

8/4/80

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
GENERAL ELECTRIC COMPANY)	Docket No. 70-1308
(GE Morris Operation Spent)	(Renewal of SNM-1265)
Fuel Facility))	

NRC STAFF RESPONSE TO STATE OF ILLINOIS
INTERROGATORIES, FIRST SET

Pursuant to 10 CFR 2.740, Intervenor, the State of Illinois, submitted written interrogatories dated July 14, 1980 to the NRC Staff.^{1/} The submission of such interrogatories is governed by 10 CFR 2.720(h)(2)(ii), which requires that they be filed with the presiding officer, in this case, the Atomic Safety and Licensing Board (the Licensing Board). However, in the interest of expediting this litigation, the Staff has voluntarily responded to these interrogatories by either answer or objection. In the event intervenor files a motion to compel discovery pursuant to 10 CFR 2.740(f), the Staff requests that the Board regard the interrogatories which are the subject of such a motion as a filing under 10 CFR 2.720(h)(2)(ii), and apply the criteria therein.

^{1/} In an "Order Extending Schedule for Discovery", dated June 23, 1980, the Atomic Safety and Licensing Board (the Board) established August 4, 1980 as the date by which answers or objections to discovery requests are to be served. Accordingly, the NRC Staff has responded to Illinois' discovery request consistent with the schedule established by the Board.

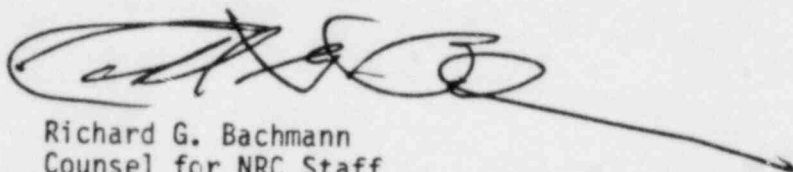
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For the reasons set forth in the attached document, the Staff objects to Interrogatory 1.A. and 1.B. The Staff has answered the remainder of the interrogatories.

Respectfully submitted,

Marjorie Ulman Rothschild

Marjorie Ulman Rothschild
Counsel for NRC Staff

A handwritten signature in black ink, appearing to read 'Richard G. Bachmann', with a long horizontal line extending to the right.

Richard G. Bachmann
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 4th day of August, 1980

INTERROGATORY NO. 1

Identify the person or persons who are employed by or are representatives of the Nuclear Regulatory Commission and who have knowledge about the following:

- A. Any interactions between the Department of Energy (DOE) or the Nuclear Regulatory Commission (NRC) and General Electric (G.E.) regarding the use of the Morris operation as a federal repository for spent fuel or any other future use.
- B. Any plans, programs, or proposals for Federal Government use of the Morris facility as a federal repository for spent fuel.
- C. Security Plans.
- D. License Amendments.
- E. Emergency Plans.
- F. Liaison with the general population and emergency facilities and state agencies dealing with emergency and evacuation plans.
- G. Radiation monitoring or testing.
- H. Any environmental appraisals or analyses prepared with regard to the use of the Morris facility as a spent fuel storage facility from 1979 forward.
- I. Any interactions with General Electric in regard to the license renewal application.
- J. Any interactions with G.E. personnel in regard to current operation of Morris.
- K. Any interactions with G.E. in regard to the License Amendment requested January 18, 1980.
- L. Amount of fuel projected to be stored during license period.

RESPONSE

A. The NRC Staff objects to this interrogatory. The regulations which govern NRC proceedings state that "[i]t is not ground for objection that the information sought will be inadmissible if the information sought appears reasonably calculated to lead to the discovery of admissible evidence."

10 CFR §2.740(b)(1). It follows that a permissible ground for objection is that the information sought does not appear "reasonably calculated to lead to the discovery of admissible evidence". This interrogatory relates to a proposed contention which was rejected by the Licensing Board as being beyond the scope of this proceeding. See "Order Ruling On Contentions of The Parties" (June 4, 1980), p. 21. As noted by the Licensing Board, the scope of the proceeding before the Licensing Board is whether the license of GE to operate the Morris facility should be renewed. Interrogatories which do not relate to admitted contentions cannot lead to the discovery of admissible evidence.

B. The Staff objects to this interrogatory for the reasons set forth with respect to A., above.

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Division of Safeguards
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- D. A. T. Clark, Jr.
Advanced Fuel and Spent Fuel Licensing Branch
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- E. Fred D. Fisher
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- F. Fred D. Fisher
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- G. A. T. Clark, Jr.
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- Philip D. Bramson, Manager
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- I. A. T. Clark, Jr.
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- R. E. Cunningham, Director
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- L. C. Rouse, Chief
Advanced Fuel and Spent Fuel Licensing Branch
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F. M. Empson
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S. A. Treby, Assistant Chief Hearing Counsel
Office of the Executive Legal Director
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Marjorie Rothschild
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John P. Roberts
Advanced Fuel and Spent Fuel Licensing Branch
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Washington, DC 20555

Douglas Weiss
License Fee Management Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555

- J. Same as I., plus C. C. Peck
Office of Inspection and Enforcement
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137
- K. The Staff is aware only of a license amendment request dated
January 23, 1980. - A. T. Clark, Jr.
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel and Material Safety
Office of Nuclear Material Safety and
Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555
- S. A. Treby, Assistant Chief Hearing Counsel
Office of the Executive Legal Director
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L. A. T. Clark, Jr.
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

INTERROGATORY NO. 2

Identify any officials or representatives of the Nuclear Regulatory Commission with whom G.E. has had contact in regard to the license renewal proceeding.

RESPONSE

- a. A. Thomas Clark, Jr.
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555
- b. R. E. Cunningham, Director
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
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- c. L. C. Rouse, Chief
Advanced Fuel and Spent Fuel Licensing Branch
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- d. F. M. Empson
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555
- e. S. A. Treby, Assistant Chief Hearing Counsel
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, DC 20555

- f. Marjorie Rothschild
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, DC 20555
- g. John P. Roberts
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555
- h. Douglas Weiss
License Fee Management Branch
Office of Administration
Nuclear Regulatory Commission
Washington, DC 20555

INTERROGATORY NO. 3

Identify any plans or proposals for change in use of the Morris facility which would necessitate a license amendment to the existing license.

RESPONSE

The present use of the Morris Operation is the storage of spent fuel discharged from nuclear power reactors. As of July, 1980 the Staff is not aware that there are plans or proposals for change in that use which would necessitate an amendment to the existing license.

INTERROGATORY NO. 4

Identify all experts to be used as consultants and/or witnesses, areas of expertise and contentions to be addressed.

RESPONSE

The following Staff personnel currently have been identified as consultants in connection with the contentions listed below. No determination has been

made at this time whether or not they will be called as witnesses. The areas of their expertise are identified in the statements of professional qualifications which are attached.

Contention 1(a)

A. T. Clark, Jr., Project Manager
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Millard L. Wacht
Accident Evaluation Branch
Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Contention 1(b)

A. T. Clark, Jr.

- (iv) Carl Sawyer
Regulatory Improvement Branch
Division of Safeguards
- (vi) William S. Bivins, Section Leader
Hydraulic Engineering Section
Hydraulic and Geotechnical Engineering Branch

Contention 2

Carl Sawyer

Contention 3

- (a) Reginald L. Gotchy
Edward F. Branagan
Radiological Assessment Branch
Office of Nuclear Reactor Regulation
- (b) Gotchy / Branagan
A. T. Clark, Jr.
- (c) Gotchy / Branagan
A. T. Clark, Jr.

(d) A. T. Clark, Jr.
Gotchy / Branagan

(e) A. T. Clark, Jr.

Contention 4

(a) George D. Calkins
Fuel Process Systems Standards Branch

(b) Jim C. Petersen
Utility Finance Branch
Office of Nuclear Reactor Regulation

(c) Fred D. Fisher
Environmental Radiation and Emergency Support
Services Section
Fuel Cycle Uranium Fuel Licensing Branch
Office of Nuclear Material Safety and Safetuards

(d)(i) Paul H. Lohaus, Chief
Waste Products Section
Low Level Waste Licensing Branch

(ii) G. D. Calkins

(iii) William S. Bivins

(iv) Paul H. Lohaus

Contention 5

(a) A. T. Clark, Jr.

(b) A. T. Clark, Jr.

(c) Fred D. Fisher

Contention 6

(a) Fred D. Fisher

(b) Fred D. Fisher

(c) Fred D. Fisher

(d) Fred D. Fisher

INTERROGATORY NO. 5

Describe the license amendment requested on January 18, 1980, and the reasons therefore.

RESPONSE

The Staff is not aware of a license amendment request dated January 18, 1980. It is believed that this interrogatory refers to a license amendment request from the General Electric Company, dated January 23, 1980. This amendment request has been previously served on the State of Illinois; however, the Staff is providing an additional copy to the State. The reasons for the amendment are those stated by the General Electric Company in its request.

INTERROGATORY NO. 6

In regard to Revision c2 of NEDO-21326 described [sic] in detail:

- A. All changes, tests and experiments proposed or projected.
- B. Which changes in plant, procedures, tests and experiments related to receipt, storage and transfer of spent fuel are proposed to be performed without prior approval of NRC.
- C. Any other types of changes in plant operation, procedures, tests or experiments are proposed or projected to be performed without prior NRC approval.
- D. Who will make the determination that changes in plant operation, procedures, tests and experiments will not require a change in the Operation Specifications, Chapter 10 of NEDO-21326 C, does not involve unreviewed safety or environmental issues and does not decrease the effectiveness of the physical security plan; what standards will be applied to make this determination; when will that determination be made.
- E. What type of NRC review of these changes listed above is anticipated.
- F. What type of reports of the changes shall be made to the NRC, to State agencies, to shareholders and to the public; when will these reports be issued.

G. Will the NRC or any other agency be notified of the inception of any changes, as listed above.

H. Identify any NRC regulations that permit changes in plant operation or procedure without prior NRC approval.

RESPONSE

6.A. As indicated in the response to 5 above, there is a pending license amendment, and it would permit changes, tests and experiments. However, this amendment has not yet been approved. Therefore, the nature of such changes, tests and experiments which may be proposed is presently unknown to the NRC Staff. The Staff is aware of only one change to be undertaken by the licensee at the Morris Operation, that of the enlargement of the pump room. This will accommodate equipment to be used in decontamination of the basin coolers and equipment for the recovery of heat from basin water for use in heating and cooling the main building, including the fuel storage area. This action is described in the General Electric letter to the NRC dated June 6, 1980, a copy of which was provided to the Service List on June 12, 1980.

6.B. The change described in response to 6.A. above is the only change to be made without NRC approval, as far as the Staff is aware.

6.C. The Staff is not aware of any changes, other than as described in 6.A. above. The only types of changes, tests or experiments which could be performed without NRC approval would be those which meet the conditions set by the license at the time.

6.D. If the amendment referred to in 6.A. is approved as written, the appropriate General Electric Company personnel will make the determination as to whether or not any changes, tests and experiments involve an unreviewed safety question, significantly affect the environment, decrease the effectiveness of the physical security plan, or significantly increase occupational exposure. This determination would be made giving due consideration to existing regulations, operation specifications, and approved procedures. The determination will be made prior to undertaking the change, test, or experiment.

6.E. If the proposed amendment is approved as submitted, a report of any changes, tests, or experiments will be made annually by the licensee. Information on any change, test, or experiment is always available to the NRC upon request.

6.F. If the proposed amendment is approved as submitted, reports to the NRC will be made annually and will describe the changes, tests or experiments and evaluation by the licensee of their likely impact. It is not known if State agencies or shareholders will be provided copies of this annual report. The reports are available to the public in the Public Document Rooms soon after receipt.

6.G. If the proposed amendment is approved as submitted, there is no requirement that the NRC be informed.

6.H. 10 CFR 50.59 permits changes, tests, and experiments to be performed at licensed nuclear reactor sites without prior NRC approval unless the proposed change, test or experiment involves a change in the technical specifications incorporated in the license or an unreviewed safety question.

INTERROGATORY NO. 7

Identify plans for future storage of spent fuel until the year 2000 including:

- A. estimated shipment date(s),
- B. number of assemblies,
- C. point of origin; owner
- D. mode of transportation,
- E. number of years of storage estimated.

RESPONSE

The license authorizes the receipt and storage of 750 tons of spent fuel with actual storage space of about 700 tons. At present, the only plans of which the Staff is aware would include the receipt and storage of an additional 33 tons from the San Onofre reactor. The responses 7.A. through 7.E. below refer to the expected shipments from San Onofre.

7.A. Not known.

7.B. 33 tons of fuel assemblies.

7.C. San Onofre, California; ownership not known.

7.D. Previous shipments from San Onofre have been by truck.

7.E. Undetermined.

INTERROGATORY NO. 8

In regard to Spent Fuel Storage Problem at Morris:

- A. Have any fuel rods ruptured, exploded, or otherwise leaked radiation while in storage? If yes, please explain.
- B. Have you experienced problems with warped or damaged fuel assemblies in storage? If yes, please explain.
- C. Have you experienced problems with damaged racks? If yes, please explain.
- D. Has the liner of the spent fuel pool ever leaked? If yes, please state total amount of coolant lost, ultimate destination of coolant that leaked, and cause of leak.
- E. Has the pool radioactive waste system ever failed? If yes, please explain.
- F. Has the pool coolant circulation system ever failed? If yes, please explain.
- G. Have you had problems with "crud" buildup on the assemblies or in the pool? If yes, please explain.
- H. Has the spent fuel pool ever been drained? If yes, please explain.
- I. Has the radiation level of the spent fuel pool ever exceeded allowable limits? If yes, please explain.
- J. Have fuel assemblies ever been dropped during handling? If so, please list dates, number of assemblies dropped, and extent of damage, if any.
- K. Please describe any problems encountered in storing spent fuel not described in response to the above questions.

RESPONSE

It is not known what "problem" is referred to in this interrogatory.

8.A. No

8.B. No

8.C. No

8.D. The liner of the spent fuel pool has leaked. About 2500 gallons of water from the pool was unaccounted for. The unaccounted for leakage was probably absorbed by the massive reinforced concrete walls and floor. The cause of the leak was the inadvertant tipping of a spent fuel transport cask against the wall of the cask unloading basin. A complete description of this incident is described in Section 8.3.1 of the Licensee's CSAR.

8.E. By the "pool radioactive waste system", the Staff believes you are referring to the basin water cleanup system. The Staff is not aware of any failure of this system.

8.F. There have been two occasions when the pool water cooling system was not operable. The cooling coils, as originally installed, were fabricated of carbon steel. When water circulation began, it was found that the water was discolored by rust. Cooling was discontinued until a stainless steel coil was installed as a replacement.

The second occasion occurred as the result of power failure during extremely cold weather in January 1977. Before power could be returned to the circulating pumps the cooling water in the coil froze and cracked the coil. The cooling system was out of service for about three months with no detrimental effect except for increased temperature and humidity in basin areas as the result of increased water temperature (45 C without cooling as compared with 31 C with cooling). Repairs were made after weather moderated.

8.G. The question speaks of a "'crud' buildup on assemblies or in the pool". It is assumed reference is being made to finely divided solids which accompany the fuel assemblies as received from the reactor. Much of this is removed by flushing of the shipping cask and is stored in the Low Activity Waste Vault. Other "crud" remains on the fuel assembly and may be seen from the pool surface. In some cases it may be removed by vacuuming, or if entrained, it will be filtered from the water. These solids are not unexpected and the Staff is not aware of problems in operation resulting from their presence.

8.H. No

8.I. No

8.J. No

8.K. The Staff is not aware of any other problems encountered in storing spent fuel not described in response to the above questions.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
GENERAL ELECTRIC COMPANY)
(GE Morris Operation Spent Fuel)
Storage Facility))
Docket No. 70-1308
(Renewal of SNM-1265)

AFFIDAVITS OF FLEMING M. EMPSON
AND A. THOMAS CLARK, JR.

We, A. T. Clark, Jr. and Fleming M. Empson, being duly sworn, do depose and state:

1. A. T. Clark, Jr. is a Senior Chemical Engineer in the Advanced Fuel and Spent Fuel Licensing Branch, Office of Nuclear Material Safety and Safeguards of the United States Nuclear Regulatory Commission. His professional qualifications statement is attached.
2. Fleming M. Empson is a chemical engineer in the Advanced Fuel and Spent Fuel Licensing Branch in the Office of Nuclear Material Safety and Safeguards of the United States Nuclear Regulatory Commission. His professional qualifications statement is attached.
3. We jointly responded to the State of Illinois interrogatories 1.C through 1.L and 2 through 8. We certify that the answers given are true and accurate to the best of our knowledge.

A. T. Clark, Jr.
A. T. Clark, Jr.

Fleming M. Empson
Fleming M. Empson

Subscribed and sworn to before
me this 4th day of August, 1980

Elizabeth Ann Lystra
Notary Public

My Commission Expires: July 1, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Arthur Thomas Clark, Jr.

Advanced Fuel and Spent Fuel Licensing Branch
Office of Nuclear Materials Safety and Safeguards

As a Senior Chemical Engineer I am responsible for managing the safety review of nuclear fuel cycle facilities.

I graduated from Rose Polytechnic Institute (now Rose-Hulman Institute of Technology) in Terre Haute, Indiana in 1958 with a Bachelor of Science Degree in Chemical Engineering. In 1972 I graduated from the University of Maryland in College Park, Maryland with a Doctor of Philosophy Degree in Nuclear Engineering. At the University I was a licensed reactor operator.

From 1958 to 1964 I was employed by the E. I. DuPont de Nemours Company at the Savannah River Laboratory and Plant. I participated in process developmental activities associated with the chemical separations facilities including ion exchange, solvent extraction, dissolution, feed clarification and other aspects of such operations. I provided technical support for the Receiving Basin for Off-Site Fuel and participated in technical studies related to plant improvements and new processes.

In 1964 I joined the Commission's Regulatory staff as a Chemical Engineer, participating in the safety review of separation facilities. I left the Commission in 1965 to attend graduate school, returning in 1971.

I have been a member of the American Nuclear Society and have been a member of the American Institute of Chemical Engineers. I reside at 6808 Beech Avenue, Bethesda, Maryland.

PROFESSIONAL QUALIFICATIONS

Fleming M. Empson

U.S. Nuclear Regulatory Commission

I am a chemical engineer in the Advanced Fuel and Spent Fuel Licensing Branch Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Silver Spring Maryland.

I received a Bachelor of Science Degree in Chemical Engineering at the University of Tennessee, Knoxville, Tennessee in 1942.

Between 1941 and 1948, I was employed as a chemical engineer with the Tennessee Valley Authority in phosphate fertilizer development at Wilson Dam, Alabama; in chemical warfare munition production with the U.S. Army Chemical Corps at Pine Bluff Arsenal, Arkansas; and in the Industrial Engineering Division, DuPont Company, Waynesboro, Virginia.

Since 1948, I have been engaged in nuclear work. I was a chemical engineer with the General Electric Company at the Atomic Energy Commission Hanford Works from 1948 to 1953. During this period, I was engaged in the development of solvent extraction processes for recovery of uranium and plutonium from irradiated uranium and of uranium from waste solutions. I participated in startup of the uranium recovery plant. In 1953 to 1954, I was employed by Thiokol Corporation at Redstone Arsenal, Alabama. From 1954 to 1973, I was employed as a chemical engineer in the Health Physics and Chemical Technology Divisions at Oak Ridge National Laboratory. During this time, I was engaged in development work on disposal of radioactive waste in geologic formations. My responsibilities included operation of experiments on disposal of liquid wastes in a salt mine. I was resident engineer for installation and operation of Project Salt Vault in a salt mine at Lyons, Kansas. I was an engineer in the following work on the proposed Federal repository for radioactive waste in salt. I have been a nuclear process engineer and a chemical engineer with the Atomic Energy Commission and the Nuclear Regulatory Commission from 1973 to the present. My responsibilities have included safety and environmental review of applications for fuel reprocessing and uranium conversion plants and for an irradiated fuel storage facility.

My office is located at the U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC 20555, Telephone: 301-427-4205.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Arthur Thomas Clark, Jr.

Advanced Fuel and Spent Fuel Licensing Branch
Office of Nuclear Materials Safety and Safeguards

As a Senior Chemical Engineer I am responsible for managing the safety review of nuclear fuel cycle facilities.

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I have been a member of the American Nuclear Society and have been a member of the American Institute of Chemical Engineers. I reside at 6008 Beech Avenue, Bethesda, Maryland.

MILLARD L. WOHL

PROFESSIONAL QUALIFICATIONS

ACCIDENT EVALUATION BRANCH

DIVISION OF SYSTEMS INTEGRATION

I am employed as a nuclear engineer in the Accident Evaluation Branch, Division of Systems Integration, U. S. Nuclear Regulatory Commission, Washington, D. C. My duties are to conduct site and accident analyses and various other safety-related studies for nuclear power and non-power reactor facilities.

I attended Case Western Reserve University (formerly Case Institute of Technology) and received a B. S. degree in Physics in 1956. I received an M. S. degree in Physics from Indiana University in 1958. I did graduate work in Nuclear Engineering at Columbia University and Case Western Reserve University from 1962 through 1964. I was a teaching assistant in Physics at Indiana University from 1956 - 1958. I have taught physics and mathematics in the evening divisions of Baldwin-Wallace College, the Ohio State University and Cuyahoga Community College from 1958 - 1973.

In 1958, I joined the NASA Lewis Research Center in Cleveland, Ohio. My initial duties involved the writing of Monte Carlo computer codes for the determination of radiation shielding requirements and propellant heating for proposed nuclear-powered rocket designs. Other assignments involved methods development and shielding and nuclear safety analyses for numerous proposed mobile nuclear vehicle applications. Numerous technical publications evolved

in the course of this work. Additionally, during the period 1958 - 1973, I had substantial research contract management responsibilities.

In 1973, I joined the General Atomic Company in La Jolla, California, as a nuclear engineer. At General Atomic I performed a variety of nuclear safety-related analyses for the High-Temperature Gas-Cooled Reactor (HTGR). These included the analysis of depressurization accidents and containment integrity studies, as well as computer code upgrading and modification.

In 1975, I joined the Accident Analysis Branch in the Division of Technical Review, U. S. Nuclear Regulatory Commission. My responsibilities involved site characteristic studies and accident analyses. Presently, I have similar but expanded responsibilities.

Professional Qualifications

Carl B. Sawyer

Regulatory Improvements Branch
Division of Safeguards

My name is Carl B. Sawyer. I have been employed by the U.S. Nuclear Regulatory Commission (NRC) and its predecessor, the U.S. Atomic Energy Commission, since 1971. My duties with these agencies have been exclusively in the physical protection regulation of licensed nuclear plants and materials.

Currently I am a Senior Program Analyst with the Regulatory Improvements Branch. My duties are to plan and conduct programs, studies, and analyses for the protection of nuclear materials against theft and for the protection of nuclear plants against sabotage. As a part of my duties I review and evaluate current and proposed physical protection programs and equipment for overall adequacy in meeting the Commission's safeguards objectives.

Certain of my recent assignments pertain to the NRC's continuing evaluation of the possible need for physical protection measures for shipments of irradiated fuel. In August 1978 I was assigned to review a study entitled "Transport of Radionuclides in Urban Environs: Working Draft Assessment" (SAND 77-1927) and to advise the Division of Safeguards management in matters pertaining to the potential for sabotage of irradiated fuel shipments. I often represent the Division of Safeguards in meetings with the Department of Transportation in matters pertaining to the potential for sabotage of irradiated fuel shipments. I am participating in an NRC-supported research program to determine details of the response of irradiated fuel and fuel casks to attack by explosives. I am the principal author of the revised requirements for the protection of irradiated reactor fuel in transit (10 CFR 73.37) and the related revised guidance document NUREG 0561.

I was one of the principal analysts in the program that led to the physical protection requirements that currently apply to fuel fabrication facilities and to the General Electric Company Morris Operation. Among my contributions were the initial concepts for dual alarm stations, access controls, communications, coordination with local police, entry and exit searches, and the physical security plans. I prepared criteria for NRC review of licensee plans for meeting NRC requirements for protection of fuel fabrication facilities. I was responsible for reviewing the initial implementation of these requirements at several facilities, including (i) General Atomic, San Diego, California; (ii) Rockwell International, Canoga Park, California; and (iii) Babcock and Wilcox in and near Apollo, Pennsylvania.

From 1956 to 1971 I was employed by various companies in the Washington, D.C. metropolitan area as an electrical engineer. My duties with the companies consisted largely of the design and development of components for advanced communications systems used by the Department of Defense and other agencies of the U.S. Government.

From 1954 to 1956 I served as a communications officer with the U.S. Air Force.

I graduated from North Carolina State College in 1954 with a BS in electrical engineering.

WILLIAM S. BIVINS
PROFESSIONAL QUALIFICATIONS
HYDROLOGY-METEOROLOGY BRANCH
DIVISION OF SITE SAFETY AND ENVIRONMENTAL ANALYSIS
OFFICE OF NUCLEAR REACTOR REGULATION

I am the Section Leader, Hydrologic Engineering Section on the staff of the Hydrology-Meteorology Branch, Division of Site Safety and Environmental Analysis.

My formal education consists of study in civil engineering at New Mexico State University, where I received a B.S.C.E. in 1966, and a M.S. in Water Resource Management from the University of Wisconsin in 1969. The graduate study was as a Planning Fellow under total sponsorship of the Corps of Engineers. I have had courses in hydrology, water resources, fluid mechanics, engineering construction, soil mechanics, water supply, geology, hydro-geology, economics, water law, urban and regional planning, and advanced mathematics.

My present employment with the NRC (formerly the AEC) dates from 1972 in the area of hydrologic engineering with the Division (now Office) of Nuclear Reactor Regulation, with the Office of Standards Development, and for consultation on siting of materials utilization facilities, and on environmental matters. My responsibility in the licensing review of nuclear facilities is in the area of flood vulnerability, adequate water supply, and surface and groundwater acceptability of effluents. In addition, I participate in the development of Regulatory Guides in these areas of interest.

From 1970 to 1972, I was a Hydraulic Engineer with the Southwestern Division Corps of Engineers, Dallas, Texas. I was responsible for the hydrologic review of multi-purpose dams, flood control projects, navigation projects, and coastal engineering development. The projects included those of the five districts of the Southwestern Division of the Corps of Engineers and included parts or all of the states of Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, Arkansas, and Louisiana.

From 1966 to 1970, I was a Hydraulic Engineer with the Corps of Engineers, Albuquerque District, Albuquerque, New Mexico. I worked on hydrologic engineering and hydraulic design projects such as multi-purpose reservoirs, channels, and levees in New Mexico, Colorado, and Kansas; including estimates of long-term water availability, and hypothetical flood events. I prepared hydrologic engineering estimates for major flood control levee systems including the water salvage potential of such a project.

I have published in the Journal of the American Society of Civil Engineers and in internal technical papers of the Corps of Engineers. I am a registered Engineer-In-Training in the State of New Mexico. I am a member of the American Society of Civil Engineers.

DR. R. L. GOTCHY

Professional Qualifications

My name is Reginald L. Gotchy. I am a Senior Radiobiologist on assignment with the Radiological Assessment Branch in the Office of Nuclear Reactor Regulation. In this capacity, I am responsible for coordinating the technical review and evaluation of the environmental radiological impact of nuclear facility operations.

I received a B.S. in Zoology from the University of Washington in 1958, an M.S. in Radiation Health from the Colorado State University in 1966, a Ph.D. in Radiation Biology from the Colorado State University in 1968, and attended the University of Washington Graduate School 1958-1959 as an AEC Radiological Physics Fellow.

I have 19 years of professional experience in health physics, industrial hygiene, radiation physics, radiation biology, environmental sciences, project coordination of research and development programs, and development of AEC and NRC standards. This experience has included operational and safety responsibilities, and review and coordination of facility operations under contract to the AEC. I have been employed by the Lawrence Radiation Laboratory, the U.S. Public Health Service, Reynolds and Electrical Engineering Company, the AEC Nevada Operations Office, and the NRC Office of Standards Development prior to my assignment in the Office of Nuclear Reactor Regulation in 1975. I was an adjunct professor of Radiation Health Technology at the University of Nevada, Las Vegas (1969-1972).

I am a member of Sigma Xi (Research Society of North America), the American Nuclear Society, the Health Physics Society and the International Radiation Protection Association, and the Radiation Research Society. I am a past member of the American Association for the Advancement of Science and the American Industrial Hygiene Association.

I am certified by the American Board of Health Physics, and served as a member of the Panel of Examiners (1972-1976). I remain active in the development of examination questions and updating my professional standing by periodic post-graduate work and training.

Professional Qualifications

My name is Edward F. Branagan, Jr. I am an Environmental Scientist with the Radiological Assessment Branch in the Office of Nuclear Reactor Regulation. Presently, I am responsible for evaluating the environmental radiological impacts from nuclear power reactors. In particular, I am responsible for evaluating radioecological models and health effect models for use in reactor licensing. I have been with the Radiological Assessment Branch for about 1 year.

I received a B.A. in Physics from Catholic University in 1969, an M.A. in Science Teaching from Catholic University in 1970, and a Ph.D. in Radiation Biophysics from Kansas University in 1976. While completing my course work for my Ph.D., I was an instructor of Radiation Technology at Haskell Junior College. My research work was in the area of DNA base damage, and was supported by a U.S. Public Health Service traineeship. My dissertation was entitled "Nuclear Magnetic Resonance Spectroscopy of Gamma-Irradiated DNA Bases."

Since joining the NRC in 1976, I have been with both the Office of Nuclear Material Safety and Safeguards (NMSS), and with the Office of Nuclear Reactor Regulation (NRR). In NMSS I was involved in project management and technical work. I was the project manager for two contracts that the NRC had with Oak Ridge National Laboratory. These contracts were concerned with estimating radiation doses from radon-222 and radium-226 releases from uranium mills. As part of my work on NRC's Draft Generic Environmental Impact Statement on Uranium Milling (DGEIS), I calculated health effects from uranium mill tailings. Upon publication of the DGEIS, I presented a paper entitled "Health Effects of Uranium Mining and Milling for Commercial Nuclear Power" at a Conference on Health Implications of New Energy Technologies. Since joining NRR, I have worked on several projects: (1) analyzed the radioecological models in the "Heidelberg Report," and (2) served as a technical contact on an NRC contract with Argonne National Laboratory involving development of a computer program to calculate health effects from radiation.

Presently, I am a member of the Health Physics Society and the American Association for the Advancement of Science.

PROFESSIONAL QUALIFICATIONS

G. D. Calkins

My name is G. D. Calkins, my business address is Office of Standards Development, U.S. Nuclear Regulatory Commission (NRC), Washington, DC 20555. I am a nuclear engineer and have served as Decommissioning Program Manager on an agency wide basis since June 1978. In this capacity I am responsible for planning and executing a program to reevaluate NRC policies and rules for decommissioning of all kinds of nuclear facilities. This includes the development of the information base on the technology, safety and costs for decommissioning nuclear facilities, the preparation of draft generic environmental statement on decommissioning nuclear facilities and the development of improved policies and rules on decommissioning. Prior to this and since I joined NRC in August 1976, I served as Technical Monitor for the contracts developing the information base mentioned above. I was self employed in nontechnical work from 1971 until I joined NRC in 1976. From 1968 to 1971 I was involved in engineering management in aircraft, space and automotive safety. From 1958 to 1968 I was employed by Atomics International and served in various management positions from Group Leader to Division Director. I was responsible for research, development, engineering, testing, quality assurance, and manufacturing of materials, fuel elements and other components needed in the development and manufacture of central power station and space nuclear reactors. From 1948 to 1958 I was at Battelle Memorial Institute, mainly as an assistant and division chief. I was responsible for research and development in the areas of uranium and thorium minerals beneficiation, radiation effects on materials, applications of radioisotopes and the

handling of large quantities of radioactive materials. From 1947 to 1948 I worked at the Oak Ridge National Laboratory developing processes for reprocessing reactor fuels. From 1942 to 1947 I served as a radar maintenance officer in the Army Air Force.

I have a B.S. degree in chemistry from Wayne State University and a M.S. degree in chemical engineering from the University of Pittsburgh.

JIM C. PETERSEN

PROFESSIONAL QUALIFICATIONS

OFFICE OF NUCLEAR REACTOR REGULATION

I am the Senior Financial Analyst in the Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission. I am responsible for the review and evaluation of the financial qualifications of nuclear facility license applicants to pursue proposed activities under a license, primarily the construction and operation of nuclear power plants. In this regard, I have prepared financial qualifications analyses for inclusion in the Staff's Safety Evaluations and for presentation as evidence on the record of the Atomic Safety and Licensing Board's safety hearings. I have served as a Staff witness before the Atomic Safety and Licensing Board in a number of proceedings. My work also involves keeping abreast of developments in the money and capital markets and in the electric utility industry.

I received a Bachelor of Science in Business Administration degree (awarded cum laude) with a major in Accounting from the University of Denver in 1968. I have continued my formal education through college and university courses in finance, math, economics and computer science and through several intensive short courses. I am a member of Beta Gamma Sigma, the national business administration honorary, and Beta Alpha Psi, the national accounting honorary. The latter organization presented me with its award for outstanding service.

From 1968 through 1973, I was employed in a number of assignments on the staff of the Controller of the Atomic Energy Commission. These assignments included reviewing, designing and implementing accounting systems and procedures for AEC offices and AEC contractors. I also assisted in the financial review of nuclear facility license applicants during the period when that function was performed by independent staff members of the AEC Office of the Controller. That function was subsequently transferred in its entirety to the NRC. In January of 1974, I joined the regulatory staff and assumed responsibilities in the financial qualifications review of nuclear facility license applicants. I have worked in NRC financial analysis since that time, except for a one-year assignment at the U. S. Department of Energy where I worked on the financing of emerging energy technologies.

DR. FRED D. FISHER
PROFESSIONAL QUALIFICATIONS

My name is Fred D. Fisher. I am the leader of the Environmental Radiation and Emergency Support Services Section of the Fuel Cycle Uranium Fuel Licensing Branch in the Office of Nuclear Material Safety and Safeguards (NMSS). That section guides emergency preparedness programs for the entire Office. The section is preparing guidance for fuel cycle and major materials licensee emergency preparedness programs and for the reviews of those programs by NMSS.

I received a Bachelor of Arts degree in Chemistry from Linfield College in 1954 and a Ph.D. in Chemical Engineering from Oregon State University in 1960.

I have been employed in nuclear materials fields since 1959, mainly in radiochemical processing and facilities engineering with General Electric, NUMEC, and Westinghouse. I have been with the NRC and the AEC in what is now the Office of Nuclear Material Safety and Safeguards since 1972. During that time I have worked on licensing of fuel cycle and materials facilities and, extensively, on generic environmental studies such as the Generic Environmental Statement on the Use of Plutonium Mixed Oxide Fuel in Light Water Reactors (GESMO).

I am a member of the American Chemical Society.

PAUL H. LOHAUS

U.S. Nuclear Regulatory Commission

Education: State University of New York BS 1967, Biology
(SUNY) at Oswego
SUNY at Albany MS 1971, Science and
Technology Forecasting
and Assessment

Work

Experience: 1979 - Present:- Section Leader, Waste Products Section, Low-Level
(Full Time) Waste Licensing Branch, Division of Waste Management. Responsibilities
include participation in the development of technical information,
draft criteria and regulations, staff technical positions and other
documentation needed for low-level waste management activities.

1977 - 1979: Waste Management Engineer, Low-Level Waste Branch,
NRC Waste Management Program. Responsibilities include participation
in the development evaluation and implementation of the NRC low-level
waste program.

1973 - 1977: Senior Technical Specialist, Agreement State Program,
NRC Office of State Programs. Responsibilities included assessment
of the adequacy and compatibility of Agreement State radiation con-
trol programs for regulation of Agreement Materials.

1967 - 1973: Senior Industrial Scientist, Committee on Licensing
New York State Atomic Energy Council. Responsibilities included
coordination of the State's nuclear material control and licensing
program.

1967: Research Technician, Albany Medical College. Performed
quantitative and qualitative biochemical analyses for mucopolysaccharide
content of burned skin, granulation tissue and urine.

Societies: Plenary Member, National Health Physics Society.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
GENERAL ELECTRIC COMPANY)	
(GE Morris Operation Spent Fuel)	Docket No. 70-1308
Storage Facility))	(Renewal of SNM-1265)

NOTICE OF APPEARANCE

Notice is hereby given that the undersigned attorney herewith enters an appearance in the captioned matter. In accordance with § 2.713(a), 10 CFR Part 2, the following information is provided:

Name	-	Richard G. Bachmann
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Admission		Supreme Court of the State of California
Name of Party	-	NRC Staff U.S. Nuclear Regulatory Commission Washington, DC 20555



Richard G. Bachmann
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 4th day of August, 1980