

August 31, 2004

Mr. J. V. Parrish  
Chief Executive Officer  
Energy Northwest  
P.O. Box 968 (Mail Drop 1023)  
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION - EMERGENCY PLAN CHANGES  
(TAC NO. MC3048)

Dear Mr. Parrish:

By application dated April 22, 2004, as supplemented by letters dated July 1, 2004, and July 22, 2004, and in accordance with 10 CFR 50.54(q) and 10 CFR 50.4(b)(5), you submitted changes to the Columbia Generating Station (CGS) Emergency Plan for NRC review and approval. The proposed changes requested an extension to the time goal from 1 hour to 90 minutes for the emergency response organization to respond and activate the Emergency Response Facilities (ERFs) in the event of an emergency. Affected sections of the Emergency Plan will be changed to reflect more realistic ERF activation time goals.

The NRC staff has completed its review of the proposed CGS Emergency Plan changes and supporting documentation as discussed in the enclosed safety evaluation. The staff concludes that the proposed changes meet the planning standards in 10 CFR 50.47(b) and the requirements in Appendix E of 10 CFR Part 50 and, therefore, are acceptable.

Sincerely,

**/RA/**

William A. Macon, Project Manager, Section 2  
Project Directorate IV  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure: Safety Evaluation

cc w/encl: See next page

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**NRR-106**

**\* SE dated 8/5/04**

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO EMERGENCY PLAN CHANGES  
ENERGY NORTHWEST  
COLUMBIA GENERATING STATION  
DOCKET NO. 50-397

1.0 INTRODUCTION

By application dated April 22, 2004 (Accession No. ML041250414), and as supplemented by letters dated July 1 (Accession No. ML041960415), and July 22, 2004 (Accession No. ML042170308), and in accordance with Title 10, *Code of Federal Regulations* (10 CFR) Section 50.54(q) and 10 CFR 50.4(b)(5), Energy Northwest (the licensee) submitted changes to the Columbia Generating Station (CGS) Emergency Plan (E-Plan) for NRC review and approval prior to implementation. The proposed changes requested an extension to the time goal for the emergency response organization to respond and activate emergency response facilities (ERFs) in the event of an emergency.

The proposed changes would change the response time goals for activation of the ERFs for CGS from 1 hour to 90 minutes. The changes would enhance the E-Plan by creating ERF activation time goals consistent with anticipated local population and traffic changes and allow for optimization of emergency response organization (ERO) resources, response and execution.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance on which the NRC staff based its acceptance are as follows:

2.1 Regulations

- 10 CFR 50.47(b)(1) states, in part: "... each principal response organization has staff to respond and to augment its initial response on a continuous basis."
- 10 CFR 50.47(b)(2) states, in part: "... adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available ...."

## 2.2 Guidance

- Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," Revision 4, states, in part: "The criteria and recommendations contained in Revision 1 of NUREG-0654/FEMA [Federal Emergency Management Agency]-REP-1 are considered by the NRC staff to be acceptable methods for complying with the standards in 10 CFR 50.47(b) that must be met in onsite and off-site emergency response plans .... Licensees and applicants may propose means other than those specified by the provisions ... for meeting applicable regulations."
- Revision 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," states in part:

In Section II.B.5, each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1.

## 3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's regulatory and technical analyses in support of its proposed E-Plan changes, which are described in their application dated April 22, 2004, as supplemented by letters dated July 1, and July 22, 2004.

### 3.1 Changes to On-Shift Repair and Corrective Action Staffing

- a. Change to Section 2.3, "Emergency Response Organization" (1st paragraph, under On-Shift description)

The following sentence was added: ***"The I&C Technician, Electrical and Mechanical Craft emergency responsibilities may be provided by shift personnel assigned to other functions."***

In the description of the proposed changes in Enclosure 3 to the supplemental letter dated July 1, 2004, the licensee states that, "This change is a clarification only to make this paragraph consistent with Table 2-1 ...."

NRC Staff Evaluation: The proposed change addresses an inconsistency with Table 2-1, which correctly reflects that on-shift repair and corrective action capabilities are performed as a collateral duty. This is also consistent with footnote "\*\*\*" in Table B-1 to NUREG-0654/FEMA-REP-1, which states that task "may be provided by shift personnel assigned other functions."

Assignment of on-shift repair and corrective action functions as a collateral duty, was previously approved by the NRC under NUREG-0892, "Safety Evaluation Report Related to the Operation of WPPSS [Washington Public Power Supply System] Nuclear Project No. 2," dated March 1982, and again verified in "Safety Evaluation for Washington Nuclear Project-2 Emergency Plan Revisions 17-19," dated April 16, 1998. WPPSS Nuclear Project No. 2 was renamed as WNP-2 on August 2, 1999, when the licensee's name was changed to Energy Northwest, and again renamed to CGS on January 8, 2001. Therefore, the proposed change is a clarification of the existing ERO on-shift staffing positions and assignments consistent with Table 2-1. As such, the proposed change is considered acceptable.

b. Changes to Table 2-1: On-Shift Equipment Operator and Maintenance Staffing

In the supplemental letter dated July 22, 2004, the licensee provided the following in relation to on-shift staffing:

<u>Group</u>	<u>Position/Title or Expertise</u>	<u>On-Shift</u>
Operations	Equipment Operator	24
Maintenance	Electrical Maintenance/ I&C [Instrumentation & Control] Support	4 <sup>2</sup>
	Mechanical Maintenance/ Radwaste Operator	4 <sup>2</sup>

<sup>2</sup> May be provided by shift personnel assigned other functions. ***Collateral functions may be assumed by responding personnel upon availability.***

NRC Staff Evaluation: The licensee stated in its supplemental letter dated July 1, 2004, that "Columbia currently maintains three HP [Health Physics] Technicians, one Chemistry Technician, and four Equipment Operators on-shift to provide adequate coverage to support both Fire Brigade and safe shutdown activities."

The existing Table 2-1 to the CGS E-Plan only commits to two Equipment Operators on-shift and two on-shift individuals who will perform electrical maintenance/I&C support or mechanical maintenance/radwaste operations as collateral duties, which is consistent with NUREG-0654/FEMA-REP-1, Table B-1. The proposed change to Table 2-1 is intended to reflect the current CGS on-shift staffing of four equipment operators: two of which are dedicated to on-shift operations but will perform on-shift maintenance when required until staff is augmented; and two additional equipment operators which are dedicated as fire brigade

members, but are also available to perform on-shift maintenance unless engaged in a fire brigade response.

The licensee's procedure SWP-EPP-01, "Emergency Response Organization and Training," Section 4.4, states, "Certain members of the on-shift crew may also cover Maintenance responsibilities during the initial stages of an event. The on-shift Equipment Operators cover these responsibilities and are identified in the Control Room Log Shift Change Stamp for each shift. These duties may involve minor mechanical, electrical, or instrumentation and control (I&C) actions ...." Equipment operators are provided mechanical, electrical, and I&C theoretical and practical training.

The proposed change is a clarification of existing ERO on-shift staffing assignments and training to perform the tasks of repair and corrective actions required for on-shift staffing under Table B-1 of NUREG-0654/FEMA-REP-1. As such, the proposed change is considered acceptable.

c. Change to Section 2.3.1.5, "Equipment Operators" (last sentence)

The licensee proposed adding the following sentence: ***"EO's [Equipment Operators] are responsible for performing emergency maintenance functions in the absence of maintenance personnel and as directed by the CRS [Control Room Supervisor] or FB [Fire Brigade] leader."***

NRC Staff Evaluation: The existing CGS E-Plan does not describe what on-shift positions or staffing are used to perform on-shift repair and corrective action, but rather only that this function will be performed as a collateral duty in accordance with NUREG-0654/FEMA-REP-1, Table B-1. The proposed changes by the licensee are intended to reflect the current practice of assigning on-shift equipment operators to perform repair and corrective actions as a collateral duty, and do not reflect a change in shift staffing or assignments. As described under the proposed changes to Table 2-1 above (Section 3.1.b), station Equipment Operators receive training in each of the maintenance expertise levels as listed in Table B-1 of NUREG-0654/FEMA-REP-1.

The proposed change is a clarification of existing ERO on-shift staffing assignments and training to perform the tasks of repair and corrective actions required for on-shift staffing under Table B-1 of NUREG-0654/FEMA-REP-1. As such, the proposed change is considered acceptable.

d. Change to Section 2.3.1.9, "Fire Brigade" (4th sentence)

The licensee proposed adding the sentence: ***"The two on-shift Fire Brigade Equipment Operators are trained to perform minor maintenance support during the initial stages of an emergency."***

NRC Staff Evaluation: Table 2-1 in the existing E-Plan lists only two equipment operators on-shift. However, CGS current on-shift staffing has an additional two equipment operators designated to support fire brigade functions, as described in Section 2.3.1.9. These two

additional equipment operators are trained, as described under proposed change to Table 2-1 above (Section 3.1.b), to receive training in each of the maintenance expertise levels as listed in Table B-1 of NUREG-0654/FEMA-REP-1 in support of on-shift maintenance activities until augmented.

In its supplemental letter dated July 1, 2004, the licensee states:

Fire Brigade positions are required to be present for Operations Support Center (OSC) activation. If the OSC is activated while the Fire Brigade is actively involved in fire-fighting activities, these personnel on the Fire Brigade are tracked as a repair team dispatched from the Control Room. Once fire-fighting response is completed or off-site fire-fighting support arrives, in approximately 30 minutes, Fire Brigade members report back to the Control Room or to the OSC to be dispatched as members of repair teams as required.

The proposed change is a clarification of existing ERO on-shift staffing assignments and training to perform the tasks of repair and corrective actions required for on-shift staffing under Table B-1 of NUREG-0654/FEMA-REP-1. As such, the proposed change is considered acceptable.

3.2 Change to Section 2.3, "Emergency Response Organization" (2nd paragraph, 1st sentence)

The licensee proposed adding the sentence: ***"Energy Northwest will maintain multiple ERO teams with one complete team being on-duty / on-call at any given time."***

NRC Staff Evaluation: The proposed change was added to address existing station ERO response policies and practices for the prompt augmentation of on-shift staffing. This policy is reflected in the justification for the change (4th paragraph), contained in Attachment 1 to the initial application dated April 22, 2004, which states:

Energy Northwest maintains multiple ERO teams with one complete team being on-duty / on call at any given time. When the Emergency Director activates the ERO, pager carrying "Essential" and "Augmenting" ERO members are paged. "Essential" and "Augmenting" ERO personnel are expected to report to their assigned facility. Personnel who are not issued ERO pages are called using an automated dialing system. The first ERO team member to arrive at a facility is available to assume their assigned position whether or not they are the on-duty / on-call team member ....

The proposed change is a clarification of existing ERO augmentation policies/practices to ensure the response goals in Table 2-1 are met. As such, the proposed change is considered acceptable.

3.3 Change to Section 2.3.1, "On-Shift Emergency Organization" (2nd sentence)

The licensee proposed adding the sentence: ***"The on-shift SROs and STA qualified individual are trained to recognize core damage indications. The STA qualified individual is also trained to determine core damage using Severe Accident Guideline (SAG) methodology."***

NRC Staff Evaluation: Section 2.3.1 of the E-Plan was revised to include discussions on existing on-shift training to recognize core damage indications provided to on-shift senior reactor operators (SROs) and shift technical advisor (STA) qualified individuals. In Enclosure 4 to the supplemental letter dated July 1, 2004, the licensee outlines the following training currently provided as part of initial and continuing training programs:

- Qualification Directory - Section 4.1 (Licensed Operator)
  - Reactor Operator (RO) and SRO License Candidates - Recognizing Core Damage (LO000090)
  - SROs and STAs - Fuel Damage (LR000066)
- Qualification Directory - Section 4.1 (Shift Technical Advisor)
  - Recognizing Core Damage (LO000088) and SAG (LO001541)

The proposed change is a clarification of existing core damage assessment capabilities to support on-shift technical support (core/thermal hydraulic) functions in accordance with Table B-1 of NUREG-0654/FEMA-REP-1. As such, the proposed change is considered acceptable.

3.4 Changes to Table 2-1, "Energy Northwest ERO Minimum Staffing Organization" (Under NOTIFICATION / COMMUNICATION Group)

The licensee proposed inserting ***"Emergency Director Function."***<sup>3</sup>

NRC Staff Evaluation: In Enclosure 2 to the supplemental letter dated July 1, 2004, the licensee states that the position of "Emergency Director" was added under the Notification/Communication function to more clearly indicate the position responsible for offsite notification and communication activities. The licensee further states:

As described in the Columbia Generating Station's Security Lieutenant Checklist and Emergency Plan Implementing Procedure 13.10.8, the Security Communications Center (SCC) Duty Officer and SCC Responder (augments the SCC Duty Officer's responsibilities) assist the Emergency Director in relaying emergency information to the offsite agencies during the initial emergency classification prior to the activation of the Emergency Operations Facility (EOF) and the transfer of Emergency Director responsibilities from the on-shift Shift Manager to either the EOF Manager or Technical Support Center (TSC) Manager.



The notifications following an emergency classification are provided simultaneously to the SCC and offsite agencies using the Crash notification system. During the initial notifications, the SCC Duty Officer conducts a roll call of the offsite agencies and ensures they receive event information ....

The proposed change is consistent with the existing emergency director responsibilities for initiating the initial notification of State/local authorities following event classification per implementing procedure(s).

The proposed change does not impact Table 2-1 staffing for communications with the NRC performed by a designated on-shift control room Emergency Notification System (ENS) communicator, and transferred to the plant/NRC liaison following TSC activation. The licensee states:

E-Plan Section 2.3.2.3 discusses the basic emergency function of the TSC Plan/NRC Liaison. This position is responsible to maintain continuous communications with the NRC during an emergency, relieving the Control Room ENS Communicator of this responsibility.

The proposed change is a clarification of existing processes to ensure consistency with current implementing procedure responsibilities and actions. As such, the proposed change is considered acceptable.

3.5 Changes to Table 2-1, "Energy Northwest ERO Minimum Staffing Organization" (Under FIREFIGHTING Group)

The licensee proposed:

<u>Group</u>	<u>Position/Title or Expertise</u>	<u>On-Shift</u>
Fire Fighting <sup>7</sup>	Fire Brigade	<del>Fire Brigade per FSAR Section 13.5<sup>2,7</sup></del> <b>See FSAR Section 13 for additional Fire Brigade requirements.</b>

NRC Staff Evaluation: The proposed change reflects the existing fire brigade staffing levels as described in the licensee's supplemental letter dated July 1, 2004, which states:

As described in the Columbia Generating Station Final Safety Analysis Report (FSAR), Section 13.1.2.3.4 and plant policies, the Fire Brigade at Columbia is comprised of a minimum of 5 members including a Fire Brigade Leader (Equipment Operator), and an Equipment Operator, a Chemistry Technician, a Health Physics (HP) Technician, and a laborer.

The change also reflects current cross-training of equipment operators, as described under proposed change to Table 2-1 above (Section 3.1.b), to receive training in each of the maintenance expertise levels as listed in Table B-1 of NUREG-0654/FEMA-REP-1 in support of on-shift maintenance activities until augmented.

The proposed change does not impact existing fire brigade staffing levels or assignments, or existing CGS policy for the training and use of fire brigade equipment operators in support of on-shift maintenance activities, when not actively engaged in a fire brigade response. Therefore, the proposed change is a clarification of existing processes, and on-shift staffing levels and responsibilities, to ensure consistency within the CGS E-Plan and with current implementing procedure responsibilities and actions. As such, the proposed change is considered acceptable.

### 3.6 Changes to Table 2-1, "Energy Northwest ERO Minimum Staffing Organization" (Footnote 2)

The licensee proposed expanding Footnote 2 to state:

<sup>2</sup>May be provided by shift personnel assigned other functions. ***Collateral functions may be assumed by responding personnel upon availability.***

NRC Staff Evaluation: The proposed change provides clarification that collateral functions would be assumed by ERO personnel augmenting on-shift staffing in accordance with Table 2-1. The proposed change does not impact on-shift staffing or augmentation levels, and is consistent with the intent of NUREG-0654/FEMA-REP-1, Table B-1. As such, the proposed change is considered acceptable.

### 3.7 Changes to ERO Augmentation (Response) / Facility Activation Times

The licensee proposed specific changes which revise the ERO augmentation (response) goal from 60 minutes to 90 minutes to respond and activate site facilities in the event of an emergency. These changes are being requested due to changes in ERO demographics that have occurred over the operational life of the plant, where more personnel now live at greater distances from the plant and where changes in traffic patterns in the Columbia Basin have increased transit times to the plant from surrounding communities.

Each of the proposed changes is discussed in the following sections and a common NRC evaluation provided following each change summary:

#### 1. Changes to Section 2.3, "Emergency Response Organization"

- a. (2nd paragraph, 2nd sentence) The licensee proposed the following change:  
"The essential emergency organization has the capability to provide manpower and other resources to assist the normal plant organization within approximately ~~60~~ **90** minutes if an emergency situation arises."
- b. (3rd paragraph, 2nd sentence) The licensee proposed the following change:  
"Those members of the ERO who are not on site at the time of the emergency will be able to respond within about ~~60~~ **90** minutes of the emergency." This change was subsequently revised in the supplemental letter dated July 1, 2004, to state: "Those members of the ERO who are not on site at the time of the emergency will be able to respond **and activate Emergency Response**

**Facilities** within about ~~60~~ **90** minutes **of classification (Alert or higher)** of the emergency."

- c. (4th paragraph, 2nd sentence) The licensee proposed the following change: "Table 2-1 demonstrates how these positions ~~align~~ **compare** with NUREG-0654/FEMA-REP-1, Rev. 1, Table B-1 requirements."

2. Change to Section 2.3.3, "Essential Emergency Operations Facility Emergency Organization" (1st paragraph, 2nd sentence)

The licensee proposed the following change: "The EOF Manager normally assumes responsibility for emergency direction and control, within approximately ~~one hour~~ **90 minutes** of the declaration of an Alert or higher emergency."

3. Changes to Table 2-1, "Energy Northwest ERO Minimum Staffing Organization"

- a. (Under AVAILABLE Column) The licensee proposed the following change to column header: "AVAILABLE IN ~~60~~ **90** MINUTES."
- b. (Under OPERATION Group) The licensee proposed the following change to Footnote 1 for the on-shift control room supervisor, which states: "On-shift as required by Technical Specifications in Modes 1, 2 and 3. Available within ~~60~~ **90** minutes for call in for Modes 4 and 5."

4. Changes to Section 5.4.1, "Environmental Field Teams"

- a. (2nd paragraph, 1st sentence) The licensee proposed the following change: "Field team members responding during off-shift hours will report to their emergency duty station within ~~60~~ **90** minutes."
- b. (2nd paragraph, 4th sentence) The licensee proposed the following change: "This deployment time could be shorter during normal work hours when field team personnel are more available and could respond sooner than the ~~60~~ **90** minute response time."

NRC Staff Evaluation: The guidance in Table B-1 to NUREG-0654/FEMA-REP-1 serves as the basis for evaluating the licensee's ability to meet the emergency response planning requirements specified in 10 CFR Part 50.47(b)(2). This standard requires that adequate staffing to provide initial facility accident response in key functional areas is maintained at all times and that timely augmentation of response capabilities is available. Table B-1 identifies the position title / expertise for various major functional areas that should be staffed on-shift or augmented within 30 and 60 minutes of event declaration. NUREG-0892, "Safety Evaluation Report Related to the Operation of WPPSS Nuclear Project No. 2," dated March 1982, states the following in response to NUREG-0654/FEMA-REP-1, Section V.II, Evaluation Criteria B (Onsite Emergency Organization), and approves the elimination of the 30 minute augmentation criteria:

The applicant has conducted a survey of the time it takes for response personnel to travel from home to work. Because of the remote location of the reactor site, some positions listed in Table B-1, NUREG-0654, take longer than the specified times to be filled on other than the day shift. The staff concludes that the applicant's response satisfies the goal of the time response of Table B-1, NUREG-0654.

Revision 3 to the E-Plan, dated April 1983, which serves as the basis for the SER, states:

Section 4.3.1 (Plant Emergency Organization): Plant personnel are assigned specific emergency functions as emergency team or emergency center workers. The normal day shift of Monday through Friday provides a large number of staff personnel for emergency assignments. Shift personnel are sufficiently trained to perform all necessary duties during the off-shifts until relief personnel arrive. Personnel with expertise in technical, mechanical, radiological safety, and environmental field activities are identified and can respond to assist the plant within one hour of notification during off-shift hours ....

Section 4.3.2 (Near-site EOF Organization): ... A sufficient staff to support the plant can be operational within one hour ....

To determine whether increasing the augmentation (response) time from 60 to 90 minutes for personnel to be available and to activate the respective ERFs continues to meet requirements, an evaluation of the major functional areas and tasks was performed.

### **Plant Operations and Assessment of Operational Aspects**

The proposed changes do not adversely impact on-shift staffing, but rather provide clarification of existing equipment operator staffing (per Section 3.4 above). NUREG-0654/FEMA-REP-1, Table B-1 does not designate staff augmentation goals for this major function area.

### **Emergency Direction and Control**

NUREG-0654/FEMA-REP-1, Table B-1 guidance indicates that the shift technical advisor, shift supervisor or designated facility manager should be assigned this function as a collateral duty, where responsibility for overall direction of facility response may be transferred when all centers are fully manned. CGS, under Footnote 3 to Table 2-1, identifies that the shift manager will perform this on-shift function and states that the shift manager is subsequently relieved by the TSC manager or EOF manager. While CGS Table 2-1 currently designates the TSC Manager and EOF manager as being available in 60 minutes, Table B-1 of NUREG-0654/FEMA-REP-1 does not designate an augmentation goal for this direction and control function. Therefore, the proposed change to ERO augmentation (response) time is considered acceptable.

### **Notification / Communication**

In accordance with Table B-1 of NUREG-0654/FEMA-REP-1, on-shift staffing should consist of one position (who per footnote "\*\*\*\*\*" may be performed as a collateral duty by engineering aide

to shift supervisor), and one "30-minute" and one "60-minute" responder. In lieu of a "30-minute" responder, the existing CGS Table 2-1 designates the SCC duty officer to assist the shift manager (under emergency director function) with notifications to ERO personnel and to offsite agencies. Section 2.3.1.4 of the CGS E-Plan states that the SCC staff (which consists of the SCC duty officer, and as a collateral duty, a security responder if available) will assist. In addition, CGS Table 2-1 identifies an on-shift control room ENS communicator, who is an individual designated by the shift manager (consistent with the Table B-1 footnote), and a security responder who would support communications as a collateral duty (if available based on security response). CGS Table 2-1 currently identifies the TSC plant/NRC liaison and EOF telecommunications manager as being available in 60 minutes to support offsite notifications/communications performed by the TSC manager or EOF manager, respectively. Based on the on-shift staffing complement designated in CGS Table 2-1 for notifications/communications (which is in excess of Table B-1 of NUREG-0654/FEMA-REP-1), the NRC staff believes that adequate on-shift resources exist to support offsite notifications/communications within 90 minutes of event classification, prior to being relieved by the TSC or EOF. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

#### **Radiological Accident Assessment and Support of Operational Accident Assessment**

- a. NUREG-0654/FEMA-REP-1, Table B-1 guidance indicates that one individual with senior health physics (HP) expertise should be available in 30 minutes to perform the major task of offsite dose assessment. The existing CGS Table 2-1 identifies the Radiological Emergency Manager as available within 60 minutes.

As justification for the proposed change to increase augmentation (response) goal to 90 minutes, the licensee, in Attachment 1 to the application dated April 22, 2004, states:

Dose assessment has progressed from calculations using spreadsheets and calculators to a stand-alone computer program, Quick Emergency Dose Projection System (QEDPS) .... Additionally, concise written instructions for emergency directors have been developed for each classification level (regardless of dose analysis) to improve the speed and ease at which protective actions can be recommended and implemented. The addition of the QEDPS dose assessment program and concise emergency director instructions has improved the ability of on-shift staffing to maintain the dose assessment function with little impact on overall accident response. The increase in response time goals for ERO augmentation will have an insignificant impact on the ability of the plant staff to provide timely and accurate dose assessments, classifications, notifications and protective action recommendations (PARs).

Section 2.3.1 of the CGS E-Plan states that SRO license holders (which include shift managers, control room supervisors and incident advisors) and STAs are available on-shift to perform offsite dose assessment at all times when required.

In addition, technological advances implemented since the issuance of NUREG-0654/FEMA-REP-1 (i.e., QEDPS dose projection system, default PARs per Supplement 3 to NUREG-0654/FEMA-REP-1, and event declaration based on pre-determined effluent monitor readings per NUMARC/NESP-007), provide a reasonable alternative to the senior HP expertise specified in Table B-1 of NUREG-0654/FEMA-REP-1 within 90 minutes of event declaration. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

- b. NUREG-0654/FEMA-REP-1, Table B-1 guidance for in-plant surveys states that one HP technician should be assigned on-shift with the capability to augment one HP technician in 30 minutes and an additional HP technician in 60 minutes. The existing CGS Table 2-1 requires one HP technician on-shift and two available within 60 minutes. In addition, the existing CGS Table 2-1, under protective action (in-plant), requires two HP technicians on-shift, while Table B-1 of NUREG-0654/FEMA-REP-1 identifies this as a collateral duty. As such, CGS Table 2-1 currently requires one HP technician above that outlined in Table B-1 of NUREG-0654/FEMA-REP-1. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.
- c. NUREG-0654/FEMA-REP-1, Table B-1 guidance for chemistry / radio-chemistry indicates that one rad/chem technician should be assigned on-shift with the capability to augment one HP technician in 60 minutes. The existing CGS Table 2-1 requires one chemistry technician on-shift and one available within 60 minutes.

Technological advances implemented since the issuance of NUREG-0654/FEMA-REP-1 (i.e., severe accident management guidelines, core damage assessment methodologies) have reduced the need for prompt augmentation of radio-chemistry capabilities. In addition, the relaxation of the regulatory requirement for post-accident sampling systems in technical specifications has reduced the on-shift chemistry staff burden. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

- d. NUREG-0654/FEMA-REP-1, Table B-1 guidance for offsite and onsite (out-of-plant) surveys does not designate on-shift staffing for these major tasks, but rather outlines the capability to augment staffing within 30 and 60 minutes. As such, the existing CGS Table 2-1 does not require on-shift staffing for these functions, but provides for staff augmentation within 60 minutes equivalent to the Table B-1 recommended 30 and 60 minute augmentation goals.

Under its justification for change in Attachment 1 to the application dated April 22, 2004, the licensee states:

As documented by the Columbia Generating Station Ten Mile EPZ Evacuation Time Estimate Study, Revision 4, dated May 2001, there are no permanent residents located within three miles of Columbia Generating Station. Approximately 289 permanent residents live between 3 miles and 5 miles. The sectors within 5 miles with the highest permanent resident population are generally to the east of the site. An additional 3674 permanent residents live 5 to 10 miles from the site. The

highest permanent resident population concentrations within the 5 to 10 mile band are south and southeast of the site. The most populated towns nearest the site are Richland and Pasco, Washington .... In the past 5 years, population growth within the 10 mile EPZ has been approximately 6 percent per year. Though some growth has occurred, population density has not significantly increased within the 10 mile EPZ and the proposed changes to the E-Plan will continue to provide protection to the public.

Due to the remote location of the CGS site, with no permanent residents within 3 miles of the site and a limited permanent resident population within 3 to 5 miles, and technological advances implemented since the issuance of NUREG-0654/FEMA-REP-1, Revision 1 (i.e., default PARs based on event classification per Supplement 3 to NUREG-0654/FEMA-REP-1), the need to promptly deploy survey teams to verify dose projections, regarding plume location and magnitude, following a radiological release is significantly reduced.

In the event of an unmonitored release, the licensee states in its supplemental letter dated July 1, 2004, that:

When warranted and directed to do so, on-shift HP Technicians are trained ..., have adequate equipment, and are capable of performing air samples and performing a gross determination of radioactivity to assist in detecting when an unmonitored release is in progress prior to mobilization of the Environmental Field Team members.

Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

- e. NUREG-0654/FEMA-REP-1, Table B-1 guidance indicates that one senior manager should be available in 60 minutes to perform the major task as EOF director. The existing CGS Table 2-1 identifies the radiation protection manager as available within 60 minutes.

Based on the technological advances implemented since the issuance of NUREG-0654/FEMA-REP-1, Revision 1 (described above), on-shift staff have adequate tools to perform a rapid dose assessment and issue PARs prior to the activation of the ERFs. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

#### **Plant System Engineering, Repair and Corrective Actions**

- a. NUREG-0654/FEMA-REP-1, Table B-1 guidance for technical support states that one STA be on-shift, core/thermal hydraulics expertise be available in 30 minutes, and two individuals (one with electrical and one with mechanical expertise) be available in 60 minutes. The existing CGS Table 2-1 states that an STA, or qualified incident advisor,

will be available on-shift in Modes 1, 2 and 3, and available for call-in during Modes 4 and 5, as described in Revision 14 to the E-Plan, dated March 31, 1994. The existing CGS Table 2-1 further states that three individuals, one experienced in core/thermal hydraulics, mechanical and electrical technical support respectively, will be available for call-in. In addition, the existing CGS Table 2-1 identifies that a technical manager, which is in excess of Table B-1 guidance, will be available for call-in.

Under its justification for change in Attachment 1 to the application dated April 22, 2004, the licensee states:

The ERO technical support personnel are provided to support supplemental actions needed to ensure the plant remains in a stable condition, restore capabilities needed for control of the plant, and assist in planning/preparing necessary corrective maintenance.

Comprehensive technical support is not needed during the initial stages of an emergency. Technical support is needed for assessing the extent and impact of damage, practical long-term stabilization options, priority corrective maintenance, and other plant recovery work. Therefore, extension of the response time goals for technical support personnel will not adversely impact the ability of the on-shift personnel to adequately handle the initial stages of an emergency.

The licensee further states in its supplemental letter dated July 1, 2004, that:

On-shift core damage determinations are performed using Severe Accident Guideline methodology, and the process is proceduralized in the Technical Support Guidelines. Control Room staff are trained in the use of this methodology .... The Shift Technical Advisor is present on-shift (required in Modes 1, 2 and 3) and advises the Emergency Director on reactor core dynamics, including core damage indications based on reactor core flow characteristics, core heat balance, radiation readings or dose projections.

Based on the capabilities of various on-shift personnel to recognize core damage indications, and technological advances since the implementation of NUREG-0654/FEMA-REP-1, Revision 1 (i.e., Severe Accident Mitigation Guidelines, core damage assessment methodology, etc.), as discussed previously under Section 3.3, the NRC staff believes that an adequate on-shift expertise exists to perform the core/thermal hydraulic function within 90 minutes of event classification until emergency response facilities are activated. In addition, Enclosure 4 to the supplemental letter dated July 1, 2004, states that the STA is trained to provide engineering and accident assessment expertise to shift management. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

- b. NUREG-0654/FEMA-REP-1, Table B-1 guidance for repair and corrective actions states that two individuals, one with mechanical maintenance / rad waste operator experience and one with electrical maintenance / I&C experience, should be designated on-shift, but may be provided by shift personnel assigned other functions. In addition, Table B-1



guidance outlines additional expertise to be augmented within 30 and 60 minutes respectively. The existing CGS E-Plan identifies two individuals, filled by on-shift equipment operators, who will perform repair and corrective actions as necessary as a collateral duty prior to staff augmentation in 60 minutes.

In Attachment 1 to the application dated April 22, 2004, the licensee states the following as justification for change in its Table 2-1 augmentation (response) goals from 60 to 90 minutes:

Due to the time needed to stabilize the plant and assess the event, the initial phase of an accident scenario is not expected to involve a significant need for maintenance personnel .... Only after plant status is understood and the plant is in a stable condition can attention be focused on corrective maintenance that may be needed to restore plant capabilities.

Until the reactor is stabilized and the casual agents are discerned, actual repairs or realignment of plant equipment would not require large-scale maintenance support. On-shift personnel are capable of performing initial maintenance activities until augmenting personnel arrive. Therefore, extending the response time goals for augmenting personnel from 60 minutes to 90 minutes will not adversely affect the ability of the on-shift personnel to manage the initial stages of an emergency.

Attachment 3 to the licensee's April 22, 2004, application further states:

Additionally, the Human Reliability Analysis (HRA) for Columbia Generating Station does not explicitly credit ERO augmentation personnel .... There are no recovery actions credited in the PSA [*probabilistic safety assessment*] (internal events, fire or seismic IPEEE) for failed equipment that relies on augmented ERO personnel for at least the first 24 hours. It is acknowledged that if augmented ERO staff are available, their availability would improve the human error probability assigned in the PSA .... Increasing the ERO augmentation time from 60 to 90 minutes will have an insignificant effect on the recovery probability of mitigating systems. Thus, protection of the health and safety of the public would not be adversely affected by the proposed E-Plan changes.

The licensee subsequently proposed changes to CGS Table 2-1 and Section 2.3.1.5 in the supplemental letters dated July 1, 2004 and July 22, 2004, to address the current CGS staffing practice of designating four equipment operators on-shift, in lieu of the current Table 2-1 commitment. As described in the proposed change to Table 2-1 above (under Section 3.1.b), equipment operators receive cross-training in each of the maintenance expertise levels listed in Table B-1 to NUREG-0654/FEMA-REP-1 in support of on-shift maintenance activities until augmented.

Of the four equipment operators identified in the proposed change to Table 2-1, two are dedicated primarily to fire brigade response. The licensee further states in its supplemental letter dated July 1, 2004, that:

Fire Brigade positions are required to be present for Operations Support Center (OSC) activation. If the OSC is activated while the Fire Brigade is actively involved in fire-fighting activities, those personnel on the Fire Brigade are tracked as a repair team dispatched from the Control Room. Once fire-fighting response is completed or off-site fire-fighting support arrives, in approximately 30 minutes, Fire Brigade members report back to the Control Room or to the OSC to be dispatched as members of repair teams as required.

The staff believes that adequate resources are available, based on the cross-training of on-shift equipment operators in mechanical, electrical and I&C maintenance activities and inclusion of all four on-shift equipment operators in Table 2-1, to support essential repair and corrective actions within 90 minutes of event classification, prior to staff augmentation. Therefore, the proposed change to ERO augmentation (response) time is acceptable.

### **Protective Actions (In-Plant)**

NUREG-0654/FEMA-REP-1, Table B-1 guidance for protective actions (in-plant) indicates that two HP technicians should be assigned on-shift to support radiation protection activities; however, these HP technicians may be provided by shift personnel assigned other functions. The existing CGS Table 2-1 assigns three HP technicians and one chemistry technician on-shift, which is beyond that required by Table B-1.

The staff believes that adequate resources are available, based on the assignment of additional on-shift technicians, to support in-plant protective actions within 90 minutes of event classification, prior to staff augmentation. Therefore, the proposed change to ERO augmentation (response) time is acceptable.

### **Firefighting**

Firefighting activities are an on-shift staff duty in accordance with NUREG-0654/FEMA-REP-1, Table B-1 guidance, which refers to plant technical specifications, rather than defining the fire brigade complement.

Availability of on-shift personnel to perform fire brigade duties is not impacted by the proposed change, and remains consistent with HP/chemistry on-shift staffing approved by the "Safety Evaluation for Washington Nuclear Project-2 Emergency Plan, Revisions 17-19," in a letter dated April 16, 1998, from A.T. Howell III (NRC) to J.V. Parrish. In addition, the licensee's response in its supplemental letter dated July 1, 2004, states that "off-site fire-fighting assistance should arrive in approximately 30 minutes to relieve on-shift Fire Brigade members." Therefore, the proposed change to ERO augmentation (response) time is acceptable.

## **Rescue Operations and First Aid**

Rescue operations and first aid activities are an on-shift staff duty in accordance with NUREG-0654/FEMA-REP-1, Table B-1 guidance. The existing CGS Table 2-1 assigns two individuals to support activities as a collateral duty, consistent with Table B-1 guidance. The proposed change does not impact the availability of on-shift personnel to perform rescue operations and first aid duties or the response by offsite ambulance support as described in the CGS E-Plan. Therefore, the proposed change to the ERO augmentation (response) time is acceptable.

## **Site Access Control and Personnel Accountability**

Site access control and personnel accountability activities are an on-shift staff duty in accordance with NUREG-0654/FEMA-REP-1, Table B-1 guidance. The existing CGS Table 2-1 indicates that on-shift security personnel staffing will be based on the station's security plan, rather than the CGS E-Plan. The proposed change does not impact on-shift security plan staffing, and therefore, is acceptable.

While the proposed change would increase the availability goal for ERO personnel to augment on-shift staffing, Section 2.2 of the CGS E-Plan was also revised to define the term "available" as, "Those members of the ERO who are not on site at the time of the emergency will be able to respond and activate emergency response facilities within about 90 minutes of classification (Alert or higher) of the emergency." Therefore, the term "available" encompasses not only ERO response, but the activation of respective emergency facilities. Based on the consideration of this and other factors as described above (i.e., on-shift staffing above that required by Table B-1 to NUREG-0654/FEMA-REP-1, cross-training of on-shift staffing, remoteness of site from significant permanent resident population areas, technological advances made since implementation of Revision 1 to NUREG-0654/FEMA-REP-1, station-specific PSA evaluation, etc.), the NRC staff believes that the proposed changes associated with an increase in ERO augmentation (response) time, as listed in Section 3.7, are not considered a decrease in effectiveness, and therefore, are considered acceptable.

## **4.0 CONCLUSION**

The NRC staff has determined that the licensee's proposed changes to the CGS E-Plan in its application dated April 22, 2004, and as supplemented by letters dated July 1, 2004, and July 22, 2004, are acceptable. The NRC staff also finds that the CGS E-Plan changes meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E of 10 CFR Part 50.

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