UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY	)	Docket Nos. 50-440 50-441
	)	
(Perry Nuclear Power Plant, Units 1 and 2)	)	

AFFIDAVIT OF
KEVIN W. HOLTZCLAW
ON CONTENTION B

County of Santa Clara)
) ss
State of California)

Kevin W. Holtzclaw, being duly sworn, deposes and says:

1. I am Principal Licensing Engineer and Program Manager of the GE Severe Accident Program, General Electric Company. My business address is 175 Curtner Avenue, San Jose, California 95125. Since March 1982, I have managed the BWR/6 standard plant Probabilistic Risk Assessment and Severe Accident submittals relating to accident evaluations beyond current design bases. A current statement of my professional and technical qualifications is attached hereto. I have personal knowledge of the matters stated herein and believe them to be true and correct. I make this affidavit in support of Applicants' Motion for Summary Disposition of Contention B.

2. Contention B asserts in part that low or no power operation at Perry during extreme conditions of inclement weather has not been included in emergency plans. Because of the extraordinarily remote probability of an accident occurring

at the Perry Nuclear Power Plant during extreme conditions of inclement weather, I do not believe that inclusion in emergency plans of a requirement for low or no power operation in such weather conditions is warranted. Neither the likelihood of a severe reactor accident nor the consequences of such an accident would be significantly reduced if the plant were required to go to low power or no power operation during periods of extreme conditions of inclement weather.

3. There is no significant risk reduction to the public afforded by either "low power" or "no power" operation during periods of inclement weather, for the reasons enumerated in the following paragraphs. For purposes of this affidavit, "low power" operation means power operation in the 15-20% thermal power range, which is the lowest thermal power level which allows electrical generation at Perry. "No power" operation means no electrical power generation at the cold shutdown condition. From the 100% operating power level it would typically require 1-2 hours to decrease the operating level to the low power range and about 3-4 additional hours to achieve cold shutdown status.

4. The likelihood of an accident sequence with the potential for core damage and fission product release is essentially the same, independent of full, low or no power level within the first day following extended full power operation. This is because the ability of water delivery systems to supply adequate core cooling is not affected by low

or no power operation. This conclusion is supported by numerous BWR evaluations (References 1-5) which illustrate the ability of the full complement of systems available to prevent core heatup and potential damage. Thus, at "no power" operation, the Control Rod Drive System (with 2 pumps to deliver water to the core), the Low Pressure Coolant Injection System (3 pumps for water delivery), the Low Pressure Core Spray System (1 pump), the Condensate Booster Pumps (3 pumps), the High Pressure Core Spray System (1 pump) would be available. In addition, at full or low power operation, an additional system is available, the Reactor Core Isolation Cooling System (1 pump). Also, in series with the Condensate Booster Pumps, the Feedwater System (2 pumps) becomes operational. Both of these additional sets of pumps are available since they are driven by steam from the reactor. Furthermore, the accident sequences with the potential for core damage require multiple equipment and/or operational failures which are not related to reactor core status (full, low or no power level).

5. There are a number of contributors to the progression of severe accident sequences. These include:

(a) random failures of standby equipment upon demand, such as valves and pumps;

(b) equipment unavailability due to normal maintenance and testing activities during operation; and

(c) equipment misalignment or miscalibration, for example, normally open valves left closed, miscalibrated sensors or instruments.

These examples, which have no dependence on reactor power

level, illustrate why the likelihood of accident progression is not reduced by a decrease in reactor power.

6. The consequences of an end of the spectrum, highly improbable event involving a significant offsite release of radiation are negligibly different if the plant is at full, low or no power operation during the postulated period of inclement weather. This is due to the rate of decay of fission products which remain radiologically active for a long period of time after shutdown. The fission product inventories are established by full-power operation. At low power, there is essentially no change in fission product inventory over time compared to full power operation because the reactor remains critical. The inventories of the important isotopes do not change appreciably (less than a factor of 2) within a period from 2-8 hours even after going to a "no power" condition (Reference 6). This slow rate of decay of the radiologically significant fission products (e.g., cesium, iodine, tellurium, strontium) is attributed to their relatively long half-lives, which range from 8 days (for iodine-131) to 28 years (for strontium-90). There are many other isotopes which also remain radioactive for a long period of time after shutdown. The attached graph representing the change in total core inventory for gamma emitting isotopes over time demonstrates the relative insensitivity of the fission product inventory to time after shutdown.

7. In summary, low or no power operation would not significantly change either the likelihood of an accident scenario leading to off-site doses or the resultant off-site doses themselves, and would therefore not significantly reduce the radiological risk to the health and safety of the public.

STATE OF CALIFORNIA)
COUNTY OF SANTA CLARA) ss:

Kevin W. Holtzclaw, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 4th day of February, 1985.

Kevin W. Holtzclaw

Kevin W. Holtzclaw

Subscribed and sworn before me this 4 day of FEBRUARY, 1985.

Karen S. Vogelhuber

NOTARY PUBLIC, STATE OF CALIFORNIA

OFFICIAL SEAL
KAREN S. VOGELHUBER
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires DEC 30, 1988

REFERENCES

1. Reactor Safety Study (RSS): An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants, WASH-1400 (NUREG-75/014, USNRC, October 1975.

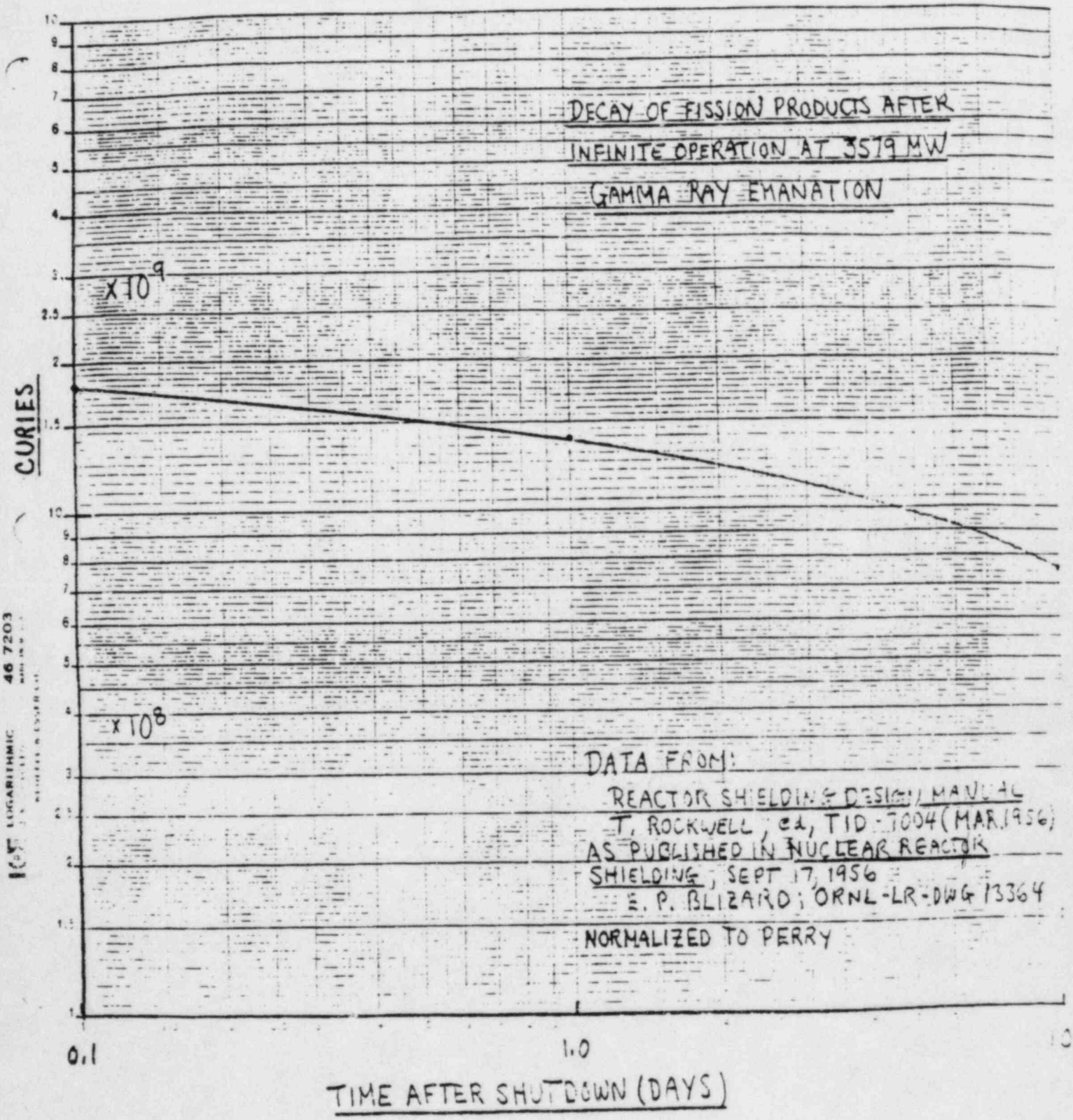
2. Probabilistic Risk Assessment Limerick Generating Station, Philadelphia Electric Company, Docket Nos. 50-352, 50-353, March 1981.

3. Final Report: Probabilistic Risk Assessment Shoreham Nuclear Power Station, Long Island Lighting Company, prepared by Science Applications, Inc. SAI-372-83-PA-01, June 24, 1983.

4. Reactor Safety Study Methodology Applications Program: Grand Gulf No. 1 BWR Power Plant, Prepared by Sandia National Laboratory and Battelle Columbus Laboratory, NUREG/CR-1659 (SAND-80-1897), October 1981.

5. GESSAR II 238 Nuclear Island, GE Document No. 22A7007, Rev. 2, Appendix 15D: Severe Accidents, Docket No. 50-447, May 1982.

6. Calculation of Fission Product Inventory and SPECTRA-RADCIO1 Program, General Electric Report NEDO-25176, October 1980.


DECAY OF FISSION PRODUCTS AFTER
INFINITE OPERATION AT 3579 MW
GAMMA RAY EMANATION
CURIES
x10^9
x10^8
DATA FROM:
REACTOR SHIELDING DESIGN MANUAL
T. ROCKWELL, ed, TID-7004 (MAR. 1956)
AS PUBLISHED IN NUCLEAR REACTOR
SHIELDING, SEPT 17, 1956
E. P. BLIZARD; ORNL-LR-DWG 13364
NORMALIZED TO PERRY
0.1
1.0
TIME AFTER SHUTDOWN (DAYS)

KEVIN W. HOLTZCLAW

EDUCATION

B.S. Mechanical Engineering (Nuclear Option), San Jose State University, 1968
M.S. Mechanical Engineering, University of California, 1973
General Electric Advanced Courses in Engineering, 1969-71

POSITIONS HELD

March 1982 - Present	Principal Licensing Engineer, Program Manager of the GE Severe Accident Program
February 1980 - March 1982	Senior Licensing Engineer BWR Systems Licensing (GE)
June 1974 - February 1980	Technical Leader, Fuel Applications and Thermal Design (GE)
January 1971 - June 1974	Engineer, Fuel Applications and Thermal Design (GE)
July 1969 - January 1971	Program Engineer, Fuel Performance and Applications (GE)
June 1968 - July 1969	Engineer - Nuclear Power Department (San Francisco Bay Naval Shipyard)

EXPERIENCE

As a senior licensing engineer from 1980 through 1982, Mr. Holtzclaw was responsible for defining and planning programs related to NRC degraded core rulemaking. He also provided the safety and licensing program management for the Limerick Probabilistic Risk Analysis. He also acted as the GE representative on AIF Industry Degraded Core Rulemaking Technical Advisory Group.

Since March 1982, Mr. Holtzclaw has served as the GE Program Manager of the GE Severe Accident Program. This has entailed managing the BWR/6 standard plant Probabilistic Risk Assessment and Severe Accident submittals relating to evaluations beyond current design basis. He continued to act as the GE representative on the Industry Degraded Core Rulemaking (IDCOR) Technical Advisory Group. He has been the responsible engineer in the GE Safety and Licensing organization for the GE Fission Product Retention Program and Severe Accident Source Terms and for programs relating to hydrogen generation and control.

Mr. Holtzclaw was an engineer and technical leader in General Electric's Fuel Design Department from 1969 to 1980 responsible

for performing Reload and Initial Core Fuel Thermal and Thermal-Hydraulic fuel design and safety analyses. He had principal responsibilities in development of thermal analysis methods, the design and licensing of 8x8 fuel and extended exposure fuel designs, and in defining acceptance criteria for fuel thermal-mechanical fuel integrity properties and capabilities.

He also worked one year as a mechanical design engineer in the nuclear power department of the San Francisco Bay Naval Shipyard.