

August 27, 2002

MEMORANDUM TO: Docket File

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

/RA/

SUBJECT: RESPONSE TO REQUEST FOR INFORMATION ON LOOSE PARTS
FOUND IN THE STEAM GENERATOR AT WOLF CREEK
GENERATING STATION

Wolf Creek Nuclear Operating Corporation (the licensee) conducted a refueling outage at Wolf Creek Generating Station (WCGS) that began on Friday, March 22, 2002. On May 10, 2002, in coming out of the outage, there were indications of an unusual noise followed by an alarm in the plant loose parts monitoring system for Steam Generator D. The plant was shut down on May 13, 2002, and the steam generator was entered to find the loose parts.

Enclosed are three e-mails dated May 17 and 20, and June 20, 2002, from the licensee. The May 17, 2002, e-mail provided (1) a copy of a special report issued by the licensee to the WCGS employees describing the loose parts found in the steam generator, and (2) pictures of the two parts found in the steam generator. The special report and the pictures can be found in ADAMS Accession No. ML022270414.

The May 20, 2002, e-mail provides answers to the six questions sent by me by e-mail to the licensee. The responses to the questions prevented the need for the staff to have a telephone call with the licensee to discuss the loose parts found in the Steam Generator "D." The licensee's answers follow the phrase "Answer)" in the e-mail. The Westinghouse letters referenced in the [...]s in the licensee's answers were not requested or reviewed by the staff.

The June 20, 2002, e-mail provides the licensee's agreement to have the information provided in the previous two e-mails docketed.

This memorandum docket the information received from the licensee on the loose parts found in Steam Generator "D." No further action was needed to be taken by the staff.

Docket No. 50-482

Enclosures: 1. E-mail dated May 17, 2002
2. E-mail dated May 20, 2002
3. E-mail dated June 20, 2002

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NRR-106

OFFICE	PDIV-2/PM	PDIV-2/LA	EMCB	PDIV-2/SC
NAME	JDonohew:ks	EPeyton	KKarwoski	SDembek
DATE	8/26/2002	8/26/02	8/27/02	8/27/02

DOCUMENT NAME: C:\ORPCheckout\FileNET\ML022340708.wpd

OFFICIAL RECORD COPY

E-MAIL DATED MAY 17, 2002

From: Wideman Steven G <stwidem@WCNOC.com>
To: "Jack Donohew (E-mail)" <JND@nrc.gov>
Date: 5/17/02 9:03AM
Subject: Information on Wolf Creek Loose Parts

Jack - attached is the Wolf Creek Bulletin on the Loose Parts found in the "D" steam generator (this what I faxed earlier). The two jpg files are pictures of the two parts that were retrieved from the SG.

<<05-17-~1.DOC>> <<MVC-001F.JPG>> <<MVC-006F.JPG>>

Steve Wideman
WCNOC Licensing
phone: 620-364-4037
fax: 620-364-4138
e-mail: stwidem@wcnoc.com

CC: Yunk Jennifer L <jeyunk@WCNOC.com>

[The three attachments, the Wolf Creek Bulletin and the two pictures (jpg files), that are referred to in the above e-mail are in ADAMS Accession No. ML022270414.]

E-MAIL DATED MAY 20, 2002

From: Yunk Jennifer L <jeyunk@WCNOC.com>
To: "Jack Donohew (E-mail) (E-mail)" <jnd@nrc.gov>
Date: 5/20/02 4:48PM
Subject: Wolf Creek Response to Loose Part Questions

Jack - Wolf Creek has provided responses to each of Mr. Karwoski's questions. If further information or a telecon is needed please contact me.

Thanks,

Jennifer Yunk
Wolf Creek

-----Original Message-----

From: Kenneth Karwoski [mailto:KJK1@nrc.gov]
Sent: Friday, May 17, 2002 1:04 PM
To: Jack Donohew
Cc: Louise Lund
Subject: Wolf Creek Loose Part

Jack,

This is to remind you of our conversation.

I would like to have a discussion with Wolf Creek to discuss their loose part with the intent that a summary of the call would be made publicly available.

Specifically, I would like information related to the following:

What provided the initial indication of the part (e.g., loose part monitor alarm)? When was the initial indication?

Answer) The initial indication of the presence of loose part(s) was an "unusual noise" heard on Channels 11 and 12 on the plant Loose Part Monitoring System (LPMS), relating to steam generator D. This "unusual noise", followed closely by the LPMS alarm, occurred on 5/10/2002 at 0115 hours during a return to power after a reactor trip.

When was the plant shut down?

Answer) The plant shutdown commenced at 1710 hours on 5/13/2002 directly subsequent to a Westinghouse presentation of the results of their just concluded evaluation of the LPMS tapes transmitted to them.

Were the parts on the primary or secondary side or both?

Answer) Two loose parts were retrieved from the primary side of steam generator D, consistent with the Westinghouse conclusions from their evaluation of the LPMS tapes.

What was the extent of the damage?

Answer) The known guide tube support pin damage is based upon the retrieval of the support pin nut and locking device (disc) from steam generator D. Although one possible failure mode is that the guide tube support pin shank did not fracture but that the nut, locking disc, and dowel pin came loose leaving an intact support pin in place in the guide tube, the evaluation for continuing operation assumed, more conservatively, that the assumed unrecovered loose parts included: 1) The guide tube support pin shank, 2) the guide tube support pin dowel pin, and 3) Fragments from the guide tube support pin nut.

There were no indications within the S/G of serious damage to the tubes, tubesheet, welds, or the divider plate caused by the loose parts. Generalized peening to various degrees of the entire bowl region/bottom face of the tubesheet and divider plate was observed. All tube plugs were found in the proper tube hole location. The skirts of the tube plugs were peened to various degrees. Most of the entire inner surface of the channel head bowl was peened to various degrees. There was no indication of a foreign object present in any of the tubes. There appeared to be indications of scratching and displaced metal on the ID's of various tubes. Whether this was caused by the objects found in the channel head, or from tooling associated with tubing NDE and other channel head maintenance operations was not determinable. It must be noted that the objects removed were larger than the tubing ID. The level of damage was considered not as severe as that of a comparison plant.

What was the acceptance criteria? What is the basis for the acceptance criteria?

Answer) The acceptance criteria for continuing operation with guide tube support pin damage and the assumed unrecovered loose parts, including the associated bases, through the end of the planned operating cycle, is documented in the Westinghouse evaluation [Westinghouse Letter LTR-MSI-02-62, Wolf Creek - Guide Tube Support Pin Loose Part JCO - Reactor Internals Evaluation]. This evaluation considered the safety concerns regarding the structural integrity of guide tubes with potentially fractured support pin shanks during operation and the potential effects on the nuclear fuel, the control rod drive mechanisms and drive line, and the applied impact and wedging loads upon the reactor pressure vessel and internals during operation from the assumed missing pieces.

The acceptance criteria and basis for the steam generator damage was documented in a bounding evaluation performed by Westinghouse [Westinghouse

Letter LTR-SGDA-02-156]. The inspection and evaluation used industry experience from plants with damaged channelhead components caused by loose parts. For the analysis, it was assumed that all of the tube welds were damaged and may be unable to perform their intended structural and leak prevention function. Resistance to tube pullout and resistance to primary-to-secondary side leakage was evaluated. Visual inspection of the mechanical plugs was adequate to establish confidence that the plugs will perform their intended plugging function through the end of the planned operating cycle. For the cladding, it was assumed that loose part impacts resulted in the cladding being breached in at least one location on the tubesheet and one location on the curved portion of the channelhead and that the low-alloy steel is exposed to the primary liquid during the entire cycle.

What was the source of the part (if known)?

Answer) The two parts retrieved have been identified as the support pin nut and locking device (disc) from a guide tube support pin.

I have a phone call with Diablo at 12:30 p.m. on Monday. I will be leaving at 1:45 on Monday. I can support a call up to about 1:00 on Tuesday and I will be traveling the rest of the week.

Thanks,

Ken
415-2752

CC: Harris Karl A <kaharri@WCNOC.com>

E-MAIL DATED JUNE 20, 2002

From: Yunk Jennifer L <jeyunk@WCNOC.com>
To: "Jack Donohew" <JND@nrc.gov>, Wideman Steven G <stwidem@WCNOC.com>
Date: 6/20/02 12:25PM
Subject: RE: Request to docket information provided by licensee

Okay

-----Original Message-----

From: Jack Donohew [mailto:JND@nrc.gov]
Sent: Thursday, June 20, 2002 9:30 AM
To: jeyunk@WCNOC.com
Subject: RE: Request to docket information provided by licensee

Excuse the delay in my reply. The answer is to docket the title and revision of the reports (not the reports themselves) provided to the NRC staff, and the susceptibility table for the CCW pipe crack issue, and the photos and WCNOC Bulletin dated May 17, 2002, special report to Wolf Creek employees. <JND>

>>> Yunk Jennifer L <jeyunk@WCNOC.com> 06/20/02 08:42AM >>>
Jack - Are you requesting to docket the CCW table, telecon notes etc.? And also what specifically on the S/G foreign objects - photos of the objects or discussion?

Jen

-----Original Message-----

From: Jack Donohew [mailto:JND@nrc.gov]
Sent: Thursday, June 20, 2002 7:24 AM
To: TWEBER01@apsc.com; jeyunk@WCNOC.com; stwidem@WCNOC.com
Subject: Request to docket information provided by licensee

This e-mail is to request that the NRC may docket information provided previously to the NRC by e-mail on the following two subjects: (1) information from Wolf Creek Nuclear Operating Corporation on the pipe cracks in the CCW system found in the last refueling outage and on the foreign object found in the steam generator in the return to power from that outage, and (2) information from Arizona Public Service Company in support of conference calls on the steam generator tube inspections for the last Unit 2 and Unit 3 refueling outages. The information to be docketed would be that which was NOT labeled in some manner confidential.
Please response by replying to the e-mail.
<JND>