UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE PROCEDURES GENERATION PACKAGE

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

DOCKET NO. 50-285

1. INTRODUCTION

The "TMI Action Plan" (NUREG-0660 and NUREG-0737) required licensees of operating reactors to reanalyze transients and accidents and to upgrade emergency operating procedures (EOPs) (Item I.C.1). The plan also required the NRC staff to develop a long-term plan that integrated and expanded efforts in the writing, reviewing, and monitoring of plant procedures (Item I.C.9). NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures," describes the use of a "Procedures Generation Package" (PGP) to prepare EOPs. A PGP is required by Generic Letter 82-33, Supplement 1 to NUREG-0737, "Requirements for Emergency Response Capability." The generic letter requires each licensee to submit a PGP, which includes:

(i) Plant-specific technical guidelines

(ii) A writer's guide

(iii) A description of the program to be used for the validation of EOPs

(iv) A description of the training program for the upgraded EOPs.

This Safety Evaluation (SE) is the review of the Omaha Public Power District (OPPD) submittal describing the development and implementation of EOPs for the Fort Calhoun Station, Unit 1 (FCS1).

The review was conducted to determine the adequacy of the OPPD program for preparing, implementing, and maintaining upgraded EOPs for FCS1. This review was based on NUREG-0800, Subsection 13.5.2, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants." Section 2 of this SE briefly discusses the OPPD submittal, the NRC staff review, and the acceptability of the submittal. Section 3 contains the staff's conclusions.

The staff determined that the procedures generation program for FCS1 has several items that must be satisfactorily addressed before the PGP is acceptable. OPPD should address these items in a revision to the PGP, or

provide justification for why such revision is not necessary. This revision and/or justification need not be submitted, but should be retained for subsequent review by the NRC staff. The revision of the PGP, and subsequently of the EOPs, should not impact the schedule for the use of the EOPs. The revision should be made in accordance with the FCS1 administrative procedures and 10 CFR 50.59.

2. EVALUATION AND FINDINGS

In a letter dated March 1, 1985, from R.L. Andrews (OPPD) to J.R. Miller (NRC), OPPD submitted its PGP for FCS1. The PGP contained the following sections:

- PGP Introduction
- Plant-Specific Technical Guidelines
- EOP Writer's Guide
- EOP Verification Program
- EOP Validation Program
- EOP Training Program

The staff review of the FCS1 PGP is documented in the following subsections.

A. Plant-Specific Technical Guidelines (P-STG)

The P-STG program description was reviewed to determine if it described acceptable methods for accomplishing the objectives stated in NUREG-0899. OPPD described a process that will use CEOG Emergency Procedure Guidelines, CEN-152, Revision 02, or the most current revision, as the basis for developing upgraded EOPs FCS1. OPPD identified the following source documents for use in generating EOPs for FCSI:

- Fort Calhoun Station Unit 1 Writer's Guide
- CEOG Emergency Procedure Guidelines (CEN-152, Revision 02, for initial upgrade or most current revision for subsequent upgrades)
- Fort Calhoun Station Unit 1 USAR
- Fort Calhoun Station Unit 1 Emergency Procedures (existing)
- Fort Calhoun Station Unit 1 Operating Procedures
- Fort Calhoun Station Unit 1 Administrative Procedures
- Fort Calhoun Station Unit 1 Radiological Emergency Response Plan and Emergency Plan Implementing Procedures
- As-built plant drawings
- Licensing commitment letters related to EOPs

The staff review of the FCS1 P-STG identified the following concern:

The PGP states that deviations from and additions to the generic technical guidelines (CEN-152 EPGs) will be documented on the EOP Development Forms 1 and 2, and that this documentation will include technical justification supporting these additions and/or deviations. The PGP should further state that the safety significance of these differences should be determined and all safety-significant differences should then be identified in the PGP.

With adequate resolution of the above item, the FCS1 plant-specific technical guidelines program should accomplish the objectives stated in NUREG-0899 and should provide adequate guidance for translating the CEOG Emergency Procedures Guidelines into the FCS1 plant-specific technical guidelines and EOPs.

B. Writer's Guide

The writer's guide was reviewed to determine if the guide described acceptable methods for accomplishing the objectives stated in NUREG-0899. The writer's guide provides guidance for the preparation of new EOPs and the revision of existing EOPs for FCS1. The writer's guide is provided to ensure that the information and guidance contained in the EOPs will be presented consistently in style and format. The staff review of the FCS1 writer's guide identified the following concerns:

1. Cautions and notes provide operators with critical or useful information concerning specific steps or sequences of steps in EOPs. The writer's guide should be revised in regard to the following topics:

   a. Section 4.5, page 18, states that precautions apply to an entire procedure, and are covered in operator training. However, the writer's guide makes no provision for including precautions in the EOPs. All cautionary information necessary for safely performing EOPs should be included in the procedures, even when this information applies to the whole procedure, in which case it should be presented immediately before the procedure to which it applies. The writer's guide should provide instructions for including precautionary information in EOPs.

   b. When a caution contains more than one topic, the importance of any one topic is obscured. The writer's guide should be revised to specify that a caution statement should contain only one topic.

c. Section 4.5, page 18, states that cautions should be placed immediately before the step to which they apply; however, Figures 4 and 5, pages 37 and 38 show a caution and a note at the bottom of the page. Since it is important that operators be aware of information presented in cautions and notes when performing an action step, Section 4.5 should be revised to state that notes will also be place directly before the step to which they apply, and that cautions and notes should not be separated from the steps to which they apply by a page break. Figures 4 and 5 should be revised to be consistent with the text.

d. Section 4.5, page 18, states that the caution extends across the entire page bordered by asterisks. The asterisks

border of Figure 4 is indented from both the right and left margins and the border of Figure 5 is indented from the left margin. Figures 4 and 5 should be revised to be consistent with the text.

e. Section 4.5, page 19, discusses the format to be used when more than one caution applies to one procedural step or section. It states that "the horizontal row of asterisks is placed only below the last caution." Section 6.7, page 33, explains that cautions are highlighted by a line of asterisks above and below the caution. Together, these instructions are confusing. The writer's guide should be revised to clarify these instructions.

f. Section 4.5, page 18, paragraph two, states "A caution shall not be used instead of an instructional step and it cannot direct an action." Section 4.5, paragraph three, states that "A note should present information only, not instructions." The examples of cautions and notes in Figures 4 and 5, pages 37 and 38, contain instructions. These examples should be revised to be consistent with the instructions given in the text.

2. Conditional statements and logic statements are used in EOPs to describe a set of conditions or a sequence of actions. These statements can be confusing, so it is important to provide explicit guidance for their use. The writer's guide should be revised in regard to the following topics:

a. Section 4.4, page 16, incorrectly defines NOT, used alone, as a logic term. In addition, step 3.1.c in Figures 4 and 5, pages 37 and 38, shows NOT, used alone, as a logic term in instruction steps. Section 4.4 should be revised to exclude this use of NOT, and Figures 4 and 5 should be revised accordingly.

b. Section 4.4, page 17, states that the use of AND and OR within the same action should be avoided if possible. Since there are occasions when it is necessary to use AND and OR in the same sentence, Section 4.4 should provide guidance for acceptable usage of AND and OR together. An example should also be provided.

c. Section 4.4, page 17, states that "The word AND shall not be used to join more than three conditions. If four or more conditions need to be joined, a list format shall be used." The writer's guide should define a list format, and an example should be provided.

d. The writer's guide does not discuss the difference between the conjunctions "and" and "or" and the logic terms AND and OR. Unless the difference between the conjunctions and the logic terms are clear, operators could mistake a conjunction for a logical term. The writer's guide should discuss this difference and should, if necessary, specify the formatting of conjunctions so they cannot be confused with logic terms. Examples should be provided.

e. Section 4.4, pages 16-18, discusses the use of THEN, but does not state that THEN should never be used alone. The logic term THEN introduces the action to be taken in response to a particular condition, or set of conditions, introduced by the logic terms IF, IF NOT, or WHEN. Because the logic term THEN is only used to introduce actions to be taken when specific conditions are met, Section 4.4 should be revised to state that THEN should never be used alone.

f. While Section 4.4, pages 16-18 discusses the use of logic terms, it does not provide examples of some of these terms. Because of the confusion that can result when using logic terms in EOPs, this section should include sequences to be avoided, and correct examples of inclusive OR, exclusive OR, IF, and WHEN.

3. During the execution of EOPs it is often necessary to refer operators to other procedures or sections of procedures. Such referencing and branching can be disruptive and cause unnecessary delays. The writer's guide should be revised to address the following concerns:

a. Section 4.8, page 20, states that referencing should be minimized in EOPs. This section should be expanded to indicate that branching should also be minimized.

b. Section 4.8, page 20, does not specify the content and format of a reference or a branch. When referencing or branching to another procedure, the procedure title and number as well as the section and step numbers should always be included in the reference to ensure that operators know what procedure they are being referred to and exactly where they should start. Section 4.8 should be revised to discuss formatting instructions for referencing and branching and to specify that procedure titles and numbers as well as section and step numbers are required. Examples of referencing and branching format that are consistent with the text should be provided.

c. In order to sufficiently emphasize GO TO and REFER TO statements it is recommended that the guidance of Section 4.8, page 20, specify that the words GO TO or REFER TO be fully capitalized or be emphasized using some other equally acceptable method.

d. Table 2, page 43, states that the verb "complete" means "to accomplish specified procedural requirements. For example, Complete steps 11 through 20 of EOP-02." This format for referencing is not mentioned in the writer's guide. If "complete" is to be used as a reference term, this format should be discussed in the writer's guide or the example should be changed.

e. The writer's guide does not discuss a method, such as tabbing, to help operators move rapidly from one part of the EOPs to another. The writer's guide should specify some method for easily identifying sections or subsections in the EOPs.

f. Items 2.d. and 2.e. of the EOP Verification Evaluation Criteria Checklist, Attachment 2 of the verification program, page 25, include important guidelines concerning referencing and branching that are not included in the writer's guide. Procedure writers are instead referred to an INPO document. Because the writer's guide is a governing document for EOP preparation, the writer's guide should include all information pertinent to EOPs. The writer's guide should be expanded to include the referenced information.

4. The proper use of emphasis techniques makes procedures easier to understand. The discussion of emphasis techniques in the writer's guide should be revised with regard to the following:

a. Section 4.7, page 19, states that underlining will be used for emphasis of logic terms, cautions, notes, section

headings, and column headings, and that underlining may be used "only where appropriate for required emphasis." These instructions are vague. Instead of stating that underlining may be used for "emphasis," Section 4.7 should explain exactly which procedure elements may be emphasized. Moreover, in Figures 4 and 5, pages 37 and 38, the verb "depress" is underlined in an instruction step, a use not discussed in the writer's guide. Section 4.7 should be revised to give inclusive instructions for the use of underlining in EOPs.

b. Section 5.7, page 28, states that "capitalization should conform to standard American English usage, but may also be used as a technique for emphasizing certain words or phrases." So that capitalization can be consistent throughout EOPs, this section should be revised to clearly specify which words and phrases should be emphasized by capitalization and when full or initial capitalization will be used.

5. The proper use of vocabulary and syntax can create EOPs that are readily understood by both procedure preparers and operators. The simplest, most familiar, and most specific words most accurately convey the intended meaning. The writer's guide should be revised in the following manner:

a. The description of operator actions in Section 3.2, page 10, states that "Instructions written in fragments, as opposed to complete sentences, provide the best use of space and allow for the clearest possible understanding." Section 42., page 13, states that "sentence fragments are preferable to long, compound, or complex sentences." also, the action steps in Figures 4 and 5, pages 37 and 38, are written as sentence fragments. While long, complex sentences should be avoided, sentence structure is an important factor in the presentation of information. Complete sentences are much more precise than sentence fragments, and are more easily understood. Sections 3.2, and 4.2, should be revised to state that instructions should be written using short, simple, but complete sentences. Examples in Figures 4 and 5 should be made consistent with the text.

b. Step 3.1.c in Figures 4 and 5, pages 37 and 38, contains a double negative. Step 3.1.1 in these figures is a negatively quantified conditional. Both steps are confusing. These steps should be rewritten as positive statements, and the writer's guide should be revised to state that using negative conditionals and double negatives in action steps should be avoided.

c. Section 4.3.1, pages 15 and 16, instructs procedure writers to begin each step with an action verb when logic terms are not required. So that there can be no confusion, the writer's guide should state that instruction steps should be written as directives. For example, the example step "visually inspect for leaks," in Table 2, page 44, does not begin with an action verb or a logic term, but is a directive.

d. Section 5.4, page 26, discusses vocabulary to be used in EOPs, but does not discuss the use of ambiguous words (words with more than one meaning). Since ambiguous words could confuse operators, Section 5.4 should state that these words should be avoided in EOPs, and that such words should be included in a list of words to avoid.

e. The list of preferred verbs in Table 2, pages 43-45, includes the verbs "increase," "decrease," and "shut" along with instructions that these verbs are not to be used. As words to be avoided these verbs should not be included in the preferred verb list, but should be included in a list of words to avoid.

f. Section 4.10, pages 21 and 22, lists "recommended action verbs," and refers procedure writers to a more detailed list in Table 3. Section 5.4, page 26, states that "acceptable verbs" are listed in Table 3. There is no Table 3 included in the writer's guide, but Table 2, pages 43 through 45, provides a list of "preferred verbs." The faulty references in Sections 4.10 and 5.4 should be corrected. Also, to prevent confusion, one name should be chosen and used consistently throughout the writer's guide to refer to this list of verbs.

g. The preferred verbs listed in Table 2, pages 43 through 45, do not include some of the recommended action verbs discussed in Section 4.10, pages 21 and 22, specifically: "throttle open," "throttle close," and "synchronize." Table 2 should be expanded to be an inclusive list of acceptable verbs, and the writer's guide should be revised to state that this list is inclusive, and that only those verbs in the list should be used in EOPs.

h. Section 5.4, page 26, states that words common to normal control room communication should be used in EOPs, and refers to Table 1 for a list of common usage words. Table 1, pages 39 through 42, is not a list of common words, but a list of acronyms and abbreviations. The writer's guide should be revised to correct this faulty reference.

i. Section 4.2, page 14, and Section 5.4, page 26, state that common usage terminology will be used when referring to parts/components and in the EOP text. If this common usage terminology is not the information that is on control panel engravings, then the control panel engravings should be included in parenthesis so the operator can check the reference if needed.

6. Operators may need to take various types of action steps to cope with different plant situations. So that the format for the various types of action steps needed can be consistent throughout EOPs, and so that the operators using the EOPs can perform the correct action without confusion, the writer's guide should include instructions for writing the various types of action steps that an operator may take to cope with different plant situations.

   a. Section 3.2, page 10, discusses immediate operator actions but the writer's guide does not provide instructions for including these actions in EOPs. The writer's guide should be revised to provide instructions for including immediate operator actions in EOPs, and should specify the formatting for these steps.

   b. The writer's guide should address the definition and format for nonsequential steps, steps performed at intervals throughout a procedure, and diagnostic steps, steps that lead the operator to the appropriate EOP section. Examples should be provided. See NUREG-0899 for further information.

   c. Section 4.2, page 14, instructs procedure writers to let operators know a step is to be performed continuously by placing an asterisk by the step, and placing the note "* Step performed continuously" at the bottom of each applicable page. This method does not help the operator to remember and does not remind him which step is to be continuously performed. A more helpful means of reminding the operator to perform the continuous steps should be employed, such as repeating the continuous step on facing pages. An example should be provided.

   d. Section 4.2, page 15, discusses time-dependent steps. This section indicates that when an instruction must be accomplished within a time frame, that time frame should be indicated in a note. All information crucial to performing instructions should be located within the instruction step. Section 4.2 should be revised so instructions for writing time-dependent steps ensure that

all information crucial to performing instructions is included within the instruction step. The writer's guide should also discuss some means of noting the time frame for time-dependent steps on subsequent pages. Formatting instructions and an example of time dependent steps should also be provided.

e. Section 4.3.1, page 16, equates contingency actions and equally acceptable steps. Contingency actions and equally acceptable steps are not the same. A contingency action is dependent on equipment status or on certain plant conditions as stated in Section 4.4 on page 17 of 45; an equally acceptable step that is as acceptable as any one of several alternative steps. The writer's guide should be revised to correct this definition, and should provide instruction on use and formatting of equally acceptable steps. An example of equally acceptable steps should be provided.

f. Section 3.4, page 11, states that contingency steps will be "distinguished by an additional number following the prefixed section and instructional step numbers (e.g., 3.1.1, 3.2.1,...)." Contingency actions are dependent upon equipment status or on plant conditions; assigning a different numbering system is not enough to distinguish them from other types of action steps, Also, this method of numbering contingency steps is not sufficient. Using this numbering systems, the contingency step, 3.1.1 in Figures 4 and 5, pages 37 and 38, seem to be contingent upon step 3.1; however, 3.1.1 is only contingent upon 3.1.c. The actions will be formatted as conditional statements, and should incorporate a more distinguishable numbering system for contingency steps.

g. The writer's guide should be expanded to discuss the definition, the format, and use of recurrent steps. And, because operators may not remember to repeatedly perform recurrent steps, the writer's guide should be expanded to include a means by which operators will be reminded to perform recurrent steps, as well as a means of letting operators know when it is no longer necessary to perform them. An example should be provided.

h. Section 4.2, page 14, discusses "verification" but does not discuss when verification is appropriate, and does not specify the format of verification steps. The writer's guide should be expanded explaining when verification steps are needed, and to provide formatting instructions for these steps. An example should be provided.

i. Figures 4 and 5, pages 37 and 38, show Steps 3.1 and 3.1.1 in a format not discussed in the writer's guide. So that steps with more than one condition can be formatted consistently, the writer's guide should discuss the formatting for these steps.

7. Information should be presented so that interruption in the flow of information from procedures to operators is minimal. The writer's guide should be revised with regard to the following topics:

a. The writer's guide does not discuss where procedures and sections of procedures should begin. Because operators will be able to find a procedure or section much more easily if it begins at the top of a new page, the writer's guide should be expanded to state that procedures and sections of procedures should begin on new pages, preferably at the top.

b. Because reference to an attachment interrupts the flow of information to operators and may result in confusion or delays, use of attachments should be limited. The writer's guide should be revised to specify criteria to be used to determine what information should be included in attachments.

c. Section 3.2, page 10, paragraph 3, discusses Section, "PRINTED OPERATOR AIDS," where all figures and tables associated with a specific EOP are to be contained. While some attachments may be placed in a special section, some figures and tables should be located near the text to which they pertain. Section 3.2 should be revised to address this point, and to clarify what types of printed operator aids will comprise attachments.

d. Section 4.2, page 13, states that instruction steps should be completed on a single page unless unavoidable. Breaking action steps between pages disrupts the flow of information. It is important that action steps be presented completely on one page. This section should be revised to state that each instruction step should be wholly contained on a single page. If an action step will not fit on a single page, it may be too long and consideration should be given to rewriting it.

e. Section 4.9, page 21, acknowledges that components referenced in EOPs may require location information. The guidance should be expanded to include the format on how location information will be presented. An example of formatted location information should also be provided.

f. Section 6.5, page 30, lists rules for the rotation of pages. Rotating pages in the middle of an instruction makes a procedure difficult to follow, increases delays, and may lead to operator error. Section 6.5 should be revised to state that page rotation will not be allowed.

8. It is important that a consistent method of section heading and step numbering be used throughout EOPs. The manner in which the text is organized and divided should be evident through the use of headings and an alphanumeric numbering system, so that operators can keep track of where they are in the procedure and know how to move easily and quickly to other parts of the procedure. The writer's guide should be revised with regard to the following

a. Section 6.3, page 29, discusses three levels of section headings, but does not provide examples of second and third level headings or explain how these levels will be used in conjunction with the section and step numbering system described in Section 3.4, page 11. The writer's guide should include this information; and, so that operators will not be confused between a step and a heading, the writer's guide should also describe how headings will differ from steps. Examples should be provided.

b. Section 3.3, page 11, states that "section numbering is required and that Figures 3 and 4 have been provided to show the desired section numbering system." Figure 3, page 36, shows Section 1 and Section 2, Figure 4, page 37, shows an unnumbered heading, "REACTOR TRIP IMMEDIATE ACTIONS," immediately before Section 3. It is unclear where this unnumbered heading belongs in the section numbering system. The writer's guide should be revised to incorporate the reactor trip immediate actions section into the section numbering system, Section 3.3 should specifically describe the section numbering system that is to be used, and Figures 3 and 4 should be revised accordingly.

c. Section 3.4, page 11, describes instruction step numbering. This section states that "Subordinate levels of detail alternate letter, number and lowercase Roman numerals." Figures 4 and 5, pages 37 and 38, provide examples of this format. So that there will be no confusion on the part of the operators as to whether he is at the correct step, the entire number should be used at each step level (i.e., 3.1.a, 3.1.b, etc). Section 3.4 should be revised to state that the entire step number in EOPs should be used at each of three step levels. Figures 4 and 5 should be revised to be consistent with the text.

d. Figure 5 shows "OPERATOR ACTIONS" as Section 4.0 instead of 3.0. This error should be corrected.

9. Figures and tables assist operators to make decisions and to locate information. The writer's guide should be revised to address the following concerns:

   a. Section 6.6, page 31, specifies that all lines in figures should be reproducible. This section should be expanded to state that all reproductions of figures and tables should be of a quality equal to the originals, thus allowing operators to work with clear, legible figures and tables.

   b. The writer's guide should be supplemented with an example of how a table and a graph in a procedure should be formatted.

10. Consistent, well-organized, and well-labelled EOPs increase the ease with which operators understand and use the procedures. The writer's guide should be revised in the following manner:

   a. Section 4.11.3, page 23, discusses attachments. This section should be expanded to state that attachments should include a cover page that includes the word "Attachment," the Attachment number, and a descriptive title of the Attachment, as well as page identification information that designates the facility.

   b. The writer's guide does not address the specific contents of, or format for Section 5, Safety Function Status Check, discussed in Section 3.2, page 10. So that procedure writers know what to include in this section of EOPs, and so that the EOPs can be formatted consistently, the writer's guide should be revised to give details of the contents and formatting instructions for the Safety Function Status Check section. An example should be provided.

   c. Section 2.1, pages 6 and 7, discusses cover sheets. This section should be expanded to instruct procedure writers that in addition to the information in Section 2.1, the facility designation should be included on cover sheets. Figure 1, page 34, should be revised accordingly.

11. Placekeeping aids can assist operators in keeping track of their positions within a procedure. These aids are of particular importance when performing steps or procedures concurrently, and in situations where the operator's attention is diverted. The writer's guide should be revised in the following manner:

a. To ensure consistent formatting, the writer's guide should provide the same formatting instructions for check-offs for objects listed in instructions, discussed in section 4.2, page 14, as provided for instruction step check-offs, discussed in Section 4.3.1, page 15.

b. Section 4.3.1, page 15, states, "A check-off provision shall be provided to the left of each instructional step." Step 3.1.1 in Figures 3 and 4, pages 37, and 38, however, does not have a check-off space. Placekeeping aids, if used consistently, can assist operators in keeping track of their positions within a procedure. The writer's guide should be revised so that text and examples are consistent.

12. Writers should be given sufficient information in the writer's guide to produce procedures that are consistently formatted. In order to assure consistency throughout the EOPs, instructions and examples in the writer's guide should be revised as follows:

a. The writer's guide provides examples but does not discuss the exact format for cover sheets, title pages, entry conditions, and purpose sections. So that formatting throughout EOPs can be consistent, the writer's guide should be revised to discuss the formatting for these portions of the EOPs.

b. Section 4.3, page 15, instructs procedure writers to write EOPs in a "single-column narrative format." Since action steps are written as numbered steps rather than as a narrative, the writer's guide should be revised to specify which sections of EOPs should be written in narrative format.

c. Procedure titles in Figures 1-4, pages 34-37, are presented in four different formats: EOP Title: REACTOR TRIP (flush left), REACTOR TRIP: EOP-01 (centered), TITLE: REACTOR TRIP (flush left), and REACTOR TRIP (centered). So that procedures can be consistently formatted, the writer's guide should be revised to provide formatting instructions for procedure titles, and figures 1-4 should correspond to the instructions given in the text.

d. Section 5.3, pages 25 and 26, discusses punctuation. The correct use of punctuation can increase the ability of operators to understand procedures. This section should be expanded to state that EOPs should use standard American English punctuation, and that all EOPs should be consistently punctuated.

e. Section 5.3.2, page 25, states that colons indicate that "a list of items is to follow"; however, Figure 3, page 36, shows a list of entry conditions not introduced with a colon. The writer's guide should be revised so that text and examples are consistent.

f. In addition to the use of colons described in Section 5.3.2, page 25, the writer's guide uses colons for section headings in Figure 1, page 34, (but not in Figures 4 and 5, pages 37 and 38) and titles in Figures 2 and 3, pages 35 and 36, (but not in Figures 4 and 5). The writer's guide should be revised to provide inclusive instructions for the use of colons in EOPs, and examples should be made consistent with the text.

g. Section 5.3.4, page 26, states that "parentheses shall be used to indicate panel numbers, locations, or other information judged to be suitable for parenthetical inclusion." This section should be revised to specify all types of information that will be included in parentheses, or to include the criteria necessary to determine when information should be judged parenthetical.

h. The uses of hyphenation described in Section 5.2.d and 5.2.e, page 24, should be avoided since they do not conform to standard English usage and do not make these words less confusing.

i. Section 5.2.a, page 24, states that hyphens should be used in "compound numerals from twenty-one to ninety-nine." However, the example given, "one hundred thirty-four," is not a numeral between twenty-one and ninety-nine. This section should be revised so that examples and text are consistent.

j. Section 6.7, page 32, states that headings for notes and cautions should be placed "three line spaces below the preceding text." However, examples of notes and cautions in Figures 4 and 5, pages 37 and 38, show these headings at four and a half line spaces below the preceding text. The writer's guide should be revised so that text and examples are consistent.

k. The writer's guide does not discuss line spacing between a note and a caution, or between two or more cautions or notes. For consistency of formatting, these instructions should be included in the writer's guide.

l. Section 6.6, page 31, specifies pitch size 12 or larger for figure numbers and titles. The writer's guide should be expanded to include information on pitch size for all portions of EOPs, including steps.

m. Item 3.c of the EOP Verification Evaluation Criteria Checklist, Attachment 3 of the verification program, page 28, includes an important guideline for equations that is not mentioned in the writer's guide. Procedure writers are instead referred to an INPO document. Because the writer's guide is a governing document for EOP preparation, the writer's guide should include all information pertinent to EOPs. The writer's guide should be revised to include this referenced information.

n. Section 6.9, page 33, states that oversized pages "shall be reorganized or reduced to a standard page." In addition, Section 6.10, page 33, states that "reduced pages should be avoided", and that the "final size of reduced pages should be standard page size." These instructions are contradictory. If reduced pages are to be used, Sections 6.9 and 6.10 should specify legibility requirements.

13. Because operators will use EOPs in stressful conditions and under time constraints, the procedures must be easily accessible to operators and should be uniquely identified to distinguish them from other plant procedures The writer's guide should be revised in the following manner:

a. EOPs must be current to be usable. The writer's guide should describe a system to ensure that the EOPs are promptly updated when changes occur in plant design, in Technical Specifications, or Guidelines, in the writer's guide, in the control room, or in other plant procedures that affect EOPs.

With adequate resolution of the above items, the FSC1 writer's guide should accomplish the objectives stated in NUREG-0899 and should provide adequate guidance for translating the technical guidelines into EOPs that will be usable, accurate, complete, readable, convenient to use, and acceptable to control room operators.

C. Verification and Validation Program

The description of the verification and validation program was reviewed to determine if it described acceptable methods for accomplishing the objectives stated in NUREG-0899. The PGP indicates that a combination of the following five methods are to be

used to verify and validate the EOPs: (1) comparative evaluation to confirm written correctness and ensure that generic and plant-specific technical aspects have been properly incorporated (verification); (2) table-top validation; (3) walk-through validation; (4) simulator validation; and (5) reference validation. The staff review of the FCS1 verification and validation programs identified the following concerns:

1. The verification program includes an EOP verification criteria checklist in Attachment 3, pages 20-28, that references applicable sections of the writer's guide and INPO Guideline 83-004. Most of the references to the writer's guide are incorrect. The verification program should be revised to correct all faulty references. Also, once the information in the referenced INPO guidelines has been included in the writer's guide, the references to the INPO guidelines should be replaced with references to the appropriate sections of the writer's guide.

2. The verification and validation programs should include a description of the objectives of the programs. That description should include the following objectives:

   a. There should be a high level of probability that the procedures will work and that the procedures will successfully guide the operator in mitigating plant transients.

   b. EOPs should be usable. Operators should be able to follow EOPs with a minimum of delays, confusion, and errors.

   c. EOPs should be technically correct and accurately reflect the plant-specific technical guidelines.

   d. EOPs should be written correctly by accurately reflecting the writer's guide instruction.

   e. The level of information and the language presented in EOPs should be compatible with the minimum number of operating staff required in the control room. The level of information and the language in EOPs should also be compatible with the staff members' qualifications, training, and experience.

   f. All instruments and controls should be adequate and an accurate correspondence should exist between the EOPs and that control room and plant hardware.

3. The validation program should describe the methods that will be used in the validation process. The validation program should indicate that a combination of simulator exercises, desk-top reviews, control room walk-throughs, and operating team reviews will be used. The validation program should be revised to address the following concerns:

   a. The validation program description states that simulator exercises, desk-top review, control room or simulator walk-throughs, and operator team reviews will be used but does not state the criteria for deciding when each method will be used. The validation program should be expanded to describe the criteria to be used for selecting the appropriate method of validation.

   b. The validation program should be revised to state that simulator exercises are the primary validation method. The program should be expanded to include a description of the criteria that will be used to select the scenarios to be run during the validation process. The criteria should be developed to ensure that all procedures are validated and should ensure that single, sequential, and concurrent failures are included. A review of the capabilities and the limitations of the simulator will then identify what can be validated on the simulator. For the parts of the EOPs that cannot be validated on the simulator, the validation program should describe the criteria for selecting any additional validation method that may be needed.

   c. Section 1.2 of the validation program, page 4, states that a reference method will be used to validate EOPs, and a checklist for this method will be used to validate EOPs, and a checklist for this method is included in Attachment 2, pages 25-27. A validation program should be plant-specific. This method of validating EOPs should be supplemented by other acceptable methods of validation.

   d. The validation program should be expanded to express a commitment that those aspects of EOPs that cannot be validated through simulator exercises will be validated through another method.

   e. The validation program should be revised to address future improvements, most notably the use of plant reference simulator. The validation program should state that when a plant reference simulator becomes available that the EOPs will be revalidated on it.

4. The verification and validation programs should be expanded to specify the criteria for selection of team members, and the roles and responsibilities of each individual.

5. The verification and validation program descriptions should be expanded to describe a plan for revising EOPs as a result of problems uncovered through the verification and validation process.

6. It is necessary to verify and validate substantive changes to EOPs. The verification and validation program should include the criteria that will be used for determining whether it is necessary to revalidate and reverify an EOP change.

With adequate resolution of the above items, the FCS1 verification and validation program should accomplish the objectives stated in NUREG-0899 and should provide assurance that the EOPs adequately incorporate the guidance of the writer's guide and the technical guidelines and will guide the operator in mitigating emergency conditions.

D. Training Program

The description of the operator training program on the FCS1 upgraded EOPs was reviewed to determine if it described acceptable methods for accomplishing the objectives stated in NUREG-0899. The training program described in the PGP consist of the following parts: (1) classroom instruction and (2) simulator training. The staff review of the FCS1 training program description for EOPs identified the following concerns:

1. To ensure that the training methods used are adequate, Section 2.5, page 5, should be revised to state that some training should be conducted with the minimum shift compliment required by the Technical Specifications.

2. The training program description should be expanded to indicate that all EOPs will be exercised by all operators on the simulator or, for those areas not conducive to simulator training, in control room walk-throughs.

3. Because the training program will be used when operators are trained on future revisions to EOPs, the training program should be revised to include the extent of operator training on the simulator and in control room walk-throughs required for various levels of EOP revisions, e.g., types vs. changes in content.

With adequate resolution of the above items, the FCS1 training program should accomplish the objectives stated in NUREG-0899 and should result in appropriate training for the FCS1 operators on the upgraded EOPs.

3. CONCLUSIONS

The staff concludes that, to adequately address the requirements stated in Generic Letter 82-33 (Supplement 1 to NUREG-0737) and provide acceptable methods for accomplishing the objectives stated in NUREG-0899 in accordance with the guidance provided in the Standard Review Plan (NUREG-0899, Section 13.5.2), the PGP submitted by Omaha Public Power District for Ft. Calhoun Station, Unit 1 in a letter from R.L. Andrews (OPPD) to J.R. Miller (NRC), dated March 1, 1985, should be revised to address the items described in Section 2 of this SE. This revision need not be submitted to the NRC. For items in Section 2 that the licensee deems inappropriate for inclusion in its PGP, it should develop and maintain documented justification. NRR or Region IV will confirm that all items described in this report have been adequately resolved by appropriate licensee action or justification in the course of routine or special inspections. Licensee implementation of commitments contained in the PGP may also be reviewed--deviations from commitments may result in enforcement action being taken by the NRC. Therefore, all revisions to the PGP should be reflected in plant EOPs within a reasonable period of time. Future changes to the PGPs and EOPs should be made in accordance with 10 CFR 50.59.

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