

January 9, 2006
GO2-06-004

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

**Subject: COLUMBIA GENERATING STATION, DOCKET NO. 50-397
CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR
EXTENSION OF DIESEL GENERATOR COMPLETION TIME**

- References:
- 1) Letter dated May 19, 2004, DK Atkinson (Energy Northwest) to NRC, "Application for Amendment of Facility Operating License No. NPF-21 for Extension of Diesel Generator Completion Time"
 - 2) Letter dated November 4, 2004, WA Macon (NRC) to JV Parrish (Energy Northwest), "Columbia Generating Station - Request for Additional Information (TAC No. MC3203)"
 - 3) Letter dated September 1, 2005, WS Oxenford (Energy Northwest) to NRC, "Response to Request for Additional Information Regarding License Amendment Request for Extension of Diesel Generator Completion Time"

Dear Sir or Madam:

By Reference 1 Energy Northwest requested a change to Technical Specification (TS) 3.8.1, "AC Sources Operating," to permit a longer Completion Time for the Division 1 and Division 2 diesel generators (DG). By Reference 2 the NRC issued a Request for Additional Information (RAI) regarding the basis for the proposed change. By Reference 3 Energy Northwest responded to the RAIs.

On December, 8, 2005, Energy Northwest met with NRC staff to discuss this amendment request. At that time NRC staff requested that certain items of discussion be clarified on the docket. This discussion is documented in Attachment 1.

A001

**CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING LICENSE AMENDMENT REQUEST FOR EXTENSION OF DIESEL
GENERATOR COMPLETION TIME**

Page 2

Additionally, a teleconference was held with members of the staff on the probabilistic risk analysis (PRA) RAI question responses of Reference 3 to address additional concerns. Attachment 2 provides additional details requested during this teleconference on fire protection compensatory actions associated with our fire protection program whenever DG-1 or DG-2 is removed from service for maintenance for greater than 72 hours.

Attachment 3 identifies additional commitments contained in this response.

If you have any questions regarding this matter, please contact GV Cullen, Licensing Supervisor at (509) 377-6105.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,

 *D. W. Coleman*
for

WS Oxenford
Vice President, Technical Services
Mail Drop PE04

- Attachments:
1. Clarification Regarding Use of DG-3 as Additional AC Source
 2. Clarification Regarding Fire Protection Compensatory Actions During the Extended Diesel Generator (DG) Completion Time (CT)
 3. Identification of Commitments

cc: BS Mallett – NRC RIV
BJ Benney – NRC NRR
NRC Senior Resident Inspector/988C
RN Sherman – BPA/1399
WA Horin – Winston & Strawn

CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR EXTENSION OF DIESEL GENERATOR COMPLETION TIME

Attachment 1

Page 1 of 3

Clarification Regarding Use of DG-3 as Additional AC Source

In Reference 3, Energy Northwest responded to the staff's RAI concern in Reference 2 to provide an additional AC source. This additional AC source consists of the capability to cross-connect the Division 3 High Pressure Core Spray (HPCS) Diesel Generator (DG-3) to the Division 1 or 2 electrical systems to power selected safe shutdown loads. Energy Northwest has completed the plant modification to add this AC source and is completing final relay calibration and breaker refurbishment. Energy Northwest believes that this additional AC source capability improves the safety of the plant and adds additional defense in depth during online maintenance of diesel generators. During the December 8, 2005 meeting, the staff concurred with this improvement in safety, but has requested clarification on committing DG-3 as an additional AC source during online DG maintenance when HPCS is also the credited system for coping with a Station Blackout (SBO). Energy Northwest does not believe this creates a Licensing Basis conflict for the reasons outlined below. The NRC staff also requested a description of the DG-3 cross-connect implementation plan that would be controlled by procedure.

Licensing Basis Conflict Discussion:

Columbia Generating Station (Columbia) is a Boiling Water Reactor (BWR-5) and is designed with three separate divisions. Division 1 and 2 are redundant divisions with low pressure AC Emergency Core Cooling Systems (ECCS) for injection and decay heat removal. Division 3 consists of the HPCS system and its dedicated DG, DG-3. The Reactor Core Isolation Cooling (RCIC) system is steam driven and its control power is from the Division 1 direct current (DC) battery power and during an SBO is independent of AC power.

There are no ECCS high pressure injection systems directly powered by AC in Division 1 or 2. In the event of a loss of off-site power (LOOP) and concurrent main turbine trip with one divisional diesel generator (DG-1 or DG-2) out of service for maintenance, the remaining division (1 or 2) would be available to provide safe shutdown capability, including decay heat removal. The Division 1 or Division 2 low pressure safe shutdown equipment would not be available while reactor pressure is above the Reactor Vessel Pressure-Low set point, but HPCS and/or RCIC would be available to control vessel level.

In the event of a failure of the remaining Division 1 or 2 DG (i.e., an SBO condition) HPCS and/or RCIC are available to provide high pressure vessel level control. Energy Northwest's SBO procedure directs operators to reduce reactor pressure manually using the SRV(s) if a make-up source is available. Once pressure is reduced to the point that low pressure make-up can be initiated, HPCS is no longer needed for SBO coping. Therefore, DG-3 will not be needed for both high pressure make up (HPCS) and low pressure make up at the same time, and crediting DG-3 for both functions does not create an operational conflict.

CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR EXTENSION OF DIESEL GENERATOR COMPLETION TIME

Attachment 1
Page 2 of 3

Additionally, crediting the multiple function use of DG-3 does not create a licensing basis conflict. The scenarios where the DG-3 cross-connect will be fully implemented are outside the assumptions of the 10 CFR 50.63 coping analysis and therefore do not violate this analysis. The following table provides scenarios when the cross connect would be implemented and the reason it does not impact the licensing basis.

Scenarios Evaluated Where DG-3 Would Be Cross-Connected to Division 1 or 2	
Scenario	Justification For Not Impacting Licensing Basis
HPCS has successfully mitigated the need for high pressure injection during the SBO and reactor pressure is below the low pressure set point.	The SBO function for the high pressure injection function has been accomplished and high pressure inventory control is not required.
A determination has been made that off-site power will not be restored within the 4-hour coping time.	This determination would forecast an SBO duration beyond the 4-hour coping licensing basis required in 10CFR50.63.
The HPCS system has failed allowing DG-3 to be available for cross connecting to Div 1 or Div 2.	Failure of HPCS is not an assumption required for 10CFR50.63.
The RCIC system is maintaining reactor vessel inventory.	The credited operating system for meeting 10CFR50.63 is HPCS. However, Energy Northwest's commitment to maintain RCIC as the preferred SBO mitigating equipment provides additional capability for high pressure injection beyond the licensing basis requirements of 10 CFR 50.63. With this redundant capability (RCIC and HPCS), use of DG-3 to power low pressure ECCS and heat removal systems provides capability beyond solely coping with an SBO. With the addition of DG-4 to maintain battery power to RCIC, approximately 300% additional margin is provided for coping with an SBO with RCIC.

DG-3 Cross-Connect Plan for LOOP OR SBO During Online DG Maintenance:

Upon the onset of the LOOP with concurrent main turbine trip, the division associated with the DG out of service for maintenance would not have power and configuration of the electrical switchgear bus would be aligned to be ready to receive power from DG-3. In the event that the LOOP progressed to an SBO condition because the remaining Division 1 or 2 DG failed, RCIC would be the preferred coping equipment for high

CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR EXTENSION OF DIESEL GENERATOR COMPLETION TIME

Attachment 1

Page 3 of 3

pressure injection¹. HPCS would also be available to provide coping per Columbia's docketed 10 CFR 50.63 coping strategy. Energization of the Division 1 or 2 switchgear would occur when the reactor pressure was reduced and HPCS was no longer needed unless plant conditions dictate otherwise.

During entry into the extended DG CT, procedures for implementing the cross-connect will provide for the swap-over to be accomplished within two hours of the occurrence of a LOOP or SBO unless plant conditions dictate otherwise. The cross-connection will be accomplished in two stages. Upon the onset of the LOOP or SBO, the division associated with the DG out of service for maintenance will be configured to be ready to receive power from DG-3 (i.e., bus alignment). This stage will be able to be accomplished in less than 90 minutes. The second stage aligns DG-3 to power the properly configured Division 1 or 2 bus (i.e., bus energization) and involves the steps that shift DG-3 from powering the HPCS high pressure function to being able to power the low pressure ECCS or heat removal function. This stage will be able to be accomplished in less than 30 minutes.

In summary, the ability to maintain adequate core cooling and safe shutdown during and following the SBO, assuming the unlikely event that restoration of an onsite or offsite source does not occur within the coping period, is assured by HPCS and/or RCIC in combination with DG-3 cross-connected to Division 1 or 2. The use of DG-3 to power the high pressure and low pressure ECCS functions is not required at the same time which allows DG-3 to be considered as an additional AC power source. During entry into the extended DG CT, procedures will direct implementation of the cross-connect within two hours of a LOOP or SBO unless plant conditions dictate otherwise.

Information in this attachment is considered clarification of previous information submitted in the referenced letters, however, the statement that "during entry into the extended DG CT, procedures will be written to direct full implementation of the cross-connect within two hours of a LOOP or SBO unless plant conditions dictate otherwise" is a commitment.

As requested during the meeting, an action has been established within our corrective action program to review existing docketed correspondence and internal evaluations associated with 10 CFR 50.63 SBO analysis and provide additional clarification to the Docket on RCIC's role in SBO mitigation.

¹ Reference Letters:

May 7, 1991 GC Sorensen to NRC, "Additional Information Regarding SBO (Tac No. 68626);"

March 6, 1992, GC Sorensen to NRC, "Safety Evaluation of the Washington Public Power Supply System Nuclear Project Number 2 Station Blackout Analysis;" and

June 26, 1992, R.R. Assa (NRC) to GC Sorenson, "Supplemental Safety Evaluation (SSE) of the Washington Public Power Supply System Nuclear Project No. 2 (WNP-2) Station Blackout Analysis (Tac No. 68626)."

CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST FOR EXTENSION OF DIESEL GENERATOR COMPLETION TIME

Attachment 2

Page 1 of 1

Clarification Regarding Fire Protection Compensatory Actions During the Extended Diesel Generator (DG) Completion Time (CT)

In the Reference 1 letter, Energy Northwest provided Fire PRA results. The NRC staff questioned whether any compensatory actions were being proposed as commitments during the extended DG CT to mitigate the risk due to potential fires and, if so, would they be contained in plant procedures.

As part of the plant's Fire Protection Program additional compensatory actions were determined to be required. These include restricting transient ignition sources and establishing hourly fire tours in certain key fire areas. Plant procedures will implement these compensatory actions for areas associated with the protected equipment, including the operable DG and its respective division's service water, batteries, and switchgear rooms. For DG-2 outages, the plant cable chase and the cable spreading room are additional key areas for these compensatory actions. Plant procedures currently limit transient combustible in these areas.

These Compensatory Actions in our Fire Protection Program are an additional commitment.

The PRA fire results provided in Reference 1 did not credit these compensatory actions. Additional conservatism also exists in the Fire PRA modeling as the Fire PRA did not credit recovery of offsite power or the additional AC sources (DG-4 and DG-3 Cross Connect). The combination of these compensatory actions and conservatisms in the Fire PRA provides assurance that the risk due to fire during the extended DG CT is not significant.

**CLARIFICATION OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING LICENSE AMENDMENT REQUEST FOR EXTENSION OF DIESEL
GENERATOR COMPLETION TIME**

Attachment 3

Page 1 of 1

Identification of Commitments:

1. Establish procedures that during entry into the extended DG CT to direct full implementation of the DG-3 cross connect to Division 1 or Division 2 switchgear (SM-7 or SM-8) within two hours of a LOOP or SBO unless plant conditions dictate otherwise.
2. Establish procedures to implement the Columbia Fire Protection Program compensatory actions to restrict transient ignition sources and establish hourly fire tours in certain key fire areas during the DG extended completion time.