

MAY 31 1984

Docket No. 50-267

Mr. O. R. Lee, Vice President  
Electric Production  
Public Service Company of Colorado  
P. O. Box 840  
Denver, Colorado 80201

Dear Mr. Lee:

We have reviewed the emergency operating procedure (EOP) upgrade program for the Fort St. Vrain Nuclear Generating Station (FSV) and find that additional effort is needed to meet the provisions of NUREG-0737, "Clarification of the TMI Action Plan," Item I.C.1, and Supplement 1, Item 7. Our review did not evaluate the technical adequacy of the FSV EOPs; it focused on the involved human factors aspects of implementing the EOPs. We have concluded that you should develop and submit a Procedures Generation Package (PGP) for our review. The details of our findings are contained in the enclosed Request for Information.

The requested PGP should consist of a writer's guide, a description of the validation/verification program, and a description of the training program, as required by Supplement 1 to NUREG-0737. Based on the finding of the referenced Oak Ridge National Laboratory review, and the fact that technical bases information is contained in the EOPs, we have determined that the required plant-specific technical guidelines need not be submitted.

If you have any questions on this subject, please contact the NRC Project Manager, P. Wagner at (817)860-8127.

Since this request relates solely to FSV, fewer than ten respondents are affected; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Original Signed By  
R. E. Ireland

*for*  
Eric H. Johnson, Chief  
Reactor Project Branch 1

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Enclosure: Request for Information

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REQUEST FOR INFORMATION  
EMERGENCY OPERATING PROCEDURE UPGRADE PROGRAM  
FORT ST. VRAIN  
PUBLIC SERVICE COMPANY OF COLORADO

The NRC staff has conducted a review of the licensee's emergency operating procedure (EOP) upgrade program. Our review included information obtained from the following sources:

Letter, dated February 16, 1982, from S. J. Ball (ORNL) to  
D. G. Eisenhut  
Letter, dated August 24, 1982, from D. W. Warenbourg to G. Kuzmycz  
Letter, dated April 14, 1983, from D. R. Lee to H. R. Denton  
Letter, dated March 9, 1984, from H. L. Brey to J. T. Collins  
Fort St. Vrain Emergency Procedures A through S, plus EOP INTRO  
Conference call between V. DeLiso, B. Clayton, P. Wagner (NRC) and  
J. Fills and C. Fuller (PSC)

The review was conducted to determine whether, in the staff's view, a more formal EOP development program, in the form of a Procedures Generation Package (PGP), is necessary for the licensee to comply with the requirements of Supplement 1 to NUREG-0737, "Requirements for Emergency Response Capability (Generic Letter 82-33)," Section 7. The staff did not attempt to evaluate the technical adequacy of either the review performed by Oak Ridge National Laboratory (ORNL) or of the Fort St. Vrain EOPs themselves. The staff has the following comments on the Fort St. Vrain EOPs and EOP development program:

1. The staff has the following concerns regarding use of the "SYMPTOM-ACTION MATRIX" format of the EOPs:
  - a. Use of identical action identifiers (i.e., an "XX") for three different operators within the space provided in each matrix location could readily lead to errors in operator identification of their respective assigned tasks. This would be caused by a combination of the similarity of the identifiers, their close proximity (especially where many symptoms are put on a single sheet, as in EP-I), stress, and simple cognitive errors.
  - b. It is not clear that operators will be able to effectively implement the EOPs when multiple symptoms occur. The following comments apply to this concern:

- 1) The combination of having related symptoms on more than one page (e.g., EP B-1, page 2 of 5, symptoms 1.1 through 1.6, and page 4 of 5, symptoms 1.7 through 1.12) in conjunction with listing actions only for the symptoms on that page (e.g., EP B-1, page 2 of 5 has follow-up actions 3.1, 3.2, 3.6, and 3.8, while page 4 of 5 has follow-up actions 3.2, 3.3, 3.4, 3.5, and 3.7), could readily lead to errors in execution as the operators go from one page of symptom-actions to another and back again. The primary concern is that operators could think an action has been completed on one page, based on having completed an action in a similar matrix location on another page.
- 2) The matrix format does not provide any prioritization for actions when multiple symptoms occur.
- 3) During the performance of actions for multiple symptoms, where more than one operator is specified to take an action, it is not clear that the matrix format provides for coordination of the operators' actions when necessary. Furthermore, it is not clear how the licensee has determined when, or if, it is necessary for the operators to perform a given step at the same time, when both operators are specified to take an action.

These concerns would be addressed by one objective of a validation/verification program, which is that the EOPs are useable (i.e., they can be followed without confusion, delays, or errors). The other objectives, as stated on page 10 of NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures," are not addressed in the documentation submitted to the NRC.

2. The staff has the following comments on the writing of the action steps in the EOPs:
  - a. Conditional action steps are written in an inconsistent manner. This can lead to errors if the inconsistency causes confusion as to whether a step is conditional or not, or if the operators miss the condition because they expect a more clearly formatted conditional statement. EP-A, steps 3.1 and 3.9, provide good examples of how a conditional step should be formatted. Other formats used that could lead to problems are in EP-A, steps 3.2, 3.5, 3.6, and 4.1, EP B-1, steps 3.6 and 4.3, and EPD-2, step 2.2. Other inconsistently formatted conditional steps exist throughout the EOPs.
  - b. The print size used in the EOPs makes them difficult to use in reduced lighting conditions.

c. The format of logic statements that use the connectives "and," "or," and "and/or" is inconsistent. In addition, the following specific problems related to the use (i.e., the definition) of these connectives exist:

- 1) The current EOPs use "and" to join multiple actions within one action step (e.g., EP-A, steps 2.1, 2.2, and 3.2). Imbedding actions in this way has led to operators performing the first action they read in each step, and not performing the other actions within a step. There should be only one action per step. Related actions should be listed as substeps or separate steps.
- 2) Use of the term "and/or" (e.g., EP-A, step 3.4) leads to confusion as to whether the "and" or the "or" applies under varying conditions. Use of either "and" or "or," but not both terms, alleviates this confusion.
- 3) When "or" is used to provide alternative actions (e.g., EP-A, step 3.7), the criteria for when each alternative applies should be provided.

There should be a consistent treatment of the connectives in logic statements, in both format and definition.

d. Some terminology appears to be used inconsistently. For example, EP B-1, steps 2.3, 2.4 and 2.5, all use the term "Ensure." Two of the steps, 2.3 and 2.4, do not include any follow-on actions. By the nature of these steps, the term "ensure" appears to mean, "check to see if the action occurred automatically; if the action did not occur automatically, take manual action to follow through on the action." In step 2.5, however, the phrase "Ensure or establish ..." (emphasis added) is used, which implies a meaning to the word "ensure" of, "check, but do not follow through." An additional, related comment is that some EOPs use "Ensure," while some EOPs use "Insure" (emphasis added). There should be a means to ensure consistent use of terminology throughout the EOPs.

e. Notes and Cautions: There are inconsistencies in how notes are written. EP-A, page 3 of 5, separates out the note, margin to margin, while EP-G, page 2 of 2, has the note only under the "ACTIONS" column. Also, there is no difference in format between cautions and notes. Because of the different nature of the information provided, and the different way the information is regarded by operators, a distinction should be made between cautions and notes.

- f. The orientation of some of the EOP matrixes is horizontal on the page, while some are oriented vertically on a page. For bound procedures, or procedures in a loose leaf binder, use of multiple procedures could cause excessive operator machinations, resulting in delays in reading and implementation of the actions, as the EOPs are oriented for reading. A consistent orientation should be used.
3. The lack of detail in the EOPs requires the operators to rely heavily on their training to properly execute the necessary actions specified in the EOPs. In addition, the staff has a responsibility to ensure that appropriate training is conducted on the upgraded EOPs. The staff will, therefore, need to review a description of the training programs for the upgraded EOPs.

As stated earlier, the staff did not undertake an independent review of the technical adequacy of the Fort St. Vrain EOPs. It appears that the EOPs which were reviewed by ORNL include the technical basis that should be provided in the plant-specific technical guidelines required by Supplement 1 to NUREG-0737. Therefore, the licensee is not required to submit plant-specific technical guidelines. However, based on the problems identified in the current version of the EOPs, the staff requires that the licensee develop and submit the remaining portions of the PGP. These are the EOP writer's guide, a description of the validation/verification program that has been, or will be, conducted, and a description of the training program for EOPs. This requirement, specified in Supplement 1 to NUREG-0737, is to ensure that the current EOPs are acceptably and consistently human-factored and implemented, and to ensure that all future EOP revisions are of the same acceptable quality. The staff does not require responses to the individual concerns stated above.