UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
UNITED STATES DEPARTMENT OF ENERGY	)	Docket No. 50-537
PROJECT MANAGEMENT CORPORATION	)	
TENNESSEE VALLEY AUTHORITY	)	
	)	
(Clinch River Breeder Reactor Plant)	)	

NRC STAFF TESTIMONY ON BOARD QUESTION 9
REGARDING PROTECTIVE ACTION GUIDES

Q1. Please state your names and affiliations.

A1. My name is Lewis G. Hulman. I am Chief of the Accident Evaluation Branch in the Division of Systems Integration, Office of Nuclear Reactor Regulation at the U.S. Nuclear Regulatory Commission.

My name is Edward F. Branagan, Jr. I am employed by the U.S. Nuclear Regulatory Commission as a Health Physicist, Radiological Assessment Branch, Division of Systems Integration in the Office of Nuclear Reactor Regulation. My involvement with the CRBR safety review has been in the area of developing guidelines for evaluating postulated accidents for CRBR.

My name is Donald J. Perrotti. I am employed by the U.S. Nuclear Regulatory Commission ("NRC") as an Emergency Preparedness Analyst in the Emergency Preparedness Branch, Division of Emergency Preparedness and Engineering Response, Office of Inspection and

Enforcement. My involvement with the CRBR safety review has been in the area of emergency planning and preparedness.

Q2. Have you prepared statements of your professional qualifications?

A2. (Panel) Yes. Copies are attached to this testimony.

Q3. What subject matter does this testimony address?

A3. (Panel) This testimony addresses the concern raised by the Atomic Safety and Licensing Board ("Board") in Board Question 9, which states as follows:

> The Staff's attention is directed to the discussion of protective action guidelines (PAGs) at pages 29-30 of the Partial Decision of February 28, 1983. The Staff is requested to address the question of whether a PAG revision for the CRBR should be made, and to explain its answer.

The issue is further defined at pages 29-30 of the Partial Decision of February 28, 1983, as follows:

> The Board would like to take note of one other subject which was raised during the hearing of Contention 5(b). This is the subject of the EPA's Protective Action Guidelines and their relationship to possible accidents at the CRBR. The CRBR is, of course, to be loaded with fuel of significantly different isotopic composition than other licensed reactors. Accidental releases then will be made up of concentrations of radioisotopes which are unique to the CRBR type of reactor. The Staff's witnesses have testified that there is no guidance on bone surface dose for evacuation purposes and that this dose could be controlling though this has not been determined. These doses seem to come mainly from alpha particle emitters such as plutonium which originate in the reactor fuel. Applicants' witnesses acknowledged that there is no PAG for bone dose. Therefore, the Board will instruct the parties to this proceeding to address further this question during the upcoming Construction Permit hearings. Specifically, the Board will hear testimony on whether the PAGs currently in use for evacuation planning purposes should be revised for use at CRBR to take account of those possible radioactive releases unique

to CRBR, especially the actinide elements including plutonium (footnotes omitted).

Q4. What are the Protective Action Guides?

A4. (Branagan) The Protective Action Guides (PAGs), promulgated in draft form by the Environmental Protection Agency, are described in a document entitled "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," EPA-520/1-75-001, revised June 1980. EPA defines PAGs as "the numerical projected doses which act as trigger points to initiate protective action" (Id., p. 1.3). PAGs can be developed for three exposure pathways: (1) exposure to airborne releases; (2) exposure to radionuclides contained in food; and (3) exposure to radioactive materials deposited on the ground. EPA has developed PAGs for exposure of the general public to airborne releases for light water reactors (LWRs). PAGs for ground deposition are being drafted by EPA; PAGs for exposure of the public to radionuclides contained in food have been developed by the Food and Drug Administration.

With respect to exposure to airborne releases, EPA recommends that shelter should be sought and evacuation considered at projected whole body doses of 1 to 5 rems, or projected thyroid doses of 5 to 25 rems. ("Dose" is a generic term which can mean absorbed dose, dose equivalent, or committed dose equivalent.) Evacuation is considered mandatory, for purposes of planning, at projected whole body dose equivalents greater than or equal to 5 rems or projected

thyroid doses greater than or equal to 25 rems. However, EPA states that "under accident conditions, the values are guidance subject to unanticipated conditions and constraints such that considerable judgment may be required for their application" (EPA-520/1-75-001, p. 2.2).

Q5. What factors does the Staff believe to be appropriate for consideration in determining the adequacy of EPA's current draft PAGs for CRBR?

A5. (Branagan) Recent information indicates that the EPA plans to develop additional PAGs for other organs and exposure pathways, in which it will consider the following major factors:

1. No detectable acute effects should occur.
2. The risk of long-term effects to individuals should be minimal and in line with risks normally acceptable for an emergency.
3. Risk of implementation should be less than the risk associated with the dose saved.
4. The PAGs should be reasonably implementable considering measurements required and time frames available.
5. The costs associated with implementation should be within costs normally acceptable to society to avoid health risks of the same magnitude.
6. PAG values should be expressed as a range so that expert judgment can be used in the face of unpredictable conditions that may accompany an emergency.

(See "Status of Protective Action Guides," Joe E. Logsdon, U.S. Environmental Protection Agency, presented at the "Annual Meeting of the Conference of Radiation Control Program Directors, Inc.," Reno, Nevada, May 18, 1983.)

The NRC Staff believes that these factors are appropriate for consideration in determining the adequacy of EPA's current draft PAGs for CRBR.

Q6. Has the Staff determined whether the spectrum of radionuclides that might be released from CRBR in the event of an accident could be different than the spectrum of radionucludes released from an LWR in such an event?

A6. (Branagan, Hulman) Yes. The Staff has long considered the fact that a higher percentage of transuranics could be released from CRBR, as compared with an LWR. For example, the Site Suitability Report (NUREG-0786, March 1977) analyzed the impact from potential accidents at CRBR in which the source term included a percentage of transuranics. Source term assumptions are an integral part of assessments of site parameters and engineered safety feature performance for both the CRBR and LWRs, for determinations of site suitability; however, no transuranic assumption has been made for site suitability analyses for LWRs.

For severe accidents (those beyond design bases), the differences between the CRBR and LWRs have also long been recognized with respect to the spectrum of radionuclides that could be released. For example, Supplement 1 to the Final Environmental Statement (NUREG-0139, October 1982) indicated a maximum percentage of transuranics released to the environment of 0.35%, while similar

severe accidents for LWRs would generally be expected to result in smaller releases.

Of course, other fuel configurations than those presently proposed by the Applicants could alter the percentage of transuranics.

Q7. Has the Staff considered whether the quantity and spectrum of radionuclides which might be released in the event of an accident at CRBR warrant a reevaluation of the PAGs for CRBR?

A7. (Branagan, Hulman) Yes. Since the CRBR is to contain a higher percentage of transuranics as compared with an LWR, the Staff has considered it appropriate to consider whether accident doses to organs other than the whole body and the thyroid would be more limiting, possibly resulting in a revision of the PAGs for CRBR.

Q8. Please describe the methodology employed by the Staff in determining whether the PAGs currently in use for evacuation planning purposes should be revised for use at CRBR?

A8. (Branagan, Hulman) The Staff developed conservative criteria for determining whether additional PAGs would be necessary for CRBR; these criteria are referred to as "analog PAGs". The Staff then compared dose estimates for "design basis" accidents and "beyond design basis" accidents to the analogs. The objective of this comparison was to determine whether any dose estimates exceeded the

analogs and, if so, whether those estimates constituted bases for modifying the PAGs for CRBR.

Q9. Please describe the analog PAGs which the Staff developed for CRBR?

A9. (Branagan, Hulman) The Staff considered conservative analogs to the current PAGs to limit the risk of long-term effects and to make it very unlikely that detectable acute effects would occur. To limit the risk of long-term effects, the Staff created analogs by modifying the current PAG for mandatory evacuation from a projected dose of 5 rems to the whole body (applicable to LWRs), to indicate a need for evacuation upon exceeding a dose estimate for an organ that is equal to the whole body dose of 5 rem divided by the appropriate mortality risk weighting factor for the organ of interest. Values for the mortality risk weighting factors utilized by the Staff in developing the analog PAGs are contained in International Commission on Radiological Protection (ICRP) Publication 26, Recommendations of the International Commission on Radiological Protection (January 1977) ("ICRP-26").

In addition, in order to assure that essentially no detectable acute effects would occur, the committed dose equivalents to the bone surface and the lung from internal exposure were limited by the Staff to one-half of the non-stochastic annual limit specified in ICRP-26 for routine exposure for those organs of workers (i.e., one-half of 50 rems). (A "committed dose equivalent" is defined as the dose equivalent to organs or tissues that will be received from one year's intake of radioactive material by an individual during

the time period following the intake (e.g., a 50-year period).

The factor of one-half has been included in this analysis to allow for differences in the general population as compared with workers. It should be noted that this approach is not commonly utilized; however, it has been adopted as a measure of conservatism for this analysis. It should also be noted that although inhalation of radioactive materials would occur soon after an accident, the doses to the bone and lung from inhalation of transuranics would be spread out over a much longer time period; it is our judgment that the analog non-stochastic limit of 25 rems is a conservative value for this comparison for the reasons stated above, as well as because it is a once-in-a-lifetime value whereas the ICRP-26 value of 50 rems represents an annual limit. (The Staff recognizes that ICRP-26 also contains a limit for exposure of the lens of the eye that is lower than this value, however, for internal exposure to transuranics, the lens of the eye is not a target organ).

Table 1 summarizes the PAGs and the analog PAGs.

TABLE 1

Organ	Mortality Risk Factor	PAG or Analog PAG	Analog Non-Stochastic Limit
Whole Body	1.0	5 (PAG)	5
Thyroid	.03	25 (PAG)	25
Lung	.12	40 (Analog)	25
Bone Surface	.03	165 (Analog)	25

Q10. Please identify the accident analyses that were considered in assessing these analog PAGs.

A10. (Hulman) The Staff considered all of the accidents for which dose estimates have been made that have been documented in (1) the FES (NUREG-0139, February 1977), (2) the FES Supplement (October 1982), (3) the Site Suitability Report (NUREG-0786, Revision, June 1982), (4) the Safety Evaluation Report (SER) (NUREG-0968, March 1983), and (5) SER Supplement No. 2 (NUREG-0968, Supplement 2, May 1983). The Staff evaluated doses for 38 accidents which ranged in severity from relatively minor events that could occur during the plant lifetime, to events that are very unlikely to occur. Included are design basis accidents, a site suitability accident, and a CDA which was analyzed in SER Supplement 2 for the purpose of evaluating the effectiveness of the filtered vent system. No specific probabilities have been assigned to the accidents. Dose estimates for all of these accidents were within both the PAGs and the analog PAGs, with the exception of the site suitability accident and the HCDA. The dose estimates for those two accidents, calculated for the low population zone boundary (LPZ) and the exclusion area boundary (EAB), are set forth in Table 2.

TABLE 2

ACCIDENTS EXCEEDING THE PAGS OR ANALOG PAGS

Accident Type			Dose Estimate (Rems)
Site Suitability Accident (described in the Site Suitability Report (NUREG-0783, Revision, June 1982))	EAB, 0-2 hrs:	Whole Body	0.6
		Thyroid	12
		Lung	0.4
		Bone[1,2/]	10
	LPZ, 30 days:	Whole Body	0.3
		Thyroid	7
		Lung	0.4
		Bone[1,2/]	9
Site Suitability Accident (Use of Annulus Filtration System) (described in the SER (NUREG-0968, March 1983))	EAB, 0-2 hrs:	Whole Body	0.6
		Thyroid	12
		Bone Surface	31
		Red Marrow	24
		Bone (total)	10
		Lung	0.4
		Liver	1
	LPZ, 30 days:	Whole Body	0.3
		Thyroid	7
		Bone Surface	27
		Red Marrow	2
		Bone (total)	9
		Lung	0.4
		Liver	1
HCDA (Controlled CDA, analogous to CDA Class 1) (described in SER Supplement 2 (NUREG-0968, May 1983))	LPZ, 30 days:[3/]	Whole Body	8
		Thyroid	192
		Lung	8
		Liver	2
		Bone[2/]	8

1/ This estimate is based upon ICRP-2, which does not differentiate between bone surface and bone marrow. However, the analysis from NUREG-0968 for the same accident does provide bone surface and bone marrow doses.

2/ Bone surface dose estimates based upon ICRP-26 may be made indirectly from bone dose estimates (using ICRP-2 estimators) by simply multiplying these bone doses by a factor of 4.

3/ No EAB (0-2 hr) doses are estimated for the HCDA because no appreciable releases would be expected during that initial period.

A review of Table 2 indicates that an HCDA would exceed the EPA's PAGs (thyroid dose) but would not exceed the analog PAGs; for this accident, then, the EPA's PAGs are adequate for emergency planning purposes. Also, a review of Table 2 indicates that a site suitability accident would exceed the analog non-stochastic limit (bone surface dose), but would not exceed the EPA's PAGs; however, the Staff believes that the EPA's PAGs are adequate for emergency planning purposes for this accident, because for the site suitability accident, the Staff utilized two assumptions that result in conservative bone surface dose estimates. These are as follows: (1) conservative meteorology (about a 1-in-20 chance that the assumed dispersion conditions will be realized); and (2) continuous occupancy at the EAB (for the first two hours) and at the LPZ (for 30 days) without any type of protective action such as sheltering. Comparing the magnitude of the site suitability accident bone surface dose estimates (31 rem) with the analog non-stochastic limit (25 rem), and considering the conservative meteorology and occupancy assumptions utilized, the Staff concludes that even if such an HCDA were to occur, it is unlikely that the analog non-stochastic limit would be exceeded. Therefore, the Staff judges that the EPA's PAGs are adequate for emergency planning purposes, for such an HCDA.

Q11. Has the Staff also considered doses from CDAs other than the HCDA referred to above?

A11. (Hulman) Yes. As indicated in response to Question 10 above, in the Supplement to the FES (NUREG-0139, Supplement 1, October 1982)

the Staff considered doses from four classes of CDAs (including a Class 1 CDA). As part of judging environmental risks for the FES Supplement, the Staff estimated and reported the health and economic risks associated with the four CDA classes. An intermediate step in the computation of such risks was the assessment of radiological doses. Since the four classes of CDAs constitute events with consequences which could be worse than were reported in Table 2 above, the Staff has undertaken to calculate specific dose computations that are useful in assessing the adequacy of the PAGs as a function of distance from the plant.

For the four classes of CDAs, the Staff analyzed three permutations of the accident sequences presented in FES Supplement No. 1, Table J-2 (Vol. 2, p. J-8). The three permutations considered were as follows:

1. Analysis of the four CDA classes listed in Table J-2 of the FES Supplement:
2. Analysis of the four CDA classes listed in Table J-2 of the FES Supplement, except that the CDA Class 4 event was modified by decreasing the probability of occurrence from 10^{-7} per reactor year to 10^{-8} per reactor year, to test the sensitivity of recent conclusions relating to a lower energetics likelihood; and
3. Analysis of the four CDA classes listed in Table J-2 of the FES Supplement, except that CDA class 1, 2 and 4 events were modified by reducing by a factor of 3 the

release fractions for certain categories of radioactive material (Ba-Sr, Ru and La), also to test the sensitivity of recent conclusions relating to a lower energetics likelihood.

Q12. Please describe the nature of the analysis performed in this regard.

A12. (Hulman) For the CDA permutations described in response to Question 10 above, computations of accident consequences in the form of conditional probability of dose estimates as a function of distance were undertaken. By conditional probability we mean that, given a CDA, an assessment was made of the likelihood of doses occurring at different distances from the plant. We then assessed the analog PAGs at different distances. This assessment indicated (1) that close to the plant, such severe accidents were likely to produce doses in excess of both the EPA's PAGs and the analog PAGs; (2) that further away, the ratio of whole body doses divided by organ doses would be unlikely to exceed the mortality risk factors used to establish the analog PAGs; and (3) the likelihood of life threatening doses from such accidents at the CRBR would be equal to or less than the risks for a comparably rated LWR.

Q13. In your conditional probability analyses, were bone surface dose estimates made?

A13. (Hulman) Not directly. Early fatality risk estimates were made, however, for which bone marrow doses are the dominant cause of fatal doses. That is, the assumptions used in the CRAC code for

estimating early fatality risks are dominated by doses to the bone marrow. Further, since bone marrow doses can be influenced significantly by differences in transuranic dose contributions, if the early fatality risks for the CRBR were estimated to be higher than for an LWR of comparable rating, a judgement could be made that even though the likelihood of such accidents might be different, the early risks for CRBR could be higher than for an LWR; such was not the case. These calculations provide additional assurance that the EPA's PAGs are adequate for emergency planning purposes at CRBR.

Q14. Has the Staff reached a conclusion as to whether the bone surface dose for an HCDA is expected to be controlling for evacuation purposes at CRBR?

A14. (Hulman) Yes; as indicated in response to Questions 10 and 11 above, the Staff has concluded that bone surface doses are not expected to be controlling for evacuation purposes in the event of an HCDA at CRBR.

Q15. Will the Applicants be required to utilize the analog PAGs developed by the Staff?

A15. (Branagan, Hulman) No. The analog PAGs were developed on a conservative basis solely to determine whether the EPA's PAGs require modification for CRBR. Having determined that no changes to the EPA's PAGs are necessary, the analog PAGs are moot.

Q16. Has the EPA indicated that it is considering the possibility of issuing new protective action guidelines?

A16. (Branagan) Based upon telephone conversations I have had with EPA representatives, I understand that EPA is considering issuance of a revision to the PAGs, possibly this Fall.

Q17. What impact would EPA's issuance of revised PAGs have on CRBR?

A17. (Branagan, Hulman, Perrotti) While we have concluded that no revision of the PAGs for CRBR is necessary, if revised PAGs are published, the Staff will review the revised PAGs for applicability to CRBR at the operating license stage of review.

Q18. In the event that the EPA's PAGs are revised or design modifications are made by Applicants following the issuance of a construction permit (but before an operating license is issued), could the appropriateness of the then current PAGs for CRBR effectively be reexamined at the operating license (OL)stage?

A18. (Perrotti, Hulman) Yes. As set forth in NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," among the items to be required at the OL stage is a specification of projected doses in accordance with the EPA's recommended PAGs (NUREG-0654, Criterion J-7 at p. 60). If the EPA's PAGs are revised before issuance of an OL for CRBR, the Staff's OL review could effectively consider the appropriateness of the revised PAGs for CRBR. Similarly, in the event that design modifications are made

by the Applicants, the appropriateness of the PAGs for CRBR can effectively be reviewed at the OL stage.

LEWIS G. HULMAN
PROFESSIONAL QUALIFICATIONS

I am presently Chief of the Accident Evaluation Branch, Division of Systems Integration, in the Office of Nuclear Reactor Regulation. I was formerly the Chief of Systems Interaction Branch and Chief of the Hydrology-Meteorology Branch, both in the Office of Nuclear Reactor Regulation.

My formal education consists of study in Engineering at the University of Iowa where I received a BS in 1958, and an MS in Engineering Mechanics and Hydraulics in 1967. In addition, I have taken post-graduate courses at the University of Nebraska, MIT, Colorado State University, and the University of California, and numerous management, technical and computer utilization courses sponsored by the government.

My employment with NRC (formerly AEC) dates from February 1971 with both the Office of Nuclear Reactor Regulation and the former Office of Reactor Standards, and for consultation on siting of materials utilization facilities. Assignments were made on both safety and environmental matters. My responsibilities in the licensing review of nuclear facilities were in the areas of site analysis, flood vulnerability, water supply, surface and groundwater acceptability of effluents, severe meteorologic events and diffusion analyses. In addition, I participated in the development of the technical bases for safety guides and standards, and research identification and analysis in these areas of interest.

From March 1980 through mid-April 1981 I was employed in private industry as a Vice President with Tetra Tech, Inc. in Pasadena, California. During this period I was responsible for business development, and for managing several contracts involving various engineering studies in water, including several contracts for government and industry. Of note were studies of a nuclear power plant in Yugoslavia for the International Atomic Energy Agency, flood protection in the Dominican Republic, a refinery intake design in Indonesia, and hurricane risk assessments in Texas, North Carolina, Florida, and New Jersey.

From 1968 to 1971, I was a Hydraulic Engineer with the Corps of Engineers' Hydrologic Engineering Center in Davis, California. I worked in special hydrologic engineering projects with most Corps' offices, participated as an instructor in training courses, and conducted research. Special projects work included water supply systems analysis for the Panama Canal, planning hydrologic engineering studies for water resource development near Fairbanks, Alaska, regional water supply and flood control studies for the northeastern U.S., hydropower and water supply studies for a dam in the northeast, and flood control studies in Mississippi.

From 1963 to 1968, I was a Supervisory Hydraulic Engineer with the Philadelphia District, Corps of Engineers. As Assistant Chief of the Hydraulics Branch, I was responsible for design aspects of multi-purpose

dams, navigation projects, coastal engineering development and special studies on modeling of dams, inlets, water supply, and shoaling, salt water intrusion, and the effects of dredging. I acted as advisor to the District Engineer, Philadelphia, on drought problems in the 1960's and represented him in technical meetings of the Delaware River Basin Commission - chaired interagency committee which evaluated the effects of the drought.

From 1958 to 1963, I was a Hydraulic Engineer with the Omaha District of the Corps of Engineers. I was responsible for the hydraulic design of flood control channels, hydraulic design of structures for large dams and several flood control projects. I also received training in hydrologic engineering, structural engineering, sedimentation, river training studies and design, and water resource project formulation.

I have published in journals of the American Society of Civil Engineers, the American Water Works Association, the Journal of Marine Geodesy, the National Society of Professional Engineers, the American Geophysical Union, and in internal technical papers and seminar proceedings of the Corps of Engineers, the AEC, and the NRC.

I am a registered Professional Engineer in the States of Nebraska and California. I am a member of the American Society of Civil Engineers, the American Meteorological Society, and the American Geophysical Union.

EDWARD F. BRANAGAN, JR.
OFFICE OF NUCLEAR REACTOR REGULATION

PROFESSIONAL QUALIFICATIONS

From April 1979 to the present, I have been employed in the Radiological Assessment Branch in the Office of Nuclear Reactor Regulation of the U.S. Nuclear Regulatory Commission (NRC). As a Health Physicist with the Radiological Assessment Branch, I am responsible for evaluating the environmental radiological impacts resulting from the operation of nuclear power reactors. In particular, I am responsible for evaluating radioecological models and health effect models for use in reactor licensing.

In addition to my duties involving the evaluation of radiological impacts from nuclear reactors, my duties in the Radiological Assessment Branch have included the following: (1) I managed and was the principal author of a report entitled "Staff Review of 'Radioecological Assessment of the Wyhl Nuclear Power Plant'" (NUREG-0668); (2) I 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; (3) I served as the project manager on an NRC contract with Idaho National Engineering Laboratory involving estimated and measured concentrations of radionuclides in the environment; (4) I served as the project manager on an NRC contract with Lawrence Livermore Laboratory concerning a literature review of values for parameters in terrestrial radionuclide transport models; and (5) I served as the project manager on an NRC contract with Oak Ridge National Laboratory concerning a statistical analysis of dose estimates via food pathways.

From 1976 to April 1979, I was employed by the NRC's Office of Nuclear Materials Safety and Safeguards, where I was involved in project management and technical work. I served as the project manager for the NRC in connection with the NRC's estimation of radiation doses from radon-222 and radium-226 releases from uranium mills, in coordination with Oak Ridge National Laboratory which served as the NRC contractor. As part of my work on NRC's Generic Environmental Impact Statement on Uranium Milling (GEIS), I estimated health effects from uranium mill tailings. Upon publication of the GEIS, 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.

I received a B.A. in Physics from Catholic University in 1969, a 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 in Lawrence, Kansas. My doctoral research work was in the area of DNA base damage, and was supported by a U.S. Public Health Service traineeship; my doctoral dissertation was entitled "Nuclear Magnetic Resonance Spectroscopy of Gamma-Irradiated DNA Bases."

I am a member of the Health Physics Society.

DONALD J. PERROTTI
OFFICE OF INSPECTION AND ENFORCEMENT
STATEMENT OF PROFESSIONAL QUALIFICATIONS

I am employed as an Emergency Preparedness Analyst in the Emergency Preparedness Branch, Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement, U. S. Nuclear Regulatory Commission. I have responsibility for the review and evaluation of radiological emergency plans submitted by reactor applicants and licensees to assure that proposed plans meet the regulatory requirements and guidance of the Commission. I also function as a Team Leader and Team Member on Emergency Preparedness Appraisal Teams engaged in the onsite inspection of the implementation phase of licensee emergency programs. I observe nuclear power plant emergency drills and exercises involving State and local government response agencies and participate in interagency critiques.

From December 1976 to October 1980 I was employed at the NRC's Region II Office of Inspection and Enforcement in Atlanta, Georgia. I was the lead inspector for Region II emergency planning inspections at nuclear power reactors and fuel facilities. My responsibilities included planning, conducting and documenting inspections of licensees' emergency plans and procedures, emergency facilities and equipment, emergency training, tests and drills, and coordination with offsite support agencies. From April 1977 to August 1978, I assisted my immediate supervisor who served as Chairman of the Federal Regional Advisory Committee (RAC) in the review of State Radiological Emergency Plans. During October 1978 I assisted in the review of State Radiological Emergency Plans. During October 1978 I assisted in the review and approval of emergency plans for two nuclear fuel facilities. During the period of March - August, 1979, I participated in the Commission's coverage of environmental monitoring programs at Three Mile Island, where I served as Emergency Monitoring Team Leader; in that capacity, I was responsible for coordination with State and Federal agencies engaged in measurement and evaluation of environmental radioactivity levels in the vicinity of the TMI nuclear plant.

From 1973, to 1976, I was employed at Florida Power and Light Company's Turkey Point Nuclear Power Plant, as Health Physics instructor. My duties included radiation safety training of plant personnel (general employees and technicians), special project reports such as providing background material for management comment on proposed changes to the Code of Federal Regulations, and maintaining radiation exposure records for plant personnel.

From 1953 to 1973, I served in the United States Army. As a member of the U.S. Army Engineer Reactors Group during the period 1961-1973, I performed a variety of jobs with varying degrees of responsibility as rank and experience were gained. Among my more responsible jobs were shift health physics technician at the PM-3A Naval nuclear power plant in McMurdo, Antarctica (1965-1966), Senior Health Physics/Process Chemistry instructor at Ft. Belvoir, Virginia (1966-1972), and Project Officer for SM-1 Army nuclear power plant (1972-1973).

I received an Associate of Arts Degree from the New York State Regents, Albany, NY, in 1973. In addition, I attended Army service schools including Special Nuclear Weapons Disposal and the 52-week Nuclear Power Plant Operators course. I have completed the following U.S. Public Health Service courses:

Basic Radiological Health
Radionuclide Analysis by Gamma Spectroscopy
Environmental Radiation Surveillance
Analysis of Radionuclides in Water
Occupational Radiation Protection
Chemical Analysis for Water Quality
Statistical Methods - Quality Control in the Laboratory
Operational Aspects of Radiation Surveillance
Reactor Hazards Evaluation

I attended the "Radiological Emergency Response Operations" course at the Nevada Test Site and the "Planning for Nuclear Emergencies" course at Harvard University.

I am and have been a member of the Health Physics Society since 1974.