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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC, 20555-0001
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PETITION FOR RULEMAKING

Mandatory Sharing of Information that is of Potential Regulatory Interest

This petition for rulemaking is submitted by Robert H. Leyse. Petitioner requests that the United States Nuclear Regulatory Commission require all of its resident inspectors at each nuclear power plant site to promptly share information with the agency that is of potential regulatory interest to the agency. This petition is at least partially inspired by the NRC press release of August 15, 2007, portions of which are copied below:

No. 07-102

August 15, 2007

NRC ISSUES ORDER TO FIRST ENERGY REGARDING INFORMATION RELEVANT TO REGULATORY ACTIVITIES

The Nuclear Regulatory Commission has issued a Confirmatory Order to FirstEnergy Nuclear Operating Company (FENOC), regarding the company's actions to ensure the prompt sharing of information of potential regulatory interest to the agency.

The Order is based on commitments FENOC made following the NRC's Demand for Information earlier this year. The demand dealt with documents and analyses the company commissioned for non-regulatory purposes, along with delays between FENOC's receipt of the information and its subsequent submittal to the agency. The analyses include the "Exponent Report," which discussed corrosion that severely weakened the Davis-Besse reactor vessel's head in 2002. The report provided conclusions that could have affected NRC-required activities at U.S. commercial reactors.

The Order requires FENOC to take several actions, including:

- ❖ Train selected employees by Nov. 30 to recognize and communicate information that could have a regulatory impact;
- ❖ Use an outside consultant to review FENOC staff's sensitivity to potentially important information in January 2008 and 2009, reporting the results and any follow-on actions to the NRC, and;
- ❖ Develop a formal review procedure for technical reports created for non-regulatory uses, to ensure recognition of the reports' possible regulatory impacts.

Following are examples of cases in which at least some resident inspectors either were aware of, or should have been aware of, the need to insure prompt sharing of information of potential regulatory interest to the agency. Apparently the resident inspectors did not promptly share that information with the agency.

Template = SECY-051

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SECY-02

1. A proprietary EPRI report, **BWR Fuel Deposit Sample Evaluation, River Bend Cycle 11 Crud Flakes** was reviewed by NRC inspectors. I have been told, *“This was an analysis of the fuel crud performed by the Electric Power Research Institute (EPRI). The EPRI analysis evaluated a sample of crud taken directly from the River Bend Station failed fuel. This document was marked proprietary. As such, the inspectors were restricted from disclosing sensitive information contained in the analysis to the general public. Instead, the inspectors sought other available information to provide a description of fuel crud cooling characteristics. The referenced document, **Two-Phase Flow and Heat Transfer**, D. Butterworth and G. F. Hewitt, Oxford University Press, 1977, suited this purpose.”*

Now, it is evident that the proprietary EPRI report, **BWR Fuel Deposit Sample Evaluation, River Bend Cycle 11 Crud Flakes**, that was (apparently temporarily) available to NRC inspectors, has information that is of potential regulatory interest to the agency. It is also evident that the resident inspectors did not share this information with the agency. Therefore, the resident inspectors or other involved NRC personnel must become subject to requirements that are comparable to FENOC’s as is illustrated in the above press release No. 07-102.

2. Ultrasonic Fuel Cleaning has been deployed at several sites and the NRC resident inspectors should have been aware of the equipment and procedures and the relevance of that information as of potential regulatory interest to the agency. There is no evidence that the resident inspectors were aware of the practice, and if they were aware of the practice, there is no evidence that they recognized ultrasonic fuel cleaning and the reasons therefore as being of potential regulatory interest to the agency.

The following disclosures by industry groups NEI and EPRI to NRC were well after the implementation of ultrasonic fuel cleaning at several licensed nuclear power reactors. To date there has been no documented NRC review and approval of the equipment and procedures, although the equipment and procedures have been applied at several nuclear power reactors in addition to those cited below.

 1. (80) Transcript of ACRS Reactor Fuels Subcommittee - Open Session, September 30, 2003, pages 1-152/229-281. ML032940295 2003-09-30 255

Ultrasonic Fuel Cleaning was discussed at the above meeting.

  1. (80) 10/01/2003 Summary of Meeting With Nuclear Energy Institute Regarding High Burnup Fuel Issues. ML032930358 2003-10-16 5

Following is from the above document:

Mr. J. Deshon made a presentation on “Ultrasonic Fuel Cleaning Technology.” He described the current “single channel” and more advanced “dual channel” fuel cleaners. He indicated that these ultrasonic fuel cleaning technologies have been successfully tested at Callaway and South Texas Project, respectively. The use of these fuel cleaners could reduce fuel crud, avoid axial offset anomaly related operational problems, and minimize personnel radiation exposure during refueling outages.



Here are portions of slides from the above set.

PWRs that have now ultrasonically cleaned fuel:

Callaway

Purpose: AOA avoidance

Callaway experienced varying degrees of AOA from Cycle 4 through 11. In combination with reducing fuel duty, CY12 was free of AOA and CY13 has had no indications through 7500 MWD/MTU

South Texas Project Unit I

Purpose: AOA avoidance, allowed a reduction in fuel assembly purchases

* First cleaning performed in October 2002

South Texas Project Unit 2

Purpose: AOA avoidance following SG replacement & up-rate, allowed a reduction in fuel assembly purchases

* First cleaning performed in April 2003

Next PWR planning to ultrasonically clean fuel: Vogtle Unit I

Planned Date: October 2003

Purpose: AOA avoidance (in anticipation of Injecting Zn) and dose rate reduction

..... *.....*.....*.....*a.....

First BWR planning to ultrasonically clean fuel: Quad Cities Unit 2

Planned Date: Spring 2004 Purpose: *Dose rate reduction*

* Mock-up testing taking place at Vallecitos, 16 discharged assemblies will be cleaned on a pre-trial basis in Fall 2003. Anticipate cleaning first reload assemblies in Spring 2004.

3. Reports of main condenser performance and fuel element crud at Energy Northwest

This section illustrates information that is available to the public (on a delayed basis). The point is that reactor inspectors never shared the following with the agency as

information of potential regulatory interest. Indeed, the reactor inspectors may not have been aware of these reports.

These reports, dated June 2006, are partially buried on the web site for Energy Northwest and are indexed under News and Information, Columbia Generating Station Information, and they may be found as follows:

<http://www.energy-northwest.com/downloads/Main%20Condenser.pdf>

<http://www.energy-northwest.com/downloads/Main%20Condenser%20Addendum%201.pdf>

Here is part of the first page of the interesting report on the main condenser that covers events that took place during a decade. The events include fouling (crud build-up) on the nuclear fuel elements.

Columbia Generating Station Main Condenser

By W. Scott Oxenford, VP Technical Services

This document summarizes longstanding performance issues related to the design and operation of the Main Condenser at Columbia Generating Station and solutions to those challenges.

The following categories summarize the issues in introductory level detail:

1. System Components Overview
2. Condenser Leakage
3. Columbia's Condenser
4. Columbia Historical Actions
5. Can Columbia Eliminate Condenser Leakage by Eliminating Debris?
6. Industry Data and Experience
7. Solutions

The following paragraph is copied from page 5 of the Main Condenser report:

Columbia's management has thoroughly reviewed options for managing ongoing condenser challenges. On each occasion, continued operating risks were accepted instead of taking action, primarily to avoid costs and extended outage length.

The photograph that follows is from page 16 of the Main Condenser report. It shows the crud that has formed on the fuel rods. The crud layers are a heat transfer barrier that is not considered in the nuclear plant design or licensing process. Furthermore, with the

crud layers, the fuel element has an increased friction factor that is also not considered in the design and licensing process. This is information of potential regulatory interest.



FIGURE 5C, Fuel that has been in the reactor for four cycles, following chemical contamination in the last cycle. Nodule formation and spallation is evident.

CGS 4-Cycle Bundle (After Chronic Condenser Leak)

There is a lot of depth to this reporting by Energy Northwest, but the reporting was never directed to the Nuclear Regulatory Commission.

Of course, there are undoubtedly additional situations that resident inspectors have encountered and have not reported to the agency even though those situations have been of potential regulatory interest to the agency. Clearly, the NRC must train all of its resident inspectors at each nuclear power plant site to recognize information that is of potential regulatory interest to the agency. The resident inspectors must be required to promptly report that information to the agency.

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Dated: August 24, 2007

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Date: Fri, Aug 24, 2007 3:08 PM
Subject: Petition for Rulemaking

It is attached.

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