

Appendix 2

Core Operating Limits Report Changes for Stability

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ABSTRACT

This report presents the cycle-specific operating limits for the operation of Cycle 17 of the Vermont Yankee Nuclear Power Station. The limits are the maximum average planar linear heat generation rate, maximum linear heat generation rate, minimum critical power ratio and stability power flow exclusion region.

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1.0 INTRODUCTION

This report provides the cycle-specific limits for operation of the Vermont Yankee Nuclear Power Station in Cycle 17. It includes the limits for the maximum average planar linear heat generation rate, maximum linear heat generation rate, minimum critical power ratio, and thermal hydraulic stability. If any of these limits are exceeded, action will be taken as defined in the Technical Specifications.

This report has been prepared in accordance with the requirements of Technical Specification 6.7.A.4. The core operating limits have been developed using the NRC-approved methodologies listed in References 1 through 29, 33 and 34, and in Technical Specification 6.7.A.4. The bases for these limits are in Reference 12, 17, and 30 through 34.

will verify that these lattice MAPLHGR limits are not violated. Tables 2.1-1 through 2.1-4 provide a limiting composite of MAPLHGR values for each fuel type, which envelope the lattice MAPLHGR values employed by the process computer. When hand calculations are required, these MAPLHGR values are used for all lattices in the bundle.

2.2 Minimum Critical Power Ratio Limits

During steady-state power operation, the Minimum Critical Power Ratio (MCPR) shall be equal to, or greater than, the limits shown in Table 2.2-1. The MCPR limits are also valid during coastdown beyond 10760 MWd/St.

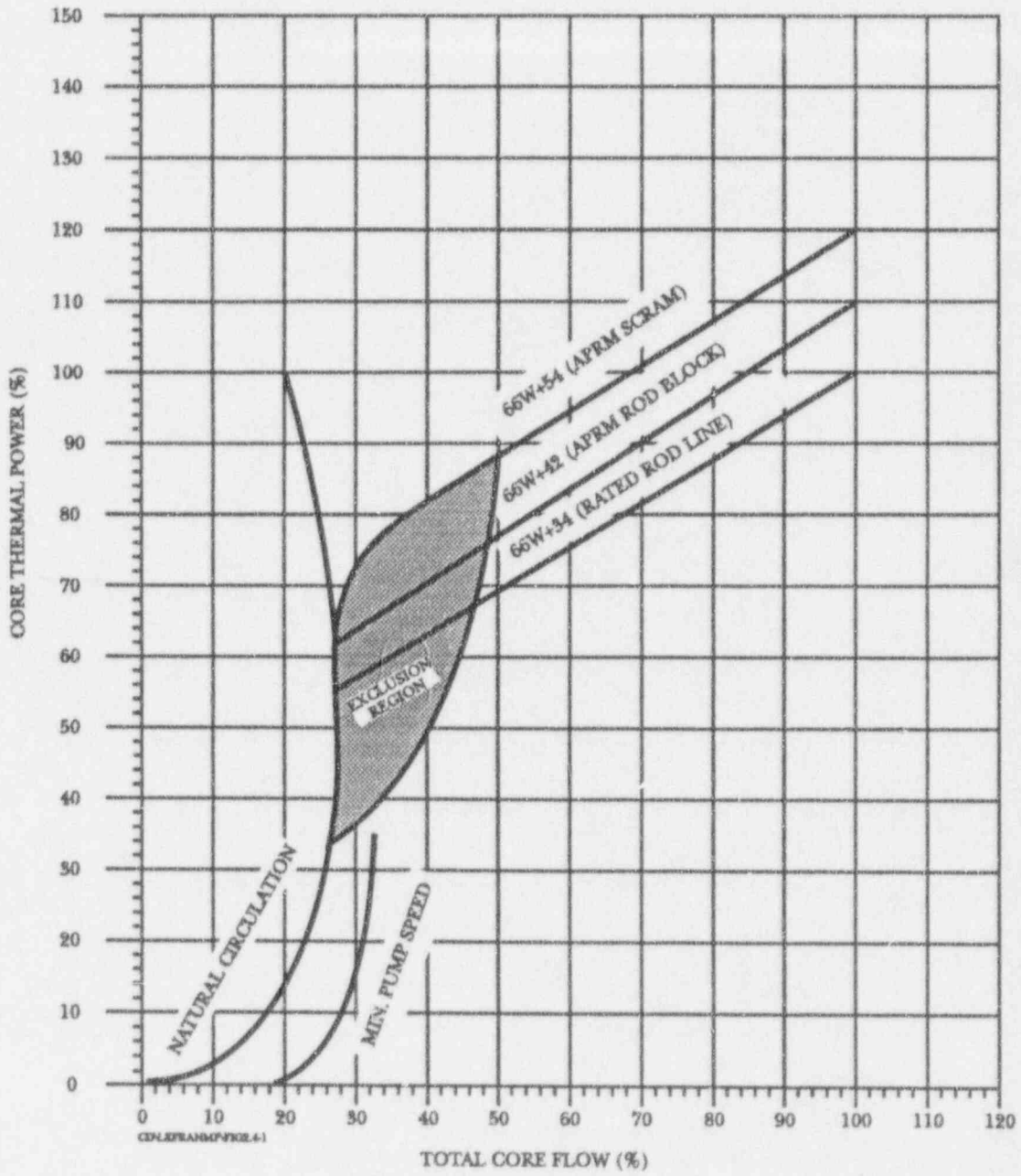
For single recirculation loop operation, the MCPR limits at rated flow shall be the values from the Table listed under the heading, "Single Loop Operation." The single loop values are obtained by adding 0.01 to the two loop operation values. For core flows other than the rated condition, the MCPR limit shall be the appropriate value from Table 2.2-1 multiplied by K_r , where K_r is given in Figure 2.2-1 as a function of the flow control method in use. These limits are only valid for the fuel types in Cycle 17.

2.3 Maximum Linear Heat Generation Rate Limits

During steady-state power operation, the Linear Heat Generation Rate (LHGR) of any rod in any fuel bundle at any axial location shall not exceed the maximum allowable LHGR limits in Table 2.3-1. This table only lists the limits for fuel types in Cycle 17.

2.4 Thermal Hydraulic Stability Limits

Normal plant operation will not occur inside the bounds of the exclusion region defined in Figure 2.4-1. These power and flow limits are applicable for Cycle 17, operation inside of the exclusion region may result in a thermal hydraulic oscillation.



Exclusion Region Boundary Equation
 $Power = 133.7831 - 6.61 (FLOW - 0.5) + 0.113 (FLOW - 0.5)^2$

Figure 2.4-1

Stability Power and Flow Exclusion Region
 (Technical Specification Reference 3.6.J)

31. Report, M. A. Sironen, Vermont Yankee Cycle 17 Core Performance Analysis Report, YAEC-1867, June 1993.
32. Report, B. Y. Hubbard, et al., End-of-Full-Power-Life Sensitivity Study for the Revised BWR Licensing Methodology, YAEC-1822, October 1991.
33. Report, General Electric Nuclear Energy, BWR Owner's Group Long-Term Solutions Licensing Methodology, NEDO-31960, June 1991.
34. Report, General Electric Nuclear Energy, BWR Owner's Group Long-Term Solutions Licensing Methodology, NEDO-31960, Supplement 1, March 1992.