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DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards plans & schedules for emergency response capabilities per Generic Ltr 82-33 re Suppl 1 to NUREG-0737, "Requirements for Emergency Response Capability." Meeting to discuss plan in detail expected shortly.

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CP&L
Carolina Power & Light Company

April 15, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
NRC GENERIC LETTER 82-33
REQUIREMENTS FOR EMERGENCY RESPONSE CAPABILITY

Dear Mr. Denton:

On December 30, 1982, Carolina Power & Light Company (CP&L) received Generic Letter 82-33, Supplement 1 to NUREG-0737, Requirements for Emergency Response Capability. As a participating member of the Nuclear Utility Task Action Committee on Emergency Response Capabilities (ERC NUTAC), which includes over forty utilities and is administratively supported by INPO, CP&L is developing an integrated implementation program which responds to the requirements of Generic Letter 82-33 as follows:

PROGRAM PLAN

Carolina Power & Light Company is using the ERC NUTAC's draft Guidelines for an Integrated Implementation Plan, which is summarized in Attachment 1, as an input for plant-specific integration planning. Attachment 1, Figure 1, shows the ERC NUTAC's method for ideal integration of emergency operating procedures (EOPs), control room design review (CRDR), Regulatory Guide 1.97 (RG-1.97), safety parameter display systems (SPDS), and emergency response facilities (ERFs). Carolina Power & Light Company's progress in integrating the H. B. Robinson (HBR) Unit 2 emergency response activities with other outstanding commitments is being taken into consideration in the development of CP&L's plant-specific input and integration criteria (Step 1 of Figure 1).

In developing the HBR integration criteria, guidelines prepared by the NUTAC's, and the Westinghouse Owners' Group (WOG) will be evaluated. The industry guidelines CP&L will consider in developing final plant-specific plans are described in Attachment 2, and are listed below:

411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

A046
A003
Add: W. Paulson

As proposed by Generic Letter 82-33, we will meet with our NRC Project Manager to explain in more detail, our integrated implementation plan as described in Attachment 3.

Yours very truly,

E. E. Utley
Executive Vice President
Power Supply and
Engineering & Construction

EEU/SRZ/lr (014BSRZr)

E. E. Utley, having been first duly sworn, did depose and say that the information contained herein is true and correct to his own personal knowledge or based upon information and belief.

Lisa M. Randall
Notary (Seal

My Commission Expires: 5/18/83

cc: Mr. J. P. O'Reilly (NRC-RII)
Mr. G. Requa (NRC)
Mr. Steve Weise (NRC-HBR)

ATTACHMENT 1

CLASSICAL INTEGRATION SCHEME

1. Emergency Operating Procedures

   a. General Guidelines

      i. Emergency Operation Procedures Implementation Guideline
      ii. "Emergency Operating Procedure Writing Guideline", (INPO 82-017), published July, 1982
      iii. EOP Verification Guidelines
      iv. EOP Validation Guidelines
      v. Westinghouse Owners' Group Generic EOP Guidelines, for low pressure plants issued 7/21/82
      vi. Emergency Operating Procedures Generation Package Guideline (INPO 83-007), published February 1983

   b. Input Criteria

      i. Writer's Guide
      ii. Emergency Procedures Guidelines
      iii. Task Analysis

2. Control Room Design Review Program

   a. General Guidelines

      i. NUTAC Guidance on CRDR, issued in March, 1983

   b. Input Criteria

      i. Control Room Survey
      ii. Human Factors Engineering Principles

3. Regulatory Guide 1.97

   a. General Guidelines

      i. NUTAC Guidelines for Accident Monitoring Instrumentation, scheduled to be issued in May, 1983

   b. Input Criteria

      i. RG-1.97 Design Guidance

4. Safety Parameter Display System

   a. General Guidelines

      i. Westinghouse Owners' Group Display Program, issued 1/4/83
      ii. NUTAC "Guidelines for an Effective SPDS Implementation Program" (INPO 83-003 NUTAC), published January, 1983

list is finalized in design, an iterative process occurs to consider changes associated with EOPs, control room improvements, SPDS design, and ERF design.

SPDS PLAN

The SPDS plan describes the tasks which will provide a method for developing, revising, and implementing the safety parameter display system design bases, and a method for documenting these efforts. This plan is plant-specific, though it is developed with cognizance of current NRC and other guidelines.

The plan should provide a description of each task involved and administrative guidance required to perform the tasks, including defining source documents, determining manpower requirements, specifying vendor involvement, establishing a schedule, and specifying a method of configuration control. Interfaces with other Supplement 1 to NUREG-0737 elements should be clearly defined to ensure complete integration.

SPDS usability is essential to the effectiveness of the system. The document provided by the SPDS NUTAC entitled, Guidelines For An Effective Safety Parameter Display System Implementation Program provides human factors guidance criteria for an SPDS, as well as guidance for other factors that influence usability.

A plant-specific list of human factors criteria pertaining to the SPDS should be developed as a basis for developing and assessing plant-specific SPDS designs. This list of criteria may be developed in conjunction with the human factors criteria required as input for the performance of a control room design review.

The EOPs, as a result of the efforts performed by the NSSS Owners Groups and plant-specific considerations, specify the critical safety functions for a plant. The SPDS design bases should incorporate this information to allow the operator to use the SPDS, if available, in conjunction with his EOPs.

The CRDR/SPDS design basis interface may be classified as one-way or two-way, depending upon the intended use of the SPDS, i.e. the interface becomes two-way if a utility intends to resolve control board HEDs by taking credit for the information displayed by the SPDS or incorporating additional information on the SPDS.

The ERF Criteria/SPDS Design Bases Interface is classified as one-way, i.e., the SPDS design bases may be used as input in the ERF design criteria, however, the ERF design should have no direct effect on the SPDS.

The iteration interface is an ongoing process as long as HEDs exist or design changes that could impact the SPDS are made to any of the other basic Supplement 1 to NUREG-0737 elements. A great deal of coordination is essential to effectively determine modifications to the SPDS without creating additional discrepancies.

To ensure an effective SPDS, the design bases must specify hardware, inputs, and software in the case of a computer based system and identify SPDS user(s), specify location, and define availability. Design bases may vary considerably. Whereas some plants may elect to design an SPDS that serves

b. Input Criteria

i. Critical Safety Functions

5. Emergency Response Facilities

a. General Guidelines

i. NUTAC Guidelines on ERFs, scheduled to be issued in May, 1983

b. Input Criteria

i. TSC Criteria
ii. OSC Criteria
iii. EOF Criteria

6. Verification and Validation

a. General

i. Summary of the NUTAC Component Verification and System Validation Guidelines
ii. Verification and Validation for Safety Parameter Display Systems NSAC/39, December 1981

b. Input Criteria

i. V&V Input Criteria

PROPOSED SCHEDULES

In parallel with the work described above and prior to the issuance of Generic Letter 82-33, we carefully reviewed numerous draft NRC and industry guidelines. Carolina Power & Light Company determined that the probability of further revisions to NRC requirements in some of these areas was significant, posing substantial risk in committing resources to follow the guidance of these documents prior to full Commission approval. With Commission approval of Supplement 1 to NUREG-0737, we have now developed preliminary schedules for completion of those activities that CP&L believes can be planned at this time.

Attachment 3 provides plans and schedules for each activity, integrated with our current plant commitments and projected outage schedules. Some long-term milestones will require confirmation as near-term milestones are actually completed, and these milestones are described in Attachment 3.

INTRODUCTION

A subcommittee of the NUTAC on Emergency Response Capabilities was formed to provide industry guidance to individual utilities for the development of an integrated implementation plan that addresses the provisions of NUREG-0737, Supplement 1. The method developed to integrate the provisions of NUREG-0737, Supplement 1, is shown in Figure 1. Recognizing the different stages of compliance to the individual requirements in NUREG-0737, the method shown in Figure 1 assumes no work has been accomplished. However, after determining individual plant status, each utility can apply the method to prepare the plant specific implementation plans required by NRC.

Figure 1 is divided into basic steps that should be considered in the development of an integrated plant-specific implementation plan. The relation of previous to succeeding steps is discussed in the following plan descriptions.

EOP PLAN

The EOP Plan consists of those tasks which will provide a documented method for developing, utilizing, revising, and controlling Emergency Operating Procedures.

This plan will include defining source documents, determining manpower requirements, establishing a schedule, and specifying method of document control. This plan also will define the interfaces with other NUREG-0737, Supplement 1 elements to ensure complete integration.

Initial plant-specific EOPs are developed by utilities for the purpose of mitigating the consequences of a broad range of initiating events, and subsequent multiple failures or operator errors, without the need to diagnose a specific event. These procedures are symptom-oriented and written with human factors considerations to improve human reliability. These initial EOPs are developed based upon a writer's guide, NSSS generic technical guidelines and a plant-specific task analysis.

Determination of procedure adequacy is dependent upon the trained operator's needs. EOPs should be checked for completeness, understandability, technical correctness, usability, and compatability with the control room. In order for operators to have confidence in the EOPs, all of these criteria must be met. A walk-through of the initial EOPs provides a method of evaluating these criteria. A utility may choose to perform an EOP walk-through in the control room, in a simulator, using a mock-up of their control room, or any combination of the three. Prior to making this decision, a utility must determine resource availability and advantages versus disadvantages of each environment. Although Figure 1 indicates only one EOP walk-though, this process should be repeated following any major modifications to the EOPs.

Plant-specific EOPs must be incorporated in an iterative process with Control room HEDs, specific utility application of RG-1.97 recommendations, SPDS design bases, and Emergency Response Facility criteria. This interactive process should be used to determine what changes can easily be made to the EOPs to accommodate discrepancies in other areas without impacting the effectiveness of the EOPs. In order for this iterative process to be most

only to aid in monitoring the critical safety functions, others may elect to incorporate additional functions into the system. In all cases, the SPDS design must consider operator usability and compatibility with plant-specific EOPs.

The EOP/SPDS design basis interface is classified as one-way, i.e., structure of the EOPs will affect the SPDS design, but the SPDS design does not determine what must be included in the EOPs.

ERF PLAN

The ERF plan consists of those tasks which describe a method for designing, implementing, and utilizing the emergency response facilities. The plan should be plant-specific, and developed in cognizance of current NRC guidelines. The following items should be considered in the development of an ERF plan:

- Purpose of the TSC, EOF, and OSC
- Description of tasks
- Source document availability
- Project personnel requirements and materials needed
- Manpower requirements and restrictions
- Description of the design documentation required
- Desired date of completion and milestones
- Schedule controlling factors
- Interfaces with other Supplement 1 to NUREG-0737 elements

A set of criteria that provides a basis for the design or upgrade of the Technical Support Center (TSC), Emergency Operating Facility (EOF) and Operational Support Center (OSC) need to be determined. The bases for this criteria should include 10CFR50.47, 10CFR50, Appendix E, NUREG-0696, Utlity Emergency Plans, and guidance provided by nuclear industry organizations. Plant-specific criteria should include, but not be limited to, the following information:

- Purpose
- Location
- Required instrumentation (not required for OSC)
- Habitability (not required for OSC)
- Communications needs
- Structural considerations (not required for OSC)
- Size
- Human Factors considerations (not required for OSC)
- Staffing needs

Guidance produced by the ERC NUTAC will provide assistance in the development of this criteria.

A set of criteria that provides a basis for identifying non-utility or utility off-site interactions that have an impact on the emergency response facilities should be developed to provide:

- Interactions with state and local government,
- Communications required between plant and utility headquarters

- Resources required from utility headquarters,
- Emergency capabilities supported by NSSS vendors, A/Es, and medical facilities
- Non-utility personnel located in the ERF during emergency conditions

A set of criteria that provides a basis for ensuring the integration of the TSC, OSC, EOF, and off-site facilities should be developed.

The ERF criteria should be included in an iterative process with other elements of Supplement 1 to NUREG-0737. These include control room improvements, plant-specific EOPs, specific RG-1.97 application and SPDS design. This iterative process should continue until all of the elements associated with ERF criteria used to build or upgrade emergency response facilities are developed based on the above considerations.

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effective, all of the elements that impact EOPs should be available at the same time. However, due to economics, manpower limitation, or vendor restrictions, this may not be possible. To accommodate this situation and to ensure effective EOPs, a utility should consider performing the iteration between EOPs and the other impacting elements as soon as each one has been developed.

CRDR PLAN

The Program Plan is the first step towards performing a CRDR and provides a method for performing the entire review.

The Control Room Inventory Portion of the CRDR (identification and documentation of equipment) can be done independently of the other tasks associated with the CRDR.

In performing the CRDR, accepted human factors guidelines should be used. Good human engineering practices should be incorporated in any control room design since the operator must interface with this equipment under stressful, as well as normal conditions.

The complete Control Room Design Review should utilize results from the EOP walk-through and control room inventory, as well as human engineering criteria, to uncover any control room design problems. This review should include, among other things, an assessment of control room layout, the control room environment, the usefulness of audible and visual alarms, the readability of displays, the adequacy of instrumentation, and the information recording and recall capabilities.

The instrumentaion and controls requirements output of task analysis should be compared with the control room inventory to determine if any required displays or controls are missing.

The operators tasks and informational requirements are validated by the EOP walk-through and provide input to the control room design review.

Control Room additions associated with the safety parameter display (e.g. SPDS) and incorporation of selected RG-1.97 recommendatios should be considered during the CRDR.

The control room improvements should be coordinated with changes resulting from other programs such as EOP, RG-1.97, SPDS, and ERF.

RG-1.97 ELEMENT

A detailed plan is presented which provides administrative guidance required to assess, and document all aspects of RG-1.97 consideration. A complete set of design criteria is developed from the plan to form a basis for plant-specific instrument selection. Utilizing the design criteria, as well as the post accident instrumentation requirements identified from the CRDR task analysis, a plant-specific list of accident monitoring instrumentation, qualification criteria and locations is developed. The plant list also provides feedback to the control room design review and SPDS design basis. ERF design criteria provides additional input to the plant list. Once the

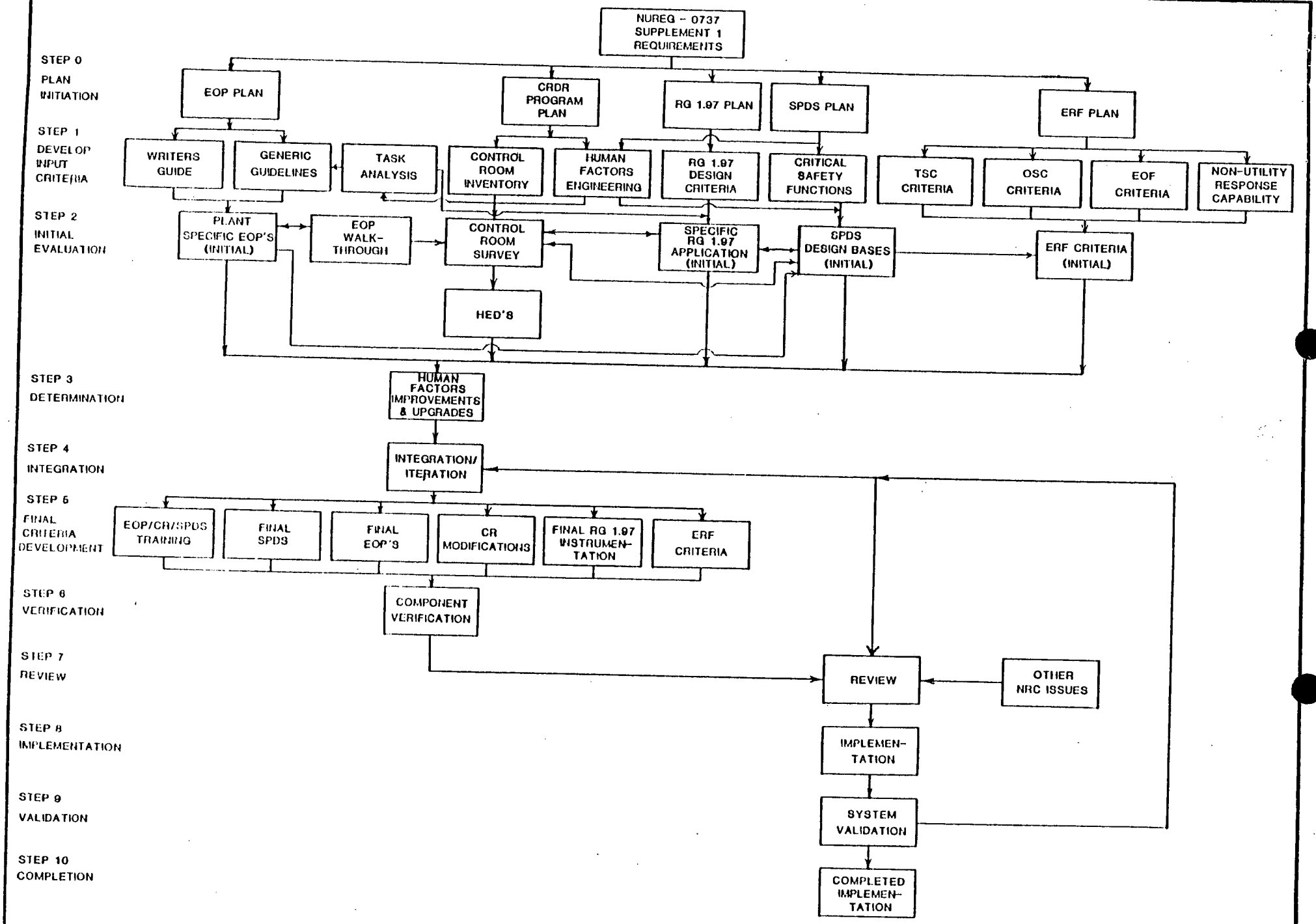
NUREG – 0737 SUPPLEMENT 1 REQUIREMENTS
STEP 0 PLAN INITIATION
EOP PLAN
CRDR PROGRAM PLAN
RG 1.97 PLAN
SPDS PLAN
ERF PLAN
STEP 1 DEVELOP INPUT CRITERIA
WRITERS GUIDE
GENERIC GUIDELINES
TASK ANALYSIS
CONTROL ROOM INVENTORY
HUMAN FACTORS ENGINEERING
RG 1.97 DESIGN CRITERIA
CRITICAL SAFETY FUNCTIONS
TSC CRITERIA
OSC CRITERIA
EOF CRITERIA
NON-UTILITY RESPONSE CAPABILITY
STEP 2 INITIAL EVALUATION
PLANT SPECIFIC EOP'S (INITIAL)
EOP WALK-THROUGH
CONTROL ROOM SURVEY
SPECIFIC RG 1.97 APPLICATION (INITIAL)
SPDS DESIGN BASES (INITIAL)
ERF CRITERIA (INITIAL)
HED'S
STEP 3 DETERMINATION
HUMAN FACTORS IMPROVEMENTS & UPGRADES
STEP 4 INTEGRATION
INTEGRATION/ ITERATION
STEP 5 FINAL CRITERIA DEVELOPMENT
EOP/CR/SPDS TRAINING
FINAL SPDS
FINAL EOP'S
CR MODIFICATIONS
FINAL RG 1.97 INSTRUMENTATION
ERF CRITERIA
STEP 6 VERIFICATION
COMPONENT VERIFICATION
STEP 7 REVIEW
REVIEW
OTHER NRC ISSUES
STEP 8 IMPLEMENTATION
IMPLEMENTATION
STEP 9 VALIDATION
SYSTEM VALIDATION
STEP 10 COMPLETION
COMPLETED IMPLEMENTATION

FIGURE 1

ATTACHMENT 2

DESCRIPTION OF GUIDELINES AND INPUT CRITERIA DEVELOPED BY INDUSTRY GROUPS

1. EOP PLAN

a. General Guidelines

i. The INPO Emergency Operation Procedures Implementation Guideline presents the basic elements of an implementation plan for EOPs, starting with the receipt of the emergency operating procedure guidelines (EPGs). The following elements are presented and discussed:

- Organization of Implementation Elements
- Crew and Shift Policy Characteristics
- Procedure System and Network
- Technical Guideline Use
- Writers Guide for EOPs
- EOP Verification
- EOP Validation
- Training
- Revision, Review, and Approval Process
- EOP Control
- Supporting Documentation Control
- Experience Feedback

The elements were identified and evaluated by the Emergency Operating Procedures Implementation Assistance (EOPIA) Review Group in accordance with the Activity Network described in the EOPIA Program Description (INPO 82-013). The elements presented are not to be construed as an exhaustive list and are considered to be generic to most plants and organizations. The elements should be reviewed by the utility for individual applicability and use. By review of each element presented, it is felt that a cohesive and efficient implementation plan for EOPs can be developed by each utility.

This document is offered as guidance only.

ii. EOP Writing Guideline

The purpose of this guideline is to provide information that can be used by a utility in writing or improving a plant-specific writers guide for emergency operating procedures (EOPs). The INPO Emergency Operating Procedures Writing Guideline presents human factors principles applicable to EOPs. These principles, if applied in developing or improving a writers guide for EOPs, will help ensure readable and understandable procedures for emergency conditions.

This guideline document is organized to present information on human factors aspects and how to address them in writing EOPs by applying principles. For each principle, an explanation is provided with guidance and examples of application. In addition, a writers guide outline, example writers guide, and emergency operating procedures are provided to show how the principles can be tied together in writing EOPs. As structured,

the guideline can be reviewed starting with either the general principles or the specific example EOP. This document is offered as guidance only.

iii. EOP Verification Guidelines (INPO)

The purpose of this guideline is to provide information that can be used by a utility in developing its Emergency Operating Procedure (EOP) Verification Program. This document provides guidance in three major areas of an EOP Verification Program. These are the program objective, program evaluation criteria, and program process.

The program objective is to ensure that consistency has been maintained between the EOPs and the EOP Source Documents. Consistency is determined by Verification Principles for written correctness and technical accuracy. Written correctness ensures information is incorporated as specified by administrative guidance. Technical accuracy ensures proper incorporation of generic and plant-specific technical information.

Program evaluation criteria are used to determine if the verification principles are satisfied. This document provides guidance for the development of plant-specific evaluation criteria. Sample evaluation criteria are provided for each verification principle for a typical plant.

The program process supports the actual comparative evaluation. This document divides the process by phases: preparation, verification, resolution and documentation. Guidance is provided for each of these process phases along with a sample verification procedure.

This document is presented for guidance only. Its program is not intended to duplicate efforts in existing EOP review and approval processes. EOP verification as presented in this document is a comparative evaluation which addresses whether the EOPs are written correctly and are technically accurate. The evaluation of whether the EOP information is usable and operationally correct is addressed during the EOP validation.

iv. EOP Validation Guidelines (INPO)

The purpose of this guideline is to provide information that can be used by a utility in developing its Emergency Operating Procedures (EOPs) Validation Program. This document provides guidance in three major areas of EOP Validation Program. These areas are the program objective, program evaluation criteria and program process.

The program objective is to determine if the trained operating shift can manage emergency conditions with EOPs. This determination is made by validation principles for operational correctness and usability. Operational correctness ensures that

EOPs are compatible with plant responses, plant hardware, and the operating shift. Usability ensures that the EOPs provide sufficient and understandable operator information.

The program evaluation criteria are used to determine if the validation principles are satisfied. This document provides guidance for the development of plant-specific evaluation criteria. Sample evaluation criteria are provided for each validation principle for a typical plant.

This program process supports the actual performance evaluation. This document divides the process by phases: preparation, validation resolution, and documentation. Guidance is provided for each of these phases along with sample procedure for each validation method.

This document is presented for guidance only. Its program is not intended to duplicate efforts in existing EOP review and approval processes. EOP validation as presented in this document is a performance evaluation which addresses whether the EOPs are operationally correct and usable. The evaluation of whether or not the EOP information is written correctly and technically accurate is made during EOP verification.

v. Westinghouse Owners' Group EOP Guidelines

The purpose of this guideline is to provide generic symptomatic emergency procedure guidelines (EPG's). These EPGs are generic to Westinghouse 2 loop through 4 loop designs, in that they address the major systems which may be used to respond to an emergency. The guidelines are written for plants as they are currently configured, no attempt has been made to propose system modifications. Because no plant has the same system configuration, the EPGs are applied to individual plants by deleting statements which are not applicable or by substituting equivalent systems where appropriate.

The program objective is to produce procedures that are more comprehensive, less voluminous and symptomatic in their treatment of emergency situations. The entry conditions, therefore, are symptomatic of both emergencies and events which may degrade into emergencies. Entry into such a procedure set is not conclusive that an emergency has or will occur.

vi. Emergency Operating Procedures Generation Package Guideline (INPO 83-007), Published February, 1983. This document contains guidance for use in the development of the Procedures Generation Package (PGP). It identifies for presentation or description in the PGP:

- Technical Guidelines
- Writers Guide for EOPs
- EOP Verification
- EOP Validation
- Training

This document also presents a sample PGP, and is offered as guidance only.

b. Input Criteria

i. Writers Guide for EOPs

A writers guide for EOPs is a plant-specific document that provides instruction on writing EOPs, emphasizing the incorporation of human factors principles. It can be either a separate document devoted specifically to EOP's or a broader document with a section devoted to EOP's.

The writers guide can be continually improved, based on feedback from operator training and experience. In addition to establishing sound writing principles, a well-developed writers guide helps to promote consistency among all EOPs independent of the number of EOP writers. It should cover the following topics:

- EOP format
- EOP organization
- EOP level of detail
- role of the EOP within the procedure system and network
- EOP content
- mechanics of style

ii. Emergency Procedures Guidelines

Mr. Eisenhut's letter of September 18, 1981 agreed with the approach being utilized. These generic guidelines identify the equipment or systems to be operated and list the steps necessary to mitigate the consequences of transients and accidents. They provide sound engineering bases for the development of EOPs. A given plant will use at least one of the two types of technical guidelines: generic or plant-specific.

- Generic Technical Guidelines - Technical guidelines prepared by a group of plants or owners groups for plants with a similar design.

- Plant-Specific Technical Guidelines - Technical guidelines prepared for plants using a generic technical guideline and/or plant-specific guidelines developed specifically for the particular plant.

When addressing this element in the formulation of an EOP implementation plan, consideration of the following major items should be included:

- mechanics of conversion
- location of the plant-specific technical information
- how the plant-specific technical information was used
- the use of old EOPs
- documentation requirements
- use of the background information supplied with the technical guideline
- licensing commitments

iii. Task Analysis

The use of the term "task analysis" in the CRDR has caused some confusion. Of all implementation elements, the task analysis is probably the least understood and, hence, may require more time and effort to be integrated properly with other CRDR activities. It is vital to the outcome of the CRDR that adequate attention be given to task analysis, since it can integrate the operational, dynamic aspects of plant operation with the results of the CRDR.

The task analysis is used to delineate the specific actions (automatic and manual) that must take place to accomplish system functions. For the CRDR task analysis, the emergency procedure guidelines (EPGs) can be the technical bases for emergency operation.

The level of detail and types of information collected during task analysis is dependent on the focus of the CRDR. When addressing this element in the formulation of a CRDR implementation plan, the following major items should be considered:

- focus and desired output of the overall CRDR
- availability of personnel to conduct task analysis
- definition of how the implementation plan can make use of industry and owners group task analysis
- extent of training required by review personnel in the use of task analysis
- documentation necessary to use data from the task analysis in potential control room deficiencies.

2. CONTROL ROOM DESIGN REVIEW PROGRAM PLAN

a. General Guidelines

i. NUTAC Guidance on CRDR

(a) CRDR Implementation Guidelines

This document provides guidance to utilities for use in developing their implementation plans for control room design review (CRDR). The basic elements of an

implementation plan for CRDR are described. The following elements are presented and discussed for each phase of the CRDR:

Planning Phase

- Organization
- Focus and Extent of the Review
- Review Team Composition
- Review Team Orientation
- Use of EPGs and EOPs

Execution Phase

- Survey
- Task Analysis (System Review)

Assessment Phase

- Human Engineering Review Principles
- Assessment of HEDs
- Effect of Operator Aids
- Effect of Current Modifications
- Prioritization of HEDs

Correction Phase

- Enhancements and Modifications
- Procedure Changes
- Operator Training

Effectiveness Phase

- Validation
- Reporting
- Feedback
- Upkeep

Documentation Phase

- Document Control
- Working Documents
- Summary Report

These elements were identified by the Nuclear Utility Task Action Committee (NUTAC on CRDR). The elements presented are not to be construed as an exhaustive list, but are considered to be generic to most plants. The elements should be reviewed by the utility for individual applicability. In an appendix of this document is an example of a CRDR implementation plan that illustrates how the elements described in the body of the guideline might be incorporated into a plant-specific document.

(b) CRDR Survey Development Guideline (NUTAC)

The Control Room Design Review Survey Development Guideline provides survey development guidance to utilities. It describes a method for generating checklists and questionnaires. These will be used in the CRDR human factors survey. The document contains an introduction, a section on definitions used and a section on method. Appendices contain examples of checklists and questions on NUREG-0700 guideline critiques. The definitions section provide definitions of those terms associated with the control room survey as those terms are used in the document.

The survey development section describes the methodology used when screening guidelines for inclusion in a control room survey checklist. Each element of the methodology is associated with at least one appendix that delineates those specific NUREG-0700 Section 6 Guidelines to which the screening criteria applies.

Appendix A contains example questions, checklists and surveys. They represent a partial conversion of NUREG-0700, Section 6 Guidelines into a set of achievable tasks.

Appendix B contains NUREG-0700, Section 6 criteria which are vague or unquantifiable. The criteria have been annotated with objective criteria.

Appendix C contains NUREG-0700, Section 6 criteria called "preferred designs". The criteria should be considered under the "Selection Improvement" phase of CRDR.

Appendix D contains those NUREG-0700 criteria which are predominately procurement specifications from MIL-STD-1472.

Appendix E contains those NUREG-0700 criteria which might degrade performance and an explanation.

b. Input Criteria

i. Control Room Survey

The control room survey is an explicit, well-defined control room design verification activity within the CRDR. The survey consists of comparing the characteristics of the existing control room with commonly accepted human engineering design criteria.

The major items to be considered when addressing this element in the formulation of a CRDR implementation plan are the human engineering criteria to be used in the review and the extent of the survey. Default criteria are contained in Section 6,

NUREG-0700, "Guidelines for Control Room Design Reviews." Other applicable human engineering criteria may also be used to support the desired focus (see "Control Room Design Review Survey Development Guideline", also being developed by the NUTAC). Though the survey can be applied to any operational area of the plant, for the CRDR the survey should be focused to the operating panels and environment inside the control room.

Whatever criteria are chosen for use, they should be referenced explicitly in the implementation plan. The following aspects of the survey should be considered:

- completeness of the survey criteria
- applicability of survey criteria to the focus of the CRDR
- training of the survey team(s) in the use of the selected criteria
- availability of equipment to measure the parameters necessary to meet the selected criteria
- auditability of the technique(s) used to apply the survey criteria
- documentation of survey results
- description of the specific operating areas to be surveyed

ii. Human Factors Engineering

During the survey phase of the CRDR, the existing control room is reviewed for compliance with commonly accepted human engineering design criteria. These criteria can be found in many source documents, such as NUREG-0700, MIL-STD-1472C, etc. Aspects of the control room that do no conform to design guidelines are classified as HEDs. The next implementation element (3.3.2) deals with the assessment of HEDs to determine the potential seriousness of errors that might result from such discrepancies.

It can be useful during the assessment phase of the CRDR to keep in mind the human factors principles on which detailed survey guidelines are based (see "Human Engineering Review Principles," also being developed by the NUTAC). During the control room survey, it is easy to lose sight of where the detailed survey criteria originated and why they were developed. The inclusion of basic human engineering principles in the development of the CRDR implementation plan serves as a reminder that the measurements and values contained in detailed guidelines are not to be interpreted as absolute, inflexible numbers.

When addressing this element in the CRDR implementation plan, the following major points should be considered:

- the level of detail of the principles
- the applicability of particular principles to the control room

- cross-reference of principles to the detailed survey guidelines
- the behavioral criteria used to judge that principle has been met
- the population to which the principle is to be applied
- the experience of review team members in interpreting human factors principles
- The completeness of the set of principles used

3. REGULATORY GUIDE 1.97 PLAN

a. General Guidelines

i. NUTAC Guidelines for Accident Monitoring Instrumentation

The objective of the RG-1.97 NUTAC subcommittee is to assist utilities in their implementation of accident monitoring instrumentation, particularly in the relation of such instrumentation to RG-1.97. To meet this objective the subcommittee will provide a document that contains the following:

- selection of plant-specific qualification criteria, ensuring that sufficient flexibility exists to accommodate plant-specific needs
- selection of plant-specific instrumentation for control room, in-plant and TSC/EOF monitoring
- example formats for RG-1.97 response
- summary of available industry positions of RG-1.97 and related guidance documents.

This document is scheduled to be issued in May 1983.

b. Input Criteria

i. RG-1.97 Design Criteria

4. SPDS PLAN

a. General Guidelines

i. NUTAC Guidelines for an Effective SPDS Implementation Program (INPO 83-003)

Provides guidance for use inplant-specific SPDS implementation programs. The document provides guidance for each of the following considerations:

- Implementation Planning
- Formulation of Design Bases
- System Design
- Preparation of Purchase Specifications
- Installation and Testing
- Training
- Documentation

- Integration
- Hardware Maintenance
- V&V of SPDS Hardware and Software

The document's appendices provide the following additional information:

- Appendix A clarifies the definition of the SPDS in terms of its operational attributes
- Appendix B summarizes human factors considerations applicable to the SPDS.
- Appendix C describes the relation of the SPDS to plant-specific critical safety functions (of the EOPs).
- Appendix D describes the evaluation of the SPDS in a control room environment, and serves as a brief introduction to the Component Verification and System Validation guidance of the ERC NUTAC.

By review of each topic addressed in these guidelines, a cohesive and efficient implementation program for the SPDS can be developed by each utility. This document is offered as guidance only.

b. Input Criteria

i. Critical Safety Functions

Guidance is provided with the NUTAC Technical Guidelines.

5. ERF PLAN

a. General Guidelines

i. NUTAC Guidelines for ERF Plan

This document provides additional guidance to selected regulatory requirements related to the TSC, OSC, and the EOF which in the opinion of the NUTAC on Emergency Response Capability, would be of benefit to utilities.

It provides:

- Guidance to utilities on how to interpret NRC regulatory documents as they relate to ERFs.
- Guidance for satisfying the intent of NRC regulatory requirements on ERFs as identified in 10 CFR 50.47 and Supplement 1 to NUREG-0737.
- Examples of alternatives for meeting the intent of NRC regulatory documents

It is recognized that most utilities have already addressed the role and function of these facilities on an interim basis, and have developed conceptual designs based on previously defined requirements. For operating license and near-term operating license plants, parts or all of these conceptual designs may have been implemented. As such, the guidance contained in this

document takes into account the progress made by utilities in upgrading their emergency response facilities.

The following format was used:

- Issue
- Regulatory Requirement
- Applicability (ERF to which requirement applies)
- NUTAC position (guidance on implementing the requirement)
- Justification for the position
- Example

b. Input Criteria

i. TSC - See description of Item 5.a.i) above

ii. OSC - See description of Item 5.a.i) above

iii. EOF - See description of Item 5.a.i) above

6. Verification and Validation

a. General

i. Summary of the NUTAC Component Verification and System Validation Guidelines

The purpose of this document is to provide guidance in developing a Component Verification and System Validation (V&V) Program. This documentation presents Component Verification as a comparative evaluation conducted to determine that there is consistency between appropriate source documents and the operator, plant, procedure and training components of a model system (System). Validation is presented as an evaluation conducted to determine that the System functions to accomplish the desired results. For ERC evaluation the desired results are to mitigate the consequences of emergency conditions. Guidance is provided for three major areas: program objectives, program evaluation criteria, and program process.

The verification process supports the actual comparative evaluation of the individual components, while the validation process supports the actual overall system evaluation. Both use evaluation criteria developed from either Component Verification or System Validation Principles. Each process is divided by four phases: preparation, verification or validation, resolution, and documentation. Guidance is provided for each phase.

This document is presented for guidance only to assist utilities in responding to the provisions of NUREG-0737, Supplement 1.

b. Input Criteria

i. V&V Input Criteria

V&V PLAN

The V&V Plan addresses component verification and system validation. The system of concern consists of four major components: operator, procedures, plant, and training.

Component verification is a comparative between appropriate source documents and a component. EOPs are an example component and the technical guidelines are sample source documents.

System validation is an evaluation conducted to determine that the system components function together to accomplish the desired results.

Further guidance can be found in the following documents being developed:

- Guidelines for Component Verification and System Validation
- Emergency Operating Procedures Verification Guideline
- Emergency Operating Procedure Validation Guideline
- Guideline for an Effective SPDS Implementation Program

EOP VERIFICATION

EOP verification is the evaluation performed to confirm the written correctness of the procedure to ensure that the generic and plant-specific technical aspects have been properly incorporated. The evaluation should also check that the human factors aspects presented in the writers guide for EOPs have been applied.

When addressing this input in the formulation of an integration plan, consideration of the following major items should be included:

- how EOP verification will be performed
- documentation of the verification process
- the process used in resolving discrepanies

Further guidance can be found in the document Emergency Operating Procedures Guideline, which is being developed by the EOPIA Review Group.

EOP VALIDATION

Validation of EOPs is the evaluation performed to determine the actions specified in the procedure can be performed by the operator to manage the emergency conditions. Methodology for EOP validation should be developed to utilize present, available, state-of-the-art methods while recognizing and allowing for future improvements. Validation should evaluate the operators' ability to manage emergency conditions. It need

only validate that part of the EOP not covered by any validation of generic technical guidelines.

When addressing this input in the formulation of an integration plan, consideration of the following major items should be included:

- how EOP validation will be performed
- use of a simulator, plant walk-throughs, or desk-top checks
- operator and training experience
- evaluation criteria and method for resolving discrepancies
- documentation of the validation process

Further guidance can be found in the document Emergency Operating Procedures Validation Guideline, which is being developed by the EOPIA Review Group.

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ATTACHMENT 3

PLANS AND SCHEDULES FOR EMERGENCY RESPONSE CAPABILITIES

SAFETY PARAMETER DISPLAY SYSTEM (SPDS)

The computer-assisted approach for SPDS, selected by CP&L as best meeting the intent of NRC requirements, requires a major capital investment. Expenditures of this magnitude could not be justified prior to Commission approval of requirements in this area. This is particularly true for SPDS owing to the considerable debate and subsequent changes in guidance which impacted specific design-related and cost-sensitive areas such as seismic qualifications, Class 1E qualifications and availability. The development of detailed hardware, software and installation bid specifications could not be completed until these requirements were approved by the Commission.

Only after detailed negotiations with a vendor is it possible to establish this design and procurement schedule including the schedule impact of other orders received by the vendor. An installation schedule cannot be completed until final design of the system is completed by the SPDS vendor and delivery is scheduled. Finally, the CRDR and EOP upgrades and RG-1.97 implementation must be integrated with the SPDS logic. This integration logic is shown on Figure 1, Attachment 1.

Carolina Power & Light Company has written a generic specification for the SPDS which includes Emergency Response Facility Information System (ERFIS) and is adaptable to all three CP&L nuclear plant sites.

On February 18, 1983, CP&L received bids from architect-engineer firms to provide preliminary engineering, construction cost, and schedule estimates and to conduct on-site evaluations to identify and recommend solutions for space, HVAC and power supply problems. An architect-enginer firm was selected and has conducted a preliminary assessment. Carolina Power & Light Company's best estimate of a schedule for development of the procurement specifications and award of contract for production of the SPDS is as follows:

Award Contract:	November 1983
Submit Safety Analysis:	January 1985
SPDS Operable: SPDS Training Complete:	Earliest Date: May, 1986 (if man-power loading during Steam Generator Replacement Outage in 1984 also permits outage work to be done on SPDS). Latest Date: 3 months after Refueling Outage #12, currently scheduled for Spring 1987, (if SPDS outage work cannot be scheduled during Steam Generator Replacement Outage in 1984).

Following negotiation with a vendor, and award of contract for the SPDS, CP&L will be in a position to commit to a firm delivery schedule for the SPDS. As requested by Generic Letter 82-33, CP&L does not desire an NRC pre-implementation review.

DETAILED CONTROL ROOM DESIGN REVIEW (DCRDR)

The Essex Corporation has completed a DCRDR for the current configuration of the HBR Control Room and has identified some human engineering discrepancies

(HED's). Carolina Power & Light Company has reviewed these HED's, has corrected some of them, and is in the process of establishing a final schedule for resolution of the remaining applicable HED's identified by the Essex Corporation review.

After SPDS and RG-1.97 implementation plans and EOP upgrades are complete, a design improvement verification and validation will be performed. Correction of any additional HED's will be completed after SPDS and RG-1.97 activities are completed during the Refueling Outage #12 (currently scheduled for Spring, 1987). Six months after this refueling outage is complete, CP&L will submit a DCRDR summary report and a description of HED's corrections in summary form.

REGULATORY GUIDE 1.97

In March 1983, CP&L contracted with a consultant for the development of an implementation plan for Regulatory Guide 1.97 post accident monitoring instrumentation. Carolina Power & Light Company will consider the NUTAC guidance documents on RG-1.97 as described in Attachment 2 in conjunction with the consultant's recommendations in developing a final RG-1.97 compliance plan. The consultant will deliver a recommendation for an implementation plan by July 1983. These recommendations must be integrated with SPDS plans and EOP upgrades before finally deciding which modifications to instrumentation are required. However, we anticipate the following milestones can be achieved:

Preliminary Report to NRC and establish Schedule for implementation	6 months after Refueling Outage #10 (scheduled for January 1984)
Final Implementation	3 months after Refueling Outage #12 (Spring 1987)

We will be able to commit to firm upcoming milestone dates after receipt and review of the above noted consultant recommendations.

UPGRADE EMERGENCY OPERATING PROCEDURES (EOPs)

Carolina Power & Light Company is drafting upgraded EOPs using the Westinghouse Owners' Group technical guidelines and INPO's EOP Writing Guideline, as described in Attachment 2 and NUREG-0899. This work has been in progress since October 1982, due to a previous CP&L commitment (involving the Pressurized Thermal Shock (PTS) issue), to have the new EOPs in place at Robinson prior to the end of the next refueling outage after December 31, 1982. To minimize re-writes and subsequent re-training, along with other advantages, the Robinson plant is developing its plant-specific procedures using Revision 1 of the low-pressure version of the Westinghouse Owners' Group (WOG) Generic Emergency Response Guidelines (ERG). The complete Revision 1 Generic Guidelines package is not expected to be available until August 1983; therefore, Robinson plant-specific procedures are presently being developed from draft versions of the Revision 1 Generic Guidelines as they become available from the WOG. Due to a need to review the Robinson plant-specific procedures against the contents of the formally issued Revision 1 of the WOG, we will submit the Procedures Generation Package for the Robinson plant approximately two months after Revision 1 of the Generic Guidelines is formally issued by the WOG. The Procedures Generation Package will include the plant-specific technical guidelines, plant-specific writer guidelines and a description of our verification and validation program. It should be noted

that the Robinson Plant Procedures Generation Package will probably not be submitted three months prior to the start of training on the new EOPs, due to our accelerated implementation schedule and the expected August 1983 delivery of the complete Revision 1 package of WOG Generic ERGs. The Robinson plant presently expects to start simulator training on the new EOPs in November 1983. Training will be completed prior to startup after Refueling Outage #10, currently scheduled to commence early 1984.

As the SPDS, RG-1.97 requirements, and CRDR results are implemented, additional minor revisions to the EOPs may be required. Assuming milestones for SPDS, RG-1.97 and CRDR activities are achieved on our proposed schedule, we anticipate updating our EOP's and completing operator training within six months after the Refueling Outage #12 (Spring 1987). We will be able to commit to this schedule after additional future milestones on these activities are actually achieved.

EMERGENCY RESPONSE FACILITIES

With respect to emergency response facilities, CP&L is currently using interim facilities, which have functioned effectively during emergency drills conducted on August 1981 and April 1982. Carolina Power & Light Company commenced construction of permanent EOF/TSC facilities on October 1982, at a location approved by NRC letter dated May 19, 1982. Construction of the buildings is 10% complete, with completion of the buildings scheduled for December 1983. We anticipate that communications (except for ERFIS) and training on these facilities will be completed by June 1984. Security modifications for the TSC integrated with the plant security system upgrades are scheduled for completion in May, 1985. In addition, when the ERFIS is implemented in the EOF/TSC, along with the SPDS in the Control Room, we anticipate training using these systems can be completed by six months after Refueling Outage #12, scheduled for Spring 1987. We will be able to commit to these proposed schedules after additional milestones on communications, security modifications and ERFIS are actually achieved.

We anticipate being able to meet NRC requirements listed in Supplement 1 to NUREG-0737 for the construction of Emergency Response Facilities with the exception of one item shown on Table 1. Our EOF is located adjacent to the plant and will meet the same radiation protection criteria as the TSC and control room. No occupant of the EOF will receive more than 5 REM (or equivalent) during the design basis accident. In addition, the state and local agencies will not be using our EOF for their Forward Emergency Operations Center, but have elected to use the Darlington National Guard Armory, 18 miles from the plant site. Should utility, local, federal or state personnel wishing to travel to the EOF elect not to do so because of radiological protection reasons, an alternate facility is available at the Darlington National Guard Armory for their use in communicating with the TSC and EOF. As described in the draft NUTAC Guideline on ERFs, we believe that an exception to the Commission's requirement for a backup EOF is justified because:

(1) There are no situations whereby evacuation of the primary EOF would be required.

(2) State and local agencies will not use the primary EOF but will establish reliable communications from their Emergency Center at the Darlington National Guard Armory.

(3) Emergency response will be enhanced by remaining in the primary EOF and not by retreating to a backup EOF with less reliable communications, facilities and training.

(4) An alternate communication facility exists at the Darlington National Guard Armory, 18 miles from the plant.

As provided in Paragraph 3.7 of Supplement 1 to NUREG-0737, NRC will make allowances for work already done by licensees in good-faith to meet previous NRC guidance. We feel that planning and training to remain in the primary EOF is a more reliable and enhanced emergency response position, and is consistent with the positions of many other licensees that are in a similar situation of having proceeded to construct these close-in facilities in good faith. Carolina Power & Light Company, therefore, requests written confirmation from the Commission that our reasoning is sound and a backup EOF would not enhance our emergency response capability nor those of the federal, state, or local agencies.

SUBMITTALS TO NRC

In summary, CP&L expects to submit the information requested in Supplement 1 to NUREG-0737 for NRC review in accordance with the following schedule:

	Submittal	NUREG-0737 Supplement 1 Reference	Schedule
1.	SPDS Safety Analysis	4.2a	January 1985
2.	CRDR Summary Report	5.2b	Six months after Refueling Outage #12 (Spring 1987)
3.	RG-1.97 Report	6.2	Six months after Refueling Outage #10 (1984)
4.	WOG EOP Technical Guidelines Guidelines (Generic)		
	a. Basic Revision (low pressure generic)	7.2a	issued 7/21/82
	b. Revision 1 - (low pressure generic)	7.2a	August, 1983 (projected)
5.	EOP Procedures Generation Package	7.2b	2 months after Revision 1 to WOG Generic Guidelines issued

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