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STAFF EXHIBIT

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W.
ATLANTA, GEORGIA 30323

NOV 15 1988

NUCLEAR REGULATORY COMMISSION
Docket No. 50-160-ren EXHIBIT NO. 15
In the matter of Ga. Tech
☑ Staff ☐ Applicant ☐ Intervenor ☐ Other
☐ Identified ☐ Received ☐ Rejected Reporter WCW
Date 5/23/96 Witness Pamela A

Docket No. 50-160
License No. R-97
EA 88-32

Georgia Institute of Technology
ATTN: Dr. J. P. Crecine, President
225 North Avenue
Atlanta, Georgia 30332

Gentlemen:

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY (NRC INSPECTION REPORT NO. 50-160/87-08 AND NRC OI INVESTIGATION REPORT NO. 2-88-003)

This refers to the Nuclear Regulatory Commission (NRC) inspection conducted at the Georgia Institute of Technology (Georgia Tech), Neely Nuclear Research Center (NNRC) on December 16, 1987, January 4-5, 1988, and January 14-22, 1988 and an investigation conducted by the NRC Office of Investigations. The inspection included a review of NNRC procedures and management controls associated with control of irradiation experiments. The report documenting the inspection was sent to you by letter dated February 10, 1988. As a result of this inspection, significant deficiencies in management control of operations at your facility were identified, including inadequate evaluation of experiments before they were authorized and inadequate controls over post irradiation activities. Consequently, the NRC issued an Order on January 20, 1988, suspending authorization to conduct irradiation experiments with the reactor and requiring certain program upgrades.

As a result of our identification of significant management control problems during the inspection and failure to comply with regulatory requirements, NRC concerns relative to the inspection findings were discussed in an Enforcement Conference held on February 23, 1988. The letter summarizing this Conference was sent to you on March 14, 1988. On February 15, 1988 you directed the immediate suspension of all reactor operations to assure that all safety questions were resolved. An Order, confirming your commitment not to restart the reactor without NRC approval, was issued on March 17, 1988.

On September 1, 1988, we provided you a copy of the synopsis of the NRC Office of Investigations (OI) report concerning alleged discrimination by Georgia Tech management against employees for engaging in protected activities. An enforcement conference on this issue was held on September 19, 1988. The letter summarizing this conference was sent to you on October 11, 1988. Your letter of September 19, 1988 requested a copy of the Investigation Report. This request is being reviewed by the NRC staff.

The violations described in the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) involve (1) failure to follow approved procedures and failure to have adequate procedures for conduct and control of experiments and for radiological safety activities and (2) failure to conduct

adequate surveys to evaluate the extent of radiological hazards which may have been present. These violations resulted from failure to implement adequate management controls and programs necessary to assure licensed activities are conducted in a safe manner in accordance with NRC and facility requirements. The OI report concluded that a severe state of disharmony and conflict existed between the operations and health physics staffs and this condition appeared to have escalated and intensified since July 1, 1987 when all staff personnel were placed under the same management structure. Poor management at all levels substantially contributed to this atmosphere. It was the failure of management evident during the January 1988 inspection that caused the NRC to issue an Order on January 20, 1988 and the Confirmatory Order of March 14, 1988.

The NRC OI investigation identified numerous examples of perceived harassment by management as well as staff factions. The involuntary dismissal of two health physics employees in February 1988 was viewed by the health physics staff as retaliation for discussing safety concerns with the NRC. While there are some indications to support this perception, such that adverse actions may have been taken because the employees were engaged in protected activities, there is, in our view, insufficient evidence to conclude that a violation of 10 CFR 50.7 occurred. Although you are not being cited, we believe the environment was conducive to such potential violations and had the potential to affect adversely the safety of reactor operations. This is clearly a significant regulatory concern. We recognize that you have made substantial changes to the organization and management to remedy this matter. Nonetheless, you should continue to assure and reinforce to all your managers and supervisors involved with NRC-licensed activities the clear understanding of the right of employees to raise safety concerns with Georgia Tech management or the NRC without fear of reprisals, and the necessity for maintaining a work environment conducive to safe operations. Your actions in this area will be reviewed by NRC in future inspections.

Your attention is also directed to our concerns with activities at the Neely Nuclear Research Center that led to the May 20, 1988 Enforcement Conference with a Senior Reactor Operator. As you know, we determined that specific enforcement action against that individual was not warranted. In fact, we concluded that the principal cause of his marginal performance was attributable to ineffective management, including a lack of adequate procedures, standards and expectations. Georgia Tech has a particular responsibility in that you develop scientists and engineers who will have important roles in the nuclear industry of the future. As we discussed during the September 19, 1988 Enforcement Conference, you share our belief that these students' attitude toward safety must be influenced by example as well as by education.

In February, March, May, and September 1988, you and members of your staff met with the NRC staff to discuss these management issues and your own assessment of the problems at NNRC. In addition, you have provided responses to the NRC Orders detailing your actions to correct the problems identified by the NRC and yourself. We note that you have instituted extensive personnel, procedural, training, and organizational changes and have also increased the direct management attention to the NNRC program. We conducted inspections in August and November 1988 to

assess the effectiveness of your corrective actions and believe your actions address our concerns. Nonetheless, to emphasize the importance to your managers of the necessity of assuring lasting and effective compliance with NRC requirements, I have been authorized, after consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Regional Operations, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty in the amount of Five Thousand Dollars ($5,000) for the violations described in the enclosed Notice. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1988) (Enforcement Policy), the violations described in the enclosed Notice have been categorized as a Severity Level III problem because they are representative of failures in management that are of significant regulatory concern and could have resulted in very serious safety consequences. The base value of a civil penalty for a Severity Level III violation or problem is $2,500. The escalation and mitigation factors in the Enforcement Policy were considered, and the base civil penalty was escalated 100 percent because of your prior poor performance in adherence to procedures and radiological controls, and because of your failure to take prompt corrective action to deal with management control problems. Similar concerns regarding your management controls and involvement in implementation of your programs for radiation protection, reactor operations and control of experiments were previously identified in two Notices of Violations issued April 14, 1987 and May 26, 1987. In addition, an enforcement conference was held on May 4, 1987 to discuss the need for increased management control of the health physics and reactor operations activities. In this meeting the NRC stressed the importance of compliance with Technical Specifications and internal procedures and an effective corrective actions program.

We note that the issues associated with these violations have been the subject of meetings, inspections, and correspondence. Thus, a significant amount of information has been provided to the NRC concerning corrective steps which have been taken. Therefore, if you do not plan to protest the violations, a response to the violations is not necessary. However, should you desire to respond to the violations you may refer to these meetings, inspection reports, and correspondence and should follow the instructions specified in the enclosed Notice when preparing your response. Please refer to the instructions in the enclosed Notice regarding payment or protest of the civil penalty. Based on the significance of the management control problem and the amount of attention this matter has received from NRC and Georgia Tech managers, including meetings, enforcement conferences, and Orders, we expect that the corrective actions taken and planned will be effective in assuring that the NNRC is operated in a safe manner in accordance with NRC and facility requirements. The NRC will monitor the effectiveness of the corrective actions during future inspections and, should our expectations not be met, will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

The responses to this letter and its enclosure are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96-511.

Sincerely,

Malcolm L. Ernst
Acting Regional Administrator

Enclosure:
Notice of Violation and Proposed
Imposition of Civil Penalty

cc w/encl:
Dr. A. P. Sheppard, Acting Vice President
for Research
Dr. R. A. Karam, Director
Neely Nuclear Research
Dr. J. S. Tulenko, University
of Florida
Dr. T. S. Elleman, North
Carolina State University
Dr. R. U. Mulder, University
of Virginia
State of Georgia

NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTY

Georgia Institute of Technology
Research Reactor

Docket No. 50-160
License No. R 97
EA 88-32

During the Nuclear Regulatory Commission (NRC) inspection conducted on December 16, 1987, January 4-5, and January 14-22, 1988, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1988), the Nuclear Regulatory Commission proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (ACT), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violations and associated civil penalty are set forth below:

A. Technical Specifications 6.4.b(2) and 6.4.b(6) require written procedures to be provided and utilized for installation and removal of experiments and experimental facilities; and radiation and radioactive contamination control.

Technical Specification 6.3.e requires a Quality Assurance Program covering the design, fabrication, and testing of experiments, including procedures for verification of kinds and amounts of their material contents to assure compliance with Technical Specification in Section 3.4.

Technical Specification 3.4.f requires materials of construction and fabrication and assembly techniques in experiments be specified.

Licensee Procedure, Request for Minor Experiment Approval, Reference No. R7420, dated April 4, 1987, limits topaz irradiation times to 30 megawatt hours (MW-hrs) and lists expected radiation levels from cadmium and aluminum material used in the experiment to be "nil."

Licensee Procedure, 3102, Quality Assurance for Experiments, dated October 28, 1982, specifies that for the Experimenters Checklist and Schedule Form, quantitative controls of the experiment, that is reactivity, radiation, temperature, and material constraints, are addressed and reviewed by licensee management prior to conducting experiments.

Contrary to the above, for a topaz irradiation experiment which resulted in a subsequent contamination event during the week of August 17, 1987, the licensee failed to follow approved procedures and failed to have adequate procedures in that:

1. Licensee Procedure 3102 was inadequate in that it specified only a review by management prior to conducting experiments and failed to specify a post-experiment review to determine if radiation levels and other experiment parameters are consistent with expected values.

2. The irradiation time for the topaz experiment exceeded the 30 MW-hrs limit allowed by the Request for Minor Experiment Approval Form. The total irradiation time was 41.8 MW-hrs.

3. Licensee operation and health physics procedures to control and/or prevent the spread of radioactive contamination and to control personnel exposure while handling and manipulating irradiated experiment material were inadequate in that measures, such as fume hoods or containment structures, were not specified and surveys were not required at exit points to all contaminated or contamination control areas.

4. Licensee procedures were inadequate in that the materials and methods for construction and fabrication of the cadmium layer used in the topaz irradiation experiment were not specified.

5. Licensee procedures for analyzing for airborne radioactive contaminants were inadequate in that samples in which gross analysis concentrations exceeded 10 CFR Part 20, Appendix B, limits were not required to be maintained a sufficient time to allow for decay of natural radon daughter products and then be recounted to evaluate the actual radiation hazards present as a result of reactor operations.

6. Licensee procedures for urine bioassay analyses and internal exposure evaluation were inadequate in that standard methodology to quantify results of radionuclide analyses in urine was specified only for tritium and appropriate biological retention models to relate calculated body burdens to a person's estimated intake of airborne radioactive contaminants were not specified.

7. The licensee did not have procedures detailing the calibration and operation of the sodium iodide (NaI) detection system used to conduct quantitative "in vivo" chest surveys for radionuclides potentially deposited within the body.

B. 10 CFR 20.201(b) requires the licensee to make or cause to be made such surveys as (1) may be necessary for the licensee to comply with regulations in Part 20, and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

10 CFR 20.201(a) defines "survey" to mean an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions.

Contrary to the above, for a contamination event which occurred during the week of August 17, 1987, the licensee failed to conduct surveys or conducted inadequate surveys to evaluate the extent of radiation hazards which may have been present in that:

1. The expected activation of the irradiated material and subsequent dose rates were not adequately evaluated on the Request for Minor Experiment Approval Form, dated April 4, 1987, in that "nil" was stated when dose rates of approximately 3 rem per hour (R/hr) were observed.

2. Radiation contamination surveys of all surfaces potentially exposed to airborne contamination (for example, walls and other vertical surfaces) in the reactor building were not conducted.

3. Surveys verifying the absence of radioactive contamination at the residence of the operator involved in the August 1987 event and who may have transferred contamination from the reactor building on his personal clothing were not conducted in a timely manner. A contamination survey was conducted and results reviewed on January 11, 1988.

C. 10 CFR 20.103(a) requires that no licensee shall possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material in any period of one calendar quarter greater than the quantity which would result from inhalation for 40 hours per week for 13 weeks at uniform concentrations of radioactive material in air specified in Appendix B, Table 1, Column 1.

10 CFR 20.103(a)(3) requires that for purposes of determining compliance with the requirements of this section, the licensee shall use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity in restricted areas and in addition, as appropriate, shall use measurements of radioactivity in the body, measurements of radioactivity excreted from the body, or any combination of such measurements as may be necessary for timely detection and assessment of individual intakes of radioactivity by exposed individuals.

Contrary to the above, for a contamination event which occurred during the week of August 17, 1987, the licensee failed to conduct suitable measurements of concentrations of radioactive materials in air or measurements of radioactivity in or excreted from the body in that:

1. Air samples collected and analyzed for radioactive concentrations in air were not representative of concentrations of radioactive material to which personnel were exposed.

2. The urine bioassay analysis conducted to evaluate the operator's exposure to airborne radioactive contamination during the August 1987 event was inadequate in that the quantitative analysis was not performed for the major radionuclide contaminant, cadmium-115, originally identified by the licensee.

3. The "in-vivo" chest survey analysis conducted to evaluate the operator's exposure to airborne radioactive contamination during the August 1987 event was inadequate in that background count levels and and the minimum limits of detection for the analysis necessary to quantify the results obtained were not determined.

D. 10 CFR 20.401(b) requires each licensee to maintain records in the same units used in this part, showing the results of surveys required by 20.201(b).

10 CFR 20.401(c) requires that records of results of surveys and monitoring maintained pursuant to Paragraph (b) of this section shall be preserved for two years after completion of the survey.

Contrary to the above, for a contamination event which occurred during the week of August 17, 1987, the licensee failed to maintain records for facility and personnel survey records in that:

1. Records of all radiation contamination surveys conducted for the facility to delineate the extent and levels of contamination throughout the containment building prior to and during decontamination activities on August 19-20, 1987, were not maintained.

2. Records of "in vivo" chest surveys conducted during August 20-21, 1987, for the operator contaminated with radioactive material were not maintained.

Collectively, these violations have been evaluated as a Severity Level III problem (Supplements I and IV).

Civil Penalty - $5,000 (assessed equally among the violations).

While a response to the Notice of Violation is not required unless you plan to protest the violations, pursuant to the provisions of 10 CFR 2.201, Georgia Institute of Technology (licensee) may submit a written statement or explanation to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice. If a reply is submitted, it should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) admission or denial of the violation, (2) the reasons for the violation if admitted, (3) the corrective steps that have been taken and the results achieved, (4) the corrective steps which will be taken to avoid further violations, and (5) the date when full compliance will be achieved. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, any such response shall be submitted under oath or affirmation.

Within 30 days of date of this Notice, the licensee may pay the civil penalty by letter addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, with a check, draft, or money order payable to the Treasurer of the United States in the amount of the civil penalty proposed above, or may protest imposition of the civil penalty in whole or in part by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission. Should the licensee fail to answer within the time specified, an order imposing the civil penalty will be issued. Should the licensee elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty, in whole or in part, such answer should be clearly marked as an "Answer to a Notice of Violation" and may: (1) deny the violations listed in this Notice in whole or in part, (2) demonstrate extenuating circumstances, (3) show error in this

Notice, or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty, such answer may request remission or mitigation of the penalty.

In requesting mitigation of the proposed penalty, the five factors addressed in Section V.B of 10 CFR Part 2, Appendix C (1988), should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201 but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of the licensee is directed to the other provisions of 10 CFR 2.205 regarding the procedure for imposing a civil penalty.

Upon failure to pay the penalty due, which has been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

The responses to the Director, Office of Enforcement, noted above (Reply to a Notice of Violation, letter with payment of civil penalty, and Answer to a Notice of Violation) should be addressed to: Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region II.

FOR THE NUCLEAR REGULATORY COMMISSION

Malcolm L. Ernst
Acting Regional Administrator

Dated at Atlanta, Georgia
this 15th day of November 1988