

From: "JER7@NRC.GOV" <jer7@nrc.gov> *ez*
To: "ERD@NRC.GOV" <erd@nrc.gov>
Date: 02/23/2007 3:47:20 PM
Subject: DB Ltr fm NEIL on Their Safety Concerns on PWR Rx Vessel Heads - CR on Subject

CC: "GCW@NRC.GOV" <gcw@nrc.gov>, "RLS4@NRC.GOV" <rls4@nrc.gov>, "JER7@NRC.GOV" <jer7@nrc.gov>

R-4

Mail Envelope Properties (45DF60BC.7DE : 5 : 26590)

Subject: DB Ltr fm NEIL on Their Safety Concerns on PWR Rx Vessel Heads -
CR on Subject
Creation Date 02/23/2007 3:46:36 PM
From: "JER7@NRC.GOV" <jer7@nrc.gov>
Created By: jer7@nrc.gov

Recipients

nrc.gov
ch_po.CH_DO
ERD (Eric Duncan)
GCW CC (Geoffrey Wright)
RLS4 CC (Richard Smith)
JER7 CC (John Rutkowski)

Post Office

ch_po.CH_DO

Route

nrc.gov

Files	Size	Date & Time
MESSAGE	2	02/23/2007 3:46:36 PM
Document.pdf	262581	
Mime.822	360855	

Options

Expiration Date: None
Priority: Standard
ReplyRequested: No
Return Notification: None

Concealed Subject: No
Security: Standard

Junk Mail Handling Evaluation Results

Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered

Junk Mail handling disabled by User
Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled

CONDITION REPORT

CR Number
07-15077

TITLE: NEIL LETTER IDENTIFIES POTENTIAL CONCERN

DISCOVERY DATE	TIME	EVENT DATE	TIME	SYSTEM / ASSET#
2/23/2007	N/A	2/23/2007	N/A	N/A N/A

EQUIPMENT DESCRIPTION N/A

DESCRIPTION OF CONDITION and PROBABLE CAUSE (If known) Summarize any attachments. Identify what, when, where, why, how.

O R I G I N A T I O N

On February 23, 2007, FENOC received, via letter from NEIL, a potential safety concern that arose out of the filings made by FENOC in the arbitration with Nuclear Electric Insurance Limited (NEIL) on the Davis-Besse Reactor Pressure Vessel Head claim. As stated in the letter, "In particular, [in a report submitted to NEIL, the] apparent position [of the report's preparer] is that susceptible materials can have crack growth rates that are significantly higher than previously assumed and small through wall cracks can lead to high rates of erosion and corrosion. Material susceptibility and crack growth rates are one of the bases for the NRC's requirements for monitoring reactor coolant system unidentified leak rates during power operation, visual (bare metal) inspections of reactor pressure vessel heads during refueling outages, and periodic volumetric examination of penetrations. If the theories in the [report] are correct, it could require reevaluation of the adequacy of these NRC requirements and the licensee programs implementing them to ensure that excessive degradation of a reactor pressure vessel head or other components could not occur in less than one operating cycle."

IMMEDIATE ACTIONS TAKEN / SUPV COMMENTS (Discuss CORRECTIVE ACTIONS completed, basis for closure.)

This CR was initiated as a result of receipt of the above letter and to evaluate this potential safety concern.

This condition does not describe any degraded condition or nonconforming condition for any systems, structures, or components. Recommend a category of "CF" to have Design Engineering evaluate the concern as identified in the subject letter. A new condition report will be written if the evaluation determines a degraded or nonconforming condition exists.

QUALITY ORGANIZATION USE ONLY		IDENTIFIED BY (Check one)		ATTACHMENTS	
Quality Org. Initiated	<input type="checkbox"/> Yes	<input type="checkbox"/> Individual/Work Group	<input type="checkbox"/> Self-Revealed	<input type="checkbox"/> Internal Oversight	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Quality Org. Follow-up	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Supervision/Management	<input type="checkbox"/> External Oversight		

ORIGINATOR	ORGANIZATION	DATE	SUPERVISOR	DATE	PHONE EXT.
WOLF, G	DBRC	2/23/2007	WUOKKO, D	2/23/2007	7120

SRO REVIEW	EQUIPMENT OPERABLE	OPERABILITY ASSESSMENT REQUIRED	ORG. NOTIFIED	IMMEDIATE INVESTIGATION REQUIRED	ORG. NOTIFIED	MODE CHANGE RESTRAINT
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No

MODE	ASSOCIATED TECH SPEC NUMBER(S)	ASSOCIATED LCO ACTION STATEMENT(S)
N/A	N/A	#1 N/A
		#2
		#3

DECLARED INOPERABLE (Date / Time)	REPORTABLE?	One Hour	Four Hour	Eight Hour	Other	APPLICABLE UNIT(S)
	<input type="checkbox"/> Yes <input type="checkbox"/> No					<input checked="" type="checkbox"/> U1 <input type="checkbox"/> U2 <input type="checkbox"/> Both
	<input type="checkbox"/> Eval Required					

COMMENTS

Current Mode - Unit 1	Power Level - Unit 1	Current Mode - Unit 2	Power Level - Unit 2
		N/A	N/A

SRO - UNIT 1	SRO - UNIT 2	DATE
	N/A	

CONDITION REPORT

CR Number
07-15077

TITLE: NEIL LETTER IDENTIFIES POTENTIAL CONCERN

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DISCOVERY DATE 2/23/2007	TIME N/A	EVENT DATE 2/23/2007	TIME N/A	SYSTEM / ASSET# N/A N/A
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EQUIPMENT DESCRIPTION N/A

FLOC System FLOC

DESCRIPTION OF CONDITION and PROBABLE CAUSE (if known) Summarize any attachments. Identify what, when, where, why, how.

On February 23, 2007, FENOC received, via letter from NEIL, a potential safety concern that arose out of the filings made by FENOC in the arbitration with Nuclear Electric Insurance Limited (NEIL) on the Davis-Besse Reactor Pressure Vessel Head claim. As stated in the letter, "In particular, [in a report submitted to NEIL, the] apparent position [of the report's preparer] is that susceptible materials can have crack growth rates that are significantly higher than previously assumed and small through wall cracks can lead to high rates of erosion and corrosion. Material susceptibility and crack growth rates are one of the bases for the NRC's requirements for monitoring reactor coolant system unidentified leak rates during power operation, visual (bare metal) inspections of reactor pressure vessel heads during refueling outages, and periodic volumetric examination of penetrations. If the theories in the [report] are correct, it could require reevaluation of the adequacy of these NRC requirements and the licensee programs implementing them to ensure that excessive degradation of a reactor pressure vessel head or other components could not occur in less than one operating cycle."

IMMEDIATE ACTIONS TAKEN / SUPV COMMENTS (Discuss CORRECTIVE ACTIONS completed, basis for closure.)

This CR was initiated as a result of receipt of the above letter and to evaluate this potential safety concern.

This condition does not describe any degraded condition or nonconforming condition for any systems, structures, or components. Recommend a category of "CF" to have Design Engineering evaluate the concern as identified in the subject letter. A new condition report will be written if the evaluation determines a degraded or nonconforming condition exists.

QUALITY ORGANIZATION USE ONLY Quality Org. Initiated <input type="checkbox"/> Yes Quality Org. Follow-up <input type="checkbox"/> Yes <input type="checkbox"/> No		IDENTIFIED BY (Check one) <input type="checkbox"/> Individual/Work Group <input checked="" type="checkbox"/> Supervision/Management		<input type="checkbox"/> Self-Revealed <input type="checkbox"/> Internal Oversight <input type="checkbox"/> External Oversight		ATTACHMENTS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
ORIGINATOR WOLF, G	ORGANIZATION DBRC	DATE 2/23/2007	SUPERVISOR WUOKKO, D	DATE 2/23/2007	PHONE EXT. 7120	

Eric,
This is the final/closed
CR write-up.

VLR
PK Smith

CONDITION REPORT

CR Number
07-15077

TITLE: NEIL LETTER IDENTIFIES POTENTIAL CONCERN

P L A N T O P E R A T I O N S	SRO REVIEW: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		EQUIPMENT OPERABLE: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		OPERABILITY ASSESSMENT REQUIRED: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		ORG. NOTIFIED		IMMEDIATE INVESTIGATION REQUIRED: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		ORG. NOTIFIED		MODE CHANGE RESTRAINT: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No								
	MODE: N/A		ASSOCIATED TECH SPEC NUMBER(S): N/A				ASSOCIATED LCO ACTION STATEMENT(S):														
							#1 N/A														
							#2														
							#3														
	DECLARED INOPERABLE (Date / Time): N/A			REPORTABLE?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Eval Required			One Hour: N/A			Four Hour: N/A			Eight Hour: N/A			Other: N/A			APPLICABLE UNIT(S): <input checked="" type="checkbox"/> U1 <input type="checkbox"/> U2 <input type="checkbox"/> Both		
	COMMENTS																				
	CR documents concerns from NEIL which do not make any T.S. equipment inoperable. Therefore, Equipment Operable is marked N/A. This condition is not reportable, Reportable marked No.																				
	Current Mode - Unit 1: 1			Power Level - Unit 1: 100			Current Mode - Unit 2: N/A			Power Level - Unit 2: N/A											
	SRO - UNIT 1: Kremer, B					SRO - UNIT 2: Myers, LD					DATE: 2/24/2007										
C R P A S U P V M R B	CATEGORY / EVAL: CF		ASSIGNED ORGANIZATION: DBDM			DUE DATE: 3/25/2007		REPORTABLE?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> LER No.													
	TREND CODES		Comp Type / ID (If Cause T or W)			Cause Org		REPORTABILITY REVIEWER: Wolf, G													
	Process / Activity / Cause Code(s): LP4 4000 NA					NONE		DATE: 02/26/07													
INVESTIGATION OPTIONS: <input type="checkbox"/> Maint.Rule <input type="checkbox"/> OE Evaluation								CLOSED BY:				DATE: 3/21/2007									

INVESTIGATION SUMMARY

CR Number:

07-15077

NOP-LP-2001-06

Category / Eval: CF Assigned Organization: DBDM Quality Followup Req'd: Yes No

For Fix Investigations Only:

Hardware / Degraded Condition Resolution Required? Yes No If Yes: Repair Scrap Rework Use-As-Is

Acceptance of the CR Investigation signifies acceptance of the following items, as applicable:

Corrective Actions (listed below)	Originator Identification (listed below, if any)	Date (listed below, if any)
Cause Analysis		
Generic Implications		
10 CFR 21 Decision Checklist		

Acceptance of Investigation: Byrd, K Date: 3/13/2007 Quality Approval: Date:

Site-VP Acceptance: Date:

Closure Comments:

Problem Statement:

FENOC received a letter from Nuclear Electric Insurance Limited (NEIL) that a potential safety concern arose out of the filings made by FENOC in the arbitration with NEIL on the Davis-Besse Reactor Vessel Head claim. The potential safety concern centers on information that was provided in Exponent Failure Analysis Associates report dated December 15, 2006. NEIL's concern is that Exponent has stated that susceptible materials can have crack growth rates that are significantly higher than previously assumed and small through wall cracks can lead to high rates of erosion and corrosion. Material susceptibility and crack growth rates are one of the bases for the NRC's requirements for monitoring reactor coolant system unidentified leak rates during power operation, visual inspections of reactor pressure vessel heads during refueling outages and periodic volumetric examination of penetrations. If the information provided in the report is correct and the NRC has not considered it in their requirements, than significant degradation of a reactor vessel head and other affected components could occur prior to being caught by licensee programs.

Resolution:

The key to determining whether Exponent's report identifies a new potential safety concern is whether or not this report identifies new information regarding crack growth rates and degradation that can occur from small through wall cracks in susceptible Alloy 600 material and Alloy 82/182 weld filler metal that would not be known to the NRC or the Nuclear Industry. Exponent has provided the following information on this topic:

"It is important to note that industry evaluations of potential crack growth rates in Alloy 600 materials used for various components in the reactor coolant system are not typically based on the highest crack growth rates ever determined from either laboratory tests or plant experience. Rather, as pointed out in the Exponent report (Exponent Report at pages 8-12, 8-13 and Figure 8.4), the industry uses a "disposition curve" for crack growth rates that envelops 75 percent of the industry data base for Alloy 600 crack growth rates. Implicit in this approach, which is accepted by the NRC, is that 25 percent of the available industry data on alloy 600 crack growth rates lie above this "disposition curve." Inspection requirements and inspection intervals, both visual for leakage and non-visual NDE for crack detection, are based on such evaluations. In this context then, the high crack growth rate reported in the November 2006 NRC/ANL report for Davis-Besse Nozzle 3 Alloy 600 material is but one of many data sets for Alloy 600 crack growth rates that lie above the 75 percent disposition curve, and none of the existing industry analyses for Alloy 600 components that are based on the industry disposition curve are invalidated by the experimental

INVESTIGATION SUMMARY

NOP-LP-2001-06

results for Davis-Besse Nozzle 3 determined by the NRC/ANL program. Moreover, clearly both the NRC and the industry are well aware of the NRC/ANL data that show high crack growth rates for the Davis-Besse Nozzle 3 Alloy 600 material. The Exponent Report adds nothing new to this data, but simply uses the NRC/ANL data to develop the timeline of Nozzle 3 cracking at Davis-Besse."

The heat of Alloy 600 material, M3935 used in the manufacture of Davis-Besse's CRDM nozzle 3 is also known by the Industry to be highly susceptible to cracking from it's performance at Oconee-3 and it's unexpected cracking morphology in the ANL tests. Material heat #M3935 was not used in the Midland head that is now installed at Davis-Besse (see attached documentation of material heat numbers for current RV head CRDM nozzles).

The NRC is also aware that small amounts of RCS leakage can cause significant degradation and can be tell tale indications of significant pressure boundary cracks. This is evident from the NRC's request to the Industry to commit to RCS unidentified leakage criteria that is much more restrictive than current Technical Specification limits for plants with unmitigated Alloy 82/182 welds.

Therefore, based on the above we do not believe that either the existing industry analyses for Alloy 600 RCS components at Davis-Besse, or the inspection requirements for the detection of cracks in such components, are affected by the high crack growth rates theorized in Exponent's report.

Note that the Exponent Report referenced in this Condition Report was prepared at the request of FirstEnergy Legal Counsel as part of the litigation between FirstEnergy and Nuclear Electric Insurance Limited (NEIL) regarding the Davis-Besse Reactor Head event. Therefore, this report and all related correspondence (including the letter from NEIL transmitting the potential safety concern to FENOC) are considered attorney-client communications, and as such are privileged and confidential. For those individuals with a need to know, contact Regulatory Compliance or the Legal Department to review a copy of the Exponent Report and the NEIL letter.

Quality Comments:

CORRECTIVE ACTIONS

CA Number:	Sched Type:	CA Type:	Cause Code:	Resp Org. Codes:	CA Acceptance:	Accept Date:	Due Date:	Completed Date:
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