



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

May 5, 1992

Docket No. 50-271

Mr. L. A. Tremblay  
Senior Licensing Engineer  
Vermont Yankee Nuclear Power Corporation  
580 Main Street  
Bolton, Massachusetts 01740-1398

Dear Mr. Tremblay

SUBJECT: SAFETY EVALUATION FOR VERMONT YANKEE NUCLEAR POWER STATION  
RELAP5YA LOCA ANALYSIS METHODOLOGY (TAC NO. M74595)

The enclosed safety evaluation report prepared by the staff accepts for referencing the Topical Report YAEC-1547 as modified and supplemented during this review.

RELAP5YA, is based on RELAP5/MOD1 with modifications made by the Yankee Atomic Electric Company (YAEC) for use in Loss of Coolant Accident (LOCA) analyses for the Vermont Yankee Nuclear Power Station (VYNPS). RELAP5YA was first submitted on January 14, 1983 for staff review, as an evaluation model conforming to the criteria of Appendix K to 10 CFR 50. However, during the course of that review, the staff concluded that requirement II.5 of Appendix K was not satisfied. RELAP5YA was found acceptable for best estimate LOCA calculations over the entire break spectrum for the VYNPS.

The present review addresses the limitations discovered in the first review, which are related to compliance of the LOCA licensing analysis to conditions I.D.5 and I.D.6 of Appendix K. During this review the staff agreed that it was not necessary for YAEC to use heat transfer models conforming to Appendix K and that alternate heat transfer models would be acceptable provided that they were justified by comparison to appropriate experimental data. Thus, YAEC presented the best-estimate, post-critical heat flux (CHF) heat transfer algorithm in RELAP5/MOD1 with their own modifications and provided comparisons and qualification analysis to TLTA, FLECHT and THTF tests to support their acceptability. Based upon this review, the staff finds that the calculated wall temperatures are higher than the experimental data and correspondingly the computed heat transfer coefficients to be generally less than those measured during the tests. Therefore, we conclude the RELAP5YA provides sufficient assurance of conservatism as a licensing code for performing large BWR LOCA analyses.

NRC FILE CENTER COPY

9205190295 920505  
PDR ADOCK 05000271  
P PDR

DF01  
111

Mr. L. A. Tremblay

- 2 -

May 5, 1992

During this review there have been several supplemental submittals referring to corrections of previous information, or providing new information in response to staff requests. All these submittals are considered part of the original reports YAEC-1547 and YAEC-1300P. The staff recommends that the licensee incorporate all this information in a revised version of the report for ease and accessibility.

The staff's evaluation (Enclosure) has referenced the supplemental submittals noted above, and includes the contribution of ITS, our contractor for the RELAP5YA review. This completes the review for TAC No. M74595.

Sincerely,

original signed by:

Patrick M. Sears, Project Manager  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosure:  
Safety Evaluation for Vermont Yankee  
Nuclear Power Station RELAP5YA LOCA  
Analysis Methodology

cc w/enclosure:  
See next page

DISTRIBUTION: Docket File 50-271, NRC & Local PDRs, SVarga, JCalvo, ACRS(10), PSears, MRushbrook, JLinville, RI, RLabel, VNerses, OGC, LLois

OFFICE	PDI-3/LA	PDI-3/PM	PDI-3(A)DIR		
NAME	MRushbrook	PSears:mw	VNerses		
DATE	5/13/92	5/12/92	5/14/92		

OFFICIAL RECORD COPY  
FILENAME: A:\VYM74595.SE

Mr. L. A. Tremblay

- 2 -

May 5, 1992

During this review there have been several supplemental submittals referring to corrections of previous information, or providing new information in response to staff requests. All these submittals are considered part of the original reports YAEC-1547 and YAEC-1300P. The staff recommends that the licensee incorporate all this information in a revised version of the report for ease and accessibility.

The staff's evaluation (Enclosure) has referenced the supplemental submittals noted above, and includes the contribution of ITS, our contractor for the RELAP5YA review. This completes the review for TAC No. M74595.

Sincerely,

original signed by:

Patrick M. Sears, Project Manager  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosure:  
Safety Evaluation for Vermont Yankee  
Nuclear Power Station RELAP5YA LOCA  
Analysis Methodology

cc w/enclosure:  
See next page

DISTRIBUTION: Docket File 50-271, NRC & Local PDRs, SVarga, JCalvo, ACRS(10), PSears, MRushbrook, JLinville, RI, RLobel, VNerses, OGC, LLois

OFFICE	PDI-3/LA	PDI-3/PM	PDI-3(A)DIR		
NAME	MRushbrook	PSears:mw	VNerses		
DATE	5/13/92	5/10/92	5/14/92		

OFFICIAL RECORD COPY  
FILENAME: A:\VYM74595.SE

670015

Mr. L. A. Tremblay, Senior Licensing  
Engineer

Vermont Yankee

cc:

Mr. J. Gary Weigand  
President & Chief Executive Officer  
Vermont Yankee Nuclear Power Corp.  
R.D. 5, Box 169  
Ferry Road  
Brattleboro, Vermont 05301

G. Della Bisbee, Esq.  
Office of the Attorney General  
Environmental Protection Bureau  
State House Annex  
25 Capitol Street  
Concord, New Hampshire 03301-6937

Mr. John DeVincentis, Vice President  
Yankee Atomic Electric Company  
580 Main Street  
Bolton, Massachusetts 01740-1398

Mr. James Pelletier  
Vice President - Engineering  
Vermont Yankee Nuclear Power Corp.  
P. O. Box 169, Ferry Road  
Brattleboro, Vermont 05301

Regional Administrator, Region I  
U. S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, Pennsylvania 19406

Resident Inspector  
Vermont Yankee Nuclear Power Station  
U.S. Nuclear Regulatory Commission  
P. O. Box 176  
Vernon, Vermont 05354

R. K. Gad, III  
Ropes & Gray  
One International Place  
Boston, Massachusetts 02110-2624

Chief, Safety Unit  
Office of the Attorney General  
One Ashburton Place, 19th Floor  
Boston, Massachusetts 02108

Mr. W. P. Murphy, Senior Vice President,  
Operations  
Vermont Yankee Nuclear Power Corporation  
R.D. 5, Box 169  
Ferry Road  
Brattleboro, Vermont 05301

Mr. David Rodham, Director  
Massachusetts Civil Defense Agency  
400 Worcester Road  
P.O. Box 1496  
Framingham, Massachusetts 01701-0317  
ATTN: James Muckerheide

Mr. Richard P. Cedano, Commissioner  
Vermont Department of Public Service  
120 State Street, 3rd Floor  
Montpelier, Vermont 05602

Public Service Board  
State of Vermont  
120 State Street  
Montpelier, Vermont 05602

Mr. Raymond N. McCandless  
Vermont Division of Occupational  
and Radiological Health  
Administration Building  
Montpelier, Vermont 05602

Chairman, Board of Selectmen  
Town of Vernon  
Post Office Box 116  
Vernon, Vermont 05354-0116