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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD

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Before Administrative Judges:

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

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

In the Matter of

Docket No. 50-160-Ren

ASLBP No. 95-704-01-Ren

GEORGIA INSTITUTE OF TECHNOLOGY
RESEARCH REACTOR
Atlanta, Georgia
Facility License No. R-97

GEORGIANS AGAINST NUCLEAR ENERGY UPDATED RESPONSES TO
NRC INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS
AND RESPONSES TO GEORGIA TECH'S DISCOVERY REQUESTS

Georgians Against Nuclear Energy (GANE) respectfully submits the following updated responses to NRC discovery requests on GANE's management contention. Following the updates to the NRC are answers to Georgia Tech's interrogatories and discovery requests.

SUMMARY

GANE is surprised and shocked at the extent of the problems we are finding in the records we looked at, few and far between as they are. You will notice that we have added several names to our Service List - Dr. Clough and his personal assistant Dr. Papp and interested students of Georgia Tech as well. We cannot detect any effect or record of the State of Georgia's so-called regulatory authority for the non-reactor operations. The NRC has cited many violations although the fines are so low as to pose no deterrent to the ongoing sloppiness of operations at the Georgia Tech Research Reactor and the Neely Nuclear Research Center. In addition, we found incidents that concern us for the health

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and safety of workers and students who use the facility. The NRC has mentioned these incidents in their inspection reports, but took no action to discourage Georgia Tech from persisting in its cavalier attitude towards health and safety. Many of the problems are repeated and ongoing. Many are dropped from discussion without resolution and never brought up again.

Dr. Clough and Dr. Papp, GANE appeals to you to intercede. If you think that the regulatory authorities are taking care of business there, you are sorely mistaken, and the students in your trust may be the ones to suffer most. Even if the Georgia Tech Research Reactor were operating legally, and we do not believe that it is, students, employees and the population of Atlanta are at risk from the vulnerability of the facility to radiological sabotage from terrorists. Further, environmental monitoring has been so flawed for so many years that no one can say with any certainty to what amount of radiation the populations of Georgia Tech campus and Atlanta are being exposed.

In the discovery questions that follow, GANE is doing its earnest best to use the due process available to us to shed light on the largely unsupervised activities that have been going on at the Neely Nuclear Research Center for years. We are listing every indiscretion, large and small, that we have uncovered so far - after all it was a pile of tiny straws that broke the camel's back. Georgia Tech has not been very thorough in its delivery of our discovery requests to us, and the Director of the Neely Nuclear Research Center has been downright uncooperative, possibly evasive. Still, we have found quite a litany.

Because reading the list may seem tedious to Dr. Clough and Dr. Papp, we are summarizing here the gist of our findings. We of course hope the President of Georgia Tech will find the entire document interesting, and will feel compelled to take immediate action to put effective supervision in place for the tasks that follow - to remove the fuel and the cobalt-60, and retire the reactor from operation. We believe that the most reasonable course for Georgia Tech to take is to retire the Neely Reactor. It has fulfilled its 30-year design life with no major catastrophe. We believe that most of the contamination is actually contained within the three buildings on the site, the reactor building, the nuclear waste hut, and the laboratory and research building. The rest of the contamination is of course, as they say, gone with the wind.

Although management problems in the nuclear program are profound, GANE does not suggest that you dissolve the nuclear program. In 50 years of startlingly high technology, the nuclear industry still has not resolved its nuclear waste problems. It is part of GANE's mission to persuade the scientists and engineers who are drawn to this field of study to apply themselves to the nuclear waste dilemma. And if you're afraid of that \$10 million decommissioning bill - GANE will put its resources and energy into begging you not to carve that building up and send it to a landfill, which is what decommissioning is at this time. We don't have the answers, but we are sure the building can remain at 900 Atlantic Drive for quite some time while options are explored. With some extensive clean-up, the laboratory building probably has many uses.

Another field that is desperate for extensive research is the health effects of radiation. This may be a more urgent joint project for Georgia Tech and Emory University than the long talked-about Boron-Neutron Capture Therapy project, which as you will see, will require extensive, and expensive, mechanical repairs to the Georgia Tech Research Reactor before it can begin.

We are dismayed to have found several false statements in legal documents from Georgia Tech to GANE, from the Director of the facility to the Nuclear Oversight Committee and from Georgia Tech to the NRC. On page one of the Safety Analysis Report that is the basic document Georgia Tech submits to the NRC in its application to renew its license for 20 years is the statement, "Over the years, fuel performance has been satisfactory with no known problems. Engineered safety systems have performed adequately and as intended. No safety problems have been encountered." In October 1992 the Director told the Nuclear Safety Committee of a fuel element weld failure, and that he had notified the NRC. There is no record in the NRC documents, which are public, of that notification. The subject was never brought up again in committee, and GANE must infer that the fuel element is still damaged. This may pose a contamination problem during the de-fueling process that is almost upon us.

The Bismuth Block Shield has been leaking since 1989. This is a recurrence of a leak that first happened in 1983 and was repaired with epoxy. The leak has not been reported to the NRC and has still not been repaired. Since 1989 the Bismuth Block has been leaking radiation and cooling water. The Shield is located between the reactor and the Biomedical Irradiation Chamber that would be used if Georgia Tech gets involved with the Boron-Neutron Capture cancer treatment we've been

hearing so much about for years. That project can never be done safely without extremely expensive and extensive repairs to the aged reactor.

GANE is terribly concerned about another material false statement concerning the presence of fresh and spent, irradiated fuel on-site. In Georgia Tech's answers to our discovery questions it is stated that there is no fresh or spent fuel on-site. However, the Director of the Georgia Tech Research Reactor cannot produce any papers showing shipment of the fuel nor are there any NRC documents as to the fuel removal. The spent fuel is extremely toxic and radioactively hot, of course, but the fresh fuel, need we remind you, is weapons-grade uranium. It is stored in a hallway that runs between the reactor building and the brick building right on Atlantic Drive (see attached site plan). The spent fuel is stored under ports on the floor of the reactor building in water which is not circulated and may be contaminated.

These deceptions have raised in GANE what we hope is a paranoid fear, that a word-game is being played with the public about the intent to remove the fuel from Atlanta for the Olympics. In the letter to the NRC from the State Attorney General dated July 25, 1995, it says Georgia Tech "will remove the HEU [high enriched uranium] fuel from its reactor before the start of the Olympics in July 1996" . . . "estimated date for removal of the HEU fuel is late January/early February 1996" . . . "there will be no nuclear fuel at the Georgia Tech site during the Olympics." With all the shell-game of "it's NRC regulated - it's State regulated" GANE's been through, we've developed a concern that the fuel will be removed from the reactor and placed in the cobalt-60 pool which is treated as two different sites by the regulators. Please, please, look into this. We feel certain that you, like us, have a picture that the stuff is going to be placed into a cask and removed from Atlanta altogether, and forever. GANE would very much like to see evidence of the arrangements that are being made with the U.S. Department of Energy for use of the shipping cask. Another observation, as we've made again and again, the cobalt-60 storage pool is much more vulnerable to outsider access and terrorism, even, than the reactor.

Aside from our newly developed paranoia that we've been duped in some dangerous word-game, a paranoia fed, we might add, by the lack of any reference of the recent reactor shutdown and fuel removal to the Nuclear Safeguards Committee - we are concerned as we read the litany of accidents, petty and serious, over the past 10 years, that the current management of the reactor facility cannot safely perform the

delicate, involved process of removing the fuel. We have talked to some experts and they recommend bringing in special personnel to oversee this procedure, if you don't choose to replace current management outright. Names that have been suggested are Dr. Melvin Carter; J.L. Shepherd Company, who performed your recent cesium removal; and John McCormick from Bionomics which is based in Knoxville, Tennessee.

Now, what GANE is involved in here with the NRC is a contention that management problems at the Georgia Tech Research Reactor are so great that safety of the public cannot be assured. And what we have found is that the reactor and research operations have become increasingly unsupervised over the years. It used to be structured so that the Director of Operations and the Director of Health Physics checked and balanced operations there. The Health Physics Department was separate from Operations and reported to the President. There were two separate committees, the Radiation Protection Committee and the Nuclear Safeguards Committee, to oversee and balance that process, ultimately to be overseen by the President of the University. In those days, Health Physics was prominently in evidence, balancing operations and contract fulfillments. Every change in management made over the last 10 years has moved towards where we are today, health physics has been completely disempowered, and everyone is pretty much taking the Director's word for everything. Because of Georgia Tech's poor performance in providing the personnel documents we requested (Georgia Tech was agreeable enough, it just provided us next to nothing) we don't have but a sketchy picture at this time of the management climate at the Neely Nuclear Research Center, but with what we do have, which is fundamentally the minutes of the Nuclear Safeguards Committee, it is pretty apparent that there is a revolving door there for the Manager of the Office of Radiation Safety and that Health Physics' presence is nearly undetectable. The Nuclear Safeguards Committee appears to us to be an ineffective formality, although we would like to credit them for taking a strong stand in recommending the removal from service of the faulty x-ray equipment after one of your students was injured and several labs were contaminated. GANE has not established if the x-ray equipment has been removed from service although one of GANE's members heard a conversation that implied that it has been.

Last, but not least, what was once Georgia Tech's shining status symbol of high technology has rusted into a neglected, arcane sort of ivory tower, or rogue white elephant, of poor science and math. The record is checkered with math errors, poor instructions, missing

instructions, failure to follow procedures, misinterpretations of data, falsification of data, and lots and lots of spilled contaminated water. In another material false statement, the license renewal application states that there is equipment on the stack for constant monitoring of wind direction and speed. When an inspector noticed that the wind rose diagrams were identical year after year and looked a little further, it was learned that no such monitoring device existed. And here's an example that should make all of you on Georgia Tech campus stop and wonder - when one of the 30 monitoring devices ringing the reactor complex registers an unusually high amount of radiation exposure, Georgia Tech, three times in the few documents we've been able to look at, has concluded that collected data was wrong because the outside monitoring device had been EXPOSED TO SUN AND RAIN. Most of the mistakes GANE found result in a failure to quantify the radiation leaking into the environment through various pathways.

Nuclear technology is about precision and kid-gloves handling. Our technological species has learned a lot about it in the 50 years since the Manhattan Project. Call us pessimists, but GANE has learned well about the accidental-releases-of-radiation-to-the-environment chapter to the story, and the cancer-and-genetic-birth-defects side. Some nuclear operations are run better than others. If the Neely reactor were young, it might be recommended to overhaul your management structure and see if it can't be done right. But the Neely reactor is in its old age. The contamination is pretty well contained. And the nuclear industry it has served still sorely needs excellent research and discovery in the new fields of nuclear waste research and radiation health effects. GANE feels that Georgia Tech could regain the status its shiny new reactor once gave it by taking a leadership role in nuclear waste and health effects research. It'd be something to brag about. And who knows, maybe some of the other top-notch research institutions will follow your lead!

GANE RESPONSES TO NRC CONTENTION 9 DISCOVERY REQUESTS

21. Identify and describe all facts in your possession or within your knowledge that supports GANE's contention or assertion.

Response: GANE presently supports its contention that management problems at the Georgia Tech Research Reactor are so great that safety for the public cannot be assured by the following:

3/9/87 - NRC cites Georgia Tech for violations for failure to have operating procedures for sampling of the liquid waste tanks and failure to follow health physics and surveillance procedures.

Methods being used would allow tritium and cobalt-60 to be released into Atlanta sewer system. (NRC Inspection Report 87-02)

5/4/87 - Georgia Tech Research Reactor Director has conference with NRC outlining actions being taken to improve management controls over operations and health physics at the facility to assure its safe operation.

6/10/87 - Dr. Melvin W. Carter, chair of the Radiation Protection Committee, resigns "as a matter of conscience and principle" finding changes in management structure "completely contrary to health physics practice." The Radiation Protection Committee was abolished leaving only the Nuclear Safeguards Committee which GANE will show to be a weak pretense at oversight for operations at, and the Director of, Neely Nuclear Research Facility. (Technique, 11/20/87)

7/1/87 - Director (Dr. Ratib Karam) of Georgia Tech Research Reactor is placed over Health Physics personnel at the facility. Previously the Office of Radiological Safety had supervised HP personnel and had independent status, reporting directly to the President of Georgia Tech. This and the abolition of the Radiation Protection Committee contribute to the degradation of management control of the safety of the facility and its operations. Manager of Office of Radiation Safety does however Chair the one remaining Nuclear Safeguards Committee.

8/18/87 - Gemstone irradiation accident, the notorious cadmium-115 contamination incident in which a reactor operator (Bill Downs) rode a MARTA bus wearing contaminated clothing, subsequently contaminating his apartment and leading to the reactor being shut-down for nearly one year. The accident happened as a result of operators ignoring unexpected high dose rates recorded in the initial experiment. Off-site contamination occurred because exit monitoring for radiation contamination was not performed - it was not even required. Reactor Director delayed reporting the incident to the NRC. No monitoring of airborne radiation was done in the most contaminated areas of the reactor building. The NRC Investigation Report questions whether incomplete, inaccurate and incorrect records of the incident are from laziness, ignorance and incompetence or active deceit. Hostilities escalate between Operations and Health Physics personnel in the wake of the incident and management cover-up. HP personnel involved (Steve Millspaugh and Paul Sharpe) were fired, it was generally felt by other reactor personnel, as reprisal for going to the NRC. (Georgia Tech did reinstate Millspaugh and Sharpe in other departments at the University.) (NRC Investigation Report 87-08)

- 1/20/88 - NRC issues order for immediate suspension of all reactor operations.
- 2/16/88 - Nuclear Safeguards Committee minutes. In Item #6 a question was raised regarding the lack of any previous intimation of the Health Physics personnel's incompetence over the past many years of reactor operation. It was suggested that NRC slackness made incompetence hard to detect! Item #7 concerned the delay in reporting the cadmium incident to the NRC. Director "conceded possible mistakes on parts of all concerned." John Crecine, President of Georgia Tech forwarded a flow chart of the chain of command to attach to the minutes.
- 3/1/88 - Georgia Tech completes decommissioning of the AGN-201 reactor by shipping weapons-grade U-235 fuel back to Oak Ridge. An element containing approximately 29 grams of U-235 is missing. Ed McAlpine, Region II NRC Nuclear Materials Chief, informed Glenn Carroll of GANE on 11/15/95 that the conclusion of the matter (of which GANE can find no official record) was the opinion that the material was never actually delivered to Georgia Tech in the first place. If that is the case, Oak Ridge made an error on the shipping papers which was not discovered by Georgia Tech in either receiving the fuel or in loading it into the AGN-201 reactor. Wherever the mistake was made, it underscores GANE's concerns that the so-called checks and balances under which Georgia Tech manages its nuclear research - oversight committees appointed by the President of Georgia Tech, Federal and State regulatory agencies, and other administrative controls that are claimed to be ensuring the safety of the public, are not sufficient. (Correspondence - Georgia Tech to NRC 3/1/88)
- 3/1/88 - Nuclear Safeguards Committee minutes. R.M. Boyd letter presents concerns about safety of hot cell/storage pool and frequent transfer of up to 600,000 curies of cobalt-60. Boyd recommends that operations should be terminated.
- 4/6/88 - Nuclear Safeguards Committee minutes. R.M. Boyd absence noted. Committee informed by Theragenics of spill of Pd-103.
- 4/22/88 - Nuclear Safeguards Committee minutes. R.M. Boyd absence noted.
- 5/88 - R.M. Boyd transfers to Georgia State University where he is still employed as Radiation Safety Officer.
- 7/1/88 - 9/1/88 - Georgia Tech fails to provide written procedures for radioactive contamination control of liquid waste. (NRC Notice of Violation 12/24/88)

- 9/30/88 - Nuclear Safeguards Committee minutes. H. Edwards and T. Thomas resign from Committee. Director invites anyone else who wants to resign to do so.
- 10/14/88 - Nuclear Safeguards Committee minutes. Committee discusses concerns about people eating, drinking, smoking in areas where radioisotopes are kept. Non-controlled access to radioisotope storage areas is a problem. The Committee asks the Director for recommendations. GANE note: The situation is never discussed again.
- 11/15/88 - NRC cites Georgia Tech for violations related to cadmium-115 accident finding significant deficiencies in management control of operations at the facility. Failures included failure to follow approved procedures, failure to have adequate procedures for conduct and control of experiments and for radiological safety activities, failure to conduct adequate surveys, and failure to evaluate the extent of radiological hazards. The NRC Investigation found perceived harassment by management and retaliation for discussing safety concerns with the NRC but lacked evidence to issue a citation. Georgia Tech was strongly rebuked in the 11/15/88 letter from Malcolm L. Ernst, NRC Acting Regional Administrator, and assessed a penalty that 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." (NRC Inspection Report 87-08)
- 11/20/88 - NRC orders Georgia Tech to cease irradiation experiments until further notice.
- 12/24/88 - NRC cites violations for improper calibration of the Kanne exhaust gas monitor and the GM gas monitor which measure the air emissions of the reactor to the environment. As a result of the incorrect calibration of the monitors, Georgia Tech failed to perform quantitative radioisotopic analyses required in order to know the amount of air-borne radiation to which the populations of Georgia Tech and Atlanta have been exposed. (Notice of Violation date 12/24/88)
- 1989 - NRC cites Georgia Tech Research Reactor for violations: failure to perform proper containment building leak tests and for operating shim blade insertion and withdrawal in a manner that could have led to a uncontrolled criticality. Georgia Tech did not perform the building leak test (essential to record the amount of radiation leaking to the environment and public) correctly because it had no instructions for analyzing data. Specific leak-rate criteria were

- missing as well and neither the Director nor the Manager of the Office of Radiation Safety were aware they need them. NRC concluded after reviewing entries in the logbook concerning the shim blade problem that the operator had no understanding of what was happening with the shim blades. (NRC Inspection Report 89-02)
- 3/30/89 - Nuclear Safeguards Committee minutes. Director requests that the Health Physics Procedures Manual be eliminated.
- 4/28/89 - Nuclear Safeguards Committee minutes. Committee approves elimination of Health Physics Procedures Manual. Confuses Celsius and Fahrenheit.
- 6/30/89 - Nuclear Safeguards Committee minutes. Kahn asks to put on next agenda mechanism for revocation of unescorted access to the reactor security zone. GANE note: This was never brought up again.
- 10/26/89 - Memo from the Director to the Nuclear Safeguards Committee. Bismuth Block is leaking at a rate of 5-rem per hour. Requests to operate the reactor anyway to fulfill contracts with Savannah River Nuclear Weapons Plant. Al'o doesn't want to jeopardize negotiations with U.S. Department of Energy for \$300,000 contract. States, "This contract is essential for the Center's continued existence." A similar leak had occurred in 1983 and was repaired with epoxy. The epoxy isn't working this time.
- 10/27/89 - Nuclear Safeguards Committee minutes. Director reports leak that has developed in liquid waste tank. Committee asked Karam to weld a patch and if the NRC needs to be informed [it wasn't].
- 12/6/89 - Letter from Director to Nuclear Safeguards Committee concerning continued tests of the Bismuth Block Leak. Not yet resolved. (GANE note: It has not been resolved yet.) Attached to this letter is a copy of the memo dated 10/26/89 with substantial material changes from the original (cited above) from page seven to the end of the letter.
- 1/26/90 - Cobalt-60 pool overflows into the lower levels of the reactor building. Subsequently an automatic shut-off device is added to the faucet. (NRC Inspection Report 90-02)
- 2/15/90 - Nuclear Safeguards Committee minutes. Item #5 - L. Petterick asked Committee to look into the availability of resources to handle removal of radioactive material from campus. Expressed concern over the safety of the site on campus where it is presently being stored [the Butler building]. His estimate of the cost of twice-a-year cleaning of the site was on the order of \$100,000/year. The Committee unanimously passed a motion to recommend to the administration that "the Institute have an adequate budget for

shipment of radioactive waste."

3/22/90 - Nuclear Safeguards Committee minutes. Item #3 - Re: Waste

"It is expected that the FY '91 budget will satisfactorily address the issue." Item #4 - Position of Manager, Office of Radiation Safety needs to be filled. Discussion over Associate Director of NNRC serving as acting manager [GANE note: isn't that a conflict of interest?] until replacement found. Committee passes a motion to "expeditiously find a new Manager."

4/26/90 - Nuclear Safeguards Committee minutes. Item #4. Committee approves operation of reactor with leaking Bismuth Block per October 26 [which version?] submittal. NNRC staff "confident" that resolution of waste disposal issue will become effective after 7/1/90 (see 3/22/90 NSC minutes). GANE note: The Bismuth Block leak never came up for discussion again with the Nuclear Safeguards Committee.

5/24/90 - Nuclear Safeguards Committee minutes. Item #2 - "Karam informed Committee that a U.S. Department of Energy team from EG&G (Idaho) had favorably reviewed NNRC operation and had recommended to DOE to fund the facility to the tune of about \$500,000/year to bring it up to speed. As a minimum, the cooling tower will be replaced. DOE has taken the recommendation under further advisement."

6/13/90 - Georgia Tech Research Reactor cited by NRC for failure to restrict access to high radiation level area where two graphite stringers had been stored for a week (according to the Director), delivering 200 millirem per hour. (.03 millirem dose per year is the equivalent for the Environmental Protection Agency standard 1:1,000,000 deaths from exposure to contaminants.) During the same inspection that the unprotected stringers were found, the NRC inspectors observed a maintenance worker finish mopping in a controlled area and then cross to the uncontrolled side of the monitoring station without performing a personal survey or having the mop surveyed. The worker proceeded to mop the floor in the uncontrolled area. The worker then came back into the controlled area and proceeded out through a door into the Reactor Control Zone and continued to work. The worker had received no training to work in the Reactor Control Zone. The Director indicated that it was difficult to get maintenance people to work in the facility and that, although this individual made an occasional mistake, he was one of the few willing to work in the reactor building. The saga was not cited! (NRC Inspection Report 90-02)

7/1/90 - Brian Copcutt takes position of Manager of Office of Radiation Safety.

- 7/19/90 - Nuclear Safeguards Committee minutes. Changed Committee structure such that the Radiation Safety Officer no longer serves as Chair. Item #5 - two non-Institute Committee members request letter from the Institute guaranteeing them indemnity against any liability charges brought against them for decisions or recommendations made.
- 11/15/90 - Nuclear Safeguards Committee minutes. Item #2 - Brian Copcutt resigns as Manager of Office of Radiation Safety.
- 1/31/91 - Nuclear Safeguards Committee minutes. The Committee discussed the status of security precautions during these times of international tension. It was recommended that a motion detector be installed at the main entrance to announce the arrival of a person. GANE note: This obviously has still not been done.
- 3/21/91 - Nuclear Safeguards Committee minutes. Item #6 - "The Committee was informed of Dr. Chapman's death. It was reported that his lab, which was temporarily shut off due to contamination problems, has now been unsealed and declared safe. It was learned that decision on cobalt source has not yet been made."
- 5/9/91 - Nuclear Safeguards Committee minutes. The committee approved the minutes of the previous meeting subject to rewriting item #6 into two separate items #6 and #7. #6 would remain the same with the removal of the last sentence. Item #7 will read as: "It was learned that no decision had been made concerning a move to decommission Crenshaw's Mountain." (GANE note: Crenshaw's Mountain has not been decommissioned to this day. It is a 10-foot pile of dirt near the practice football field and Alexander Memorial Coliseum. The dirt is piled over an 8-foot culvert and accessed by an underground network. Crenshaw's Mountain contains a five-curie cobalt-60 source. Harmful amounts of cobalt-60 are measured in picocuries, or TRILLIONTHS of a curie) Item #4 of 5/9/91 minutes granted a request from the Director to reduce the secondary water flow rate in the GTRR for 90 days. GANE Note: GANE suspects that's because the Bismuth Block leaks less at lower pressure. But what if we need the coolant?
- 6/27/91 - Nuclear Safeguards Committee minutes. EG&G (Idaho) interested in making NNRC major Boron/Neutron Capture Therapy facility. Interest in support of research and activity of \$500,000 to \$1,000,000, provided Tech continues to support functioning of center. Some changes will be made in configuration of facility. Will take 6 months to 1 year to get NRC approval. "Eventually the facility will be used to treat patients also." GANE note: the new cooling tower's great guys, but what about that pesky bismuth block leak between the reactor and the biomedical irradiation chamber?

- 8/1/91 - Nuclear Safeguards Committee minutes. Another 90-day extension on the secondary water flow is granted.
- 9/17-19/91 - NRC inspection finds Neely Nuclear Research Center Emergency Procedures do not require emergency notification to the State of Georgia (Department of Natural Resources) and Atlanta/Fulton County Emergency Management Agency as is required. Georgia Tech is told to amend procedures. (NRC Inspection Report 91-04)
- 9/26/91 - Nuclear Safeguards Committee minutes. Committee approves permanent reduction of secondary water flow from 960 gallons per minute to 900 CPM.
- 11/14/91 - Nuclear Safeguards Committee minutes. These minutes are missing.
- 1/29/92 - Nuclear Safeguards Committee minutes. Gamma Irradiation experiment for EG&G described in great detail. No record of it ever receiving Committee approval.
- 1/92 - Director fails to get required approval of Nuclear Safeguards Committee for Facility Modification 92-001 Picoammeter Monitor.
- 3/12/92 - Nuclear Safeguards Committee minutes. Jim O'Hara appointed Acting Radiation Safety Manager after Betty Revsin resigns for personal reasons.
- 4/30/92 - Nuclear Safeguards Committee minutes. Committee, failing to satisfy the question of how James Powers was able to obtain radioactive materials without going through channels, approves Form A allowing his experiment anyway!
- 6/25/92 - Nuclear Safeguards Committee minutes. Item #6 states that the previous concern regarding James Powers was resolved satisfactorily. No details. Item #7 - the Director requests to replace committee members Gordon, Barefield and Mahaffey with Braga, Tornabene, and Ghiassiaan. GANE note: the three new members are listed present as committee members at the next meeting. GANE thought that the committee members were appointed by the President.
- 10/29/92 - Nuclear Safeguards Committee minutes. Rodney Ice is new Manager of the Office of Radiation Safety. Item #4 - Roger Wartell request was tabled due to lack of clarity in the proposal. Item #5 - Director informs the committee that he has sent a report on the fuel element weld failure to the NRC. (GANE can't find record of Georgia Tech reporting either the fuel element weld failure or the Bismuth Block leak in NRC files.)
- 12/10/92 - NRC cites Neely Nuclear Research Center for failure to require proper notification in Emergency Procedures. The State of Georgia (Department of Natural Resources) and Atlanta/Fulton County

Emergency Management Agency are supposed to be notified in an emergency. Director had failed to understand discussion in exit interview during 9/91 inspection. (NRC Inspection Report 92-04)

12/17/92 - Nuclear Safeguards Committee minutes. Motion approved to change Item #4 (Roger Wartell proposal) in 10/29/92 NSC minutes to read "monitoring equipment to be provided on a regular basis (once a month) by Dr. B. Kahn" (instead of MORS). By the way, R. Wartell's request was approved although nothing is said about how his proposal had been clarified.

2/5/93 - NRC violation cited for operating reactor without required safety system scrams. (NRC Violation 50-62/94-04-01)

2/25/93 - Nuclear Safeguards Committee minutes. Form A request by R. Wartell was approved subject to (i) clarification by the Principal Investigator on the radio chemical form, and (ii) a resubmission of the Form A request with the revision.

5/13/93 - Nuclear Safeguards Committee minutes. "The Committee granted Form A requests . . . (i) Robert Nerem: Conditions - (a) monitoring must include the incubator (b) comment: Item 11. A 'Geiger counter' is inappropriate to use with tritium. Must use wipe tests using liquid scintillation counter, not Geiger counter." GANE note: Seems these kids are being let loose in the lab with some basic knowledge missing.

9/93 - NRC cites violations for the Nuclear Safeguards Committee for failure to conduct required audits. Also, Georgia Tech was cited for failure to perform biweekly contamination surveys and neutron radiation surveys. Yet another violation was cited for wrong descriptions of material, inadequate emergency notification information and the omission of survey data for the Radioactive Materials Shipments showing radiation levels of the packages. NRC Inspection Report 93-02 notes that the procedure for reactor start-up contains "unclear" guidance for monitoring period meters or recorder during approach to criticality. Also, an unnamed individual received a dose of 150 millirem in 1992. Another individual that was mopping up the Bismuth Block leak had an intake of 1.8 microcuries of tritium. After the exposure the management assigned .3 MPC hours to the individual. MPC hours, however, are not tracked. The indicator needle for primary cooling water pressure needs repair. It was bent - apparently from over ranging and was untagged for repair work. Flooded mess in emergency lighting generator room. Director says the leak will be repaired after approval of a plan to modify the Bismuth Shield (GANE supposes facility management is still

looking for a new, improved brand of glue). Firehoses in sections laying in the water, old leaking batteries sitting in water. A thermoluminescent dosimeter (one of 30 surrounding the facility) near the nuclear waste barn had registered significantly higher than background in 1992. Georgia Tech had concluded the high levels recorded by the TLD to be attributable to environmental damage; i.e. rain and excess heat. The NRC establishes the high readings were coming from the extremely active Radium-226 sources stored in the building. (NRC Inspection Report 93-02)

- 9/23/93 - Nuclear Safeguards Committee minutes. "R. Karam presented for the Committee's general information a memo from Dr. Ice explaining the Bismuth Block cooling water leak accident. He pointed out that the memo did not need Committee's approval."
- 11/93 (approximately) - Rebecca Long, NRC Inspector sues for sex discrimination because her superiors ignored and changed her reports on the Georgia Tech Research Reactor. The sex discrimination related also to disparity in pay-scale between her and her male counterparts. She cited the good-old boy network as protecting Georgia Tech from an honest assessment and blocking her from raising and addressing the real issues.
- 11/1/93 - Georgia Tech's methodology to determine Shim Safety Blade reactivity worth still a safety concern with NRC. (Cover letter to Notice of Violation for NRC Inspection Report 93-02)
- 2/10/94 - Nuclear Safeguards Committee minutes. Item #4 - "R. Ice reported to the committee an event leading to the contamination of Robert Nerem's laboratory. He informed further that the hallway to the lab has since been decontaminated." (GANE note: By an untrained guy with a mop no doubt.) Item #5 - "R. Ice reported to the Committee the chronology of events prior to and since leaking of Ni-63 sealed source that apparently occurred during shipment to Antarctica. The PI involved was F. Eisele. The source was in the Antarctica [sic] on an approved NRC reciprocity agreement. The report was accepted."
- 2/15/94 - Jumpers left in place while reactor taken to criticality. Operators failed to turn on TR-2 recorder prior to start-up. When the recorder is off the following scrams are inoperative: Shield Coolant High Temperature Scram, Bismuth Coolant High Temperature Scram. If the temperature had become excessive, the automatic scram signal would have failed, leading to a meltdown. (NRC Notice of Violation 8/20/94)
- 1994 - Labels on the D₂O outlet valve and the D₂O inlet valve (D₂O is heavy [radioactive] water) are transposed. Discrepancy in pressure

- gauge range found, and the fire extinguisher is expired. No violations were noted! (NRC Inspection Report 94-05)
- 3/17/94 - Nuclear Safeguards Committee minutes. Item #7 - "The Committee was informed about R. Nerem's letter to R. Karam. R. Karam reported an occurrence (without safety implications) (see 2/15/94) involving a violation of procedure for reactor operation. The operator [Bill Downs] in question has since been restricted to a limited access."
- 4/1/94 - NRC violation cited for failing to retrain operators for proper procedures to empty pond. (Violation 50-62/I.R.94-04-01)
- 4/15/94 - Downs resigns.
- 5/19/94 - Nuclear Safeguards Committee minutes. Item #6: "Dr. Karam felt that a sufficient number were present [to make a quorum at the 3/17/94 NSC meeting], therefore, all members not present will be contacted to see if they were left off the attendance lists of the minutes of 3/17/94."
- 5/24/94 - Letter from E.F. Cobb, Chair of the Nuclear Safeguards Committee, to the NSC informing that no quorum was reached at the 3/17/94 meeting.
- 8/11/94 - Nuclear Safeguards Committee minutes. Item #2 - "Minutes of the meeting of March 17, 1994, were distributed, but it was decided that a quorum did not exist at that meeting. All items addressed at that meeting were brought up for consideration and approval." GANE note: except Item #7 concerning R. Nerem's letter about an occurrence.
- 8/94 - Georgia Tech commits math error on neutron radiation survey causing them to be off in their calculations by a factor of 100 times - they divided when they should have multiplied. In addition, certain thermoluminescent dosimeters register extremely high levels. Georgia Tech and NRC conclude the high readings are caused by exposure to sunshine and rain in the environment. No violation cited. GANE does not understand why a system which is not regarded as reliable by Georgia Tech and the NRC is used to document the amount of radiation released to the environment and surrounding populations. (NRC Inspection Report 94-02)
- 10/27/94 - Nuclear Safeguards Committee minutes. Item #6 - "In another inspection, NRC cited a violation which has resulted in a slight change in the forms. There was a reported spill in Dr. Kahn's lab (an ampule containing a small amount of tritium used as a standard broke in the liquid scintillation counter). It has been cleaned out." GANE note: by an untrained guy using spit and a Q-tip?

12/8/94 - Nuclear Safeguards Committee minutes. Item #4 - "R. Karam discussed the failure of an older x-ray diffraction equipment where the shutter malfunctioned and a student may have been exposed on December 6, 1994. . . . Although the dosage was well below permissible limit, (GANE note: how do they know the dose if they aren't sure if the student was exposed?) R. Ice and S. Stock asked (GANE note: R. Ice has to ask?) and received an authorization to research the issue further. . . . an interim subcommittee was appointed consisting of S. Ewald, B. Livesay, and B. Kahn to keep up further developments."

2/9/95 - Nuclear Safeguards Committee minutes. V. Incident reports - S. Stock: "The Committee discussed the report by S. Stock on the causes of the accident (see minutes 12/9/94 [concerning the radiation exposure of a student by faulty x-ray equipment]) and means taken to prevent its recurrence. This was followed by a discussion of Form A request by S. Stock . . . The Committee imposed the Form A request with the following conditions for a continued operation, and appointed a subcommittee to oversee the same and issue an interim approval.

1. A detailed review of all procedures before any continued operation.
2. An investigation for a long-term solution to the problem; i.e. it may include alternatives such as retrofitting.
3. A satisfactory assessment of the unit by the Manager of the Office of Radiation Safety after all safety modifications have been installed.
4. Obtaining of a circuit diagram that specifies the operation of the shutter, with such modification as necessary to assure shutter safety.

J. Choi: . . . The Committee imposed the following conditions for a continued operation of Dr. Choi's research.

1. A ~~prominate~~ [sic] sign shall be posted by the door indicating that all persons leaving the room must monitor themselves for contamination before leaving the room. A logbook of monitoring is to be maintained.
2. Specific safety procedures for the use of radioisotopes are to be posted. In addition, the posting is required to contain the warning that no procedural variance is allowed without the P.I.'s specific approval."

Item VI. "Dr. Karam discussed the NRC hearing on complaints by two citizens regarding safe operation of the NNRC. He pointed out that

the NRC is satisfied with the safety of the entire reactor operation." GANE note: Yeah, sure, that's why we're still in litigation and your license renewal is still hung up a year later. Further, the NRC intervention is never discussed in subsequent NSC meetings, including the shutdown of the reactor during the Olympics and the removal of the fuel from downtown Atlanta.

3/23/95 - Nuclear Safeguards Committee minutes. Item I - Revision of last meeting's minutes. Item V.1 (S. Stock) strike conditions 3 & 4. GANE note: WHY? Item V.2 (Dr. Choi) remove the word "prominate" [sic]. (GANE note: Georgia Tech specifically prefers an obscure sign?) "R. Karam discussed and walked the committee through the final report from Dr. Choi on the contamination incident [the student radiation exposure from faulty x-ray equipment]. The Committee was of the opinion that Dr. Choi has fulfilled the conditions (see revised minutes 2/9/95) for a continued operation [of the x-ray equipment]. It is expected that there will be at least one additional audit visit by Dr. Ice to Dr. Choi's lab before 6/1/95." Item IV - Form A approvals: "J.M. Wampler: the x-ray unit is old and of outdated design in the context of safety issues. However, the way it is being operated by the P.I. and his associates under his supervision is deemed safe, provided that no undergraduates [!] are allowed to operate it. The Committee gave its approval."

3/95 - Accidental release of water from the cobalt-60 shielding pool due to a valve that was improperly left open. Not only was the technical error committed, but the accident was improperly reported to the NRC instead of the State of Georgia, regulatory authority for the cobalt-60. Not reported in Nuclear Safeguards Committee minutes.

6/21/95 - NRC cites violation for wrong and missing data of environmental emissions of radioactivity from Georgia Tech Research Reactor for the years 1983, 1986, and 1988-1993. The data errors appear to arise out of calculation mistakes, not an effort to falsify environmental data. Management was also cited for making a material false statement in the 1994 Safety Analysis Report submitted as part of its relicensing application where it stated falsely that equipment for continuous, automatic measurement and recording of wind speed and direction was installed. In the absence of actual data Georgia Tech had submitted the same windrose diagram year after year! NRC cites Nuclear Safeguards Committee for failure (since 1993) to provide oversight for operation and calibration of a low background alpha/beta proportional counter used for contamination control and effluent measurements. Comments are

- recorded about continued extremely high readings from the TLD on the fence by the nuclear waste hut. (NRC Inspection Report 95-01)
- 7/95 - Georgia Tech response to Notice of Violation cites human error and that the Director takes it for granted that the Manager of the Office of Radiation Safety does not need supervision.
- 9/21/95 - Nuclear Safeguards Committee minutes. Item #3. Change in management structure approved over opposition of a committee member.
- 10/13/95 - Memo from E.F. Cobb, Chair of the Nuclear Safeguards Committee strongly recommending that out-dated, unsafe x-ray units be removed from service. A student has narrowly missed a significant radiation burn. The accident would not have occurred if the unit met current x-ray equipment safety requirements. The Committee recommends these units be replaced with new units before they cause more harmful radiation exposure.
- 11/95 - Glenn Carroll from GANE sees classified documents at two separate times contained in the same file while reviewing documents at the Neely Nuclear Facility. The second time was after the file had been courteously sent back to the Director with the assumption that he would purge the file of any sensitive documents before returning it for her review.
- 11/15/95 - Fox Network airs "A Current Affair" program which documents the intrusion of a TV-crew into the building, over the barbed-wire fence and onto the roof over the fresh (weapons-grade uranium) fuel storage vault.
- 11/16/95 - Nuclear Safeguards Committee minutes. Item #4.4.1 - Dixon Parker takes over for Taylor as PI on Co-60 irradiation sources. (Taylor retired). Item #5.2 - Karam informed the Committee that security at the NNRC has been increased since the "Current Affairs" [sic] incident. GANE note: The door is now locked. How about some surveillance equipment and armed guards until you get all the radioactive material removed?
- 11/29/95 - NRC issues inane inspection report in which the NRC minimizes the problem of the TV crew security breach by concluding that since the TV crew didn't pick any locks to any secure areas or pack any bombs or grenades into the facility, that all is well and safe and we're almost set for the Olympics this summer. (NRC Inspection Report 95-04)
- 12/1/95 - Georgia Tech Response to GANE's Discovery Request, Interrogatory #14: "Where is the spent fuel?" Response: "GTRR has no spent fuel. All fuel is used in the reactor." #15: "Is there a load

of fresh fuel on the premises, and if so, where is it?" Response:
"GTRR does not have a load of fresh fuel on the premises."

1/5/96 - Georgia Tech cannot produce shipping documents of the spent and fresh (weapons grade uranium) fuel. The NRC records contain no documentation of shipment away from Atlanta. GANE alleges a material false statement in the 12/1/95 discovery response.

22. Identify all persons with knowledge of the facts underlying GANE's contention or assertion.

Georgia Tech failed to provide GANE with personnel files citing the retrieval system software in the personnel department. GANE has gleaned some names of former reactor personnel from certain documents we have reviewed and feel that it should not be incumbent upon us to identify people who have previously worked under the management of the Georgia Tech Research Reactor. GANE acknowledges that Georgia Tech appears to be willing to search for any file we can name, however, they have not managed to come up even with some of those. We expect Georgia Tech to keep working on this and GANE will review the files when they are available. GANE raises the question of how Georgia Tech thinks they can defend the case without knowledge of who has been employed at the Neely Nuclear Research Center and without interviewing them to establish how they found their work experience and if the environment was one emphasizing safety and if they felt comfortable raising safety concerns there.

In answer to your interrogatory a partial list follows: Dr. Ratib A. Karam, R.M. Boyd, Dr. Melvin Carter, Rebecca Long, Paul Sharpe, Steve Millspaugh, Daphne Acock, John J. Poston, Brian Copcutt, Dave Cox, Mitch Mercer, Fred Apple, Bill Downs, Betty Revsin, Les Patterick, Richard Barrow, Bernd Kahn, J.C. O'Hara, Jerry Taylor, E. Jawdeh (Jawo'eh?), L. McDowell, Glenn Carroll, Pamela Blockey-O'Brien. Of this list Dr. Ratib A. Karam is the only one who knows the entire story but GANE believes he practices deception and may not be a reliable witness.

23. Identify any person GANE presently intends to call as a witness in this proceeding to testify regarding the contention or assertion. If GANE expects to call any such person as an expert witness, state the subject matter on which the person is expected to testify, state the substance of the facts and opinions as to which the person is expected to testify, and provide a summary of the grounds for each opinion.

We reserve the right to add to this list when Georgia Tech produces

the personnel files it said that it would in their answer to our discovery request. We intend to call the above named persons as witnesses. Most of the above named are former employees of the Neely Nuclear Research Center and are expected to testify that they worked in an unhealthy work environment where raising health and safety issues was actively discouraged. Dr. Melvin Carter was Chair of a now defunct oversight committee and is expected to reiterate the concerns he stated publicly when he resigned - that the management changes consolidating responsibility under the Director were detrimental to health physics principles and fostered an unhealthy and unsafe working environment. Rebecca Long is an NRC Inspector who brought a sex discrimination suit against the Region II NRC for chilling her investigation of the Georgia Tech Research Reactor, complaining of a good old boy network that was covering up Georgia Tech's mistakes. Glenn Carroll and Pamela Blockey-O'Brien are ordinary citizens who have read widely on the subject of the Georgia Tech Research Reactor and spoken with former employees and industry experts and bring a particular breadth of perspective to the topic.

24. With respect to any person listed in response to the interrogatory, state the details of that person's education, employment history and asserted area of expertise.

Although we have the names, we reiterate, we have not yet gained access to Georgia Tech's personnel files where much of that data will be found. Dr. Karam has received his B.S. in Chemical Engineering, an M.S. and Ph.D. in Nuclear Engineering, all from from the University of Florida. He has worked at Georgia Tech since 1972 as an Assistant Professor, Professor, and in 1984 was given the job as Director of the Neely Nuclear Research Center. An interesting note: an affirmative action waiver was granted so that he could be hired without the customary practice of advertising the job opening. Glenn Carroll has a Bachelor of Visual Arts from Georgia State University conferred in 1982. She has her own business, Glenn Carroll Graphics, exhibits paintings and since Chernobyl has hoped to save her own skin by working to keep the level of radiation in the environment to a minimum.

25. Identify any persons who have knowledge of the relevancy of the contention or assertion to the security plan and the safeguards used and in place at the Georgia Institute of Technology Research Reactor (GTRR).

Mike Salort and Wendy Sax from Fox Network's "A Current Affair" have the most intimate knowledge of anyone we know with the lack of security at the Neely Nuclear Research Center. The second time Glenn Carroll from GANE was shown a classified document at Neely Nuclear Research Center (see 11/95) she gave herself permission to read it. It described the location of surveillance cameras and the practice of campus police concerning the facility. The document was dated 1994 as she recalls and jived with what R.M. Boyd has told GANE about security measures in place when he was last employed there in 1988.

26. Identify all documents GANE intends to rely upon in support of its contention or assertion, or which are otherwise relevant to the contention or assertion.

All Minutes from Nuclear Safeguards Committee

Documents relating to criteria for Nuclear Safeguards Committee

- * Resumes of Nuclear Safeguards Committee members
- * Authorizations for Nuclear Safeguards Committee members
- * Personnel files of radiation safety officers
- * Personnel files of health physics employees
- * Personnel files of reactor operators
- * List of all persons who formerly served on the Nuclear Safeguards Committee, including, for each person listed, the dates of service, last known telephone number and address

NRC Inspection Report 87-02

5/4/87 Conference Report with Georgia Tech
Technique, 11/20/87

NRC Investigation Report 87-08

NRC Investigation Report 2-88-003

Correspondence - Georgia Tech to NRC 3/1/88

NRC Notice of Violation 12/24/88

NRC Order dated 11/20/88

Notice of Violation dated 12/24/88

NRC Inspection Report 89-02

Memo from Dr. Karam to Nuclear Safeguards Committee dated 10/26/89

Letter from Karam to Nuclear Safeguards Committee dated 12/6/89
w/attachment

NRC Inspection Report 90-02

NRC Inspection Report 91-04

Facility Modification 92-001 Picoammeter Monitor

NRC Inspection Report 92-04

NRC Violation 50-62/94-04-01

NRC Inspection Report 93-02

NRC Notice of Violation 8/20/94
NRC Inspection Report 94-05
NRC Violation 50-62/Inspection Report 94-04-01
Letter from E.F. Cobb to Nuclear Safeguards Committee dated 5/24/94
NRC Inspection Report 94-02
Letter from Karam to State of Georgia dated 4/24/95
NRC Inspection Report 95-01
Georgia Tech Response to NRC Notice of Violation dated 7/95
Memo from E.F. Cobb to G. Wayne Clough, et al. dated 10/13/95
"Nuclear Nightmare in Atlanta" - A Current Affair 11/15/95
NRC Inspection Report 95-04
Georgia Tech Response to GANE Discovery particularly Interrogatory #14
and Interrogatory #15
Correspondence concerning JC O'Hara resignation
Documents related to Rebecca Long
PNO-II-83-009 on 1/31/83 re cobalt-60 shielding pool leak

*** Documents promised to GANE by Georgia Tech but not yet provided. We believe it to be clerical type errors and not deliberate evasion.**

27. Provide copies of the documents you have identified in response to the interrogatory.

GANE cannot afford copies of these documents for ourselves as the parties understand. The NRC will have to pay Georgia Tech's 25¢ per page copying fee for any of their documents they would like to review GANE supposes. By the way, it would be really swell if the NRC would set up a Public Document Room for us on this because we have become increasingly uncomfortable and inconvenienced working with the NRC files kept at the Neely Nuclear Research Center.

28. As to each document identified in response to the interrogatory, state whether or not GANE intends to seek to move each such document into the record as evidence in this proceeding.

Yes.

29. As to each document identified in response to the interrogatory, state what fact or opinion GANE intends to establish if the document is entered into evidence.

See answer to #21. Also, the Minutes are also notable for what they do not contain: rare discussion of NRC Violations, no discussion of State regulations, no discussion of environmental contamination, only one

slight challenge to the Director - the quorum question (and we wonder what was up with that), no communication up the chain of command to the Vice President and President, no meaningful discussion of the interventions conducted by GANE and Pamela Blockey-O'Brien and in particular no mention of shutting the reactor for the Olympics or shipping fuel out of Atlanta.

30. Identify the specific NRC regulation which would be violated if the contention or assertion were shown to be true. Explain your answer.

GANE's Assertions (Contention #9):

a) "Management problems at the GTRR are so great that safety for the public cannot be assured."

b) "Safety concerns at the Georgia Tech reactor are the sole responsibility of Dr. R.A. Karam."

c) "Dr. Karam is the director who withheld information about a serious accident from the NRC (1987 cadmium-115 accident)."

d) "The NRC was advised of the 1987 cadmium-115 accident by the safety officer at that time, who was later demoted, and left the GTRR operation claiming harassment."

3) "Since the incident, management has been restructured giving the director (Dr. Karam) increased authority, including increased authority over the Manager of the Office of Radiation Safety."

(f) "Although the safety officer has a line to higher-ups than the director, since he/she works for the director on a day-to-day basis, the threat of reprisal would be a huge disincentive to defying the director."

(g) "The Nuclear Safeguards Committee which has theoretical oversight of the GTRR operations has a distinct flaw in having no concern with health issues."

(h) "The Office of Radiation Safety Manager is sought for its knowledge of law more than its knowledge of health physics."

10 CFR Subpart B. §1.11 (b) states: "These responsibilities include protecting the public health and safety, protecting the environment, protecting and safeguarding nuclear materials and nuclear power plants in the interest of national security, and assuring conformity with antitrust laws."

31. Provide any and all information, produce copies of all documents in your possession, and respond fully as requested in Interrogatories 21-30 above, regarding any incidents or problems involving the GTRR which have occurred from 1988 to the present, which GANE contends

demonstrate significant, serious or continuing management problems at GTRR.

See #21, #26 and the SUMMARY at the beginning of this document. GANE does not possess all the documents and cannot afford to provide copies for the service list. The heftiest documents are NRC Inspection Reports and the parties already possess them. You may request the Nuclear Safeguards Committee minutes from Georgia Tech. Again we believe that the documents that have not yet been provided by Georgia Tech will provide a lot of relevant evidence.

32. State whether GANE contends that the corrective actions taken by the Licensee following the events in 1987 failed to adequately resolve any management problems which may have existed at the GTRR prior to the taking of such actions. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above. See #21, #22, #23, #26 as well as the SUMMARY at the beginning of this document. Please forgive us, for not supplying the documents yah-da yah-da since we can't afford to possess them ourselves.

33. State whether GANE contends that the enforcement actions taken by the NRC following the events in 1987 failed to adequately resolve any management problems which may have existed at the GTRR prior to the taking of such actions. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above. See the SUMMARY, #21, #22, #23, #26. In particular the failure of management to report the fuel element weld failure and the bismuth block leak, as well as the material false statement concerning the presence of fresh and spent fuel on-site.

34. State whether GANE contends that any employees or personnel associated with the GTRR (a) have been intimidated from raising safety concerns by the facility's Director, or (b) have feared reprisals by the facility's Director, at any time from 1988 to the present. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

(a) Yes. (b) Yes. R.M. Boyd will not cooperate with us for fear of reprisal still. When we get to see the personnel files that Georgia Tech has not yet supplied as well as documents related to people who have served on the Nuclear Safety Committee we will be able to provide a fuller answer.

35. State whether GANE contends (a) that any employees or personnel associated with the GTRR have failed to properly raise safety concerns at the GTRR, or (b) that safety problems have not been reported at the GTRR, at any time from 1988 to the present. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

(a) Karam has not fixed the fuel element weld failure or the bismuth block leak and has allowed students to be irradiated by faulty x-ray equipment. (b) Karam has not reported the fuel element weld failure or the bismuth block leak to the NRC. In addition, see #21.

36. State whether GANE contends that the Nuclear Safeguards Committee (NSC), the Office of Radiation Safety (ORS), or the Manager of ORS have failed to properly perform their respective roles, at any time from 1988 to the present. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

The NSC is unable to truly oversee Karam and pretty much take his word for everything. The notable exception is their slow but eventual pressure to take the faulty x-ray equipment out of service. The SUMMARY and #21 and #22 provide a bit better than sketchy picture of the climate, and when you read the entire minutes of the Nuclear Safeguards Committee you will see that they rarely contribute anything meaningful, for instance, they make note of the weaknesses in the Form A requests, then grant them anyway, then hear a report about the accident that happened during the experiment at a subsequent meeting. Meaty issues are raised and never followed up on: The issue of unrestricted access to areas where radioisotopes are stored, smoking and eating in areas where radioisotopes are stored, the leak in the waste tank, the fuel element weld failure. It really stood out to GANE in the case of the x-ray irradiation of a student when the Manager of ORS had to ask permission to investigate further. We need to see Georgia Tech's Personnel Files to really shape the picture of who can

relate the stories for us. Brian Copcutt's story is bound to be interesting. And the story remains the same on our ability to provide you with copies of the above listed documents.

37. State whether GANE contends that the structure and/or allocation of responsibilities of the NSC or the ORS provide a basis for finding that continued operation of the GTRR fails to provide reasonable assurance that the public health and safety will be adequately protected. Identify each and every such regulation, requirement or guidance document. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

Previously the Office of Radiological Safety had supervised Health Physics personnel and had independent status, reporting directly to the President of Georgia Tech. This and the abolition of the Radiation Protection Committee contribute to the degradation of management control of the safety of the facility and its operations. Manager of Office of Radiation Safety at first held the Chair of the one remaining Nuclear Safeguards Committee. In July of 1990 however this was changed. A sad example of how disempowered the health physics side of the management equation has become is in the illustration of Rodney Ice, MORS, asking for permission to investigate the student's radiation exposure from faulty, out-dated x-ray equipment. See #30 for the regulation. #21, #22, #26 (sorry, you'll have to get your own docs).

38. State whether GANE contends that the structure and/or allocation of responsibilities of the NSC or the ORS fails to comply with any applicable NRC guidance document. Identify each and every such regulation, requirement or guidance document. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

Please see the answer to your interrogatory #30.

39. State whether GANE contends that the events in 1987-88 demonstrate a reason to believe that current or future operation of the GTRR fails or will fail to provide adequate protection of the public health and safety. Explain your answer in detail, and provide any and all bases

for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

The change to a one-committee safety program and consolidation of responsibility under Dr. Karam are incongruous with the gravity of the situation as the NRC responded in its citations and reports to Georgia Tech following the 1987 incidents and violations. In the time following NRC oversight has grown weaker. The Committee is mostly for show. They don't conduct independent inspections. They go on guided tours and are shown what they are told is worth seeing. They haven't even been told about the shut-down of the reactor and the removal of the fuel. With all the references in the Inspection Reports that we are citing and entering into the record of spills from the bismuth block leak, it would seem reasonable that the NRC would make the connection - that the bismuth block is leaking and it needs to be fixed. Why doesn't the NRC know that the fuel element weld has failed? Do they only know what they are told? The TV crew broke into the reactor facility the first week of October. The NRC and Georgia Tech both only know what they've been told, they have no investigative power. A system of radiation monitoring is being used outside the facility which these grown-up scientists, if they don't like the readings, will blame on the weather! There's no air monitoring device, doesn't an NRC inspector climb the stack once a decade to see if everything is in order up there? The impression GANE and the public is getting is that no one's in charge, and that the technology, even on a small scale as at Georgia Tech, is too complicated to handle. The Inspection Reports are rife with the NRC educating Georgia Tech as to the math that has to be done to calculate the emissions. GANE knows this is an educational institution, but we really hoped that the professors the knowledgeable teachers, not students of the NRC. We don't believe that the NRC exists to teach its licensees. In addition, see #21 - there are numerous examples cited of GTRR failure to have, understand, and follow procedures. Management continues to conceal problems from the NRC and the oversight committee and the President.

40. State whether GANE contends that the current management of the GTRR fails or [sic] [will fail?] to provide adequate protection of the public health and safety. Explain your answer in detail, and provide any and all bases for this contention. Provide all information, identify all persons, and provide copies of all documents which relate to this contention, as requested in Interrogatories 21-30 above.

NRC Inspection Report 95-01 describes a litany of calculation errors concerning the emissions from the reactor. There is no monitoring of wind direction and speed, and management made material false statements about that. They don't believe the readings on the TLDs if they don't like them (NRC Inspection Report 93-02). They let the maintenance workers who are foolhardy enough to work for them harm themselves and give them no training for the special needs of their facility (NRC Inspection Report 90-02). They exposed students for almost one year to faulty x-ray equipment (see the Nuclear Safeguards Committee Minutes 12/8/94 - E.F. Cobb's memo 10/13/95). They mail leaking packages (NSC Minutes 2/10/94) and packages that are falsely labeled as to their contents with incorrect emergency contact information (NRC Inspection Report 93-02). They failed their building leak rate test (NRC Inspection Report 89-02), they lost (or diverted) U-235 (Correspondence 3/1/88). #21, #22 and you've heard it before about our ability to provide documents.

GEORGIA INSTITUTE OF TECHNOLOGY'S INTERROGATORIES REQUEST
REQUEST FOR PRODUCTION OF DOCUMENTS TO GANE

1. Please identify each aspect of the management organization or structure, operations, supervision, budgetary functions, or otherwise which you contend serves as a basis for the denial of renewal by the NRC of Georgia Tech's license.

The organization is basically under the control of one man, Dr. Karam, who is not being meaningfully supervised by any entity. The Committee is weak and made up of customers of the reactor. The Vice-President and President are uninvolved. The NRC is sometimes teacher, sometimes apologist, and sometimes gives a \$1,000 fine which doesn't mean much to a business which is bringing in \$700,000 annually.

2. Please identify and describe all facts in your possession or control or within your knowledge which supports each of the aspects of management listed in response to Interrogatory no. 1.

Please see the answer to #21 in the NRC interrogatories.

3. Please identify and describe all documents in your possession or control or within your knowledge which supports each of the aspects of management listed in response to Interrogatory no. 1.

Please see the list provided to answer #26 of the NRC interrogatories.

4. Please identify, giving name, address, and business and home telephone numbers, each person having knowledge of the aspects of

management identified by you in response to Interrogatory no. 1 above.
As you have read, we are still working with Georgia Tech to gain access to the vast majority of the personnel documents we seek.
To date:

R.M. Boyd, Safety Dept., Georgia State University, 158 Edgewood Avenue, Atlanta, GA 30303, 404-651-2282

William H. Downs, 2250 Cheshire Bridge Road NE, Apt. C-14, Atlanta, GA 30324-4257

Steve N. Millspaugh, 9394 Indian Springs Drive, Roswell, GA 30075, 770-594-8044

Paul Sharpe, 100 Tarver Terrace, College Park, GA 30349, 770-766-7000

Please see the answer to #22 of the NRC interrogatories for the rest of the partial list of people we are seeking more information about from you.

5. Identify any person GANE presently intends to call as a witness in this proceeding to testify regarding this contention. For each such person, please state:

- a. name, address, business and home telephone number
- b. place of employment, title, and education
- c. whether such individual was at any time an employee of Georgia Tech

See information listed in your #4 and in NRC Interrogatory #23,

6. If GANE expects to call an expert witness to testify on its behalf, please provide the following information:

- a. name, address, business and home telephone number
- b. place of employment, title, and education
- c. professional experience
- d. the subject matter on which the expert will testify
- e. the substance of the facts and opinions as to which the expert is expected to testify
- f. a summary of the grounds for each opinion

R.M. Boyd, Safety Dept., Georgia State University, 158 Edgewood Avenue, Atlanta, GA 30303, 404-651-2282. Mr. Boyd is Radiation Safety Officer at Georgia State University. He worked at Georgia Tech for many years with the current Director, and ended up leaving voluntarily as a result of the management changes that followed the notorious cadmium-115 incident of 1987. His standing in the Georgia radiation community is good and he has alot of knowledge of affairs at Georgia Tech even after leaving in 1988 because of friends and colleagues who have been involved with or employed at Georgia Tech and have come to

share his sense that management problems at GTRR are profoundly grave. Because of his fear of reprisal from Georgia Tech he is not a friendly witness to us and GANE believes the full story will only come out on the witness stand where he is forced to honor the court.

7. Identify all documents which GANE intends to admit into evidence at the hearing of this case.

Please see item #26 of the NRC Interrogatories.

8. Identify the specific NRC regulation which you contend has been violated or is currently being violated by Georgia Tech.

Please see #30 of the NRC Interrogatories.

9. Provide all information and produce copies of all documents in your possession which document or describe in any manner any incidents or problems involving the GTRR which have occurred from 1998 [sic] to the present, which GANE contends demonstrate significant, serious, or continuing management problems at Georgia Tech.

Please see the SUMMARY at the beginning of this document as well as the answer to #21 of the NRC Interrogatories.

10. State whether GANE contends that the corrective actions taken by the Licensee following the events in 1987 failed to adequately resolve any management problems which might have existed at the GTRR prior to the taking of such actions. If the answer to this interrogatory is yes, please explain fully why such corrective actions did not resolve any such problems.

Please refer to the answers to #36 and #37 in the NRC Interrogatories. As you can see from the SUMMARY and the answer to NRC Interrogatory #21, it's pretty much an accident a week at the Georgia Tech Research Reactor. The "corrective" actions of consolidating all authority in the Director has made things much worse. When we get to review your personnel files and contact some of the former employees perhaps we will find out why it was so hard to retain a Manager of the Office of Radiation Safety for years. We have heard that Health Physicists come and go, we really haven't been able to research that with the few files you have provided thus far.

11. State whether GANE contends that the Nuclear Safeguards Committee (NSC), the Office of Radiation Safety (ORS), or the Manager of ORS have failed to properly perform their respective roles, at any time from 1988 to the present. If the answer to this interrogatory is yes,

please explain fully all examples of improper or inadequate performance of these entities since 1988.

Please refer to #36, #21 of the NRC Interrogatories and the SUMMARY at the beginning of this document.

12. Does GANE have a management plan that it contends should be instituted at GTRR? If the answer to this interrogatory is yes, please state the following:

a. the identity of the person(s) who developed such plan

b. describe such plan, giving specific details as to organization, safety assurance, and operation

c. describe all differences between the organizational structure and management currently in place at GTRR and the plan suggested by GANE

Yes. We would be delighted to reiterate GANE's vision for the GTRR. The 30-year license has expired for the Georgia Tech Research Reactor. The current management has not kept accurate records of the environmental damage it has caused because it cannot perform its math calculations correctly. The Bismuth Block Shield is leaking and the basement is contaminated by a constant flood of water from that leak coupled with the radioactive metal grindings of the shutter which fall every time the shutter is used and are carried down with the water. From reading the minutes of the NSC meetings, every single lab in the Neely Nuclear Research Center must be contaminated by now. There is spent and fresh fuel stashed all over the building and cobalt-60 to contend with. If the facility were in better shape it might be a worthwhile activity to devise a management plan that would work safely. With honest, hard-working, talented management, and a robust, empowered health physics program, a concern about safety of workers, the public and environment, there might be a mix that would be reasonable. At this point, given the degradation of the facility, the damage to the environment and the unsafe culture which has become endemic, GANE suggests it's time to change the question. The management structure that is needed now is one to perform closure and clean-up of the facility. We've been reluctant to come right out and say this, but given the material false statements about the air monitoring equipment and presence of fuel, failure to report serious safety concerns (fuel weld failure and bismuth block leak), inability to perform too many procedures correctly and too many errors in calculations, too many analyses of environmental contamination not performed - in short, the current Director is not up to the task. To perform the clean-up, GANE recommends that you use outside contractors

for fuel removal and to assess the contamination of the buildings and lend expertise on available methods for clean-up or more precisely stated, containment. The nuclear program would be wise (and on the leading edge of a new market) to reorient its goals to a nuclear waste mission. The Health Physics program needs to be reinstated to equal power with operations. Make-up of the oversight committee needs to be half health physics people and half technical people. Another worthy goal for the nuclear program is gathering more knowledge of the health effects of radiation exposure. This is a discipline that, alongside nuclear waste, has received a short supply of energy in the 50 years of the nuclear industry. GANE would like to see Rebecca Long reinstated to the GTRR project as NRC investigator since we have gotten the impression that she is an earnest and intelligent NRC investigator. If she took her job too seriously to please the good-old-boy network, GANE puts that on the plus side of her resume.

The differences between our vision and the current morass are, different director, different mission, use outside expertise, maybe the same radiation safety officer, let's empower him and see how he does. Emphasis on health and safety instead of production. Restructure management at the facility to equally empower health and safety personnel with operations. Restructure committee to have balanced talents. Give the committee a key to the door, so to speak, the power to fire one of the managers if need be. Let's get some people that are strong in math in there. Maybe Arjun Makhijani would like the job of helping Georgia Tech back out of the nuclear corner - a physicist and environmentalist tackles a real-life nuclear waste and contamination problem. Give one of those big mouth environmentalists a chance to put their money where their mouth is, eh?

13. Does GANE contend that management at the GTRR should be changed in any respect? If so, please describe all such proposed changes and the purpose of all such changes.

Please see the previous answer.

14. Does GANE contend that the GTRR cannot be managed appropriately and safely under any management plan? If the answer to this interrogatory is yes, please provide the factual basis of such contention.

Yes. The fact is that GTRR's license is expired and it's an old rundown leaking piece of equipment which has ended its service life. The fact is there is no safe level of radiation. The fact is there is plenty and years of work to do to shut her down properly and deal with

the building and contamination legacy. The fact is that humanity is crying for options to deal with nuclear waste and spent radioactive buildings. The fact is, if we don't learn how to deal with a small operation like the Georgia Tech Research Reactor, how will we ever manage to face the legacy of the large facilities like Nuclear Power Plant Vogtle? The fact is, there is plenty of risk in the clean-up and containment activity but it is a more worthy goal than to push our luck by operating the Georgia Tech Research Reactor further. She gave a good service life. Let's dignify her service by giving the students at Georgia Tech an education opportunity to lead us to a wisdom for which humanity has been waiting 50 years.

Respectfully submitted,

Glenn Carroll

Glenn Carroll
Representative for GANE

Dated and signed January 11, 1996
in Decatur, Georgia

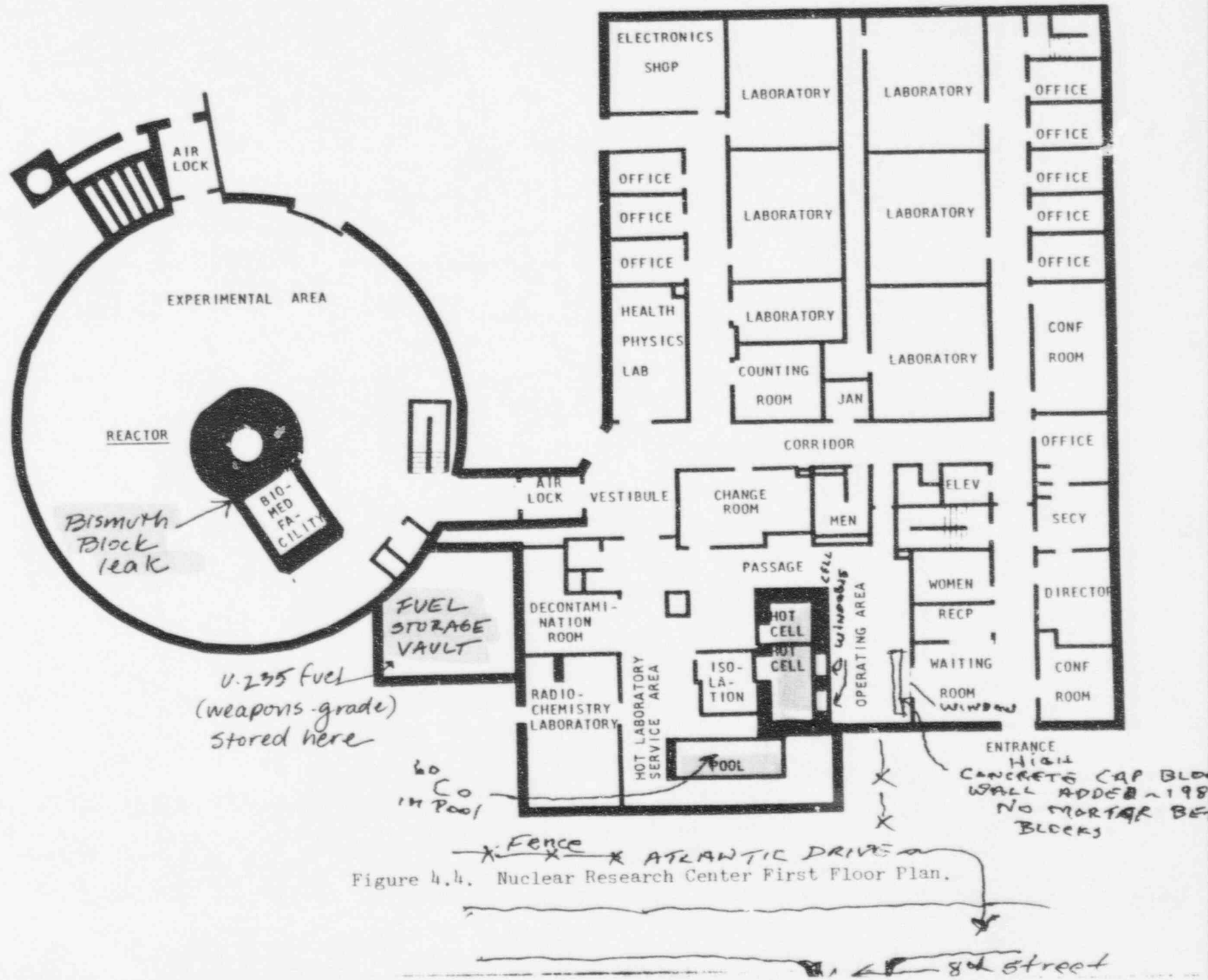


Figure 4.4. Nuclear Research Center First Floor Plan.