NUCLEAR REGULATORY COMMISSION

[Docket No. 50–346; License No. NPF–3EA–03–214]

In the Matter of FirstEnergy Nuclear Operating Company, (Davis-Besse Nuclear Power Station, Unit 1); Confirmatory Order Modifying License (Effective Immediately)

I.

FirstEnergy Nuclear Operating Company (FENOC, or the Licensee) is the holder of Facility Operating License No. NPF–3 issued on April 22, 1977, by the Nuclear Regulatory Commission (NRC or Commission) pursuant to 10 CFR Part 50. The license authorizes the operation of Davis-Besse Nuclear Power Station, Unit 1 (Davis-Besse), in accordance with conditions specified therein. The facility is located on the Licensee’s site in Ottawa County, Ohio.

II.

The discovery of circumferential cracking in some of the control rod drive mechanism (CRDM) nozzles that penetrate the reactor pressure vessel (RPV) head at Oconee Nuclear Station, Unit 3, in February 2001, and Oconee Nuclear Station, Unit 2, in April 2001, raised concerns about the potential safety implications and prevalence of cracking in RPV head penetration nozzles in pressurized-water reactors (PWRs). In response to these concerns, the NRC issued NRC Bulletin 2001–01 on August 3, 2001. The bulletin required all PWR operators to report to the NRC on the structural integrity of the CRDM nozzles, including their plans to ensure that future inspections would verify structural integrity of the reactor vessel boundary. Davis-Besse was shut down on February 16, 2002, when it began its 13th refueling outage, which included an inspection of CRDM nozzles. On March 6, 2002, FENOC employees discovered a cavity in the RPV head. The cavity was the result of corrosion caused by long-term leakage of reactor coolant, which contains boric acid, from small cracks in one of the CRDM nozzles.

The NRC staff subsequently determined that FENOC’s failure to properly implement its boric acid corrosion control and corrective action programs was a performance deficiency that allowed reactor coolant system pressure boundary leakage to occur undetected for a prolonged time, resulting in RPV upper head degradation. The NRC determined that the Licensee’s performance deficiency had high safety significance, in the Red range, as documented in a letter to the Licensee dated May 29, 2003 (ADAMS Accession No. ML031490778).

The NRC took a series of actions in response to the discovery of the cavity in the Davis-Besse RPV head. An Augmented Inspection Team was sent to Davis-Besse on March 12, 2002, to collect facts regarding the conditions that led to the head degradation. Additionally, the NRC issued a Confirmatory Action Letter (CAL) to the Licensee on March 13, 2002 (ML020730225), confirming the Licensee’s agreement that NRC approval is required for restart of Davis-Besse. The CAL also documented a number of

Committee on Education and Human Resources (9 a.m.–11:30 a.m.)

Room 1235

• Approval of Minutes
• Comments from the Chair
• Report from the Subcommittee on S&E Indicators
• Broadening Participation Workshop
• Presentation on EHR Priorities and 2005 Budget

Plenary session of the Board (12:45 p.m.–3:30 p.m.)

Room 1235

• Approval of Open Minutes from February, 2004
• Resolution to Close Portions of May, 2004
• Chairman’s Report, including — Report on Senate Appropriation Hearings — Update on Smithsonian Institution Funding — Director’s Report — Committee Reports

Closed

Ad Hoc Committee on the 2004 Vannevar Bush Awards (8:15 a.m.–9 a.m.)

Room 1240

• Discussion of Candidates
• Balloting

Plenary session of the Board (11:45 a.m.–12:15 p.m.)

Room 1235

In Executive Closed Session:

• Nominating Committee Election
• Approval of Honorary Awards

In Closed Session:

• Approval of Minutes from February, 2004
• NSB Member Proposals
• Closed Committee Reports, if Any

Michael P. Crosby,
Executive Officer, NSB.

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actions that the Licensee must implement before restart. By letter dated April 29, 2002 (ML021190661), the NRC informed FENOC that its corrective actions at Davis-Besse would receive enhanced NRC oversight, as described in NRC Inspection Manual Chapter 0350, “Oversight of Operating Reactor Facilities in a Shutdown Condition With Performance Problems.” That enhanced monitoring began on May 3, 2002, and included the creation of a panel to provide the required oversight during the plant shutdown and during and after any future restart until a determination is made that the plant is ready for return to the NRC’s normal reactor oversight process.

By letter dated April 18, 2002 (ML021130029), “Confirmatory Action Letter Response—Root Cause Analysis Report,” the Licensee submitted to the NRC its technical root cause analysis report for the RPV head degradation, as revised by letter dated September 23, 2002 (ML022750125), “Revision 1 to Root Cause Analysis Report Regarding Reactor Pressure Vessel Head Degradation.” The Licensee concluded that the probable cause of the degradation was primary water stress corrosion cracking of the nozzle. The physical factors that caused corrosion of the RPV head were the CRDM nozzle leakage associated with through-wall cracking, followed by boric acid corrosion of the RPV low-alloy steel. The Licensee further concluded that the large-scale corrosion occurred as a result of a failure to detect and arrest the leakage until advanced symptoms had appeared.

The Licensee submitted to the NRC its nontechnical root cause analysis by letter dated August 21, 2002 (ML022750405), “Management and Human Performance Root Cause Analysis Report on Failure to Identify Reactor Pressure Vessel Head Degradation.” In this analysis, the Licensee concluded that “there was a lack of sensitivity to nuclear safety and the focus was to justify existing conditions. The overall conclusion is that Management ineffectively implemented processes and thus failed to detect and address plant problems as opportunities arose.” The Licensee identified a number of root causes for the failure to identify boric acid corrosion of the RPV head, including:

1. Less-than-adequate nuclear safety focus—A production focus established by management, combined with minimum action to meet regulatory requirements, resulted in acceptance of degraded conditions on the RPV head and other components affected by boric acid.

2. Less-than-adequate implementation of the corrective action program, as indicated by the following:
   a. Addressing symptoms rather than causes
   b. Low categorization of conditions
   c. Less-than-adequate cause determinations
   d. Less-than-adequate corrective actions
   e. Less-than-adequate trending
   f. Less-than-adequate analyses of safety implications—Failure to integrate and apply key industry information and site knowledge/experience, effectively use vendor expertise, and compare new information to baseline knowledge led to less-than-adequate analyses and decisionmaking with respect to the nuclear safety implications of boric acid on the reactor vessel head and in the containment.

3. Less-than-adequate compliance with the boric acid corrosion control and in-service test programs—Contrary to these programs, boric acid was not completely removed from the RPV head. The affected areas were not inspected for corrosion and leakage from nozzles and the sources of the leakage were not determined.

As documented in NRC Inspection Report No. 50–346/02–15 (ML030380037), dated February 6, 2003, the NRC concluded that the Licensee’s management and human performance initial root cause analyses were not sufficiently broad to identify potential contributors in the engineering and corporate support areas and were not developed in an integrated manner to identify potentially systemic issues. Additional analyses were performed by the Licensee, including assessments in the areas of operations, engineering, oversight, and corporate support, and were evaluated by the NRC, as documented in NRC Inspection Report No. 50–346/02–18 (ML032050528), dated July 24, 2003. Following review of the additional FENOC analyses, the NRC concluded that the Licensee’s overall nontechnical root cause assessment was of appropriate depth and breadth to develop actions to correct and prevent recurrence of the management and human performance deficiencies associated with the RPV head degradation.

Corrective actions taken by the Licensee included the development of a Return-to-Service Plan, which described FENOC’s actions for Davis-Besse’s safe and reliable return to service. The Return-to-Service Plan was initially submitted to the NRC on May 21, 2002 (ML021430429), the NRC has been revised several times, most recently on April 6, 2003 (ML031000739).

The NRC Davis-Besse Oversight Panel established a Restart Checklist, which lists the essential issues requiring disposition prior to restart. The Restart Checklist was originally issued on August 16, 2002 (ML022310034), and has been revised as necessary by the Oversight Panel based on the results of NRC inspections and the Licensee’s assessments. The Restart Checklist addresses those issues necessary to resolve the causes of the RPV head degradation so that the Licensee can safely restart and operate the plant. For example, issues requiring resolution before the Oversight Panel can consider a recommendation for restart include (1) the adequacy of safety-significant structures, systems, and components inside containment, (2) the adequacy of safety-significant programs, such as the corrective action program, self-assessment programs, and the boric acid corrosion management program, and (3) the adequacy of organizational effectiveness and human performance, including the effectiveness of corrective actions.

While the Restart Checklist establishes those essential actions necessary for safe restart and operation, a key element in preventing recurrence of a safety-significant event such as the RPV head degradation is effective Licensee self-assessment. Given the magnitude, scope, and duration of problems found at Davis-Besse, and that the Licensee’s own self-assessments were not effective in preventing risk-significant performance deficiencies, additional assurance that the Licensee’s self-assessment programs remain effective is essential.

III.

To address the issues identified above and ensure sustained safe performance in plant operation, the Licensee developed the Davis-Besse Nuclear Power Station Operational Improvement Plan—Operating Cycle 14, which was submitted to the NRC by letter dated November 23, 2003, “Integrated Report to Support Restart of the Davis-Besse Nuclear Power Station and Request for Restart Approval” (ML033360251) and most recently revised on January 27, 2004 (ML040280597). The Operational Improvement Plan provides for a managed transition from the Return-to-Service Plan to normal plant operations and refueling outages. The purpose of the Operational Improvement Plan is to ensure that improvements realized during the extended outage remain in place and are further built upon to improve performance in the future.

On November 12, December 9, and December 10, 2003, the Licensee met
with the NRC staff regarding the Davis-Besse Nuclear Power Station
Operational Improvement Plan for Operating Cycle 14. Among other long-
term corrective actions, the Operational Improvement Plan focuses on Licensee
initiatives to measure and sustain achievements in the areas of
management and human performance at Davis-Besse. The Operational
Improvement Plan contains a number of key improvement initiatives, including
continuing actions in the areas of operations, engineering, safety culture, and corrective actions.

As assurance that the Operational Improvement Plan initiatives are
sufficient to ensure the continued integrity of the reactor coolant system and
correction of the underlying management and organizational
problems which led to the RPV head degradation, the Licensee also
committed to the following actions. By
letters dated March 31 (ML030930451) and
November 14, 2003 (ML033220323), FENOC committed to conduct certain
inspections every refueling outage for
leakage from the RPV upper head and
from pressure-retaining components above the RPV head. These include the
CRDM flanges. In addition, by letter dated July 30, 2003 (ML032160384), FENOC committed to conduct similar
inspections of the reactor vessel
underside incore monitoring instrumentation nozzles, including
during the Cycle 14 midcycle outage. As
noted in the NRC staff assessment
(ML032510339), the midcycle
inspection was planned to assure prompt
identification of any significant reactor coolant
system pressure boundary
leakage should it develop. The midcycle
outage activities will provide additional confirmation of the material status of the reactor coolant system.

Notwithstanding the corrective actions completed to address the CAL
and Restart Checklist and planned by the Licensee in the Operational
Improvement Plan, the NRC requires additional measures with respect to
independent assessments and midcycle inspections to provide reasonable
assurance that the long-term corrective actions remain effective for those
conditions that resulted in risk-
significant performance deficiencies.
During the course of the extended
shutdown of Davis-Besse beginning in
February 2002, FENOC conducted a
number of thorough evaluations and
self-assessments. Examples include the
evaluation of system design, the
assessment of the completeness and
accuracy of design information, the
evaluation of operational performance
deficiencies during the normal
operating pressure test, and the
evaluation of the failure to comply with
technical specification requirements
during testing of the steam and
feedwater rupture control system. However, Licensee assessments of
operational performance prior to both
the normal operating pressure test and
the NRC’s Restart Readiness Assessment
Team Inspection in December 2003
failed to identify a number of
deficiencies. NRC inspections also
discovered problems that were not
originally found by the Licensee, most
notably in safety culture, in the
corrective action program, and in the
quality of engineering calculations and
analyses. These issues indicated
weaknesses in the Licensee’s ability to
assess, find, and correct conditions
adverse to quality. In addition, on
November 23, 2003, the Licensee
concluded that the plant, programs, and
personnel were ready to support safe
operation, subject to completion of a
few, well-defined work activities prior to
restart, and requested the NRC
schedule a meeting as stated in the CAL,
and then provide approval for restart. A
meeting was originally scheduled for
December 18, 2003, to discuss restart.
However, due to self-revealing
equipment and operational problems
and issues from the NRC Restart
Readiness Assessment and the
Management and Human Performance
inspection teams, the meeting was
delayed. Given the Licensee’s previous
conclusion that it was ready to support
safe operation, these problems were
additional evidence of inadequate self-
assessment. Since then, the NRC
recognizes that FENOC has
implemented significant corrective
actions resulting in improved
performance and self-assessment
capability. Nevertheless, considering the
problems noted above and going forward, the NRC requires independent
outside assessments to ensure continued
effective Licensee self-assessments and
sustained safe performance in the areas of
operations, engineering and
corrective actions at Davis-Besse.

On February 26, 2004, the Licensee
executed a consent form in which it
committed to implement the conditions in
Section IV below with respect to future independent assessments of
operations, safety culture, corrective
actions, and engineering at Davis-Besse,
and inspections of the reactor coolant
system pressure boundary during a
midcycle outage. The independent
assessments will provide important
confirmation of the effectiveness of the
Licensee’s self-assessments and long-
term improvement actions. The reactor
coolant system pressure boundary
inspections will assure prompt
identification of any leakage should it
develop. The Licensee further agreed
that this Order would be effective upon
issuance and waived its right to a
hearing.

I find that the Licensee’s
commitments, as set forth in Section IV,
are acceptable and necessary and
conclude that with these commitments,
plant safety is reasonably assured. In
view of the foregoing, I have determined
that public health and safety require
that the Licensee’s commitments be
confirmed by this Order. Based on the
above, this Order is immediately
effective upon issuance.

IV.

Accordingly, pursuant to Sections
103, 161b, 1611, 161o, 182 and 186 of the Atomic Energy Act of 1954, as
amended, and the Commission’s
regulations in 10 CFR 2.202 and 10 CFR
Part 50, it is hereby ordered, effective
immediately, that Licensee No. NP-3 is
modified as follows:

1. FENOC shall contract with
independent outside organizations to
conduct comprehensive assessments of
the Davis-Besse operations performance,
organizational safety culture, including
safety conscious work environment, the
corrective action program
implementation, and the engineering
program effectiveness. Ninety days prior
to the assessments, FENOC shall inform
the Regional Administrator, NRC Region
III, in writing, of the identity of its
outside assessment organizations,
including the qualifications of the
assessors, and the scope and depth of the
assessment plans. These outside
independent assessments at Davis-Besse
shall be completed before the end of the
4th calendar quarter of 2004 and
annually thereafter for 5 years. Within
45 days of completion of the
assessments, the Licensee shall submit
by letter to the Regional Administrator, NRC Region III, all assessment results
and any action plans necessary to
tackle issues raised by the assessment
results.

2. FENOC shall conduct a visual
examination of the reactor pressure
vessel upper head bare metal surface,
including the head-to-penetration
interfaces; the reactor pressure vessel
lower head bare metal surface,
including the head-to-penetration
interfaces; and the control rod drive
mechanism flanges, using VT–2
qualified personnel and procedures
during the Cycle 14 midcycle outage.
The results and evaluation of the
inspections will be reported by letter to
the Regional Administrator, NRC Region
III. prior to restart from the midcycle outage, and any evidence of reactor coolant leakage found during the inspections will be reported by telephone within 24 hours of discovery to the Regional Administrator, NRC Region III, or designee.

If the Licensee determines that submittals made in accordance with these conditions contain proprietary information as defined by 10 CFR 2.390, the Licensee shall also provide a nonproprietary version in accordance with 10 CFR 2.390(b)(1)(ii). The Regional Administrator, NRC Region III, may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee of good cause.

V.

Any person adversely affected by this Confirmatory Order, other than the Licensee, may request a hearing within 20 days of its issuance. Where good cause is shown, consideration will be given to extending the time to request a hearing. A request for extension of time in which to request a hearing must be made in writing to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and must include a statement of good cause for the extension. Any request for a hearing shall be submitted to the Secretary, U.S. Nuclear Regulatory Commission, ATTN: Chief, Rulemakings and Adjudications Staff, Washington, DC 20555. Copies of the hearing request shall also be sent to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555, to the Assistant General Counsel for Materials Litigation and Enforcement at the same address, to the Regional Administrator for NRC Region III, 801 Warrenville Road, Lisle, Illinois 60532–4351; telephone (630) 829–9870; or by e-mail at pjl2@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The U.S. Nuclear Regulatory Commission (NRC) is considering the issuance of a license amendment Material License No. 13–10179–01 issued to Pfizer Inc. (the licensee), to terminate its license and authorize release of its Terra Haute, Indiana, facility for unrestricted use. The NRC staff has prepared an Environmental Assessment (EA) in support of the proposed action in accordance with the requirements of 10 CFR part 51. Based on the EA, the NRC has concluded that a Finding of No Significant Impact (FONSI) is appropriate. The amendment will be issued following the publication of this Notice.

II. EA Summary

The purpose of the proposed action is to terminate Pfizer Inc.’s license and release its Terra Haute, Indiana, facility for unrestricted use. The NRC authorized Pfizer Inc. to utilize labeled compounds of H–3 and C–14 for research and development on July 17, 1964. On September 25, 2003, Pfizer Inc. submitted a license amendment request to terminate its license and release its Terra Haute facility for unrestricted use. Pfizer Inc. has conducted surveys of the facility and provided information to the NRC to demonstrate that the site meets the license termination criteria in subpart E of 10 CFR part 20 for unrestricted release. The staff has examined Pfizer Inc.’s request and the information that the licensees has provided in support of its request, including the surveys performed by Pfizer Inc. to demonstrate compliance with 10 CFR 20.1402, “Radiological Criteria for Unrestricted Use,” in order to ensure that the NRC’s decision is protective of the public health and safety and the environment.

III. Finding of No Significant Impact

The staff has prepared the EA (summarized above) in support of Pfizer Inc.’s proposed license amendment to terminate its license and release the Terra Haute facility for unrestricted use. Based on its review, the staff has determined that the affected environment and the environmental impacts associated with the decommissioning of Pfizer Inc.’s facility are bound by the impacts evaluated by the “Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities” (NUREG–1496). Additionally, no non-radiological impacts were identified. The staff also finds that the proposed release for unrestricted use of the Pfizer Inc. facility is in compliance with the 10 CFR 20.1402, and finds no other activities in the area that could result in cumulative impacts. On the basis of the EA, the staff has concluded that the environmental impacts from the proposed action would not be significant. Accordingly, the staff has determined that a FONSI is appropriate, and has determined that the preparation of an Environmental Impact Statement is not warranted.

IV. Further Information

In accordance with 10 CFR 2.790 of the NRC’s “Rules of Practice,” Pfizer Inc.’s request, the EA summarized above, and the documents related to this proposed action are available electronically for public inspection and copying from the Publicly Available Records (PARS) component of NRC’s document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. These documents include Pfizer Inc.’s letter dated September 25, 2003, with enclosures (Accession No. ML040090414); and the EA summarized above (Accession No. ML040560303). These documents may also be viewed electronically on the public computers located at the NRC’s Public Document Room (PDR), O 1 F21, One White Flint North, 11555 Rockville Pike, Rockville,