

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
METROPOLITAN EDISON COMPANY) Docket No. 50-289
(Three Mile Island, Unit 1))

NRC STAFF RESPONSE TO
UNION OF CONCERNED SCIENTISTS
INTERROGATORIES (SECOND SET)

In accordance with 10 C.F.R. §2.720 and 10 C.F.R. §2.744 the NRC Staff has responded to the Union of Concerned Scientists (UCS) Second Set of Interrogatories to NRC Staff dated February 1, 1980.

In its first set of Interrogatories to the Staff, UCS asked that each question be answered in five parts, A-E. Where possible, the Staff has answered all five sections. Also, the NRC Staff has invoked that portion of the Commission's Order of August 9, 1979 (slip op. at 11) which allows as an adequate response to a discovery request a statement that information is available in the Local Public Document Rooms and guidance as to where the information can be found.

Although the NRC Staff has provided, as requested, the names of individuals who are familiar with the Staff's Status Report, parties are reminded that any contact with these individuals must be through the Counsel for the NRC Staff. Responses to Interrogatories 191-193, 195, 196, 197(a, c), 198, 199, 204, 205 (b-d), and

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212 are not yet completed. These answers will be filed as soon as possible. Following the responses to the Interrogatories are affidavits identifying the individuals who prepared the responses and verifying them.

Question 190

Page C1-10 contains the Staff's evaluation of the environmental qualifications of EFW pump motors and control valves.

- a. Identify the specific regulations, Regulatory Guides, Branch Technical Positions or other documents containing the standards used, or to be used, as the basis for this evaluation.
- b. Is it the Staff's position that testing in a simulated adverse environment is not required for these components? If so, explain the basis for that position.

Response

- A.
 - a) SRP 3,6 Branch Technical Position ASB 3-1 Implementation section part 4,d
 - b) Further adverse environmental testing of the EFW pump motor is not required. We have certification documentation from the pump motor manufacturers that indicates they are qualified for the expected environment. The control valves are still an open item.
- B. TMI Startup Report, NRC TMI-1 Restart Status Report and Item 190.A.a above.
- C. NONE
- D. NONE
- E. NOT KNOWN AT THIS TIME

Question 194

Pages C2-5 and C2-6 contain a discussion of the procedures to be used to assure that safety-related system valves are in the correct position. Does the Staff take the position that conformance with this part of the Order will provide a degree of protection to the public equivalent or superior to what would be provided if the design of TMI-1 met Regulatory Guide 1.47?

Response

- A. Yes
- B. Regulatory Guide 1.47
NRC TMI-1 Restart Status Report
TMI-1 Administrative Procedure No. 1012
- C. NONE
- D. NONE
- E. NOT KNOWN AT THIS TIME

Question 197(b)

With respect to the discussion on page C2-10, please answer the following:

- b. Describe the range of consequences to the public that are possible if reactor vessel integrity is lost.

Response

- (b) WASH-1400, Table 5-2, contains a listing of accident sequences by release categories resulting from reactor vessel rupture. Each release category represents a certain fraction of core inventory which is released to the environment. The Staff, however, has not performed TMI site-specific calculations of the consequences to the public of such releases.

Question 200

In Section C8, the Staff lists the "positions" taken in NUREG-0578. Following each "position" is a section entitled "clarification". Is it the Staff's position that compliance with the items in the "clarification" sections are necessary and sufficient to demonstrate compliance with the "positions?"

Response

Yes, it is the Staff's position that compliance with the items in the clarification sections are necessary to demonstrate compliance with the positions. The clarification sections were taken from a letter from H. R. Denton to All Operating Nuclear Power Plants on "Discussion of Lessons Learned Short-Term Requirements" dated October 30, 1979, which provides additional discussion of the NRC Staff requirements. This letter can be found in the Local Public Document Rooms. It should be noted that the intent of the original requirements was not changed by this letter. For some items, no additional clarification was given and compliance with the original position is sufficient to demonstrate compliance.

Question 201

Page C8-6 contains seven items of "clarification" with regard to the NUREG-0578 position on power supply for pressurizer heaters. Please answer the follow:

- a. What is the basis for item 3?
- b. With respect to item 4, what is the basis for requiring change-over of the heaters to emergency power to be accomplished manually rather than automatically? Identify the regulations, if any, which require this.
- c. Is it the Staff's position that the safety-grade circuit breakers referenced in "clarification" item #6 can be made to conform to the requirement for an isolation device set forth in Reg. Guide 1.75?

Response

- A. a) Clarification item 3 on page C8-6 of the Restart Report states that the power sources for the pressurizer heaters need not necessarily have the capacity to provide power to the heaters concurrent with the loads required for LOCA.

The basis for this clarification is that providing the emergency power supply capability to the pressurizer heaters will reduce challenges to the emergency core cooling system by facilitating natural circulation rather than high pressure emergency core cooling itself. It should be recognized that providing the emergency power supply to the heaters will not preclude all challenges to ECCS, NUREG-0578 states, therefore, that careful attention should be given to assure that the reliability of the power source (diesel generators) is not degraded as a result of implementing the capability to supply selected pressurizer heaters. The power source may have the capacity to provide power to the heaters concurrent with loads required for LOCA, but this is not a requirement.

201.b.c A. b) The basis for the manual transfer is that plenty of
time is available (two hours for TMI-1).

c) YES

B. Regulatory Guide 1,75
NRC TMI-1 Restart Status Report
TMI-1 Restart Report

C. NONE

D. NONE

E. NOT KNOWN AT THIS TIME

Question 202

On page C8-14, the Staff states:

The similarities between the instruments used at Three Mile Island Units 1 and 2 lead us to conclude that the detection of reduced coolant level or the existence of core voiding in TMI-1 can be readily determined with the existing plant instrumentation, provided the operator is aware of the available information and interprets it correctly.

Is it the Staff's position that this meets IEEE 279, §4.8, as incorporated in 10 CFR 50.55(a)(h)? If so, specify what "the desired variables" are and explain how the existing instrumentation provides direct measures of those variables.

Response

It is our opinion that the existing plant instrumentation at TMI-1 provides sufficient information to the operator to indicate reduced reactor vessel coolant level, core voiding, and deteriorated core thermal conditions.

For those instruments which provide input to plant protection systems (such as reactor coolant pressure for ECCS actuation), these inputs meet the requirements of IEEE 279, §4.8. That is, "to the extent feasible and practical, protection system inputs shall be derived from signals that are direct measures of the desired variables."

For those instruments which do not provide input to plant protection systems (such as core exit thermocouples), a determination of their conformance with the requirements of IEEE 279, §4.8 has not been made.

The instruments which can be used by the reactor operator detect inadequate core cooling are identified in the licensee's response to Question 17, Supplement 1, Part 1 of the Restart Report. Although these instruments can provide sufficient information to detect adverse core conditions, the NRC Lessons Learned Task Force concluded that a more direct indication of inadequate core cooling could be provided to the operator. This consideration is addressed in Question 95, Supplement 1, Part 2 of the Restart Report. The licensee's final response to this question has not yet been received.

Question 203

In several instances including for example, primary coolant saturation meters and feedwater flow meters, the Staff is requiring and/or has found acceptable the use of only two indicators.

- a. Explain how the operator is expected to discern which is correct if the two give differing readings.
- b. Is it the Staff's position that such designs conform to the requirements contained in IEEE 279 that "the design shall minimize the development of conditions which would cause meters, annunciators, recorders, alarms, etc., to give anomalous indications confusing to the operator?"

Response

- A. a) For the subcooling meters, the two meters are required for single failure considerations. Should the two meters give conflicting readings to the point where there would be a concern and yet neither reading is sufficiently off to be obviously in error, the operator has the steam tables for diverse indication of subcooling margin.
- For the EFW flow meters, there are four meters in total, two per steam generator. Divergent readings can be accommodated by pump discharge pressure and most importantly by steam generator level. Additionally, Lessons Learned required an accuracy of only $\pm 10\%$ although TMI-1 has committed to $\pm 5\%$.

b) The equipment included in this interrogatory is not required to meet the requirements of IEEE 279. Redundant meters were required for single failure consideration. The operator, as discussed in part a above has diverse means for dealing with anomalous indications should they occur.

B. NUREG 0578

TMI-1 Restart Report

NRC TMI-1 Restart Status Report

C. NONE

D. NONE

E. NOT KNOWN AT THIS TIME

Question 205

With respect to the discussion of isolation of the reactor coolant pump seal injection lines on pages C8-22 and C8-23, please answer the following:

- a. Describe the evaluations the Staff has done to determine whether the health and safety of the public is better protected by not automatically isolating the seal injection lines or by isolating them.
- b. What is the Staff's judgment concerning the probability of a loss-of-reactor-coolant if the seal injection lines are isolated? Consider in your answer the probability of loss of off-site power, the new procedure for the operators to trip the reactor coolant pumps and the addition of a means to automatically trip the reactor coolant pumps.
- c. What information is available to the operator to indicate the need to manually isolate the seal injection lines?
- d. In approving a design which does not provide for automatic isolation of the seal injection lines, did the Staff consider the financial consequences of damage to the reactor coolant pumps?

Response

A. Section 2.1.4, "Containment Isolation Provisions for PWRs and BWRs" of NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short Term Recommendations" discusses the need to permit post-accident operation of certain non-safety equipment. The experience of TMI-2 showed that post-accident operation of the reactor coolant pumps may be desirable. Therefore, it becomes advantageous to maintain non-ECCS support services for reactor coolant pump operation. The reactor coolant pump seal injection system provides cooling for the reactor coolant pump seals. Isolation of this system could damage the pumps which would result in the loss of this system for post-accident service.

The staff concludes that maintaining the integrity of the reactor coolant pumps is important to orderly plant shutdown and beneficial to the health and safety of the public. We have, therefore, permitted post-accident use of this system.

- B. None.
- C. None.
- D. None.
- E. The expert(s) has not been identified.

Question 206

The staff states on page B-1:

In our evaluation, each item or sub-item covered by the Order has been reviewed for conformance with the requirements of the Order. Where existing standards remain valid, they are used as the basis for assessing such conformance. In some areas, existing standards have been judged inadequate since the TMI-2 accident; in others, formal acceptance standards do not exist. In these cases, new acceptance criteria have been or are being developed. Where these are available, they have been used. Where new criteria are not available, judgment of the Staff has formed the basis for assessing conformance with the Order, considering such factors as comparison with other plants, degree of improvement over previous implementation, and expert opinion. In each case, when new criteria or standards become available, we will evaluate the items against those criteria and report our findings in a supplement to this evaluation.

Please identify each "item or sub-item" as to which "existing standards have been judged inadequate" or "formal acceptance standards do not exist."

Response

Items for which standards for judging conformance with the Order did not exist or were inadequate are:

Management and Technical Capability

Operations Training

Facility Procedures

Criteria for Emergency Planning and Operational Quality Assurance, while not considered inadequate, are being upgraded to improve performance in these areas.

Question 207

Provide a list of the Staff members who performed the technical review and prepared the inputs to the Status Report.

Response

The Staff members who performed the technical review and prepared inputs to the Status Report were:

G. Mazetis
J. Voglewede
P. Norian
S. Newberry
R. Fitzpatrick
F. Allenspach
J. Gilray
B. Boger
J. Lee
J. Roe
J. Petersen
J. Nehemias
H. Silver
J. Wermiel
D. Pickett

Question 208

Provide a list of the Staff management personnel who reviewed and approved the inputs to the Status Report.

Response

The Staff management personnel who reviewed and approved inputs to the Status Report were:

R. Vollmer
J. Collins
R. Tedesco
T. Murphy
D. Skovholt
W. Haass
F. Pagano
B. Grimes
G. Mazetis
P. Collins

Question 209

With respect to both groups, of persons identified in the two previous answers, provide a statement of their educational background, training, and qualifications.

Response

The Professional Qualifications Statements for most of the individuals named in Interrogatories 207 and 208 are attached. This information is not provided for R. Vollmer, R. Tedesco, F. Pagano, and B. Grimes but will be sent to you in the near future.

Question 210

With respect to both groups, provide their time and attendance cards for the period since the TMI-2 accident until the present time. A computer printout of this data is acceptable if accompanied by an explanation of the program and activity codes.

Response

The NRC Staff objected to this question in its February 25, 1980 pleading entitled, "NRC Staff Objections to Discovery Requests".

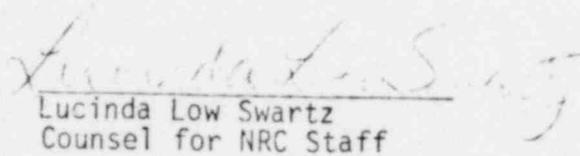
Question 211

Provide the Staff inputs to the Status Report.

Response

The NRC Staff objected to this question in its February 25, 1980 pleading entitled, "NRC Staff Objection to Discovery Requests".

Respectfully submitted,



Lucinda Low Swartz
Counsel for NRC Staff

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

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
METROPOLITAN EDISON COMPANY,) Docket No. 50-289
ET AL.)
(Three Mile Island, Unit 1))

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF RESPONSE TO UNION OF CONCERNED SCIENTISTS INTERROGATORIES (SECOND SET)", dated March 4, 1980 in the above-captioned proceeding, have been served on the following, by deposit in the United States mail, first class, or, as indicated by an asterisk through deposit in the Nuclear Regulatory Commission's internal mail system, this 4th day of March, 1980:

* Ivan W. Smith, Esq. Atomic Safety & Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, D. C. 20555	Mr. Steven C. Sholly 304 South Market Street Mechanicsburg, Pennsylvania 17055
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Dr. Linda W. Little 5000 Hermitage Drive Raleigh, North Carolina 27612	Mr. Marvin I. Lewis 6504 Bradford Terrace Philadelphia, Pennsylvania 19149
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Karin W. Carter, Esq. 505 Executive House P.O. Box 2357 Harrisburg, Pennsylvania 17120	Ms. Jane Lee R.D. 3; Box 3521 Etters, Pennsylvania 17319
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Counsel for NRC Staff

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
METROPOLITAN EDISON COMPANY, et al.) Docket No. 50-289
(Three Mile Island, Unit 1))

AFFIDAVIT OF ROBERT G. FITZPATRICK

I, Robert G. Fitzpatrick, being duly sworn, do depose and state:

1. I am a Senior member of the Power Systems Branch in the Division of Systems Safety, Office of Nuclear Reactor Regulation of the United States Nuclear Regulatory Commission. I am responsible for the electrical aspects of the safety review of assigned nuclear power plants, including Three Mile Island, Unit 1 Restart Program.
2. The answers to UCS Interrogatories 190 (a&b), 194, 201 (b&c), and 203 (a&b) were prepared by me. I certify that the answers given are true and accurate to the best of my knowledge.

Robert G. Fitzpatrick
Robert G. Fitzpatrick

Subscribed and sworn to
before me this 3 day of
February 1982.

Michael J. Goss
Notary Public

My Commission expires: July 1, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

METROPOLITAN EDISON COMPANY, et al.

(Three Mile Island, Unit 1)

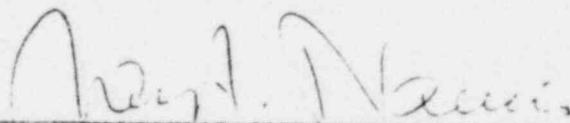
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Docket No. 50-289

AFFIDAVIT OF JAN A. NORRIS

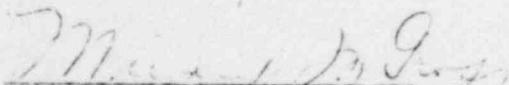
I, Jan A. Norris, being duly sworn, do depose and state:

1. I am employed by the Division of Site Safety and Environmental Analysis, Office of Nuclear Reactor Regulation of the United States Nuclear Regulatory Commission. I have been assigned to prepare an environmental appraisal for the proposed restart of TMI-1.
2. The answer to Union of Concerned Scientists Interrogatory #197(b), Second Set, was prepared by me. I certify that the answer given is true and accurate to the best of my knowledge.


Jan A. Norris

Subscribed and sworn to
before me this 3 day of

February 1982


Notary Public

My Commission expires: July 1, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

METROPOLITAN EDISON COMPANY, et al.

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Docket No. 50-289

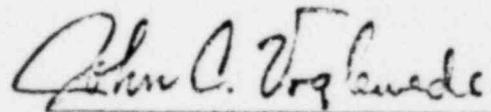
AFFIDAVIT OF JOHN C. VOGLEWEDE

I, John C. Voglewede, being duly sworn, do depose and state:

1. I am a Reactor Engineer with the Core Performance Branch, Division of Systems Safety, United States Nuclear Regulatory Commission. My responsibilities include the review of nuclear fuel design and performance data and the related analyses as used in support of power plant licensing submittals.

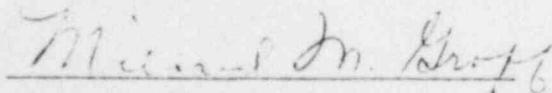
2. The answers to UCS Interrogatories 200, 201(a) and 202 were prepared by me.

I certify that the answers given are true and accurate to the best of my knowledge.



John C. Voglewede

Subscribed and sworn to before
me this 4 day of June 1980.
Mark



Notary Public

My Commission Expires: July 1, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

METROPOLITAN EDISON COMPANY, et al.

(Three Mile Island, Unit 1)

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Docket No. 50-269

AFFIDAVIT OF HARLEY SILVER

I, Harley Silver, being duly sworn, do depose and state:

1. I am a Senior Project Manager in the Division of Project Management, Office of Nuclear Reactor Regulation of the United States Nuclear Regulatory Commission. I am responsible for managing the safety review of assigned nuclear power plants, including Three Mile Island, Unit 1 Restart Program. My professional qualifications statement is attached.
2. The answers to UCS' Interrogatories 206, 207, and 208 were prepared by me. I certify that the answers given are true and accurate to the best of my knowledge.

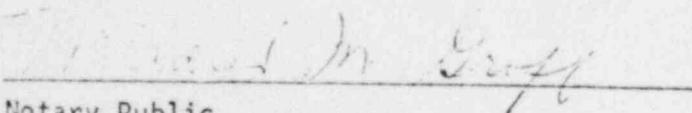


Harley Silver

Subscribed and sworn to

before me this 4 day of

March
1980



Notary Public

My Commission expires:

July 1, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

METROPOLITAN EDISON COMPANY, et al.

(Three Mile Island, Unit 1)

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Docket No. 50-289

AFFIDAVIT OF DOUGLAS V. PICKETT

I, Douglas V. Pickett, being duly sworn, do depose and state:

1. I am a Containment Systems Engineer in the Division of Systems Safety, Office of Nuclear Reactor Regulation of the United States Nuclear Regulatory Commission. I am responsible for reviewing the containment related systems of assigned nuclear power plants, including Three Mile Island, Unit 1 Restart Program. My professional qualifications statement is attached.
2. The answers to the Union of Concerned Scientists' Interrogatories 101, 102, 103, 104, 106, 107 and 205(a) were prepared by me. I certify that the answers given are true and accurate to the best of my knowledge.

Douglas V. Pickett
Douglas V. Pickett

Subscribed and sworn to
before me this 10th day of

July 1982.

Michael M. Goff
Notary Public

My Commission expires: July 1, 1982

GERALD R. MAZETIS

PROFESSIONAL QUALIFICATIONS

I am employed as a Section Leader in the Reactor Systems Branch, Division of Systems Safety, Office of Nuclear Reactor Regulation. My responsibilities include supervising the safety reviews of the reactor coolant system, emergency core cooling system, and other reactor systems which are assigned to me during the review of nuclear power reactor license applications.

I graduated from the U.S. Naval Academy in 1963 with a Bachelor of Science degree. In 1968 I received a Master's degree in Nuclear Engineering from Catholic University of America and have been pursuing additional part-time graduate studies.

From 1968 to 1972, I was an engineer with the General Electric Company where I was involved in the licensing of boiling water reactors. My duties included coordinating technical inputs to safety analysis reports and participating in various safety reviews of General Electric reactor systems.

In January 1972, I accepted employment with the Atomic Energy Commission (now the Nuclear Regulatory Commission) in the Reactor Systems Branch. I have been the assigned reviewer for various safety systems of Davis-Besse Unit 1, Clinton Station, and the B&W standard plant design. In addition,

I have reviewed the LOCA analyses for several pressurized water reactors.

Since being assigned as Section Leader in June 1976, my duties have included the supervision of the safety reviews of both Boiling Water Reactors and Pressurized Water Reactors.

John C. Voglewede

Core Performance Branch
Division of Systems Safety
U.S. Nuclear Regulatory Commission

My name is John C. Voglewede. I am employed as a Reactory Engineer with the Core Performance Branch, Division of Systems Safety, U.S. Nuclear Regulatory Commission, Washington, D.C. The responsibilities of this position include the review of nuclear fuel design and performance data and the related analyses as used in support of power plant licensing submittals.

My general technical background is that of a nuclear fuels engineer with experience in high-temperature materials, steady-state and transient fuel performance modeling, and scientific application of data processing equipment. I am familiar with the mechanical properties, testing, fabrication, characterization, and criticality control of nuclear ceramics. I am also familiar with the regulatory requirements associated with nuclear fuel performance.

I hold the degree of Bachelor of Science in Physics (1969) from St. Procopius College and the degree of Master of Science in Computer Science (1976) from Illinois Institute of Technology.

From 1965 to 1969, I was an undergraduate student at St. Procopius College (Illinois Benedictine College) at Lisle, Illinois.

From 1969 to 1977, I was employed as a Scientific Associate with the Ceramics/Fuel Properties Group in the Materials Science Division at Argonne National Laboratory. During this period, I worked with high-speed data acquisition and control systems in order to study the transient behavior of nuclear fuels in out-of-reactor simulation experiments. I developed computer models for the analysis of these experiments and was also involved with property specification and model development for the laboratory fuel performance codes. As principal investigator in a mechanical properties program, I studied high-temperature creep and densification behavior of oxide nuclear fuels. I was responsible for the nuclear criticality and operational control of a plutonium mechanical testing facility.

In February 1977, I began working for the Core Performance Branch, Division of Systems Safety, U.S. Nuclear Regulatory Commission, as a Reactory Engineer. The responsibilities of this position include the review of nuclear design and performance data, which are submitted as part of an applicant's Safety Analysis Report. The specific areas of review are the nuclear and fuel systems design as well as the thermal and hydraulic design of the reactor core (Chapter 4 of the Standard Format). My major responsibility has been the review of analytical methods for fuel thermal performance predictions, which are developed and described by each reactor vendor and subsequently referenced in nuclear power plant licensing submittals. These analytical methods are normally implemented in the form of computer codes.

In June of this year, I was reassigned to the Three Mile Island Unit 2 Lessons Learned Task Force as the representative of the Core Performance Branch. I served in this capacity until October 1979, at which time I was transferred to the Three Mile Island Unit 1 Restart Review Task Force.

I am an active member of the American Nuclear Society. A list of my professional publications is attached.

POOR ORIGINAL

JOHN C. VOGLEWEDE

PUBLICATIONS

1. R. O. Meyer and J. C. Voglewede, *Temperature Gradient Vacuum Furnace for Diffusion Studies to 2000°C*, Rev. Sci. Inst. 42(7), 993-995 (July 1971).
2. A. A. Solomon, J. L. Routbort, and J. C. Voglewede, *Fission-induced Creep of UO_2 and its Significance to Fuel-element Performance*, ANL-7857 (September 1971).
3. J. L. Routbort, N. A. Javed, and J. C. Voglewede, *Thermal Creep of Mixed-oxide Fuel Pellets*, Am. Ceram. Soc. Bull. 51, 389 (April 1972). ABSTRACT
4. J. L. Routbort, N. A. Javed, and J. C. Voglewede, *Compressive Creep of Mixed-oxide Fuel Pellets*, J. Nucl. Mater. 44(3), 247-259 (September 1972).
5. J. L. Routbort and J. C. Voglewede, *Creep of Mixed-oxide Fuel Pellets at High Stress*, Am. Ceram. Soc. Bull. 52(4), 352 (April 1973). ABSTRACT
6. J. L. Routbort and J. C. Voglewede, *Correlation of Oxide Fuel Creep with Microstructure and the Influence on Fuel-element Performance*, Am. Ceram. Soc. Bull. 52(4), 398 (April 1973). ABSTRACT
7. J. L. Routbort and J. C. Voglewede, *Final-stage Densification of Mixed-oxide Fuel*, Am. Ceram. Soc. Bull. 52(9), 721-722 (September 1973). ABSTRACT
8. J.T.A. Roberts, J. L. Routbort, J. C. Voglewede, and A. A. Solomon, *Development of a Mechanical Model of In-reactor Fuel Behavior: Status Report*, ANL-8028 (July 1973).
9. J. L. Routbort and J. C. Voglewede, *Creep of Mixed-oxide Fuel Pellets at High Stress*, J. Am. Ceram. Soc. 56(6), 330-333 (June 1973).
10. J.T.A. Roberts and J. C. Voglewede, *Application of Deformation Maps to the Study of In-reactor Behavior of Oxide Fuels*, J. Am. Ceram. Soc. 56(9), 472-475 (September 1973).
11. J. L. Routbort and J. C. Voglewede, *Final-stage Densification of Mixed-oxide Fuel*, Am. Ceram. Soc. Bull. 53(4), 363 (April 1974). ABSTRACT
12. J. C. Voglewede, *Thermal Densification of Mixed-oxide Fuel*, Am. Ceram. Soc. Bull. 53(8), 619 (August 1974). ABSTRACT
13. J. C. Voglewede, *Performance Analysis of Cache Memory*, M.S. Thesis, Illinois Institute of Technology (May 1976).
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POOR ORIGINAL

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16. C. R. Kennedy and J. C. Voglewede, *Relocation Phenomena in UO_2 Pellets Subjected to Simulated LWR Power Cycles*, Am. Ceram. Soc. Bull. 56(3), 342 (March 1977). ABSTRACT
17. J. C. Voglewede, *Application of Fuel Properties Data to Out-of-Reactor Simulation Studies*, Am. Ceram. Soc. Bull. 56(3), 342 (March 1977). ABSTRACT
18. B. J. Wrona, J. C. Voglewede, and T. M. Galvin, *Effects of Pellets Density and Axial Restraint on Failure Threshold*, Trans. Am. Nucl. Soc. 26, 376-377 (June 1977). ABSTRACT
19. R. O. Meyer, C. E. Beyer, and J. C. Voglewede, *Fission Gas Release from Fuel at High Burnup*, U.S. Nuclear Regulatory Commission Report NUREG-0418, (March 1978).
20. R. O. Meyer, C. E. Beyer, and J. C. Voglewede, *Fission Gas Release from Fuel at High Burnup*, Nuclear Safety 19(6), 699-708 (November-December 1978).
21. J. L. Routbort, J. C. Voglewede, and D. S. Wilkinson, *Final-Stage Densification of Mixed Oxide Fuels*, J. Nucl. Mater. 80(2), 348-355 (May 1979).

POOR ORIGINAL

Paul E. Norian

Professional Qualifications

I have been assigned to the Bulletins and Orders Task Force as a member of the Analysis Group since June 1979. I serve as Alternate Group Leader and coordinate the reviews of small break loss-of-coolant accidents (LOCA) and transient analyses submitted by the vendor owner's groups since the Three Mile Island accident. From 1975 until this assignment, I was Section Leader of the Systems Analysis Section, Analysis Branch, Division of Systems Safety. I was responsible for supervising the review of reactor vendor transient and LOCA analysis methods, the improvement of NRC analysis methods used in related accident analyses and the performance of staff audit calculations for transient and LOCAs.

I graduated from Lehigh University in June 1955 with a Bachelor of Science Degree in Engineering Physics. I also attended Drexel Institute of Technology, Catholic University of America, and the University of Maryland where I have taken various graduate courses in mathematics, physics, and electrical engineering.

In July 1955, I began work as a physicist with the duPont Company at the Savannah River Plant in Aiken, South Carolina. From that time until March 1962, I worked in the Works Technical Department on operational physics problems associated with the heavy water production reactors at Savannah River. This work included such assignments as the development of monitoring systems, performance of physics calculations required in reactor operation and the development of new fuel elements, the review of operating procedures, and the analysis of various operating problems. In March 1962, I was transferred to the duPont Company's Chestnut Run Laboratories in Wilmington, Delaware, and worked for its Film Department on the development of industrial applications for plastic films.

In December 1963, I accepted a position with the Division of Reactor Licensing of the U. S. Atomic Energy Commission, and was project leader in the construction permit review of Consolidated Edison's Indian Point No. 2 reactor and Wisconsin-Michigan's Point Beach No. 1 reactor. I was assigned as a nuclear engineer in the Systems Performance Branch of the Division of Reactor Standards in March 1967. My responsibilities included analyzing and evaluating the performance of engineered safety systems and performed computer calculations for the evaluation of containment response and LOCA. In March 1971, I participated in the Regulatory Task Force reappraisal of emergency core cooling systems for light water reactors. My main responsibility for the task force was the review of computer codes and input assumptions for LOCA analyses. In May 1973, I was assigned to the Core Performance Branch in the Directorate of Licensing. I served as Section Leader in the Thermal Hydraulics Sections and supervised the review of portions of reactor vendor model changes to conform with the new requirements for LOCA models specified in Appendix K to 10 CFR Part 50.

Professional Qualifications

Scott F. Newberry

Reactor Systems Branch
Division of Systems Safety
U.S. Nuclear Regulatory Commission

My name is Scott F. Newberry. I am employed as a Reactor Engineer, Task Force for TMI-2 Support, U.S. Nuclear Regulatory Commission, Washington, D. C. The responsibilities of this Task Force include core cooling, cleanup and recovery operations.

I attended the United States Naval Academy, Annapolis, Maryland, and received a B.S. degree in 1970. I am currently attending the Graduate School of Engineering at the Catholic University of America, Washington, D. C., as a part-time student.

From 1970 to 1971 I attended the Navy Nuclear Power Training Program which consisted of training at the Nuclear Power Training School, Bainbridge, Maryland, and the S3G submarine reactor prototype in West Milton, New York.

From 1972 until 1974 I worked as Engineering Officer of the Watch aboard the USS Daniel Boone SSBN 629 (BLUE), a nuclear fleet ballistic missile submarine. My primary assignment was to serve as the ship's Main Propulsion Assistant and Radiological Controls Officer during this period. I was responsible for the ship's reactor coolant system and steam system propulsion machinery and the control of all radioactive material on board.

In 1974 I qualified as Nuclear Engineering Officer in the Naval Reactors Program.

From 1974 to 1976 I served as Weapons Officer, USS Nathan Hale SSBN 623 (GOLD). During this period I was involved in the ship's precritical and power range testing program during the nuclear refueling overhaul as a Command Duty Officer.

EDUCATIONAL AND PROFESSIONAL QUALIFICATIONS
OF ROBERT G. FITZPATRICK

EDUCATION

B.S. Electrical Engineering, 1971; Northeastern University, Boston, Mass.

M.S. Electrical Engineering, 1972; Northeastern University, Boston, Mass.

Major: Electrical Power Systems Engineering

PROFESSIONAL QUALIFICATIONS

From 1974 to the present I have worked for the Nuclear Regulatory Commission involved in the technical review of electrical systems (onsite and offsite power, and instrumentation and control). Through 1976 I was a member of the Electrical Instrumentation and Control Systems Branch. This Branch was split in January 1977 into an I&C branch and a power branch. Since this split I have been a member of the Power Systems Branch. My present title is Senior Reactor Systems Engineer (Electrical). Following the Three Mile Island accident, I have been assigned to the Three Mile Island Site Support Group.

From 1972 - 1974 I worked for Yankee Atomic Electric Company in Westboro, Massachusetts. I was assigned to the Electrical and Control Engineering Group and my duties included work on the Yankee operating nuclear plants and the Seabrook Project. (Prior to this I spent 3 years with Yankee as a cooperative education student while attending Northeastern University.)

I am a member of the IEEE and also represent the NRC as a member of IEEE Nuclear Power Engineering Committee Subcommittee 4 "Auxiliary Power Systems". This Committee is charged with developing standards for onsite and offsite power systems.

Frederick R. Allenspach

- June 1952
- Graduate - Polytechnic Institute of Brooklyn
 - Degree in Bachelor of Mechanical Engineering
- July 1952
to August 1953
- New York Naval Shipyard
- August 1953
to August 1954
- Republic Aviation Corporation
- August 1954
to August 1956
- Military Service
- September 1956
to June 1968
- Employed by the Brookhaven National Laboratory, Reactor Division. Approximately two years as operating shift supervisor in charge of an operating shift on the Brookhaven Graphite Research Reactor (BGRR). Approximately three years as BGRR day shift supervisor responsible for various reactor support activities.
- Approximately six years as BGRR Assistant Operations Group Leader primarily responsible for the temperature monitoring and reactor fuel management programs. One year as BGRR Operations Group Leader responsible for all operational aspects of the reactor.
- Included during this period at Brookhaven National Laboratory were several short term supplemental assignments to Brookhaven National Laboratory review and audit committees assigned the responsibility to determine if other Brookhaven nuclear reactors were being operated in accordance with the applicable rules and regulations.
- June 1968
to June 1974
- Employed by the Atomic Energy Commission, Directorate of Licensing, Operational Safety Branch. My responsibilities include (as assigned); review and evaluation of applicants organizational structure, technical and administrative qualifications of applicants proposed reactor operating organization, including emergency plans and industrial security plans; development of guides and codification of

present and proposed practices with respect to administrative procedures for the operation of licensed reactors; the review of operating reports from licensed reactors for safety related items; and the preparation of reports relative to operating experiences at licensed reactors.

June 1974
to present

- Employed by the Atomic Energy Commission, Division of Project Management, Quality Assurance Branch. My responsibilities include review and evaluation of applicants organizational structure, technical and administrative qualifications of applicants proposed reactor operating organization, development of standards, codes and guides with respect to administrative procedures for the operation of licensed reactors; and the development of uniform acceptance criteria for subjects required to be addressed by license applicants relating to operational safety matters.

I have attended the MIT course on Light Water Reactor Safety, attended the POPO course in Industrial Defense and Disaster Planning for Privately Operated Facilities sponsored by the Dept. of Army at the Military Police School in Fort Gordon, Georgia, and a Babcock and Wilcox Simulator training course.

QUALIFICATIONS AND EXPERIENCE OF
JOHN WILLIAM GILRAY

Present Position Title: Nuclear Engineering in the Quality Assurance Branch,
Licensing

Responsibilities: Participates as a senior member of the Office of
Nuclear Reactor Regulation - Quality Assurance Branch
staff whose function is primarily one of evaluating,
from a safety standpoint, all reactor construction
and operating proposals with response to quality
assurance and/or technical specifications. Serves
as Senior Nuclear Engineering Specialist for group
evaluation of power reactor license applications.

6/63 - 6/72 Title: Quality Control Engineer for the AEC Space Nuclear
Propulsion Office.

Responsibilities: As the SNPO-C on-site Quality Control Engineer in
the prime contractor's plant, is responsible for
monitoring the contractor's quality control program
and providing technical direction relative to the
testing, inspection and adherence to aerospace-rated
quality control procedures for the development of the
nuclear rocket engine (NERVA). Direct: inspection
personnel of the Air Force Plant Representative's
office assigned to NERVA program relative to day-to-
day inspections and quality surveys.

8/62 - 6/63 Title: Quality Control Engineer for Bourn's Inc. (Electronic
Component Co.)

Responsibilities: Responsible for the Quality Control and Reliability
policies and activities in the manufacturing and
inspection of potentiometers and relays used in the
Aerospace industry. Evaluates the design and in-
spection processes for adequate quality and reliability
requirements.

1/59 - 8/62 Title: Quality Control Engineer at Alco Products, Inc.
(Fabricator of Nuclear Components)

Responsibilities: Responsible for establishing and assuring proper
implementation of Quality Control and Quality Assurance
requirements for nuclear components from the design
purchasing and manufacturing phases thru the shipment
of the components of the Navy Nuclear Shipyards.

Schooling: Graduate in BSME 1958

Courses: Optical Tooling Engineering
Radiography and Film Reading

Societies: Society of Non-Destructive Testing
American Society of Quality Control

PE: Registered Professional Quality Engineer

PROFESSIONAL QUALIFICATIONS LIST

BRUCE A. BOGER

Education

June 1971 Received BSNE - University of Virginia
June 1972 Received MENE - University of Virginia

Work Experience

June 1972 to June 1977 Virginia Electric and Power Company
Surry Nuclear Power Station

Assistant Engineer - Performed startup testing on Unit No. 2.

Associate Engineer - Reviewed facility design modifications.

Engineer - Assisted the Supervisor-Engineering Services; trained for and received a Senior Reactor Operator License.

Supervisor - Engineering Services - Directed the activities of the onsite engineering staff.

June 1977 to September 1977 Virginia Electric and Power Company
Richmond, Virginia

Supervisor - Nuclear Engineering Services - Directed the activities of the offsite engineering staff in support of Surry Power Station.

October 1977 to Present U. S. Nuclear Regulatory Commission
Bethesda, Maryland

Reactor Engineer in the Operator Licensing Branch - Administer licensing examinations to nuclear power plant and research reactor personnel.

Professional Affiliations

Registered Professional Engineer - State of Virginia

Member - American Nuclear Society

Jay Y. Lee
Professional Qualifications
TMI Technical Support
NRC Recovery Operations Office
Office of Nuclear Reactor Regulation

My name is Jay Y. Lee. I am a senior nuclear engineer in the TMI Technical Support of the NRC Recovery Operations Office at the Three Mile Island Nuclear Station. I was detailed to this position on April, 1979 as a member of the Task Force for TMI Support. In this position, I perform technical reviews, analyses, and evaluations of the recovery operations for TMI-2, the restart programs for TMI-1, and the TMI-2 Reactor Containment Building entrance program.

Prior to this assignment, I was a senior nuclear engineer in the Effluent Treatment Systems Branch in the Office of Nuclear Reactor Regulation, I was responsible for Technical reviews, analyses, and evaluations of reactor plant systems and equipment for fission product removal and treatment of radioactive wastes, as to the adequacy of provisions in meeting the applicable regulations. I am also responsible for the derivation of models used in the calculation of source terms to estimate the radiological impact on the environment, the adequacy of the instrumentation provided for maintaining radioactive discharges from nuclear power plants and for providing technical bases for guides and standards.

I received a Bachelor of Science degree in Chemical Engineering from the University of Minnesota in 1962 and a Master of Science degree in Nuclear Engineering from the Catholic University of America.

My professional experience totals approximately 17 years of design, construction, start-up, operation, and licensing of central station nuclear power plants.

From 1962 to 1966, I was employed as the plant chemical engineer by Northern States Power Company at Pathfinder Atomic Power Plant (decommissioned). In this position, I was responsible for operation and maintenance of radwaste treatment systems and for the implementation of the occupational health and effluent and environmental monitoring programs.

From 1966 to 1969, I was a nuclear systems engineer with Bechtel Corporation at San Francisco. In this position, I was responsible for technical review of the design and construction of reactor plant systems of central station nuclear power plants.

From 1969 to 1974, I was employed as the senior chemical engineer by Sacramento Municipal Utility District at Rancho Seco Nuclear Generating Station. In this position, I was responsible for design reviews, construction, and start-up operation of the radwaste treatment systems and the plant secondary system.

In 1974, I accepted the position of senior nuclear engineer with the U. S. Nuclear Regulatory Commission.

JACK W. ROE, JR.
PROFESSIONAL QUALIFICATIONS
OFFICE OF NUCLEAR REACTOR REGULATION
U.S. NUCLEAR REGULATORY COMMISSION

My name is Jack W. Roe, Jr. I am an Emergency Preparedness Analyst in the Office of Nuclear Reactor Regulation. My duties include the review and evaluation of nuclear power reactor emergency plans.

I hold a Bachelor of Science degree in Nuclear Science from the U.S. Naval Academy and a Master of Science degree in Nuclear Engineering from the University of Texas.

I joined the NRC in February of 1976 as a Coordinator for Technical Specifications. From February of 1976 to May 1977 I participated in the development and implementation of standard technical specifications for nuclear power plants, research and test reactors. In May 1977, I was transferred to the Reactor Safeguards Licensing Branch where my duties were to coordinate and perform reviews of site physical security plans. In February 1979, I was transferred to the Reactor Safeguards Development Branch where my duties included the evaluation and coordination of NRR's reactor safeguards programs and policies. In September 1979, I was transferred to the Emergency Preparedness Branch where my duties include the review and evaluation of nuclear power plant emergency plans.

Prior to joining the NRC, I spent 8 years in the U.S. Navy, resigning in February, 1976, as a Lieutenant. While in the U.S. Navy I served on two nuclear powered submarines. During my service in the U.S. Navy I received extensive training and experience in the operation and maintenance of naval nuclear power plants.

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.

John V. Stephens
PROFESSIONAL QUALIFICATIONS
Radiological Assessment Branch
Division of Site Safety and Environmental Analysis

I am a Senior Health Physicist in the Radiological Assessment Branch, Division of Site Safety and Environmental Analysis, Office of Nuclear Reactor Regulation.

My formal education consists of study in Physics at Rensselaer Polytechnic Institute where I received a B.S. in 1948 and at Columbia University where I received an A.M. in 1949. I received a Ph.D. in Environmental Health (Radiological) from the University of Michigan in 1960.

Before joining AEC/NRC, I served three years at Brookhaven National Laboratory as a health physicist, six years at the University of Michigan as health physicist and assistant director of a radiation effects laboratory, and three years as Director of Radiological Health Surveys for the National Sanitation Foundation. In the latter position, I designed, organized, and directed the environmental survey for the Enrico Fermi nuclear plant.

I joined the AEC in September 1960, as a health physicist in the Office of Health and Safety. My principal duties there related to development of radiation protection standards. With the two exceptions noted below, I have continued with AEC (and NRC) since that time. My principal responsibility was in the development of Standards until September 1974; during most of those years I served as a branch chief-through several name changes and reorganizations-most recently as Chief, Occupational Health Standards Branch, March 1972 to September 1974.

Since September 1974, I have served as Senior health physicist in the Radiological Assessment Branch. My principal function is the review of power reactor applications, both at the construction permit and operating license stage, to determine the adequacy of proposed occupational radiation protection programs and the related efforts proposed to assure that occupational radiation exposures will be maintained as low as is reasonably achievable.

From June 1963 to September 1965, I took a leave of absence from AEC and served as principal member of the Occupational Safety and Health Division of the International Labor Office in Geneva, Switzerland. My work was principally in the development of international standards.

In December 1971, I was transferred to the Criteria and Standards Division, EPA, serving as Chief, Criteria and Standards Branch, until my return to AEC in March 1972.

I have published about 40 technical articles in professional journals and other publications in the general areas of low-level counting, environmental monitoring, radiation effects on biological systems, and control of occupational radiation exposure.

I have been a Certified Health Physicist since 1960, and am a Charter member of the Health Physics Society and of the Baltimore-Washington Chapter.

Harley Silver
Senior Project Manager
Division of Project Management
Office of Nuclear Reactor Regulation
Nuclear Regulatory Commission
Professional Qualifications

I am a Senior Project Manager, responsible for managing the safety review for the Nuclear Regulatory Commission of assigned plants, including Three Mile Island Unit 2. I have served in this capacity since October 1973, and had been assigned Three Mile Island Unit 2 from May 1975 until mid-1979. Since the fall of 1979, I have been assigned as the Project Manager of the TMI-1 Restart Program.

I received the degree of Bachelor of Mechanical Engineering from New York University in 1949 and have subsequently taken graduate level courses in Engineering and Business Administration.

Between 1950 and 1952, I served in the United States Air Force as a First Lieutenant. From 1952 to 1955 I was employed as a Design Engineer by the M. W. Kellogg Company.

From 1955 through 1962, I was employed as a Project Engineer by architect-engineering firms, including Hydrocarbon Research, Inc. and Bechtel Associates.

Between 1963 and 1970, I was employed by the Westinghouse Electric Corp. in both the Astronuclear Laboratory and Weapons Systems Department as, successively, Project Engineer, Supervisor of various design groups, and Manager of Systems Integration.

In 1971, I joined Offshore Power Systems as Manager of Component Engineering, in which capacity I remained until joining the Nuclear Regulatory Commission.

I am a Registered Professional Engineer in the State of New York (Certificate Number 32892).

Jared S. Wermiel

Professional Qualifications

Auxiliary Systems Branch
Division of Systems Safety
Office of Nuclear Reactor Regulation

I am a Reactor Engineer in the Auxiliary Systems Branch in the Division of Systems Safety, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission. In this position I perform technical reviews, analyses, and evaluations of reactor plant features pursuant to the construction and operation of reactors.

I received a Bachelor of Science Degree in Chemical Engineering from Drexel University in 1972. Since 1972 I have taken courses on PWR and BWR System Operation, Reactor Safety, and Fire Protection.

My experience includes seven years with the Bechtel Power Corporation as a Systems Design Engineer engaged in the design of various nuclear power plant auxiliary and balance of plant systems. These have included cooling water systems, water treatment systems and fire protection systems.

I joined the Auxiliary Systems Branch of the Commission in March, 1978. Since joining the Commission I have performed safety evaluations on nuclear power plant auxiliary systems including main and auxiliary feedwater systems for the Virgil C. Summer Nuclear Station, Palo Verde Nuclear Generating Station Units 4 and 5, Allens Creek Nuclear Generating Station, North Anna Power Station Units 1 and 2, Byron/Braidwood Stations and Enrico Fermi Atomic Power Plant Unit 2. I have also reviewed various topical reports and provided comments on proposed ANSI Standards dealing with various auxiliary systems.

I have responsibility for the review of the following nuclear power plant auxiliary systems: new and spent fuel storage, spent fuel pool cooling, fuel handling, service water, component cooling water, condensate storage, ultimate heat sink, instrument air, chemical and volume control, main steam isolation valve leakage control, heating ventilating and air conditioning, fire protection, portions of the main steam system , main feedwater, and auxiliary feedwater.

I am a registered Professional Engineer in the State of Maryland.

I am an Associate Member of the American Institute of Chemical Engineers.

PROFESSIONAL QUALIFICATIONS

Douglas V. Pickett

I am a Containment Systems Engineer in the Containment Systems Branch of the Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission. In this position, which I have held since October 1975, I am responsible for the review and technical evaluation of containment related aspects for PWR applications for both construction permits and operating licenses. Among the plants for which I have or have had this responsibility are Davis Besse Nuclear Power Station, Unit 1; Arkansas Nuclear One, Unit 2; Erie Nuclear Plant, Units 1 and 2; Virgil C. Summer Nuclear Station; Shearon Harris Nuclear Power Plant, Units 1, 2, 3 and 4; Midland Plant, Units 1 and 2; RESAR 414; and Haven Nuclear Plant, Units 1 and 2.

From June 1973 to October 1975, I was employed as an engineer in the Power Division of Stone and Webster Engineering Corporation, Boston, Massachusetts. My responsibilities included subcompartment analysis to establish design criteria for both PWR and HTGR containments, preparing answers to AEC requests for additional information concerning containment spray systems and supm design and writing the appropriate SAR sections. In addition, I wrote technical specifications for field equipment purchases.

During the summer of 1972 I was employed as a technician for Nuclear Fuel Services in Rockville, Maryland. Here, I assisted in the development of computer codes which predicted the fuel depletion rates for both pressurized and boiling water reactors.

My academic training includes a Bachelor of Science in Nuclear Engineering from the University of Virginia in 1973 followed by a Master of Mechanical Engineering from the Catholic University of America in 1978.

In 1968, I joined the Atomic Energy Commission's regulatory staff (now NRC) as a licensing program manager (LPM) responsible for overall management of the staff's review of several nuclear power plant applications for construction permits. I was also involved in the development of guidance for the review of quality assurance program descriptions based on the QA criteria given in Appendix B. In 1972, I became the Technical Assistant for Boiling Water Reactors, reporting to the Assistant Director for BWRS. In 1974, I was assigned to the position of Special Assistant for Standardization with the responsibility for developing the programmatic requirements for the licensing of standardized nuclear power plants.

In June 1978, I was appointed to my present position of Chief, Quality Assurance Branch, DPM.

John T. Collins, Jr.
Professional Qualifications
NRC Recovery Operations Office
Office of Nuclear Reactor Regulation

My name is John T. Collins, Jr. I am the Deputy Director of the NRC Recovery Operations Office at the Three Mile Nuclear Station. I was appointed to this position on May 31, 1979, as part of the interim organization within the Office of Nuclear Reactor Regulation. In my present capacity as the senior NRC official onsite I am responsible for the supervision of all technical activities performed by the onsite professional staff of the Office of Nuclear Reactor Regulation and for the supervision of all surveillance and enforcement activities performed onsite by the professional staff of the Office of Inspection and Enforcement.

In addition to this assignment, I am also Chief of the Effluent Treatment Systems Branch in the Office of Nuclear Reactor Regulation. In this position I am responsible for planning, organizing, directing and supervising the activities of the branch in performing technical reviews, analyses and evaluations of reactor plant systems and equipment for fission product removal and treatment of radioactive wastes, as to the adequacy of provisions in meeting the applicable regulations. I am also responsible for the derivation of models used in the calculation of source terms to estimate the radiological impact on the environment, the adequacy of the instrumentation provided for maintaining radioactive discharges from nuclear power plants and for providing technical bases for guides and standards.

I attended Idaho State University and Pennsylvania State University majoring in general engineering. I also took special courses in ventilation engineering and industrial hygiene engineering at Michigan State University and North Carolina State University.

My professional experience totals approximately 25 years of which more than 21 have been concerned with occupational health and safety and treatment of radioactive wastes.

From 1954-1957, I was employed as a laboratory technician by Goodyear Atomic Corporation at the Portsmouth Gaseous Diffusion Plant. From 1957-1963, I held the position of Industrial Hygiene Engineer in the Nuclear Division of the Beryllium Corporation, Hazelton, Pennsylvania. In this position, I was responsible for the design, installation, operation and maintenance of filtration and waste treatment systems and for the implementation of the occupational health and effluent and environmental monitoring programs.

In 1963, I accepted the position of Industrial Hygiene Engineer with the AEC's Idaho Operations Office, Idaho Falls, Idaho. In this capacity, I was responsible for the appraisal of AEC contractor's programs at the National Reactor Testing Station in the areas of occupational health, pollution abatement, waste management and effluent monitoring. In April 1971, I transferred to the Division of Waste Management and Transportation, AEC Headquarters, Washington, DC, as a Materials and Process Engineer. In November 1971 I was detailed to the Regulatory Division as Lead Nuclear Engineer in the Effluent Treatment Systems Branch, Directorate of Licensing. In April 1975, I was appointed Chief of the Effluent Treatment Systems Branch.

POOR ORIGINAL

I am a member of the American Industrial Hygiene Association and the American Nuclear Society. I have served on various ANS Working Groups for the development of ANSI Standards related to systems for the processing of radioactive liquid and gaseous wastes. I am presently a member of ANS 40.1 Working Group to develop a standard for volume reduction systems for use in nuclear power plants. I am also a member of the ASME Radwaste Committee and serve on the Committee on Nuclear Air & Gas Treatment Systems. In addition, I am a member of NCRP Scientific Committee-41, Radiation Generated In Nuclear Fuel Cycle Facilities. Over the past five years I have served on various IAEA Technical Committees and presently serve on the Committee on Removal, Storage and Disposal of Gaseous Radionuclides from Airborne Effluents from Nuclear Facilities.

POOR ORIGINAL

Experience

Presently I am the Chief of the Radiological Assessment Branch of the Office of Nuclear Reactor Regulation, USNRC. Members of this branch under my supervision evaluate radiation protection programs for workers and assess the radiological impact of reactor facilities on the environment. As a member of the branch, I evaluated the adequacy of radiation protection programs in support of the licensing of commercial nuclear power plants. I participated in the development of programs, acceptance criteria, and solutions to managerial and technical activities associated with those evaluations. For three years at the Electric Boat division of General Dynamics Corporation, I managed a department performing electrical, electronic, mechanical, piping and structural inspections and non-destructive test operations to assure compliance with plan and procedure requirements for all shipboard and shop work associated with the construction, test and overhaul of nuclear powered submarines. I also managed all radiological safety activities at the Groton shipyard for over four years. For one year at Allis-Chalmers Manufacturing Company and four and one-half years as a civilian employee of the Army and Navy at Fort Belvoir, Virginia and Pearl Harbor Naval Shipyard, Hawaii, I managed audit, technical and operational radiological safety functions primarily associated with the construction, operation, test, overhaul and repair of nuclear power reactors. For two and one-half years I worked as an Assistant Health Physicist on the staff of Brookhaven National Laboratory performing various research, training and monitoring activities.

EDUCATION

M.S., Management, 1972, Rensselaer Polytechnic Institute, Troy, N.Y.
M.S., Radiological Physics, 1957, University of Rochester, Rochester, N.Y.
B.S., Science, 1956, Union College, Schenectady, N.Y.

SPECIAL TRAINING

BWR and PWR Fundamentals, USNRC, 1977, 1978
AIF Institute on OSHA Impact on Nuclear Industry, 1975
Modern Management and Supervision, USDA, 1974
Management by Objectives, General Dynamics, 1972
Statistical Quality Control Management Institute, Univ. of Conn., 1971
Nuclear Reactor Engineering and Operations, Ft. Belvoir, Va., 1964
Criticality Hazards Evaluation, ORNL, 1959
Radiological Defense Officer's Course, OCD, 1958

SOCIETIES AND SPECIAL APPOINTMENTS

Health Physics Society; American Nuclear Society; Certified by the American Board of Health Physics; Member of the ABHP Panel of Examiners; present or past member of American National Standards Institute ANS Working Group; ex-officio member of two AIF/NESP Task Forces concerned with occupational exposure; and served one year on the Wisconsin State Industrial Commission Radiation Protection Advisory Council.

POOR ORIGINAL

In December 1976, I started working for the Reactor Systems Branch, Division of Systems Safety, U.S. Nuclear Regulatory Commission, as a reactor engineer. I have reviewed construction and operating license safety analyses in the reactor systems areas for compliance with NRC regulations. The reactor systems areas include:

1. Structures, systems, and components to be protected from internally generated missiles inside containments.
2. Overpressure protection systems and the steam generator safety valves.
3. Reactor coolant pressure boundary leakage detection system.
4. Residual heat removal systems.
5. Reactivity control systems.
6. Emergency core cooling systems.
7. Configuration and process design parameters of the reactor coolant pumps, steam generators (PWR); reactor coolant piping.

In June 1979, I was detailed to the Task Force for TMI-2 Support. Responsibilities in this Task Force include:

1. Analysis of plant conditions and proposed changes in system design or operation mode.
2. Review of proposed operating plans and system modifications, and procedures to accomplish major operations such as long-term cooling.
3. Preparation of Technical Specifications appropriate to the plant conditions and activities.

DONALD J. SKOVHOLT

PROFESSIONAL QUALIFICATIONS

DIVISION OF PROJECT MANAGEMENT

I am the Assistant Director for Quality Assurance and Operations of the Division of Project Management. In this position, I am responsible for the management of the Regulatory programs for evaluation of specific subject areas in determining the issuance of authority to construct and to operate all proposed reactor facilities in the USA. The review topics assigned to this position include: 1) Quality Assurance, 2) Personnel Training, 3) Preoperational and Startup Testing Programs, 4) Conduct of Operations, and 5) Financial Qualifications. In addition, I manage the program for examining and licensing all operators of nuclear reactors. I report to the Director, Division of Project Management.

I attended Bucknell University in Pennsylvania and received a Bachelor of Science degree in Chemical Engineering in 1952. In June 1952, I commenced employment with the E. I. duPont de Nemours and Company at the Oak Ridge National Laboratory with principal duties involving chemical separation processing of irradiated fuel. In 1953, I transferred, with duPont, to the Savannah River Plant. My position was Shift Supervisor in the Reactor Division. The duties entailed determination of proper construction and quality assurance, preoperational testing, procedure preparation and initial operation of the production reactors at that site.

March 1980

WALTER P. HAASS

PROFESSIONAL QUALIFICATIONS
DIVISION OF PROJECT MANAGEMENT
OFFICE OF NUCLEAR REACTOR REGULATION
U.S. NUCLEAR REGULATORY COMMISSION

My name is Walter P. Haass. I am Chief, Quality Assurance Branch, U.S. Nuclear Regulatory Commission (NRC). My duties are to direct, supervise, and coordinate the review of nuclear power plant license applications and topical reports to determine compliance with the Commission's quality assurance criteria stated in Appendix B to 10 CFR Part 50 for plant design, construction and operation in order to promote protection of public health and safety.

I received a Bachelor of Science degree in Mechanical Engineering from Stevens Institute of Technology in 1952.

Upon graduation, I joined the Westinghouse Electric Corporation with an initial assignment on the Graduate Student Training Program. As part of this program, I spent one year at the Oak Ridge School of Reactor Technology. My next assignment was at the Atomic Power Division where I was engaged in the thermal-hydraulic aspects of the design of proposed nuclear power plants.

In 1959, I accepted a position at the Martin Marritta Corporation, Nuclear Division. My activities included project engineering work on the mechanical design aspects of the PM-1 and PM-3A portable nuclear power plants at Sundance, Wyoming and McMurdo Sound, respectively; and program management work for several radioisotopic SNAP programs including SNAP-11 and SNAP-13.

From mid-1954 to 1957, I was on active duty with the U. S. Navy. In 1957, I accepted a position with the Westinghouse Electric Corporation at the Westinghouse Testing Reactor in Waltz Mills, Pennsylvania. I served in several supervisory positions in the Operations and Engineering Departments at that facility. Also, during this period, I performed graduate study at the University of Pittsburgh and received a Master of Science degree in Nuclear Chemical Engineering in 1962.

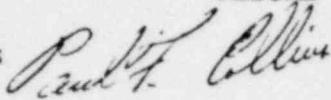
In April 1962, I joined the Atomic Energy Commission as Chief of the Operator Licensing Branch in the Division of Licensing and Regulation. In this position, I developed and administered the programs for the examination and licensing of facility operators and senior operators at reactor and reprocessing facilities. My duties also included assisting in facility licensing matters in aspects related to reactor operations.

In February 1967, I was appointed as the Assistant Director for Reactor Operations of the Division of Reactor Licensing. In this position, I was responsible for the nuclear safety evaluation of all operating licensed reactors in the United States, for approval of proposed changes to licenses and to facility design and operation, for the evaluation of operational safety activities of reactors and for the examination and licensing of reactor operators and senior operators.

In April 1974, I was appointed to my present position.

RESUME

Paul F. Collins



AEC-NRC Career

1969-Present

Chief, Operator Licensing Branch

During my tenure as Chief, the number of operator and senior operator applications have increased from about 600 in 1969 to over 1300 in 1976. The number of examiners has increased from 4 full time and 9 consultant examiners to 8 full time and 17 consultant examiners. New procedures and practices introduced during this period have resulted in sufficient efficiencies to enable this function to be conducted with a minimum increase in staffing and administrative supports.

In addition to administering operator and senior operator license examinations the accomplishments of this branch, since I have have been Chief, have included the following:

1. The development of minimum training requirements to become eligible to sit for license examinations.
2. The development of specifications and acceptance criteria for Nuclear Power Plant Simulators used in the above training programs. There are presently twelve simulators operating, under construction or planned.
3. Development of Appendix A, 10 CFR Part 55, Operator Regualification Programs.

4. Assistance in the preparation of WASH-1130, Utility Staffing for Nuclear Power Plants.
5. Publication of NUREG-0094, NRC Operator Licensing Guide.

In addition to supervising and providing the prime input to the above, I have been an active member of ANS. I served on the ANS 3.4 Committee that developed ANSI N546-1976, Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants.

Presently, I am a member of the Reactor Operations Division Executive Committee, *AMERICAN NUCLEAR SOCIETY*

In my present position I am the chief spokesman in NRC for all matters concerning operator licensing. As such, I have frequent contacts with middle and top management of utilities, reactor vendors, simulator manufacturers and training companies.

Experience Summary

- 1952-1953 U.S. Army, 2nd. Lt. Transportation Corps. Stationed at U.S. Port of Embarkation, N.Y.C. Assigned to the Management Division. Conducted efficiency studies and supervised machine accounting office.
- 1953-1958 Quality Control Supervisor - E.I. duPont de Nemours & Co. Savannah River Plant, Aiken, S. C. Responsible for the receipt and inspection of all components used in the five production reactors. Also responsible for the receipt storage and shipment for processing all heavy water used in the reactor

department. Finally, responsible for the shipment of spent fuel from the reactor department to reprocessing facilities. Supervised four foremen and 32 operators.

1958-1963 Reactor Shift Supervisor. Responsible for the routine operation of one of the production reactors. My time was evenly divided between shift operations and performing engineering support to operations.

1963-1965 Instructor-Reactor Department-Operator Training School
Taught courses involving all aspects of reactor operations and related basic principles of physics, chemistry and engineering.

1965-1969 Reactor Engineer-Operator Licensing Branch-AEC
Responsible for administering examinations to operators and senior operators at all types of power and non-power reactor facilities. Became PWR Group Leader in 1967.

1969-Present Chief, Operator Licensing Branch

Education BSME Rensselaer Polytechnic Institute 1952