GENERAL ELECTRIC

NUCLEAR ENERGY DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTNER AVE., SAN JOSE, CALIF. 95125
Phone (408) 297-3000, TWX NO. 910-338-0116

LEGAL OPERATION

February 19, 1975

Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: DOCKET Nos. 50-155, 50-10, and 50-133

Dear Sir:

Attached are the Affidavits of Patrick W. Marriott, Manager of Emergency Core Cooling Systems Engineering of the Boiling Water Reactor Systems Department of General Electric. His Affidavits are in support of applications filed, or to be filed shortly, requesting extension of the time for filing analyses required by Appendix K of 10 CFR 50 for Consumers Power's Big Rock Point plant (Docket No. 50-155), Commonwealth Edison's Dresden-1 plant (Docket No. 50-10), and Pacific Gas & Electric's Humboldt Bay plant (Docket No. 50-133).

This letter would have been mailed on February 18, 1975 but for an error noticed on that date after the affiant was unavailable.

Respectfully submitted,

Terry A. Trumbull

Terry A. Trumbull, Attorney
Legal Operation
M/C 304, Ext. 3797

es

Attachments

2021

AFFIDAVIT OF PATRICK W. MARRIOTT

I, Patrick W. Marriott, being duly sworn, depose and state as follows:

1. My name is Patrick W. Marriott. I am Manager of Emergency Core Cooling Systems Engineering of the Boiling Water Reactor Systems Department of the General Electric Company. My business address is 175 Curtner Avenue, San Jose, California 95125. One of my responsibilities is the analysis of the response of boiling water reactor (BWR) systems to postulated loss-of-coolant accidents (LOCA) in order to demonstrate that the emergency core cooling systems (ECCS) of those reactors conform to applicable USNRC acceptance criteria. This responsibility includes analysis of the Big Rock Point, Dresden-1 and Humboldt Bay BWRs (domestic BWR/1 reactors).

2. My Affidavit of February 18, 1975, to which this Affidavit is appended, is incorrect in one regard in Paragraph 4. The date in the second sentence for submittal of final results for Big Rock Point and Dresden-1 should be corrected to read April 4, 1975.

P. W. Marriott

Subscribed and sworn to before me this 19th day of February, 1975.

Notary Public

OFFICIAL SEAL
SUSAN H. DeSILLE
NOTARY PUBLIC-CALIFORNIA
SANTA CLARA COUNTY
My Commission Expires Apr. 13, 1977

175 Curtner Avenue, San Jose, CA. 95114

AFFIDAVIT OF PATRICK W. MARRIOTT

I, Patrick W. Marriott, being duly sworn, depose and state as follows:

1. My name is Patrick W. Marriott. I am Manager of Emergency Core Cooling Systems Engineering of the Boiling Water Reactor Systems Department of the General Electric Company. My business address is 175 Curtner Avenue, San Jose, California 95125. One of my responsibilities is the analysis of the response of boiling water reactor (BWR) systems to postulated loss-of-coolant accidents (LOCA) in order to demonstrate that the emergency core cooling systems (ECCS) of those reactors conform to applicable USNRC acceptance criteria. This responsibility includes analysis of the Big Rock Point, Dresden-1 and Humboldt Bay BWRs (domestic BWR/1 reactors).

2. During the first seven months of 1974, my staff developed analytical models for LOCA/ECCS performance to conform with 10 CFR 50 Appendix K requirements and analyzed all large domestic operating BWRs to show conformance to 10 CFR50.46 by the deadline of August 4, 1974. The analytical models which were developed are applicable to BWR/1 reactors, but their principal emphasis is on the large, high-power BWR/2 through 6 product lines.

3. In early June of 1974, it became evident that because of the large amount of plant-unique work required to adapt the evaluation models to the BWR/1 reactors and because of the nearly total commitment of my staff to analysis of the large, high-power reactors, it would not be possible to complete the BWR/1 analyses by August 4.

4. In June 1974, General Electric recommended that the operators of BWR/1 reactors request extensions to the August 4 required dates. The operators did so, and extensions were granted on August 5. The terms of the extension called for submittal of conservatively determined "preliminary" results by October 31, and for submittal of final results by March 31, 1975 (Humboldt Bay) and April 30, 1975 (Big Rock Point and Dresden-1). Since the extensions allowed eight additional months to complete the calculations, they were judged to be adequate and realistic by General Electric, assuming use of evaluation models then in effect, which were believed to be final except for small matters of detail.

5. In the last four months of 1974, five modifications were made to the General Electric evaluation models in response to USAEC requirements. These changes were:

   a. Use of 102% nominal bundle power in the core heat-up calculation;

   b. Use of a fission energy release rate of 200 MeV in computing decay power generation;

   c. Assumption of pool film boiling after nucleate boiling is lost in the flow "window" of jet-pump reactors (does not apply to BWR/1 reactors);

   d. Modification of the blowdown heat transfer correlation in nonjet-pump reactors;

e. Consideration of the effects of spray entrainment and countercurrent flow limiting in computing the reflood rate.

6. Of the above, a through d are straightforward in application. Point e, spray entrainment and countercurrent flow limiting (CCFL), constitutes a major modification to the BWR LOCA/ECCS analysis. This modification has affected the BWR/1 analytical schedule in three ways:

a. It was not possible to commence work on the BWR/1 analyses on schedule because my staff was almost entirely committed to this new requirement throughout November and December of 1974 in order to develop the new correlations, develop new analytical models to account for the effects, and conduct new refill-reflood calculations for all domestic jet-pump BWRs by December 28, 1974, as required by the USAEC;

b. The new analytical models require much more plant-unique input than before for the BWR/1 reactors (as well as for the more recent product lines);

c. It may be necessary to revise the generic refill/reflood analytical model to analyze these unique reactors. No modifications are now foreseen to be necessary, but the schedule would be affected if they should be required.

7. Completion of the BWR/1 analyses has been made more difficult by the December 28, 1974 USAEC safety orders requiring that complete new LOCA/ECCS calculations of all other operating reactors be performed using the final evaluation models by June 28, 1975. Prior to December 28, 1974, it was General Electric's understanding, based on discussions with the USAEC, that it would be possible to spread these calculations over the next two years, as new licensing actions took place on operating plants. Consequently, General Electric's planned analytical work load for the first half of 1975 was increased significantly by the December 28, 1974 orders.

8. The operators of domestic BWR/1 reactors have sent engineers to San Jose to conduct the analyses with the assistance of my staff. These representatives have provided valuable assistance in seeking out plant-unique information and in adapting the generic models for use on BWR/1 plants. However, because of the complications enumerated above, it is not possible to complete the analyses on the original schedule.

9. The BWR/1 analysis schedules, on which the June 1974 extension requests were based, were predicated on completing the calculations in approximately eight months, using the analytical models as they stood at that time. Some of the progress to date on the BWR/1 analyses still applies under the December models, and the schedule has been accelerated by assistance from the reactor owners. The schedule for this work, including significant milestones, is as follows:

Milestone	Date
DBA calculations complete (except Humboldt Bay)	March 21, 1975
Checkout of break spectrum analysis without CCFL complete	March 28, 1975
DBA quality assurance complete (except Humboldt Bay)	April 4, 1975
Specification and quality assurance of break spectrum methods (including CCFL) complete	April 25, 1975
Break spectrum calculation complete, including Humboldt Bay DBA	May 23, 1975
Break spectrum quality assurance complete, including Humboldt Bay DBA quality assurance	June 6, 1975
Licensing package including break spectrum complete	June 28, 1975

The Humboldt Bay analysis schedule differs from that of Big Rock Point and Dresden-1 because Humboldt Bay's natural circulation design requires a break spectrum analysis to define a "worst-case" LOCA (DBA). As stated in 6 (c) above, the principal risk in this schedule lies in the chance that modifications to the generic evaluation models will be required and the schedule contains no provision for such modification.

10. It is my belief that the above schedule can be met for the BWR/1 reactors. This schedule will be reviewed monthly commencing on March 15, 1975, and the BWR/1 operators will be promptly notified of improvements or potential problems.

P W Marriott

Patrick W. Marriott

Subscribed and sworn to before me this 18th day of February, 1975.

Gail G Kerr

Notary Public

OFFICIAL SEAL
GAIL G. KERR
NOTARY PUBLIC-CALIFORNIA
SANTA CLARA COUNTY
My Commission Expires July 24, 1977

175 Curtner Avenue, San Jose, CA 95114

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DESCRIPTION:

Ltr trans the following:

ENCLOSURES:

Affidavits of Patrick W. Marriott

ACKNOWLEDGED

DO NOT REMOVE

PLANT NAME: Dresden 1
Humboldt Bay / Big Rock Pt.

FOR ACTION/INFORMATION LDM 2/24/75

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