August 3, 2000

MEMORANDUM TO: File Center

FROM: Jack N. Donohew, Senior Project Manager, Section 2 ***/RA/***
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: RESPONSES TO QUESTIONS ON LICENSEE APPLICATION REGARDING OPEN CONTAINMENT PENETRATIONS DURING REFUELING OPERATIONS FOR WOLF CREEK GENERATING STATION (TAC NO. MA9293)

Attached are two e-mails providing responses from the licensee regarding administrative controls and potential radiological consequences of the fuel handling accident inside containment for the proposed amendment on open containment penetrations while handling irradiated fuel inside containment during refueling operations. The responses clarify information provided by the licensee in its application dated June 23, 2000.

Docket No. 50-482

Attachments: 1. E-mail dated July 21, 2000
2. E-mail dated July 26, 2000

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E-MAIL DATED JULY 21, 2000

From: Wideman Steven G <stwidem@WCNOC.com>
To: "'Donohew Jack'" <JND@nrc.gov>
Date: Fri, Jul 21, 2000 2:57 PM
Subject: Response to E-mail Comments on Containment Penetration LAR

Jack - the attached file provides responses to the questions that were e-mailed to Licensing on July 3, 2000. If necessary, we can set up a phone call to discuss these responses.

QUESTIONS FOR TSTF-312 AMENDMENT REQUEST

1a. What containment penetrations would not be allowed to be opened under administrative controls during refueling operations?

The LCO Note exception would not apply to the equipment hatch or the air lock doors because of the proximity of where this Note is placed in the LCO. The justification for not excepting any of the other penetrations is that the analysis assumes that the containment structure does not prevent release of the gap activity from reaching the site boundary. The assumption is that all the gap activity is released within 2 hours and that the 10 CFR 100 limits will not be exceeded. Containment closure is viewed as a defense-in-depth approach to limit radioactive releases.

There have been no exceptions identified. The proposed change is not intended to be used non conservatively, but to allow the plant to continue with refueling operations if the situation would occur that a penetration must be opened.

1b. Would each open penetration have one person assigned to close the penetration in the event of an FHA?

The Technical Specifications do not require the treatment of the penetrations in the same manner as penetrations are treated during power operations. Therefore, a dedicated individual for each penetration is not required. There may be appropriate times when a dedicated individual is utilized to control several valves in close proximity such as performing LLRTs or when using a Reactor Operator to control several valves on one panel.

TSTF-312 proposed TS Bases which defines administrative controls, in this case, as:

- Appropriate personnel will maintain an awareness of the open status of the penetration flow path during core alterations and movement of irradiated fuel assemblies within containment.

- Specified individuals will be designated and readily available to promptly isolate open penetration flow paths in the event of a FHA inside containment.

These administrative controls are acceptable because during a FHA containment pressure is

not expected to increase above atmospheric and that the radioactive dispersion within containment will be slow enough to allow time for penetration isolation.

2. What is the longest time expected to close these containment penetrations? What was done to demonstrate that there is assurance that this time can be met?

The longest time expected is in the order of a few minutes. This is justified because of the following:

- Containment closure is normally set prior to fuel movement so most penetrations will be isolated, already.

- Exceptions will be known by the Control Room and addressed on a case-by-case basis. Penetrations would normally be open for testing purposes. The specific reason and location for opening the penetration is reviewed and the best method for isolation is determined. Most of the time the penetration is easily isolated by remote hand switch. Other times, like during LLRTs the individual manipulating the valve will be designated to close the penetration. The individual is right there to perform this task.

- These situations will be specified at the time during the pre-job briefing for the activity. The briefings will normally cover the individuals' responsibilities and establish the methods for closure in the event of a FHA inside containment. The designated individuals will be readily available for prompt isolation. The individual(s) will know when to isolate the penetration through communications from the control room such as radios, gatronics, etc. In addition, the containment evacuation alarm can be easily heard from anywhere in containment as another means to alert the individual to isolate the penetration just prior to evacuation.

3. Do you agree with the quantities (assumptions for the dose consequences) given in Table 2 of the safety evaluation for Amendment No. 95 as being currently correct for Wolf Creek? Is it known why the staff's dose consequences in Amendment No. 95 are less than the dose consequences reported in USAR Table 15.7-8? The staff reported 0.14 rem whole body and 39.7 rem thyroid for the exclusion boundary, and USAR Table 15.7-8 reports 0.177 rem whole body and 64.1 rem thyroid.

No, the assumptions and parameter values given in Table 2 of the safety evaluation for License Amendment No. 95 are consistent with Wolf Creek's current radiological consequences calculation for the postulated fuel handling accident occurring inside the containment, with the exception of the release fraction for Iodine-131. Since the issuance of Amendment No. 95, WONOC has reanalyzed the potential radiological consequences of a postulated fuel handling accident.

The reanalysis was performed based on updated radiation source terms, which are generated with assumptions and parameters commensurate with the current plant operation and the foreseeable changes on fuel management program. The major assumptions and parameters used in the source term analysis include:

EFPD = 510 (18-month fuel cycle with a 30 day refueling and 98% capacity factor),
Enrichment = 5.0 w/o (consistent with SFP rerack project),
Core average cumulative burnup = 38,400 MWD/MTU, and
Discharge burnup = 56,200 MWD/MTU (average assembly).

The reanalysis also incorporated an updating of the assumption on the release fraction for Iodine-131. Note that the previous calculation assumed the gap activity in the damaged rods consists of 10% of the total noble gases other than Kr-85, 30% of the Kr-85, and 10% of the total radioactive iodine, in accordance with the regulatory positions specified in Regulatory Guide 1.25. As indicated in NUREG/CR-5009, the extended burnup release fractions are all lower than those assumed in Regulatory Guide 1.25, with the exception of Iodine-131. According to that report, a release fraction of 0.12 was calculated for Iodine-131 for a peak rod at burnup level of 60 GWd/t, whereas Regulatory Guide 1.25 assumes a release fraction of 0.10 (normal burnup). Since Iodine-131 is the dominant contributor to the offsite thyroid dose, adoption of a higher release fraction for the extended burnup fuel results in the calculated thyroid dose increasing from 55.2 rem to 64.1 rem.

E-MAIL DATED JULY 26, 2000

From: Wideman Steven G <stwidem@WCNOC.com>
To: "'Donohew Jack'" <JND@nrc.gov>
Date: Wed, Jul 26, 2000 3:50 PM
Subject: Additional Questions Regarding LAR on Containment Penetrations

Jack - response to question 1 and 2 from the additional questions that were provided on July 24, 2000. I will let you know about the phone call for the additional questions after I talk with Jin Hseu.

ADDITIONAL QUESTIONS FOR TSTF-312 AMENDMENT REQUEST

1. Have administrative procedures been written to identify the requirement to close any containment penetration that is open in the event of a fuel handling accident inside containment?

We are currently revising the procedures to implement the administrative requirements specified by the LAR. The proposed changes are to be independently reviewed and approved through the Qualified Reviewer process. Because the proposed changes affect an administrative control procedure it must be reviewed by affected managers and approved by the PSRC.

Would this be done during the implementation of the proposed amendment?

The required procedure changes are implemented in conjunction with the issuance of the license amendment.

Would these penetrations be required to be closed for any other event?

Yes. TS LCO 3.9.5, RHR and Coolant Circulation- Hi Water Level, and LCO 3.9.6, RHR and Coolant Circulation- Low Water Level require that any open penetrations providing direct access from containment atmosphere to outside atmosphere be closed within 4 hours. Wolf Creek, however has a commitment associated with Generic Letter 88-17 to close these penetrations at reduced inventory conditions within 30 mins. This is discussed in the TS 3.9.6 Required Action B.3 Bases.

2. In the accident analysis, it is assumed that the fuel has decayed 100 hours. What ensures that the fuel damaged in a fuel handling accident inside containment can not have decayed less than 100 hours?

Pre-Amendment No. 123 Technical Specification 3/4.9.3 was relocated to the USAR as dicussed in the conversion application (Section 3/4.9, DOC 3-01-R). USAR Section 9.1.4.2.3 (page 9.1-48) was revised to specify the time frame for subcriticality prior to movement of irradiated fuel in the reactor vessel.
Additionally, these requirement are implement by procedure GEN 00-009, "Refueling," which has a precaution (step 4.41) that the reactor shall be determined to have been subcritical for al least 100 hours. In the body of the procedure there is a signoff verification (step 6.2.6.3) to

ensure that the reactor has been subcritical for at least 100 hours. The date and time the reactor was made subcritical is documented in the procedure and the date and time core unloading is commenced in documented in the procedure.