

3069

General Information**Assigned Office:** NRR**OEDO Due Date:** 01/24/2014**Other Assignees:****SECY Due Date:****Date Response****Requested by Originator:****Other Parties:** Tanya Mensah, NRR; Merrilee Banic, NRR; Andrea Russell, NRR; David Pelton, NRR; Mary Spencer; OGC**Subject:** 2.206 - Condenser Tube Degradation at James A. FitzPatrick Nuclear Power Plant**Description:****CC Routing:** OGC, Region I**ADAMS Accession Numbers - Incoming:****Response / Package:****Other Information****Cross Reference No:****SRM\Other:** No**Process Information****Action Type:** 2.206 Review**OEDO Concurrence:** No**Signature Level:****OCM Concurrence:** No**Special Instructions:****OCA Concurrence:** No**Document Information****Originator Name:** David Lochbaum**Date of Incoming:** 07/25/2013**Originator Org:** Union of Concerned Scientists**Document Received by OEDO Date:** 07/25/2013**Addressee:** R. W. Borchardt, EDO**Incoming Task:** E-mail**OEDO POC:** Dan Merzke

TEMPLATE: EDO-001

ERIDS: EDO-01

Boyer, Rachel

From: Borchardt, Bill
Sent: Thursday, July 25, 2013 11:39 AM
To: Boyer, Rachel
Subject: Fw: 2.206 Petition re: condenser tube degradation at FitzPatrick
Attachments: 20130725-jaf-ucs-nrc-condenser-tube-events.pdf

Bill Borchardt
Via blackberry

From: Dave Lochbaum <DLochbaum@ucsusa.org>
To: Borchardt, Bill
Cc: Dean, Bill; Thadani, Mohan; Jessica@allianceforgreeneconomy.org <Jessica@allianceforgreeneconomy.org>; Gunter, Paul <paul@beyondnuclear.org>; Judson.tim@gmail.com <Judson.tim@gmail.com>; Deb katz <deb@nukebusters.org>
Sent: Thu Jul 25 09:30:20 2013
Subject: RE: 2.206 Petition re: condenser tube degradation at FitzPatrick

Sorry - the petition is attached this time.

From: Dave Lochbaum
Sent: Thursday, July 25, 2013 9:08 AM
To: Bill.Borchardt@nrc.gov
Cc: Bill.Dean@nrc.gov; Mohan.Thadani@nrc.gov; Jessica@allianceforgreeneconomy.org; Gunter, Paul; Judson.tim@gmail.com; Deb katz
Subject: 2.206 Petition re: condenser tube degradation at FitzPatrick

Dear Mr. Borchardt:

Attached is a 10 CFR 2.206 petition submitted on behalf of the Alliance for a Green Economy, Beyond Nuclear, Citizens Awareness Network, and the Union of Concerned Scientists asking that the NRC take enforcement action to require that the degrading condenser tubes at the FitzPatrick nuclear plant be replaced prior to the unit restarting from its fall 2014 refueling outage.

We not not plan to also mail in a hard copy of this electronic version, but would be glad to do so upon request.

Thanks,
David Lochbaum
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Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

July 25, 2013

R. William Borchardt, Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Recurring Condenser Tube Leaks and Petition Pursuant to 10 CFR §2.206 for the James A. FitzPatrick Nuclear Power Plant

Dear Mr. Borchardt:

On behalf of the Alliance for a Green Economy, Beyond Nuclear, Citizens Awareness Network, and the Union of Concerned Scientists, I respectfully submit this petition pursuant to 10 CFR §2.206.

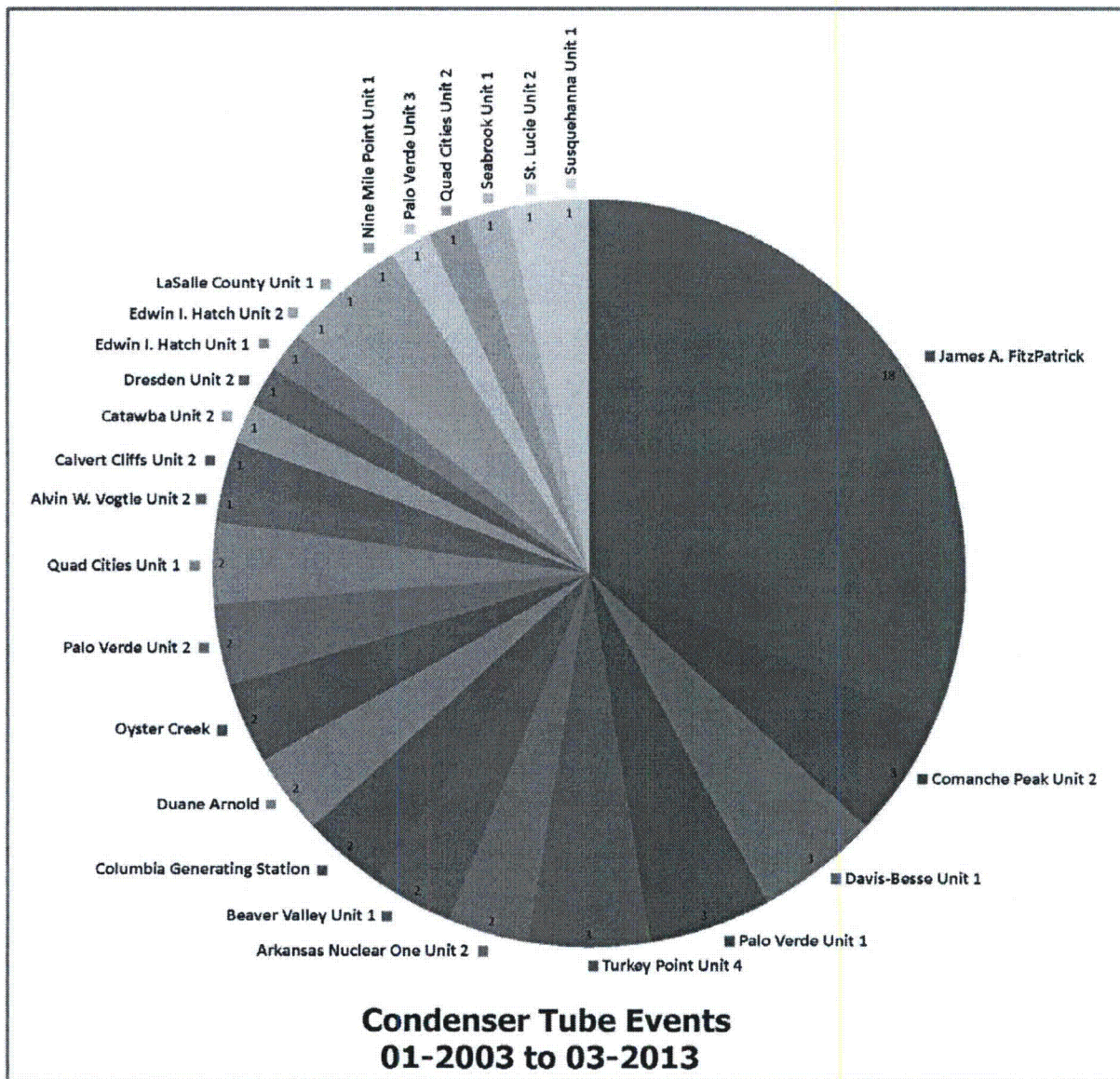
Each quarter, the Nuclear Regulatory Commission (NRC) staff places monthly operating data reports into the Agencywide Documents Access and Management System (ADAMS). For example, the reports for the first quarter of 2013 are in ADAMS at <http://pbadupws.nrc.gov/docs/ML1312/ML13126A379.pdf>. I read each of these reports and transfer items of interest into a database of events. These items include planned and unplanned reactor shut downs, reactor startups, and significant power reductions for non-routine maintenance and testing. Among the items are events when operators shut down a reactor or reduce its power level due to condenser tube leaks.

Condenser tube leaks are noteworthy for several reasons. The condenser is the normal heat sink for the heat produced by the reactor core when it is operating and when it is shut down. Condenser tube leaks could cause the normal heat sink to become unavailable. The NRC's reactor oversight process recognizes the elevated risk associated with a reactor shut down with complications (see <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/unplanned-scrams-with-complications.html>). Condenser tube leaks could cause the normal heat sink to become unavailable which in turn can complicate the operator's response to a reactor shut down.

In addition, condenser tube leaks have caused extensive damage to nuclear plant components. UCS described a September 1972 event at Millstone Unit 1 in a post to our blog (<http://allthingsnuclear.org/fission-stories-3-high-tide-in-the-reactor/>). This reactor was shut down for months while workers replaced components within the reactor vessel that had been damaged by sea water leaking in through failed condenser tubes.

Over the 43 months between January 1, 2003, and March 31, 2013, the operating data reports described 57 condenser tube events at U.S. nuclear power plants – an average of slightly over 1.3 events per month across the U.S. fleet.

But the events are not scattered uniformly across this fleet. One reactor has experienced over 30 percent of condenser tube events in the past decade – the James A. FitzPatrick Nuclear Power Plant in your region. FitzPatrick has reported 18 condenser tube leaks. For comparison, the next highest number of events over this period is only three (a four-way tie among Comanche Peak Unit 2, Davis-Besse Unit 1, Palo Verde Unit 1, and Turkey Point Unit 4).



More troubling is the recent trend that strongly suggests the bad situation at FitzPatrick is getting worse. FitzPatrick reported three condenser tube events in 2011, nine in 2012, and four during the first three months of 2013.

**Condenser Tube Events at U.S. Nuclear Power Reactors
January 1, 2003 to March 31, 2013**

| Reactor | Date | State | Event Description |
|-----------------------------|----------|-------|--|
| James A. FitzPatrick | 20130322 | NY | The operators reduced the reactor power level to 47 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20130318 | NY | The operators reduced the reactor power level to 45 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20130223 | NY | The operators reduced the reactor power level to 49 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20130201 | NY | The operators reduced the reactor power level to 44 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20121220 | NY | The operators reduced the reactor power level to 46.6 percent at 11:00 pm to plug leaking main condenser tubes. |
| Comanche Peak Unit 2 | 20121119 | TX | The operators halted the reactor power ascension at 50 percent for repairs to leaking main condenser tubes. |
| Palo Verde Unit 2 | 20121110 | AZ | The operators held the reactor power level at 40 percent while workers plugged leaking condenser tubes. |
| Davis-Besse Unit 1 | 20121109 | OH | The operators reduced the reactor power level to 50 percent for repairs to a leaking condenser tube. |
| James A. FitzPatrick | 20121109 | NY | The operators reduced the reactor power level to 49.1 percent at 5:47 am to plug leaking condenser tubes. |
| James A. FitzPatrick | 20120905 | NY | The operators reduced the reactor power level to 49 percent to plug leaking condenser tubes. |
| Dresden Unit 2 | 20120830 | IL | The operators shut down the reactor due to condenser tube leaks. |
| James A. FitzPatrick | 20120725 | NY | The operators reduced the reactor power level to 49 percent to plug leaking condenser tubes. |
| James A. FitzPatrick | 20120619 | NY | The operators reduced the reactor power level to 49 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20120614 | NY | The operators reduced the reactor power level to 47 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20120401 | NY | The operators reduced the reactor power level to 11 percent to troubleshoot a recirculation pump motor low oil level alarm and to plug leaking condenser tubes. |
| Palo Verde Unit 1 | 20120225 | AZ | The operators reduced the reactor power level to 40 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20120125 | NY | The operators reduced the reactor power level to 48 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20120115 | NY | The operators reduced the reactor power level to 48 percent to repair a leaking condenser tube. |
| Oyster Creek | 20120111 | NJ | The operators reduced the reactor power level to repair a leaking condenser tube. |
| Arkansas Nuclear One Unit 2 | 20111220 | AR | The operators reduced the reactor power level to 47 percent to repair a leaking condenser tube. |
| James A. FitzPatrick | 20111202 | NY | The operators reduced the reactor power level to 48 percent to repair a leaking condenser tube. |
| Comanche Peak Unit 2 | 20111111 | TX | The operators reduced the reactor power level to 54 percent to repair a leaking condenser tube. |
| Catawba Unit 2 | 20111013 | SC | The operators reduced the reactor power level to 45 percent to repair a leaking condenser tube. |
| Palo Verde Unit 1 | 20110928 | AZ | The operators reduced the reactor power level to 40 percent to repair a condenser tube leak. |
| Susquehanna Unit 1 | 20110705 | PA | The operators reduced the reactor power level to 73 percent due to increased condenser conductivity caused by leaking condenser tubes. |
| Comanche Peak Unit 2 | 20110519 | TX | The operators manually tripped the reactor from 97 percent power due to a condenser tube leak that caused sodium concentrations in the steam generator to increase. |
| James A. FitzPatrick | 20110506 | NY | The operators reduced the reactor power level to 50 percent to repair main condenser tube leaks. |
| James A. FitzPatrick | 20110430 | NY | The operators reduced the reactor power level to 54 percent to repair a main condenser tube leak. |
| Beaver Valley Unit 1 | 20101210 | PA | The operators reduced power to 82 percent for repairs to two leaking condenser tubes. |
| Turkey Point Unit 4 | 20101209 | FL | The operators tripped the reactor when a condenser tube leak caused high sodium levels in the steam generators. |
| Columbia Generating Station | 20100603 | WA | The operators reduced the reactor power level to 55 percent for repairs to condenser tubes. |
| LaSalle County Unit 1 | 20100115 | IL | The operators reduced the reactor power level to 55 percent to repair a condenser tube leak. |
| Columbia Generating Station | 20090709 | WA | The operators reduced the reactor power level to 55 percent to plug a leaking condenser tube. |
| Turkey Point Unit 4 | 20090527 | FL | The operators reduced the reactor power level so leaking condenser tubes could be identified and plugged. |
| Beaver Valley Unit 1 | 20090416 | PA | The operators reduced the reactor power level to 82 percent for workers to repair a condenser tube leak. |
| Quad Cities Unit 2 | 20090416 | IL | The operators reduced the reactor power level so leaking condenser tubes could be identified and plugged. |
| James A. FitzPatrick | 20090413 | NY | The operators reduced the reactor power level to 46 percent to plug a leaking condenser tube. |
| Arkansas Nuclear One Unit 2 | 20090228 | AR | The operators reduced the reactor power level to 90 percent due to a condenser tube leak. |
| Nine Mile Point Unit 1 | 20090225 | NY | The operators reduced the reactor power level to 43 percent to repair a condenser tube leak. |
| Quad Cities Unit 1 | 20081031 | IL | The operators reduced the reactor power level to add oil to a recirculation pump motor and to repair a condenser tube. |
| Seabrook Unit 1 | 20080605 | NH | The operators reduced the reactor power level to 30 percent to repair a condenser tube leak. |
| Quad Cities Unit 1 | 20080411 | IL | The operators reduced the reactor power level to 23 percent to repair a condenser tube leak and to add oil to the recirculation pump 1A lower motor bearing. |
| Oyster Creek | 20071219 | NJ | The operators manually scrambled the reactor when a feedwater pump tripped on low suction pressure. The operators had reduced the reactor power level for maintenance on the recirculation pump motor-generator sets and to repair condenser tube leaks. A worker's error in the circulating water lineup to the condenser caused low suction pressure for the feedwater pump. |
| James A. FitzPatrick | 20071003 | NY | The operators reduced the reactor power level to 64 percent to repair a condenser tube leak. |
| Palo Verde Unit 2 | 20070725 | AZ | The operators reduced the reactor power level to 40 percent to repair a condenser tube leak. |
| Palo Verde Unit 3 | 20070529 | AZ | The operators reduced the reactor power level to 40 percent to plug a condenser tube leak in hotwell 1A. |
| Davis-Besse Unit 1 | 20070518 | OH | The operators reduced the reactor power level from 100 percent to 40 percent to repair a condenser tube leak. The operators reduced the reactor power level from 40 percent to 20 percent for a containment entry to add oil to a reactor coolant pump. |
| Davis-Besse Unit 1 | 20070323 | OH | The operators reduced the reactor power level to 47 percent to locate and plug a leaking condenser tube. |
| Edwin I. Hatch Unit 1 | 20070130 | GA | The operators shut down the reactor for repairs to bypass valve spargers 1 and 2, condenser tubes, and the condenser inlet isolation valve. |
| Calvert Cliffs Unit 2 | 20060128 | MD | The operators reduced the reactor power level and took the generator offline at 12:45 am. The operators further reduced the reactor power level to 3 percent while workers searched for the source of high conductivity in the condenser hotwell water. A condenser tube leak was identified and plugged in condenser waterbox 21B. The unit was connected to the electrical grid at 1:13 pm. The operators returned the reactor power level to 100 percent at 6:45 pm. |
| St. Lucie Unit 2 | 20060120 | FL | The operators manually tripped the reactor due to a condenser tube leak in condenser 2B2. |
| Turkey Point Unit 4 | 20051028 | FL | Workers identified condenser tube leaks that delayed the reactor restart. |
| Alvin W. Vogtle Unit 2 | 20050523 | GA | The operators manually tripped the reactor due to indications of an extraction steam bellows rupture in the line to feedwater heater 3C and increasing feedwater sodium concentrations. Workers identified multiple extraction steam bellows failures and a single condenser tube rupture. |
| Edwin I. Hatch Unit 2 | 20050523 | GA | The operators manually scrambled the reactor due to adverse water chemistry trends indicative of condenser tube leakage. |
| Duane Arnold | 20031103 | IA | The operators manually shut down the reactor to repair a condenser tube leak. |
| Palo Verde Unit 1 | 20030327 | AZ | The operators manually tripped the reactor when a condenser tube leak caused secondary system sodium limits to be exceeded. |
| Duane Arnold | 20030201 | IA | The operators manually scrambled the reactor at 2:33 am due to high conductivity in the hotwell caused by a suspected condenser tube leak. Workers found that a deflector plate downstream of the 1E-5B low pressure feedwater heater dump valve CV-1340 broke loose and punctured a condenser tube and dented several other tubes. The deflector plate failed after approximately four months of continuous use of CV-1340 instead of the drain valve for heater level control. |

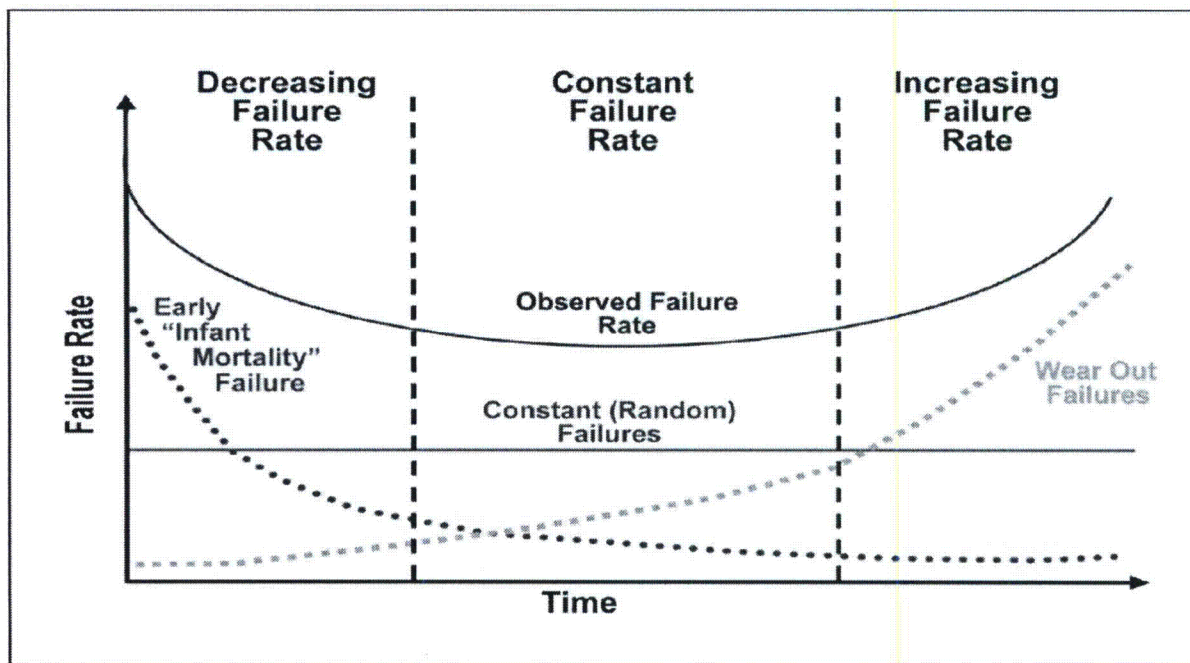
The evidence strongly suggests that (a) the condenser tubes at FitzPatrick are degrading, (b) the degradation rate is accelerating, and (c) the frequency of condenser tube events is increasing.

Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, to 10 CFR Part 50 (see <http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-appb.html>) requires that plant owners develop and maintain quality assurance programs. This regulatory requirement explicitly states:

As used in this appendix, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

Sixteen condenser tube events at FitzPatrick during the 11 months from January 1, 2011 to March 31, 2013 is compelling empirical evidence that components are NOT performing satisfactorily in service. This unsatisfactory performance is made even more evident by the fact that no other nuclear power reactor in the United States is experiencing condenser tube events at even close to the frequency they are occurring at FitzPatrick.

Quite simply, the condenser tubes are wearing out at FitzPatrick. The NRC staff explained this aging phenomenon recently in their analysis of age-related incidents from licensee event reports and inspection findings between 2007 and 2011 (see <http://pbadupws.nrc.gov/docs/ML1304/ML13044A469.pdf>). This NRC memo contained the "bathtub curve."



The increasing frequency of condenser tube events at FitzPatrick constitutes irrefutable evidence that these components are in the right-hand region of the bathtub curve where wear-out failures occur at increasing rates.

Your staff concedes this point and the owner's fault. In its report dated April 23, 2013, covering the biennial problem identification and resolution inspection at FitzPatrick (see <http://pbadupws.nrc.gov/docs/ML1211/ML12114A279.pdf>), the NRC staff stated:

The [NRC] team observed that Entergy did not properly consider FitzPatrick operating history, specifically the 4 years of outages, when projecting the expected condenser tube life. Consequently, Entergy did not properly plan and design for condenser tube replacement prior to tube leakage which has necessitated frequent downpowers for repair. Planned corrective actions include condenser tube sleeving during the Fall 2012 refueling outage and a complete replacement of all condenser tubes in the Fall 2014 refueling outage.

The track record for plant owners making good on their plans to implement safety fixes is mixed. When safety fixes are not implemented on schedule, the public shoulders the burden from unnecessarily elevated risk.

On July 1, 2013, the NRC issued a confirmatory order (see <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML13114A928'>) to the owner of the Oconee nuclear plant. This order transformed the owner's previously stated plans for implementing safety upgrades into more enforceable regulatory requirements. In other words, the NRC must now formally review and approve any delays in completing the safety upgrades. Before this order, the owner could have unilaterally deferred completion deadlines.

While perhaps not posing the same heightened risk to the public as the safety shortcomings at Oconee, condenser tube degradation at FitzPatrick poses risks to the public. The plant's owner has plans to remedy this safety problem by replacing all the tubes during a refueling outage scheduled for fall of 2014. But the owner could readily – and without NRC approval – revise its plans to correct this problem at a later date.

Therefore, we petition the NRC under Section 2.206 to 10 CFR to take enforcement action¹ by imposing a regulatory requirement that all the condenser tubes be replaced at FitzPatrick prior to the reactor restarting from its fall 2014 refueling outage.

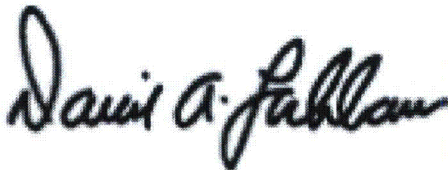
The enforcement action we request is needed to protect the public from the owner opting to defer correcting this safety problem. As the NRC has explicitly noted, the owner failed to “properly plan and design for condenser tube replacement” and is experiencing abnormally high occurrences of condenser tube failures. The fall 2014 refueling outage provides the owner with sufficient time to properly plan for the replacement of the degrading tubes. Any further delays

¹ The form of this enforcement action is up to the NRC: it could be via an order, or by amendment of the operating license to include a license condition, or any comparable means that result in the owner having to formally obtain NRC permission before operating FitzPatrick beyond its fall 2014 refueling outage without having replaced all its condenser tubes.

would benefit the owner at the public's expense. Because this owner is clearly at fault (as the NRC has found), it is unfair for the public to continue picking up the tab for the owner's poor performance. If the owner does not replace the tubes during its refueling outage in fall 2014, then extending the downtime of the reactor until the replacements are finally completed would more equitably share the burden between the owner (who is at fault) and the public (which has no blame in this matter).

We, the petitioners, would like to exercise our right to address the NRC staff before the Petition Review Board (PRB) meets to consider our request. We believe we have clearly articulated the enforcement action we are requesting as well as its justification, but seek the pre-PRB meeting to highlight key issues as well as answer any clarifying questions the NRC staff may ask.

Sincerely,

A handwritten signature in black ink that reads "David A. Lochbaum". The signature is fluid and cursive, with the first name "David" being the most prominent.

David Lochbaum
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