REGULA●RY INFORMATION DISTRIBUTI● SYSTEM (RIDS)

ACCESSION NBR:8610210058 DOC.DATE: 86/10/14 NOTARIZED: NO DOCKET #
FACIL:50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylva 05000387
50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
AUTH.NAME AUTHOR AFFILIATION
KEISER,H.W. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
ADENSAM,E. BWR Project Directorate 3

SUBJECT: Records to remaining open issues re DCRDR,including upgraded task analysis & color convention in control room. Safe shutdown analysis demonstrates that safe shutdown can be accomplished w/o using HPCI sys.

DISTRIBUTION CODE: A003D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 11
TITLE: OR/Licensing Submittal: Suppl 1 to NUREG-0737(Generic Ltr 82-33)

NOTES:1cy NMSS/FCAF/PM. LPDR 2cys Transcripts. 05000387
1cy NMSS/FCAF/PM. LPDR 2cys Transcripts. 05000388

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	BWR ADTS	1	1	BWR EB	1	1
	BWR EICSB	2	2	BWR FOB	1	1
	BWR PD3 LA	1	1	BWR PD3 PD	7	7
	THADANI,M	1	1	BWR PSB	1	1
	BWR RSB	1	1			
INTERNAL:	ADM/LFMB	1	0	IE/DEPER/EPB	3	3
	NRR BWR ADTS	1	1	NRR PAULSON,W	1	1
	NRR PWR-B ADTS	1	1	NRR/DSRO EMRIT	1	1
	NRR/DSRO/EIB	1	1	NRR/DSRO/RSIB	1	1
	REG FILES	1	1	RGN1	1	1
EXTERNAL:	LPDR	2	2	NRC PDR	1	1
	NSIC	1	1			
NOTES:		3	3			

TOTAL NUMBER OF COPIES REQUIRED: LTTR 35 ENCL 34

(PP&L) Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215/770-5151

Harold W. Keiser
Vice President-Nuclear Operations
215/770-7502

OCT 14 1986

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Project Director
BWR Project Directorate #3
Division of Boiling Water Reactor Licensing
U.S. Nuclear Regulatory Commission
Washington DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
DETAILED CONTROL ROOM DESIGN REVIEW
PLA-2737 FILE A17-19

DOCKET NO. 50-387
50-388

Dear Ms. Adensam:

This letter is provided in response to the remaining open issues regarding the Detailed Control Room Design Review. The enclosed information reflects discussions between PP&L and members of your staff during a meeting at the Susquehanna SES site on September 22, 1986.

UPGRADED TASK ANALYSIS
FOR THE DETAILED CONTROL ROOM DESIGN REVIEW

BACKGROUND

Prior to Task Analysis:

Human factors considerations were intrinsic to the conceptualization and evolution of the control room at Susquehanna SES. The historical development of the control room design is summarized in Section 1 of the Susquehanna Steam Electric Station Detail Control Room Design Review Summary Report (PLA-1947, Nov. 11, 1983). Clearly, the Susquehanna SES control room design is largely a product of the concern for good operator-equipment interfaces and much that would have been improved through task analysis was intrinsic in that design.

Original Task Analysis

Between July 1981 and August 1982, General Physics completed a function and task analysis as part of the DCRDR. This original analysis was based on the regulatory guidance (NUREG 0700) and Susquehanna procedures (early versions of EOPs and OPs) available at that time. The plan to perform the analysis in this manner was described in the Program Plan submitted to the NRC (PLA-1079, dated June 3, 1982). The NRC reviewed this plan and provided no direction to

A003
1/1

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

change (letter dated July 20, 1983, A. Schwencer to N. W. Curtis). A description of the methodology used and results of this analysis were provided to the NRC as part of the DCRDR Summary Report.

NRC Response

On February 9, 1984, the NRC, in a Safety Evaluation Report responding to the DCRDR Summary Report, concluded that the original task analysis had not been performed properly. After discussions with the NRC, PP&L concluded that the NRC's concern was based on lack of details in the DCRDR Summary Report rather than substantive issues with the task analysis itself. As a result PP&L sent the NRC detailed information on the task analysis (PLA-2201 dated May 16, 1984). In addition, the NRC reviewed PP&L's task analysis files during an on-site audit. Following this round of information exchange, the NRC still had concerns. The concerns were in two general areas: format and scope of the original task analysis. The NRC indicated the existing format did not sufficiently identify the information and control requirements associated with the identified tasks. The NRC also recommended that the scope of the analysis be enlarged to address Revision 3 of the BWR Owners Group Emergency Procedures Guidelines (EPGs).

PP&L Response:

It is our belief that the NRC's concerns with regard to our original task analysis are a result of our early performance of the effort. Since the time of its development, the regulations and procedures have changed (NUREG 0737, Supplement 1 was issued, EOPs based on Rev. 3 EPGs were developed). Consequently, both PP&L and NRC agreed that the original task analysis could be improved. As a result, PP&L agreed to reformat the original information to conform to the present regulatory guidance. PP&L also agreed to increase the scope of the task analysis to include all of the Rev. 3 EPGs. The reformatted original task analysis and commitment to upgrade was submitted to the NRC on March 1, 1985 as part of the DCRDR Supplemental Summary Report.

PP&L Revised Position

Subsequent to submitting the commitment to complete an upgraded task analysis, PP&L reevaluated its position and determined it was not necessary. PP&L discovered that what was expected to be found by the upgraded task analysis was being discovered during the validation of the EOPs. PP&L presented its position to the NRC that our EOP validation methodology accomplished all the purposes of the upgraded task analysis (PLA-2558 dated November 27, 1985).

JUSTIFICATION FOR NOT UPGRADING

There are two reasons why PP&L should not complete an upgraded task analysis. First, all of the NUREG 0737 efforts that could have benefitted from an upgraded task analysis are complete. Second, and more important, the methodology PP&L used to develop our responses to NUREG 0737 requirements is an acceptable alternative to the use of task analysis.

[illegible]

All Efforts Complete

All of the efforts required by NUREG 0737 are complete and most have been reviewed and judged satisfactory by the NRC. SPDS is installed and functioning and the NRC has issued a Safety Evaluation Report indicating the acceptability of SPDS. The Emergency Response Facilities (EOF & TSC) are complete and functioning and the NRC has completed a post implementation audit that found them acceptable. The Emergency Operating Procedures are completed and in use in the control room. The modifications to satisfy Regulatory Guide 1.97 requirements have been installed. The minor improvements identified in the DCRDR have either been implemented or will be implemented shortly in the control room. The only outstanding commitment from the original response to Supplement 1 to NUREG 0737 is performance of System 1 and System 2 Validation. These are both scheduled for second quarter 1987. It is very unlikely that an upgraded task analysis would unearth any information that would be significant enough to reopen any of these completed projects.

Acceptable Alternative Utilized

PP&L believes that an acceptable alternative has been utilized to achieve the results originally envisioned by the NRC for the task analysis. The specific objectives for performance of a task analysis have evolved. Clearly now the NRC expects the DCRDR task analysis to be the basis for all the NUREG 0737 efforts. Also, the expectation is that this will assure that all efforts are integrated. These expectations were not so clear when PP&L's original task analysis was performed in 1981-82. Except for limited application in the DCRDR, PP&L did not use task analysis as the basis for development of any of the responses to NUREG 0737 or to assure integration of the responses. In response to regulatory pressure during the licensing process, PP&L developed a plan to address all the requirements of NUREG 0737 as quickly as possible. Each effort was developed using conventional methods not necessarily based on the DCRDR task analysis.

These methods involved development of an integrated schedule/plan (see Figure 1). Each element was then developed independently using the methodology listed on the table below. Integration and conformance to NUREG 0737 criteria are assured by the validations listed on the same table. The process was accomplished by dividing the emergency response capabilities into two systems: System 1, the Accident Mitigation and Prevention System, revolves around the control room operator and involves integration of the operating shift, the control room (including all enhancements), the emergency operating procedures and operator training. System 2, the Emergency Plan Response System, revolves around the emergency personnel and involves the integration of emergency personnel, emergency response facilities (including all enhancements), the Emergency Plan Implementing Procedures, and emergency plan training. Separate validation tests were performed on separate elements of each system and will be performed on the integrated elements of each system.

Element	Methodology	Validation
SPDS	Multi-Discipline Review (Including HFE)	Separate Validation
ERFs	Design Effort Based on Regulatory Guidance	System 2 Validation
EOPs	"Expert" Interpretation of EPGs with Multidiscipline Review	Separate Validation
RG 1.97	Design Effort Based on BWROG Subcommittee Analysis and on Regulatory Guidance	System 1 and System 2 Validation
DCRDR	Corrected HEDs Based on Task Analysis, NUREG 0700 Review, Etc.	System 1 Validation

PP&L is convinced that this methodology produces the same results expected of the use of task analysis.

Copies of the SPDS and EOP Validation Reports are enclosed. The methodologies used in each validation process are described within each report. It should be noted that the validation included scenarios for reactivity control, secondary containment control, and radioactivity release control. PP&L also plan to validate any future upgrades to the EOP.

It's PP&L's opinion that task analysis is not the only way to accomplish the objectives of NUREG 0737. The real test that the hardware, procedures and training resulting from any of these methodologies, including use of task analysis, satisfy human factor criteria should be based on performance criteria. Validation is a proven performance based test. PP&L is not alone in this position. Edger Shiver, et al, stated in "Task Analysis as a Technique to Ensure Safe Job Performance"; "...human factors criteria are first of all performance criteria, that is, if correct performance is obtained, the process used to obtain it is assumed to be correct. For example, if the procedures work, it is safe to assume that a valid process was used to develop them. However, there is no way to ensure that performance criteria are met simply by applying the right process. It is not possible to say that because task analytic techniques have been used to prepare procedures or training that that ensures performance criteria will be met. The validation of products prepared by task analytic processes must be accomplished to satisfy performance criteria."

The results of the validations demonstrate our methodology has been effective. One final round of validations will be conducted during 1987. PP&L expects these validations will be a final proof test that our methodology has provided the results sought by NUREG 0737, Supplement 1; that is proper development of each of the recommended improvements in emergency response capability and

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

assurance of integration of the improvements with each other and with existing capabilities. PP&L can see no useful purpose in performing an upgraded task analysis.

IMPACT

The impact of being forced to complete an upgraded task analysis is not trivial. Significant dollars and PP&L manhours would have to be expended. The most severe impact, however, would be the diversion of very limited resources from more productive projects. PP&L's resources are already allocated to projects intended to improve emergency response capability. These projects have been selected based on a high probability they will result in a significant improvement in emergency response capability. To displace any of these projects with an upgraded task analysis which has questionable merit would be counter to the overall intent of NUREG 0737.

COLOR CONVENTION IN THE SUSQUEHANNA CONTROL ROOM

The Overuse of Color/Inconsistent and Conflicting Color Meanings

The NRC staff has in the past contended that color coding is overused in the SSES control rooms and that color meanings are inconsistent and in some cases, conflicting. We disagree with the staff's contention. A close look at the SSES control room color convention (Attachment A) reveals a limited set of colors utilized in a limited set of contexts. By using easily distinguishable contexts with a limited number of colors within each context and avoiding colors of similar hues within each context we believe we have reduced the probability of operator error. Specifically, in the context with the most use of color (process variables), 18 colors are used, but this is a context (Process Variables) where recognition of color meaning is not as important as color differentiation (i.e. color is being used for separation of various types of process mimics to distinguish flow paths). Even in this context, generally less than five colors are present on any one panel section. In support of our design, various studies have shown that when color is being used to condition operator actions, up to 10 color variations in a context are realistically perceptible with relatively low error rates (Chapanis & Halsey, 1956) and that under ideal conditions, as many as 15-24 variations of hue can be discriminated (Woodson, 1982; Teichner, Christ and Corso, ONR-CR213-102-4F).

Our operations personnel have been thoroughly trained on the context/color meaning combinations currently in use at SSES. We are convinced that the contexts we have chosen are distinctive and we have been careful to ensure that a color assignment within a context does not have a strong association with another meaning in the same context.

Inconsistency with Population Stereotypes

PP&L does not believe that a stereotypical color convention has been identified for the nuclear industry. The color convention utilized in the SSES control room, however, is typical of the color convention utilized throughout the PP&L system. Our operations personnel are thoroughly familiar with the system in use at SSES and as a result of extensive training and operating experience have acquired strong associations with the convention in use. Since we do not believe there is a stereotypical color convention in use throughout the industry and because of the already strongly established color associations with our existing personnel, we see no reason or requirement to change our color convention. Any individual we might hire in the future who has worked with another color convention, would have to learn our system. We should also point out that this new employee, irrespective of their background, would undergo extensive training prior to assuming operational responsibilities in the SSES control room. In reality, implementing changes to the existing color convention would result in a sizeable negative transfer impact on the performance of our current operating personnel that would initially, and probably for some time thereafter, increase the human error rate. In fact, using the logic applied by the staff whereby behavioral carryovers from previously learned systems will affect performance under stressful situations, incorporating a new system would result in the entire control room staff being subject to the confusion the NRC staff has postulated. This situation would, in our view, create a far more serious problem than dealing with the new employee who may have to learn a new system.

Conclusion

PP&L believes the staff to be in error regarding its conclusion that color coding is overused at SSES and that color meanings are inconsistent and conflicting. We believe that a change in the currently used convention would not result in any substantial increase in the protection of the health and safety of the public and in fact would be detrimental, costly and difficult to implement.

LAMP TESTING (HED 108)

NUREG-0700, Guideline 6.5.3.1, deals with the characteristics and problems associated with light indicators. The goal is to provide light signals that are physically reliable. Guideline 6.5.3.1 suggests three (3) precautions to assure reliability:

1. Dual-bulb or dual-filament light assemblies should be used.

2. Bulb test capability should be provided.

3. Design should encourage immediate replacement of burned-out bulbs by providing rapid and convenient replacement with power on and without hazard to personnel or equipment.

[illegible]

Each of these suggested precautions have been reviewed by PP&L relative to their application to any existing non-testable light in the control room. Dual-filament lights are no longer being manufactured as it has been found that they are no more reliable than single filament lights. The use of dual-bulb lights was reviewed but there are considerable problems associated with wiring these devices as well as a lack of space on the panels to accommodate these devices. Installation of self-test features in the panels would require massive amounts of re-wiring, outage time to install, and would adversely impact plant operations by increasing panel complexity while decreasing panel reliability as a consequence of the increased panel complexity. The option of periodically extracting bulbs from the panel for the purpose of testing them subjects both the bulb and its socket to stresses that in themselves contribute to lamp and/or socket failure in shorter periods of time. Additionally, we believe that observing lamps during surveillances could be argued to provide reliability data on bulb life, but we do not believe it does anything to increase reliability of the light signals.

The more PP&L investigated the reliability of light signals, the more apparent it became that an innovative solution was required. Consequently, we have developed a comprehensive program to accomplish the intent of NUREG 0700, Guideline 6.5.3.1, by providing highly reliable indication to the operator without lamp test features. The elements of the program are as follows:

1. All indicating lamps in the SSES Control Room will be replaced with qualified LED lamps and lamp lenses. LED bulbs will be burned in prior to installation to prevent infant mortality effects.

2. A hand-held bulb tester will be provided to operations staff and the plant stockroom so that all bulbs supplied for control room use can be pretested.

3. Base responsibilities of operators include the requirement to check for correct indication before proceeding to perform any procedural step and the requirement to change burned-out bulbs when they are identified. Records will be kept of control room lamp usage to document lamp reliability.

4. Each control room will be re-lamped on the longest interval possible consistent with low probability of lamp failure (currently calculated to be every eight years-70% of the bulb's specified 11.4 year life).

Alternating current lamps can be replaced in the near future with a small number of lamp sockets requiring replacement. Direct current lamp circuits however, will require dropping resistor modifications and a waiting period for the manufacturer to begin quantity production. Both lamp types have been successfully seismically tested.

This work will be completed during the fourth refueling and inspection outage for Unit 1 and the second refueling and inspection outage for Unit 2. This schedule reflects the time required to perform necessary engineering and control room modifications plus time for the bulb manufacturer to begin production and establishment of necessary stocks.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

FIRE PANEL ACCESS (HED No. 295)

PP&L originally identified a human engineering deficiency describing limited physical and visual access to controls and associated labeling on Control Room Panel 650. After investigating the problem it was concluded that there were no requirements for use of the controls on the panel by operations personnel during normal or emergency operations.

The control switch portion of the 650 panel was provided in the control room as a convenience to facilitate startup of the station. Currently it provides a third level of redundancy for each of the functions on the panel; however, there is no planned use for the panel. Remote local switches are provided for use by the fire brigade. Manual non-electrical releases are provided as backup for control valves. The fire brigade does not rely on use of the functions provided by the 650 panel in the control room.

Inadvertent actuation of the switches on the 650 panel has been considered. Of the switches located on the panel only the following are considered to have safety significance (i.e. actuate systems in safety related areas):

Switch No.	Area Protected	Type of System
DS 115/215	HPCI Turbine & HPCI Turbine Lube Oil System	Deluge
DS 091	H&V Filter OF125A (Control Rm Emer Outside Air)	Deluge
DS 092	H&V Filter OF125B (Control Rm Emer Outside Air)	Deluge
DS 093	H&V Filter OF169A (Standby Gas Treatment Sys)	Deluge
DS 094	H&V Filter PF169B (Standby Gas Treatment Sys)	Deluge
PA 142/242	Lower Cable Spreading Room	Preaction
PA 161/261	Upper Cable Spreading Room	Preaction
PA 124	Personnel Access Compartment (Fire Zone 1-2B)	Preaction
PA 131/231	Access Area (683'-0", Fire Zones 1-3A,B,2-3B)	Preaction
PA 143/243	Control Access Area (719'-1:,Fire Zone 1-4A,2-4A)	Preaction
PA 151/251	Fuel Pool Pump Room	Preaction
PA 011	Diesel Generator Room A	Preaction
PA 012	Diesel Generator Room B	Preaction
PA 013	Diesel Generator Room C	Preaction
PA 014	Diesel Generator Room D	Preaction

Operation of a preaction system is initiated by sensors which detect a rapid temperature rise, a fixed high temperature, and/or the presence of combustion products. The sensor releases a tripping device opening a deluge valve, which permits water to flow into the sprinkler piping system. Water discharges from the sprinkler head only when fusible links holding the sprinkler heads closed are melted. Because of this design, inadvertent operation of switches on the 650 panel in the control room will have no safety significance, as it will only result in filling the sprinkler piping system and not the inadvertent discharge of water into the area to be protected.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

Deluge systems are automatic open-head water spray systems using heat detectors to open deluge valves. The individual systems can be manually actuated either locally or from the control room using the 650 panel switches.

The deluge systems protecting safety related charcoal systems are provided with an additional safety related valve which must be actuated in order for water to be discharged into the filters. For these systems, actuation from the control room causes only the deluge valve to open. The safety related valve is opened by heat sensors located at the filter. Consequently, no safety significance is associated with inadvertent actuation of these switches.

The deluge system provided in the HPCI room potentially could be inadvertently actuated from the control room resulting in a discharge of water into the room. The safe shutdown analysis for Appendix R evaluated the effects of a fire involving the HPCI Room. The effects of inadvertent water application would be less severe than those of a fire. In either event, the safe shutdown analysis demonstrates that safe shutdown can be accomplished without using the HPCI system. Also, the Final Safety Analysis Report analyzes the effect of losing the HPCI system.

The information provided in this letter encompasses PP&L's presentations during the meeting of September 22, 1986. The information requested by your staff is incorporated in the discussions of the individual items. This letter and the completion of committed work closes these items.

Very truly yours,

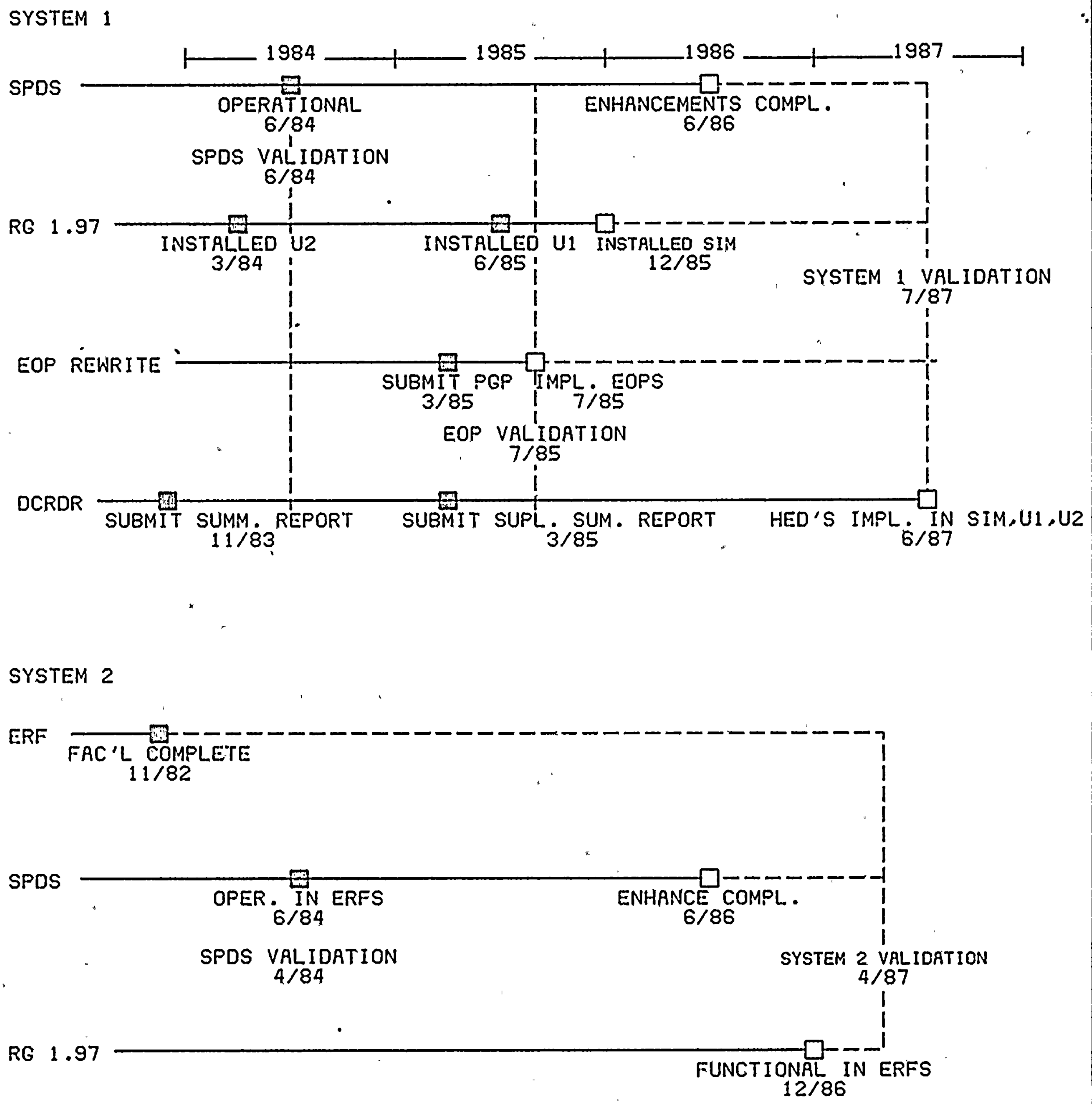
H W Keiser

H. W. Keiser
Vice President - Nuclear Operations

cc: M. C. Thadani USNRC
L. R. Plisco USNRC

FIGURE 1

EMERGENCY RESPONSE CAPABILITY IMPROVEMENT SCHEDULE



PP&L NUCLEAR DIVISION: COLOR MATRIX SYSTEM

COLOR	PROCESS VARIABLES	ELECTRICAL LINES	CONTROL INDICATORS	CRT CONVENTION	PLANT & EQUIPMENT	GAS CYLINDERS
1. WHITE	MAIN STEAM	A BACKGROUND NON 1E B [illegible] KV	A. AUTO MODE: NORMAL B ANNUNCIATOR: TROUBLE	A. PROCESS LIMIT TIC MARK B. LOW CONFIDENCE DATA C. ALARM GROUP 3		
2. BLACK		480V	PUMP SWITCH COLLAR			
3 YELLOW	SPENT RESIN	A. 4 KV B. BACKGROUND 1E		A. VARIABLES WITHIN PROCESS LIMITS B. ALARM GROUP 2	CAUTION: SPECIAL INSTRUCTIONS	COMPRESSED AIR: BREATHING QUALITY
4 PURPLE (MAGENTA)	SOLID RADWASTE GASEOUS WASTE			EXTREME ALARM	RADIATION WARNINGS	
5 ORANGE	CHEMICAL WASTE	A. 500KV B CHANNEL C		NON-DYNAMIC ELEMENT REQUIRES ATTENTION		
6 LIGHT BLUE	SODIUM SILICATE SMOKE REMOVAL LINE					
7. RED	A. DRY CAKE DISCHARGE-RW FILTER B. RBCCW RECIRCULATION	A. DIV 1 B. CHANNEL A	A. FLOW PATH AVAILABLE (VALVES OPEN, BREAKERS CLOSED) B. SYSTEM INITIATED (MOTOR RUNNING). C. ANNUNCIATOR. TRIP	A. VARIABLE OUTSIDE PROCESS LIMITS B. ALARM GROUP 1	A. DO NOT OPERATE DEVICE TAG B FIRE EQUIPMENT C. EMERGENCY STOP	A. COMBUSTIBLE GAS B. HYDROGEN
8. MEDIUM GRAY	AUXILIARY OR SEALING STEAM					
9. GREEN	H_2O - A. CIRCULATION B. SERVICE C. FCW D. HOT DOMESTIC	A 69KV B. DIV 2 C CHANNEL B	A ABNORMAL CONDITION B ABNORMAL CONDITION-SYSTEM INITIATED C. UNIT ISOLATION	A. PLANT EQUIPMENT B. NON-DYNAMIC ELEMENTS	A. TAG-STOP RE-ENERGIZING TRIPPED EQ B. SAFETY 1ST AID EQUIPMENT	
10 PINK	LAUNDRY WASTE					
11 BLUE (CYAN)	H_2O - A. CONDENSER B. FW C. REACTOR	A. 13.8KV B. CHANNEL D		TITLE & BORDERS	BREAKER SPRINGS CHARGED	
12. VIOLET	OILY WASTE	DC	BLACKOUT INSTRUMENTATION			
13. LIGHT GRAY	AIR					HIGH TEMP PRESSURE
14 GOLD	N_2 & CONTAINMENT ATMOSPHERE	CHANNEL E				
15. MOSS GREEN	CAUSTIC					OXIDIZING AGENT
16. LIGHT BROWN	DRY CEMENT					COMPRESSED AIR: NOT BREATHING QUALITY
17 BROWN		230KV	THROTTLING VALVE SWITCH			TOXIC & POISONOUS MATERIALS
18. CORAL		120 208 VAC				
19. DARK BLUE	LIQUID RADWASTE					
20. AMBER			A. NO FLOW, NOT OPERATING, BREAKER OPEN, VALVE CLOSED, MOTOR OFF B. ANNUNCIATOR: PRETRIP			
21 ORANGE YELLOW	ACID					
22 PURPLE RED	LOW PRESSURE LUBE OILS					FLAMMABLE MATERIALS
COMBINATIONS 1 BLACK & YELLOW					HAZARDOUS AREA - NON RADIATION	
2 MAGENTA & YELLOW					HAZARDOUS AREA - RADIATION	

ATTACHMENT A