
TWR	TOWER
TX	TEMPERATURE SAMPLING POINT TRANSMITTER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	U
UC	UNIT COOLER
UF	UNDER FREQUENCY
UHS	ULTIMATE HEAT SINK
UNBAL	UNBALANCE
UNK	UNKNOWN
UNT	UNIT
UPR	UPPER
UPS	UNINTERRUPTED POWER SERVICE
UPSC UPSCL	UPSCALE
UPSTR	UPSTREAM
US	UNIT SUBSTATION
UV UNVOLT	UNDER VOLTAGE

Abbreviation	Definition
	V
V	VOLTS
V/R VR	VOLTAGE REGULATOR
VAC	VACUUM
VAP VPR	VAPOR
VBS	STATION VITAL BUS (125 VDC)
VDC	VOLTS DC
VENT	VENTILATION
VERIF	VERIFY VERIFICATION
VES	VESSEL
VEX	VALVE-EXPLOSIVE
VIB	VIBRATION
VLV V	VALVE
VLVS	VALVES
VOL	VOLUME
VOLT	VOLTAGE

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	W
WC	WASTE COLLECTOR
WCT	WASTE COLLECTOR TANK
WDG	WINDING
WDT	WASTE DISCHARGE TANK
WG	WATER GUAGE
WR	WIDE RANGE
WST W	WASTE
WTH	WATER TREATMENT HYPOCHLORITES
WTR	WATER

NMP-2 Abbreviations & Acronyms
Sorted by Abbreviation

Abbreviation	Definition
	X
X CONN XC	CROSSCONNECT
X OVER	CROSSOVER
XFER XFR	TRANSFER
XFMR XFMER X	TRANSFORMER
XSR	TRANFORMER STATION RESERVE
X-TIE	CROSSTIE
	Z
ZPA	ZERO PERIOD ASYMPTOTE
uCI/CC	MICROCURIES PER CUBIC CENTIMETER
uCI/S	MICROCURIES PER SECOND
<	LESS THAN
>	GREATER THAN
%	PERCENT
+	AND
3D	3D MONICORE SYSTEM

APPENDIX D

STANDARD ABBREVIATIONS
REV 3 8/90

Sorted by Definition

Appendix D is the NMP-2 Standard Abbreviations List. The list is arranged by alphabetical order of the definitions (Appendix C is arranged by alphabetical order of the abbreviations).

If multiple abbreviations are given, the first abbreviation listed is preferred. Abbreviations with FSAR in parenthesis beside the definition originate from the Final Safety Analysis Report and are not necessarily for use in the control room.

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
A	
ABNORMAL	ABN, ABNORM
ABOVE	ABV
ABSOLUTE	ABSOL
ACCELERATION	ACCL
ACCIDENT	ACCDNT
ACCUMULATOR	ACC
ACKNOWLEDGE	ACK
ACTIVATED	ACT
ACTUATED	ACTU
ADMINISTRATIVE PROCEDURE ANNULUS PRESSURIZATION (FSAR)	AP
ADSORBTION	ADSRB
AFTERCOOLER	AFTERCLR AFTCLR
AIR CONDITIONER	A/C
AIR CONDITIONING UNIT	ACU
AIR OPERATED DAMPER	AOD
AIR OPERATED VALVE	AOV
AIR REMOVAL SYSTEM	ARC
ALARM	ALM
ALARM CLEAR	ALMCLR
ALTERNATE	ALTN
ALTERNATOR	ALTNTR
ALTERNATE ROD INSERTION	ARI

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
ALTERNATING CURRENT	AC
ALTERNATOR	ALT
AMBIENT	AMB
AMPERE	AMP
ANALYZER	ANAL, ANL
ANALYZER INDICATING TRANSMITTER	AIT
AND	+
ANNUNCIATOR	ANN
ANTICIPATED TRANSIENT WITHOUT SCRAM	ATWS
AREA RADIATION MONITOR	ARM
AREA RADIATION MONITORING SYSTEM	ARMS
AS LOW AS REASONABLY ACHIEVABLE	ALARA
ASSEMBLY	ASSY
ASSOCIATED	ASSOC, ASC
ATMOSPHERE	ATMOS, ATM
AUTO START	A/START
AUTO TRIP	AT
AUTOMATIC CIRCUIT BREAKER	ACB
AUTOMATIC DEPRESSURIZATION SYSTEM	ADS
AUTOMATIC DEPRESSURIZATION SYSTEM VALVE	ADSV
AUXILIARY	AUX
AUXILIARY BOILER - STEAM	ABM
AUXILIARY BOILER SYSTEM	ABS

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
AVAILABLE	AVAIL
AVERAGE	AVG
AVERAGE POWER RANGE MONITOR	APRM
AZIMUTH	AZ

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
B	
BACKUP	BU
BACKWASH	BKWSH, BW
BALANCE OF PLANT	BOP
BASEMENT	BSMT
BATTERY	BATT, BAT
BEARING	BRG
BEGINNING OF CYCLE	BOC
BELOW	BEL
BINARY CODED DECIMAL	BCD
BIOLOGICAL SHIELD WALL	BSW
BLOCK	BLK
BLOCKING	BLOCK
BLOWDOWN	BLWDN
BLOWER	BLWR
BOILER	BLR
BOILING WATER REACTOR	BWR
BOOSTER	BSTR, BST
BOTTOM	BOT
BOTTOM CENTER PRESSURE (FSAR)	BCP
BRANCH TECHNICAL POSITION	BTP
BREAKER	BRKR, BKR
BREATHING	BRTHNG
BREATHING AIR	BA

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
BUILDING	BLDG, BLD
BUILDING HEATING	BHTG
BUSHING	BSNG
BYPASS	BYP
BYPASS VALVE	BV

Definition	Abbreviation
C	
CABINET	CAB
CALIBRATION	CALIB, CAL
CALIPER	CLPR
CANCEL	CANCL
CARD	CD
CAVITY	CAV
CENTER	CTR
CHAMBER	CHMBR, CHAM, CHM
CHANNEL	CHAN, CH
CHARCOAL	CHAR
CHARGER	CHGR
CHECK	CHK
CHEMICAL	CHEM
CHILLED	CHILL, CHIL
CHILLER	CHL
CIRCUIT	CKT
CIRCULATING/CIRCULATION	CIRC
CIRCULATING WATER	CW
CIRCULATING WATER SYSTEM	CWS
CLEAN	CLN
CLEAN STEAM REBOILER	CSR
CLEANUP	CLN-UP, CU
CLOSE	CLS

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
CLOSED	CLSD, CL
CLOSED COOLING WATER	CCW
CLOSED LOOP COOLING WATER	CLCW
CLOSED LOOP COOLING WATER-PRIMARY	CCP
CLOSED LOOP COOLING WATER-SECONDARY	CCS
CLOSURE	CLSR
COEFFICIENT	COEFF
COLD REHEAT SYSTEM	CRS
COLLECTOR/COLLECTION	COLL
COLLISION-IMPORTED-VELOCITY METHOD (FSAR)	CIVM
COMBINED INTERMEDIATE VALVE	CIV
COMBUSTIBLE GAS CONTROL SYSTEM	CGCS
COMMON	COM
COMMON MODE FAILURE ANALYSIS	CMFA
COMMUNICATION	COMM
COMPLETE	COMPL
COMPRESSOR	CPRSR, CPSR, C
COMPUTER	COMP, CMPTR
CONCENTRATE	CONC
CONCENTRATION	CONC
CONDENSATE	CNST, CND
CONDENSATE STORAGE	CNDS
CONDENSATE STORAGE TANK	CST
CONDENSATION OSCILLATION	CO

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
CONDENSER	CNSR
CONDITIONING	CONDITION
CONDUCTIVITY	COND, CNDCTY
CONNECT	CONN
CONSTANT	CONST, CONS
CONTAINMENT	CONTMT, CONMT, CNMT
CONTAINMENT AND REACTOR VESSEL ISOLATION CONTROL SYSTEM	CRVICS
CONTAINMENT ATMOSPHERE DILUTION (DEVICE)	CAD
CONTAINMENT MONITORING SYSTEM	CMS
CONTAINMENT PURGE SYSTEM	CPS
CONTINUOUS AIR MONITOR	CAM
CONTROL/CONTROLLER	CONT
CONTROL BUILDING	CB
CONTROL ROD DRIVE MECHANISM	CRDM
CONTROL ROD DRIVE	CRD, RDS
CONTROL ROD DRIVE SYSTEM	RDCS
CONTROL ROD DROP ACCIDENT	CRDA
CONTROL ROD POSITION INDICATION (FSAR) (Use Rod Position Information System - RPIS)	CRPI
CONTROL ROOM	CONT RM, CR, CONTRM
CONTROL ROOM EQUIPMENT CABINETS	CEC
CONTROL SWITCH	CS
CONTROL VALVE	CV

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
CONVERSION	CONV
COOL DOWN RATE	CDR
COOLER	CLR
COOLERS	CLRS
COOLING	CLG
COUNTS PER SECOND	CPS
COUPLING	CPLG
CRITICAL HEAT FLUX	CHF
CRITICAL POWER RATIO	CPR
CROSSCONNECT	X CONN, XC
CROSSOVER	X OVER
CROSSTIE	X TIE
CUMULATIVE USAGE FACTOR	CUF
CURIE	CI
CURRENT	CUR
CYCLE	CYC

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
D	
DAMPER	DAMPR, DMPR
DEAERATOR	DEAR
DECANT	DCNT
DECONTAMINATION	DECON
DEGRADED	DEGRD
DEGREE	DEG
DEGREES FARENHEIT	^{o}F DEGF
DEMAND	DEM
DEMINERALIZER/DEMINERALIZED	DEMIN, DMN
DEPRESSURIZE	DEPRESS
DESIGN ASSESSMENT REPORT FOR HYDRODYNAMIC LOADS	DAR
DESIGN BASIS	DB
DESIGN BASIS ACCIDENT	DBA
DESIGN BASIS EARTHQUAKE	DBE
DESIGN BASIS FLOOD LEVEL	DBFL
DETECTION DETECTOR DETECTED	DETECT, DET
DEVIATION	DEV
DIAPHRAGM	DIAPH
DICTIONARY	DICT
DIESEL	DSL
DIESEL GENERATOR	DG

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
DIESEL GENERATOR BUILDING	DGB
DIFFERENTIAL	DIFF
DIFFERENTIAL PRESSURE	DP, P
DIGIT	DIG
DIGITAL RADIATION MONITORING SYSTEM	DRMS
DIRECT CURRENT	DC
DIRECT CURRENT DIFFERENTIAL TRANSDUCER	DCDT
DIRECTIONAL	DIR
DISABLED	DISAB, DSABL
DISCHARGE	DISCH, DIS
DISCONNECT	DISCON
DISPLAY	DISPL
DISTILATE	DSTLT, DST
DISTRIBUTION	DISTR, DSTR
DIVERTER	DIVERT
DIVISION	DIV, D
DOME	DOM
DOWN	DN
DOWNSCALE	DNSCALE, DNSCL, DNSC
DRAIN	DRN, DR
DRAINS	DRNS, DRS
DRAIN TANK	DT
DRAIN VALVE	DV
DRIVE	DRV

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
DRYWELL	DW, DRWL
DRYWELL/REACTOR BUILDING EQUIPMENT DRAINS	DER
DRYWELL/REACTOR BUILDING FLOOR DRAIN SYSTEM	DFR
DRYWELL SPRAY INITIATION PRESSURE LIMIT	DWSIPL
DRYWELL TEMPERATURE CONTROL	DWT

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
E	
EFFICIENCY	EFF
EFFLUENT	EFFL
EJECTOR	EJCTR, EJCT
ELECTRIC	ELEC, ELC
ELECTRICAL DRAWING NUMBER	ESK
ELECTRIC PROTECTIVE ASSEMBLY	EPA
ELECTRO HYDRAULIC CONTROL	EHC
ELEVATION	ELEV, EL
EMERGENCY	EMER, EM
EMERGENCY AC DISTRIBUTION 4160 V	ENS
EMERGENCY BEARING OIL PUMP	EBOP
EMERGENCY CORE COOLING SYSTEM	ECCS
EMERGENCY DIESEL GENERATOR	EDG
EMERGENCY DIESEL GENERATOR SYSTEM	EGS
EMERGENCY OPERATIONS FACILITY EQUIVALENT OCCURENCE FACTOR (FSAR)	EOF
EMERGENCY PLANNING ZONE	EPZ
EMERGENCY RESPONSE FACILITY	ERF
EMERGENCY TRIP SYSTEM	ETS
ENCLOSURE	ENCL, ENC
END OF CYCLE	EOC
ENERGY INFORMATION CENTER	EIC

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
ENGINE	ENG
ENGINEERED SAFETY FEATURE	ESF
ENGINEERING CHANGE AUTHORIZATION	ECA
ENGINEERING CHANGE NOTICE	ECN
ENTHALPY	ENTH
ENVIRONMENTAL QUALIFICATION DOCUMENT	EQD
EQUALIZING	EQL
EQUIPMENT	EQUIP, EQPT, EQ
EQUIPMENT PIECE	EP
ENVIRONMENTAL QUALIFICATION	EQ
EVACUATION	EVAC
EVAPORATOR	EVAP, EV
EXCESS FLOW CHECK VALVE	EFV, EFCV
EXCHANGER	EXCH
EXCITOR	EXC
EXCLUSION AREA BOUNDARY	EAB
EXECUTE	EXEC
EXHAUST	EXH
EXPANSION	EXP
EXPECTED	EXPTD
EXTERNAL	EXTRNL
EXTRACTION, EXTRACTOR	EXTRCTN, EXTR
EXTREME HIGH	EH
EXTRUDER/EVAPORATOR	EX/EV

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
F	
FACTOR	FACTR
FAIL TO CLOSE	FTC
FAIL TO START	FTS
FAILURE/FAILED	FAIL
FAILURE MODES AND EFFECTS ANALYSIS	FMEA
FAN	FN
FEED	FD
FEED COLLECTOR	FDC
FEEDER	FDR
FEEDWATER	FD WTR, FW, FDW
FEEDWATER SYSTEM	FWS
FEET, FOOT	FT
FIELD	FLD
FIELD DEVIATION DISPOSITION	FDDR
FILTER	FLTR, FLT
FILTER DEMINERALIZER	F/D
FILTRATION	FLTN
FINAL SAFETY ANALYSIS REPORT	FSAR
FIRE PROTECTION SYSTEM	FPS
FIRE PROTECTION WATER	FPW
FIXTURE MOUNTING HEIGHT	FMH
FLANGE	FLG
FLOOR	FLR

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
FLOOR DRAIN	FLDR
FLOW	FLO
FLOW CONTROL VALVE	FCV
FLOW IN	FL IN
FLOW VALVE	FV
FLUID	FLU
FLUID ACTUATOR SYSTEM	FAS
FLUX	FLX
FORWARD	FWD
FRACTURE APPEARANCE TRANSITION TEMPERATURE	FATT
FREQUENCY	FREQ
FRESH	FSH
FROM	FR
FUEL	F
FUEL POOL COOLING AND CLEANUP	FPCC
FUEL ZONE	FZ
FULL ARC (MODE OF TCV OPERATION) (FSAR)	FA
FULL CLOSE	FL CL
FULL-LENGTH EMERGENCY COOLING HEAT TRANSFER	FLECHT
FUNCTIONAL CONTROL DIAGRAM	FCD

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
G	
GALLONS PER MINUTE	GPM
GAS TREATMENT SYSTEM	GTS
GASEOUS	GAS
GENERAL	GENL
GENERAL DESIGN CRITERION	GDC
GENERAL ELECTRIC COMPANY	GE
GENERATOR	GEN, GN
GENERATOR LEADS	GEN-L
GE THERMAL ANALYSIS BASIS	GETAB
GE VALVE DESIGNATION NUMBER	FO
GLAND	GLD
GREATER THAN	>
GOVERNOR	GOV
GROSS	G

Definition	Abbreviation
H	
HAND CONTROLLED VALVE	HCV
HATCH	HAT
HEADER	HDR
HEAT	HT
HEAT AFFECTED ZONE	HAZ
HEAT CAPACITY LEVEL LIMIT	HCLL
HEAT CAPACITY TEMPERATURE LIMIT	HCTL
HEATER	HTR
HEATERS	HTRS
HEAT EXCHANGER	HX
HEAT EXCHANGER/COOLER	E
HEATING	HTG
HEATING AND VENTILATION CONTROL BUILDING	HVC
HEATING AND VENTILATION-REACTOR BUILDING	HVR
HEATING, VENTILATING, AND AIR CONDITIONING	HVAC
HEAVY DENSITY FILL MATERIAL (FSAR)	HDFM
HIGH	HI, H
HIGH-EFFICIENCY PARTICULATE AIR/ ABSOLUTE (FILTER)	HEPA
HIGH ENERGY LINE BREAK (FSAR)	HELB
HIGH-HIGH	HI-HI, H-H, HI/HI, H/H
HIGH-LOW	HI-LO, H-L, HI/LO, H/L
HIGH PRESSURE HORSEPOWER	HP

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
HIGH PRESSURE CORE SPRAY	HPCS
HIGH TEMPERATURE	HI T
HIGH VOLTAGE	HV
HISTORICAL	HIST
HOLDING	HLDG
HOMOGENEOUS EQUILIBRIUM MODEL (FSAR)	HEM
HOPPER	HPPR
HOT REHEAT STEAM	HRS
HOTWELL	HWL
HOUR	HR
HUMIDITY	HMDT
HYDRAULIC	HYDR
HYDRAULIC CONTROL UNIT	HCU
HYDRAULIC FLUID	HYDR FL
HYDRAULIC POWER UNIT	HPU
HYDRAULICALLY CONTROLLED VALVE	HYV
HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO	HEPCO
HYDROGEN	H_2
HYDROGEN RECOMBINER SYSTEM	HCS

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
I	
INACTIVE	INACTV
IMBALANCE	IMBAL
INADEQUATE CORE COOLING	ICC
IN ACCORDANCE WITH	IAW
INBOARD	INBD, IB
INCH, INCHES	IN
INCIDENT DETECTION CIRCUITRY (FSAR)	IDC
INCOMPLETE	INCMPL
INDICATOR	IND
INFLUENT	INFL
INHIBIT	INHIB
INITIATE/INITIATION/INITIATED	INIT
INJECT/INJECTION	INJ INJCTN
INLEAKAGE	INLKGE
INLET	INL, IN
INLET/OUTLET	IN/OUT
INNER	INNR
INOPERABLE	INOP
INPUT	INP
INPUT/OUTPUT	I/O
INSTRUMENT	INSTR, INST
INSTRUMENT AND ELECTRICAL DRAWING	IED
INSTRUMENT AIR SYSTEM	IAS

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
INSTRUMENT DATA SHEET	IDS
INSULATED POWER CABLES ENGINEERS ASSOCIATION (FSAR)	IPCEA
INTAKE	INT
INTERCEPT STOP VALVE	ISV, CIV
INTERCEPT VALVE	INV, CIV
INTERCONDENSER	INCNSR
INTERGRANULAR STRESS CORROSION CRACKING	IGSCC
INTEGRATED LEAKAGE RATE TEST	ILRT
INTERIM ACCEPTANCE CRITERIA (NRC)	IAC
INTERLOCK	INTLK, INLK
INTERMEDIATE	INTERM, INTMD, INTD
INTERMEDIATE BREAK ACCIDENT	IBA
INTERMEDIATE RANGE MONITOR	IRM
ISOLATION	ISOL, ISO
ISOLATION COOLING SYSTEM	ICS
ISOLATION VALVE	IV

Definition	Abbreviation
J	
J.A. FITZPATRICK STATION	JAF
JACKET	JKT
K	
KILOVOLT	KV

L

Definition	Abbreviation
LAKE	LKE
LAKE SURVEY DATUM (OF 1935)	LSD
LEAK LEAKING	LK
LEAKAGE	LKGE, LK
LEAKAGE CONTROL SYSTEM	LCS
LEAKAGE MONITORING SYSTEM	LMS
LEAK-DETECTION SYSTEM	LDS
LESS THAN	<
LEVEL	LVL
LEVEL CONTROL VALVE	LCV
LEVEL VALVE (LCV)	LV
LEVEL VALVE X	LVX
LIMIT	LIM
LIMITING CONDITION OF OPERATION	LCO
LIMITING SAFETY SYSTEM SETTING	LSSS
LINE	LN
LINEAR HEAT GENERATION RATE	LHGR
LIQUID	LIQ
LIQUID RADWASTE SYSTEM	LWS
LOAD	LD
LOAD TAP CHANGING	LTC
LOCAL POWER RANGE MONITOR	LPRM
LOCKOUT	LKO, L.O., LKOUT

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
LOGIC	LGC
LOOSE PARTS DETECTION SYSTEM	LPDS
LOSS OF COOLANT ACCIDENT	LOCA
LOSS OF FEEDWATER	LOFW
LOSS OF OFFSITE POWER	LOOP, LOP
LOW	LO, L
LOW FREQUENCY MOTOR GENERATOR	LFMG
LOW-LOW	LO-LO, L-L, LO/LO, L/L
LOW POPULATION ZONE	LPZ
LOW POWER ALARM POINT	LPAP
LOW POWER SET POINT	LPSP
LOW PRESSURE	LP
LOW PRESSURE COOLANT INJECTION	LPCI
LOW PRESSURE CORE SPRAY	LPCS, CSL
LOW SPECIFIC ACTIVITY (BOXES)	LSA
LOWER	LOR
LUBE OIL	LUBO
LUBRICATING	LUBE

Definition	Abbreviation
M	
MACHINE	MACH
MAIN	MN
MAIN CONDENSATE SYSTEM	CNM
MAIN SHAFT	MN SFT
MAIN STEAM	MS
MAIN STEAM ISOLATION	MSI
MAIN STEAM ISOLATION VALVE	MSIV
MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM	MSIV-LCS
MAIN STEAM LINE	MSL
MAIN STEAM LINE BREAK	MSLB
MAIN STEAM SYSTEM	MSS
MAIN STOP VALVE	MSV
MAINTENANCE	MAINT
MAINTENANCE AND CALIBRATION COMMUNICATION SYSTEM (FSAR)	M/CC
MAKEUP	MU, MKUP
MAKEUP WATER STORAGE AND TRANSFER	MWS
MANUAL/AUTO	M/A
MANUAL/MANUALLY	MAN
MASTER	MAST
MATERIAL	MAT
MAXIMUM	MAX
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE	MAPLHGR

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
MAXIMUM LINEAR HEAT GENERATION RATE	MLHGR
MAXIMUM PERMISSIBLE CONCENTRATION	MPC
MEAN LOW WATER DATUM	MLD
MECHANICAL	MECH
MECHANICAL TRIP VALVE	MTV
MEGAWATT ELECTRIC	MWE
MEGAWATT THERMAL	MWTH
MERCURY	HG
METER	METR
METHOD OF IMAGES (FSAR)	MOI
MICROCURIES PER CUBIC CENTIMETER	uCI/CC
MICROCURIES PER SECOND	uCI/S
MIDDLE	MID
MILLIREM	mr
MILLIREM PER HOUR	MR/HR
MINIMUM	MIN
MINIMUM CRITICAL POWER RATIO	MCPR
MINUTE	MIN
MISPLACED BUNDLE ACCIDENT (FSAR)	MBA
MOISTURE	MSTR
MOISTURE SEPARATOR REHEATER	MSR
MONITOR	MON
MOTION	MTN
MOTOR	MOT

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
MOTOR CONTROL CENTER	MCC
MOTOR DISCONNECT SWITCH	MDS
MOTOR GENERATOR	MG
MOTOR OPERATED DAMPER	MODMPR, MOD
MOTOR OPERATED DISCONNECT	MODS
MOTOR OPERATED GATE	MOG
MOTOR OPERATED VALVE	MOV

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
N	
NARROW RANGE	NR
NATIONAL BUREAU OF STANDARDS	NBS
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH	NIOSH
NEGATIVE	NEG
NET POSITIVE SUCTION HEAD	NPSH
NEUTRAL	NEUT
NEUTRON	NTRN
NEUTRON MONITORING SYSTEM	NMS
NEW YORK POWER AUTHORITY	PASNY
NIL DUCTILITY TRANSITION	NDT
NIL DUCTILITY TRANSITION TEMPERATURE	NDTT
NITROGEN	N_2
NO FLOW	NFL
NON-REGENERATIVE HEAT EXCHANGER	NRHX
NON RETURN VALVE	NRV
NON SAFETY RELATED	NSR
NORMAL	NORM, NOR
NORMAL AC DISTRIBUTION 13.8 KV	NPS
NORMAL AC DISTRIBUTION 4160 V	NNS
NORMAL STATION SERVICE	NSS
NOT APPLICABLE	N/A
NOT AVAILABLE	NOAVLB, N-AVAI
NOT CLOSE	NOT CL

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
NOT FILLED	N-FILL
NOT FULL CLOSE	NOFLCL
NOT FULL OPEN	NOFLOP
NUCLEAR BOILER	NB
NUCLEAR BOILER RATED (THERMAL POWER)	NBR
NUCLEAR DATA LINK	NDL
NUCLEAR ENERGY DIVISION (GE)	NED
NUCLEAR PLANT RELIABILITY DATA SYSTEM	NPRDS
NUCLEAR SAFETY OPERATIONAL ANALYSIS	NSOA
NUCLEAR STEAM SUPPLY SYSTEM	NSSS
NUMBER	NO

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
O	
OCCUPATIONAL RADIATION EXPOSURES	ORE
OPERABLE OPERATOR	OPER
OPERATING BASIS EARTHQUAKE	OBE
OPERATIONAL TRANSIENT	OT
ORIFICED FUEL SUPPORT	OFS
OUTER	OUTR
OUT OF FILE	OOF
OUT OF SERVICE	OOS
OUTBOARD	OUTBD, OB
OUTLET	OUTL, OUT
OVERALL	OVALL
OVERCURRENT	OVCRNT, OC
OVERLOAD	OVLD, OL
OVERRIDE	OVRD, OR
OVERVOLTAGE	OV, OVRVLT
OXYGEN	O_2

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
P	
PAGE PARTY/PUBLIC ADDRESS SYSTEM (FSAR)	PP/PA
PARTIAL	PART
PARTICULATE	PARTIC
PEAK CLADDING TEMPERATURE	PCT
PEAK POWER/PRECONDITIONED POWER CORE MARGIN	PCRAT
PELLET-CLADDING INTERACTION	PCI
PENETRATION	PNTRN
PERCENT	%, PCT
PERMANENT	PERM
PERMISSIVE	PERMIS
pH	pH
PHASE	PH
PINION	PIN
PIPING AND INSTRUMENTATION DIAGRAM	P&ID
PLANT VENT STACK	PVS
POINT PRESS TRANSMITTER	PT
POLISHER POLISHING	POLISH
POSITION	POSN, POS
POST-ACCIDENT MONITORING	PAM
POTENTIAL	POT
POTENTIAL TRANSFORMER	POT XFMER
POUND MASS	LBM

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
POUNDS	LB
POUNDS PER SQUARE INCH	PSI
POUNDS PER SQUARE INCH DIFFERENTIAL	PSID
POUNDS PER SQUARE INCH GAGE	PSIG
POWER	PWR
POWER FACTOR	PF
POWER GENERATING CONTROL CENTER	PGCC
POWER LOAD UNBALANCE	PLU
POWER RANGE MONITOR	PRM
POWER SPECTRUM DENSITY	PSD
POWER SUPPLY	PS
PRECOOLER	PRE-CLR
PREHEATER	PREHTR
PRELIMINARY SAFETY ANALYSIS REPORT	PSAR
PRESSURE	PRESS, PRES, PR
PRESSURE CONTROL VALVE	PCV
PRESSURE SAFETY VALVE	PSV
PRESSURE SUPPRESSION PRESSURE	PSP
PRESSURE VALVE	PV
PRE-TREATMENT	PRE-TRTMT
PRIMARY	PRIM, PRI
PRIMARY CONTAINMENT	PC
PRIMARY CONTAINMENT AND REACTOR VESSEL ISOL CONTROL SYSTEM (FSAR)	PCIS, PCRVICS
PRIMARY CONTAINMENT PRESSURE CONTROL	PCP

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
PRIMARY CONTAINMENT PRESSURE LIMIT	PCPL
PROBABLE MAXIMUM FLOOD	PMF
PROBABLE MAXIMUM SURGE (FSAR)	PMS
PROBABLE MAXIMUM WINDSTORM	PMWS
PROCESS COMPUTER SYSTEM	PCS
PRODUCT QUALITY CHECKLIST	PQL
PROGRAM	PGM
PROGRAMMABLE LOGIC CONTROLLER	PLC
PROGRESS	PRG
PROJECT TEST PROGRAM OBJECTIVES	PTPD
PROTECTION	PROT, PRT
PUBLIC ADDRESS SYSTEM	PA
PULL-TO-LOCK	PTL
PUMP	PMP, PP,P
PUMPS	PMPS
PURGE	PRGE

Q

Definition	Abbreviation
QUALITY ASSURANCE	QA
QUALITY CONTROL	QC

Definition	Abbreviation
R	
RADIAL	RDL, RADL
RADIATION	RADN
RADIATION WORK PERMIT	RWP
RADIOACTIVITY RELEASE CONTROL	RR
RADS	R
RADWASTE	RADW, RW
RADWASTE BUILDING	RWB
RANGE	RNG
RATE	RT
REACTION	REAC
REACTOR	RX
REACTOR BUILDING	RB
REACTOR BUILDING CLOSED LOOP COOLING (CCP)	RBCLC
REACTOR BUILDING CLOSED LOOP COOLING WATER	RBCLCW
REACTOR BUILDING LEVEL CONTROL	SCL
REACTOR BUILDING POLAR CRANE	RBPC
REACTOR BUILDING RADIATION CONTROL	SCR
REACTOR BUILDING TEMPERATURE CONTROL	SCT
REACTOR BUILDING VENTILATION SYSTEM	HVRS
REACTOR COOLANT PRESSURE BOUNDARY	RCPB
REACTOR COOLANT SYSTEM	RCS
REACTOR CORE ISOLATION COOLING	RCIC
REACTOR FEED PUMP	RFP

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
REACTOR MANUAL CONTROL SYSTEM	RMCS
REACTOR PRESSURE VESSEL	RPV
REACTOR PROTECTION SYSTEM	RPS
REACTOR RECIRCULATION PUMP	RRP
REACTOR RECIRCULATION SYSTEM	RRSM
REACTOR SYSTEM OUTLINE	RSO
REACTOR WATER CLEANUP SYSTEM	RWCU, WCS
REBOILER	REBLR, RBLR
REBOILERS	RBLRS
RECEIVING	RCVG
RECEIVER	RCVR
RECIRCULATING/RECIRCULATION	RECIRC, RECIR
RECIRCULATION PUMP TRIP	RPP
RECOMBINER	RECOMB, RBNR
RECORDER	RCDR, REC
RECOVERY	RCVY, RCVRY
RECTIFIER	RECT
RECYCLE	RECYC
REDUCER	RED
REDUNDANT REACTIVITY CONTROL SYSTEM	RRCS
REFERENCE	REFR, REF
REFUEL	RFUL
REGENERATIVE	REGEN, RGEN
REGENERATIVE HEAT EXCHANGER	RHX

Definition	Abbreviation
REGULATED	REGLTD, RGLTD
REGULATOR	REG
REHEAT	REHT
REHEATER	REHTR, RHTR
REHEATING	REHTG
RELATIVE HUMIDITY	RH
RELAY	RLY
RELIEF	RLF
REMOTE	REM
REM PER HOUR	R/HR
REMOTE SHUTDOWN	RSD
REMOTE SHUTDOWN SYSTEM	RSS
REMOVAL	RMVL, REM
REQUIRED	REQ'D
RESERVE	RES
RESERVOIR	RSVR, RSV
RESIDUAL	RESID
RESIDUAL HEAT REMOVAL SYSTEM	RHR
RESIN	RSN
RESTORE	RESTR
RESTRICTED AREA BOUNDARY	RAB
RESTRICTING ORIFICE	RO
RETRACT	RETRCT
RETRANSMIT	RETR

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
RETRIEVAL	RTRV
RETURN	RTN, RET
REVOLUTIONS PER MINUTE	RPM
RHR CONTAINMENT SPRAY COOLING MODE (FSAR)	RCSCM
RHR LOOP B	RHRB
RHR REACTOR SHUTDOWN COOLING MODE (FSAR)	RSCM
RHR SUPPRESSION POOL COOLING MODE (FSAR)	RSPCM
ROD BLOCK MONITOR	RBM
ROD PATTERN CONTROLLER	RPC
ROD POSITION INFORMATION SYSTEM	RPIS
ROD SEQUENCE CONTROL SYSTEM	RSCS
ROD WORTH MINIMIZER	RWM
ROOM	RM
ROOT MEAN SQUARE	RMS
RPV PRESSURE CONTROL	RP
RPV REACTIVITY CONTROL	RQ
RPV WATER LEVEL CONTROL	RL
RUNBACK	RUNBK, RUNB
RUNNING	RUN

Definition	Abbreviation
S	
SAFE/SAFETY	SAF
SAFE SHUTDOWN	SS
SAFE SHUTDOWN EARTHQUAKE	SSE
SAFETY ANALYSIS REPORT	SAR
SAFETY PARAMETER DISPLAY SYSTEM	SPDS
SAFETY-RELATED DISPLAY INSTRUMENTATION	SRDI
SAFETY RELIEF VALVE	SRV
SAFETY RELIEF VALVE DISCHARGE LINE	SRVDL
SAFETY RELIEF VALVE TAIL PIPE LEVEL LIMIT	SRVTPLL
SAFETY REVIEW AND AUDIT BOARD	SRAB
SAMPLE	SMPL, SM
SAMPLE TANK	SMT
SAMPLING	SMPLG
SATURATION	SAT
SECONDARY	SCDRY
SCAVENGING	SCAV
SCRAM DISCHARGE INSTRUMENT VOLUME	SDIV
SCRAM DISCHARGE VOLUME	SDV
SCREEN	SCRN
SCREENWELL	SCRNWELL
SCREENWELL AND FIRE SYSTEM	HVY
SCREENWELL BUILDING	SWLB
SEAL	SL

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
SECOND, SECONDS	SEC
SECURITY RELATED MATERIAL	SEC REL MAT
SELF-CONTAINED BREATHING APPARATUS	SCBA
SEPARATOR	SEP
SEQUENCE	SEQ
SERVICE	SVCE, SER
SERVICE AIR SYSTEM	SAS
SERVICE WATER SWITCH	SW
SERVICE WATER SYSTEM	SWP
SHAFT	SHFT, SFT
SHEAR	SHR
SHELL	SHL
SHUT	SHT
SHUTDOWN	SHTDN, SDN
SHUTDOWN COOLING	SDC
SIGNALS	SGNLS, SIG
SILENCER	SIL
SINGLE ACTIVE COMPONENT FAILURE	SACF
SINGLE-CHANNEL ANALYZER	SCA
SINGLE EQUIPMENT FAILURE	SEF
SINGLE OPERATOR ERROR	SOE
SINGLE OPERATOR FAILURE	SOF
SITE OPERATIONS REVIEW COMMITTEE	SORC
SLUDGE	SLDG

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
SMALL BREAK ACCIDENT	SBA
SMOKE	SMK
SOLENOID OPERATED VALVE	SOV
SOLID	SOL
SOURCE RANGE MONITOR	SRM
SOV X	SOVX
SPARGE	SPGE
SPECIAL	SPCL
SPENT FUEL POOL	SFP
SPENT FUEL POOL COOLING AND CLEANUP SYSTEM	SFC
SPENT FUEL POOL HEAT EXCHANGER	SFPHX
SPENT RESIN	SPT RSN
SPREADER	SPREAD, SPRDR
SQUARE ROOT OF THE SUM OF THE SQUARES	SRSS
STACK	STK
STANDARD METROPOLITAN STATISTICAL AREA	SMSA
STANDARD REVIEW PLAN	SRP
STANDBY	STBY, SBY
STANDBY GAS TREATMENT SYSTEM	SBGTS, SBGT, GTS
STANDBY LIQUID CONTROL	SLC, SBLC
STANDBY LIQUID CONTROL SYSTEM	SLCS
STANDBY SERVICE SUBSTATION	EJS
STARTER	STR
STARTUP	SU

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM	SPDES
STATION	STA
STATION CONTROL 120 V PANEL	SCM
STATION VITAL BUS (125 VDC)	VBS
STATOR	STTR
STATUS	STAT
STEAM	STM, ST
STEAM JET AIR EJECTOR	SJAE
STEAMLINE	STMLINE
STEP UP GEAR	SUG
STOP VALVE	SV
STRAINER	STRN
STORAGE	STOR, STG
STUCK OPEN RELIEF VALVE	SORV
SUBSTATION	SUBSTA
SUBSTITUTE POSITION GENERATOR	SPG
SUCTION	SUCT, SUC
SUDDEN	SUDD
SUMMARY	SMRY
SUMP	SMP
SUPERVISORY	SUPV
SUPPLY	SUPLY, SPLY, SUP
SUPPRESSION	SUPPR, SUPP, SPPR
SUPPRESSION CHAMBER	SC

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
SUPPRESSION POOL	SP
SUPPRESSION POOL COOLING SOUND-POWERED COMMUNICATION SYSTEM (FSAR)	SPC
SUPPRESSION POOL LEVEL CONTROL	SPLC
SUPPRESSION POOL LOAD LIMIT	SPLL
SUPPRESSION POOL TEMPERATURE CONTROL	SPT
SURGE	SRGE, SG, SRG
SWITCHGEAR	SWGR, SWG
SWITCHYARD	SWYD
SYNCHROSCOPE	SYNC
SYSTEM	SYS

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
T	
TANK	TK
TEMPERATURE	TEMP, TMP
TEMPERATURE CONTROL VALVE	TCV, TV
TEMPERATURE INDICATOR	TI
TEMPERATURE SAMPLING POINT TRANSMITTER	TX
TEMPERATURE SENSOR/SWITCH	TSS
TERTIARY	TRTRY
THERMAL	THERM, THRM
THERMOLUMINESCENT DOSIMETER	TLD
THROTTLE	THROT, THR
THRUST	THRST
TIMER	TMR
TOWER	TWR
TRAIN	TRN
TRANSFER	XFER, XFR
TRANSFORMER	XFMR, XFMER, X
TRANSFORMER STATION RESERVE	XSR
TRAVELING	TRAV
TRAVELING WATER SCREENS AND WASH SYSTEM	SWT
TRAVERSING INCORE PROBE	TIP
TREATMENT	TRTMT
TRIP	TR

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
TRIP UNIT	T-U
TROUBLE	TRBL
TUNNEL	TNL
TURBIDITY	TURBID
TURBINE	TURB
TURBINE BUILDING	TB
TURBINE BUILDING CLOSED LOOP COOLING	TBCLC, CCS
TURBINE BUILDING CLOSED LOOP COOLING WATER	TBCLCW
TURBINE GENERATOR	TG
TURBINE STOP VALVE	TSV
TURBINE STOP VALVE CLOSURE	TSVC
TURBINE SUPERVISORY INSTRUMENTATION	TSI
TURNING GEAR	TRNGR, TG

Definition	Abbreviation
U	
ULTIMATE HEAT SINK	UHS
UNBALANCE	UNBAL
UNDER FREQUENCY	UF
UNDER VOLTAGE	UV, UNVOLT
UNINTERRUPTED POWER SERVICE	UPS
UNIT	UNT
UNIT COOLER	UC
UNIT SUBSTATION	US
UNKNOWN	UNK
UPPER	UPR
UPSCALE	UPSC, UPSCL
UPSTREAM	UPSTR

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
V	
VACUUM	VAC
VALVE	VLV, V
VALVE-EXPLOSIVE	VEX
VALVES	VLVS
VAPOR	VAP, VPR
VENTILATION	VENT
VERIFY	VERIF
VERIFICATION	VERIF
VESSEL	VES
VIBRATION	VIB
VOLTAGE	VOLT
VOLTAGE REGULATOR	V/R, VR
VOLTS	V
VOLTS DC	VDC
VOLUME	VOL

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
W	
WASTE	WST, W
WASTE COLLECTOR	WC
WASTE COLLECTOR TANK	WCT
WASTE DISCHARGE TANK	WDT
WATER	WTR
WATER GUAGE	WG
WATER TREATMENT HYPOCHLORITES	WTH
WIDE RANGE	WR
WINDING	WDG

NMP-2 ABBREVIATIONS AND ACRONYMS
Sorted by Definition

Definition	Abbreviation
Z	
ZERO PERIOD ASYMPTOTE	ZPA
+/- 24 VOLTS DC DISTRIBUTION	BWS
125 VOLTS DC DISTRIBUTION	BYS
3D MONICORE SYSTEM	3D

APPENDIX E
Rev 3 8/90

SYSTEM NAME, CODE, AND NUMBER - SORTED BY NUMBER

NMP-2 SYSTEM CODES - SORTED BY NUMBER

System Number	System Name	System Code
01	MAIN & AUXILIARY STEAM	ASS
02	MOISTURE SEPARATOR REHTR VENT & DRAINS	DSR
03	CONDENSATE SYSTEM	CNM
04	CONDENSATE STORAGE & TRANSFER	CNS
05	CONDENSATE DEMIN	CND
06	FEEDWATER SYSTEM	FWS
07	FEEDWATER CONTROL	FWC
08	FEEDWATER HTRS & EXTRACTION STEAM	HDH
09	CONSENSATE AIR REMOVAL	ARC
10A	CIRCULATING WATER	CWS
10B	ACID TREAT SYSTEM	WTA
10C	WATER TREAT HYPOCHLORITES	WTH
11	SERVICE WATER	SWP
12	TRAVELING WATER SCREENS & WASH	SWT
13	RB CLOSED LOOP COOLING WATER	CCP
14	TB CLOSED LOOP COOLING WATER	CCS
15	MAKEUP WATER	WTS
16	MAKEUP WATER STORAGE & TRANSFER	MWS
17	PLANT SAMPLE	SSP
18	ROOF DRAINS & STORM WATER	SRR
19	INSTRUMENT & SERVICE AIR	IAS
20	BREATHING AIR	AAS
21	MAIN TURBINE	MSS
22A	TURB GEN LUBE OIL, TURN GEAR & SEAL	TMG

NMP-2 SYSTEM CODES - SORTED BY NUMBER

System Number	System Name	System Code
22B	TURB OIL COND & STOR	LOS
22C	WASTE OIL	WOS
23	TURB EHC SYSTEM	TMB
24	GEN ISO PHASE BUS DUCT COOLING	GML
25	CLEAN STEAM REBOIL & AUX CONDENSATE	CNA
26	TURB GEN STATOR COOLING	GMC
27	GEN HYDROGEN & CO_2 GAS	GMH
28	NUCLEAR BOILER INSTRUMENTATION	ISC
29	REACTOR RECIRCULATION	RCS
30	CONTROL ROD DRIVE HYDRAULICS	RDS
31	RESIDUAL HEAT REMOVAL	RHS
32	LOW PRESSURE CORE SPRAY	CSL
33	HIGH PRESSURE CORE SPRAY	CSH
34	AUTOMATIC DEPRESSURIZATION	ADS
35	RX CORE ISOLATION COOLING	ICS
36	STANDBY LIQUID CONTROL	SLS
37	RX WATER CLEAN	WCS
38	SPENT FUEL POOL COOLING AND CLEANUP	SFC
39	FUEL HANDLING & RX SERVICING EQUIP	FHS
40	LIQUID RADWASTE	LWS
41	SOLID RADWASTE	WSS
42	OFF GAS	OFG
43	FIRE PROTECTION WATER	FPW
44	FIRE PROTECTION FOAM	FPF

NMP-2 SYSTEM CODES - SORTED BY NUMBER

System Number	System Name	System Code
45	FIRE PROTECTION LOW PRESSURE CO_2	FPL
46	FIRE PROTECTION HALON	FPG
47	SMOKE FLAME & TEMP DETECTION	FPM
48	AUXILIARY BOILER	ABM
49	HOT WATER & GLYCOL HEATING	HVG
50	DOMESTIC WATER	DWS
51	SANITARY PLUMBING	PBS
52	RX BLDG VENTILATION	HVR
53	CONTROL BLDG HVAC	HVC
54	NORMAL SWGR BLDG VENT	HVN
55	TURBINE BLDG VENT	HVT
56	RADWASTE BLDG VENT	HVW
57	DIESEL GEN BLDG VENT	HVP
58	SCREENWELL & FIRE H&V	HVY
59A	CB/RB ELECT TUNNELS VENT	HVN
59B	AUX SERVICE BLDG HVAC	HVL
59C	MISC VENT SYSTEM	HVI
60	DRYWELL COOLING	DRS
61	CONTAINMENT PURGE & STANDBY GAS	CPS
62	DBA RECOMBINER	HCS
63	REACTOR BLDG DRAINS	DFR
64	TURBINE BLDG DRAINS	DET
65	RADWASTE BLDG DRAINS	DFW
66	MISC DRAINS	DFM

NMP-2 SYSTEM CODES - SORTED BY NUMBER

System Number	System Name	System Code
67	DRYWELL DRAINS	DER
68	MAIN GEN. AND EXCIT.	GMS
69	345 KV TRANSFORMER	SMP
70	STA ELECT FD & 115 KV SWYD	SPF
71	NORMAL AC HIGH VOLT DIST	NHS
72	STANDBY & EMERGENCY AC DIST	SYD
73	NORMAL DC DIST	BYS
74	EMERGENCY DC DIST	DMS
75	STATION LIGHTING	LAS
76	PLANT COMMUNICATION	ISG, PCS
77	GROUNDING & CATH PROTECTION	COS, COJ
78	REMOTE SHUTDOWN	RSS
79	AREA RAD MONITORING	RMS
80	PROCESS & AIRBORNE RAD MONITORING	RMS
81	CONTAINMENT LEAKAGE MONITORING	LMS
82	CONTAINMENT ATMOSPHERE MONITORING	CMS
83	PRIMARY CONTAINMENT ISOLATION	ISC
84	REACTOR BLDG CRANES & ELEVATORS	MHR
85	RX COOLANT & ECCS LEAK DETECTION	RSS
86	LOOSE PARTS MONITORING	LPM
87	STANDBY & EMERGENCY AC DIST	SCM
88	NITROGEN SYS/CONTAINMENT INERTING	CSN
90	SIESMIC MONITOR	ERS
91	PROCESS COMPUTER	IHC

NMP-2 SYSTEM CODES - SORTED BY NUMBER

System Number	System Name	System Code
92	NEUTRON MONITOR	NMS
93	ROD BLOCK MONITOR	RBM
94	TRAVERSE INCORE PROBE	TIP
96	RX MANUAL CONTROL & ROD POSITION INDICATION	RMC
97	REACTOR PROTECTION	RPS
100A	STANDBY DIESEL GENERATOR	EGF
100B	HPCS DIESEL GENERATOR	EGA
101	MISC. CRANES, ELEV & DOORS	MHW
102	DECON SYSTEM	DCS
103	PGCC	CEC
104	SECURITY SYSTEM	
105	TRANSIENT ANALYSIS RECORDER SYSTEM	SXS
106	REDUNDANT REACTIVITY CONTROL	RRS
107	VIBRATION MONITORING	LPM