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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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FILE: INES

March 21, 2002

NOTE TO COMMISSIONER ASSISTANTS

OCM/RM

__ Dennis Rathbun
cc Mike Tschiltz
__ Alan Levin
__ Jennifer Uhle
__ Keith McConnell
__ Christiana Lui
__ Bob McOsker
__ Marian Zobler
X Karen Henderson
__ Clare Kasputys
__ Barbara Gabriel
__ Linda Herr
__ Terry Agneu

OCM/GJD

cc Brad Jones
__ Cynthia Jones
X Tom Hiltz
__ Joe Olencz
__ Kerri Kavanagh
__ Donna Smith
__ Noble Green

OCM/ND

cc Maria Lopez-Otin
__ Roger Davis
X Rick Croteau
__ Diane Flack
__ Vicki Bolling

OCM/EM

cc Jeffry Sharkey
__ Kathryn Winsberg
X James Beall
__ Heather Astwood
__ Scott Moore
__ Linda Lewis
__ Judy Ledbetter

OCM/JM

cc Lynne Stauss
__ Margie Doane
X Brian McCabe
__ John Thoma
__ Lorna Kipfer
__ Tojuana Fortune

FROM: John W. Craig
Assistant for Operations, OEDO
Debra J Corley for

SUBJECT: INES RATING OF DAVIS-BESSE REACTOR HEAD DEGRADATION 'EVENT"

Attached please find the staff's rating of the Davis-Besse "event" in accordance with the INES user's manual. The event rating form provides the basis for a rating of "3," the most significant rating NRC has made for a reactor since full participation in the INES program began. The staff intends to inform the IAEA of this rating by March 27, 2002.

Attachment: As stated

cc: W. Travers, EDO (w/attachment)
C. Paperiello, DEDMRS (w/attachment)
W. Kane, DEDR (w/attachment)
P. Norry, DEDM (w/attachment)
J. Craig, AO (w/attachment)
S. Morris, OEDO (w/attachment)
J. Shea, OEDO (w/o attachment)
R. Wessman, IRO (w/o attachment)
SECY (w/attachment)
OGC (w/attachment)
OCA (w/attachment)
OPA (w/attachment)
OIP (w/attachment)
CIO (w/o attachment)
CFO (w/o attachment)
EDO R/F (w/attachment)

EDO-006

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

Draft

Mr. Dominique Delattre
INES Coordinator
Division of Nuclear Safety
International Atomic Energy Agency
Wagramerstrasse 5
P.O. Box 100
A-1400 Vienna
Austria

Dear Mr. Delattre:

Enclosed is a completed Event Rating Form for an event at the Davis-Besse Nuclear Power Station. The event involved the discovery of significant unexpected deterioration of reactor vessel head material in the vicinity of a penetration during an inspection conducted on March 8, 2002. This event was rated in accordance with Section IV-3.2.3 of the 2001 INES Users Manual. The event was assigned a rating of ***level 3.***

Sincerely,

Joseph J. Holonich, Deputy Director
Incident Response Operations

Enclosures:
INES Rating Form
Press Release

THE INTERNATIONAL NUCLEAR EVENT SCALE (INES)

EVENT RATING FORM (ERF)

TO BE SENT TO THE IAEA INES CO-ORDINATOR BY

IAEA, WAGRAMERSTRASSE 5. P.O. BOX 100, A-1400 VIENNA, AUSTRIA

- FAX. + 43 1 2060 29723
- PHONE. + 43 1 2060 22685
- E-MAIL: D.J C.DELATTRE@IAEA.ORG

EVENT TITLE	UNEXPECTED DETERIORATION OF REACTOR VESSEL HEAD MATERIAL IN VICINITY OF PENETRATION	EVENT DATE
		08.03.02

RATING	RATING DATE	OUT OF SCALE	BELOW SCALE	ON SCALE								SAFETY ATTRIBUTE		
PROVISIONAL ☐ FINAL ■				0	1	2	3	4	5	6	7		DEGR. DEFENCE IN-DEPTH	■
													ON-SITE IMPACT	
	15.03.02						■						OFF-SITE IMPACT	

COUNTRY	USA	FACILITY NAME	DAVIS-BESSE NUCLEAR POWER STATION	FACILITY TYPE	PWR

ASPECTS OF SIGNIFICANCE TO THE PUBLIC:

ACCIDENT ☐ INCIDENT ■ DEVIATION ☐

	YES	NO
- RADIOACTIVE RELEASES OFF-SITE	☐	■
- RADIOACTIVE RELEASES ON-SITE	☐	■
- WORKERS INJURED BY RADIATION	☐	■
- WORKERS INJURED PHYSICALLY	☐	■
- PLANT SAFETY IS UNDER CONTROL	■	☐
- THE EVENT REPORTED IS A DISCOVERY OF A DEFICIENCY BY ROUTINE SURVEILLANCE	☐	■
- A PRESS RELEASE WAS MADE (IF YES, PLEASE ATTACH IT)	■	☐

SHORT DESCRIPTION OF THE EVENT: On 8 March 2002, with the reactor shut down for a refueling outage, the licensee discovered a significant loss of reactor vessel head base material adjacent to a penetration nozzle that was being inspected. The licensee was performing an inspection of control rod drive nozzles in the reactor vessel head as required by the regulator (US NRC). During the repair of one of the nozzles, the licensee noted some deterioration of the base material surrounding the nozzle. The reactor vessel head is composed of an approximately 6.5 inch thickness of carbon steel base material with a stainless steel weld cladding applied to the interior surface. After removal of the nozzle and cleaning of the immediate surrounding area, the licensee discovered significant wastage of the carbon steel material adjacent to the nozzle boring with a total approximate size of 5 inches x 7 inches. The reactor vessel head material in this area had been reduced to a minimum thickness of less than 0.3 inches, which is the thickness of the cladding.

JUSTIFICATION OF THE RATING: This event was rated in accordance with Section IV-3.2.3 of the INES User's Manual "Potential Events (including structural defects)". The potential initiator (major LOCA) is considered to be an unlikely occurrence. According to Table III, this event, with safety function operability within Operating Limits and Conditions (applicable due to normally scheduled outages of safety equipment during long periods of operation of the unit) results in a base rating of 2/3.

The rating of 2/3 was confirmed to be level 3 based upon the size of the degraded structural area. In addition, the inspection revealing the condition was not part of the normal surveillance inspection process at this facility and the discovery of the degraded condition occurred only during inspections specifically required by the regulator. This condition, if not discovered, could have directly led to an accident. Thus, the rating of level 3 is appropriate.

CONTACT PERSON FOR FURTHER INFORMATION	NAME	Joseph J Holonich
	ADDRESS	USNRC, Washington, DC 20555
	PHONE	(301) 415-7482
	FAX	(301) 816-5151

PLEASE ATTACH ADDITIONAL INFORMATION ON JUSTIFICATION OF THE EVENT RATING AND DIFFICULTIES ENCOUNTERED, IF NEEDED

Davis-Besse Rating Flowchart:

1) Section IV-3.2.3 (page 37) Potential events (including structural defects)

- Assume the defect leads to a failure, if it could also lead to an initiator (refer to page 86, in this case a Major LOCA (unlikely))

2) Go to Page 33, Table III, to determine upper bound of rating

- Unlikely, with safety function operability within Operating Limits and Constraints = Level 2/3
- Safety Function Availability: Within OL&C due to time of existing condition (i.e., the LOCA could have occurred during a normally scheduled outage of safety equipment during an operating cycle)

3) Page 39 - Consideration of additional factors

- Level 3 (upper value) based on the size of the degraded structural area
- Additionally, the inspection revealing the condition was not part of the normal surviellance program, and was revealed only as a result of Bulletin inspections
- If not discovered, could have led to an accident

Actions:

- Approve INES Rating
- Inform Commission
- Inform the Licensee and NEI
- Inform OPA and OIP
- Post on IAEA Nuclear Events Web-based System (NEWS)
- Post on Davis-Besse Web Page
- Coordinate with Jim Blaha

NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF PUBLIC AFFAIRS, REGION III
801 Warrenville Road
Lisle IL 60532

Web Site: http://www.nrc.gov

No. III-02-002

CONTACT: Jan Strasma (630) 829-9663

March 12, 2002

E-mail: opa3@nrc.gov

NRC TO CONDUCT AUGMENTED INSPECTION OF DAVIS-BESSE REACTOR VESSEL DAMAGE

The Nuclear Regulatory Commission has begun a Augmented Team Inspection into damage to a small area of the top of the reactor vessel, apparently caused by corrosion, at the Davis-Besse Nuclear Power Station. The plant, located at Oak Harbor, Ohio, is operated by FirstEnergy Corporation.

The plant has been shut down since February 16 for refueling and maintenance.

The cavity in the top of the reactor vessel was discovered during inspection and repair activities in the outage. It is about 4 inches by 5 inches and approximately 6 inches deep. The reactor vessel head, fabricated of carbon steel with a stainless steel liner, is about 6 1/2 inches thick.

During the outage, plant personnel inspected 69 control rod tubes which pass through the reactor vessel head. The NRC issued a bulletin last August requiring the detailed inspections at Davis-Besse and other sites after cracking problems were found at several other nuclear plants.

Using ultrasonic techniques, FirstEnergy workers found cracks through the tube walls in three tubes, and lesser cracks in two additional tubes.

During repairs to one of the tubes with through-wall cracks, workers discovered the void adjacent to the tube.

The NRC's Augmented Inspection Team, comprised of metallurgical and engineering specialists, will monitor the utility's investigation and evaluation of the cavity and its determination of the conditions causing the damage. The inspection is being conducted to better understand the circumstances surrounding the corrosion and damage and to consider whether similar conditions might exist at other plants.

The preliminary cause of the damage appears to be corrosion as a result of boric acid deposits. Boric acid is a constituent of the water in the reactor cooling system and was apparently deposited on the reactor vessel through the leaking crack in the control rod tube or some other source.

The utility is developing its plans for repair of the reactor vessel head. The NRC will review

the utility's plans.

Following completion of the inspection, the NRC will hold a meeting in the plant vicinity to discuss the inspection findings. The meeting will be open to public observation.

The inspection report, issued about four weeks after the inspection, will be available on the agency's website and through its Electronic Reading Room at http://www.nrc.gov as an Agencywide Document Access and Management System (ADAMS) document. Help in using ADAMS is available through the NRC Public Document Room at 301/415-4737 or 800/397-4209.

The NRC has issued an Information Notice to operating nuclear plants to inform them of the corrosion damage at Davis-Besse. The notice will be available online in the Electronic Reading Room with the accession number of ML020700556.

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