

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
Thomas E. Murley, Director

In the Matter of)	(10 CFR 2.206)
)	Docket No. 50-341
DETROIT EDISON COMPANY)	
(Fermi-2))	
)	

DIRECTOR'S DECISION UNDER 10 CFR 2.206

INTRODUCTION

By Petition to the Director, Office of Nuclear Reactor Regulation, dated February 4, 1988, pursuant to 10 CFR 2.206, the Honorable James Caldwell, the Honorable Steven Langdon, the Honorable Herb Gray, and the Honorable Howard McCurdy, members of the Canadian Parliament (Petitioners), have appealed the decision to allow Fermi-2 to go into full-power operation. The Petitioners base this request upon information contained in a January 15, 1988 letter to Detroit Edison Company (Licensee) from Mr. A. Bert Davis, Regional Administrator, Region III of the United States Nuclear Regulatory Commission (NRC), and an attached Regulatory Assessment, authorizing Fermi-2 to operate at full power. According to the Petitioners, these documents reveal the existence of a number of deficiencies at the plant that should have prevented the NRC from granting this authorization. The Petitioners also base this request on their assertion that Fermi-2 should not be allowed to operate because of certain deficiencies in the plant's design and certain past attempts by the Licensee to withhold information from the NRC.

As specific relief, the Petitioners request: (1) that the January 15, 1988 decision authorizing full-power operation be overturned; (2) that the license to operate Fermi-2 be revoked; and (3) that the Licensee be required to prove, to the satisfaction of both the NRC and the relevant Canadian authorities, that it is absolutely safe to operate the plant and that such operation does not endanger the health and safety of the people of Windsor and Essex County, Canada.

By letter dated March 16, 1988, I advised the Petitioners that the issues raised in the Petition were under consideration and that the NRC would respond within a reasonable time. For the reasons set forth below, I have determined that the Petition should be denied.

DISCUSSION

A. BACKGROUND

Before assessing Petitioners' contentions, a review of the background of this matter would be helpful. Detroit Edison Company, the licensee for Fermi-2, received a full-power operating license for Fermi-2 on July 15, 1985. This license was granted without NRC knowledge of an out-of-sequence rod-pull event that occurred under a lower power license on July 2, 1985, and resulted in the reactor going critical prematurely. Following disclosure of the event, the NRC issued a Confirmatory Action Letter (CAL), dated July 19, 1985, to the Licensee. This CAL, among other things, confirmed the Licensee's commitment to obtain concurrence from NRC prior to exceeding 5 percent power.

In addition to the rod-pull event, numerous Technical Specification and procedural violations occurred at Fermi-2 between July 1, 1985 and

October 15, 1985. These violations, along with the out-of-sequence rod-pull event, were described in an NRC inspection report for Fermi-2 (50-341/85040(DRP)) dated November 14, 1985. A total of \$375,000 in civil penalties was assessed by the NRC for these violations.

Because of the nature and magnitude of the Fermi-2 problems, the Licensee was not allowed to resume operating the unit beyond 5 percent power. A 10 CFR 50.54(f) letter was issued on December 24, 1985, identifying the NRC's concern and requesting that the Licensee evaluate and address management weaknesses, develop a comprehensive plan to ensure the readiness of the facility to restart, and identify the actions necessary to improve regulatory and operational performance.

The Licensee responded to the 10 CFR 50.54(f) letter on January 29, 1986. Actions taken by the Licensee included improving its operations and security plans, changing management personnel and structure, and forming an Independent Overview Committee (IOC). The NRC reviewed and found these corrective actions to be acceptable. Additionally, hold points in the power ascension of Fermi-2 at 20, 50 and 75 percent of full-power were established which could not be exceeded until the NRC had assessed Fermi's operations at each stage and found them acceptable. To accomplish these assessments, an NRC Restart Team was formed, led by a senior NRC manager. The IOC also independently assessed the Licensee's ability to exceed these regulatory hold points. The power ascension and assessments required almost two and one-half years to complete. By letter of January 15, 1988, Fermi-2 was released from the final hold point of 75 percent and allowed to go to full-power. This letter is the subject of the Petition.

B. THE PETITIONERS' CONCERNS WITH THE JANUARY 15, 1988 LETTER AND THE ATTACHED REGULATORY ASSESSMENT

Regional Administrator A. Bert Davis' January 15, 1988 letter authorizing the Licensee to allow Fermi-2 to proceed beyond 75 percent power is based primarily on the recommendations of a special NRC team of managers and technical experts established to monitor the Licensee's initiatives and plant performance. This team closely monitored the Licensee's performance during Fermi-2's operation up to and through each hold point. As part of its decision of whether to release the plant from the 75 percent power hold point, the team considered all known areas of weakness. It then analyzed whether sufficient improvement had been made or would be expected in these areas to support full-power operation. Input for the Regional Administrator's decision to release the plant from the 75 percent power hold point was also provided by the NRC's Office of Nuclear Reactor Regulation and by Region III technical divisions. During this period, the IOC also independently assessed the Licensee's performance.

The Restart Team's conclusions were listed in a detailed written assessment (hereinafter referred to as the NRC Staff Assessment) which was included as an attachment to the January 15, 1988, letter. The Restart Team concluded that identified problems at the facility had either been resolved or sufficient progress had been made in resolving them to allow Fermi-2 to be operated safely at full power. It also noted that some areas still required improvement. The January 15, 1988 letter of Mr. Davis incorporated these same conclusions and also stated that continued work and effort by the Licensee was required.

The Petitioners claim that these words of caution by the Restart Team and Mr. Davis, advising the Licensee that improvement is required, are

grounds for their requested relief since they signify that the facility is not ready to be operated. We do not agree, since the statements in question ^{1/} were intended to encourage the Licensee to strive for excellence and to improve its past performance. A challenge to achieve excellence is often given by the NRC to licensees, and it was not intended to imply that the Licensee is not competent to safely operate Fermi-2. If the NRC had believed that Fermi-2 could not be safely operated, then the Licensee would have been ordered to shut down the facility.

The Petitioners also claim that the NRC Staff Assessment reveals that there are a number of problem areas ^{2/} remaining at the facility that

^{1/} One of these statements relied upon by the Petitioners is Mr. Davis' advice to the Licensee that "while your almost three months of continuous operation has shown a positive trend toward improved performance, and your overall operation is considered acceptable, significant work and effort on your part is still required to become a good performer." The Petitioners also quoted a statement by Mr. Davis that, "attention to detail, good communications, adherence to procedures and operational performance standards, as well as a slow and cautious approach with strong management oversight and teamwork are requisites to continued successful performance." The Petitioners claim these statements establish that the Licensee lacks important attributes necessary to operate a nuclear facility and that the Licensee is not a "good performer." However, the Petitioners mischaracterize these statements since they were not intended to convey that the Licensee lacks these attributes (i.e., attention to detail, good communications, etc.); rather, the Licensee was being reminded, as might any licensee who is about to begin full-power operation, that these are the types of qualities necessary to safely operate a nuclear facility. Similarly, the encouragement for the Licensee to become a "good performer" was not intended to mean that the Licensee was incapable of operating the facility safely; it was merely a recommendation that the Licensee strive to be better.

^{2/} According to the Petitioners, these alleged problem areas, as listed in the NRC Staff Assessment, include: the adequacy of the T-C-3 testing of the feedwater system; the unexpected vibration of the reheater tank emergency drain line; the need for repairs and replace-

should have prevented the NRC from allowing it to be operated. As a basis for this claim, the Petitioners have quoted from those portions of the report where deficiencies were listed. Significantly, however, they have ignored those portions of the report that explained that these deficiencies had either been corrected in whole or at least sufficiently to allow the facility to operate safely at full power. By ignoring the corrective measures that were taken, they have failed to provide any basis to suggest that the facility cannot be safely operated. Under these circumstances, no basis has been provided for the relief the Petitioners seek.

The Petitioners' underlying basis for their request to shut down Fermi-2 appears to be that nuclear plants with identified problems should not be allowed to operate. However, although it is expected that licensees will pay meticulous attention to, and achieve and maintain a high level of compliance with, NRC requirements, it is recognized that errors may occur. What is most significant is that violations, when identified, are properly assessed in terms of understanding their

(FOOTNOTE FROM PREVIOUS PAGE)

ment of parts following the plant scram of December 31, 1987; the concern for main steam line and RHR head spray piping vibration; the failure to have site-specific loop accuracy calculations to justify the performance of instruments during harsh accident conditions; the failure to have the safety parameter display system fully operational; the higher-than-normal number of events that occurred since the last assessment; an increase in the corrective maintenance backlog; the failure to conduct early review sessions of the Control Room Evaluation Program; several NRC enforcement matters that had not yet been fully resolved; the failure to have a final emergency response plan in place for all of Windsor and Essex County; concerns with the Licensee's program to improve Technical Specifications; and a failure of the Licensee's testing program to verify feedwater control.

significance and cause, and that necessary corrective actions are taken to prevent their recurrence. Discrete violations at a nuclear facility do not give rise to a significant safety concern so long as they have been cured or are being cured, and there has been no overall breakdown in a licensee's programs that would raise legitimate doubt about the safety of the facility. See Philadelphia Electric Co. (Limerick Generating Station Units 1 and 2), DD-85-11, 22 NRC 149, 161 n. 7 (1985); Arizona Public Service Co. (Palo Verde, Unit 2), DD-86-8, 24 NRC 151, 166 (1986). In the case of Fermi-2, after deficiencies and programmatic breakdowns were identified in 1985, the NRC staff assured safe operation by requiring the facility to operate at reduced power levels until the problems were sufficiently addressed. A special team was assigned to monitor the Licensee's initiatives to resolve these problems and the plant's performance. Only after this team, the Region, and the Office of Nuclear Reactor Regulation were satisfied that these problems were being properly addressed was Fermi-2 allowed to operate at full power.

In reaching its decision to release Fermi-2 from the 75 percent power hold point, the NRC considered in detail the items now cited by the Petitioners from the January 15, 1988, letter and attached NRC Staff Assessment. The NRC also carefully weighed many of these same issues in allowing Fermi-2 to proceed past the hold points for power ascension that had been previously set. The Petitioners have not produced any facts to undermine these findings. Under these circumstances, I conclude that the issues cited by the Petitioners with respect to the January 15, 1988 letter and the NRC Staff Assessment do not provide a basis for granting the requested relief.

C. OTHER CONCERNS RAISED BY THE PETITIONERS

In addition to their concerns arising out of the January 15, 1988 letter and the NRC Staff Assessment, the Petitioners have identified the following additional problems concerning Fermi-2.

1. The General Electric Mark I Reactor

The Petitioners claim that certain NRC research establishes that the General Electric Mark I reactor, which is the design for Fermi-2, is an old and inherently risky reactor design whose containment will fail in 90 percent of severe accident scenarios.

The Petitioners' concerns are based on information contained in Draft NUREG-1150 (February 1987), "Reactor Risk Reference Document," which is a recent NRC draft analysis of different reactor designs.

The evaluation of severe accident vulnerability involves three distinct evaluations. First, the probability of an accident involving core damage. Second, the likelihood of containment failure and third, an assessment of the radiological consequences and public doses resulting from the accident. All three issues must be considered in making a determination on the magnitude of severe accident risk and what actions should prudently be taken to reduce those risks.

The studies which have been conducted emphasize that the results inherently possess large uncertainties. The draft results of NUREG-1150 present the most recent program, whose intent is to accurately reflect the severe accident risk at a number of U.S. nuclear power plants, and also to properly reflect the areas of uncertainty. This study included an evaluation for Peach Bottom, a plant quite similar to Fermi in reactor design and containment. The study presented the estimated mean frequency

of core damage to be approximately one chance in 100,000 per year of operation. Another comprehensive risk study conducted for the Limerick plant estimated a mean core damage probability of 1 in 10,000.

These results are consistent with NRC's belief that core melt accidents are very unlikely. Draft NUREG-1150 also investigated the probability of early containment failure following a core melt. This study concluded that our ability to accurately predict the response of a Mark I containment was limited for situations where it was subjected to the harsh temperature and pressure conditions following a core melt accident. As stated earlier, the report indicated that containment failure probability (for these extremely unlikely events) could likely range from 10 to 90 percent.

These uncertainties are currently the subject of research efforts to better predict the behavior of containments during severe accidents, so that a more complete risk perspective can be assembled for guiding our regulatory activities. However, it is important that these uncertainties be properly characterized. They are not identified deficiencies in the BWR Mark I containments, which have been demonstrated to satisfy their design performance requirements. Rather, these uncertainties are areas which guide our research investigations, whose goals are to provide improved understanding of very unlikely risk situations at nuclear power facilities. Results from these studies (including high containment failure probabilities) also allow us to calculate public risk estimates assuming that one element of the three which go into a risk assessment (containment failure) is less favorable.

Even allowing the large uncertainties which result in a high upper value for containment failure, the NUREG-1150 study estimated that the probability of a large reactor accident that results in one or more early fatalities ranged from one in one million to one in one billion. Given a severe accident, the probabilities of very high radiation exposure and the distances over which they would occur were also estimated to be reasonably small. The risk levels for Fermi would of course depend on its actual core melt probability, containment behavior, the local demography, and could vary somewhat from the results presented in NUREG-1150. The results of this and related studies do, however, support our overall conclusion of low severe accident risk at the Fermi plant. One contributing factor is that the massive reactor containment structures may retain considerable radioactive material following a core melt even if its pressure boundary is failed. In this regard, containment failures include cracks or other phenomena that result in loss of pressure integrity that can result in leaks but should not be viewed solely as catastrophic failure of the containment structure. Plateout and deposition of material within containments, even though there may be leakage, also increase the time available to implement effective evacuation activities.

While we believe that severe accident risks are low at operating nuclear plants, our goal is to pursue additional activities to achieve even lower levels of public risk. To assure that our risk conclusions are applicable to all operating units, a number of programs are going forward to assess severe accident likelihood and consequences. These programs include plant specific studies to determine any severe accident vulnerabilities, both from the perspective of accident frequencies and

from containment performance following a core melt. Any problems will be dealt with if identified. This program is known as the individual plant examination (IPE) program which is expected to commence later this year. These and related programs will be conducted to provide further assessments of severe accidents on a plant specific basis, so that appropriately low risk levels can be maintained.

2. The Exemption From Inerting

The Petitioners also contend that Fermi-2 is unsafe because of the exemption it has received from the general rule requiring the inerting of the primary containment system with nitrogen. According to the Petitioners, this exemption endangers the surrounding area by increasing the risk for an accident at the reactor.

At the outset, it should be noted that the inerting exemption is no longer operative and the facility is now required to be inerted in accordance with its technical specifications. Nevertheless, in addressing this contention, a brief technical explanation of this subject is helpful. The purpose of inerting is to limit the possibility of post-accident hydrogen explosions inside the primary containment. To prevent such explosions, the containments of boiling-water reactors (BWRs) are normally inerted during operation. However, there is an exception to this general rule, which has been granted to Fermi-2 and almost all other recently licensed BWRs, that allows reactor licensees limited exemptions from inerting during initial operation so that they can perform start-up testing. These exemptions are limited to the end of start-up testing or 120 effective full-power days, whichever occurs first. Start-up tests are important since they insure that the nuclear facility's systems function

as designed and that problems identified during the testing are corrected. It is best that the reactor's containment not be inerted during certain tests so that personnel can enter it for visual inspections. The potential for an accident and subsequent hydrogen explosion during start-up testing is small because the plant generally operates at lower power levels and experiences several start-ups and shut-downs during this period which decrease the potential build-up of fission products.

Because of the need for start-up testing and the small degree of risk of explosion during this testing, the decision to allow Fermi-2 and other BWRs limited exemptions from inerting was fully justified. Upon expiration of this exemption, Fermi-2 was inerted in accordance with the requirements of the technical specifications governing the operation of the facility.

3. The Alleged Inadequate Infrastructures

The Petitioners claim that there have been "continual discoveries of inadequate infrastructure included in the construction of the reactor" that has resulted in continuing accidents and problems at the plant.

Although it is not entirely clear what the Petitioners mean by their use of the word "infrastructure," I disagree with this characterization if they are implying that the design of Fermi-2 is deficient. The NRC has found that the design of this unit meets our regulation. Nevertheless, I acknowledge that there have been deficiencies in the implementation of this design into the as-built features of the plant and the plant's Technical Specifications and operating procedures. Many of the Fermi-2 operational problems were caused by these deficiencies. However, as discussed above, these deficiencies, and the Licensee's resolution of

them, were taken into account during the NRC's detailed regulatory assessment following its Confirmatory Action Letter of July 19, 1985. Based upon this assessment, the NRC staff determined that these deficiencies had been adequately resolved or were in the process of being resolved in a time-frame and manner acceptable to support NRC's release from each hold point.

For these reasons, to the extent that Fermi-2 may have had an "infrastructure" problem, the Petitioners' concern is not valid since remedial action has been already taken.

4. The Large Number of Violations at Fermi-2 and the Withholding of Information From the NRC

The Petitioners also claim that Fermi-2 has one of the highest levels of "fines" for breaches of NRC regulations of any nuclear reactor in the United States, and that one of these violations, which involved the Licensee withholding information about the facility reaching criticality just before it was issued an operating license in 1985, is grounds for now revoking this license.

Although Fermi-2 has experienced a large number of violations compared to other reactors, the NRC has devoted considerable regulatory oversight to Fermi-2 to assure that the problems causing these violations have been adequately addressed. Regulatory actions taken by this Agency have included issuance of the July 19, 1985, Confirmatory Action Letter and the December 24, 1985, 10 CFR 50.54(f) letter, discussed above. In addition, civil penalties have been levied to emphasize the seriousness of the violations and the need for the Licensee to improve its operations. The Licensee's initiatives, designed to rectify these problems, have included significant management and organizational changes, and numerous

improvement programs focused on improving personnel and hardware performance.

These improvements and regulatory actions have provided reasonable assurance to the NRC that the problems causing these violations are being properly addressed and that the present operation of Fermi-2 at full power is justified. The NRC will continue to closely monitor the operation of Fermi-2 in the future. The information-withholding incident in 1985, which the Petitioners claim constitutes a basis for withdrawing the facility's operating license, was acted upon by the NRC in 1985 by the imposition of substantial civil monetary penalties on the Licensee and not allowing the facility to operate beyond 5 percent power. (See Discussion at Section A, supra.) There is no new information which would provide a reasonable basis for now reopening the question of whether additional penalties should be assessed for this past violation.

5. The Licensee's SAFETEAM Program

The Petitioners further claim that the Licensee's SAFETEAM program "holds back information from the NRC." However, they have offered no facts to substantiate their claim, and there have been no problems or occurrences at the facility to indicate that the SAFETEAM program has inhibited or restricted employee communication with the NRC.

SAFETEAM is a voluntary program not required by the NRC, established by the Licensee in 1983, to assist plant managers in the early identification of errors or omissions during the construction and operation of the plant. The program provides an opportunity for site workers, in confidence, to express to a select group of Licensee's representatives concerns that may not be recognized or effectively responded to through normal

channels of communication within the Licensee organization. Past NRC inspections and investigations have indicated that issues brought into the SAFETEAM program has been addressed. Although the NRC identified certain programmatic weaknesses, safety-related concerns were found to have been properly addressed by the Licensee. ^{3/}

The Licensee's SAFETEAM program does not interfere with its employees' rights to report safety-related matters to the NRC. Employees at the facility are still encouraged to report safety-related problems directly to the NRC by notices that the Licensee has visibly posted on site. In these notices, employees are alerted of their right to contact the NRC and advised that their confidentiality will be maintained in the event such contacts are made.

Under these circumstances, I conclude that Petitioners' contention regarding SAFETEAM lacks merit.

CONCLUSION

The deficiencies at Fermi-2 identified by the Petitioners as issues in their Petition were all well known to the NRC and were previously considered in our regulatory decisions. Civil penalties were imposed and a Confirmatory Action letter and a 10 CFR 50.54(r) letter were issued to assure that these deficiencies were adequately addressed. To assure the safe operation of Fermi-2, this facility was not allowed to operate at full power for over a two-year period until adequate assurances had been

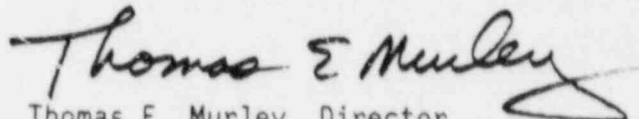
^{3/} The results of these NRC inspection findings are documented in NRC Inspection Report Nos. 50-341/85029 and 50-341/85037, dated July 26, 1985 and October 25, 1985, respectively.

received that these deficiencies were adequately addressed. The NRC's January 15, 1988 letter allowing full-power operation was thus fully justified.

For these and the other reasons discussed above, I find no basis for taking the actions requested by the Petitioners. Accordingly, the Petitioners' requests pursuant to 10 CFR 2.206 are denied.

As provided in 10 CFR 2.206(c), a copy of this decision will be filed with the Secretary.

FOR THE NUCLEAR REGULATORY COMMISSION



Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 28th day of July 1988