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

March 10, 1980

Docket No. 50-271

Mr. Robert L. Smith  
Licensing Engineer  
Vermont Yankee Nuclear Power  
Corporation  
25 Research Drive  
Westboro, Massachusetts 01581

Dear Mr. Smith:

During the last several years, data have begun to indicate that the fission gas release rate from LWR fuel pellets is increased (enhanced) with burnup. Many of the current fuel performance analyses do not consider the impact of burnup release on safety. By letters dated November 23, 1976, the NRC staff requested all LWR licensees to assess the higher fission gas release for fuel burnups above 20,000 Megawatt-day per metric ton (MWD/T).

Also, by NRC staff letter dated January 18, 1978, all U. S. LWR fuel suppliers were requested to revise their fuel performance analyses to include the enhancement of fission gas release at higher burnups.

All responses to the November 23, 1976 letters have been reviewed. We have concluded that no immediate licensing action is required for operating reactors. This conclusion is valid for typical reported LWR fuel bundle and batch burnups. Any extension of these burnups or other factors which significantly affect fission gas release, LOCA PCT or fuel rod internal pressure is outside the scope of the conclusion.

The effect of enhanced release on BWR ECCS performance has been discussed with General Electric (GE). GE has pointed out that because of operational restrictions and physical limitations, the LOCA analysis is not limiting in high burnup fuel (25,000 MWD/T). High burnup fuel generally cannot achieve linear power densities near the LOCA limit early in cycle. The limiting fuel bundle is usually in its second cycle of reactor operations where burnup levels are below  $\approx 20,000$  MWD/T. Late in a BWR fuel cycle, there is less axial power peaking reducing the feasibility for any given axial location to exceed LOCA linear power density limits, and the fuel bundle power is generally limited by MCPR considerations. Thus, it is unlikely that a high burnup bundle can exceed the ECCS performance criteria in case of a LOCA. The argument is appropriate for Exxon fuel bundle design also based on the review of Exxon analyses for operating BWRs. Therefore, no immediate licensing action is necessary on operating BWRs.

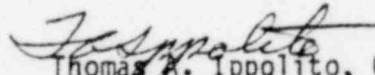
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Mr. Robert L. Smith

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Inasmuch as you and/or the staff will be evaluating all future reloads against fuel vendors' revised fuel performance codes which provide for increase in fission gas release at higher burnups, we consider this a satisfactory resolution of this concern.

Sincerely,

  
Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

cc: See next page

Mr. Robert L. Smith

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cc:

Ms. J. M. Abbey  
Vermont Yankee Nuclear Power  
Corporation  
77 Grove Street  
Rutland, Vermont 05701

Mr. Donald E. Vandenburg,  
Vice President  
Vermont Yankee Nuclear Power  
Corporation  
Turnpike Road, Route 9  
Westboro, Massachusetts 01581

John A. Ritsher, Esquire  
Ropes & Gray  
225 Franklin Street  
Boston, Massachusetts 02110

Laurie Burt  
Assistant Attorney, General  
Environmental Protection Division  
Attorney General's Office  
One Ashburton Place, 19th Floor  
Boston Massachusetts 02108

Ronald J. Wilson  
810 18th Street, N. W.  
Suite 802  
Washington, D. C. 20006

Honorable M. Jerome Diamond  
Attorney General  
State of Vermont  
109 State Street  
Pavilion Office Building  
Montpelier, Vermont 05602

Mr. J. E. Griffin, President  
Vermont Yankee Nuclear Power  
Corporation  
77 Grove Street  
Rutland, Vermont 05701

John R. Stanton, Director  
Radiation Control Agency  
Hazen Drive  
Concord, New Hampshire 03301

John W. Stevens  
Conservation Society of  
Southern Vermont  
P. O. Box 256  
Townshend, Vermont 05353

Dr. Mars Longley, Director  
Occupational & Radiological Health  
10 Baldwin Street  
Montpelier, Vermont 05602

New England Coalition on Nuclear  
Pollution  
Hill and Dale Farm  
West Hill - Faraway Road  
Putney, Vermont 05346

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

W. F. Conway, Plant Superintendent  
Vermont Yankee Nuclear Power  
Corporation  
P. O. Box 157  
Vernon, Vermont 05354

Mr. Charles Sheketoff  
Assistant Director  
Vermont Public Interest  
Research Group, Inc.  
26 State Street  
Montpelier, Vermont 05602

Brooks Memorial Library  
224 Main Street  
Brattleboro, Vermont 05301