

NUREG-0750
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Pages 1-45

NUCLEAR REGULATORY COMMISSION ISSUANCES

July 1995



U.S. NUCLEAR REGULATORY COMMISSION

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NUCLEAR REGULATORY COMMISSION ISSUANCES

July 1995

This report includes the issuances received during the specified period from the Commission (CLI), the Atomic Safety and Licensing Boards (LBP), the Administrative Law Judges (ALJ), the Directors' Decisions (DD), and the Decisions on Petitions for Rulemaking (DPRM).

The summaries and headnotes preceding the opinions reported herein are not to be deemed a part of those opinions or have any independent legal significance.

U.S. NUCLEAR REGULATORY COMMISSION

Prepared by the
Division of Freedom of Information and Publications Services
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
(301/415-6844)

COMMISSIONERS

Shirley A. Jackson, Chairman
Kenneth C. Rogers

B. Paul Cotter, Jr., Chief Administrative Judge, Atomic Safety and Licensing Board Panel

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Commission
Issuances

COMMISSION

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONER:

Shirley A. Jackson, Chairman¹

In the Matter of

Docket No. 50-160-Ren
(Renewal of License No. R-97)

GEORGIA INSTITUTE OF
TECHNOLOGY
(Georgia Tech Research Reactor,
Atlanta, Georgia)

July 26, 1995

In this proceeding involving a license renewal application filed by the Georgia Institute of Technology (Georgia Tech), the Commission currently is considering appeals from Atomic Safety and Licensing Board order LBP-95-6, 41 NRC 281 (1995), which granted the Georgians Against Nuclear Energy's (GANE) petition for leave to intervene and admitted two contentions, one challenging the physical security at the Georgia Tech Research Reactor (GTRR), and the other alleging problems in the GTRR's management. Georgia Tech and the Nuclear Regulatory Commission Staff requested the Commission to stay discovery pending resolution of the appeals.

In light of new facts received, the Commission lifts its earlier imposed temporary stay of discovery, vacates the Licensing Board decision on the security contention, and remands the security contention to the Board for reconsideration.

MEMORANDUM AND ORDER

This proceeding concerns an application filed by the Georgia Institute of Technology (Georgia Tech) to renew its license to operate the Georgia Tech

¹ This Decision was made by Chairman Jackson under delegated authority, as authorized by NRC Reorganization Plan No. 1 of 1980, after consultation with Commissioner Rogers. Commissioner Rogers has stated his agreement with this Decision.

Research Reactor (GTRR). The Commission currently is considering appeals from Atomic Safety and Licensing Board order LBP-95-6, 41 NRC 281 (1995), which granted the request for hearing and petition for leave to intervene of the Georgians Against Nuclear Energy (GANE). The Licensing Board's decision admitted two contentions, one challenging the physical security at the GTRR, and the other alleging problems in the GTRR's management. Pursuant to 10 C.F.R. § 2.714a, both Georgia Tech and the NRC Staff appealed LBP-95-6.

Along with its appeal, Georgia Tech requested the Commission to stay discovery pending resolution of the appeal. The NRC Staff joined in the request for a stay. Georgia Tech and the NRC Staff object in particular to divulging to GANE the security arrangements for the GTRR, including security plans for the 1996 Olympic Games in Atlanta. On June 9, 1995, the Commission issued a temporary "housekeeping" stay of discovery on GANE's security contention, to allow the Commission to receive and consider the parties' responses to three questions relating to the merits of the stay request. For the reasons stated in this order, the Commission now lifts the temporary stay of discovery, vacates the Licensing Board decision on the security contention, and remands that contention to the Board for reconsideration in light of new facts.

Georgia Tech's response to the Commission's stay order introduces new information that according to the NRC Staff may render moot GANE's security contention. Georgia Tech now states that it will remove the fuel from its research reactor prior to the Olympic Games, and will replace the fuel only after the Games have concluded. Because GANE's security contention centered on the risk of a terrorist attack at the GTRR during the 1996 Olympics, and alleged that during refueling the GTRR's "bomb-grade" uranium fuel could be a "tempting target" for terrorists,² the NRC Staff argues that Georgia Tech's decision to remove the fuel may fundamentally affect the security contention's nature and vitality.

In light of this new development, the Commission believes that appellate review of the admissibility of the security contention now, without further developing the record, would be premature. In Commission practice the Licensing Board, rather than the Commission itself, traditionally develops the factual record in the first instance. The Commission therefore has decided to vacate the Licensing Board's original ruling on the admissibility of the security contention and to remand it to the Board for reconsideration in light of new facts.

The following inquiries may be relevant to the Board's reconsideration of the security contention:

² LBP-95-6, 41 NRC at 289.

- (1) Whether Georgia Tech's statement that it will remove the fuel from the reactor means that no fuel will be on site during the Olympic Games. The NRC Staff has suggested four pertinent questions: (a) What specific materials will be removed from the facility and what materials will remain on site? (b) Will the high-enriched uranium (HEU) fuel be removed from the site, or only from the reactor, prior to the Olympics? (c) Does the licensee's statement that it "plans to remove the fuel" signify its intent to replace the current HEU fuel with low-enriched (LEU) fuel? (d) Will the replacement fuel for the reactor be brought on site for storage, although not placed in the reactor, before the Olympics have concluded? Two other questions may also prove pertinent: (a) When will removal of the HEU fuel and any other materials take place? (b) What assurances exist that removal will be accomplished in a timely fashion?
- (2) Whether the removal of the fuel renders moot GANE's claim that "bomb-grade" uranium fuel constitutes a "tempting target" to terrorists requiring special security precautions during the Olympic Games. *See* 41 NRC at 289, 293-95.
- (3) Whether, in light of the proposed changes at the GTRR, GANE's security contention continues to satisfy the Commission's standards for admissibility of contentions. *See* 10 C.F.R. § 2.714(b)(2) and (d)(2).

The Board may of course choose to consider additional matters or to pose additional questions to the parties.³

Because any discovery on the security contention would be premature until the Licensing Board has reconsidered the contention's admissibility, the temporary stay of discovery imposed June 9, 1995, is now unnecessary and the Commission hereby lifts it. The Commission's remand of the security contention is without prejudice to any party's filing a subsequent appeal or application for a stay of discovery on the security contention. The Commission will continue to review the standing and management contention issues raised by the appeals of LBP-95-6, and will decide those issues in a separate decision, to be issued in due course.

For the reasons stated in this Order, the Commission lifts the temporary stay on discovery, vacates the Licensing Board decision in LBP-95-6 insofar as it approved GANE's security contention, and remands that contention to the Board for further consideration consistent with this Order.

³Two additional documents recently filed with the Commission by Georgia Tech, one just yesterday (July 25), seemingly answer some of the Commission's inquiries, but we leave Georgia Tech's more recent statements for the Licensing Board to consider in its reevaluation of the security contention. *See* "Georgia Institute of Technology's Clarification of Response to Commission's Order Issuing Housekeeping Stay" (July 22, 1995); Letter of Patricia Guilday to Office of the Secretary, dated July 25, 1995.

It is so ORDERED.

For the Commission

JOHN C. HOYLE
Secretary of the Commission

Dated at Rockville, Maryland,
this 26th day of July 1995.

Atomic Safety and Licensing Boards Issuances

ATOMIC SAFETY AND LICENSING BOARD PANEL

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James P. Gleason,* *Deputy Chief Administrative Judge (Executive)*
Frederick J. Shon,* *Deputy Chief Administrative Judge (Technical)*

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*Permanent panel members

LICENSING BOARDS

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Charles Bechhoefer, Chairman
Dr. Jerry R. Kline
Dr. Peter S. Lam

In the Matter of

Docket No. 50-160-OM
(ASLBP No. 95-710-01-OM)
(Order Modifying Facility
Operating License No. R-97)

GEORGIA INSTITUTE OF
TECHNOLOGY
(Georgia Tech Research Reactor,
Atlanta, Georgia)

July 31, 1995

In a proceeding involving the proposed conversion of fuel in a research reactor from high enriched fuel (HEU) to low-enriched fuel (LEU), the Licensing Board accepts the standing of the Petitioner for intervention based on standing established by that Intervenor in an ongoing license-renewal proceeding (subject to confirmation that the member upon whom the Intervenor relied in the renewal proceeding also seeks representation in the instant proceeding). The Board sets schedules for the filing of proposed contentions and responses thereto.

RULES OF PRACTICE: STANDING TO INTERVENE

Under certain circumstances, even if a current proceeding is separate from an earlier proceeding, the Commission may refuse to apply its rules of procedure

*During the numbering process, LBP-95-13 was inadvertently skipped.

in an overly formalistic manner by requiring that petitioners participating in the earlier proceeding must again identify their interests to participate in the current proceeding. *Georgia Power Co.* (Vogtle Electric Generating Plant, Units 1 and 2), LBP-91-33, 34 NRC 138 (1991).

MEMORANDUM AND ORDER (Intervention Petition)

This proceeding involves an enforcement action against the Georgia Institute of Technology (Georgia Tech or Licensee), dated June 16, 1995 ("Conversion Order") under which the NRC Staff is proposing to modify Georgia Tech's operating license to require the use of Low Enriched Uranium (LEU) fuel rather than the High Enriched Uranium fuel (HEU currently authorized. The modification implements a requirement appearing in 10 C.F.R. § 50.64, which limits the use of HEU in nonpower reactors (like the GTRR) and requires each licensee to replace its HEU with LEU (with limited exceptions not here applicable).

A Notice of Opportunity for Hearing on the Conversion Order appeared in the *Federal Register* of June 22, 1995. 60 Fed. Reg. 32,516. On July 6, 1995, Georgians Against Nuclear Energy (GANE) filed a timely request for a hearing. Georgia Tech has filed no response to GANE's request; the NRC Staff filed a response opposing GANE's request on July 26, 1995.¹

At the present time, GANE is a party to an ongoing proceeding concerning Georgia Tech's application to renew its operating license. The same Licensing Board assigned to this proceeding is also presiding in the renewal proceeding.²

The Staff recites a number of alleged procedural deficiencies as a basis for our denying GANE's hearing request. Specifically, it asserts that GANE has failed to state a factually correct or legally sufficient basis in support of its hearing request and, further, has not demonstrated an interest that may be adversely affected by a proceeding on the Conversion Order or its standing to request a hearing (Staff Response at 2).

In opposing GANE's hearing request for failing (in the Staff's opinion) to adhere to certain procedural requirements, the Staff has overlooked, as it did in the renewal proceeding, a procedural right afforded to GANE under NRC regulations. See Memorandum and Order (Intervention Petition), dated November 23, 1994, unpublished, Docket No. 50-160-Ren. Namely, under 10

¹ NRC Staff's Response to Request for Hearing on Conversion Order Filed by Georgians Against Nuclear Energy, dated July 26, 1995 (hereinafter, Staff Response).

² Establishment of Atomic Safety and Licensing Board, dated July 18, 1995 (60 Fed. Reg. 37,909, July 24, 1995).

C.F.R. § 2.714(b)(1), which is applicable to enforcement as well as licensing proceedings, a petitioner need not set forth contentions in the initial hearing request but, without leave of the Board, is permitted an additional period of time to do so. Further, a petitioner is afforded the same time period within which to amend its statement on standing, also without leave of the Board.

Furthermore, in another proceeding involving GANE, where there also were two proceedings in which GANE sought to participate, the Licensing Board determined, with respect to standing, that a showing in the first proceeding need not be reiterated in the second proceeding. The Board remarked, *inter alia*, that

while true that no affidavits were appended to the instant petition attesting that at least one member of GANE lived in close proximity to the . . . facility, we deem it was not necessary for GANE once again to establish this requisite interest of one of its members. Having established in the very recent, similar . . . case that one of its members resided in close proximity to the . . . facility, we will not delay the timely progress of the instant case by demanding that such affidavit be filed.

Georgia Power Co. (Vogtle Electric Generating Plant, Units 1 and 2), LBP-91-33, 34 NRC 138, 141 (1991). Earlier, the Commission itself had reached a similar conclusion, refusing to apply its rules in "an overly formalistic manner," as the Licensee had urged. *Consumers Power Co. (Midland Plant, Units 1 and 2), CLI-74-3, 7 AEC 7, 12 (1974)*.

We see no reason here not to accept GANE's statement of standing submitted in the renewal proceeding. We do so, subject to GANE's advising us that Mr. Robert Johnson wishes GANE to represent his interests in this as well as the renewal proceeding.

GANE must still set forth the contentions it wishes to assert in this proceeding. It should advise us and the parties of those contentions, including all the information set forth in 10 C.F.R. § 2.714(b) and (d). If it wishes to reassert the contentions admitted in the renewal proceeding, it should state why they may be relevant to the instant proceeding. The statement as to GANE's contentions, as well as its statement as to Mr. Johnson's intentions, should be filed (mailed) no later than Monday, August 21, 1995. Responses may be filed by Tuesday, September 5, 1995 (for the Applicant) and Monday, September 11, 1995 (for the Staff).

The Board will thereafter hold a prehearing conference for this proceeding, possibly in conjunction with a prehearing conference in the renewal proceeding. The conference will be held at a date and time to be announced later, either in Atlanta or through a telephone conference call. At that conference, the Board will also consider whether consolidation of the two proceedings, in whole or in part, is warranted. In their statements to be submitted on contentions, the parties and petitioner should also set forth their views on consolidation (assuming we were to find that GANE has set forth at least one admissible contention).

IT IS SO ORDERED.

FOR THE ATOMIC SAFETY
AND LICENSING BOARD

Charles Bechhoefer, Chairman
ADMINISTRATIVE JUDGE

Rockville, Maryland
July 31, 1995

Directors'
Decisions
Under
10 CFR 2.206

DIRECTORS' DECISIONS

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

William T. Russell, Director

In the Matter of

Docket No. 99900271

ROSEMOUNT NUCLEAR INSTRUMENTS,
INCORPORATED
(Eden Prairie, Minnesota)

July 5, 1995

The Director of the Office of Nuclear Reactor Regulation denies a petition by Paul M. Blanch that requested certain action with regard to Rosemount Nuclear Instruments, Incorporated (Rosemount). The petition requested that: (1) Rosemount immediately inform all users of safety-related transmitters in accordance with the requirements of 10 C.F.R. Part 21 of the shelf-life limitations of its pressure transmitter sensor-cell fill-oil and that the fill-oil may crystallize if the transmitters are exposed to temperatures of less than 70°F, and provide all available information to each licensee for evaluation; (2) the NRC take "prompt and vigorous" enforcement action against Rosemount for knowingly and consciously failing to provide notification as required by 10 C.F.R. Part 21 of these issues and that a separate violation be issued for each defect and failure to provide the required notice; and (3) the NRC consider escalated enforcement action due to the repetitive nature of the alleged violations.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206**I. INTRODUCTION**

On November 21, 1994, Mr. Paul M. Blanch (the Petitioner) filed a petition with the Executive Director for Operations, pursuant to section 2.206 of Title 10 of the *Code of Federal Regulations* (10 C.F.R. § 2.206), in which he requested that (1) Rosemount Nuclear Instruments, Incorporated (Rosemount),

immediately inform all users of safety-related transmitters in accordance with the requirements of 10 C.F.R. Part 21 of the shelf-life limitations of its pressure transmitter sensor-cell fill-oil, and that its pressure transmitter sensor-cell fill-oil may crystallize if the transmitters are ever exposed to temperatures of less than 70 degrees Fahrenheit (°F), and provide all available information to each licensee for evaluation as it applies to each licensed facility; (2) the U.S. Nuclear Regulatory Commission (NRC) take "prompt and vigorous" enforcement action against Rosemount for knowingly and consciously failing to provide notification as required by 10 C.F.R. Part 21 of the shelf-life limitations of the fill-oil and its potential to crystallize, and that a "separate violation must be issued" for each defect and each day of failure to provide the required notice; and (3) the NRC consider escalated enforcement action due to the repetitive nature of the alleged violations.

The Petitioner's letter has been referred to me pursuant to 10 C.F.R. § 2.206 of the Commission's regulations. By letter dated December 22, 1994, I acknowledged receipt of the petition. As described in that letter, the Petitioner's request that Rosemount "immediately" inform all users of safety-related transmitters of the shelf-life limitations of the fill-oil and the potential for crystallization was denied. With regard to the Petitioner's request that the NRC take "prompt and vigorous" enforcement action and consider escalated enforcement action against Rosemount for its alleged reporting failures, I informed the Petitioner that the Staff was evaluating this matter and would take appropriate enforcement action after completion of its evaluation, should it be warranted.

II. DISCUSSION

As set forth in 10 C.F.R. § 21.1, the regulations in Part 21 establish procedures and requirements for implementation of section 206 of the Energy Reorganization Act of 1974, which requires notification to the Commission of any basic component supplied to a licensed facility that has defects that could create a substantial safety hazard. Under 10 C.F.R. § 21.21(a), each entity subject to the regulations in Part 21 must evaluate "deviations" and "failures to comply" in order to identify a defect or failure to comply that could create a substantial safety hazard, were it to remain uncorrected.¹ In accordance with 10 C.F.R. § 21.21(b),

¹ Section 21.3 defines a *deviation* as a departure from the technical requirements included in a procurement document. A *defect* is defined, in part, as a deviation in a basic component delivered to a purchaser for use in a facility or an activity subject to the regulations in Part 21 if, on the basis of an evaluation, the deviation could create a substantial safety hazard; the installation, use, or operation of a basic component containing a defect; or a condition or circumstance involving a basic component that could contribute to the exceeding of a safety limit. A *failure to comply* is defined as an activity or basic component that fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or license of the Commission relating to a substantial safety hazard. (See 10 C.F.R. § 21.21(a)(3)(i)).

if the deviation is discovered by the supplier and the supplier determines that it does not have the capability to perform the evaluation to determine if a defect exists, then the supplier must inform the purchasers or affected licensees within 5 working days so that the purchaser or licensee may evaluate the deviation.

The Petitioner asserts that Rosemount became aware of a defect that may have created a substantial safety hazard and failed to report this defect to the affected licensees within 5 working days for evaluation. The Petitioner also asserts that neither the NRC nor Rosemount possess the technical areas of expertise to conduct this evaluation, and that the ultimate responsibility for evaluation is with the licensees.

A. Shelf-Life Limitations

The Petitioner's first request was that Rosemount must immediately inform all users of its safety-related transmitters of the shelf-life limitations of its pressure transmitter sensor-cell fill-oil and that the pressure transmitter sensor-cell fill-oil may crystallize if the transmitters are ever exposed to temperatures of less than 70°F. The Petitioner further requested that Rosemount must provide all available information to each licensee for evaluation as it applies to each licensed facility.

The shelf-life issue was first identified and discussed in NRC Inspection Report No. 99900271/93-01 which documented the results of an inspection conducted on February 1 through 4, and March 8 through 12, 1993, of the Rosemount Eden Prairie, Minnesota facility. The NRC inspection team review of the viscosity test date recorded on a container of Dow Corning (DC) 704 silicone oil used for Rosemount safety-related transmitter Models 1153 and 1154 sensor cells, located in the nuclear production sensor-cell oil-fill area, indicated that the contents were beyond the manufacturer's certified shelf life. The team noted that, upon receipt of this material, Rosemount Receipt Inspection verified its viscosity value and wrote that value and the date of test on the outside of each container. The applicable Dow Corning product specification data sheet stated, "when stored in the original, sealed container, at or below 77 degrees F, DC 704 oil has a shelf life of 12 months from the date of shipment, although no inherent limitations on the useful life of this product are known to exist." The team discussed this issue with Rosemount engineers, who stated that, as a result of product liability concerns, Dow Corning, in 1992, changed the certified shelf life of the oil listed on their product data sheet from "indefinite" to 12 months. Rosemount, however, still considered the shelf life to be indefinite and issued an engineering change notice in September 1992 to modify its procurement drawings to reflect this position. A letter dated April 14, 1992, from Dow Corning to Rosemount stated, in part, that "Dow Corning certifies that DC 704 will meet the sales specification requirements for 12 months from date of shipment when properly stored in the original

unopened container Because the sensor is completely sealed and free from contaminants and air it shouldn't change chemically over a long period of time." Another letter from Dow Corning to Rosemount, dated August 31, 1992, regarding the useable life of DC 704 stated that no inherent limitations on useful life of the product are known to exist and that it is the responsibility of Rosemount to test and evaluate Dow Corning products in their specific applications to determine compatibility. During the February and March 1993 inspection, the NRC inspectors observed that Rosemount had established a test and evaluation program that encompassed its sensor-cell application in the safety-related transmitters. The inspectors observed that Rosemount has been performing functional testing of its transmitters which includes testing at pressure and within the operational limits. Based upon the inspectors' observations and their review of Rosemount correspondence with Dow Corning, the NRC concludes that the shelf life of the oil does not constitute a safety issue.

The Petitioner filed an earlier petition on March 28, 1994, in which he requested that the NRC inform all users of Rosemount 1150-series pressure transmitters and series-510 and -710 DU trip devices of "significant safety problems identified in NRC Inspection Report 99900271/93-01." By letter dated May 2, 1994, the Petitioner repeated this request. I responded to this request by letter dated June 3, 1994. In my response, I summarized some of the above discussion and stated that the Staff did not consider the shelf life of the DC 704 fill oil to be significant.²

The Commission's regulations in 10 C.F.R. Part 21 require that notification be provided of any basic component supplied to a licensed facility that contains defects that could create a substantial safety hazard. However, the Staff determined that Rosemount was not required to notify the NRC or to inform its customers under the provisions of Part 21 because a defect or deviation as defined in 10 C.F.R. § 21.3 was not identified.

B. Sensor-Cell Fill-Oil Crystallization

An NRC Staff concern regarding potential crystallization of DC 704 silicone oil that is used in Rosemount Models 1153 and 1154 safety-related transmitters' sensor cells was formally transmitted to Rosemount by an NRC letter dated June 2, 1994. That letter identified the Staff's concern regarding an apparent disparity between the fill-oil manufacturer's precautionary note on temperature limitations and the Rosemount product data sheet. The June 2, 1994 letter also noted that Rosemount believed it had adequately addressed the concern in tests conducted in 1980, but that it was pursuing the matter further with

² A Director's Decision responding to the other issues raised in the Petitioner's December 31, 1992, and March 28, 1994 petitions (DD-94-12) was issued on December 15, 1994. 40 NRC 370.

the fill-oil manufacturer. Rosemount's letter of September 28, 1994, provided an analysis and response to these concerns. Rosemount's analysis concluded that preconditioning of the fill oil during the transmitter manufacturing process, coupled with initial and periodic testing of the transmitters in service at plants, provide adequate assurance that proper transmitter performance is maintained. The analysis also noted that Rosemount was aware of the fill oil's potential for crystallization and addressed its concerns in a 1980 report that concluded that crystallization was not a concern as long as certain conditions were met. These conditions are assured by Rosemount's manufacturing processes and its transmitter's specified range of operation. Rosemount informed the Staff in a September 1994 submittal that it found no evidence of fill-oil crystallization at licensee facilities. In addition, an NRC Staff review of industry data did not identify any instances of Rosemount Model 1153 or 1154 transmitter sensor-cell oil crystallization. The NRC Staff conducted an inspection at the Rosemount facility in January 1995 (Inspection Report 99900271/95-01), specifically to review the crystallization issue. Based on the team's review of the Rosemount procedures, manufacturing process, and personal interviews with the Rosemount manufacturing and engineering staff, the NRC Staff concluded that Rosemount's actions in 1980 regarding the DC 704 cautionary note adequately addressed its Part 21 responsibilities and the validity of its engineering basis for its Model 1153 and 1154 low-temperature-designed application. Additionally, the team determined that, although not required by Part 21, Rosemount had provided its customers a summary of its engineering analysis in a letter of December 1, 1994, and that Rosemount had appropriately implemented its applicable manufacturing process controls. The team also concluded that Rosemount's conditioning of the DC 704 oil before its use should remove any existing seeds that could cause crystallization. Based on a review of the information provided by Dow Corning, observations of Rosemount testing, and industry historical data that indicate no instances of crystallization, the Staff concludes that the concern regarding crystallization of DC 704 oil is adequately addressed by the transmitter manufacturing process and performance testing by the licensees.

In summary, the Staff found that Rosemount identified, evaluated, and took appropriate actions regarding the manufacturer's cautionary note concerning the transmitter fill-oil temperature limitations in 1980. Since Rosemount's manufacturing and testing processes are sufficient to ensure a low probability of crystallization of the fill oil, the Staff has determined that Dow Corning's cautionary note regarding crystallization did not constitute a deviation from the Rosemount product data sheet. Therefore, Rosemount was not required to inform its customers of the issue under the provisions of Part 21.

The aspect of the Petitioner's request regarding shelf-life limitations and crystallization of the fill oil is denied. The shelf-life issue was evaluated by the Staff and, as discussed in my December 22, 1994 letter to the Petitioner,

found not to be a significant safety issue. As discussed in the NRC's December 9, 1994 letter to Rosemount and NRC Inspection Report No. 99900271/95-01 the crystallization issue was determined by NRC Staff to have been adequately addressed by Rosemount in regard to its engineering and Part 21 responsibilities. Rosemount was not required under Part 21 to inform affected purchasers of these conditions; therefore, no violation of Part 21 was identified. Since the remainder of the Petitioner's request relates to enforcement action that is predicated on a violation of NRC regulations, the remainder of the Petitioner's request is also denied.

III. CONCLUSION

As explained above, following its review of the Petitioner's request and supporting argument, the NRC Staff concludes that Rosemount did not violate Part 21 with respect to the issues raised in this petition. Accordingly, the petition is hereby denied.

A copy of this Decision will be filed with the Secretary of the Commission for the Commission to review as provided in 10 C.F.R. § 2.206(c). The Decision will become the final action of the Commission 25 days after issuance unless the Commission, on its own motion, institutes a review of the Decision in that time.

FOR THE NUCLEAR
REGULATORY COMMISSION

William T. Russell, Director
Office of Nuclear Reactor
Regulation

Dated at Rockville, Maryland,
this 5th day of July 1995.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

William T. Russell, Director

in the Matter of

Docket Nos. 50-361
50-362

SOUTHERN CALIFORNIA EDISON
COMPANY, *et al.*
(San Onofre Nuclear Generating
Station, Units 2 and 3)

July 24, 1995

The Director, Office of Nuclear Reactor Regulation, denies a petition filed on September 19, 1994, and supplemented by letters dated December 2 and December 7, 1994, by Mr. Richard M. Dean requesting a shutdown of the San Onofre Nuclear Generating Station (SONGS). The request was based on concerns regarding the closure of the Pacific Coast Highway and the recent financial losses incurred by Orange County as related to the County's ability to effectively participate in emergency evacuation plans in the event of an emergency at SONGS.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

I. INTRODUCTION

By petition dated September 19, 1994, Mr. Richard M. Dean (Petitioner) requested that the Nuclear Regulatory Commission (NRC) take action with regard to San Onofre Nuclear Generating Station (SONGS). The Petitioner requested that the NRC shut down the SONGS facility based upon gross negligence by Southern California Edison Company in not having an escape plan. The Petitioner asserted as a basis for this request that the closure of the Pacific Coast Highway (PCH) at the Dana Point/San Clemente border (due to a

landslide on January 16, 1993) invalidates the emergency evacuation plans for the residents of San Clemente. Notice of receipt of the petition indicating that a final decision with respect to the requested action would be forthcoming at a later date was published in the *Federal Register* on November 9, 1994 (59 Fed. Reg. 55,900).

The Petitioner, in letters dated December 2 and December 7, 1994, again requested the NRC to close the SONGS facility. The Petitioner asserted as a basis for this request that the recent financial losses incurred by Orange County called into question the county's ability to effectively participate in emergency evacuation plans in the event of an emergency at SONGS. Since these concerns were closely related to those expressed in the Petitioner's September 19, 1994 petition, they were treated as supplements to that petition.

Because the petition involves matters related to offsite emergency planning, the NRC requested the assistance of the Federal Emergency Management Agency (FEMA) in responding to the issues raised by the petition. By presidential directive, FEMA has been assigned the responsibility for assessing the adequacy of offsite emergency plans for the area surrounding a nuclear plant. The NRC is responsible for assessing the adequacy of onsite emergency plans and has the final licensing authority. FEMA responded to NRC's request for assistance by letter dated March 22, 1995.

II. DISCUSSION

Title 10 of the *Code of Federal Regulations* (C.F.R.), Part 50, section 50.54(q), states in part that "A licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in § 50.47(b)." Section 50.54(s)(1) states in part that

Each licensee who is authorized to possess and/or operate a nuclear power reactor shall submit to NRC within 60 days of the effective date of this amendment the radiological emergency response plans of State and local governmental entities in the United States that are wholly or partially within a plume exposure pathway EPZ, as well as the plans of State governments wholly or partially within an ingestion pathway EPZ.

Section 50.47(a)(1) states in part that "no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protection can and will be taken in the event of a radiological emergency." Section 50.47(a)(2) further states in part, "The NRC will base its finding on a review of the Federal Emergency Management Agency (FEMA) findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented." The review and approval of State and local

radiological emergency plans and preparedness by FEMA are performed under the provisions of 44 C.F.R. Part 350.

Officials from the State of California, Orange County, the City of San Clemente, and other jurisdictions in the emergency planning zone (EPZ) for the SONGS facility have participated in the development of the Radiological Emergency Preparedness (REP) plans to be implemented in the event of an incident at the facility. These REP plans have been evaluated in detail during each of the biennial REP exercises that began in May 1981; findings of these exercises have been reported to the NRC by FEMA. During these biennial exercises, evacuation route impediments, such as landslides, are simulated to test the capability of the offsite response organization to deal with such a contingency. The California State and local officials have continued to meet such challenges successfully during these biennial REP exercises. The most recent exercise was conducted in September 1993. As documented in (1) the October 13, 1993 letter from the NRC to Southern California Edison Company, forwarding the Staff's inspection report of the September 1993 exercise, and (2) the March 27, 1995 letter from FEMA to the NRC, forwarding its report on the exercise, the offsite radiological emergency response plans and preparedness for the State of California and the affected local jurisdictions can be implemented and are adequate to provide reasonable assurance that appropriate measures can be taken off site to protect the health and safety of the public in the event of a radiological emergency at the site.

The Petitioner's assertion that, with the closure of the PCH, Interstate 5 is the only route out of San Clemente is incorrect. The SONGS EPZ has a total of ten sectors for evacuation purposes. Three of these sectors comprise the City of San Clemente. The portion of the PCH affected by the landslide only affects the evacuation of one sector, Sector 3, of the City of San Clemente.

The landslide on January 16, 1993, closed the PCH at the San Clemente and Dana Point border. More landslides occurred in February 1993. However, an alternate route was established around the landslide area by local officials to act as a substitute evacuation route while the PCH was being repaired. The PCH had been scheduled to reopen in January 1995. However, in January 1995, the entire area received extremely heavy rainfall, causing further delays in the reopening of this portion of the PCH. The PCH was officially reopened on April 5, 1995. During reconstruction activities, the PCH was not open to the general public. However, two lanes were open for construction traffic and they could have been used to supplement the alternate route, if needed, as a means for evacuating the area. As stated by FEMA in its letter dated March 22, 1995, since an alternate evacuation route was established during the period when the PCH was closed to normal traffic, and since the PCH was available for emergency use, the safe evacuation of the citizens of San Clemente was not compromised.

With respect to the Petitioner's concerns regarding the ability of Orange County to effectively participate in emergency evacuation activities considering the County's current financial difficulties, FEMA concludes that Orange County is meeting its obligations in this matter. According to FEMA's letter dated March 22, 1995, Orange County officials are aware that the current financial situation presents a major challenge in restructuring and prioritizing services to meet their objectives and mandates within their available resources. However, the Board of Supervisors recognizes that the primary mission of the County or of the local County government is the protection of health, safety, and welfare of the citizens and visitors to the County. During this financial crisis, the Board has repeatedly reiterated and publicly confirmed that these services are the highest priority for all County agencies and departments, including those services provided to contract cities such as San Clemente. In addition, a representative of the County is an active participant on the SONGS Interjurisdictional Planning Committee (IPC), which meets on a formal basis with officials of SONGS, the affected cities, the Camp Pendleton Marine Corps Base, the State Department of Parks and Recreation, the Capistrano Unified School District, San Diego County, and federal and state emergency organizations to coordinate their nuclear power plant plans, preparedness, and procedures for emergency response to an emergency or incident at the SONGS site. The IPC also coordinates the multiagency planning, training, and drills for multihazard emergency response. The IPC representatives meet at least monthly to ensure their planning and preparedness measures are thoroughly coordinated and current. Accordingly, as stated by FEMA in its letter dated March 22, 1995, Orange County's financial difficulties are not preventing it from meeting its emergency evacuation responsibility.

III. CONCLUSION

The institution of proceedings pursuant to section 2.206 is appropriate only if substantial health and safety issues have been raised. See *Consolidated Edison Co. of New York* (Indian Point, Units 1, 2, and 3), CLI-75-8, 2 NRC 173, 175 (1975); *Washington Public Power Supply System* (WPPSS Nuclear Project No. 2), DD-84-7, 19 NRC 899, 924 (1984). This is the standard that has been applied to the concerns raised by the Petitioner to determine whether the action requested by the Petitioner is warranted. With regard to the request made by the Petitioner to shut down the SONGS facility, I find no basis for taking this action. The respective local jurisdictions have maintained their emergency plans in effect and continue to monitor them on a regular basis to ensure that they remain current and coordinated. Appropriate evacuation routes are available. Local officials are aware of their resource limitations and have focused resources to ensure that the

health, safety, and welfare of the citizens are of priority. FEMA has repeatedly determined that offsite emergency response plans and preparedness can be implemented and are adequate to provide reasonable assurance that appropriate measures can be taken offsite to protect the health and safety of the public in the event of a radiological emergency at the SONGS facility. On the basis of FEMA's findings, the NRC continues to find that there is reasonable assurance that adequate protection can and will be taken in the event of a radiological emergency at the SONGS facility. For the reasons discussed above, no basis exists for taking any action in response to the petition as no substantial health or safety issues have been raised by the petition. Accordingly, the Petitioner's request for action pursuant to section 2.206 is denied.

A copy of this Decision will be filed with the Secretary of the Commission for the Commission to review in accordance with 10 C.F.R. § 2.206(c) of the Commission's regulations. As provided by this regulation, the Decision will constitute the final action of the Commission 25 days after issuance, unless the Commission, on its own motion, institutes a review of the Decision within that time.

FOR THE NUCLEAR
REGULATORY COMMISSION

William T. Russell, Director
Office of Nuclear Reactor
Regulation

Dated at Rockville, Maryland,
this 24th day of July 1995.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

Frank J. Miraglia, Acting Director

In the Matter of

Docket No. 50-160

GEORGIA INSTITUTE OF
TECHNOLOGY
(Georgia Tech Research Reactor,
Atlanta, Georgia)

July 31, 1995

The Acting Director, Office of Nuclear Reactor Regulation, partially denies a petition dated October 23, 1994, filed by Ms. Pamela Blockey-O'Brien (Petitioner). This Partial Director's Decision also considered subsequent letters from the Petitioner dated November 12 and December 4, 1994, February 21, February 23, March 6, March 28, April 19, May 18, June 27, and July 18, 1995. The Petitioner requested (1) the shutdown and decontamination of the Georgia Tech Research Reactor, (2) the revocation of liquid radioactive material release authority to all licensees, (3) the revocation of licenses that use the principle of as low as reasonably achievable, (4) the termination of transportation of radioactive material by mail, and (5) the modification to posting requirements for radioactive material. After a review of the Petitioner's concerns, the Acting Director concluded that the Petitioner's concerns, addressed to date, do not raise substantial health and safety concerns warranting the requested actions. The reasons for the partial denial are fully set forth in the Partial Director's Decision.

PARTIAL DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

I. INTRODUCTION

On October 23, 1994, Ms. Pamela Blockey-O'Brien (the Petitioner) filed a petition with the U.S. Nuclear Regulatory Commission (NRC) Staff pursuant to 10 C.F.R. § 2.206, that requested that the NRC Staff revoke the license of the Georgia Institute of Technology (Georgia Tech) Research Reactor, shut down this research reactor and its support facilities, and remove all radioactive material and contamination off site to a government-created "National Sacrifice [A]rea" such as the Savannah River or Oak Ridge facilities. In addition, the Petitioner requested that the NRC Staff withdraw all license authority nationwide involving the discharging or dumping of any quantity of radioactive material to all the sewers or waters in the United States or oceans of the world, and withdraw all licenses to all nuclear facilities, including nuclear power plants (NPPs), which operate under as low as reasonably achievable (ALARA) principles. Finally, the Petitioner requested both that the NRC Staff modify every license issued to transporters of radioactive materials and builders of NPPs so that these parties must put 2-foot-high letters on everything transported or built stating "DANGER-RADIOACTIVE" and in smaller letters "there is no safe level of radiation, any exposure can [a]ffect health," and prohibit the transportation of radioactive material by mail. The NRC Staff received additional letters dated November 12 and December 4, 1994, and February 21, February 23, March 6, March 28, April 19, May 18, June 27, and July 18, 1995, from the Petitioner and also considered these letters in this Partial Director's Decision. All letters related to this petition have been placed in the Public Document Room and docketed under the Georgia Tech Research Reactor Docket No. 50-160, in accordance with NRC Management Directive 8.11, "Review Process for 10 C.F.R. 2.206 Petitions."

As bases for the request to shut down and decontaminate the Georgia Tech Research Reactor, the Petitioner asserted that (1) a water flume comes out of the ground "destabilizing the reactor and the ground in some way"; (2) "[r]adiation levels in soil and vegetation climb markedly in GA EPD documents" around the Georgia Tech Research Reactor; (3) there is no record of air monitoring ever having been done; (4) heavy rainfall causes water to back up in the sewer and drainage lines causing flooding of the reactor parking lot and campus, as well as causing sinkholes, "puff-ups" on campus ground, and welded-shut manhole covers to be blown off; (5) radioactive contaminants have been routinely discharged into the sanitary sewer from the Georgia Tech Research Reactor's wastewater holding tank and contamination has

spread by backup of the sewage system; (6) should the Georgia Tech Research Reactor be further destabilized, the reactor and the tank holding cobalt-60 could "break apart," causing radioactive contaminants to "drain into groundwater/down sewers/into the runoff ditch"; (7) the Georgia Tech Research Reactor is in an earthquake zone; (8) there is absolutely no reason to keep the Georgia Tech Research Reactor operating; (9) security at the Georgia Tech Research Reactor is extremely lax; and (10) in case of an accident or terrorist attack, evacuation of the campus and downtown Atlanta would be impossible both now and during the Olympics.¹

As the bases for the request to withdraw all license authority nationwide involving the discharging or dumping of any quantity of radioactive material to all the sewers or waters in the United States, to withdraw all licenses for all nuclear facilities, including NPPs, which operate under ALARA principles, and to change labeling requirements for radioactive material, the Petitioner asserted that there is no safe level of radiation, that storage and disposal of radioactive waste is inadequate, and that the NRC's new sewage dumping guidelines are totally inadequate. The Petitioner also asserted that the request to restrict mailing of radioactive materials relates to the occurrence of transportation accidents.

II. DISCUSSION

A. Revocation of Georgia Tech Research Reactor License

The following discussion relates to the request that the NRC Staff revoke the license of the Georgia Tech Research Reactor, shut down this research reactor and its support facilities, and remove all radioactive materials and contamination off site. This Partial Director's Decision addresses NRC-licensed activities.²

1. A Water Flume Comes Out of the Ground "Destabilizing the Reactor and the Ground in Some Way"

The Petitioner stated that "[d]etailed maps show that a water flume comes out of the ground directly next to and west of the reactor." On request, the Petitioner

¹ Issue (8) includes concerns that substantial management deficiencies persist. Issue (9) involves concerns on general security and, particularly, security during the period of the 1996 Olympics. Issue (10) includes concerns on evacuation in case of a terrorist attack. Since these concerns are the subject of an ongoing license renewal proceeding before an Atomic Safety and Licensing Board, these concerns will be addressed in a Final Director's Decision at an appropriate time after considering the decisions reached in the license renewal process. All other issues related to this 2.206 petition were considered in this Partial Director's Decision.

² The 10 C.F.R. § 2.206 petition included some mention of the cobalt-60 irradiation facility which is not licensed by the NRC and is, therefore, not covered in this discussion except as it may affect research reactor safety. The 2.206 petition and this Partial Director's Decision have been transmitted to the State of Georgia, the licensing authority for the cobalt-60 facility and for other state-licensed material also mentioned in the petition.

identified the "detailed maps" as City of Atlanta, Department of Public Works (DPW) Sheets I-11 and H-11, which show "flumes" or "storm drain inventory."

The NRC Staff reviewed these drawings. Drawing I-11 did not show a flume indication. Drawing H-11 does indicate a "flume" to the west of the Georgia Tech Research Reactor. The NRC Staff discussed this drawing and indication of a "flume" with DPW, the agency responsible for the sewer system and the drawings. The DPW indicated that the word "flume" in the drawing means a surface drainage path. Physical onsite examination of this location showed a surface drainage path consisting of a concrete-lined channel extending along the back retaining wall of the Georgia Tech Research Reactor facility site, approximately where the "flume" was indicated on the drawing.

Furthermore, physical examination of the Georgia Tech Research Reactor facility and site have found no evidence of an underground water flume or destabilization of the Georgia Tech Research Reactor facility or ground. Additional factors related to stability of the Georgia Tech Research Reactor are addressed under issues (4), (6), and (7).

The NRC Staff finds no reason to conclude that there is an underground water flume destabilizing the Georgia Tech Research Reactor and surrounding ground. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes that the Petitioner's concerns do not present a substantial health or safety issue warranting the action requested by the Petitioner.

2. "Radiation Levels in Soil and Vegetation Climb Markedly in GA EPD Documents" Around the Reactor

The State of Georgia (GA) Environmental Protection Division (EPD) provided the NRC Staff with its environmental radiation monitoring results as compiled on November 23, 1994. These results included data from environmental monitoring for radioactivity with thermoluminescent dosimeters (TLDs), and from soil and vegetation sampling around the Georgia Tech Research Reactor.

The NRC Staff discussed the results with EPD. EPD stated that its monitoring found no evidence of release of radioactive material from the Georgia Tech Research Reactor. EPD further indicated that the values and variations in monitored radiation exposures and concentrations were typical of environmental monitoring results and showed no increasing trend.

The NRC Staff has concluded based on the types, quantities, and relative concentrations of the isotopes measured by EPD that they are not from the Georgia Tech Research Reactor. Some of the isotopes measured by EPD are naturally occurring. Specifically, beryllium-7 is from reactions of cosmic rays with air, potassium-40 is from primordial sources, radium-226 is from the decay of naturally occurring uranium-238, and radium-228 is from decay of naturally

occurring thorium-232.³ Additionally, radiation monitoring of effluents from the Georgia Tech Research Reactor and of areas within the research reactor containment by Georgia Tech, as required by the Technical Specifications 3.2.a and 3.5.b, provided further evidence that the measurements by EPD of other isotopes (i.e., cesium-137, cerium-141, cerium-144, ruthenium-103, zirconium-95, and niobium-95) were not from the Georgia Tech Research Reactor. Rather, EPD indicated that the radioisotopes were from other sources, such as fallout from nuclear weapons testing around the world. Furthermore, as measured by EPD, there is no indication of other radioisotopes, which would be expected if the radioactivity were from the Georgia Tech Research Reactor.

The conclusion, that there is no evidence that the release of radioactive material from the Georgia Tech Research Reactor has contributed to the monitored radiation levels in the soil and vegetation, is also corroborated by the Georgia Tech environmental monitoring program. This environmental monitoring program has used film badges, and currently uses TLDs, at various locations around the Georgia Tech Research Reactor. The film badges were provided by a National Voluntary Laboratory Accreditation Program certified vendor. The TLDs meet American National Standards Institute standards. One monitored location in the Georgia Tech Research Reactor stack measured the direct radiation for airborne releases from operation of the Georgia Tech Research Reactor. This monitor has indicated airborne effluent releases generally below detectable levels and always well below the limits of 10 C.F.R. Part 20, "Standards for Protection Against Radiation," as verified most recently in NRC Staff Inspection Report Nos. 50-160/95-01, 50-160/94-02, and 50-160/93-02.⁴ These results are consistent with the EPD data and further confirmed the conclusions of the State of Georgia EPD that its monitoring found no evidence of release of radioactive material from the Georgia Tech Research Reactor that has contributed to the monitored radiation levels in soil and vegetation.

The NRC Staff evaluation of the data confirmed the EPD conclusion that the EPD data showed no increasing trend in radiation levels around the Georgia Tech Research Reactor. The values and variations of all monitored locations around the Georgia Tech Research Reactor were typical of environmental monitoring results at other locations, were attributable to nonreactor sources, and showed no record of an increasing trend. Further corroboration of this conclusion was provided in the discussion addressing issues (3) and (5) in this Partial Director's Decision in that releases of radioactive isotopes from the Georgia Tech Research Reactor are well within NRC regulatory limits and do not correspond to the radioisotopes found in the soil or vegetation samples.

³Kathren, R. L., "Radioactivity in the Environment: Sources, Distribution, and Surveillance," 1984

⁴These and the other inspection reports referenced in this Partial Director's Decision are available from the NRC's Public Document Room, the Gelman Building, 2120 L Street, NW, Washington, DC 20037.

The NRC Staff finds no reason to conclude that the Georgia Tech Research Reactor is contributing to radiation levels in soil or vegetation. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes that the Petitioner's concern does not present a substantial health or safety issue warranting the action requested by the Petitioner.

3. There Is No Record of Air Monitoring Ever Having Been Done

The Petitioner asserted that monitoring for airborne radioactive releases from the Georgia Tech Research Reactor is inadequate. However, in addition to the environmental monitoring programs previously discussed, the Georgia Tech Research Reactor is required by its Technical Specifications 3.2.a and 3.5.b to monitor and restrict radioactive releases, including airborne releases. The monitoring system includes instruments to monitor gaseous and particulate radioactivity and to initiate safety-related functions (e.g., containment isolation). All radioactive releases are required to be within the limits established in 10 C.F.R. Part 20. NRC Staff inspections, as documented most recently in Inspection Report Nos. 50-160/95-01, 50-160/94-02, and 50-160/93-02 related to the Georgia Tech Research Reactor, have found that the effluent releases have been within 10 C.F.R. Part 20 limits. Therefore, there is neither a technical need nor a regulatory requirement for additional monitoring of air samples outside the Georgia Tech Research Reactor, since all releases are controlled, as required by Technical Specifications and in accordance with NRC regulations.

The Petitioner also raised a concern related to the storage of waste at the Georgia Tech Research Reactor. The concern is that there is a large amount of waste material stored at the facility and this storage is generally unsafe. Inspection Report Nos. 50-160/95-01, 50-160/94-02, and 50-160/93-02 have verified that storage of radioactive waste has been maintained in accordance with applicable regulatory requirements (10 C.F.R. Part 20) at the Georgia Tech Research Reactor.

The Petitioner also raised concerns about various health effects around the Atlanta area and in other localities (e.g., around the Three Mile Island nuclear power plant near Harrisburg, Pennsylvania), but did not provide correlation to conditions related to the Georgia Tech Research Reactor. Therefore, the Petitioner did not provide bases for further action based on these concerns. Further, the data and information from EPD, the licensee, the Oak Ridge Institute for Science and Education (ORISE), and the Idaho National Engineering Laboratory (INEL), as evaluated by the NRC Staff in this issue and on issues (2) and (5), indicate little potential for the Georgia Tech Research Reactor to have contributed to such health effects.

The NRC Staff finds no reason to conclude that the Georgia Tech Research Reactor radiation monitoring program is unacceptable. The Petitioner provided

no facts to conclude otherwise or bases to conclude that additional monitoring should be required. Therefore, the NRC Staff concludes that the Petitioner's concern does not present a substantial health or safety issue warranting the action requested by the Petitioner.

4. Heavy Rainfall Causes Water to Back Up in the Sewer and Drainage Lines Causing Flooding of the Reactor Parking Lot and Campus, as Well as Causing Sinkholes, "Puff-ups" on Campus Ground, and Welded-Shut Manhole Covers to Be Blown Off

The Petitioner indicated that a major sinkhole of the Orme Street line (a major sewer line in the area) caused a backup and flooding in 1993 on the Georgia Tech Campus at the North parking lot at the Georgia Tech Research Reactor facility site. This flooding had no effect on the Georgia Tech Research Reactor, since the research reactor structures, systems, and components are isolated from the sewer by a series of valves. Further, the containment steel-reinforced concrete floor is approximately 8 feet thick.⁵ This structure supports containment internals and provides weight to protect against the buoyancy of groundwater. The structure is designed to withstand the effects of buoyancy due to groundwater which has been found on test borings at levels ranging from 11 to 40 feet.⁶ Further, DPW stated that the work that is being done on the Orme Street line and related construction activities minimize the potential for such future flooding or other problems associated with that line.

As also indicated by the Petitioner, there is a 72-inch-diameter storm drain/sanitary sewer line that could be a potential source of flooding or a sinkhole near the Georgia Tech Research Reactor. This sewer line is approximately 100 feet from the containment.⁷ By letter,⁸ DPW confirmed that the line had been inspected to ensure integrity and was found in "very good condition" on a May 24, 1994 walk-through. The DPW was "not aware of any problems with this storm sewer" and did not "anticipate any problem with the maintenance or operation of this sewer in the foreseeable future." This conclusion was reverified with DPW, including consideration of the construction (e.g., blocks and concrete pipe) and configuration (e.g., on old drainage paths) of the sewer. DPW also indicated that this drain line is considered to be a private sewer and is not part of the city system, although DPW also indicated that they have been involved in

⁵"Safety Analysis Report for the 5 MW Georgia Tech Research Reactor," Georgia Institute of Technology, Atlanta, GA 30332-0425, April 1994 (hereinafter SAR), § 4.3, *Description of Reactor Containment Building*, at 43.

⁶SAR § 2.3, *Hydrology and Geology*, at 23.

⁷SAR, Figure 4.3, at 30.

⁸Letter dated January 9, 1995, from L. Chambers of the Department of Public Works for the City of Atlanta to R. Karam of Georgia Tech.

the inspection and maintenance of such lines and there is no plan to discontinue that practice.

The Petitioner raised related issues on the structural capability of the foundation-bearing material and water intrusion around the containment foundation potentially causing destabilization of the structure. This concern referenced three Georgia Geologic Survey documents.⁹ The Georgia Geologic Survey was requested to evaluate the Petitioner's references to these reports with respect to the geology and seismology related to the Georgia Tech Research Reactor. By letter dated May 11, 1995, the State Geologist responded to the NRC Staff.¹⁰ The letter stated, in part, that:

I have reviewed the letters from a petition to shut down the Georgia Tech Research Reactor. The letters suggest (1) that the reactor overlies the Wahoo Creek Formation, which is not a suitable nor a stable foundation material, (2) that there is an earthquake risk, particularly from the Brevard Zone, (3) that unique geologic fractures, particularly horizontal fractures, might cause large quantities of ground water to seep into the reactor and cause problems. My review indicates that the petition's suggestions are specious.

The Wahoo Creek formation is one of many geologic formations of the Piedmont Physiographic Province. The fact that the Wahoo Creek Formation weathers into "slabs" is not relevant; in situ, it is a competent rock adequate to provide suitable foundation for the reactor. Comparison of the foundation characteristics of weathered and in situ rock material is not reasonable nor appropriate.

Georgia is a relatively aseismic state and earthquakes are rare. The Brevard Zone should not be considered as an "earthquake fault". The proximity of the Brevard Zone to the reactor is not relevant. Fractured rock, which is ubiquitous to the Piedmont, underlies the reactor. There are no data to suggest that horizontal fractures having high water yielding characteristics underlie or are even near the reactor. From a hydrogeological point of view, there are no known unique features of the reactor site to suggest that ground water would affect reactor safety.

The Piedmont extends from Alabama to New Jersey and occupies many tens of thousands of square miles. The comments made in the petition would apply at virtually any location in the Piedmont. In addition, the petition cites several reports published by the Geologic Survey Branch of The Georgia Environmental Protection Division. The reports cited were prepared under my direction; I personally reviewed and approved them. There are no data in these reports that indicate the reactor at Georgia Tech is not safe or poses an environmental threat.

These findings confirm the NRC Staff geologic and seismic conclusions presented in issue (7), and further support the related data and design for

⁹McConnell and Abrams, "Geology of the Greater Atlanta Area," Georgia Geologic Survey Bulletin 96; Cressler, Thurmond, and Heiter, "Groundwater in the Greater Atlanta Region," Georgia Geologic Survey Bulletin Information Circular 63; and Herrick and Legrand, "Geology and Groundwater Resources of the Atlanta Area, Georgia," Georgia Geological Survey Bulletin 55.

¹⁰Letter from William H. McLemore, State Geologist, Georgia Department of Natural Resources, to Marvin M. Mendonca, NRC Staff, May 11, 1995.

the Georgia Tech Research Reactor as discussed under this issue. These findings confirm that further analysis or testing is not needed for hydrogeological conditions at the Georgia Tech Research Reactor.

The Petitioner also indicated that "a sinkhole appeared next to the reactor years ago and was filled in. A [w]itness to that is still very much alive." The Petitioner provided the NRC Staff with information to contact the witness. This individual said that while he and two other individuals were walking from the facility, one of the individuals fell into a sinkhole to the armpits or so, and the two other individuals helped him get out. This individual also stated that the sinkhole was near the waste storage tank facility and that the time frame was somewhere between the late 1960s and middle 1970s. The area near the waste storage tank facility was physically examined while going over the area on foot at about 3-foot intervals. No sinkhole was observed.

In addition, the NRC Staff questioned several members of the Georgia Tech Research Reactor staff. One of these Georgia Tech Research Reactor staff members recalled the sinkhole referred to by the Petitioner. However, none of the questioned Georgia Tech staff members recalled any other sinkholes at the research reactor facility. This was further confirmed by discussions with selected NRC Staff members with experience related to the Georgia Tech Research Reactor. These NRC Staff members were not aware of any sinkholes at the facility other than the one of concern to the Petitioner.

Additionally, drawings of the research reactor site¹¹ and physical examination of the research reactor facility and site showed no major drainage paths (other than the 72-inch storm drain line previously discussed) that could impact the Georgia Tech Research Reactor.

Construction drawings and records¹² were also reviewed, and selected portions of the installation were examined by the NRC Staff to determine the vulnerability of the foundation structure for the Georgia Tech Research Reactor to the phenomena that were raised in the petition. The drawings showed the bottom of the Georgia Tech Research Reactor containment building steel shell about 25 feet below finished grade. The drawings indicated that the Georgia Tech Research Reactor containment building is anchored by bolts to a steel-reinforced concrete pad about 1 foot thick and to a ring foundation that extends approximately another 12 feet down under the concrete pad. Further, examination of selected portions of the foundation and containment structure found the structure consistent with the construction and drawing details. Construction test boring records also showed that the pad and ring foundation rest on material that meets or exceeds construction specifications for safe bearing capacity. The construction test boring records showed the material at the bottom

¹¹ SAR, Figures 4.2 and 4.3, at 29 and 30.

¹² Letter from R. A. Karam, Georgia Tech, to D. M. Collins, USNRC, dated October 22, 1993.

of the foundation ring to be moderately hard to hard gray gneiss. As previously discussed in issue (4) and in this issue, no information has been provided by the Petitioner or is known to the NRC Staff to suggest that this foundation and support structure are not as designed or are not acceptable.

Sinkholes develop in soils or in lime-tone as solution cavities. Although sinkholes could develop in the soil fill material surrounding the Georgia Tech Research Reactor facility, there is no credible source for sinkhole development. Sinkholes cannot develop in or significantly affect gneiss such as that on which the Georgia Tech Research Reactor foundation is built. Therefore, the development of sinkholes near or underneath the Georgia Tech Research Reactor is not a credible event.

Even in the unlikely event of failures of the 72-inch storm drain line or the Orme Street line previously mentioned, erosion or sinkhole effects could not be expected to affect the Georgia Tech Research Reactor, since the lines are far from the research reactor containment relative to these potential effects, and the design of the reactor facility is such that it would not be impacted by such phenomena. The 72-inch storm drain is about 100 feet from the reactor containment and passes below the northwest corner of the laboratory and office building which is adjacent to the containment building. The footings for the office building, which measures approximately 90 by 130 feet, were founded on the partially weathered rock. Assuming the 72-inch line did collapse where it passes under the building, approximately a 20-foot-square section of the northwest corner of the building could be affected. This section of the building houses laboratories, offices, and storage areas. Radioactive materials are not stored in this area. The remaining portion of the facility, particularly the research reactor containment building, would not be affected because of the design characteristics of the foundation and support material as previously discussed.

DPW verified that the Orme Street line is 10 to 12 feet in diameter and is about 1200 feet from the Georgia Tech Research Reactor. The sinkhole that resulted from the failure of the Orme Street line was a sinkhole approximately 50 feet in radius, which is at the upper limit of sinkhole size in the Atlanta area, based on DPW experience. Based on this experience (which is consistent with NRC Staff information on such phenomena) it is not credible to consider that a sinkhole from the Orme Street line, at a distance of 1200 feet, could affect the Georgia Tech Research Reactor.

The containment foundation for the Georgia Tech Research Reactor is considered to be impervious to the effects of sinkholes as the foundation rests on relatively hard material to depths and distances well beyond the credible influence of any potential source for a sinkhole.

Puff-ups are heaves, or upward expansion, which occur when locked-in stress in soil, usually clay, exceeds the load above it. The most common occurrence of puff-ups is in regions that were overlain by glaciers and the soils beneath

(till, lake beds, etc.) were overconsolidated. When the glaciers melted, there was still enough material over these clays to lock in the stress. Removal of some of this overlying material, either by erosion or excavation, allows the clays to expand. Puff-ups can occur in unglaciated regions generally soon after either erosion or excavation removes the overlying material. Research reactor construction was completed in the 1960s, and considering this time interval, occurrence of a puff-up at the facility is highly unlikely. Further, puff-ups are near-surface, soil deformation phenomena. As discussed above, the relatively hard, relatively deep foundation structure and gray gneiss-bearing material of the Georgia Tech Research Reactor could not be expected to be affected by the geologic phenomenon of puff-ups.

With regard to the welded manhole covers that were thrown up to 8 feet as alleged by the Petitioner by sewer backup problems, the distance from the containment to the nearest manhole cover has been verified by physical examination of the site to be greater than 50 feet. This physical examination found no other potential impact point related to the Georgia Tech Research Reactor that was closer than 50 feet. The Petitioner has neither provided nor does the NRC Staff possess any information or experience that would suggest that a manhole cover could be thrown the distance and have the force necessary to damage the Georgia Tech Research Reactor. Therefore, the potential for damage to the Georgia Tech Research Reactor due to this asserted phenomenon is not credible.

Based on the above, these design features and conditions provide assurance that the Georgia Tech Research Reactor would not be adversely affected by flooding, sinkholes, "puff-ups" or thrown welded manhole covers. These phenomena could not be expected to affect the Georgia Tech Research Reactor, given the design and configuration of the facility. Therefore, the NRC Staff concludes that the Petitioner's concern does not present a substantial health or safety issue warranting the action requested by the Petitioner.

5. *Radioactive Contaminants Have Been Routinely Discharged into the Sanitary Sewer from the Georgia Tech Research Reactor's Wastewater Holding Tank and Contamination Spread by Backup of the Sewage System*

Radioactive materials can be released to the sanitary sewer system from the Georgia Tech Research Reactor in accordance with 10 C.F.R. § 20.2003.¹³ The Georgia Tech Research Reactor licensee monitors releases to the sewage system, and NRC Staff inspections (e.g., Inspection Report Nos. 50-160/95-01,

¹³ Radioactive releases to the sanitary sewer were previously permitted in accordance with 10 C.F.R. § 20.303, which was superseded by section 20.2003 on January 1, 1994.

50-160/94-02, and 50-160/93-02) have confirmed that the radioactive releases (primarily cobalt-60 and tritium) to the sanitary sewer have met NRC discharge limits.¹⁴

The Petitioner expressed a concern that the release to the sanitary sewer system could expose individuals, including sewer workers, to radiation. The releases from the Georgia Tech Research Reactor to the sanitary sewer have generally been several orders of magnitude less than NRC regulatory limits. Further, the assumption in the regulation of ingestion directly at the point of release from the campus provides considerable conservatism to ensure that individuals, such as sewer workers or other individuals, would be exposed to a lesser degree even in the event of a potential backup of the sewer system with large quantities of water.

Furthermore, in response to a request from the State of Georgia, the NRC Staff had ORISE perform an independent analysis for radioisotopes in process sludge and ash samples from the City of Atlanta's R. M. Clayton sewer treatment facility. The samples were taken from the sewer treatment facility on March 13, 1995. This analysis detected naturally occurring and accelerator-produced radioisotopes (used primarily for medical diagnostic and therapeutic treatments). There were no detected radioisotopes from the Georgia Tech Research Reactor. Similarly, the NRC Staff had an independent analysis performed by INEL of liquid waste samples from the Georgia Tech Research Reactor. This analysis found no indication of the contamination suggested by the Petitioner (e.g., plutonium or uranium).

Georgia EPD and Georgia Tech analysis on wastewater are consistent with these results. This sampling and analysis verified that a relatively small amount of radioactive material has been released from the Georgia Tech Research Reactor facility to the sanitary sewer system, and any material that has been released is well within NRC regulatory limits. These facts, and the regulatory conservatism and monitoring results, as previously discussed, establish that no further sampling of the sewer releases or system is necessary to ensure that the health and safety of the public is protected.

An issue was also raised by the Petitioner regarding the need for the Georgia Tech Research Reactor to have a sewer discharge permit from the City of Atlanta. The City of Atlanta does not deal with radiological health and safety issues over which NRC has regulatory authority (*see* 10 C.F.R. § 8.4). The City of Atlanta is responsible for the release of materials to the sanitary sewer system for other than radiological health and safety reasons. With regard to the concern about

¹⁴ It should also be noted that revisions to the NRC's regulations with regard to release to sewage systems are under consideration (Advanced Notice of Proposed Rulemaking, "Disposal of Radioactive Material by Release into Sanitary Sewer Systems," 59 Fed. Reg. 9146 (Feb. 25, 1994)).

compliance with city ordinances, the City of Atlanta is the appropriate regulatory body to deal with the implementation of its requirements.

Since there is no evidence of the spread of unacceptable contamination from the Georgia Tech Research Reactor effluents to the sewage system, the NRC Staff finds no reason to conclude that unacceptable radioactive contamination was released or could be spread by the backup of the sewage system. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes that the Petitioner's concern does not present a substantial health or safety issue warranting the action requested by the Petitioner.

6. *Should the Georgia Tech Research Reactor Be Further Destabilized, the Reactor and the Tank Holding Cobalt-60 Could "Break Apart," Causing Radioactive Contaminants to "Drain into Groundwater/Down Sewers/Into the Runoff Ditch"*¹⁵

From the evaluations and inspections to date, there is no evidence that the Georgia Tech Research Reactor has been "destabilized" in any manner. The Georgia Tech Research Reactor is designed to reduce the likelihood and mitigate the consequences of uncontrolled releases of radiation. For example, the design and configuration features as discussed for issue (4) provide considerable assurance that the Georgia Tech Research Reactor has not and will not be "destabilized" due to the previously postulated concerns expressed by the Petitioner.

A recent safety evaluation of the Georgia Tech Research Reactor by the NRC Staff is associated with the Order to Convert from High Enriched Uranium (HEU) to Low Enriched Uranium (LEU).¹⁶ The associated safety evaluation considered all potential safety analyses that are affected by the change-out of the fuel, including potential design-basis accident scenarios. This safety evaluation was issued on the bases that the pertinent reactor design features (1) continue to acceptably ensure that the health and safety of the public is protected for the HEU fuel and (2) have also been demonstrated to be acceptable for the LEU fuel.

The Petitioner raised concerns on various structures, systems, and components at the research reactor. First, the ability of the containment building steel structure at the Georgia Tech Research Reactor to control releases of radioactive material was questioned. In this regard, the containment leak rate is tested, in accordance with Technical Specification 4.3.b, for at least 2.0 pounds per square

¹⁵ "Destabilized" in the context of this petition issue has been defined as some condition that would result in the uncontrolled release of radioactive material.

¹⁶ "Georgia Institute of Technology (Georgia Tech Research Reactor): Order Modifying Facility Operating License No. R-97," 60 Fed. Reg. 32,516 (June 22, 1995).

inch gauge (psig), which is the design-basis pressure. Technical Specification 4.3.b requires that leakage from the containment building shall not exceed 1.0% of the building air volume in 24 hours at 2.0 psig overpressure. Actual test results show that leakage is about one-half that value. Containment building structural requirements based on expected external pressures have been estimated capable of withstanding internal pressures of at least 7.5 psig.¹⁷ This leakage integrity and the testing and design margin provide assurance that radioactive materials will not be released in an uncontrolled manner from the Georgia Tech Research Reactor containment.

The design function of the shield and crane support wall to mitigate potential radiation exposures was also questioned by the Petitioner. The steel-reinforced concrete wall inside the containment extends about 34 feet above the outside ground level. A safety function of the steel-reinforced concrete wall is shielding during potential design-basis accident conditions.¹⁸ The design calculations for this shielding function have been reviewed and independently verified. This review finds that the calculations conservatively modeled radioactive source terms and containment configuration.

The Petitioner also raised an issue of a potential "runaway chain reaction." The Georgia Tech Research Reactor is designed with two independent and diverse shutdown systems: the reactor scram system and the top reflector drain system. These systems have significant shutdown capability and have been shown, both analytically and experimentally, capable of withstanding any excess reactivity condition.¹⁹ These analyses show that the Georgia Tech Research Reactor can meet (with substantial margin) the Technical Specification 3.1.a requirements to be shut down (i.e., subcritical by at least 1.0% delta k/k with both the highest reactivity worth shim-safety blade and the regulating rod fully withdrawn). Further, specific design features of the Georgia Tech Research Reactor prevent or mitigate reactivity and power increase conditions. Analyses²⁰ show that both the HEU and LEU fuels are designed to withstand maximum credible reactivity worth/power excursion conditions without damage, including maximum reactivity addition conditions. As indicated in the SAR, this analysis technique has been verified by test data.²¹ This degree of shutdown capability and provisions for mitigation of design-basis accidents is consistent with other U.S. research reactor designs, has been verified by data and NRC Staff review, and provides assurance that the Georgia Tech Research Reactor can be safely shut down for any credible condition, including analyzed accident conditions.

¹⁷ SAR § 4.3.2, *Provisions for Insuring Leak-Tightness*, at 49.

¹⁸ SAR § 4.3, *Description of Reactor Containment Building*, § 4.3.1, *General Layout*, at 42-49.

¹⁹ SAR § 5.6, *Shutdown Margins*.

²⁰ SAR § 5.10, *Accident Analyses*, at 139-144.

²¹ SAR § 5.9.1, *Comparison of Calculations with SPERT-II Experiments*, at 137-138.

The Petitioner also raised a concern that a previous accident analysis assumed a fuel loading accident that was considered "incredible" and no analysis of this scenario was performed in the current SAR.²² The SAR states: "During refueling operations, all control elements are required to be fully inserted and the top D₂O reflector drained to storage. Following the refueling operation, the reactor startup will be accomplished with standard practice. Under these conditions, a sudden introduction of reactivity is impossible."²³ Although the NRC Staff agrees with the Licensee that this accident is not credible, the NRC Staff did verify that the results would be acceptable in the unlikely event of such an accident. Specifically, in the safety evaluation for the Order to Convert from HEU to LEU,²⁴ the NRC Staff found that (1) the previous safety evaluation²⁵ remained valid in that the HEU fuel would not be damaged by the fuel loading accident and (2) the reactivity characteristics of the LEU compared to the HEU fuel are such that the maximum fuel temperatures of the LEU fuel would be less than the temperature for the HEU fuel during the potential fuel loading accident. Therefore, the NRC Staff finds that, although the fuel loading accident analysis was not and need not be performed in the current SAR for the Georgia Tech Research Reactor, the potential results, if the analysis were to be performed in the current SAR, would remain acceptable for both fuel types.

The Petitioner also raised a concern regarding the emergency cooling capabilities at the Georgia Tech Research Reactor. The research reactor is designed with an emergency cooling system.²⁶ The system, as required by Technical Specification 3.7, consists of a passive tank capable of providing cooling for 30 minutes, and two separate long-term supplies, only one of which is required for a total of 12 hours of cooling. (It should be noted that in the SAR the licensee assumed that (1) the long-term cooling supply connections are prevented or interrupted, (2) a complete core meltdown and conservative fission product release occurred, and (3) conservative radiological exposure conditions existed. These assumptions were used in a calculation to demonstrate acceptable design bases for the Georgia Tech Research Reactor containment, that is leakage rate and shielding functions, as previously discussed.) The Petitioner's concern relates to the time required to make the manual connections to the backup water supplies and potential radiation exposures during this process. These connections are made outside the containment structure. The 30-minute cooling period flow is

²² SAR § 5.10.3, *Fuel Loading Accident*.

²³ SAR § 8.4.2, *Fuel Loading Accidents*.

²⁴ Letter from Marvin M. Mendonca, NRC, to Dr. Ratih A. Karam, Georgia Institute of Technology, "Issuance of Order Modifying License No. R-97 to Convert from High- to Low-Enriched Uranium — Georgia Institute of Technology (TAC No. M85896)," Enclosure 3, Safety Evaluation § 2.14.5, *Fuel Loading Accident*.

²⁵ U.S. Atomic Energy Commission, Safety Evaluation by the Directorate of Licensing, Docket No. 50-160, Georgia Institute of Technology, § 6.0, *Accident Analysis*, at 12, dated December 19, 1972.

²⁶ SAR § 4.4.8.3, *Emergency Cooling System*, at 87-90.

designed to be provided by gravity flow from the previously mentioned passive tank through two redundant fast-acting, failsafe valves. This cooling ensures no fuel damage or radiation release effect in the event of the loss-of-coolant accident in that 30-minute time period. The NRC Staff concludes, based on a walk-through with the Licensee, that 30 minutes continues to be an acceptable time to make the connections. The long-term emergency cooling connections could be accomplished within the 30-minute time period and there would be no increased radiation exposure while making these connections. Therefore, the previous NRC Staff conclusion in licensing the Georgia Tech Research Reactor remains valid, that is, there will be acceptable emergency cooling of the core in the event of the loss-of-coolant accident.

The Petitioner also raised a concern on the reduction in shielding for the cobalt-60 storage pool, caused by the use of water from this storage pool to provide one of the two alternate long-term water supplies for emergency cooling of the research reactor. The emergency cooling function effect on radiation levels from the cobalt-60 pool was reviewed and independently verified. This evaluation has found that the reduction in water above the cobalt-60 sources for the long-term reactor emergency cooling function would not significantly affect the shielding of the cobalt-60 source, i.e., there will remain sufficient water for shielding. This was confirmed with the Georgia EPD, the licensing authority for the cobalt-60 source, and the Georgia Tech Research Reactor licensee. Therefore, the use of the cobalt-60 pool for emergency cooling of the Georgia Tech Research Reactor would not adversely impact that function or radiation safety.

The Petitioner raised a concern regarding the use of hot channel factors and engineering uncertainty factors. The SAR analyzed the fuel design to establish safety limits considering power peaking conditions (hot channel factors) and conservative fuel manufacturing tolerance (engineering uncertainty factors). Consistent with research reactor regulatory policy, the SAR verified that these safety limits would not be exceeded or even approached, so that no fuel damage would occur.²⁷ The NRC Staff finds that these conclusions remain valid for both the current HEU fuel and for the LEU fuel as documented in the Order to convert from HEU fuel.²⁸

The Petitioner also had a concern related to the reasonableness of assuming a scram after pump failures in the SAR. The SAR paragraph in question states: "The loss of the primary D₂O pump or the secondary cooling water pump can result in undesirable reactor operating conditions. These systems are therefore provided with high temperature and low flow interlocks with the reactor scram

²⁷ SAR § 5.7, *Thermal-Hydraulic Safety Parameters*, at 127-135.

²⁸ Letter from Marvin M. Mendonca, NRC, to Dr. Raïb A. Karam, Georgia Institute of Technology, Enclosure 3, Safety Evaluation § 2.11, *Thermal-Hydraulics*.

circuitry. Of the two pump failures, the loss of the D₂O pump is the more serious. Two independent low D₂O flow scram interlocks, and loss of electrical power interlocks have been provided in the reactor safety instrumentation. It is therefore acceptable to assume that the reactor will scram because of low flow shortly after an electrical power failure or the more serious case of pump seizure.²⁹ These interlocks provide redundant and diverse scram functions for the Georgia Tech Research Reactor. The NRC Staff concludes that in the unlikely event that one of the independent low D₂O flow scram interlocks were to fail or be inoperable, the other low D₂O flow scram interlock would scram the reactor. These redundant scram interlocks are required by Technical Specification 3.2.a. Additionally, the high D₂O temperature and loss of electrical power scram interlocks provide additional assurance that the reactor will scram on potential pump failure events. Based on the redundancy of the low D₂O flow scram interlocks and the additional redundancy from diverse scram interlocks such as the high D₂O temperature scram interlocks, the NRC Staff concludes that it is acceptable to assume that the reactor will scram for the potential pump failure analysis.

The Petitioner also asserted that plutonium and cesium-137 were not included in the core burnout analysis. For the core burnout analysis, data show that the assumed release fractions from the fuel of isotopes in the SAR are conservative and that plutonium, cesium, or other particulate isotopes would not be released.³⁰ Furthermore, page 196 of the SAR states that the source term includes daughter products of the released volatile fission products, which would include cesium-137 as a daughter product of released isotopes. Based on the above-quoted data and consideration of volatile fission-product decay daughters, the release assumptions are acceptable.

The Petitioner also indicated that there were errors in the Georgia Tech Research Reactor SAR. These alleged errors include the following: that the half-life of iodine-131 was incorrectly specified; that the geologic data are inadequate; that population data are outdated; that the radiation exposure calculational technique and data used to estimate design-basis accident radiological doses are outdated; that incorrect names were used for State of Georgia organizations; and that a 30-year wind rose was needed.

Regarding the half-life of iodine-131, there was a typographical error where 1.92 hours was typed instead of 192 hours. This has been corrected by the Licensee in a January 1995 SAR revision.

The geologic data presented by the Licensee in the SAR, along with other data and information that were provided by the Petitioner, DPW, the Georgia Geologic Survey, and the Licensee, have been evaluated and discussed by the

²⁹ SAR § 3.2.2, *Pump Failures*.

³⁰ SAR at 196 and Reference B.1.

NRC Staff in issues (4) and (7) of this Partial Director's Decision. Based on these evaluations by the NRC Staff, the geologic data do not change the previous Staff conclusions in licensing the Georgia Tech Research Reactor, and the NRC Staff does not possess any information that would suggest that the geologic information for the research reactor is not acceptable.

The population data presented by the Licensee were from the 1990 census rather than from current City of Atlanta or other estimates on population as stated by the Petitioner. The use of the 1990 census data is acceptable because they are the latest official U.S. census data. The use of such data as implemented in the Georgia Tech Research Reactor SAR and the Technical Specifications is consistent with reactor licensing practices for restricted area, exclusion area, and low population zones.

The radiation exposure calculational technique and data used to estimate design-basis-accident radiological doses (SAR Appendices B and C) were reviewed and found to be conservative and therefore acceptable for use.

Regarding the use of incorrect names for State of Georgia organizations, this was a failure of the Licensee to completely update its SAR and will be corrected in the license renewal process.

Finally, the use of a 5-year wind rose, rather than a 30-year wind rose, is not significant to the Georgia Tech Research Reactor safety analysis or emergency planning because conservative assumptions, which are independent of the wind rose data, are used for dose assessments in the SAR.³¹ In addition, the Georgia Tech emergency preparedness plan uses actual measurements, rather than wind rose assumptions, to determine necessary protective actions.³² Also, as previously discussed in issues (2) and (3), the environmental, effluent, and area radiation monitoring for the Georgia Tech Research Reactor, provides acceptable verification of compliance to Technical Specification and 10 C.F.R. Part 20 requirements, and further wind direction data or wind rose accuracy for environmental monitoring is not required.

The design and analysis features, as documented in the SAR and appropriately required and verified in the Technical Specifications for the Georgia Tech Research Reactor, reduce the potential for or mitigate the consequences of design-basis accidents and provide acceptable assurance that there will be no uncontrolled release of radioactive material. Therefore, the NRC Staff finds no reason to conclude that the radioactive contaminants would be spread by any credible event or condition at the Georgia Tech Research Reactor. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes

³¹ SAR, Appendix B.

³² Letter from R. A. Karam, Georgia Tech, to U.S. Nuclear Regulatory Commission, dated April 19, 1994, Attachment 6, Emergency Preparedness Plan.

that the Petitioner's concern does not raise a substantial health or safety issue warranting the action requested by the Petitioner.

7. *The Georgia Tech Research Reactor Is in an Earthquake Zone*

The NRC Staff has continued to closely follow the seismic and geologic developments in the tectonic province in which the Georgia Tech Research Reactor is located. The site is located in the southeastern Piedmont, which, along with the Blue Ridge, comprises the southern portion of the broad region designated by the NRC Staff as the "New England-Piedmont Tectonic Province." The New England-Piedmont Province is bounded on the northwest by the Southern Valley and Ridge Tectonic Province and on the southeast by the Coastal Plain Tectonic Province.

The NRC Staff has extensively reviewed the geology and seismology of this region (e.g., the Safety Analysis Reports for McGuire, Catawba, North Anna, Shearon Harris, Vogtle, and Summer Nuclear Power Plants). These studies include considerations of the New Madrid, Charleston, east Tennessee, and Brevard seismic zones that were mentioned in the petition. These evaluations by the NRC Staff, as documented in the safety evaluations for the McGuire, Catawba, North Anna, Shearon Harris, Vogtle, and Summer Nuclear Power Plants, and other, nuclear and non-nuclear-related evaluations during the last two decades, have identified no capable faults³³ in this region.

The NRC also has supported regional seismic networks in the southeast.³⁴ In 1990, the NRC began to transfer support from these regional networks to the National Seismic Network operated by the United States Geological Survey. The NRC Staff continues to review the results from these networks, and finds no new information that would change previous conclusions on the seismicity of the southeastern Piedmont (i.e., there are no capable faults and the potential for a damaging earthquake is very remote).

Seismology has been considered in the licensing of the Georgia Tech Research Reactor. The New Madrid, Missouri, and the Charleston, South Carolina earthquakes (that were mentioned in this petition issue) were considered, as were lesser-magnitude earthquakes in and near Georgia. The Petitioner has presented no new seismic information for the region. The NRC Staff evaluation continues

³³ Capable faults are defined in 10 C.F.R. Part 100, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," Appendix A, § III "Definitions."

³⁴ These networks include the Charleston network, first operated in 1973 by the U.S. Geological Survey (USGS). Others were added during the mid and late 1970s and early 1980s, which were operated by Virginia Polytechnic and State University (Central Virginia and Giles County Seismic Zones), the University of Memphis (Southern Appalachians and New Madrid Seismic Zones), Georgia Institute of Technology (Georgia and Alabama), and St. Louis University (New Madrid Seismic Zone).

to support the conclusion that the seismology for the Georgia Tech Research Reactor has been acceptably considered in the licensing of this facility.

A study of seismic hazards has been performed for Georgia Tech and referenced in the petition.³⁵ This study reviewed seismic history, performed probabilistic and deterministic seismic ground motion studies, and made estimates of potential ground motion. The report validated Standard Building Code seismic coefficient requirements for the Georgia Tech campus, and did not change the conclusion on the acceptability of the Georgia Tech Research Reactor.

The above conclusions, as previously discussed in issue (4), are further supported by the Georgia State Geologist in a letter dated May 11, 1995.

The NRC Staff finds no reason to conclude that the seismic characteristics for the site are unacceptable for the Georgia Tech Research Reactor. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes that the Petitioner's concern does not raise a substantial health or safety issue warranting the action requested by the Petitioner.

8. *There Is Absolutely No Reason to Keep the Georgia Tech Research Reactor Operating*

The license for the Georgia Tech Research Reactor was issued in accordance with all applicable requirements. The Licensee programs in education, research, and development are consistent with the Georgia Tech Research Reactor license. Specifically, the Georgia Tech license renewal request dated April 19, 1994, discussed activities at the research reactor, including nuclear education in nuclear engineering and health physics. It also discussed contributions to the community, such as plant irradiation experiments for high school science classes and use by the Boy Scouts of America for nuclear merit badges at the Georgia Tech Research Reactor. The Georgia Tech Research Reactor has capability for biomedical irradiation research and development, isotope production, neutron diffraction, and activation analysis. The license renewal request specified programs evaluating radiation decomposition of chemicals, characterizing neutron-absorbing materials, and characterizing soil samples.

The Petitioner also raised concerns on the monitoring and calibration of neutron beams for medical therapy. At this time, the Georgia Tech Research Reactor is not authorized to conduct medical therapy,³⁶ so the specific concern is not applicable.

³⁵ "Seismic Hazard Study for the Georgia Institute of Technology Campus, Atlanta, Georgia," Law Engineering Project No. 57704495.01, March 16, 1993.

³⁶ The Georgia Tech Research Reactor cannot perform medical therapy without specific authorization under the provisions of the Atomic Energy Act § 104(a). Georgia Tech may perform experiments, such as the characterization of irradiation conditions for potential, future medical therapy as long as the experiments and research reactor are

(Continued)

The Petitioner has asserted that substantial management deficiencies persist, including concerns on the problems related to the 1987/1988 time frame. This concern on the persistence of substantial management deficiencies may be addressed in the pending license renewal proceeding. As previously outlined in the Introduction to this Partial Director's Decision, the Final Director's Decision will take into account any relevant findings from this license renewal proceeding at an appropriate time after completion of the NRC Staff review.

The NRC Staff finds no reason at this time to conclude that the Georgia Tech Research Reactor is not continuing to conduct research and development activities in accordance with the Atomic Energy Act and NRC regulations. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes that no information has been provided on this issue to conclude that a substantial health or safety issue exists warranting the action requested by the Petitioner.

9. Security at the Georgia Tech Research Reactor Is Extremely Lax

The concerns on security issues, as previously outlined in the Introduction to this Partial Director's Decision, may be addressed in a pending license renewal proceeding. These issues will be addressed in a Final Director's Decision at an appropriate time after taking into account any relevant findings from this license renewal proceeding and after completion of the NRC Staff reviews.

10. In Case of an Accident or Terrorist Attack, Evacuation of the Campus and Downtown Atlanta Would Be Impossible Both Now and During the Olympics³⁷

With respect to potential accident conditions for the Georgia Tech Research Reactor, the Emergency Planning Zone (EPZ), the area within which predetermined protective actions are established, is a 100-meter radius from the facility.³⁷ This EPZ is in accordance with NRC emergency preparedness guidance applicable to research reactors.³⁸ The Georgia Tech Research Reactor accident analyses³⁹ demonstrate that this 100-meter EPZ is conservative for the Georgia Tech Research Reactor. These analyses have been found acceptable most re-

within the provisions of the current license and other NRC regulatory requirements. In order to perform medical therapy at the Georgia Tech Research Reactor, an associated license under the provisions of 10 C.F.R. § 50.21(a) would be required, as well as associated modifications to the Technical Specifications from the NRC.

³⁷ That portion of the issue that deals with potential terrorist attacks will be included in issue (9) on security.

³⁸ "Standard Review Plan for Review and Evaluation of Emergency Plans for Research and Test Reactors," NUREG-0849, Appendix II.

³⁹ SAR § 5.10, *Accident Analyses*, at 139-144; § 8, *Reactor Hazards Evaluation*; and Appendices A, B, and C, at 176-214.

cently in the safety evaluation for the Order to convert from HEU fuel.⁴⁰ These analyses demonstrate that the potential need for protective actions outside the EPZ is highly unlikely. The specification of emergency classifications (e.g., no general emergency classification) for the Georgia Tech Research Reactor has also been reviewed by the NRC Staff and found to be consistent with the NUREG-0849 guidance. The Georgia Tech Research Reactor emergency plan has been previously verified by the NRC Staff to be acceptable in accordance with this regulatory guidance and applicable regulations.

The Georgia Tech Research Reactor has conducted emergency response drills in accordance with its emergency plan (the last three drills were on October 19, 1994, November 4, 1993, and November 9, 1992). The drills have included involvement of onsite or offsite agencies, such as the Georgia Tech Police Department, the Atlanta Fire Department, the Atlanta/Fulton County Emergency Management Agency, the Georgia Emergency Management Agency, the Georgia Environmental Protection Division, and the Grady Memorial Hospital. Training, equipment, and contingency planning for onsite and offsite personnel have been acceptably in accordance with emergency plan requirements, as verified most recently in NRC Staff Inspection Reports 50-160/94-04, 50-160/93-03, and 50-160/92-04. Police, fire, and medical personnel have been observed by NRC Staff to acceptably perform their responsibilities. Other recent discussions with these emergency response organizations demonstrate that they acceptably understand and feel capable of discharging their responsibilities under emergency conditions at the Georgia Tech Research Reactor.

With regard to emergency preparedness during the Olympics,⁴¹ the NRC Staff and the Licensee have been discussing the necessary steps to take for reactor safety during this event for some time before this petition was raised. The Licensee has decided to not operate the research reactor during the 1996 Olympics and to remove the spent fuel from the facility prior to the Olympics.⁴² This would eliminate the potential for radiological releases during the Olympics related to the presence of such fuel on site, and would reduce the potential for any emergency response to be taken due to radiological conditions for the Georgia Tech Research Reactor during the Olympics.

Georgia Tech has indicated that there are no events or additional resident population that are planned to be within the EPZ, and that the entire campus is to

⁴⁰ Letter from Marvin M. Mendonca, NRC, to Dr. Ra'ib A. Karam, Georgia Institute of Technology, Enclosure 3, Safety Evaluation, § 2.14, *Potential Accident Scenarios*.

⁴¹ As previously noted, the implications of terrorist acts during the Olympics relative to emergency preparedness may be addressed in a pending license renewal proceeding. These issues will be addressed in a Final Director's Decision at an appropriate time after taking into account any relevant findings from this license renewal proceeding and after completion of the NRC Staff reviews.

⁴² Georgia Institute of Technology's Response to Commission's Order Issuing Housekeeping Stay, dated June 21, 1995, and letter from Patricia Guilday, Assistant Attorney General, State of Georgia, Department of Law, to the Secretary of the NRC dated July 25, 1995.

be controlled for access such that increased transient population through the EPZ is not expected. Further, supplemental emergency provisions for the Olympics are being planned by Georgia Tech in coordination with the Atlanta Committee for the Olympic Games, the U.S. Department of Defense, the Federal Bureau of Investigation, the Georgia State Patrol, Georgia Department of Transportation, City of Atlanta Police, and City of Atlanta Fire Department.

Additionally, the Petitioner in her July 18, 1995 letter, raised a concern on emergency preparedness for power reactor licenses, including emergency preparedness during the Olympics. NRC regulations require the development of emergency preparedness plans for all reactor licenses. The Petitioner presented no information and the NRC Staff does not know of any information that would suggest that reactor emergency preparedness is not acceptable, including emergency preparedness during the Olympics.

The Petitioner also raised an issue addressing the location of the emergency command center within the Georgia Tech Research Reactor building. However, the emergency command center is outside the containment structure in which the Georgia Tech Research Reactor is housed. The emergency command center is isolated from the containment structure, which, as previously discussed on issue (6), is capable of withstanding pressures greater than would result from any analyzed accident. The discussions on the preceding issues also demonstrate that there is little likelihood that the emergency command center could be affected by a radiological event related to the Georgia Tech Research Reactor. The emergency command center is monitored for radiation so that in the unlikely event of an indication of unacceptable radiation in the emergency command center, or if it were to otherwise become unavailable, alternative actions could be taken (e.g., relocation of emergency response personnel). The above is consistent with the Georgia Tech Research Reactor emergency plan and previous NRC acceptance of the emergency plan, continues to acceptably implement the requirements of NUREG-0849, and, therefore, provides acceptable emergency preparedness for the Georgia Tech Research Reactor.

Based on the above, the 100-meter EPZ at the Georgia Tech Research Reactor is acceptable as a planning basis to ensure the protection of the public health and safety both now and during the Olympics, and the likelihood of evacuation or other protective action beyond the EPZ is acceptably low. During the Olympics, Georgia Tech's plans to not operate and to remove spent fuel ensure that there will be minimal potential of radiological-related emergencies arising in connection with the NRC license for the Georgia Tech Research Reactor. Further, during the Olympics, the conditions around the research reactor, access controls to the campus, and planning for supplementary emergency provisions ensure that the provisions of the emergency plan will not be adversely affected by the Olympics.

The NRC Staff finds no reason to conclude that the emergency planning zone for the Georgia Tech Research Reactor is not acceptable, including during the time period of the Olympics. The Petitioner provided no facts to conclude otherwise. Therefore, the NRC Staff concludes that no information has been presented to conclude that a substantial health or safety issue exists warranting the action requested by the Petitioner.

B. Revocation of Liquid Radioactive Material Release Authority; Revocation of Licenses Using the Principle of As Low As Reasonably Achievable; Prohibition of Transportation of Radioactive Material by Mail; and Modification to Posting Requirements for Radioactive Material

The following are general requests by the Petitioner for actions related to various categories of licenses:

1. The request to withdraw all license authority nationwide involving the discharging or dumping of any quantity of radioactive material to all the sewers or waters in the United States;
2. The request to withdraw all licenses to all nuclear facilities, including nuclear power plants, which operate under as low as reasonably achievable (ALARA) principles;
3. The request that the NRC Staff prohibit the transportation of radioactive material by mail; and
4. The request that the NRC Staff modify every license issued to transporters of radioactive materials and builders of nuclear power plants so that these parties must put 2-foot-high letters on everything transported or built stating "DANGER-RADIOACTIVE" and in slightly smaller letters "there is no safe level of radiation, any exposure can [a]ffect health."

The bases for these requests are that there is no safe level of radiation, that storage and disposal of radioactive waste is inadequate, and that the NRC sewage discharge guidelines are totally inadequate. The Petitioner has also indicated that the basis for the request related to transportation by mail is that accidents have occurred while transporting radioactive materials. The issues enumerated by the Petitioner are broadly framed requests to take actions to prohibit discharging all radioactive material into sewers and waters of the United States, to create a zero-release limit of radioactive material, and to modify the transportation regulations under 10 C.F.R. Part 71.⁴³ The Petitioner

⁴³The NRC's packaging and transportation regulations in Part 71 are part of a broad regulatory scheme for the packaging and transportation of radioactive materials. The packaging and transportation of radioactive materials are also subject to the regulations of the U.S. Department of Transportation and the U.S. Postal Service. See 10 C.F.R. § 71.0(b).

also raises concerns over the adequacy of current NRC regulations related to radiation protection.⁴⁴ Finally, the Petitioner questions the adequacy of NRC and Environmental Protection Agency (EPA) regulations on allowed radioisotopes in the environment.

For each of the Petitioner's concerns cited directly above, the Petitioner has provided no specific information or basis that would support taking action on the Petitioner's four requests cited in this section. The Petitioner's request to withdraw all license authority for the discharging of any quantity of radioactive materials to all sewers and waters is based on a general assertion that the NRC's sewer dumping guidelines are totally inadequate. The Petitioner offers no support for this assertion. In addition, the Petitioner's stated bases for the request to withdraw all licenses that operate under AL, RA principles (i.e., there is no safe level of radiation and the storage and disposal of radioactive materials, as well as the regulations, are inadequate) have not been substantiated by any data or references in the petition. Finally, no information was provided that transportation accidents had not been evaluated and issues resolved under the provision of current regulations or that present regulations regarding the use of mail to transport radioactive material is not acceptable. Because these stated concerns are general and are not supported by additional information in the petition, these concerns do not provide the basis for taking enforcement action under 10 C.F.R. § 2.206.

No specific information was provided to support the Petitioner's general statements on the inadequacy of NRC regulations. The Petitioner has provided no information that would lead to a conclusion that the packaging and transportation regulations in 10 C.F.R. Part 71, the radiation protection regulations in 10 C.F.R. Part 20, and the NRC's and EPA's environmental protection regulations, are not providing acceptable protection to the public health and safety, as well as to the environment. Since the Petitioner has not submitted any relevant technical, scientific, or other data to support any of the general requests for the actions enumerated in this section, or raised a substantial health and safety concern based on these issues, the Petitioner's general requests for such actions are denied. However, should this Petitioner, or anyone, wish to provide relevant technical, scientific, or other data and grounds to support any change to NRC regulations, a Petition for Rulemaking can be submitted in accordance with 10 C.F.R. § 2.802.

⁴⁴ These concerns include that the release limits to the sewer systems is established as a monthly concentration and allows release of soluble material, that the brain and ovaries are not specifically mentioned in the organ dose weighting factors, that an individual is not considered a member of the public any time in which the individual receives an occupational dose, that special exposures should not be allowed, that no dose be allowed to the embryo/fetus whether the woman is declared pregnant or not, and that radiological release limits are established assuming a "Reference Man."

III. CONCLUSION

The institution of proceedings pursuant to section 2.206 is appropriate only if substantial health and safety issues have been raised. See *Consolidated Edison Co. of New York* (Indian Point, Units 1, 2, and 3), CLI-75-8, 2 NRC 173, 175 (1975); *Washington Public Power Supply System* (WPPSS Nuclear Project No. 2), DD-84-7, 19 NRC 899, 924 (1984). This is the standard that has been applied to the concerns raised by the Petitioner to determine whether the action requested by the Petitioner is warranted.

With regard to the requests made by the Petitioner discussed herein, the NRC Staff finds no basis for taking such actions. Rather, as explained above, the NRC Staff concludes that no substantial health and safety issues have been raised by the Petitioner. Accordingly, the Petitioner's requests for action, pursuant to section 2.206 on the Georgia Tech Research Reactor, are denied on issues A.1 through A.8 and A.10, insofar as the issues on A.8 do not relate to the Petitioner's concerns on the persistence of substantial management deficiencies and the issues on A.10 do not relate to the Petitioner's security issues. As previously noted in the Introduction and Discussion to this Partial Director's Decision, the issue related to the persistence of management problems (part of A.8) and the issue related to security (A.9 and part of A.10) will be decided after taking into account the results of the licensing proceeding on the license renewal application. In addition, the Petitioner's requests on general license and authority revocation, as discussed in Section B of this Partial Director's Decision, are denied.

A copy of this Decision will be filed with the Secretary for the Commission as provided by 10 C.F.R. § 2.206(c) of the Commission's regulations. The Decision will become the final action of the Commission 25 days after issuance unless the Commission, on its own motion, institutes review of the Decision in that time.

FOR THE NUCLEAR
REGULATORY COMMISSION

Frank J. Miraglia, Acting Director
Office of Nuclear Reactor
Regulation

Dated at Rockville, Maryland,
this 31st day of July 1995.