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NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
THE HARTFORD ELECTRIC LIGHT COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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July 14, 1980

Docket No. 50-245
A01075

Mr. Boyce H. Grier, Director
Region 1
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

References: (1) B. H. Grier letter to W. G. Counsil dated July 3, 1980, transmitting I&E Bulletin No. 80-17.
(2) W. G. Counsil letter to B. H. Grier dated July 8, 1980.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 1
I&E Bulletin No. 80-17

In Reference (1), the NRC Staff requested that Northeast Nuclear Energy Company (NNECO) provide information related to Millstone Unit No. 1 as a result of a failure at a BWR to fully insert all control rods.

NNECO provided the response to Item 1 of Reference (1) in Reference (2). In response to Items 4, 6, and 7 of Reference (1), NNECO hereby provides the following information.

Items 4a, b, c, and d

NNECO has reviewed the emergency operating procedures at Millstone Unit No. 1 and has revised them, as necessary, to include the operator actions described in Items 4a, b, c, and d of Reference (1).

Item 4e

In response to Item 4e of Reference (1), full training of all licensed operators to recognize and mitigate the event as described in Reference (1) was completed as of July 10, 1980.

Item 6a

NNECO has revised the affected station procedures and forms to include the Reference (1) reporting requirements.

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Item 6b

NNECO has revised the affected station procedures to include the operator action described in Item 6b of Reference (1).

Item 6c

The response to this Item will be submitted with the information requested by Item 2 of Reference (1), within the twenty (20) day reporting period.

Item 7

Analyses have been performed for Millstone Unit No. 1 by General Electric, the reactor manufacturer, to determine the response to selected transients in light of the incomplete scram concerns as described in Reference (1). The two transients included are MSIV closure with half scram (180° sector) and turbine trip with bypass plus complete scram failure. The analyses and results are discussed in Attachment 1.

These analyses demonstrate the capability of Millstone Unit No. 1 to safely mitigate a severe pressure transient from full power without exceeding the service level "C" limit of 1500 psig using heat removal and safety systems presently installed. This also includes degraded scram assumptions and the absence of recirculation pump trip (RPT).

NNECO has previously committed to install RPT during the Fall, 1980 maintenance and refueling outage, scheduled to begin within approximately ten weeks. RPT will provide further improvement to the unit's ATWS mitigation capability.

We trust you find this information satisfactorily dispositions the Reference (1) concerns.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil

W. G. Counsil
Senior Vice President

Attachment

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

July 14, 1980

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensees herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Sheila M. Oater
Notary Public

My Commission Expires March 31, 1981

DOCKET NO. 50-245

ATTACHMENT 1

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 1

I&E BULLETIN NO. 80-17

JULY, 1980

RESPONSE TO IE BULLETIN 80-17

ATWS WITHOUT RPT
FOR
MILLSTONE UNIT 1

Introduction

This document provides the results of the evaluation of anticipated transients without scram (ATWS) without recirculation pump trip (RPT) as required by Item 7 of IE Bulletin 80-17. Based on discussions with the NRC, an assessment of a full ATWS in plants not having RPT implemented is required as part of an analysis of the net safety of derating plants such that calculated peak vessel pressures do not exceed the assumed "Service Level C" limit of 1500 psig considering all available heat removal systems. This evaluation was provided to Northeast Utilities for Millstone Unit 1 by the General Electric Company.

Discussion

General Electric believes that basing decisions relative to plant safety on a complete failure to scram does not properly reflect the occurrence at Browns Ferry Unit 3. It should be noted that the initial partial scram at Browns Ferry Unit 3 resulted in a power reduction from approximately 36% to less than 1%. A conservative evaluation of the Browns Ferry 3 occurrence has been performed by GE for plants which do not have recirculation pump trip incorporated in their design. These analyses indicate that the scram of 50% of the control rods will effectively mitigate the consequences of anticipated transients.

In light of the above discussion and in response to Bulletin 80-17 two ATWS transients are presented. These transients are: 1) a generic bounding case for MSIV closure with scram of all rods in a 180° sector of the core, and 2) a plant specific case for turbine trip with bypass with no scram as required by IE Bulletin 80-17.

MSIV Closure

A generic bounding case was analyzed in which end of equilibrium cycle core conditions were assumed and that only control rods in a 180° sector of the core are inserted during scram. The control rods in the other half of the core were assumed to remain in the full power position General Electric believes this case bounds any possible non-detectable water accumulations in the scram discharge volume which are not detectable with the current instrument configuration.

For this evaluation the control rods were separated into functional and non-functional 180° sectors of the core. Under these conditions the reactor power was conservatively calculated to fall to 40% in the first 70 seconds.

A bounding analysis of the peak reactor pressure for the postulated half scram condition was performed for a MSIV closure in a plant with the following characteristics:

Initial Power Level	100%
Scram Worth	-3$
Void Coefficient	-11 ¢/%
Safety Valve Setpoint/Capacity	1255 psia/16% NBR
Relief Valve Setpoint/Capacity	1110 psia/40% NBR

The results of this analysis show that the peak vessel pressure (without RPT) is less than 1460 psig at 47 seconds.

Based on the above it is concluded that for a conservatively defined partial scram condition in plants without RPT and with combined safety and relief valve capacity of 56% NBR, the peak pressure is maintained well below 1500 psig. The safety and relief valve capacity and reactor vessel size used in this assessment is small compared to operating BWR's which do not incorporate RPT, thereby maximizing the peak vessel pressure. In addition, a conservative void coefficient was used. Previous sensitivity studies have shown that this combination of parameters is a limiting case for operating BWR's without RPT and hence it can be concluded that this generic analysis indeed bounds the results which would be obtained for individual plants.

Turbine Trip With Bypass

A plant specific analysis of the turbine trip with bypass transient for which no scram occurs has been performed for Millstone Unit 1. The input parameters for this analysis are given in Table 1. No credit is taken for heat removal systems other than the safety and relief valves, and/or the turbine bypass to the main condensor and the isolation condensor. The isolation condensor has been accepted for use in previous Millstone accident analysis cases.

The results of this analysis show that the peak vessel pressure reaches 1072 psig in 100 seconds for full power operation. The transient response of the system is shown in Figure 1.

Conclusion

Based on the above evaluation no plant derates are necessary to meet the 1500 psig limit. The conservative bounding MSIV half scram evaluation shows that the 1500 psig limit is not exceeded. The plant specific analysis of turbine trip with bypass shows that the 1500 psig limit is not exceeded for the very conservative case of no scram. Therefore, it can be concluded that continued operation of Millstone Unit 1 without ATWS RPT is not an unreviewed safety question and does not produce a safety hazard to the general public.

TABLE 1
Transient Input Parameters

Power Level (mwt)	2011
Rated Core Flow (10^6 lb/hr)	69.0
Rated Steam Flow (10^6 lb/hr)	7.94
Steam Dome Pressure (psig)	1035
Turbine Bypass Capacity (% rated steam flow)	105
Number of Relief Valves	N/A
Setpoints (psig)	
Capacity (% rated steam flow at setpoint)	
Number of Safety Valves	N/A
Setpoint (psig)	
Capacity (% rated steam flow at setpoint)	
Number of Safety/Relief Valves	6
Setpoint (psig)	1140
Capacity (% rated steam flow at setpoint)	61
Void Fraction (%)	39.3
Void Coefficient (-¢/% Rg)	8.7
Doppler Coefficient (-¢/°F)	0.31

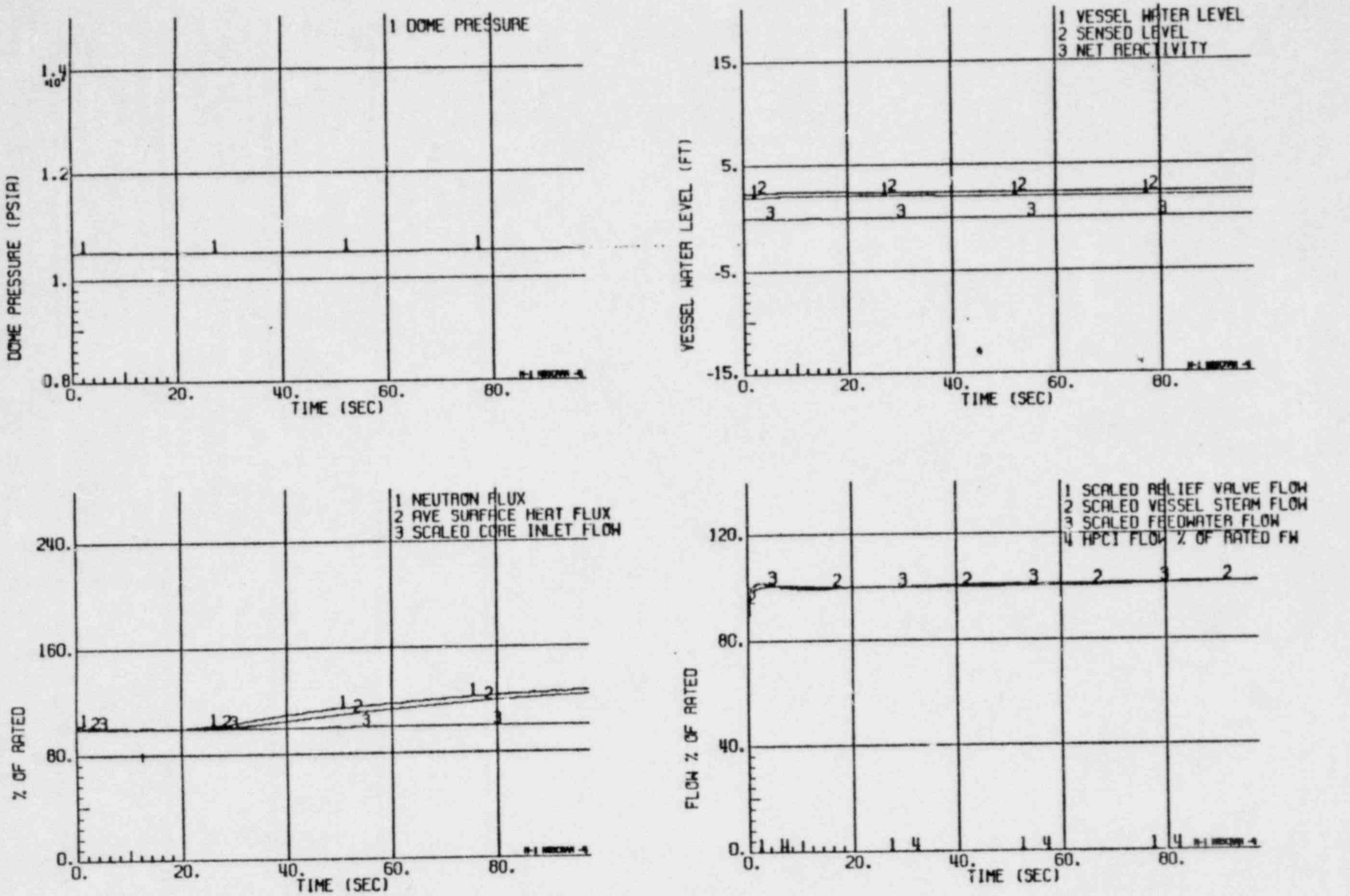

Figure 1 Time Response of Turbine Trip With Bypass, No Scram, 100%PWR/100%FLOW

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