

# PHILADELPHIA ELECTRIC COMPANY

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SHIELDS L. DALTROFF  
VICE PRESIDENT  
ELECTRIC PRODUCTION

(215) 841-5001

June 3, 1982

Docket No. 50-277

Mr. John F. Stolz, Chief  
Operating Reactors Branch #4  
Division of Licensing  
US Nuclear Regulatory Commission  
Washington, DC 20555

References: Docket No. 50-277, Application for Amendment of Facility Operating License DPR-44, submitted 2/19/82 with respect to the Peach Bottom Atomic Power Station Unit 2 Reload 5 Application.

Attachment: Letter, G. R. Hull to W. M. Alden, Peach Bottom 2 Reload 5 (Cycle 6) Reload Licensing Analysis Error, dated 5/19/82

Dear Mr. Stolz:

This letter serves to provide additional information with respect to the Peach Bottom Unit 2 Application for Amendment of Facility Operating License as a result of an error discovered in the current version of the ODYN transient computer code which was used for performing the Peach Bottom 2 Reload 5 (Cycle 6) pressurization transient analyses. Results of these analyses were reported in the General Electric document Y1003J01A34 which was previously submitted at the time of the referenced Reload 5 license amendment application.

General Electric has re-analyzed the pressurization transients utilizing the corrected version of ODYN. The attached

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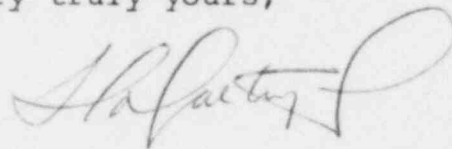
GE correspondence provides a description and explanation of the analysis error, including a table of revised cycle MCPR values for pressurization events. Philadelphia Electric has appropriately revised and enclosed copies of pages 133d, 133e, 142, 142a, and 142b of the Peach Bottom 2 Reload 5 Facility Operation License Amendment Application.

General Electric is currently preparing a revision to the Supplemental Reload Licensing Submittal for Peach Bottom Atomic Power Station Unit 2, Reload No. 5 (Y1003JO1A34). We will forward this revised document to you when it becomes available in approximately 2 - 3 weeks. In the meantime, the attached General Electric letter documents the required OLYN related revisions.

Also enclosed per the request of Summer Sun of your staff are the answers to the two questions which he posed to Philadelphia Electric Company regarding the OLYN re-analysis.

If you or your staff have any questions regarding the above changes, please contact us.

Very truly yours,

A handwritten signature in dark ink, appearing to read "J. F. Stolz", is written over the closing. The signature is fluid and cursive, with the first and last names being clearly legible.

Attachment

cc: C. J. Cowgill - Site Inspector

SUPPLEMENT

REFERENCE: Docket No. 50-277, Application for Amendment of Facility Operating License DPR-44, submitted 2/19/82 with respect to the Peach Bottom Atomic Power Station Unit 2 Reload 5 Application

SUBJECT: Responses to OLYN Error Questions (requested by Summer Sun, NRC, 5/20/82)

Question #1

Why do the corrected Feedwater Controller Failure (FWCF) transient MCPR values remain unchanged in the OLYN re-analysis results? Was a FWCF re-analysis performed?

Answer

GE performed an OLYN re-analysis for the FWCF transient. The peak heat flux value increased from the 'old' (OLYN power distribution error) value of 120.8% (rounded off to 121% in the reload licensing submittal) to a re-analysis value of 121.1%. However, the MCPR values did not change significantly enough to cause an increase in the previously submitted values.

Question #2

Why do the re-analysis MCPR results appear to be sensitive to exposure range, i.e., EOC vs. EOC-2000 MWD/t?

Answer

In the performance of system core-wide transient analyses, the axial power distribution used in the initialization of the EOC transient analyses is different from the axial power distribution used in the EOC-2000 transient analyses. Specifically, the EOC-2000 axial power distribution is more bottom peaked than the EOC case. The ODYN programming error was an error which completely 'ignored' the first node (core bottom) from the heat balance calculation. The effect of this error was to eliminate the nodal power from the integrated bundle power calculation, hence a reduced MCPR change. In the EOC-2000 case (more bottom peaked), the total integrated power was relatively lower, hence greater MCPR relief, resulted. In the re-analysis, with the first node accounted for, the EOC-2000 MCPR values were, for the same reason, more impacted than the EOC MCPR values.

Table 3.5.K.2

OPERATING LIMIT MCPR VALUES  
FOR VARIOUS CORE EXPOSURES\*

<u>Fuel Type</u>	<u>MCPR Operating Limit**</u> <u>For Incremental Cycle Core Average Exposure</u>	
	<u>BOC to 2000 MWD/t</u> <u>Before EOC</u>	<u>2000 MWD/t before EOC</u> <u>To EOC</u>
8x8R/LTA	1.23	1.27
P 8x8R	1.25	1.30
P8DRB285	1.29	1.30

\* If requirement 4.5.K.2.a is met.

\*\* These values shall be increased by 0.01 for single loop operation.

Table 3.5.K.3

OPERATING LIMIT MCPR VALUES  
FOR VARIOUS CORE EXPOSURES\*

<u>Fuel Type</u>	<u>MCPR Operating Limit**</u> <u>For Incremental Cycle Core Average Exposure</u>	
	<u>BOC to 2000 MWD/t</u> <u>Before EOC</u>	<u>2000 MWD/t before EOC</u> <u>To EOC</u>
8x8R/LTA	1.34	1.39
P 8x8R	1.37	1.42
P8DRB285	1.37	1.42

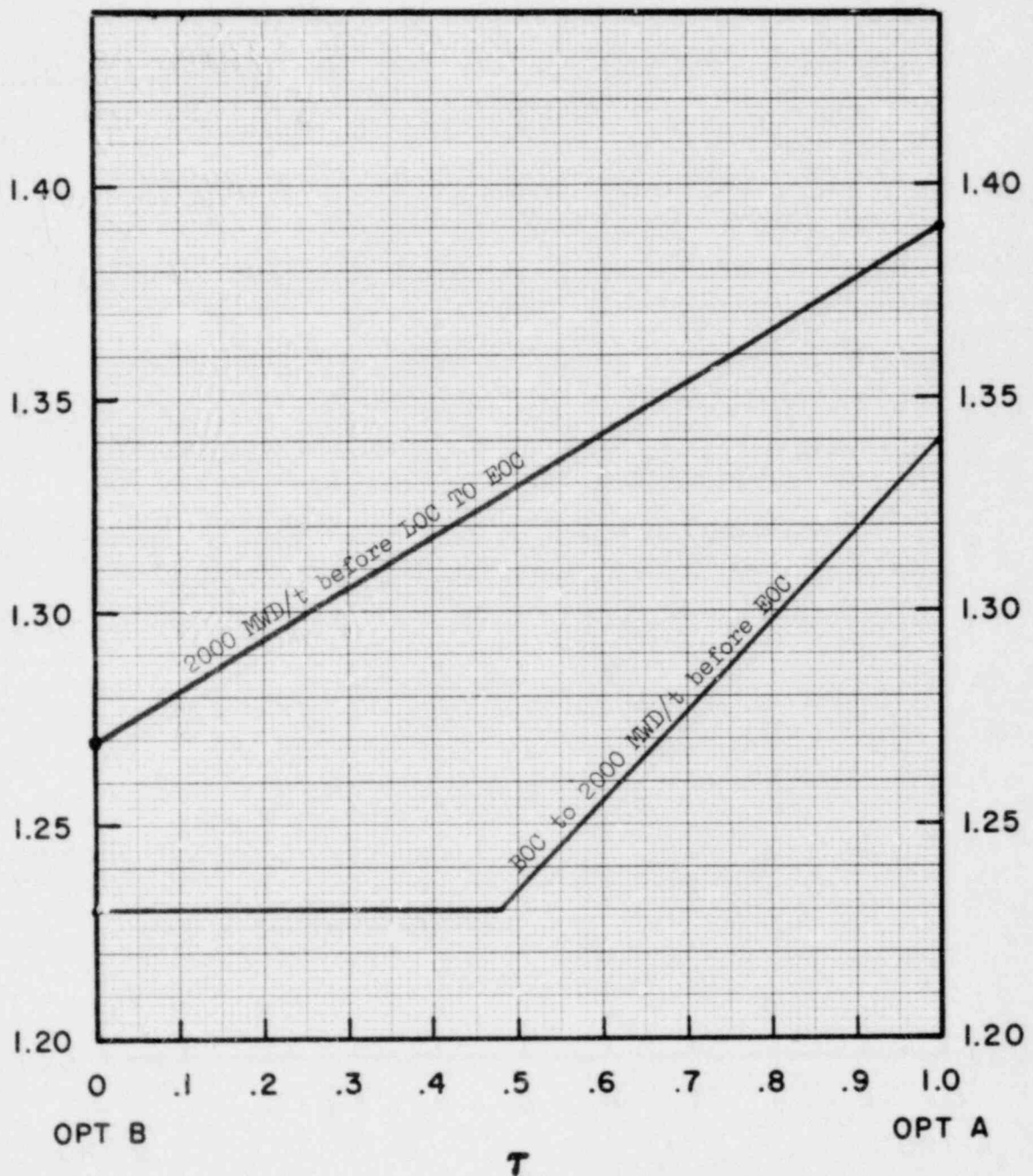
\* If surveillance requirement 4.5.K.2 is not performed.

\*\* These values shall be increased by 0.01 for single loop operation.

PEACH BOTTOM UNIT 2

FIGURE 3.5.K.1 MCPR OPERATING LIMIT vs  $T$

FUEL TYPE 8x8R/LTA

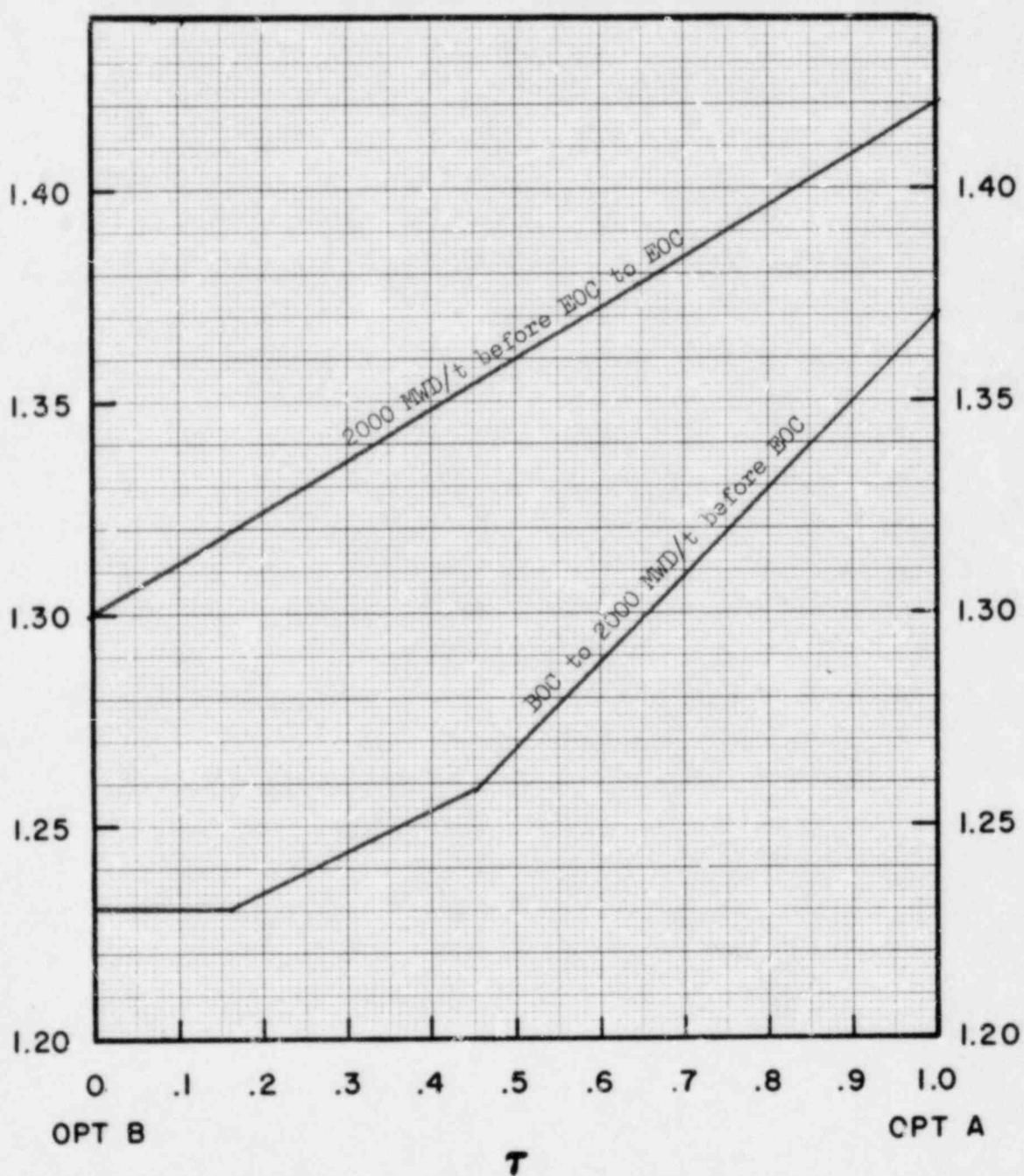




PEACH BOTTOM UNIT 2

FIGURE 3.5.K.2 MCPR OPERATING LIMIT vs  $T$

FUEL TYPE P8x8R

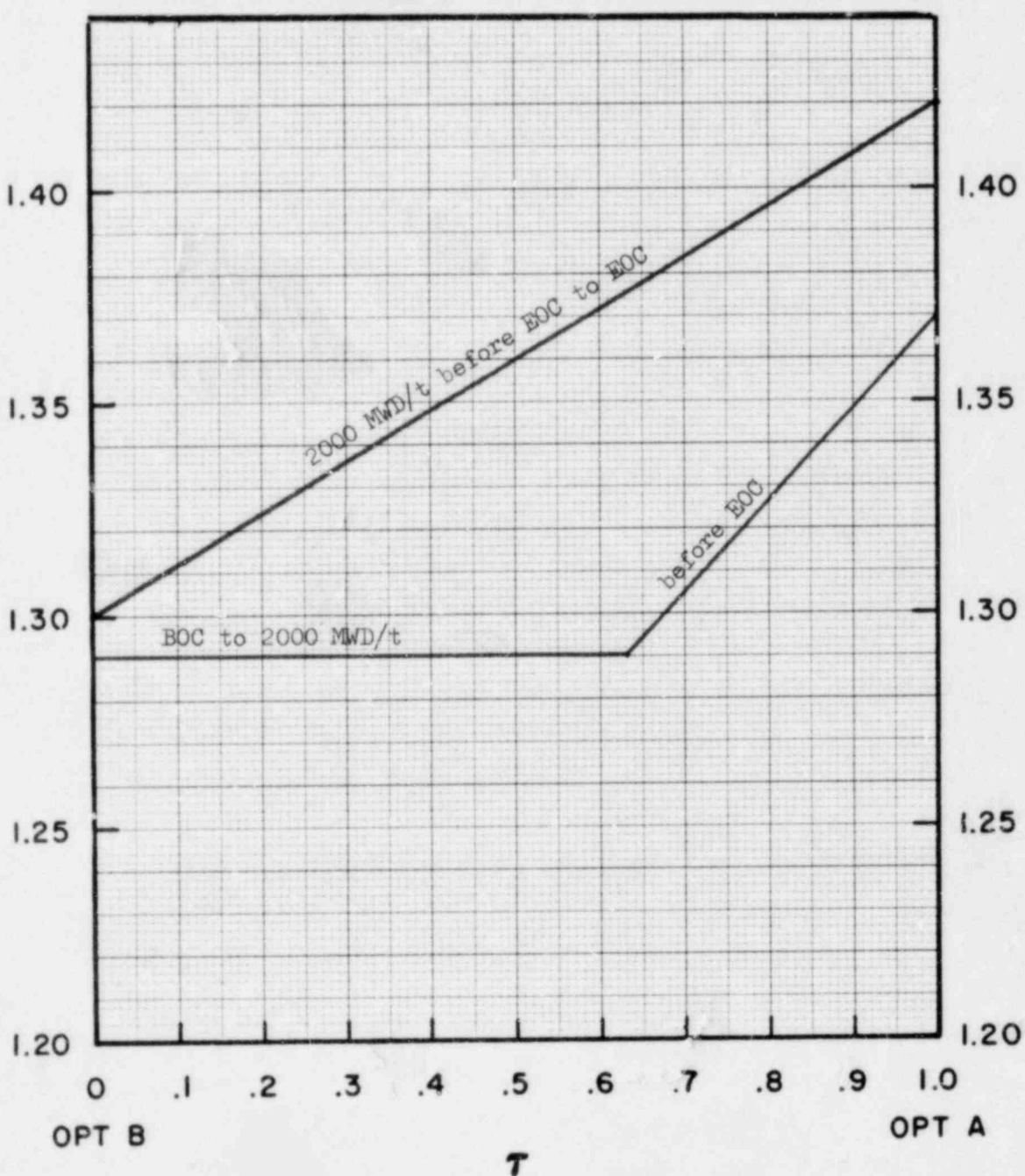




PEACH BOTTOM UNIT 2

FIGURE 3.5.K.3 MCPR OPERATING LIMIT vs  $T$

FUEL TYPE P8DRB285



# GENERAL ELECTRIC

NUCLEAR FUEL  
AND SERVICES  
DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTNER AVE., SAN JOSE, CALIFORNIA 95125

May 19, 1982  
GRH:82-044

cc: J. M. Carmody  
R. A. Hanvelt  
R. T. Hill  
R. H. Logue  
E. T. Norton  
D. W. Radcliffe  
W. T. Ullrich

Mr. W. M. Alden, S7-1  
PHILADELPHIA ELECTRIC COMPANY  
2301 Market Street  
Philadelphia, PA 19101

SUBJECT: Peach Bottom 2 Reload 5 (Cycle 6) Reload Licensing  
Analysis Error

REFERENCE: "Supplemental Reload Licensing Submittal for Peach  
Bottom Atomic Power Station Unit 2, Reload No. 5",  
Y1003J01A34, December 1981.

Dear Bill:

This will confirm my May 4, 1982 telephone conversation with  
L. F. Rubino.

GE has discovered a minor error in the current version of the ODYN transient computer code which was used for performing Peach Bottom 2 Reload 5 (Cycle 6) transient analyses. Results of these analyses were reported in the reference Peach Bottom 2 Reload 5 reload licensing submittal document. While the accuracy of the current version of ODYN is within the range of transient model uncertainty, a corrected version has been developed, and will be used in future reload licensing analyses.

The Peach Bottom 2 Reload 5 (Cycle 6) pressurization transients have been reanalyzed utilizing the corrected version of ODYN. The revised Option A and Option B  $\Delta$ CPR values for ODYN-analyzed pressurization transients are provided in the attached table. REDY-analyzed transients, such as the Loss of 100°F Feedwater Heating, and other events, such as Bundle Loading Error and Rod Withdrawal Error, are not affected by this ODYN error. The corrected MCPR operating limits, summarized in the attached table, will be provided to PE in the form of a revision to the reload license submittal document on about June 7, 1982.

Mr. W. M. Alden

-2-

May 19, 1982

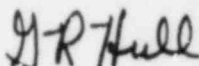
The current ODYN version was developed in 1981 for improved compatibility with automated design methods. The NRC was notified in October, 1981 that GE intended to use this version in reload licensing analyses, and the code was put into production in late 1981. As part of this notification, the NRC was informed that the new version predicted peak heat fluxes up to 2.1% less than the original program that the NRC had reviewed in detail (1% in peak heat flux  $\approx 0.01$  in  $\Delta CPR$ ). Recently, it was discovered that the axial power distribution calculation in the current version was incorrectly programmed, and that this error accounted for most of the difference in licensing calculation results from the original version.

GE believes that this error does not constitute a reportable condition under 10CFR21 because the error was reflected in our model qualification statements to the NRC in October, 1981, and because the magnitude of the error is well within the NRC recognized uncertainty of ODYN. However, this problem is being corrected for both past and future licensing analyses.

A number of plants, in addition to Peach Bottom 2 Reload 5, are also affected by this ODYN error. The NRC was called on May 5, 1982 to inform them of the correction to the ODYN code and of our plans to issue corrected results to the affected customers by July 1, 1982. I will keep you informed if the NRC indicates any additional actions are required.

We recognize that this error will result in inconvenience to PE. For that, we offer our sincere apologies.

Very truly yours,



G. R. Hull  
Fuel Project Manager  
Peach Bottom 2/3  
M/C 174; (408) 925-6176

rem

PEACH BOTTOM 2 RELOAD 5 (CYCLE 6)  
CYCLE MCPR VALUES

<u>EXPOSURE RANGE</u>	<u>PRESSURIZATION EVENTS</u>	<u>OPTION A</u>	<u>OPTION B</u>
		(8x8R&LTA/ P8x8R)	(8x8R&LTA/ P8x8R)
BOC to EOC- 2000 MWd/ST	Load Rejection Without Bypass	0.27/0.30	0.06/0.08
	Feedwater Controller Failure	0.19/0.21	0.13/0.15
EOC-2000 MWd/ ST to EOC	Load Rejection Without Bypass	0.32/0.35	0.20/0.23
	Feedwater Controller Failure	0.26/0.28	0.19/0.21