SNUPPS

Standardized Nuclear Unit Power Plant System

5 Choke Cherry Road
Rockville, Maryland 20850
(301) 869-8010

Nicholas A. Petrick
Executive Director

March 21, 1984

SLNRC 84-0048 FILE: 0671.1
SUBJ: NRC Audit of SNUPPS Control Room Design Reviews, Week of February 27, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Docket Nos. STN 50-482 and STN 50-483

Reference: SLNRC 84-0019, dated 02/02/84: Summary Report

Dear Mr. Denton:

The reference letter transmitted the Detailed Control Room Design Review Summary Report for SNUPPS and included resolutions to the Supplementary Survey (SS) and Auxiliary Shutdown Panel (ASP) reviews. Site audits were performed by the NRC during the week of February 27, 1984 and included reviews of all open issues requiring dispositioning prior to the licensing of the Callaway plant. Attachment 1 contains a formal transmittal of the Callaway implementation schedule for resolutions to SS and ASP findings. This schedule is based on a preliminary schedule and commitments made during the recent audit. Attachment 2 lists additional commitments made during the NRC audit. With this transmittal, all human factors related items required prior to licensing of Callaway are considered closed.

Very truly yours,

Nicholas A. Petrick

DJK/nldllal7
Attachments

cc: D. T. McPhee KCPL
G. L. Koester KGE
D. F. Schnell UE
J. Neisler/B. Little USNRC/CAL
W. Schum/P. Smith USNRC/WC
J. Konklin USNRC/RIII

B001
1/1

Attachment 1

CALLAWAY IMPLEMENTATION SCHEDULE FOR SUPPLEMENTARY SURVEY AND AUXILIARY SHUTDOWN PANEL FINDINGS

SUPPLEMENTARY SURVEY

FINDING AND PRIORITY	ACT	NO	UND	FL	5%P	REF	A/T
1.1 (5)		X					
2.1 (5)		X					
2.2 (0)	X			X			
2.3 (5)	X			X			
2.4 (6)		X					
2.5 (5)		X					
2.6 (5)		X					
2.7 (5)		X					
2.8 ( )	X			X			
3.1 (4)			X				
4.1 (6)		X					
4.2 (0)	X			X			
4.3 (6)		X					
4.4 (0)	X			X			
4.5 (0)		X					
4.6 (0)	X			X			
5.1 (6)	X						X
5.2 (0)	X			X			
5.3 (5)	X					X	
5.4 (5)	X					X	
5.5 (5)		X					
5.6 (5)		X					
5.7 (5)		X					
5.8 (5)	X					X	
5.9 (0)	X			X			
5.10 (5)	X					X	
5.11 (5)	X					X	
5.12 (5)	X			X			
5.13 (6)		X					
5.14 (5)	X			X			
5.15 (5)	X			X			
5.16 (0)	X					X	
5.17 (5)		X					
5.18 (0)	X					X	
5.19 (0)	X					X(Note)	
5.20 (6)		X					
5.21 (6)		X					
7.1 ( )			X				
7.2 (5)		X					
7.3 (5)		X					
7.4 (5)		X					
7.5 (5)		X					
7.6 (5)	X						X
7.7 (5)		X					
7.8 (5)		X					
7.9 (5)		X					
7.10 (6)		X					
7.11 (5)		X					
7.12 (6)		X					
7.13 (5)		X					
7.14 (5)		X					
7.15 (5)		X					
7.16 (6)		X					
7.17 (5)	X					X	
7.18 (5)		X					
8.1 ( )		X					
8.2 (5)		X					
8.3 (5)		X					
8.4 (5)		X					
8.5 (5)		X					
9.1 ( )	X						X

ASP REVIEW

FINDING AND PRIORITY	ACT	NO	UND	FL	5%P	REF	A/T
1.1 (2)	X			X			
1.2 (1)	X			X			
1.3 (2)	X			X			
1.4 (2)	X			X(Note)			
1.5 (2)	X			X(Note)			
1.6 (2)	X			X			
2.1 (2)	X						X
2.2 (5)		X					
2.3 (1)	X				X		
4.1 (2)		X					
4.2 (4)	X			X			
4.3 (5)		X					
4.4 (5)	X				X		
4.5 (5)	X				X		
5.1 (5)		X					
5.2 (5)		X					
5.3 (5)		X					
5.4 (5)		X					
5.5 (5)		X					
5.6 (5)		X					
5.7 (5)		X					
5.8 (5)	X						X
5.9 (5)	X			X			
5.10 (5)		X					
5.11 (2)		X					
6.1 (5)	X			X			
6.2 (5)	X			X			
6.3 (2)	X			X			
6.4 (5)	X			X			
6.5 (5)		X					
8.1 (5)		X					
8.2 (1)	X			X			
8.3 (2)		X					

ACT - Action to be taken
NO - No action to be taken
UND - Undecided - will be investigated during Environmental Study
FL - Implementation expected by Fuel Load
5%P - Implementation planned prior to exceeding 5% power
REF - Implementation planned prior to completion of first refueling outage
A/T - Administratively controlled or handled through training

(NOTE) See attachment 2 for complete description of resolution and implementation schedule

9b29

Attachment 2

A supplement to the Summary Report identifying changes to responses described below will be submitted to the NRC prior to exceeding 5% power.

Initial Essex and NRC Review

The most recent set of resolutions to these findings was transmitted by SLNRC 83-0063, 11/30/83. Resolutions to all findings were found by the NRC to be acceptable, with the following clarifications:

Finding 5.13: Labels will be added to the seven Hagan controller faceplates indicating the direction of vernier rotation for Open. The seven controllers identified are:

Silver	Black
BGHC123	BGHC182
BGHC128	BGHC387
EPHC943	EJHIC606
	EJHIC607

Union Electric will implement this modification prior to exceeding 5% power.

Finding 5.18: Union Electric agreed to include in the appropriate procedures, steps for an operator to check for burnt light bulbs in the Control Room and Auxiliary Shutdown Panel (ASP) at shift turnover. Kansas Gas and Electric has already included this step in their procedures. Callaway implementation will be accomplished prior to fuel load.

Finding 8.19: The NRC reviewed mirror imaging used throughout the SNUPPS control room and found it to be acceptable, provided one of two groups of containment spray system displays on RL017 is rearranged to be identical to the other group. It was agreed that this would be accomplished at both SNUPPS units. Union Electric will implement this modification prior to exceeding 5% power.

General: Homemade scales were found during the audit and these scales will be replaced with new scales within one week from receipt. Receipt is scheduled for 03/15/84.

Supplementary Survey (SS)

Findings and responses for this review are contained in the Summary Report, transmitted by SLNRC 84-0019, 02/02/84. The following commitments/comments were made regarding responses and schedule for implementation and a complete implementation schedule for Callaway is attached:

SS Finding 2.3: A cord clamp is being used to keep the cord for the Public Address off the floor. The length of the existing cord is acceptable. This will be noted in the supplement to the Summary Report.

SS Findings 3.1 and 7.1: These findings will be investigated in the Callaway Environmental Survey. Portions of the study not directly applicable to Wolf Creek will be reviewed in a separate study prior to Wolf Creek's fuel load. Results of the Study will be discussed with the NRC prior to the Callaway fuel load.

SS Finding 3.13: The NRC noted that it is acceptable to adjust the annunciator auto silence function between 3 and 10 seconds. This will be noted in the supplement to the Summary Report.

SS Finding 4.4: A label will be used in lieu of an escutcheon to indicate switch position. This will be noted in the supplement to the Summary Report.

SS Finding 5.5: The supplement to the Summary Report will indicate that all Foxboro controllers were reviewed and were found to differentiate between actual and demand.

SS Finding 5.16: A label will be added to Hagan controller faceplates identifying the direction of vernier rotation required to open the valve. This will be implemented at Callaway prior to exceeding 5% power. This will be noted in the supplement to the Summary Report.

SS Finding 5.19: Union Electric will place orders for all chart paper by 04/13/84 and, by fuel load, paper with 0 to 100% scales will be used in any recorder that does not have its proper paper installed. It is anticipated that the bulk of the paper ordered will be received and installed prior to exceeding 5% power. In the interim, until the remainder of the paper is installed, the recorder tag number and ON/OFF times and dates will be noted on the 0 to 100% paper being used in its place. This will be noted in the supplement to the Summary Report.

SS Finding 7.4: There is no inconsistency between CRT's and control boards. This will be noted in the supplement to the Summary Report.

SS Findings 7.10 and 7.11: The supplement to the Summary Report will reflect the existing design for feedback messages and periodic feedback.

SS Finding 7.12 The revised response to SS Finding 7.12 is provided below and will be noted in the supplement to the Summary Report:

Finding: Colors used on the CRT to convey information are not consistent with all other color codes in the control room.

Response: The process lines of the P&ID displays were originally designed to use mimic line colors for the various plant systems, however, this resulted in diagrams that were difficult to assimilate because of color clutter. This significantly detracted from the purpose of the displays, particularly when the dynamic state is considered. Accordingly, the use of the mimic colors was modified and line colors were primarily based on the fluid

media and its dynamic status, i.e., static, pressurized, flowing, undefined status. Process line segments within each P&ID have the capability of changing color based on their current state. Generally, based on more than 40 displays, only one fluid is represented in any given P&ID display. This results in a clear understanding of the fluid media and dynamic status which therefore justifies the inconsistency between the CRT and mimics.

Yellow is used in the P&ID alphanumeric information to depict static, nonvariable information for titles, equipment labels and other notes, whereas white is used for similar type information (message types, headers, etc.) on General Displays. This difference in colors is minor and should not affect operator performance. For points in normal status in the P&ID alphanumeric information, the current updated numeric values are white rather than green (as in the General Displays) to provide improved readability. These differences have been identified to the operators through training and have been determined to be non-problematic.

Based on previous experience with revising colors on the BOP computer system, changes are very expensive and, in conjunction with the above explanation, are not cost effective. No further changes to BOP computer system colors are planned.

SS Finding 7.16: The TermiNet 1200 has the capability to output information at 60 lines per minute (120 characters per second). Based on the alarm field size on the printer (70 characters per line) the actual printer capability is greater than 100 lines per minute. However, a 300 line per minute printer is located immediately adjacent to the control room. The TermiNet printer has a "fail over" capacity so that the operator can channel output to the high speed printer. During emergency situations the 60 line per minute is more than adequate for providing essential sequential alarm information to the operator in the control room without resulting in an information overload condition. Given that the TermiNet terminal has advantages to the operator not available on a high speed printer and under circumstances where a high speed printer is available to the operator adjacent to the control room, no further action is anticipated. The buffer capacity for the BOP computer system is 1526 alarms and the buffer capacity for the annunciator system is 1000 alarms. The SNUPPS alarm system and printer, therefore, are capable of handling the anticipated flow of alarms in any emergency situation. This will be noted in the supplement to the Summary Report.

SS Finding 9.1: The supplement to the Summary Report will indicate that operators will be trained to realize that changes in water density can cause the reactor vessel level indicator to read above 100%, which also explains the reason for a scale range of 0 to 120%. Wolf Creek's scale range is inconsistent and it was determined that the range of 0 to 120% is correct. Wolf Creek's scale will be modified.

SS General: The Charging Pump to RCP Seal Flow indicators (BG-FI-215A, B) have non-linear scales from 0 to 80 GPM whereas normal flow is approximately 32 GPM. The NRC requested that the utilities study this situation to determine why this scale was chosen and if it should be replaced with a new scale. Resolution of this issue will be noted in the supplement to the Summary Report.

Auxiliary Shutdown Panel (ASP)

Findings and responses for this review are contained in the Summary Report. The following reflects additional commitments/comments made during the meeting and a complete implementation schedule for Callaway is attached.

ASP Findings 1.2 and 1.3: A 2-drawer file cabinet will be bolted within the ASP room prior to fuel load. This will be noted in the supplement to the Summary Report.

ASP Finding 1.5: An agreeable, permanent resolution will be determined with the NRC prior to exceeding 5% power. In the interim, a temporary step will be made available within the ASP room. Union Electric will reroute the site specific security door box conduit and remove the security door box hanger prior to fuel load. The hinge for Union Electric's fire door that separates both trains of the ASP will be located approximately 12 inches out from the adjacent wall.

ASP Finding 5.9: Plans to include procedural steps to check for burnt light bulbs is covered above by initial Essex and NRC Finding 5.18.

ASP Finding 8.2: Tape will be used as an interim fix, if necessary, for demarking the ASP. Demarcation will eventually be painted on as a permanent fix, prior to the end of the first refueling outage. This will be noted in the supplement to the Summary Report.

General: The Environmental Survey of the ASP room will be performed in conjunction with the Control Room Environmental Survey.

Technical Evaluation Report

Appendix A of the TER was reviewed and the following comments were made:

1.0 Control Room Workspace

All items except the "Environment" were included during the SS. The "Environment" will be included in a future Environmental Survey to be performed at each site. Results from the Environmental Survey for Callaway will be discussed with the NRC prior to fuel load and will include an evaluation of the ASP room.

Any findings, proposed resolutions and implementation schedule will be included in the supplement to the Summary Report. This supplement is required prior to exceeding 5% power operation.

5.0 Displays

Only the "effect of final illumination installation on display readability" was not included in the SS and will be reviewed in the Environmental Survey.

6.0 Labels and Location Aids

The NRC reviewed Panel RL017 and RL018 mimics during this meeting and agreed that the mimics are acceptable. Each utility provided a copy of their maintenance tag out system to the NRC and gave presentations for its implementation. This was found to be acceptable by the NRC.

7.0 Process Computer

With the exception of "effect of final illumination installation on CRT readability," all items were reviewed during the SS. The remaining portion will be included in the Environmental Survey.

8.0 - 9.0 Panel Layout and Control Display Integration

Review of the "remote shutdown panel" was performed in the ASP review, previously discussed. Panels RL017 and RL018 underwent extensive mimic redesign and Panel RL022 was reviewed during the SS. Since previous reviews were performed at Callaway and included many findings germane to the Callaway site panels, KGE employed a separate review of the Wolf Creek site panels and forwarded separate findings and resolutions to the NRC of these site panels in a previous submittal, which the NRC found to be acceptable.

Task Analysis

The SNUPPS Task Analysis, described in the Summary Report, is still being reviewed by the NRC. NRC acceptance of the Task Analysis is not a prerequisite for Callaway licensing, which, as previously stated, is based on a Preliminary Design Assessment (PDA).

DJK/dck/10b1