T/C

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July 14, 1980

Mr. James G. Keppler, Director
Directorate of Inspection and
Enforcement - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
Additional Response to IE Bulletin
80-17
NRC Docket Nos. 50-237/249 and 50-254/265

Reference (a): J. G. Keppler letter to C. Reed dated July 3, 1980

Dear Mr. Keppler:

This letter is to provide an additional response for Dresden 2/3 and Quad Cities 1/2 to the subject bulletin which was transmitted by Reference (a).

Item 7 of the bulletin requested that analyses be performed on plants without a ATWS related RPT to determine any derating necessary to ensure service Level C limits are not exceeded. The attachment to this letter contains the results of these analyses for Dresden Units 2/3 and Quad Cities Units 1/2. As indicated, the analyses performed were for a MSIV closure with 1/2 of the control rods failing to scram and a turbine trip with bypass event with all control rods failing to scram. These analyses required no deratings to remain below the service Level C limit.

The analyses were performed by the NSSS vendor for these units, the General Electric Co. General Electric has indicated that, through their discussion and understanding with the NRC, submittal of these test results will satisfy the requirements of the

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bulletin. If any additional information is required, please contact this office.

Very truly yours,

Robert F. Janecek

Robert F. Janecek
Nuclear Licensing Administrator
Boiling Water Reactors

cc: Director, Division of
Reactor Operations Inspection

SUBSCRIBED and SWORN to
before me this 14TH, day
of July, 1980

Notary Public

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RESPONSE TO IE BULLETIN 80-17

ATWS WITHOUT RPT
FOR
DRESDEN UNITS 2 AND 3
QUAD CITIES UNITS 1 AND 2

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 Commonwealth Edison 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 Dresden Units 2 and 3. 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.

The results of this analysis show that the peak vessel pressure reaches 1322 psig in 8.3 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 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)	2527
Rated Core Flow (10^6 lb/hr)	98.0
Rated Steam Flow (10^6 lb/hr)	9.77
Steam Dome Pressure (psig)	1005
Turbine Bypass Capacity (% rated steam flow)	40
Number of Relief Valves	5
Setpoints (psig)	1125
Capacity (% rated steam flow at setpoint)	27.8
Number of Safety Valves	8
Setpoint (psig)	1253
Capacity (% rated steam flow at setpoint)	50
Number of Safety/Relief Valves	N/A
Setpoint (psig)	
Capacity (% rated steam flow at setpoint)	
Void Fraction (%)	34.5
Void Coefficient (-¢/% Rg)	7.4
Doppler Coefficient (-¢/°F)	0.31

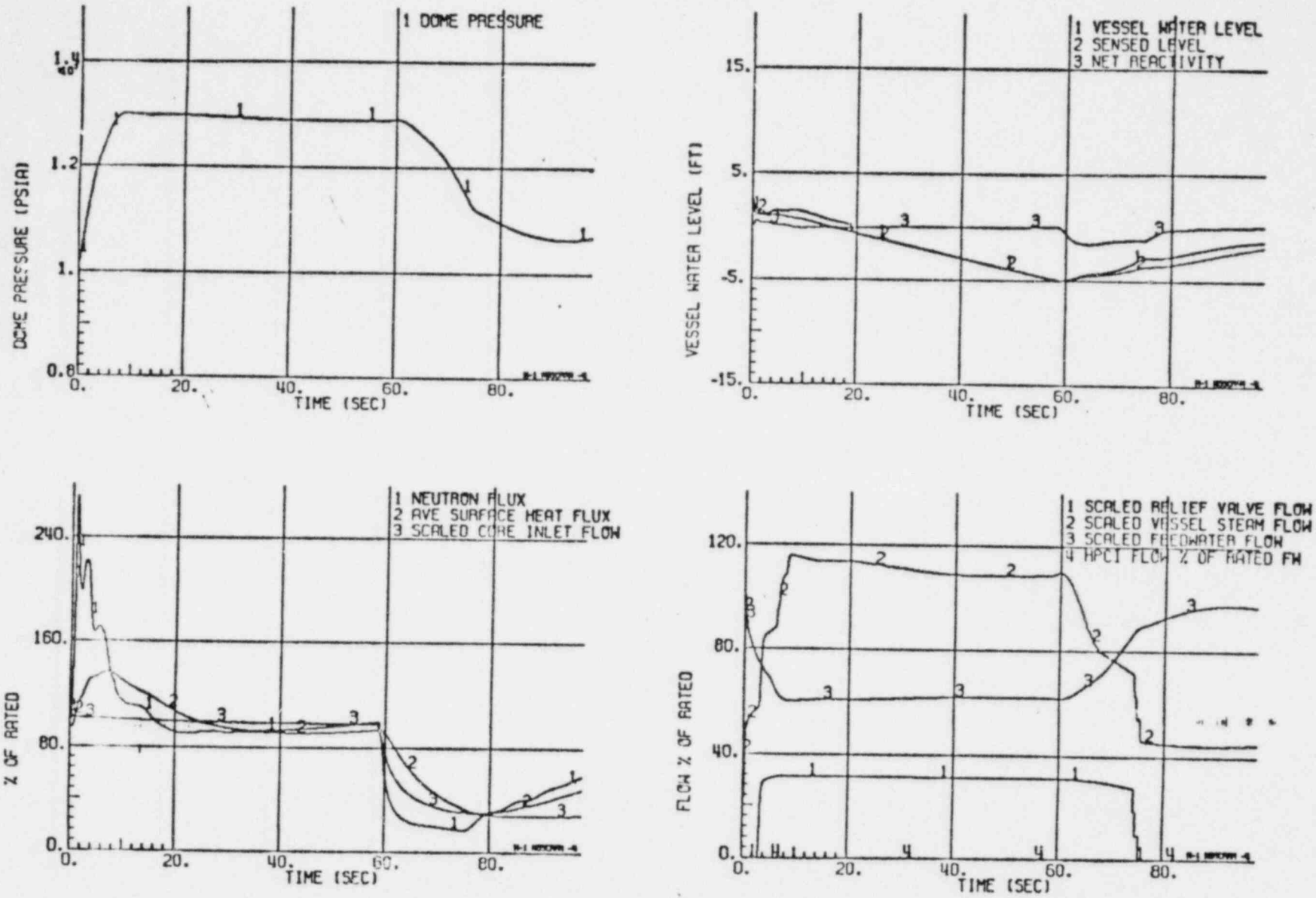

Figure 1 Time Response of Turbine Trip With Bypass, No Scram, 100%/100%.