
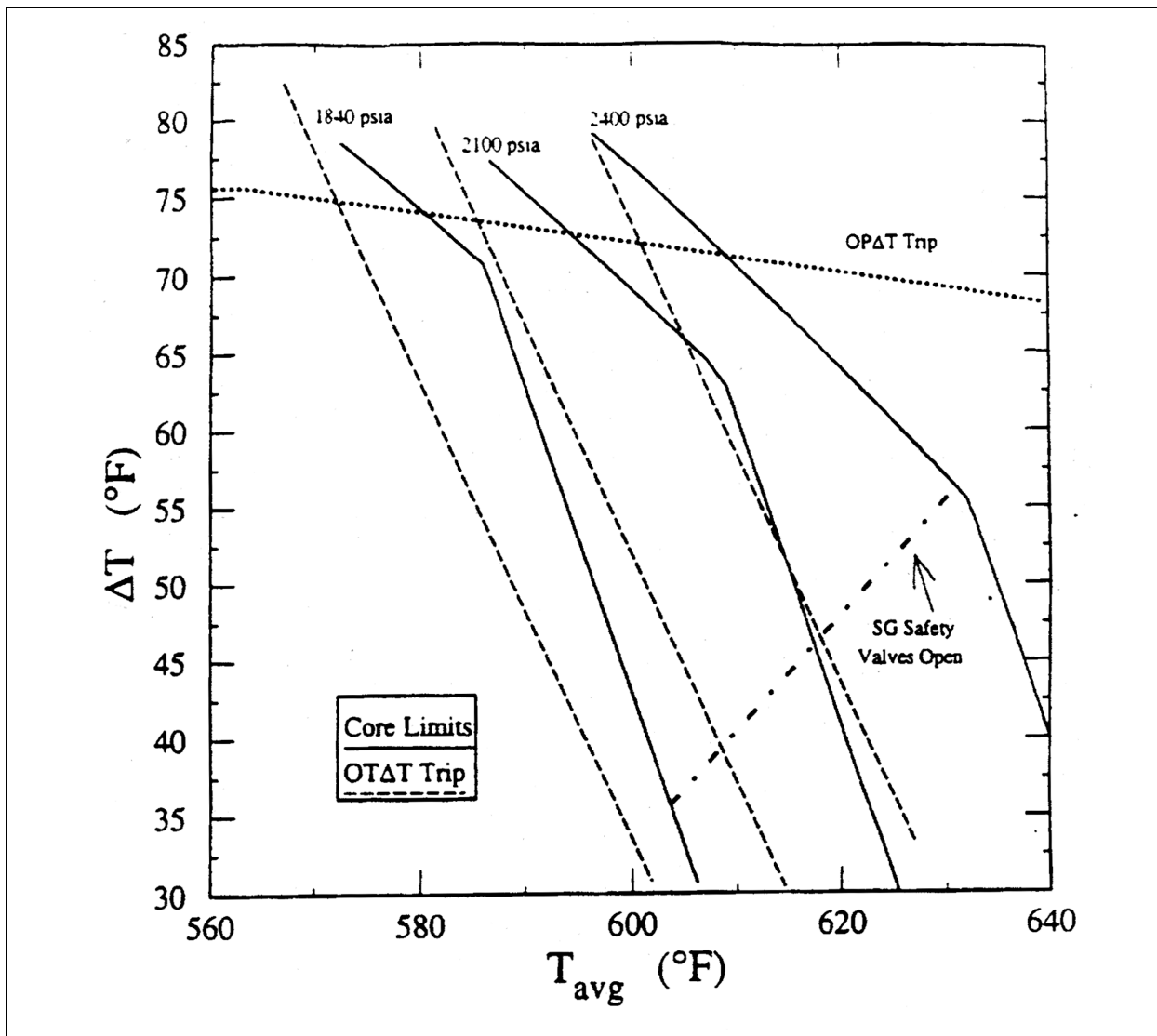


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Note: Operation at an RCS pressure of 2100 psia is no longer supported by the safety analyses; however, some safety analyses performed at reduced RCS pressure and temperature conditions were evaluated and demonstrated to remain bounding for the Return to RCS NOP/NOT program. Hence, this figure has been maintained for completeness.

UFSAR Figure: 14.1-1


Change Description:
UCR-2054, Rev. 0

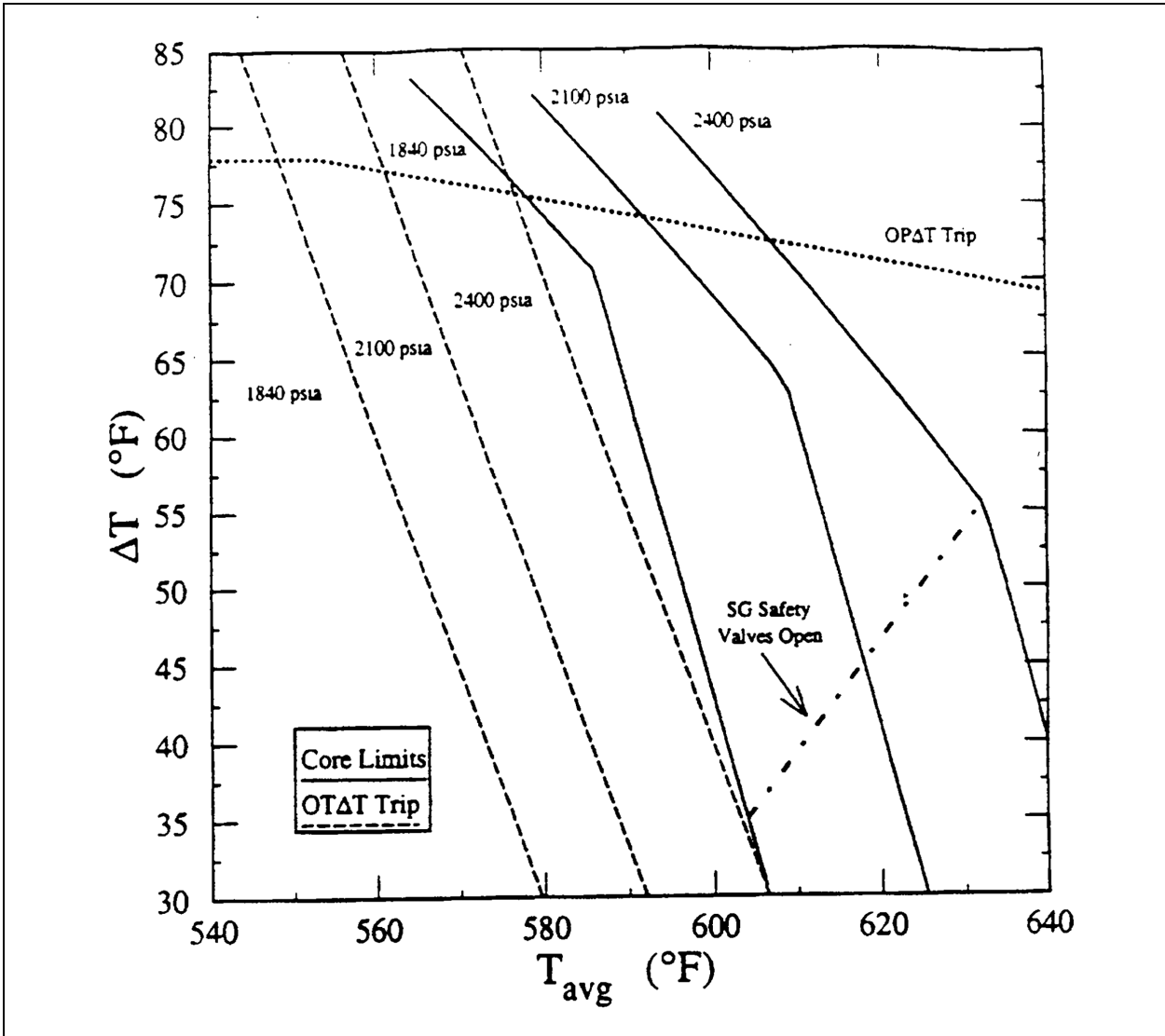
Unit 1

Title: Illustration of Overtemperature and Overpower ΔT Protection

Nominal T_{avg} = 576.3°F – Nominal Pressure = 2100 psia

UFSAR Revision 30.0

 <p>INDIANA MICHIGAN POWER™ An AEP Company</p>	<p>INDIANA AND MICHIGAN POWER D. C. COOK NUCLEAR PLANT UPDATED FINAL SAFETY ANALYSIS REPORT</p>	<p>Revised: 27.0 Chapter: 14 Sheet: 1 of 1</p>
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Note: Operation at an RCS pressure of 2100 psia is no longer supported by the safety analyses; however, some safety analyses performed at reduced RCS pressure and temperature conditions were evaluated and demonstrated to remain bounding for the Return to RCS NOP/NOT program. Hence, this figure has been maintained for completeness.


UFSAR Figure: 14.1-2

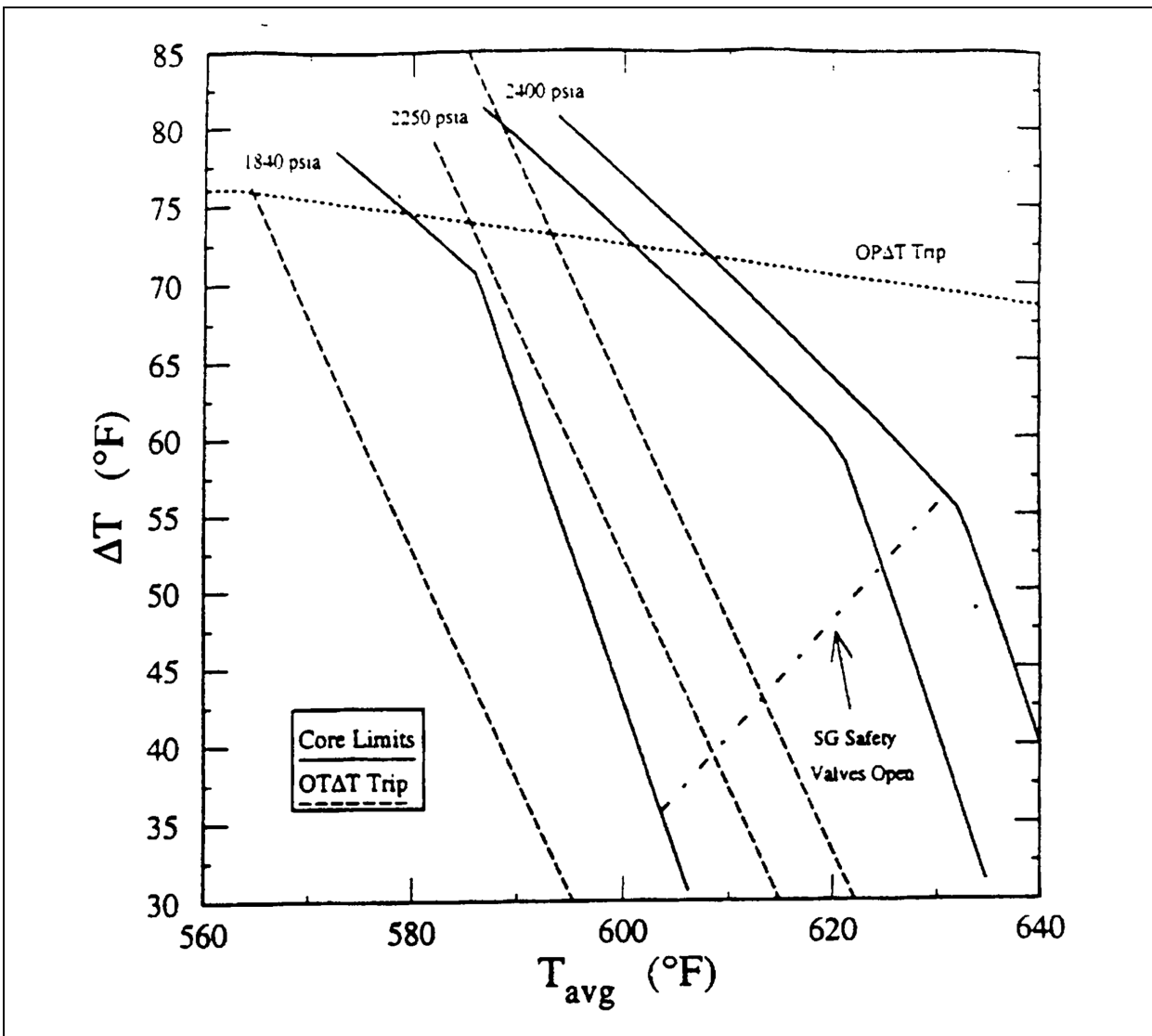
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UCR-2054, Rev. 0

Unit 1

Title: Illustration of Overtemperature and Overpower ΔT Protection
Nominal T_{avg} = 553.0°F – Nominal Pressure = 2100 psia


UFSAR Revision 30.0

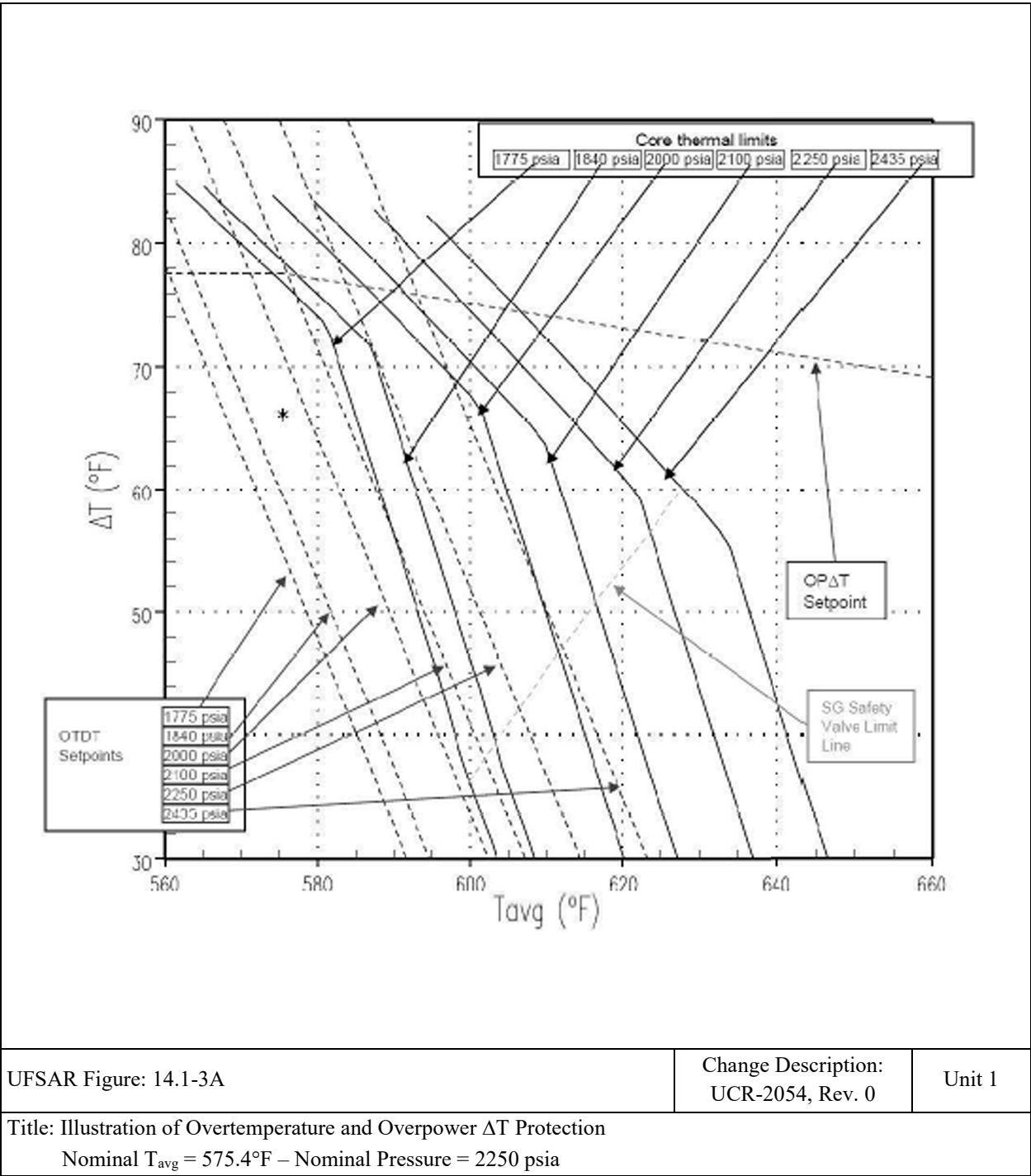
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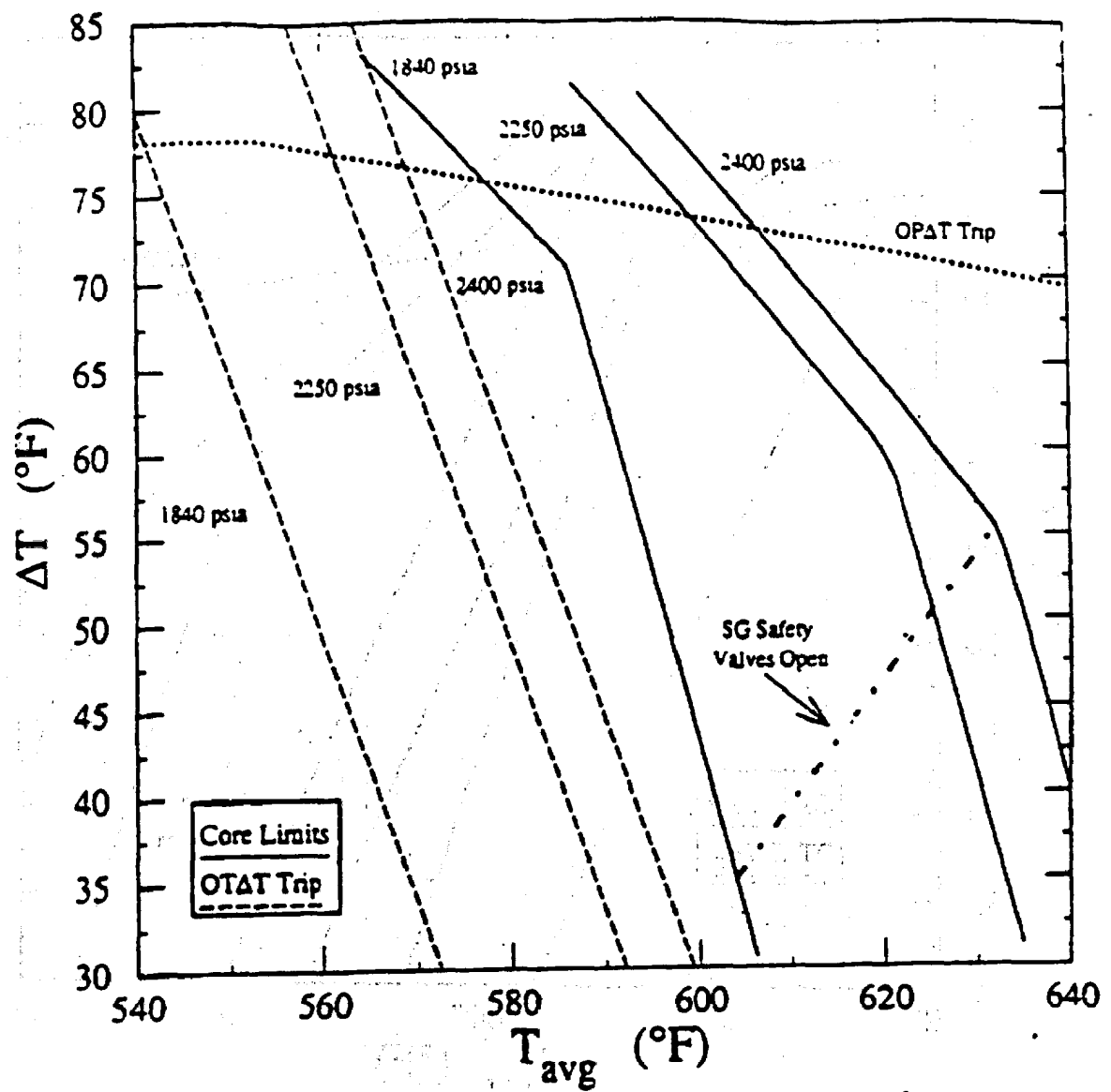


Note: Operation at an RCS pressure of 2100 psia is no longer supported by the safety analyses; however, some safety analyses performed at reduced RCS pressure and temperature conditions were evaluated and demonstrated to remain bounding for the Return to RCS NOP/NOT program. Hence, this figure has been maintained for completeness.

UFSAR Figure: 14.1-3	Change Description: UCR-2054, Rev. 0	Unit 1
<p>Title: Illustration of Overtemperature and Overpower ΔT Protection Nominal T_{avg} = 576.3°F – Nominal Pressure = 2250 psia</p>		

 <p>INDIANA MICHIGAN POWER[™] <small>An AEP Company</small></p>	<p>INDIANA AND MICHIGAN POWER D. C. COOK NUCLEAR PLANT UPDATED FINAL SAFETY ANALYSIS REPORT</p>	<p>Revised: 27.0 Chapter: 14 Sheet: 1 of 1</p>
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**DONALD C. COOK
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UNIT 1**

FIGURE 14.1-4

Illustration of Overtemperature and Overpower ΔT Protection
 Nominal T_{avg} = 553.0°F
 Nominal Pressure = 2250 psia

UFSAR Revision 30.0

Cook Nuclear Plant Unit 1 Normalized Negative Reactivity Insertion as a Function of Time Used for the Reactor Trip In Transient Safety Analysis

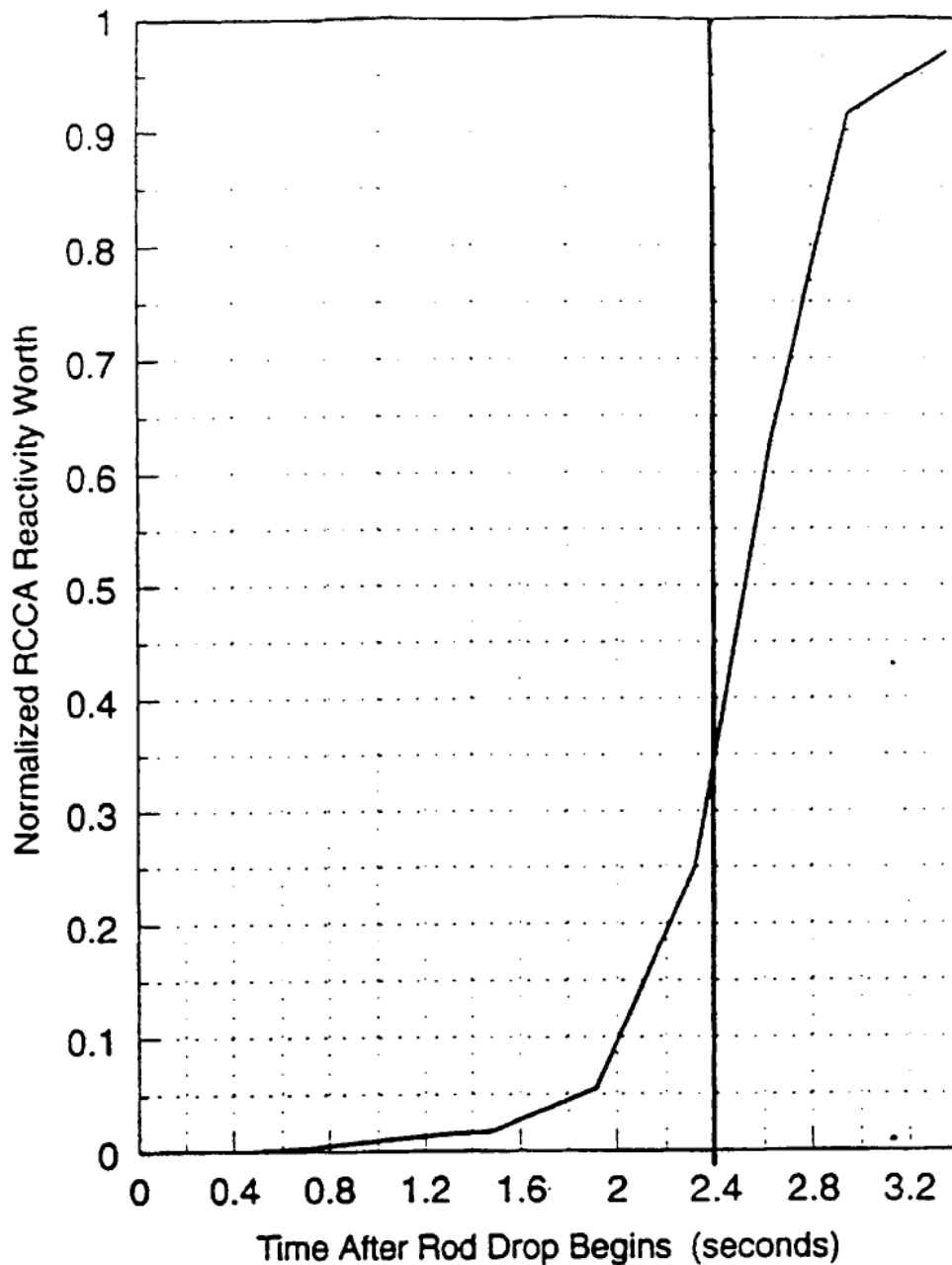
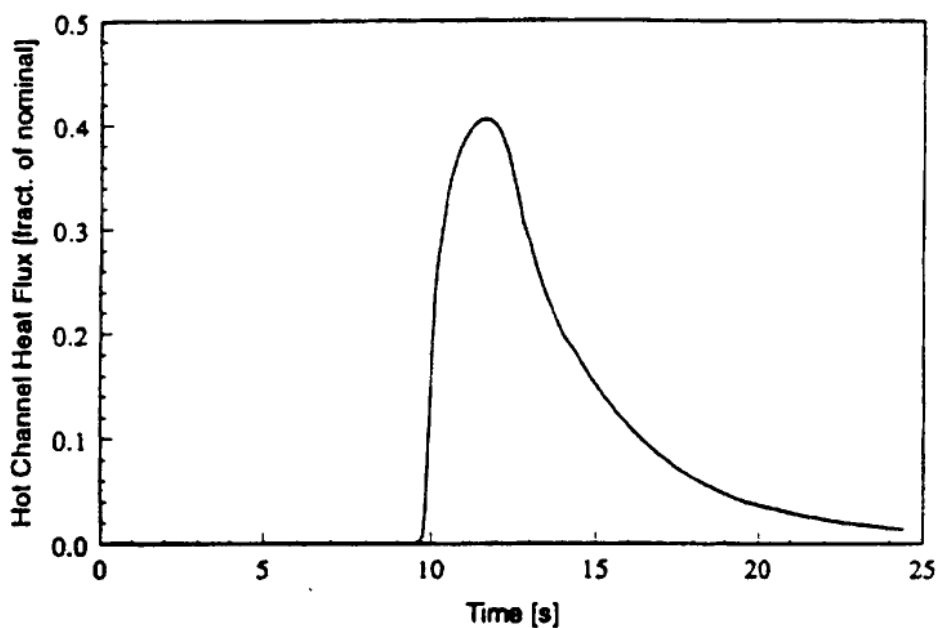
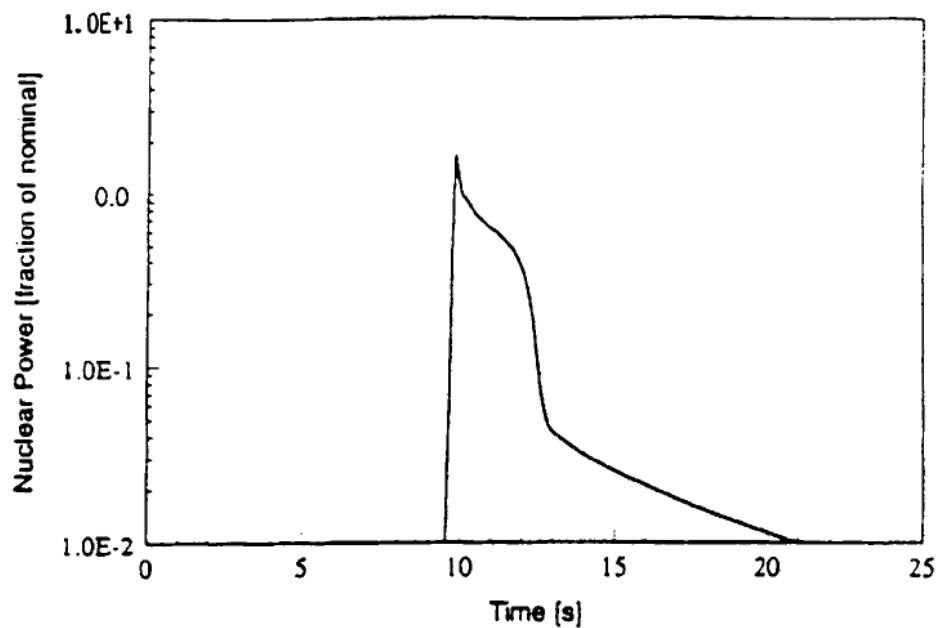


Figure 14.1-5 Trip Reactivity vs. Rod Drop Time

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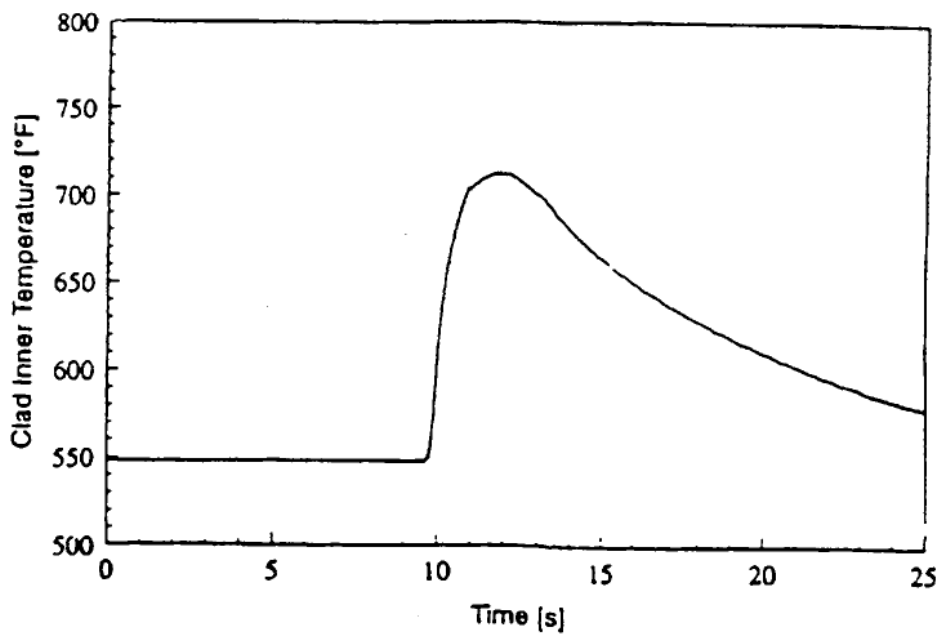
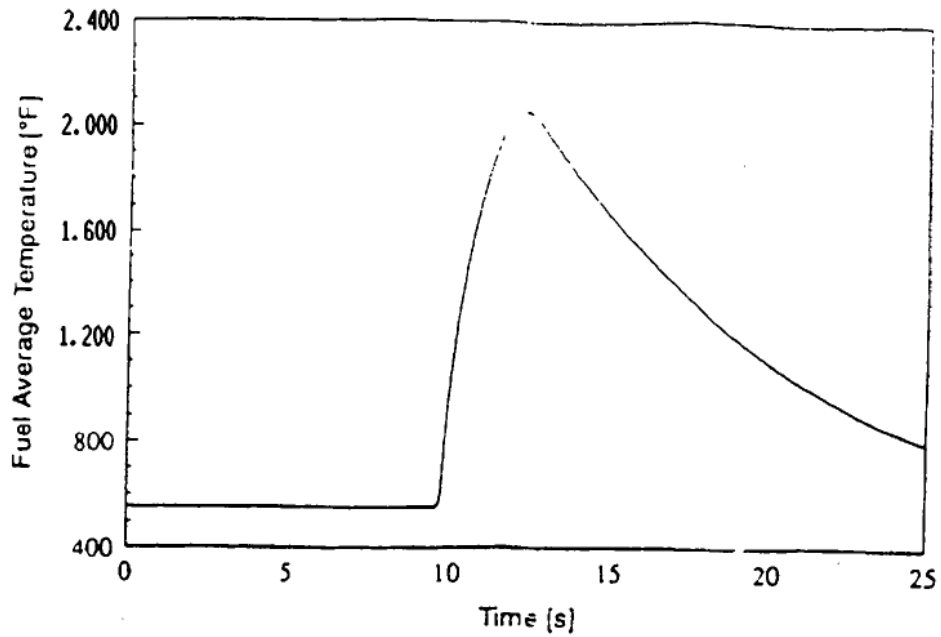


**DONALD C. COOK
NUCLEAR PLANT
UNIT 1**

FIGURE 14.1.1-1

**Nuclear Power and Hot Channel Heat Flux vs. Time For
The Rod Withdrawal From Subcritical Event**

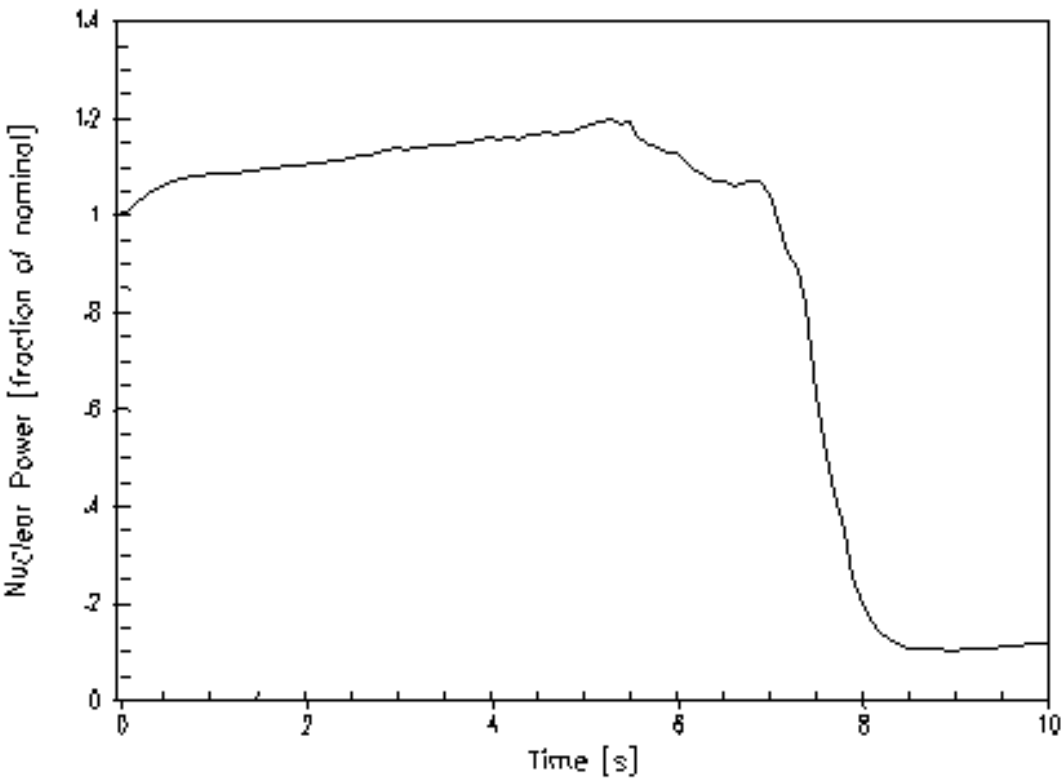
UFSAR Revision 30.0



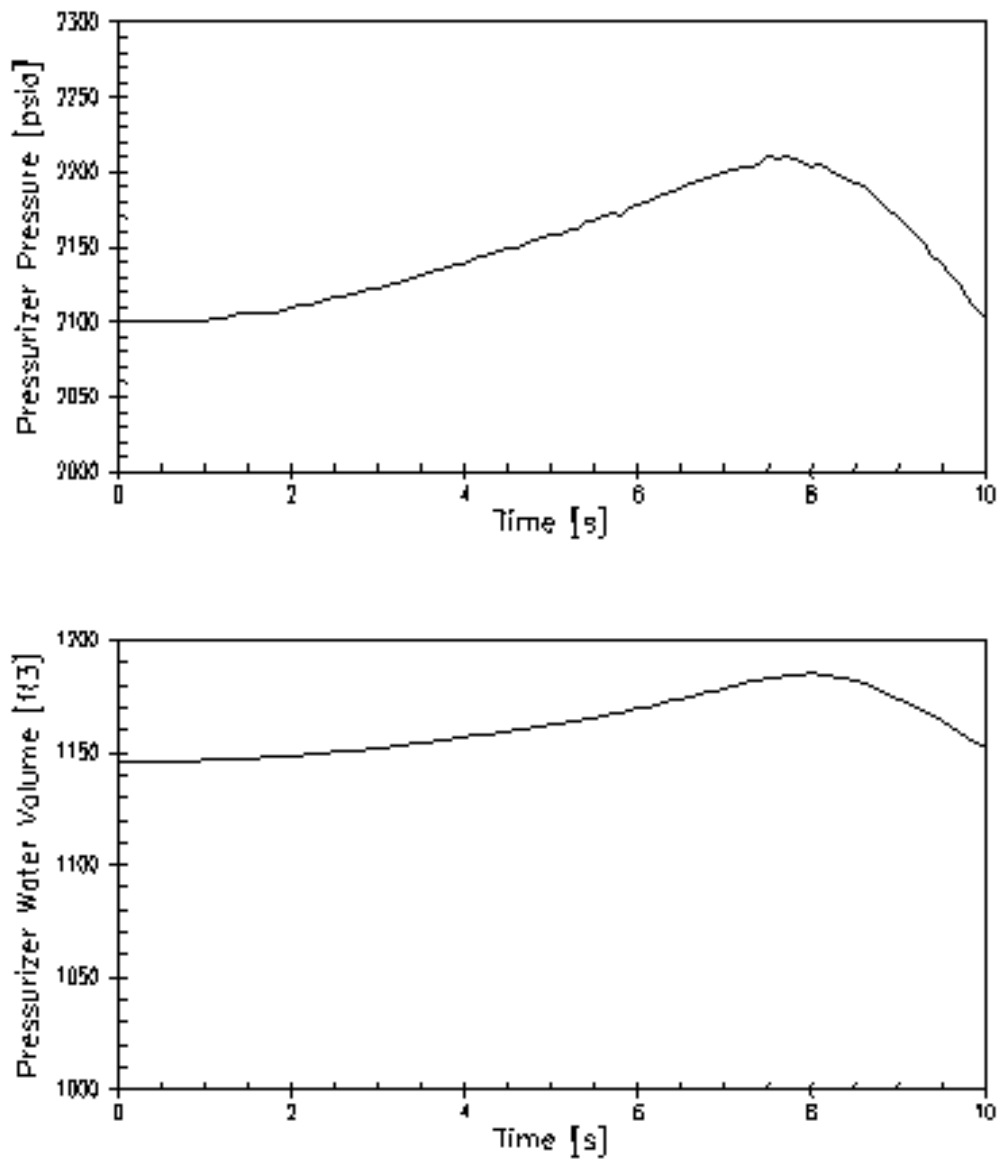
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UNIT 1

FIGURE 14.1.1-2

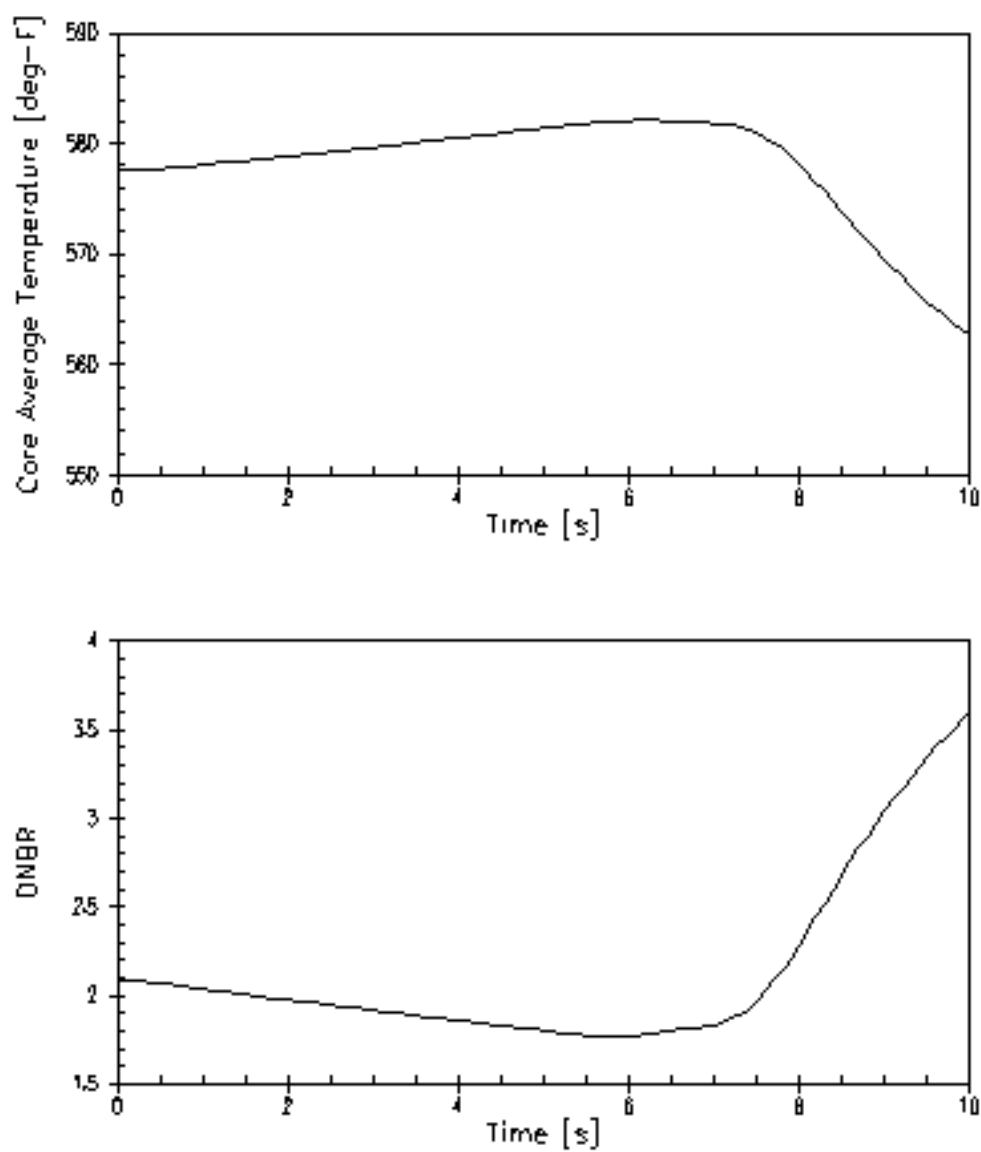
Fuel Average and Clad Temperature vs. Time For
The Rod Withdrawal From Subcritical Event



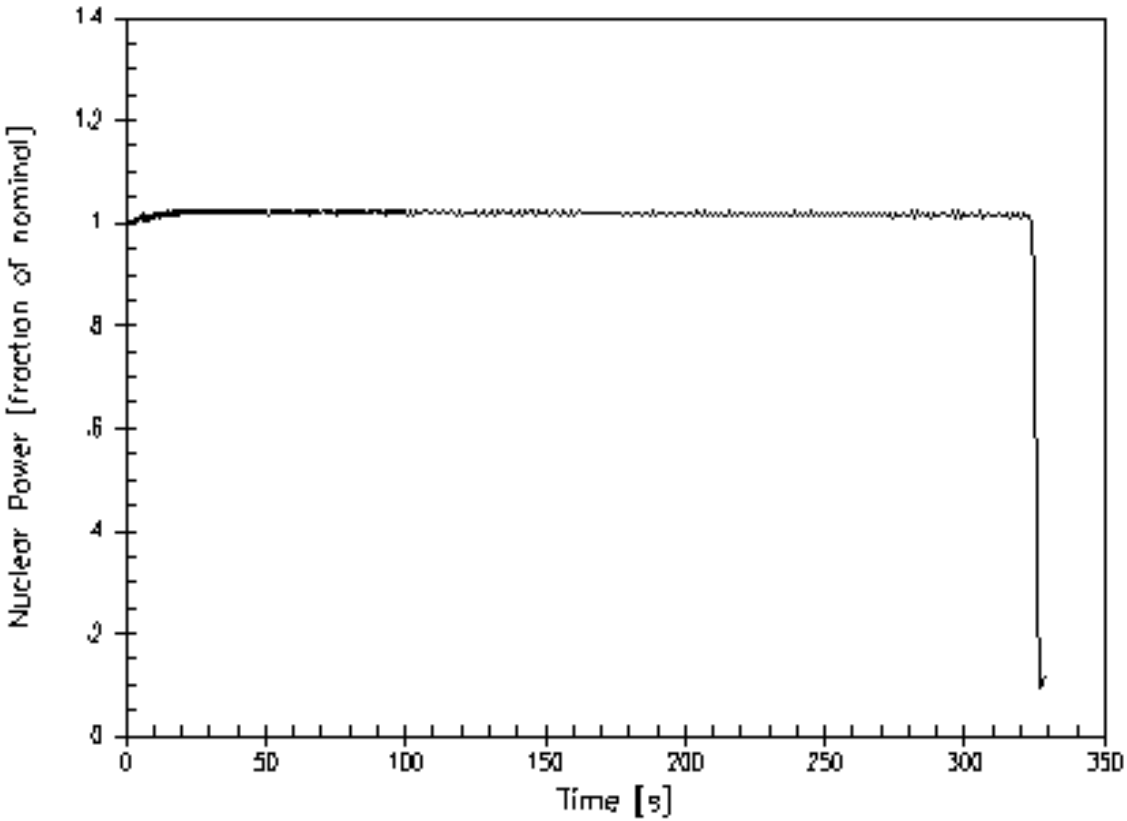
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		UFSAR Figure: 14.1.2-1	Sheet 1 of 1



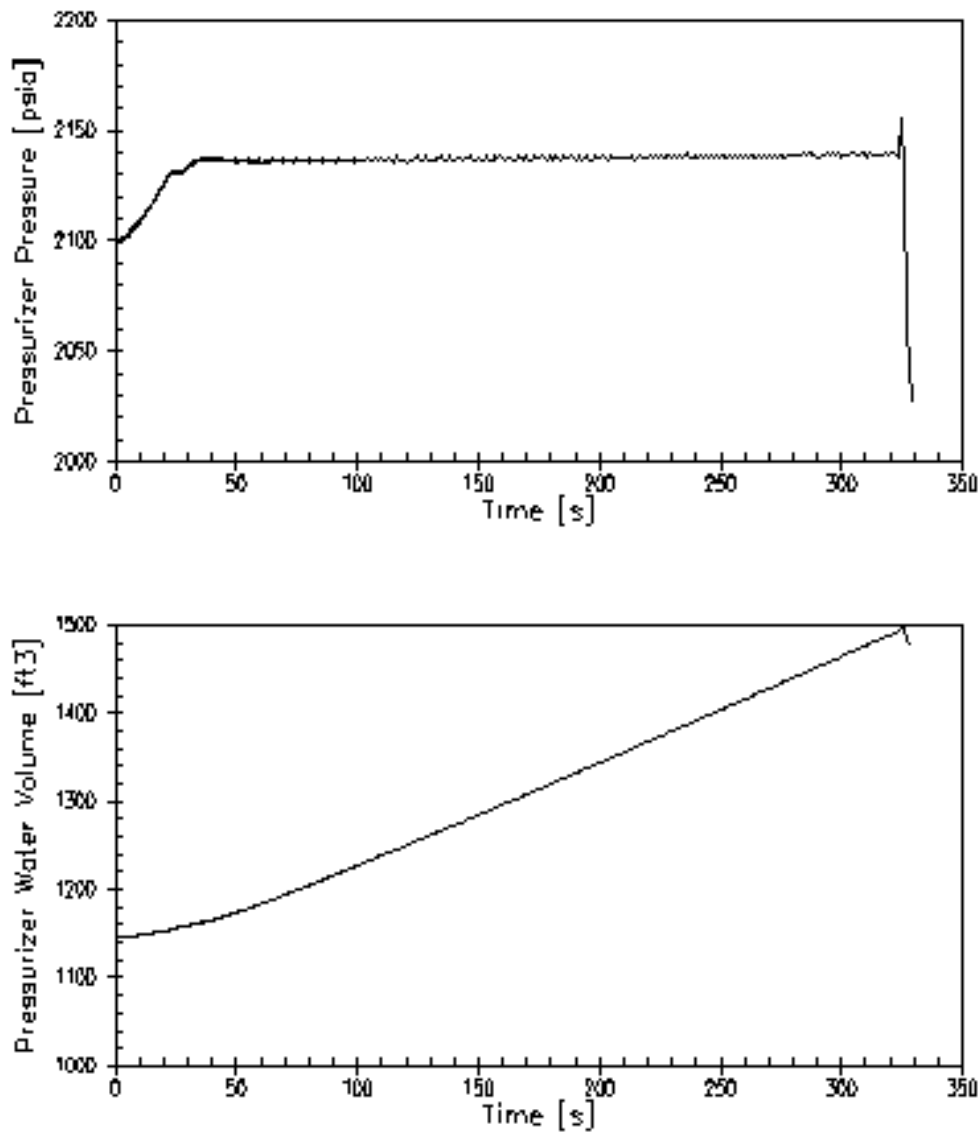
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		UFSAR Figure: 14.1.2-2	Sheet 1 of 1



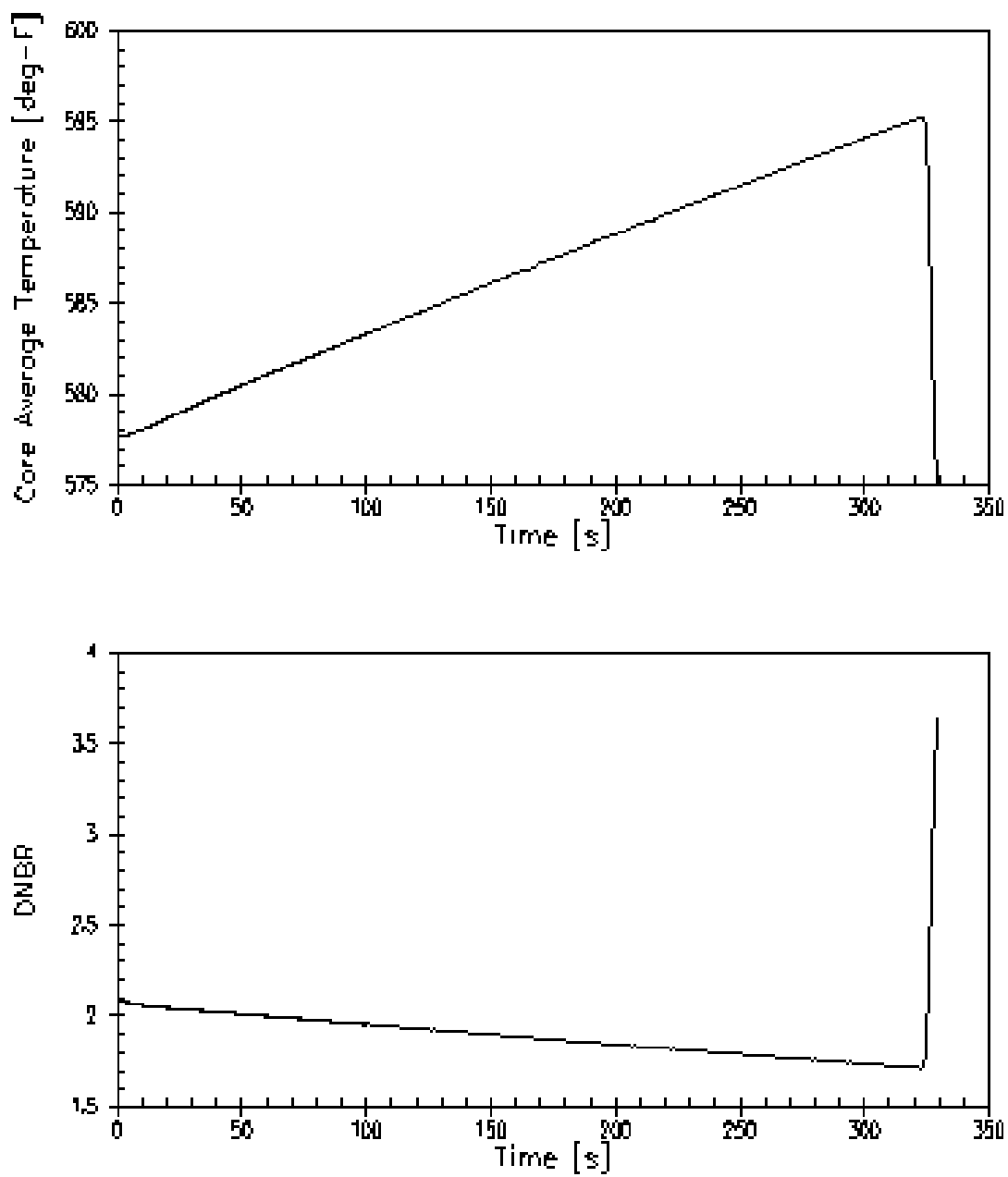
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		UFSAR Figure: 14.1.2-3	Sheet 1 of 1



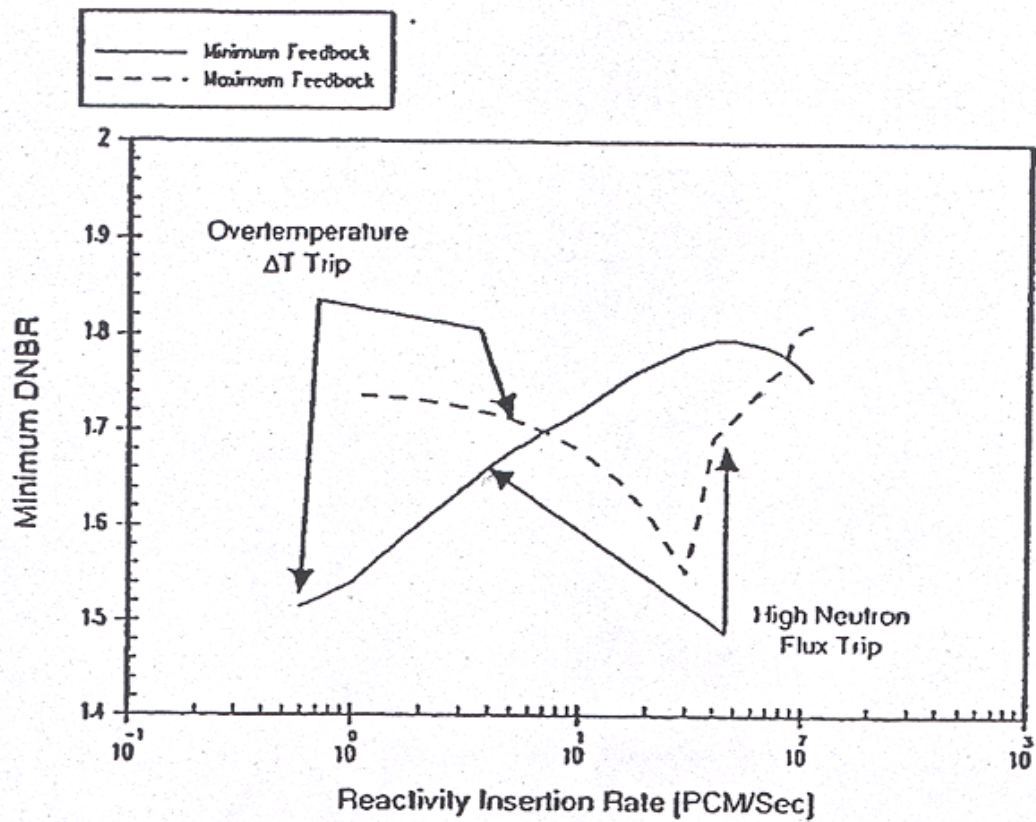
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		UFSAR Figure: 14.1.2-4	Sheet 1 of 1



Revision: 18.1		Change Description: UCR-1667	
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		UFSAR Figure: 14.1.2-5	Sheet 1 of 1



Revision: 18.1	Change Description: UCR-1667	
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Revision: **18.1**

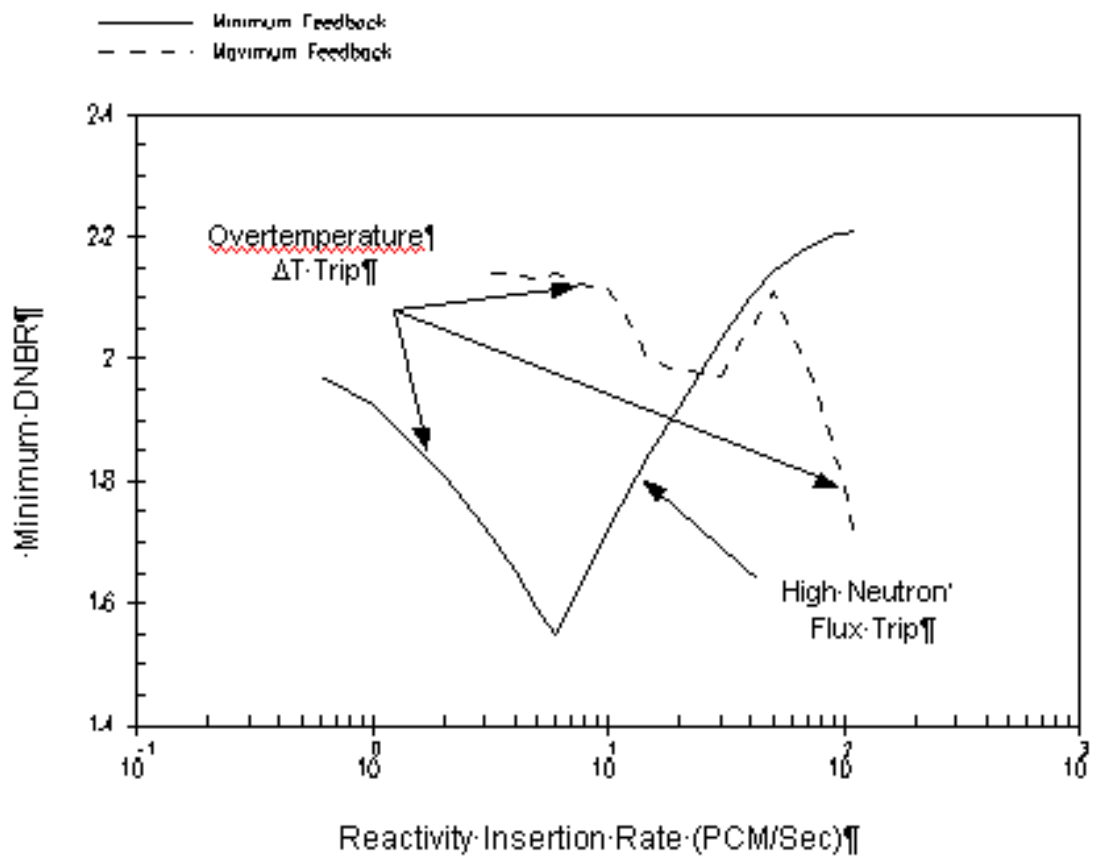
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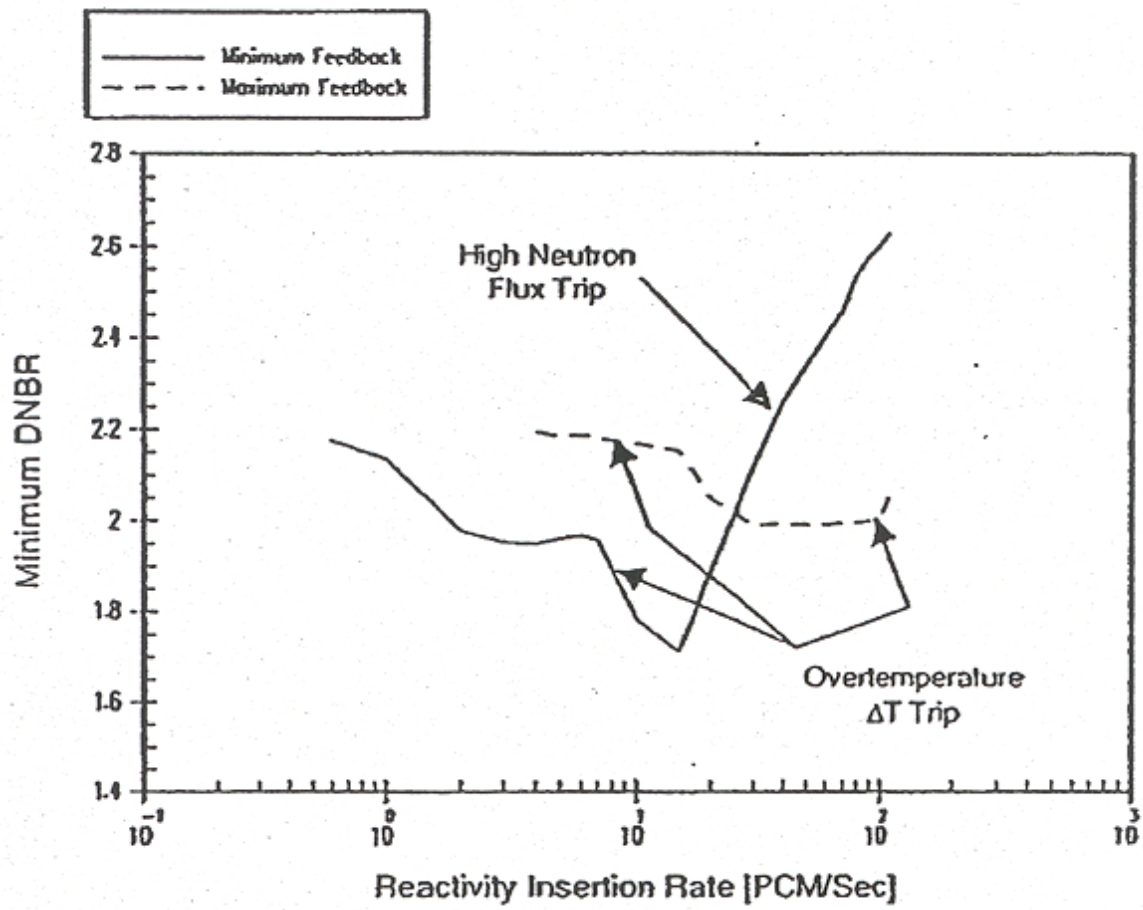
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RCCA Withdrawal At Power Event, 100% Power**

UFSAR Figure: **14.1.2-7**

Sheet 1 of 1



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	UFSAR Figure: 14.1.2-8	Sheet 1 of 1



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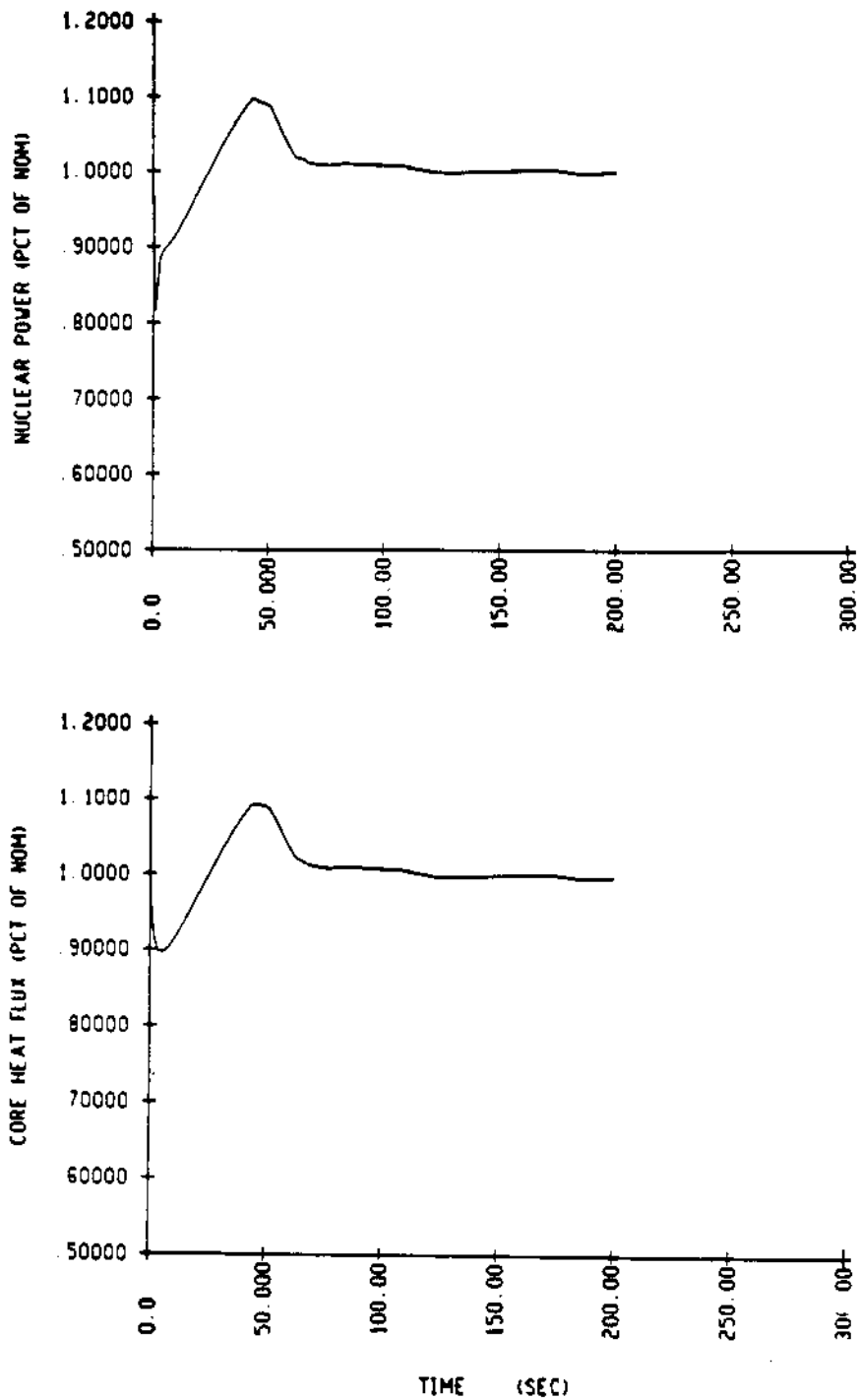


FIGURE 14.1.3-1

Nuclear Power and Core Heat Flux Versus Time
for a Typical Response to a Dropped
RCCA(s) in Automatic Control

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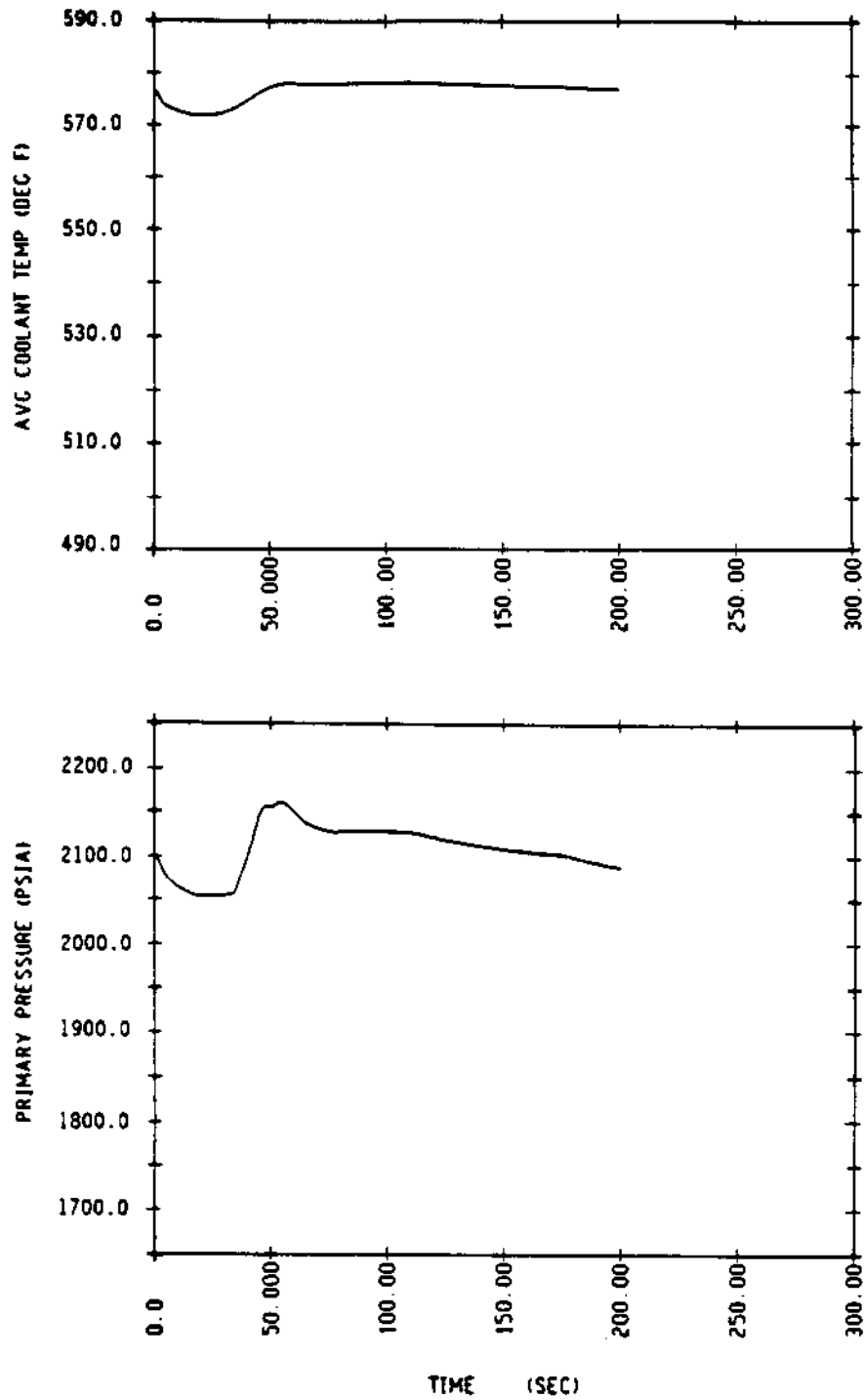
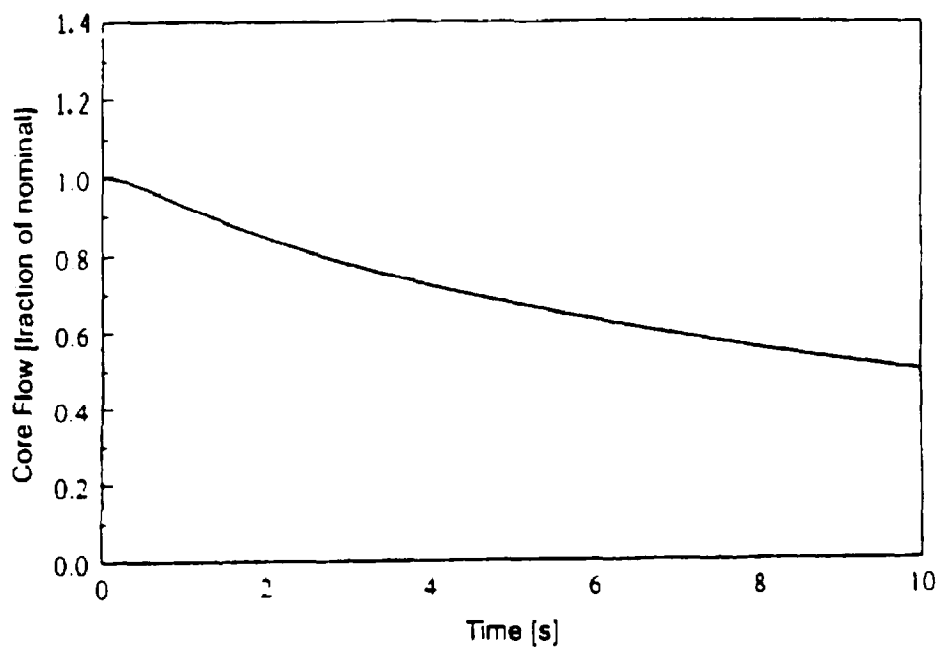
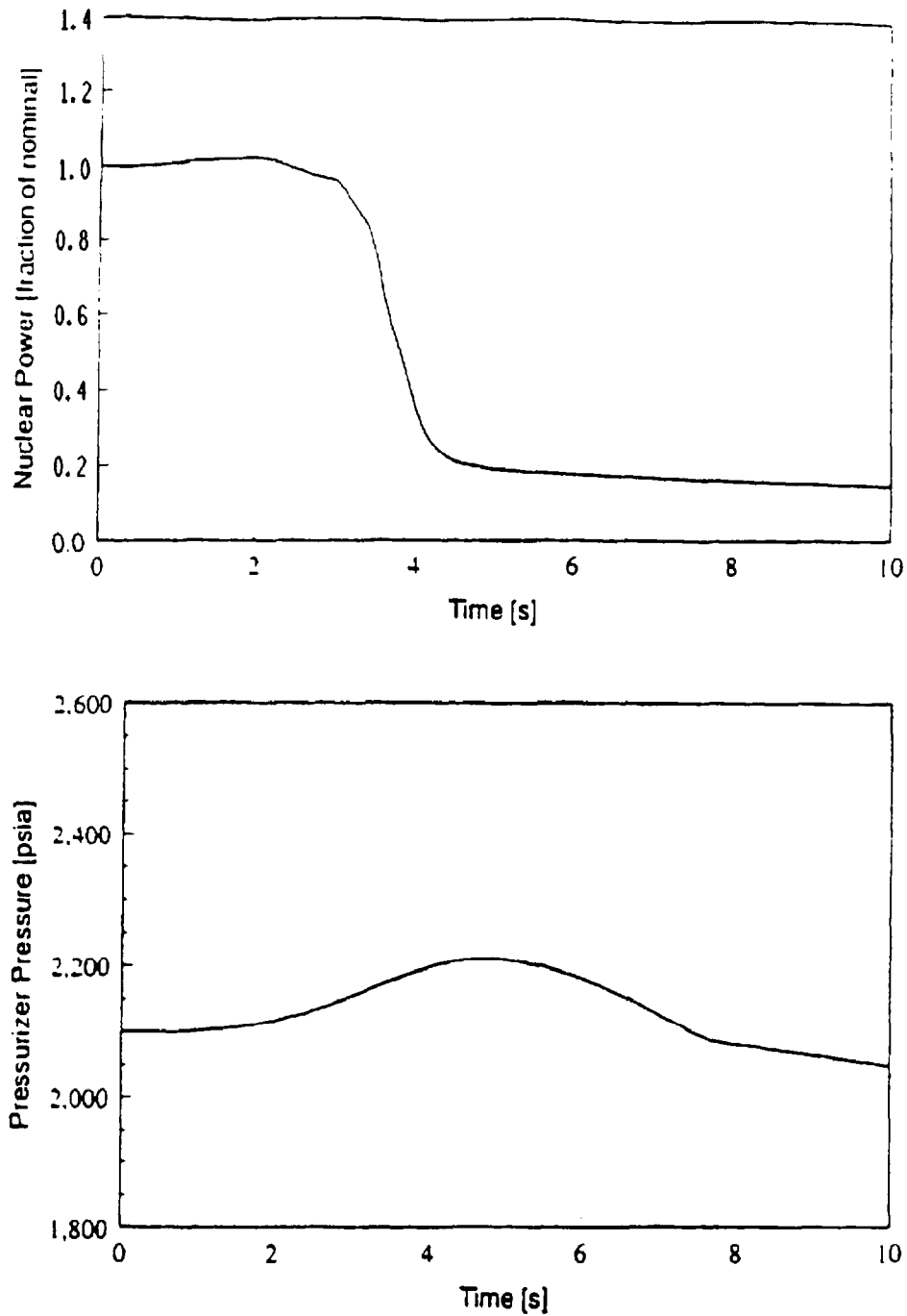


FIGURE 14.1.3-2 Average Coolant Temperature and Pressurizer Pressure Versus Time for a Typical Response to a Dropped RCCA(s) in Automatic Control



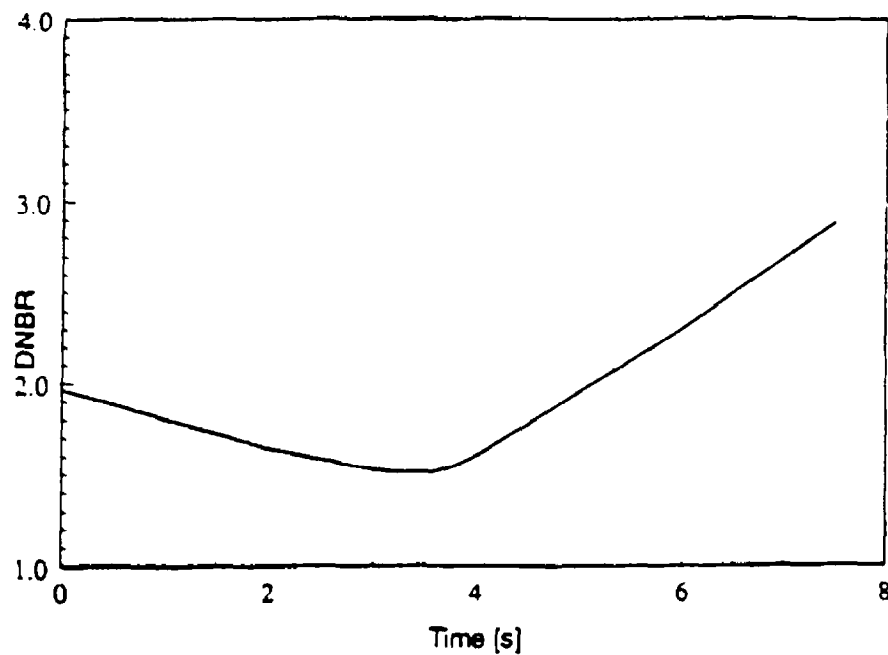
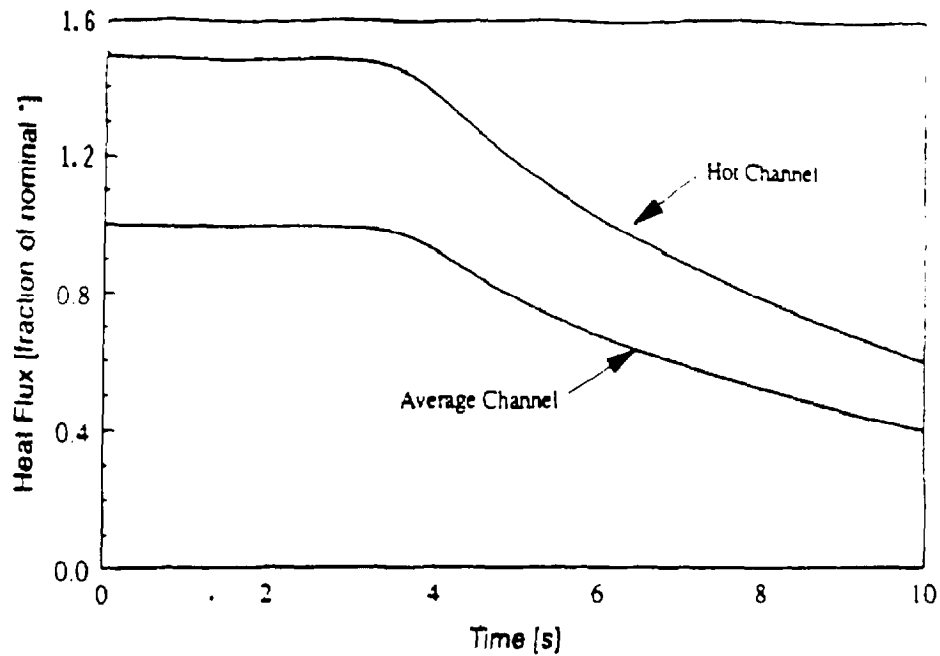
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FIGURE 14.1.6-1
Total Core Flow vs. Time for
The Complete Loss Of Flow Event



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FIGURE 14.1.6-2
Nuclear Power and Pressurizer Pressure vs. Time for
The Complete Loss Of Flow Event

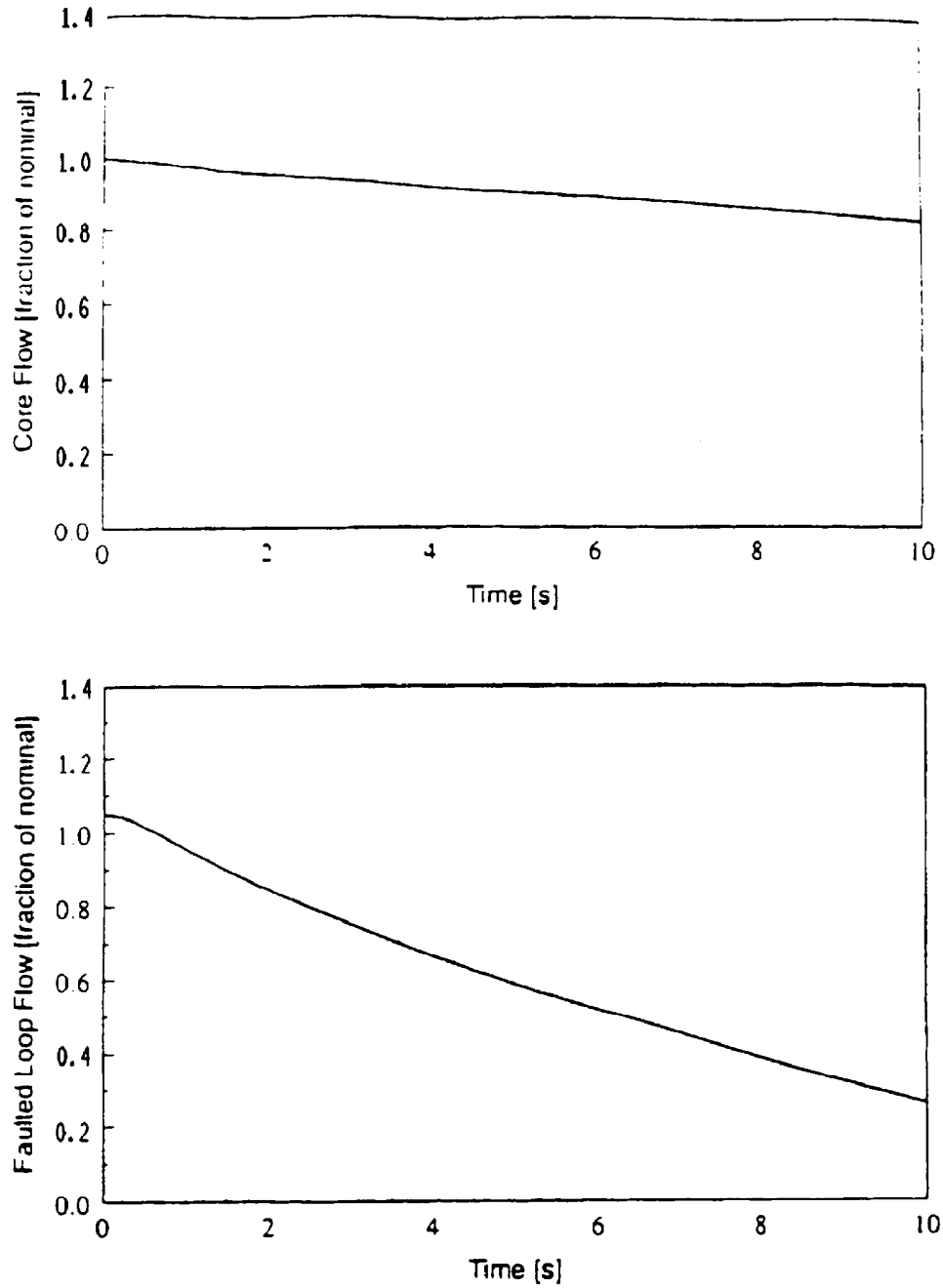


* Heat fluxes are shown as a fraction of the nominal average channel heat flux

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FIGURE 14.1.6-3

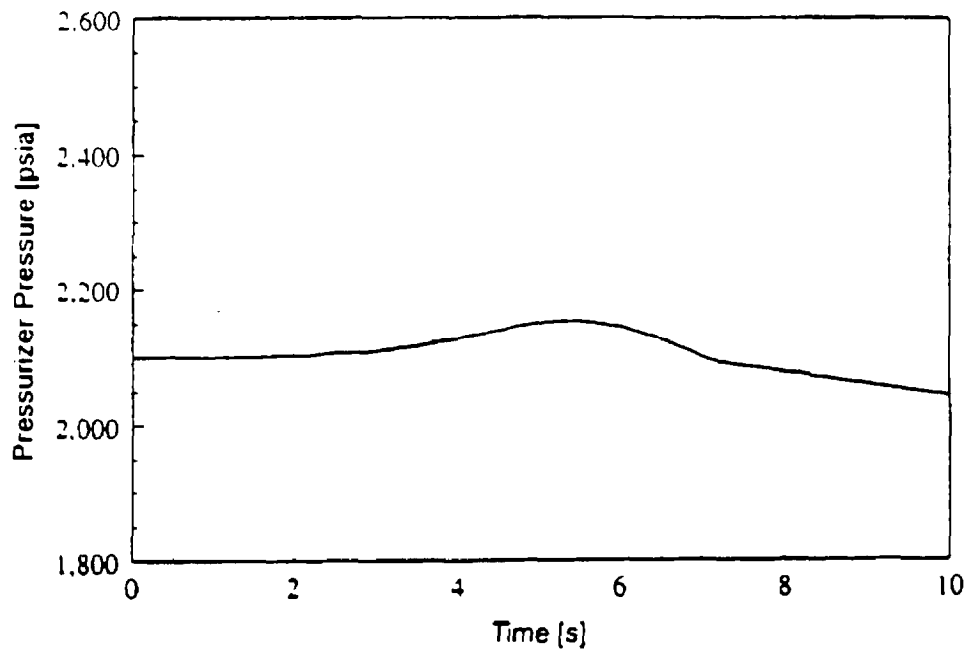
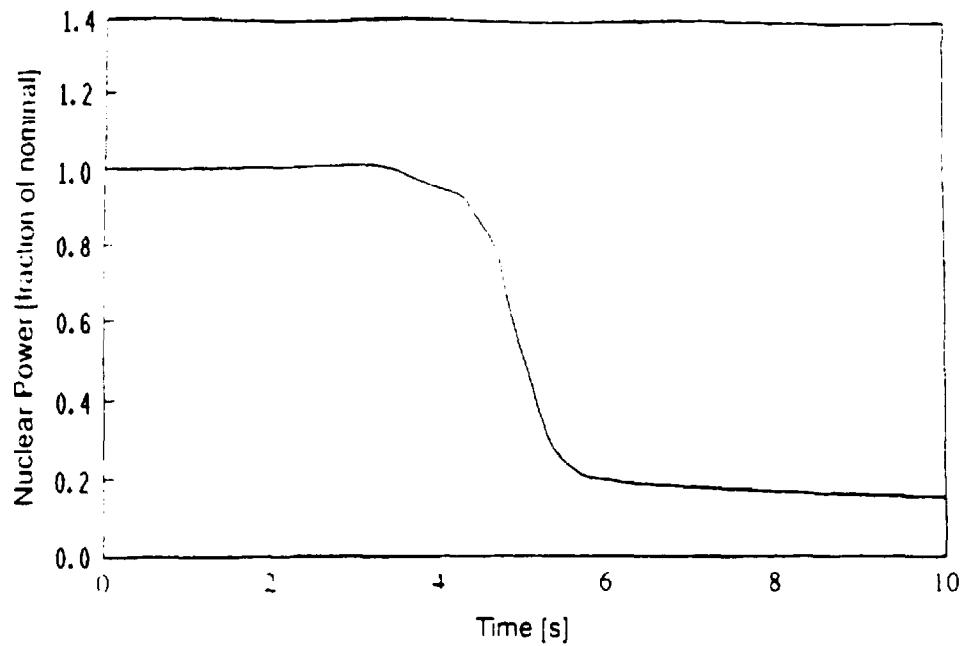
Average and Hot Channel Heat Fluxes and DNBR
vs. Time for the Complete Loss Of Flow Event



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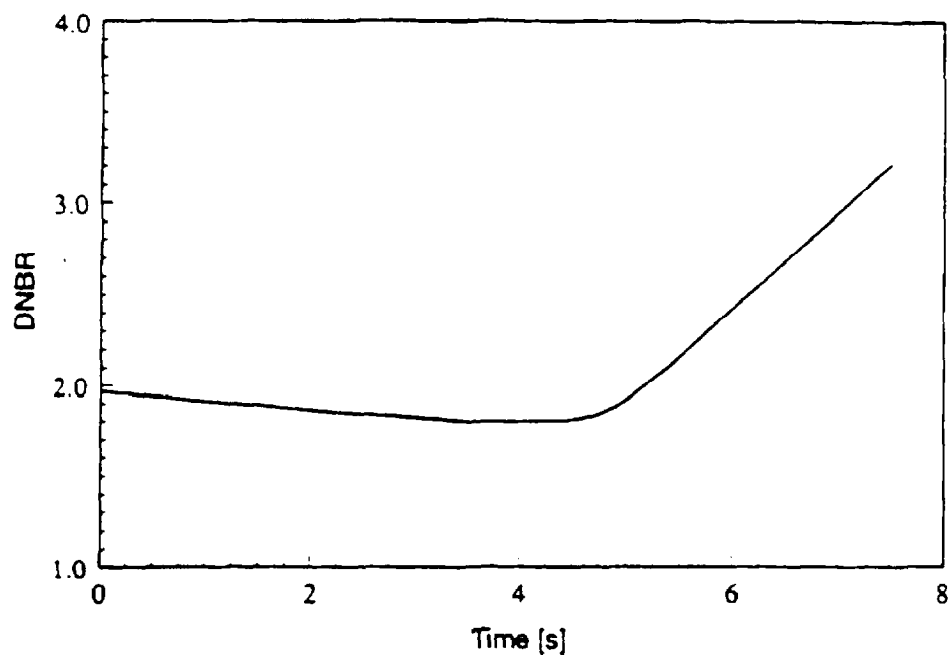
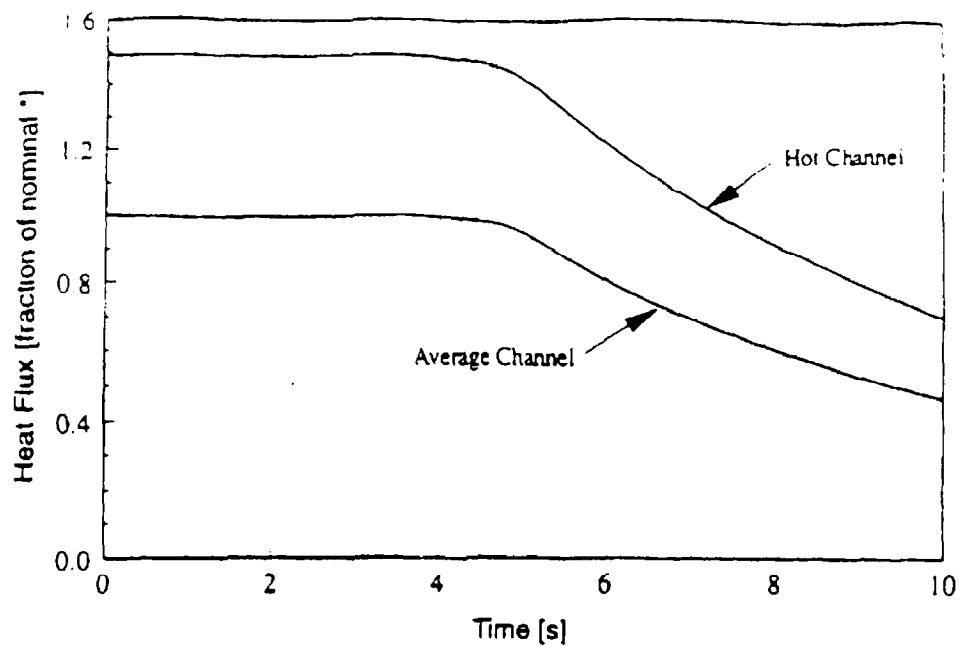
FIGURE 14.1.6-4
Total Core Flow and Faulted Loop Flow vs. Time for
The Partial Loss Of Flow Event

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UNIT 1

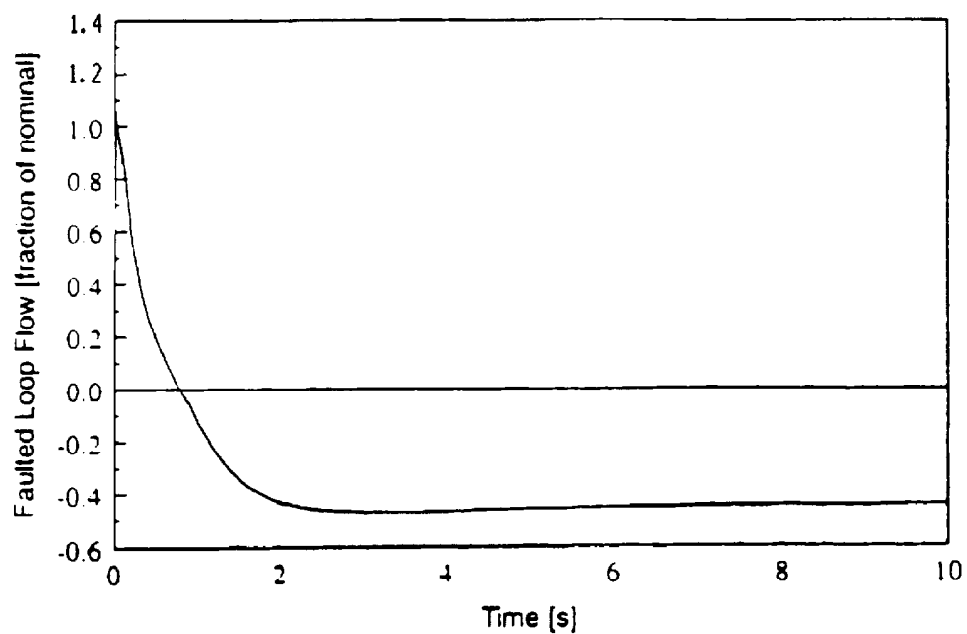
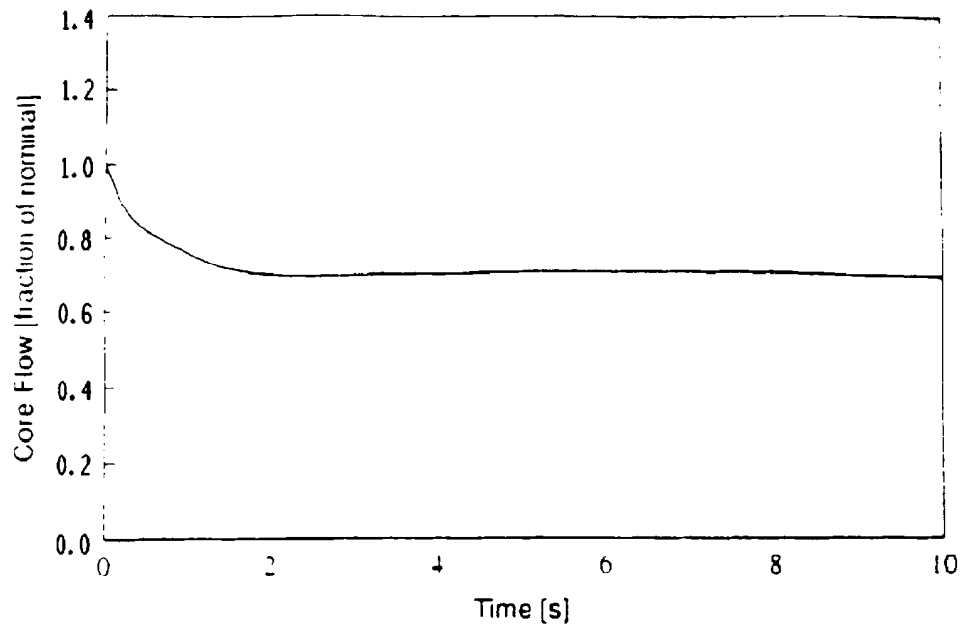
FIGURE 14.1.6-5
Nuclear Power and Pressurizer Pressure vs. Time for
The Partial Loss Of Flow Event



• Heat fluxes are shown as a fraction of the nominal average channel heat flux

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UNIT 1

FIGURE 14.1.6-6
Average and Hot Channel Heat Fluxes and DNBR
vs. Time for the Partial Loss Of Flow Event

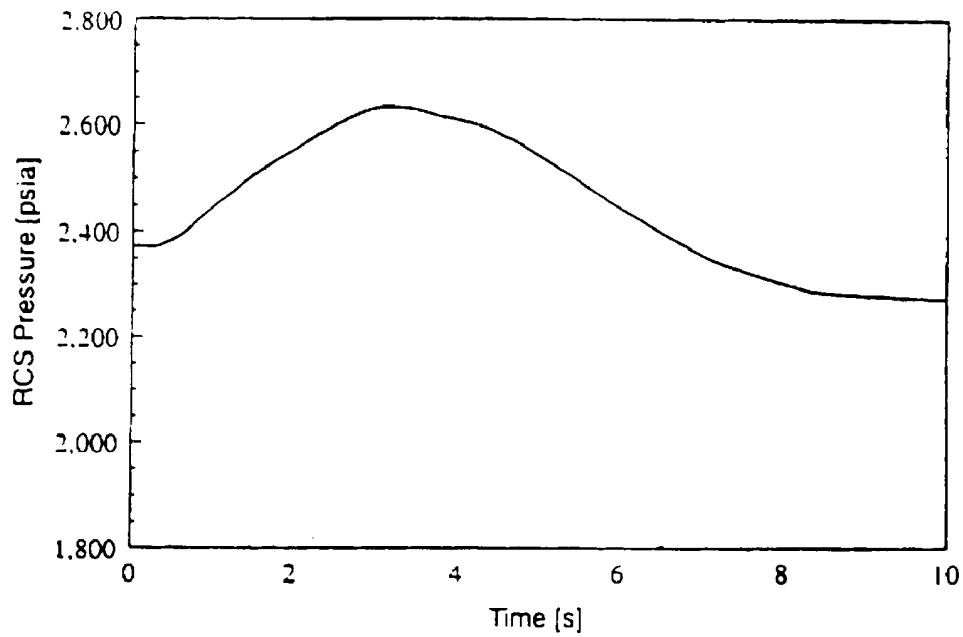
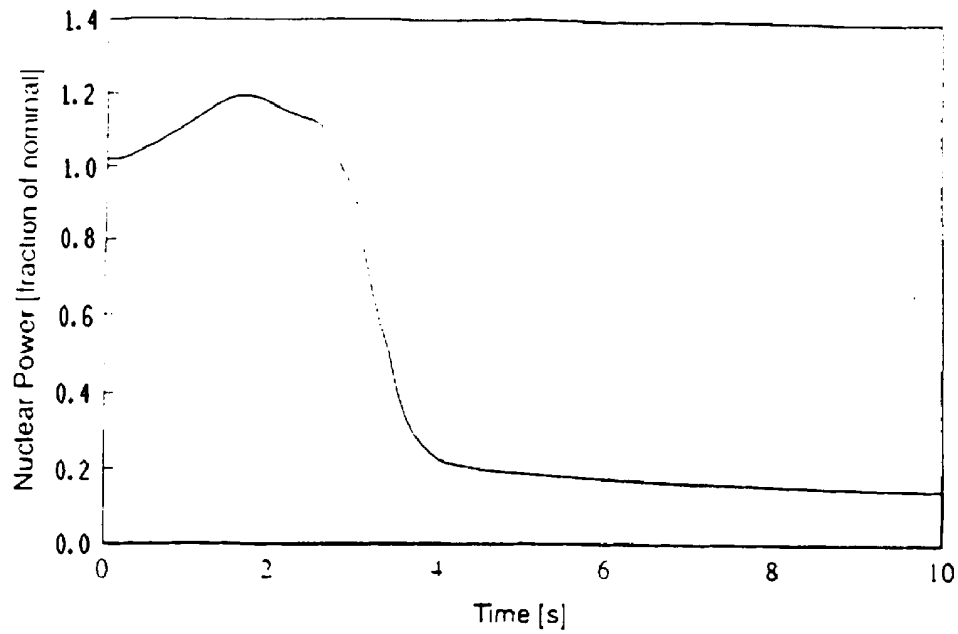


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FIGURE 14.1.6-7

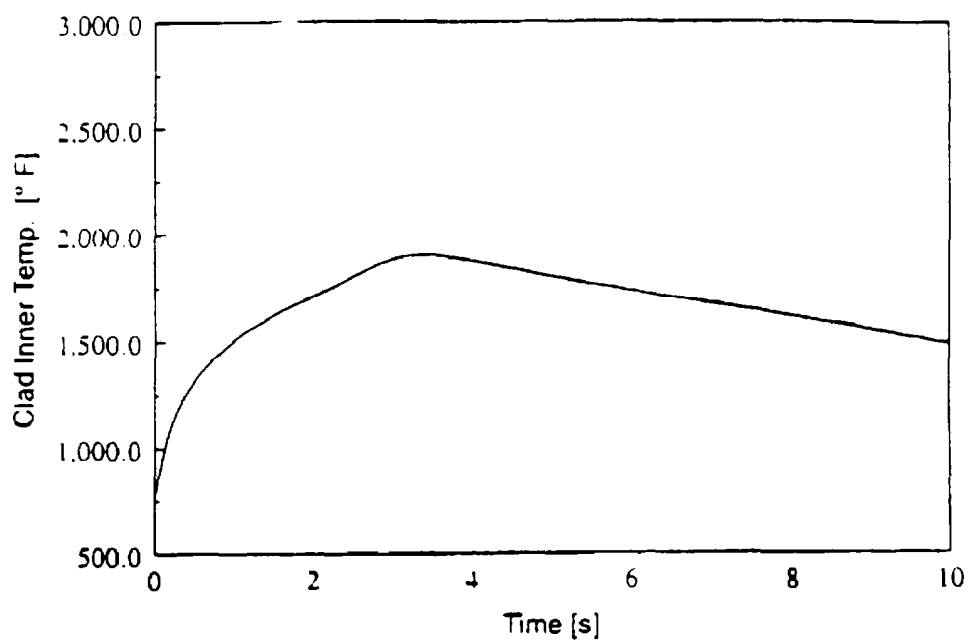
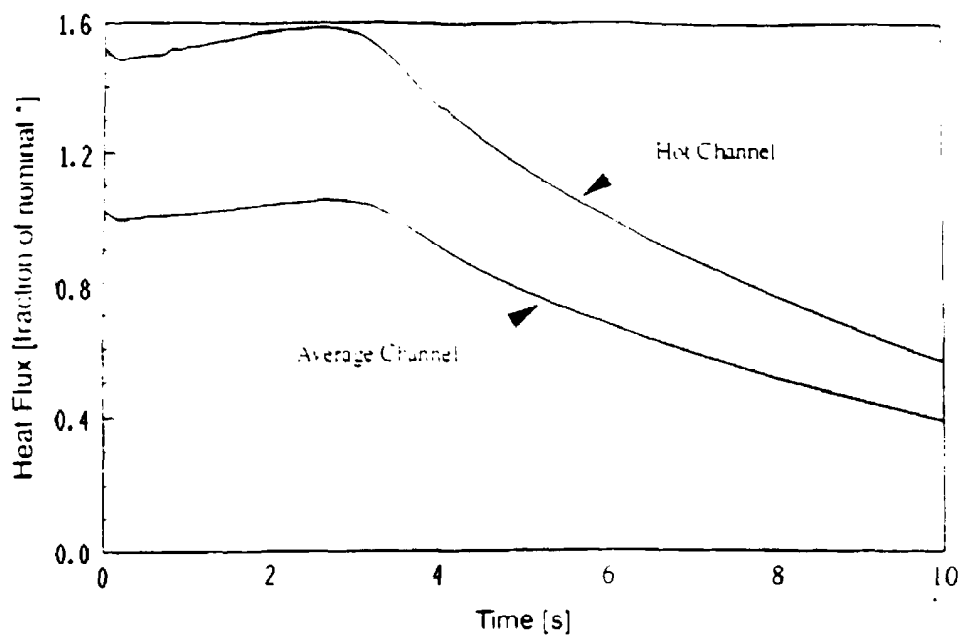
**Total Core Flow and Faulted Loop Flow vs. Time
For The Locked Rotor Event**

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FIGURE 14.1.6-8
Nuclear Power and RCS Pressure vs. Time
For The Locked Rotor Event

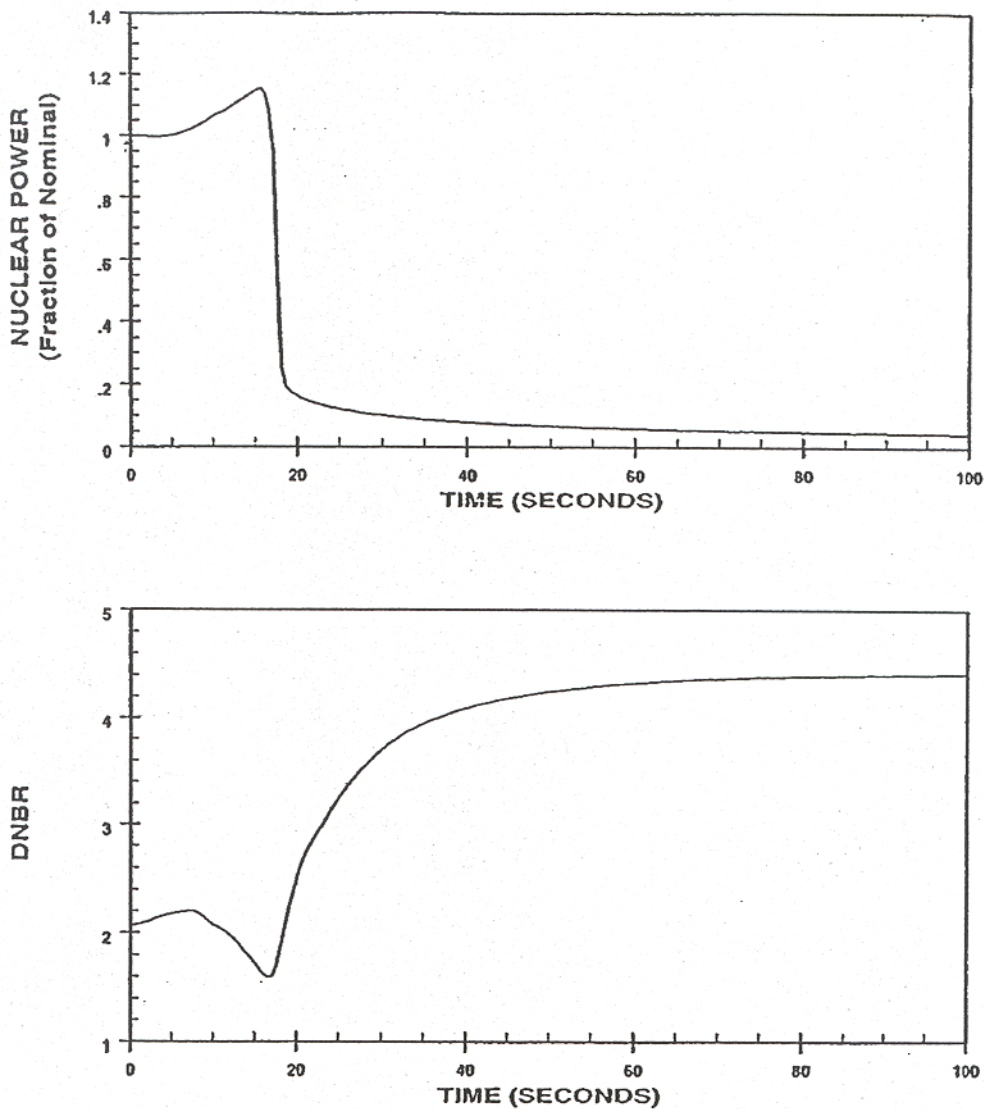


* Heat fluxes are shown as a fraction of the nominal average channel heat flux

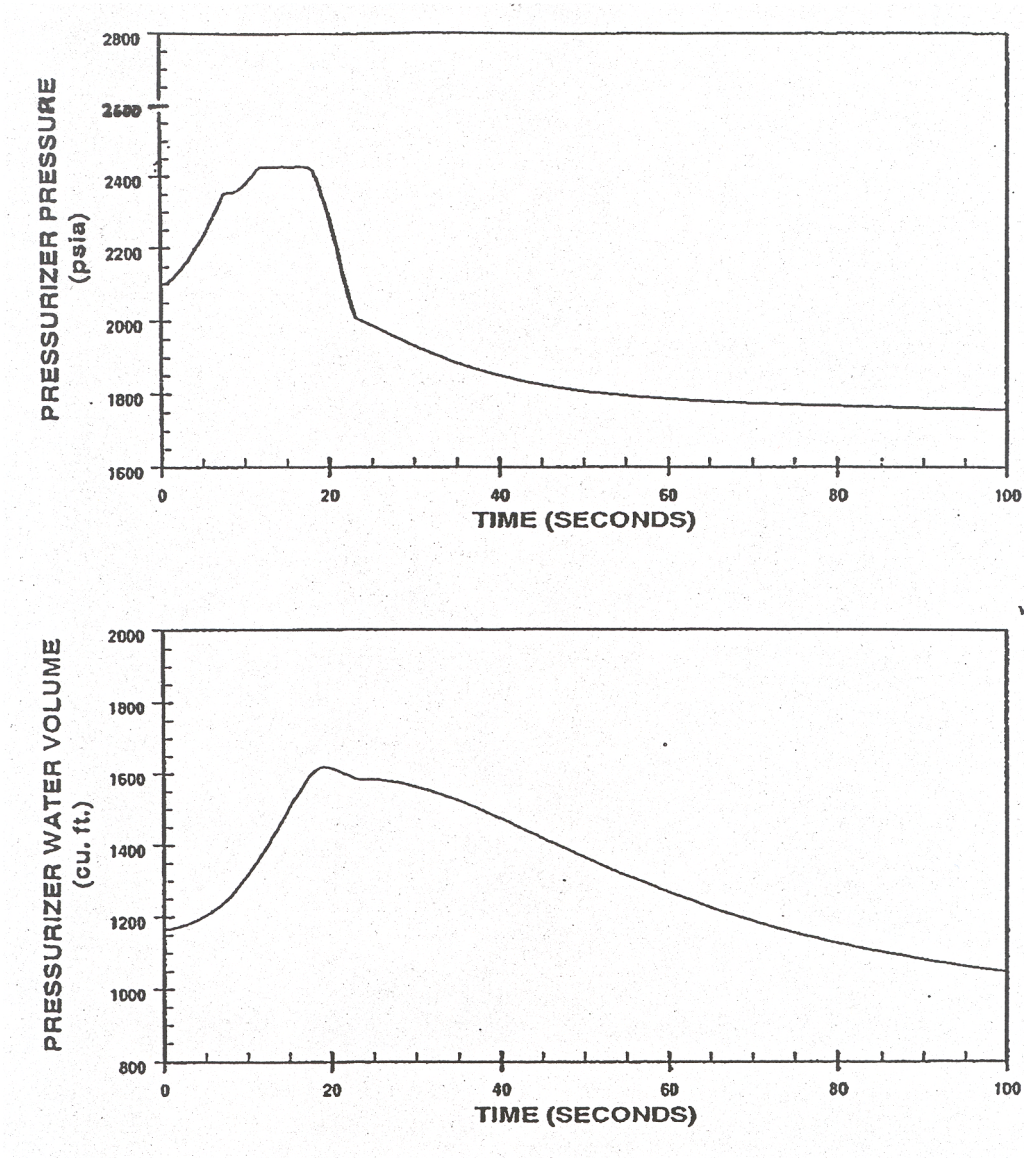
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FIGURE 14.1.6-9

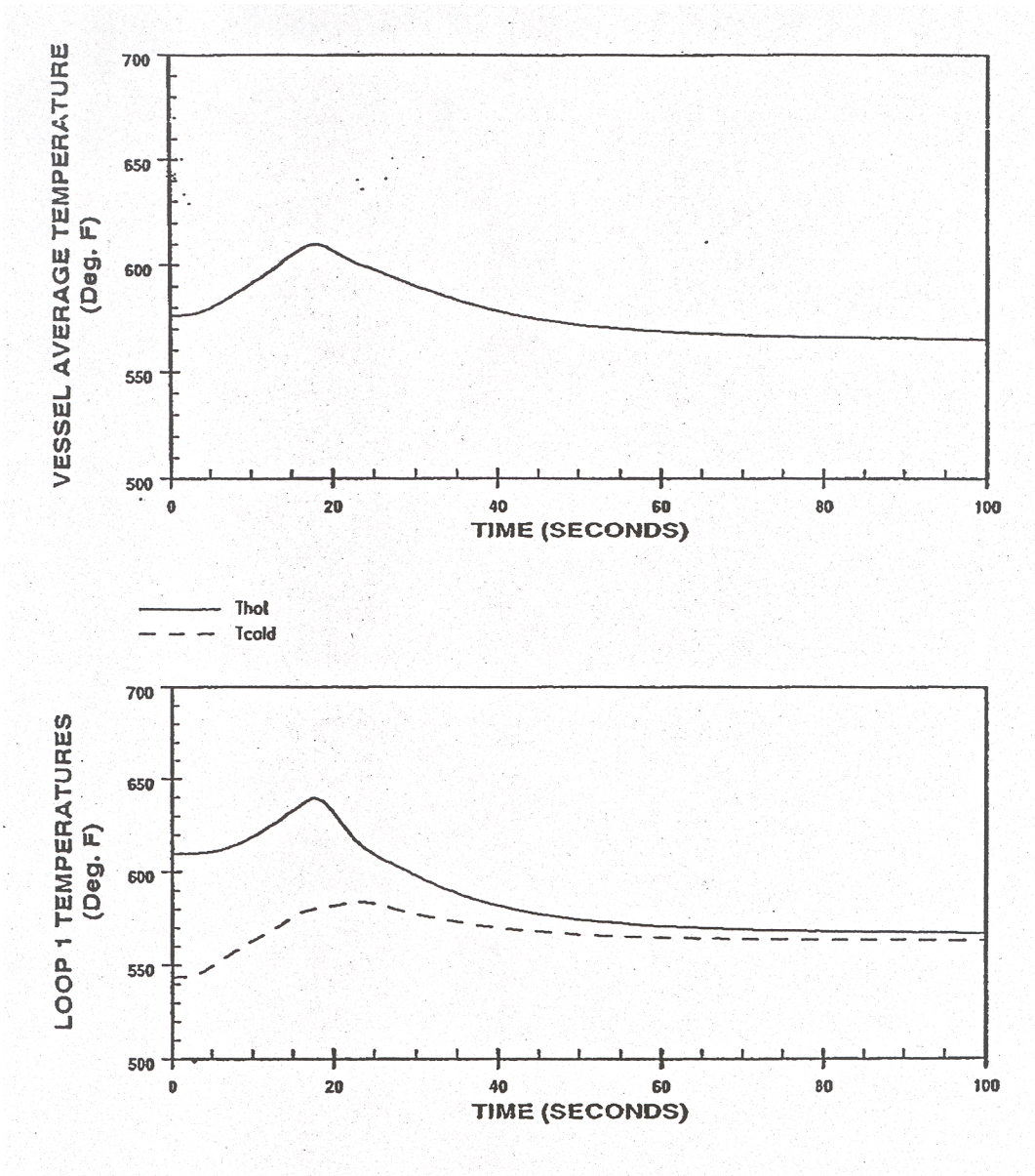
Average and Hot Channel Heat Fluxes vs. Time and
Clad Inner Temperature vs. Time
For The Locked Rotor Event



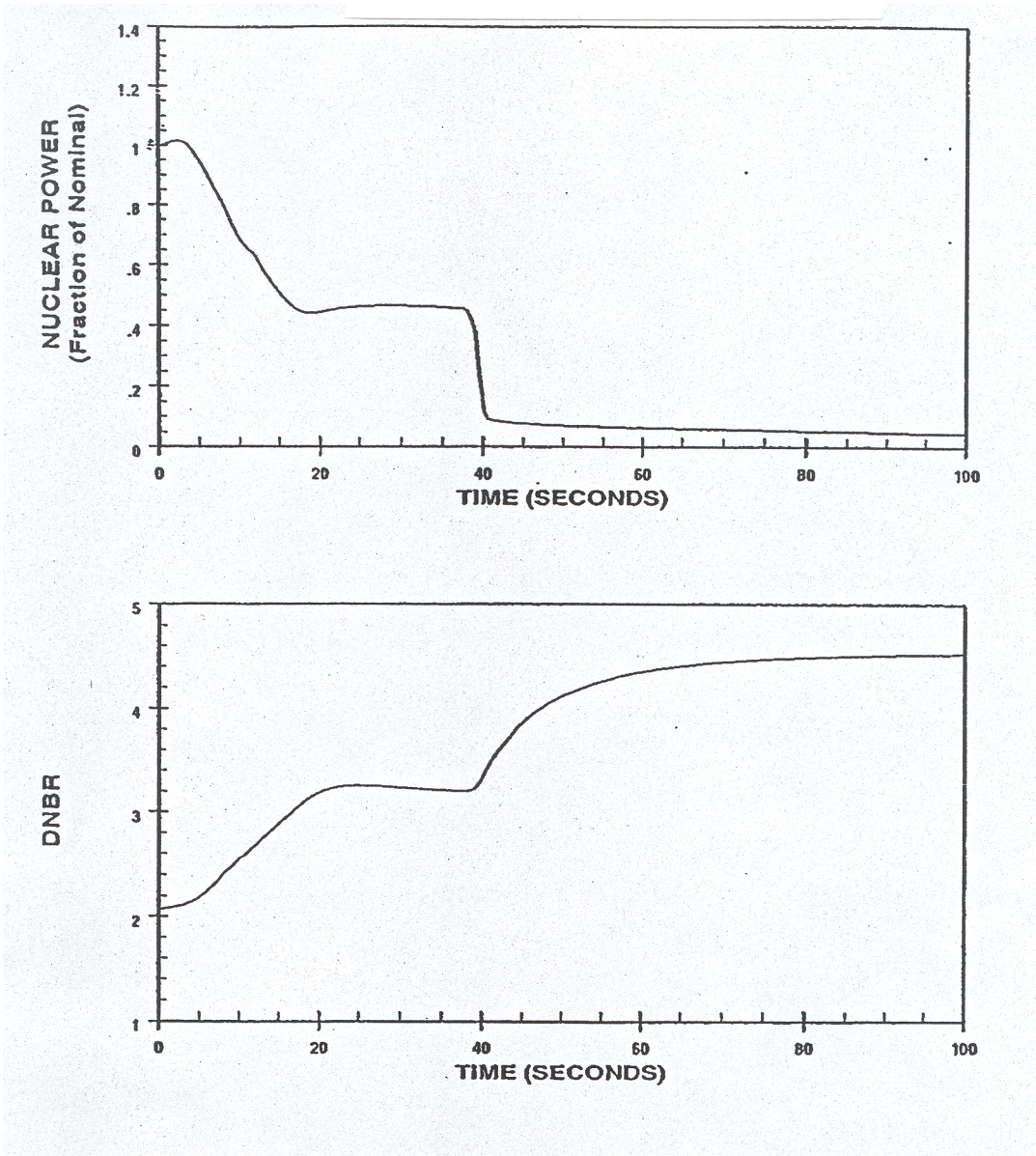
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AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN		Title: Nuclear Power and DNBR vs. Time For Loss of Load, Minimum Reactivity Feedback With Pressurizer Spray and PORVs	
		UFSAR Figure: 14.1.8-1	Sheet 1 of 1



Revision: 18.1	Change Description: UCR-1667	
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	Title: Pressurizer Pressure and Pressurizer Water Volume vs. Time For Loss of Load, Minimum Reactivity Feedback With Pressurizer Spray and PORVS	
	UFSAR Figure: 14.1.8-2	Sheet 1 of 1



Revision: 18.1		Change Description: UCR-1667	
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN		Title: Vessel Average and Loop 1 Temperatures vs. Time For Loss of Load, Minimum Reactivity Feedback With Pressurizer Spray and PORVs	
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Revision: **18.1**

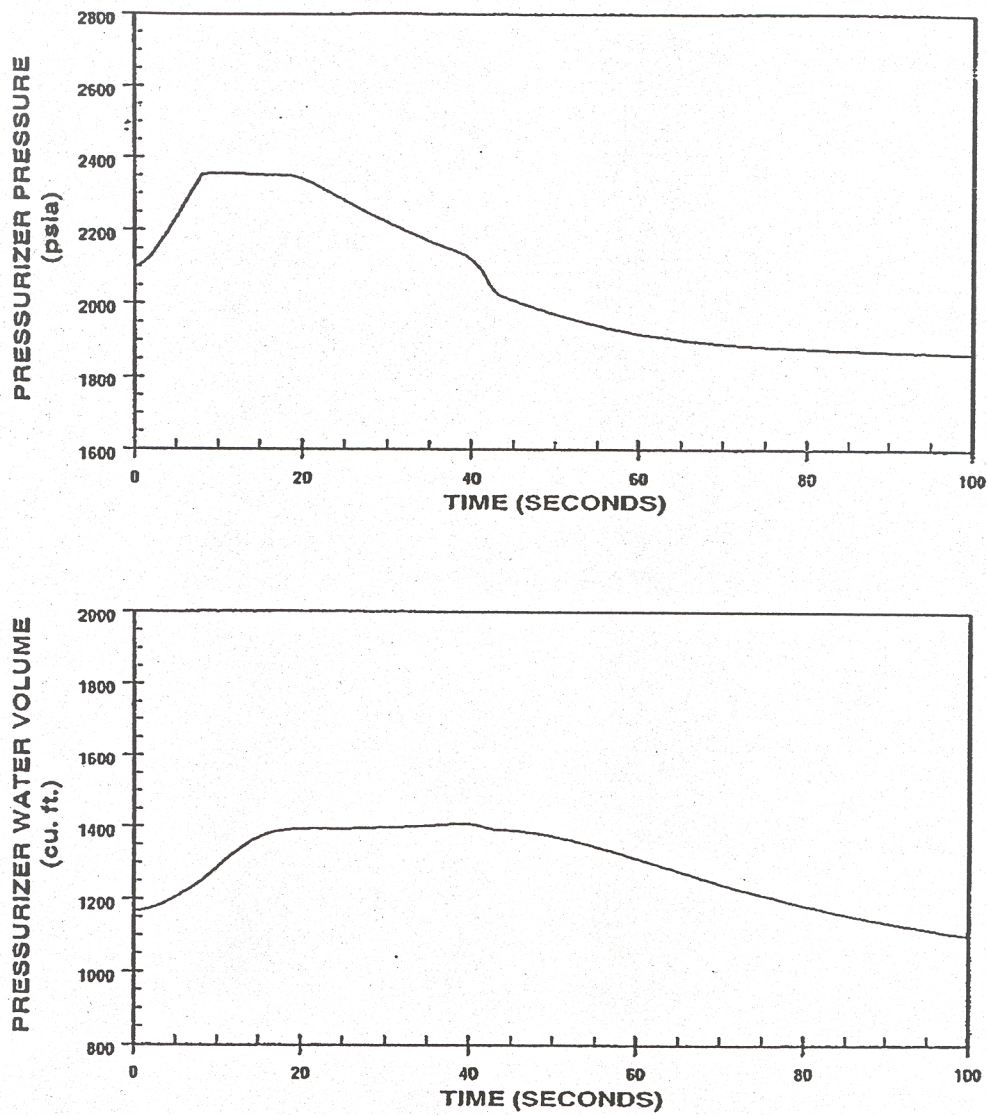
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**AMERICAN ELECTRIC POWER
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NUCLEAR GENERATION GROUP
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Title: **Nuclear Power and DNBR vs. Time For Loss of Load,
Maximum Reactivity Feedback With Pressurizer
Spray and PORVs**

UFSAR Figure: **14.1.8-4**

Sheet 1 of 1



Revision: **18.1**

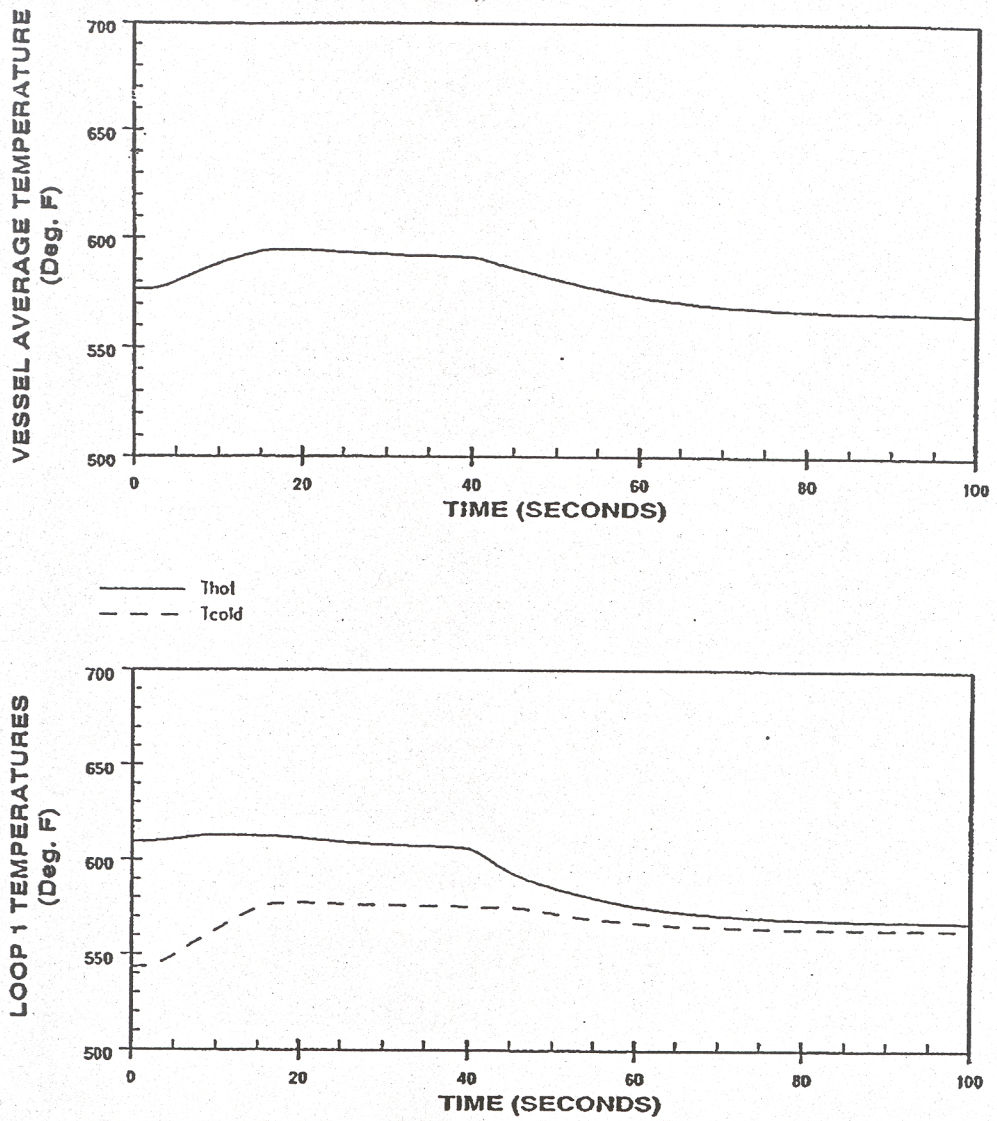
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**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **Pressurizer Pressure and Pressurizer Water Volume
vs. Time For Loss of Load, Maximum Reactivity
Feedback With Pressurizer Spray and PORVs**

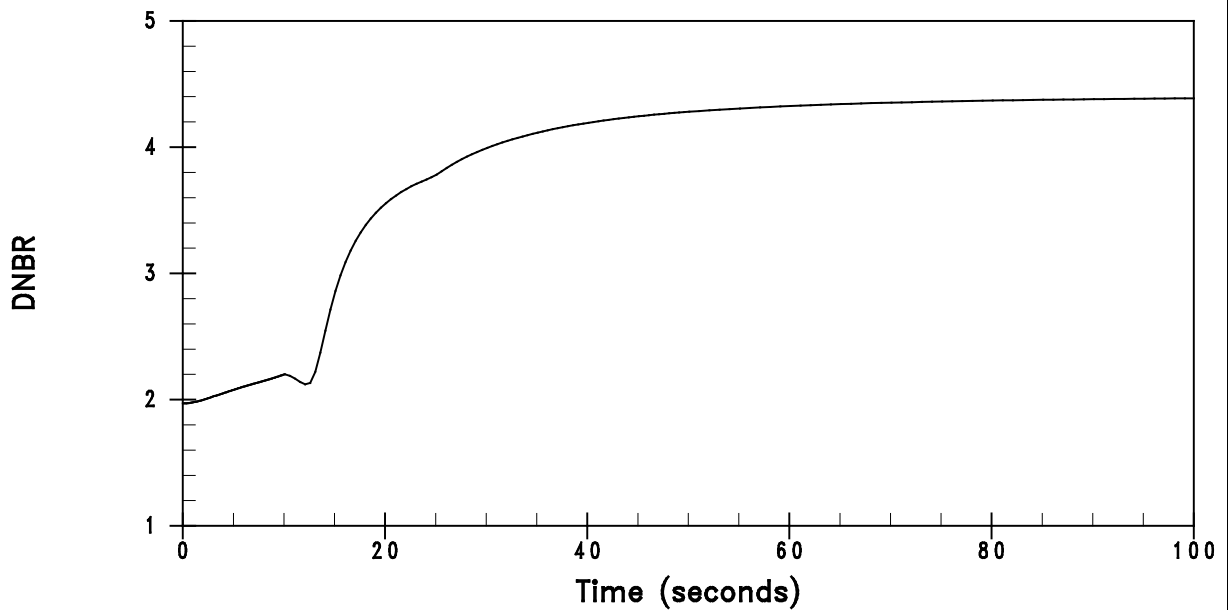
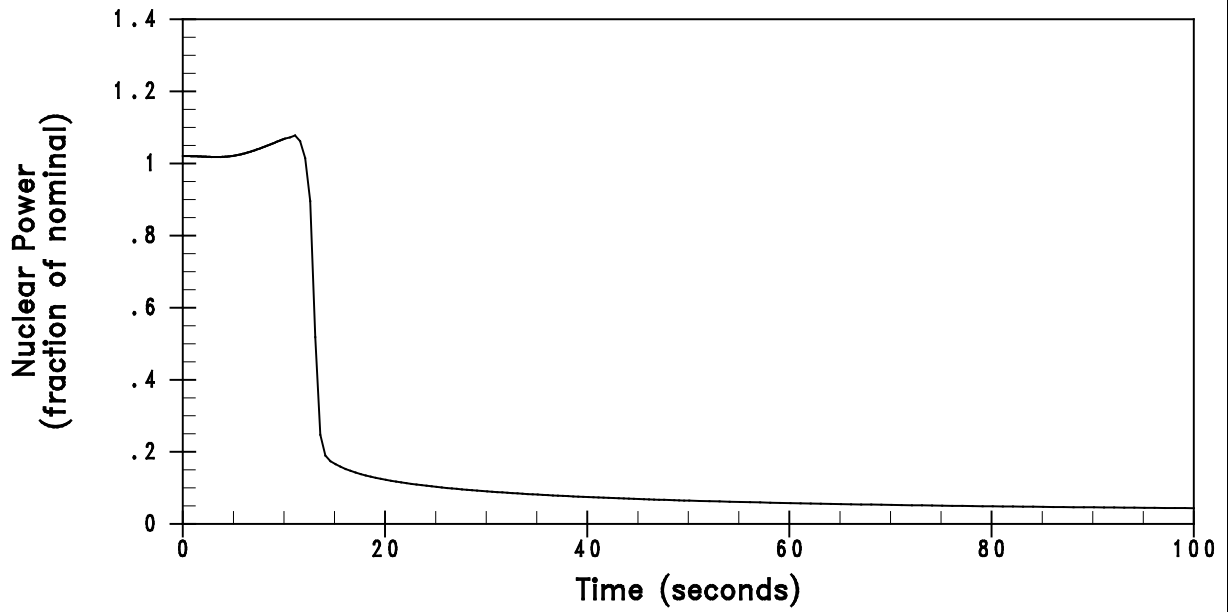
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Sheet 1 of 1




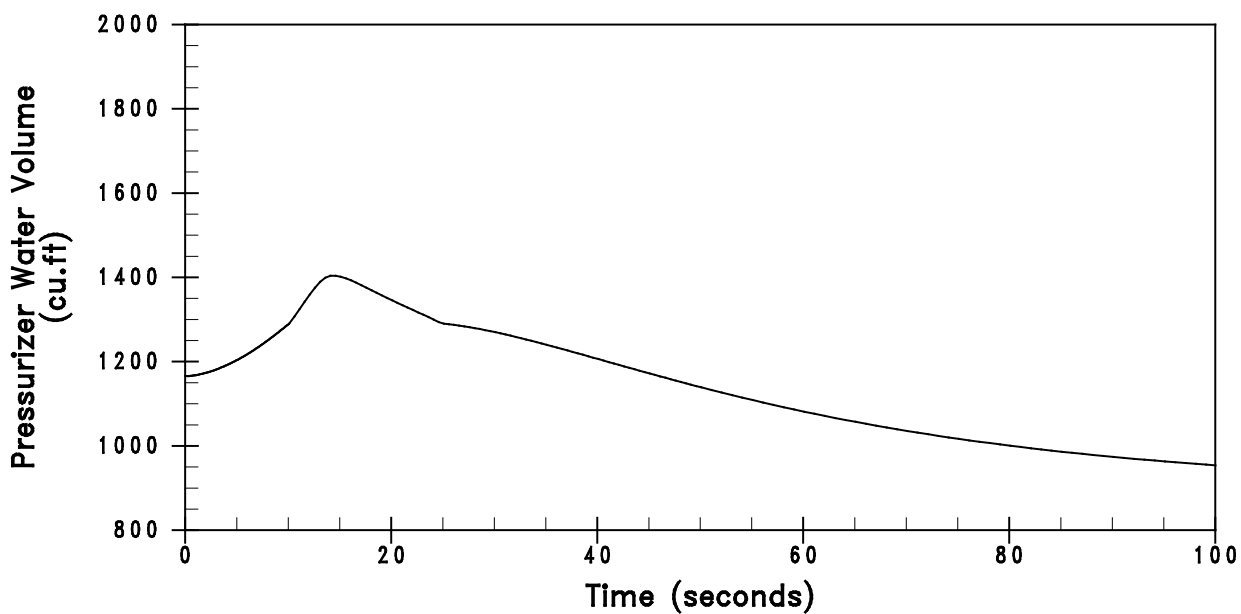
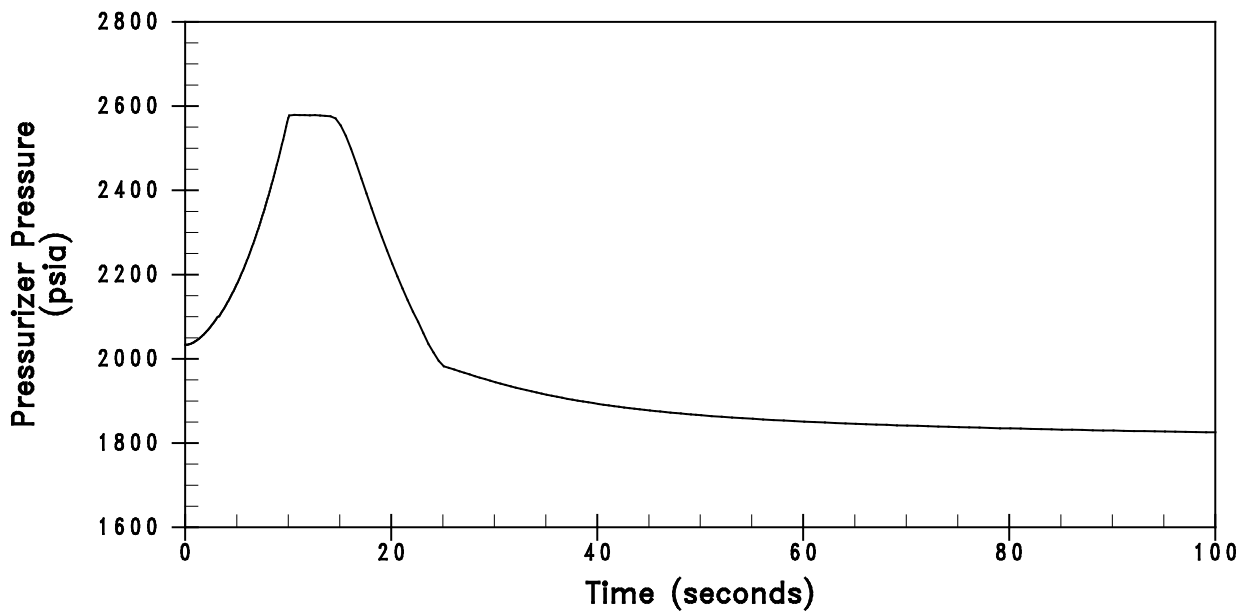
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	UFSAR Figure: 14.1.8-6		Sheet 1 of 1

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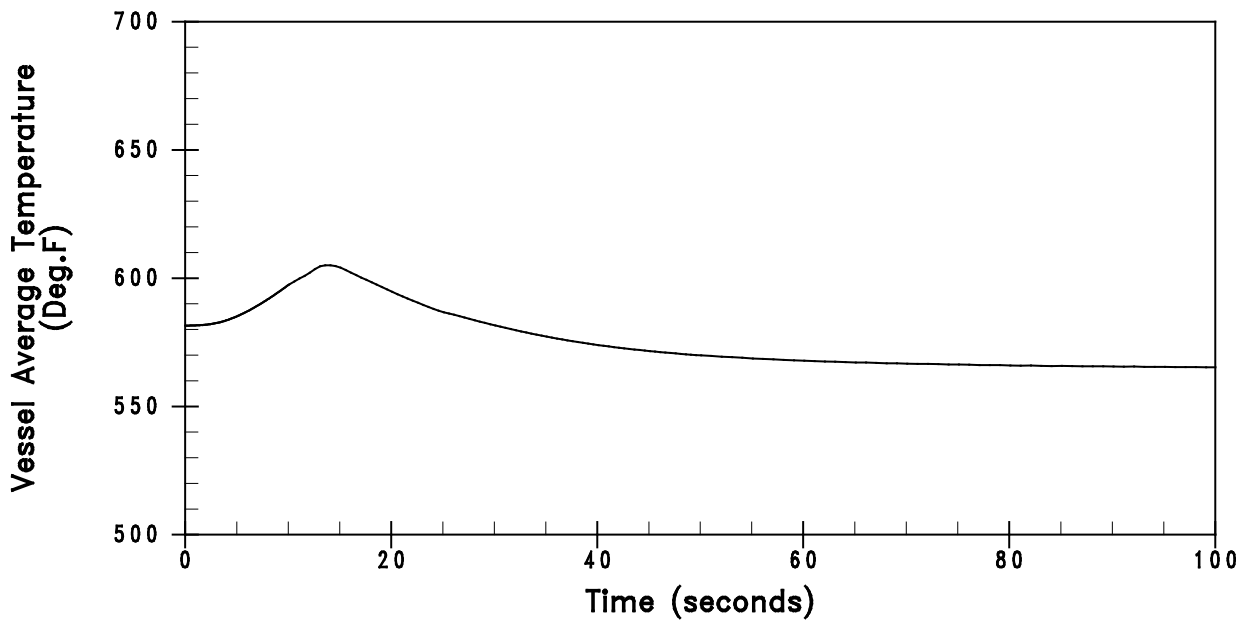
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16.6	Revised per 99-UFSAR-1540		
REV.	Description		
Revision			
 <i>An AEP Company</i>	Title: Nuclear Power and DNBR vs. Time For Loss of Load, Minimum Reactivity Feedback Without Pressurizer Spray and PORVs		
	DWG. NO. UFSAR FIG 14.1.8-7		SH 1 of 1

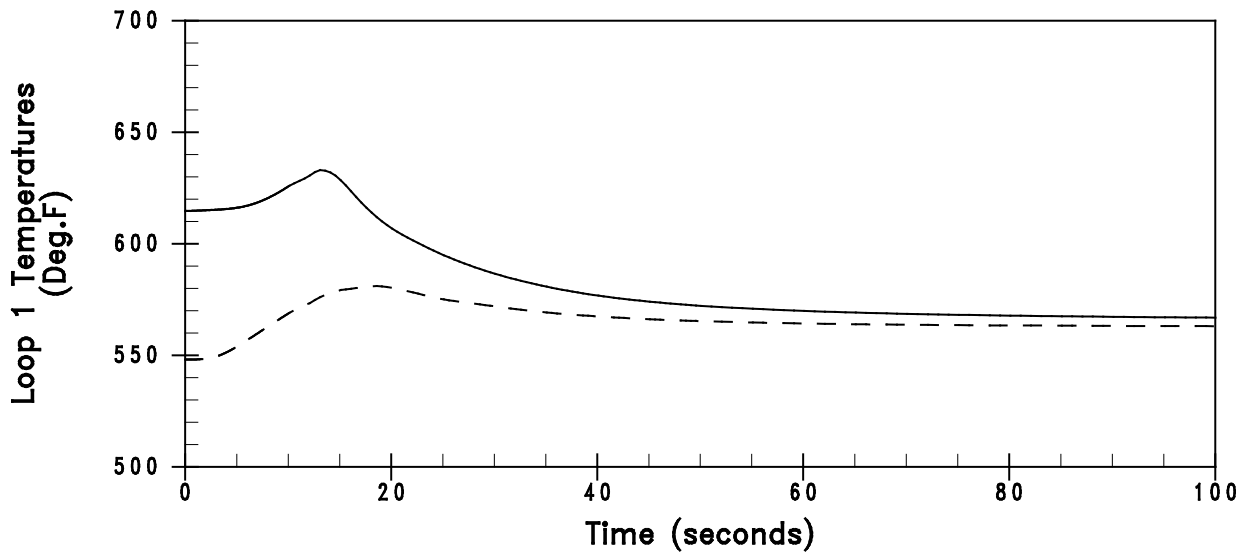


UNIT 1


16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Pressurizer Pressure and Pressurizer Volume vs. Time For Loss of Load, Minimum Reactivity Feedback Without Pressurizer Spray and PORVs		
	DWG. NO. UFSAR FIG 14.1.8-8		SH 1 of 1

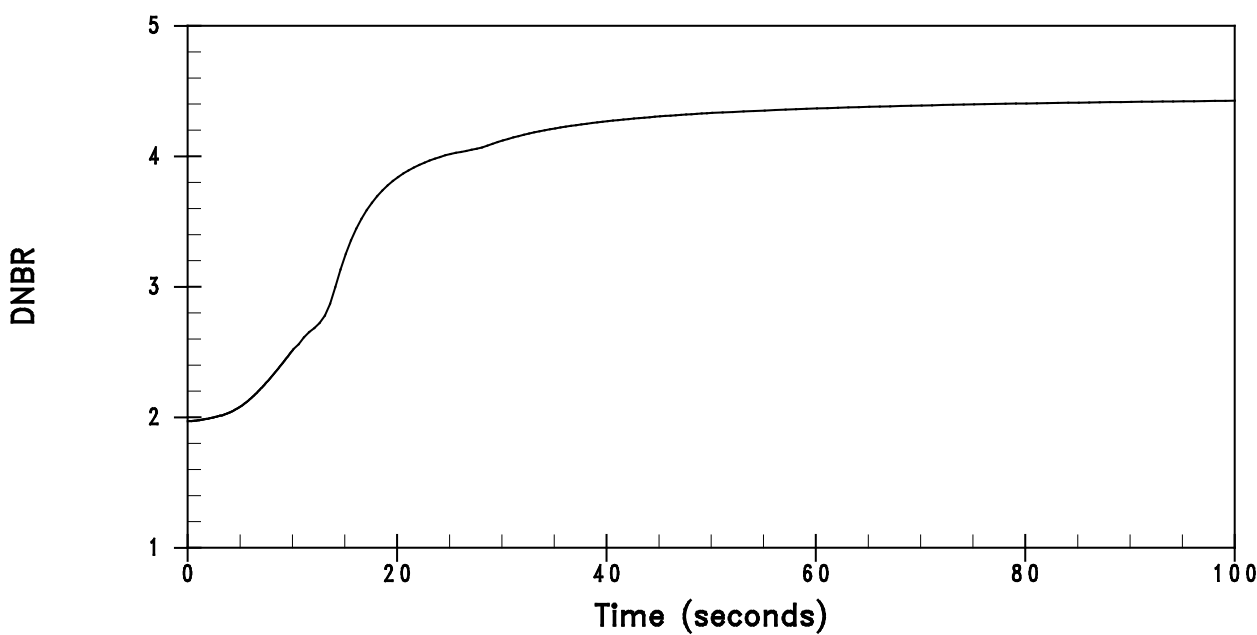
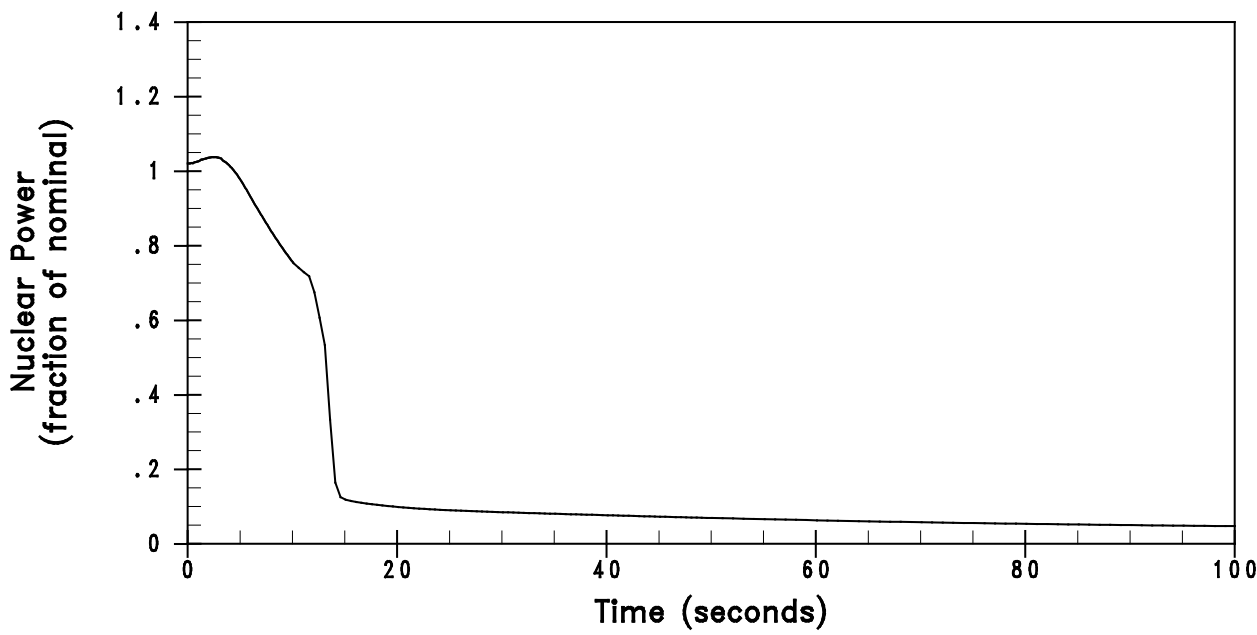


— T_{hot}
- - - T_{cold}




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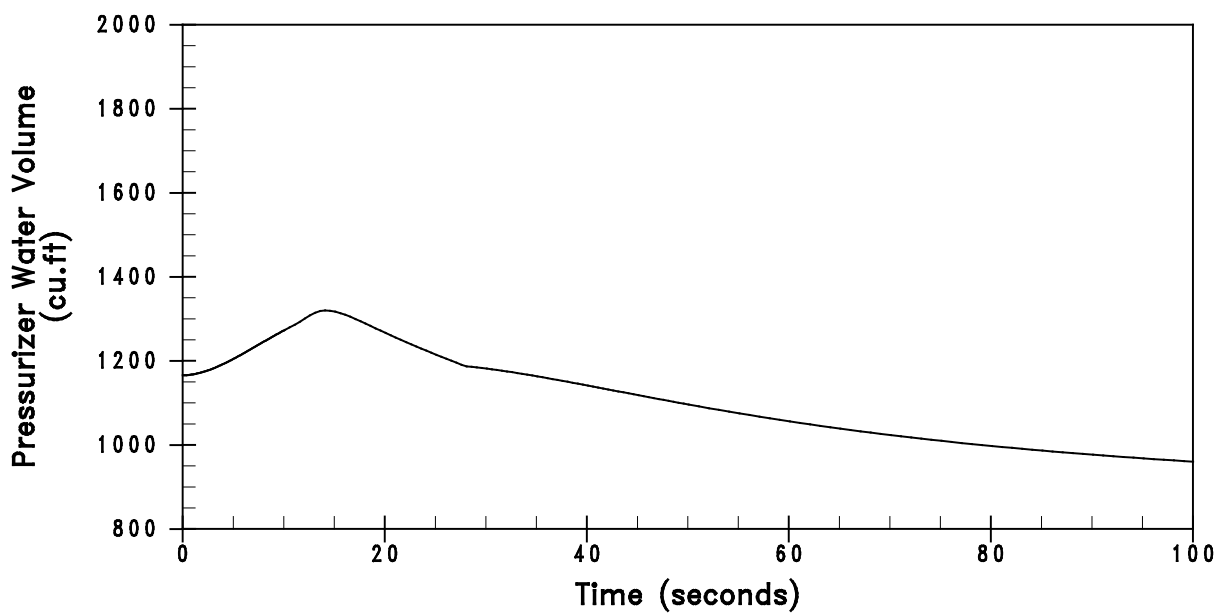
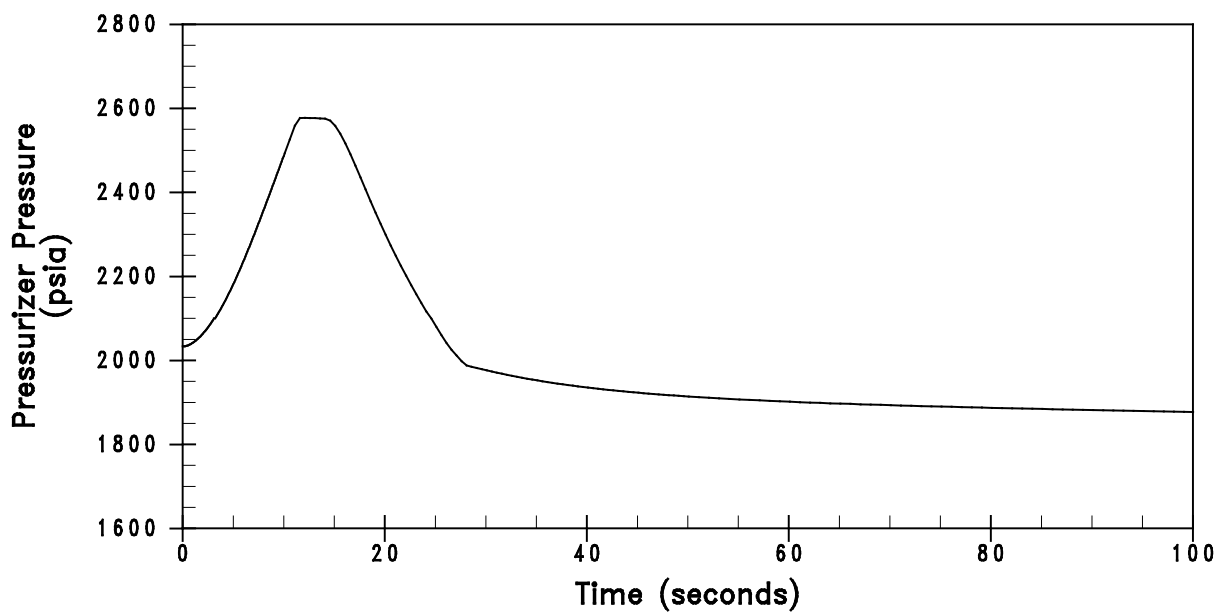
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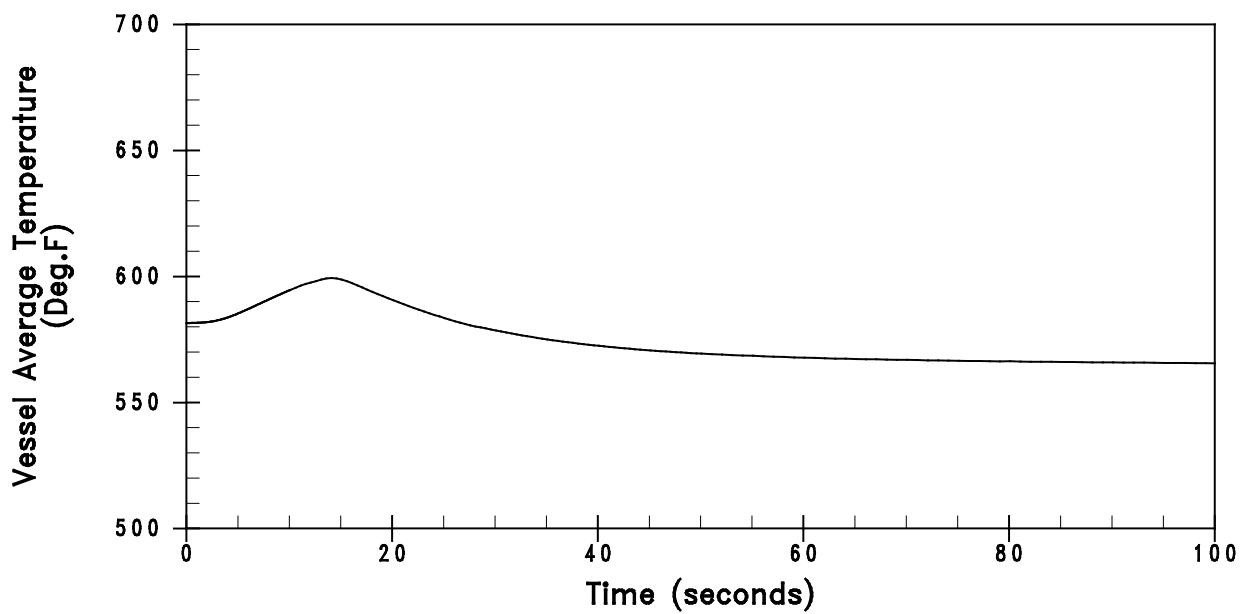
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REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Nuclear Power and DNBR vs. Time For Loss of Load, Maximum Reactivity Feedback Without Pressurizer Spray and PORVs		
	DWG. NO. UFSAR FIG 14.1.8-10		SH 1 of 1

UFSAR Revision 30.0

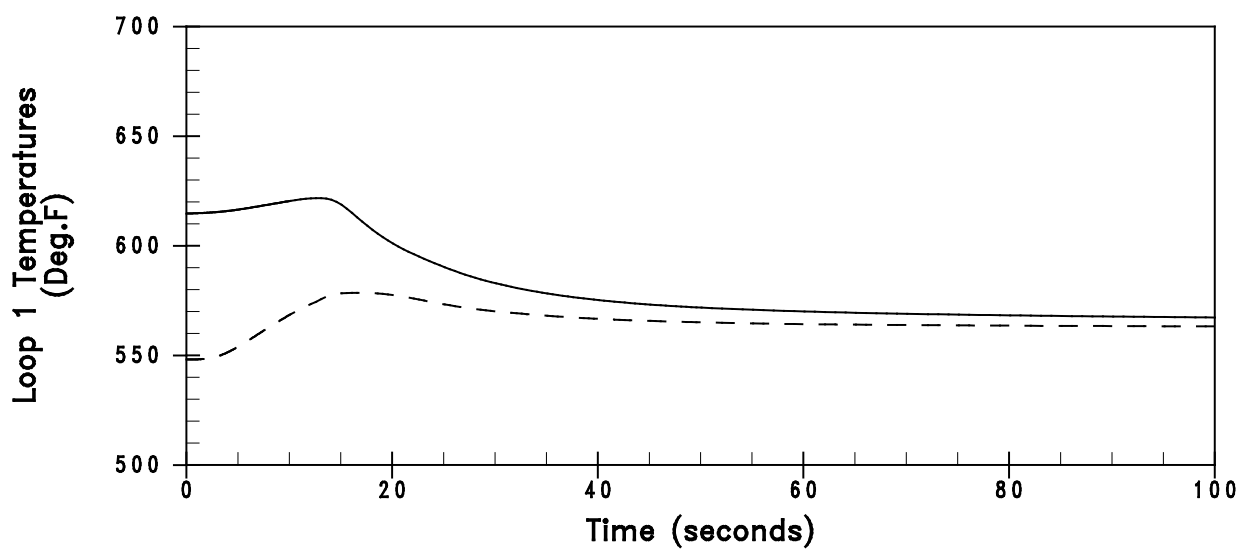


UNIT 1


16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Pressurizer Pressure and Pressurizer Water Volume vs. Time For Loss of Load, Maximum Reactivity Feedback Without Pressurizer Spray and PORVs		
	DWG. NO. UFSAR FIG 14.1.8-11		SH 1 of 1



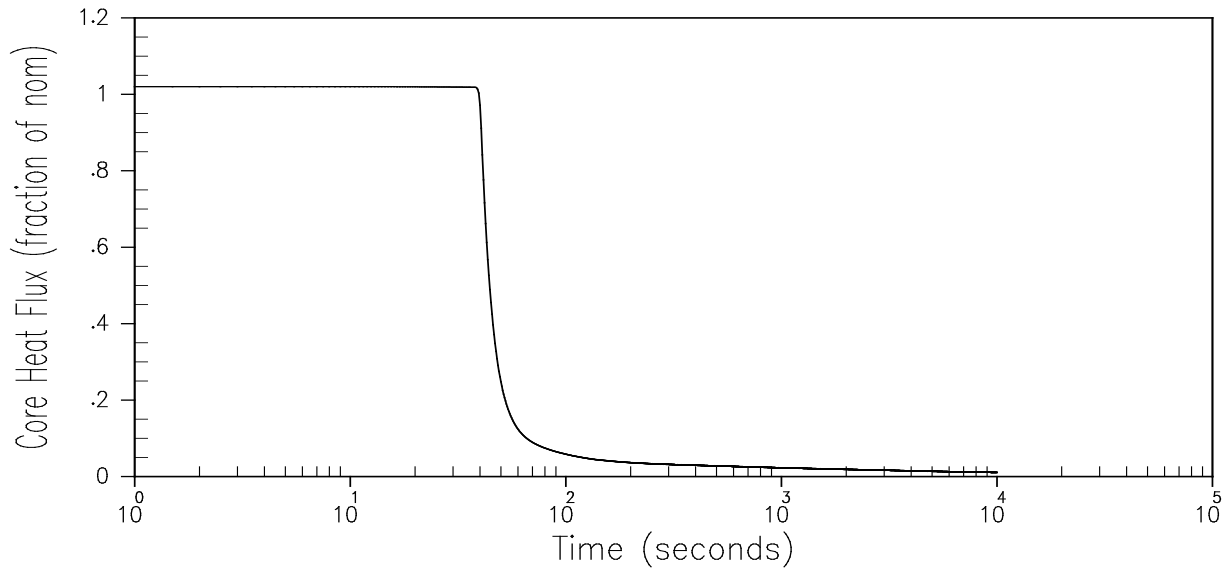
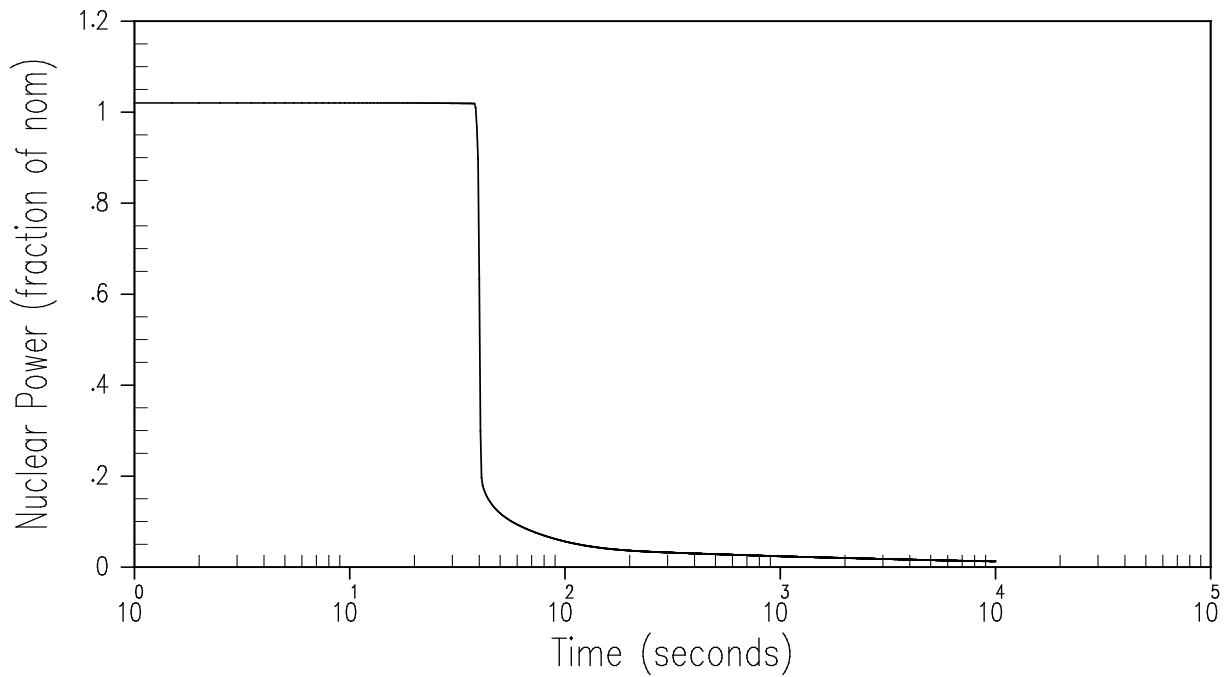
— T_{hot}
- - - T_{cold}




UNIT 1

16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 An AEP Company	Title: Vessel Average and Loop 1 Temperatures vs. Time For Loss of Load, Maximum Reactivity Feedback Without Pressurizer Spray and PORVs		
	DWG. NO. UFSAR FIG 14.1.8-12		SH 1 of 1

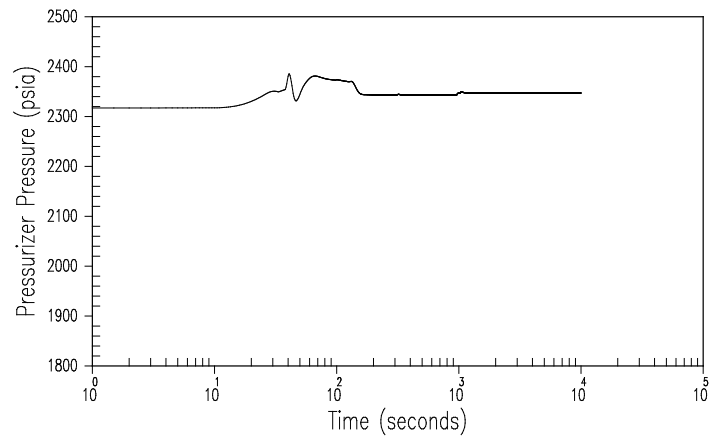
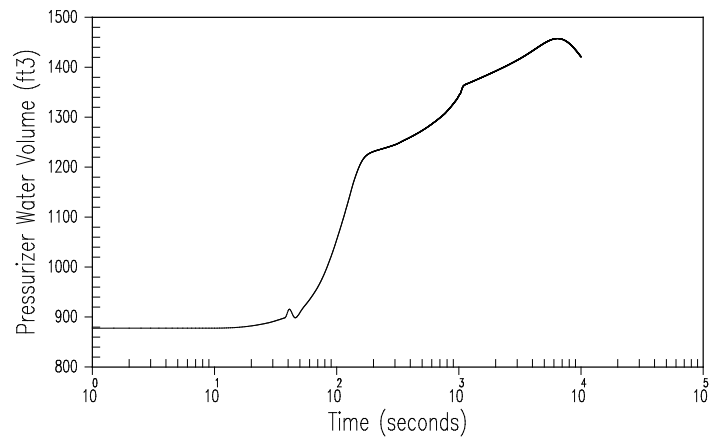
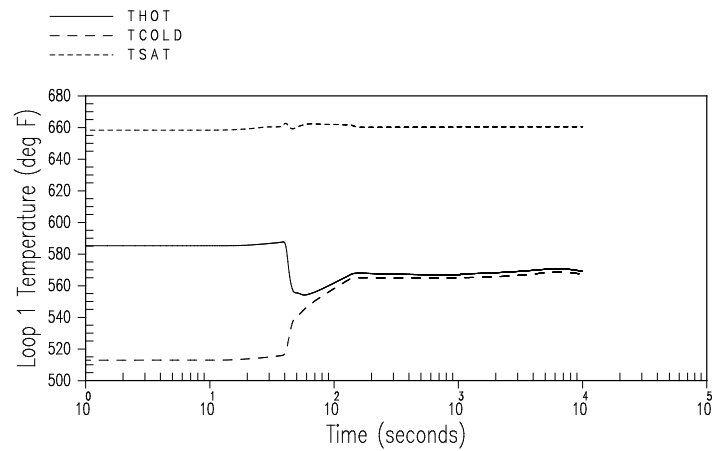
UFSAR Revision 30.0




UNIT 1

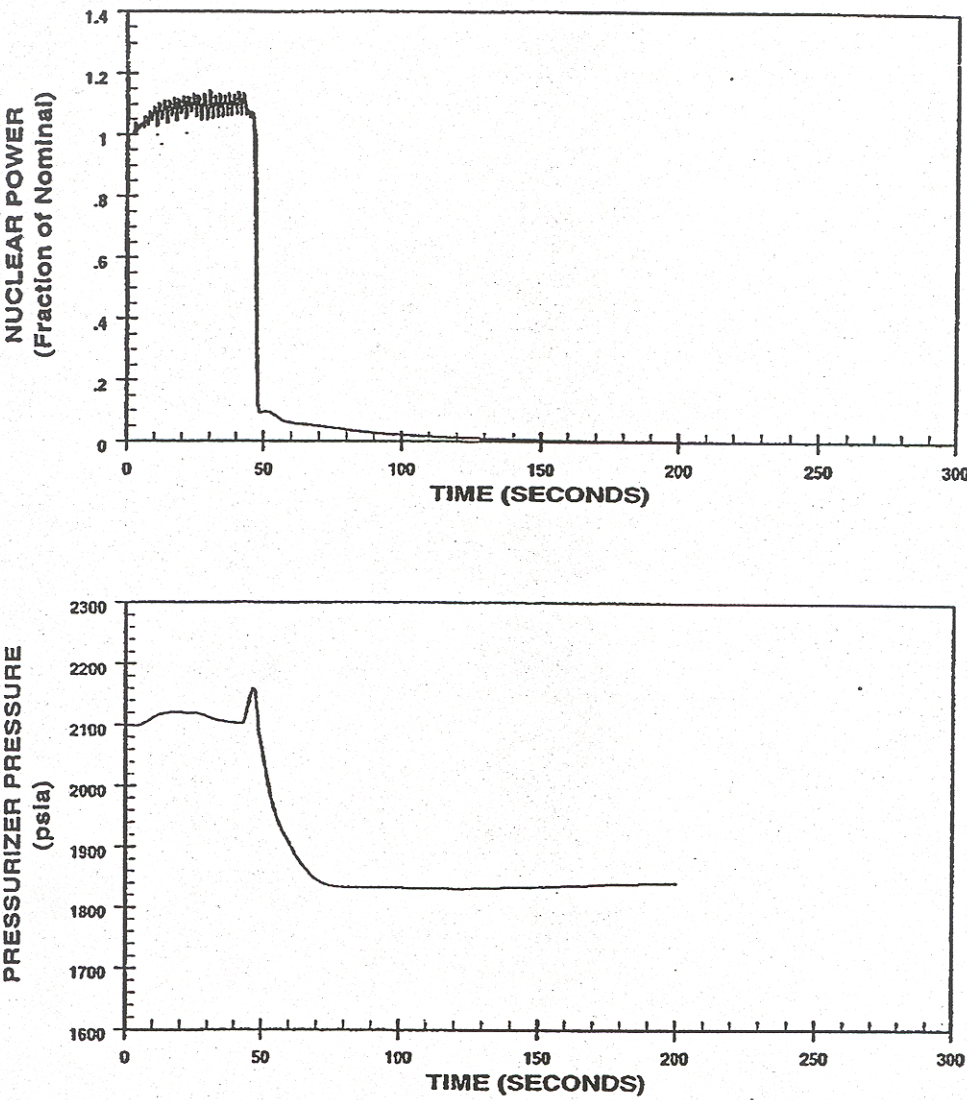
16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Nuclear Power and Core Heat Flux vs. Time (Loss of Normal Feedwater)		
	DWG. NO. UFSAR FIG 14.1.9-1		SH 1 of 1

UFSAR Revision 30.0



UNIT 1

16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Pressurizer Water Volume, Pressurizer Pressure and Loop Temperature vs. Time (Loss of Normal Feedwater)		
	DWG. NO. UFSAR FIG 14.1.9-2		SH 1 of 1



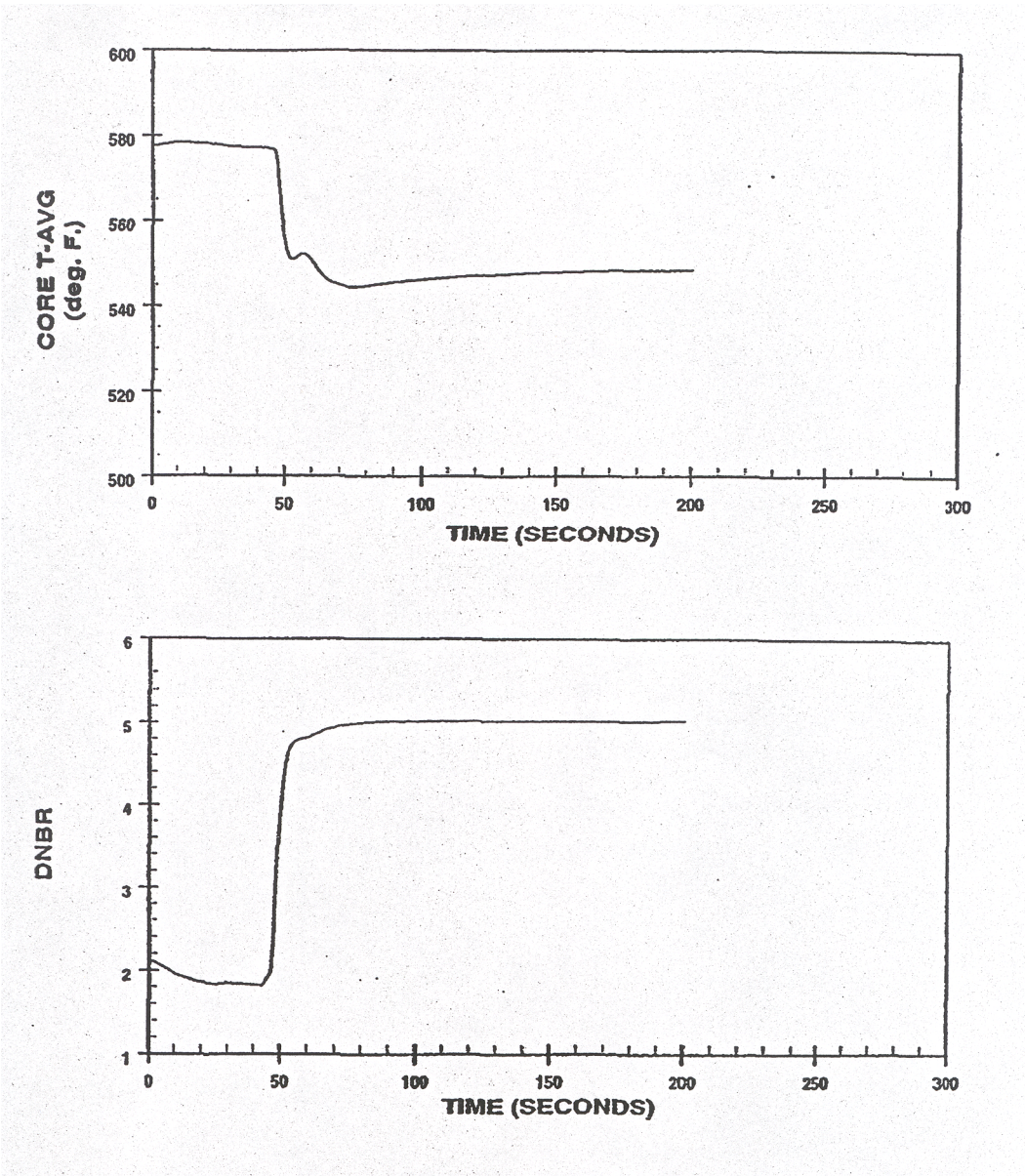
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**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

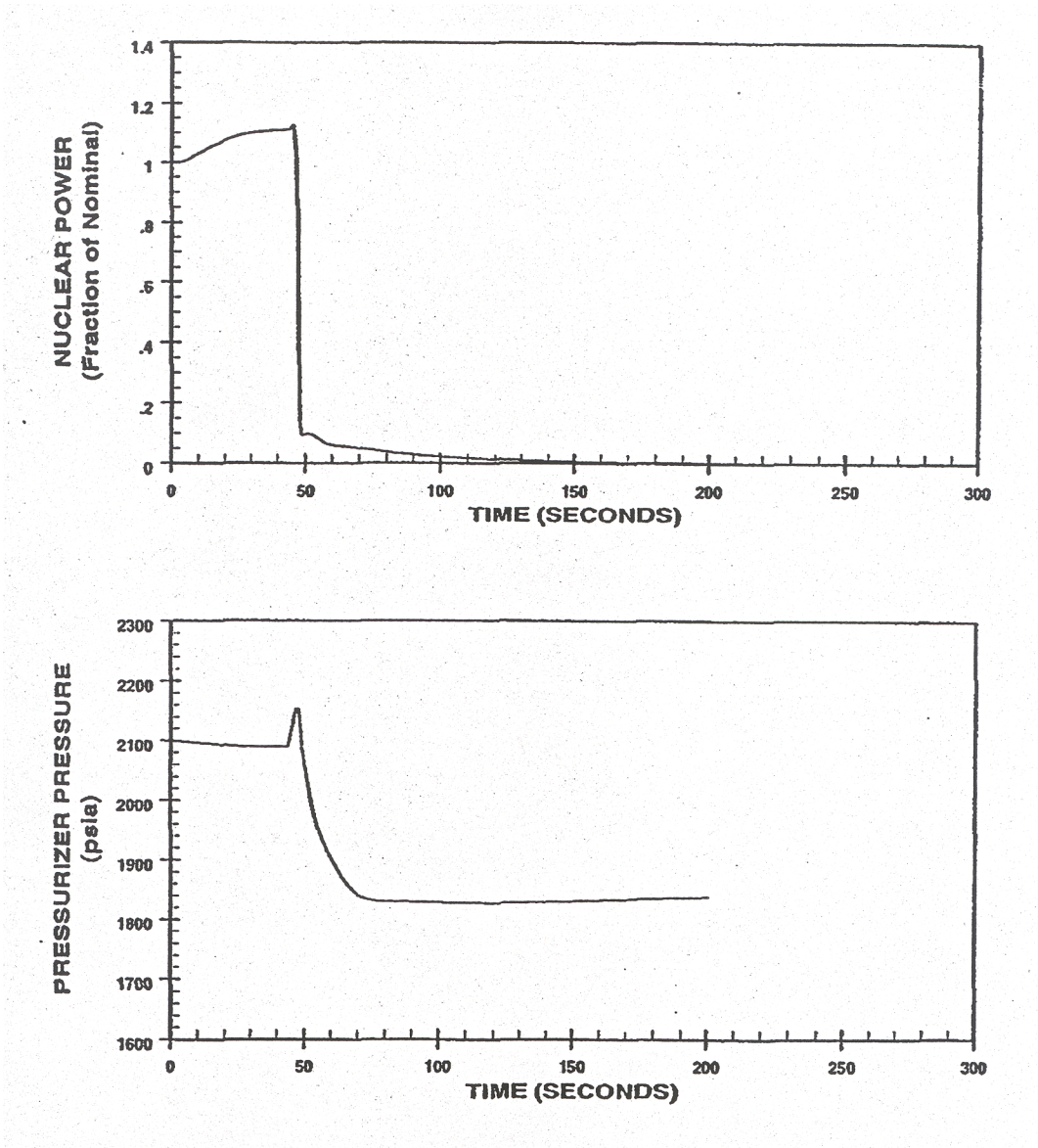
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Single Loop Feedwater Malfunction With Automatic
Rod Control at Full Power**

UFSAR Figure: **14.1.10-1**

Sheet 1 of 1



Revision: 18.1		Change Description: UCR-1667	
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN		Title: Core Average Temperature and DNBR vs. Time For Single Loop Feedwater Malfunction With Automatic Rod Control at Full Power	
		UFSAR Figure: 14.1.10-2	Sheet 1 of 1



Revision: **18.1**

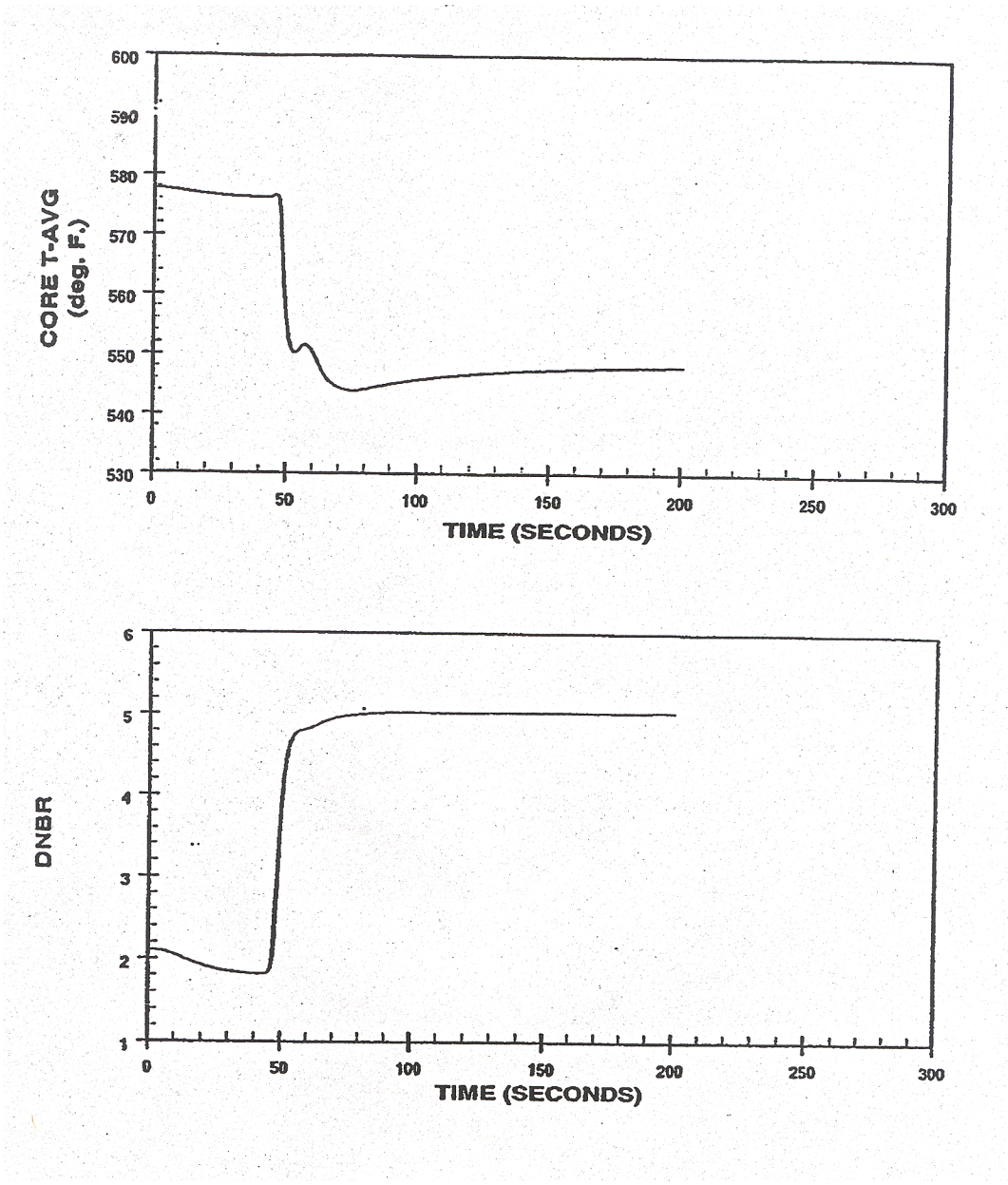
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**AMERICAN ELECTRIC POWER
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BRIDGMAN, MICHIGAN**

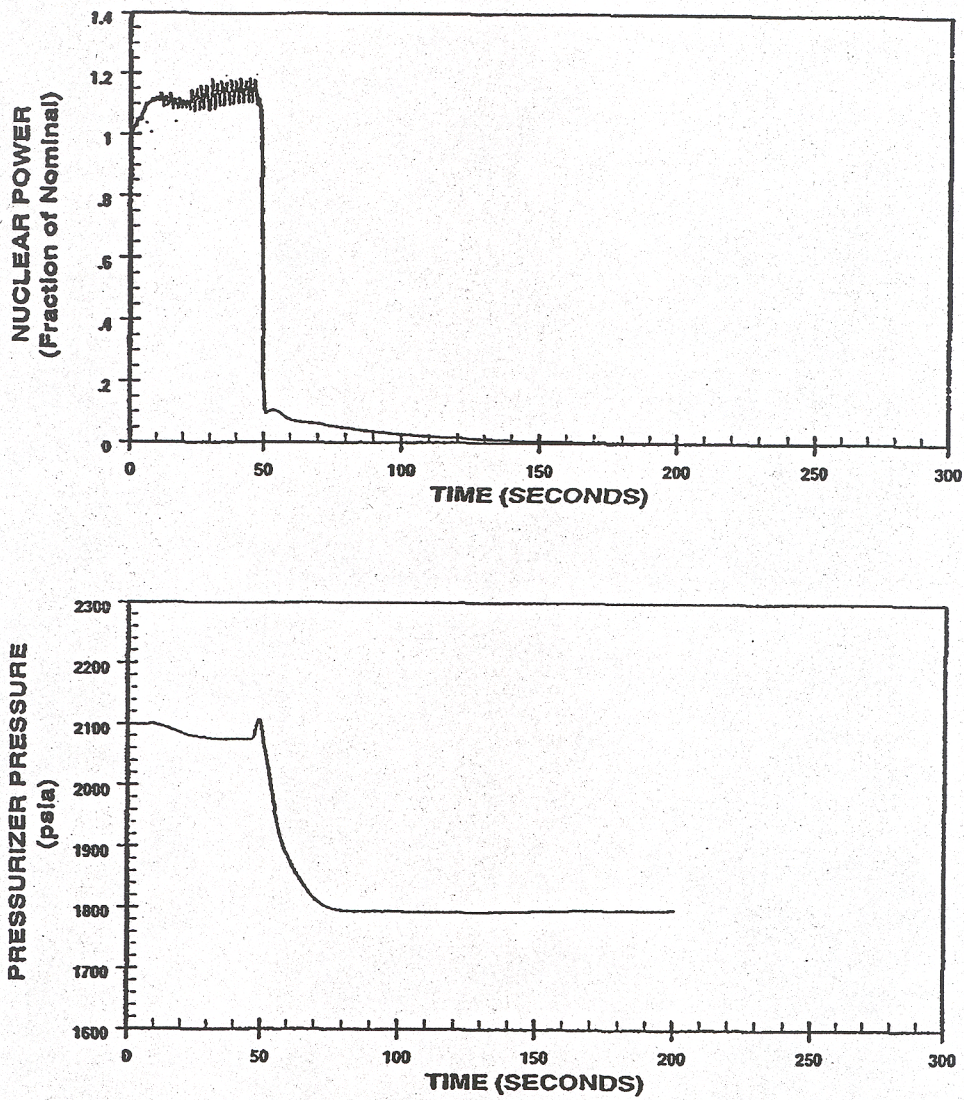
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Single Loop Feedwater Malfunction With Manual Rod
Control at Full Power**

UFSAR Figure: **14.1.10-3**

Sheet 1 of 1



Revision: 18.1	Change Description: UCR-1667		
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	Title: Core Average Temperature and DNBR vs. Time For Single Loop Feedwater Malfunction With Manual Rod Control at Full Power		
	UFSAR Figure: 14.1.10-4		Sheet 1 of 1



Revision: 18.1

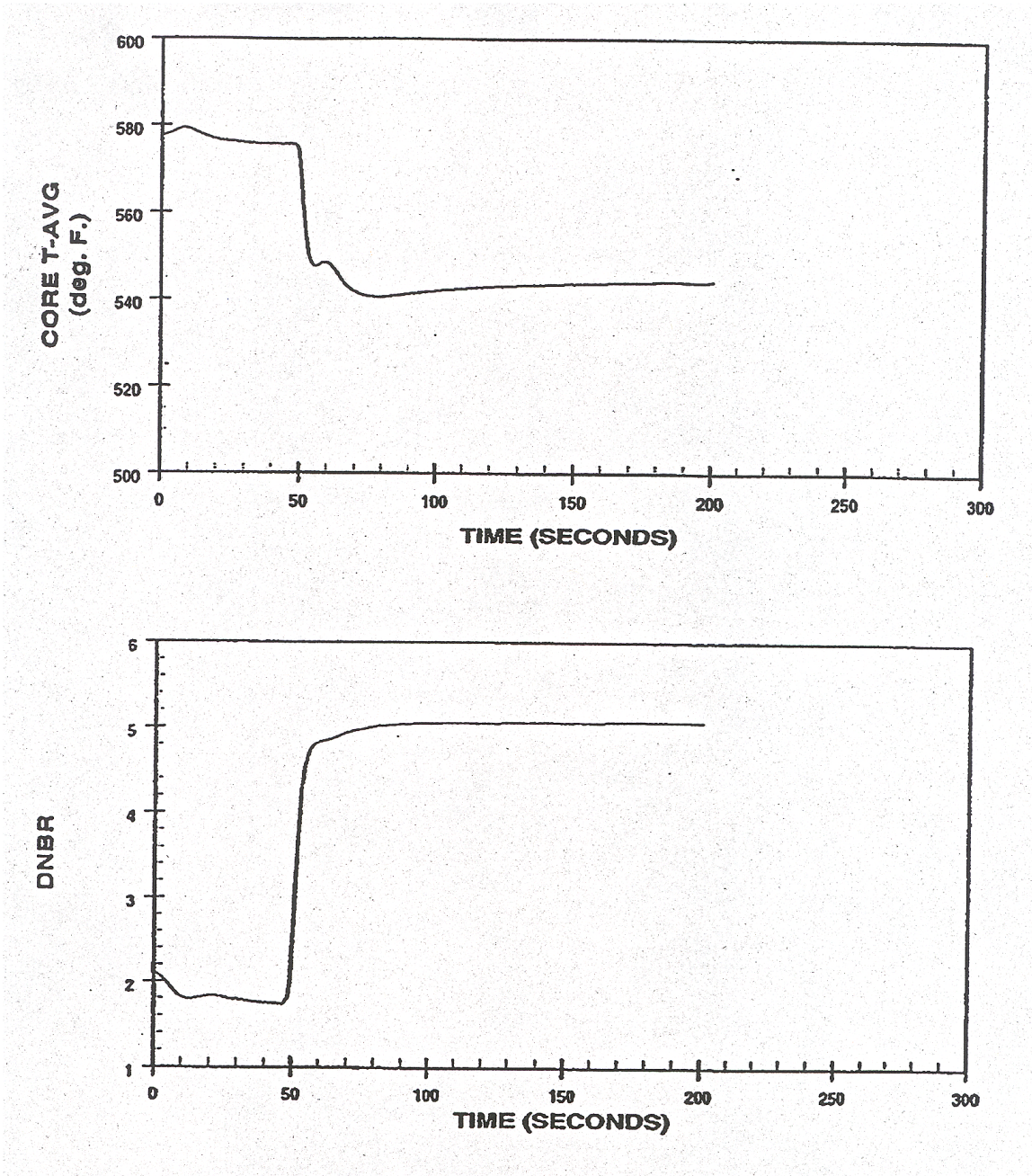
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COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

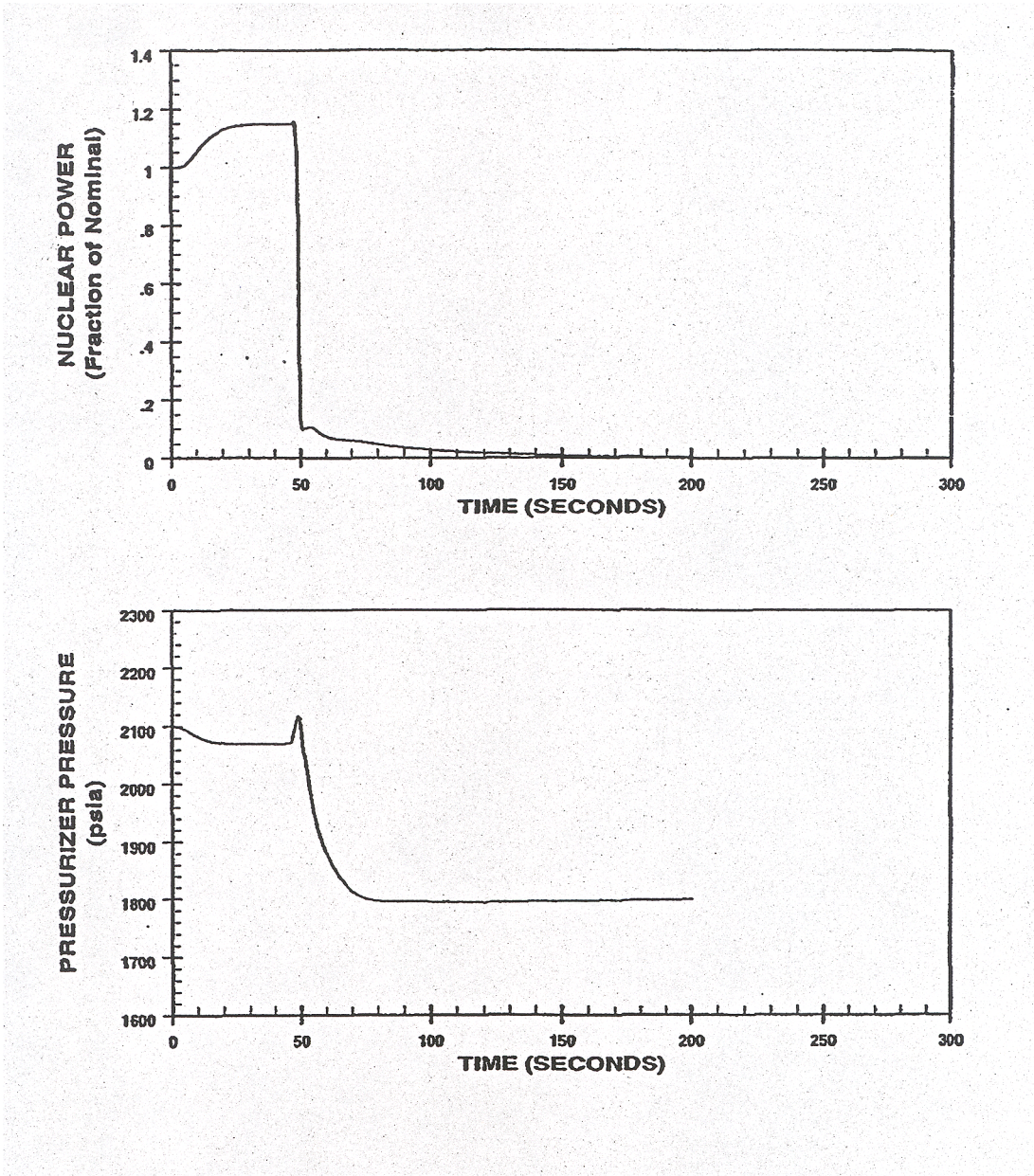
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Multi-Loop Feedwater Malfunction With Automatic
Rod Control at Full Power

UFSAR Figure: 14.1.10-5

Sheet 1 of 1



Revision: 18.1	Change Description: UCR-1667	
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	Title: Core Average Temperature and DNBR vs. Time For Multi-Loop Feedwater Malfunction With Automatic Rod Control at Full Power	
	UFSAR Figure: 14.1.10-6	Sheet 1 of 1



Revision: **18.1**

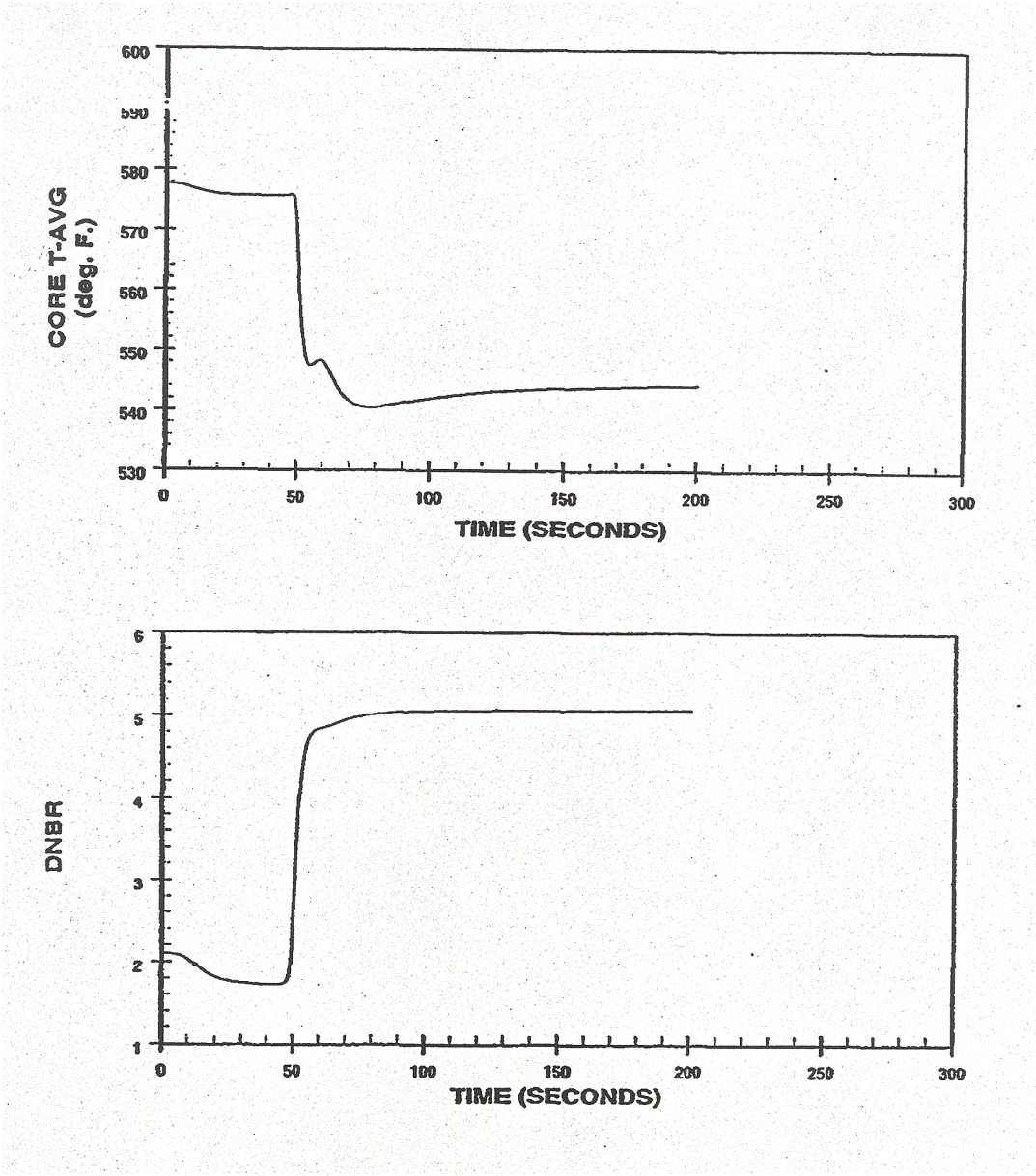
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**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **Nuclear Power and Pressurizer Pressure vs. Time For
Multi-Loop Feedwater Malfunction With Manual Rod
Control at Full Power**

UFSAR Figure: **14.1.10-7**

Sheet 1 of 1



Revision: **18.1**

Change Description: **UCR-1667**

**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **Core Average Temperature and DNBR vs. Time For
Multi-Loop Feedwater Malfunction With Automatic
Rod Control at Full Power**

UFSAR Figure: **14.1.10-8**

Sheet 1 of 1

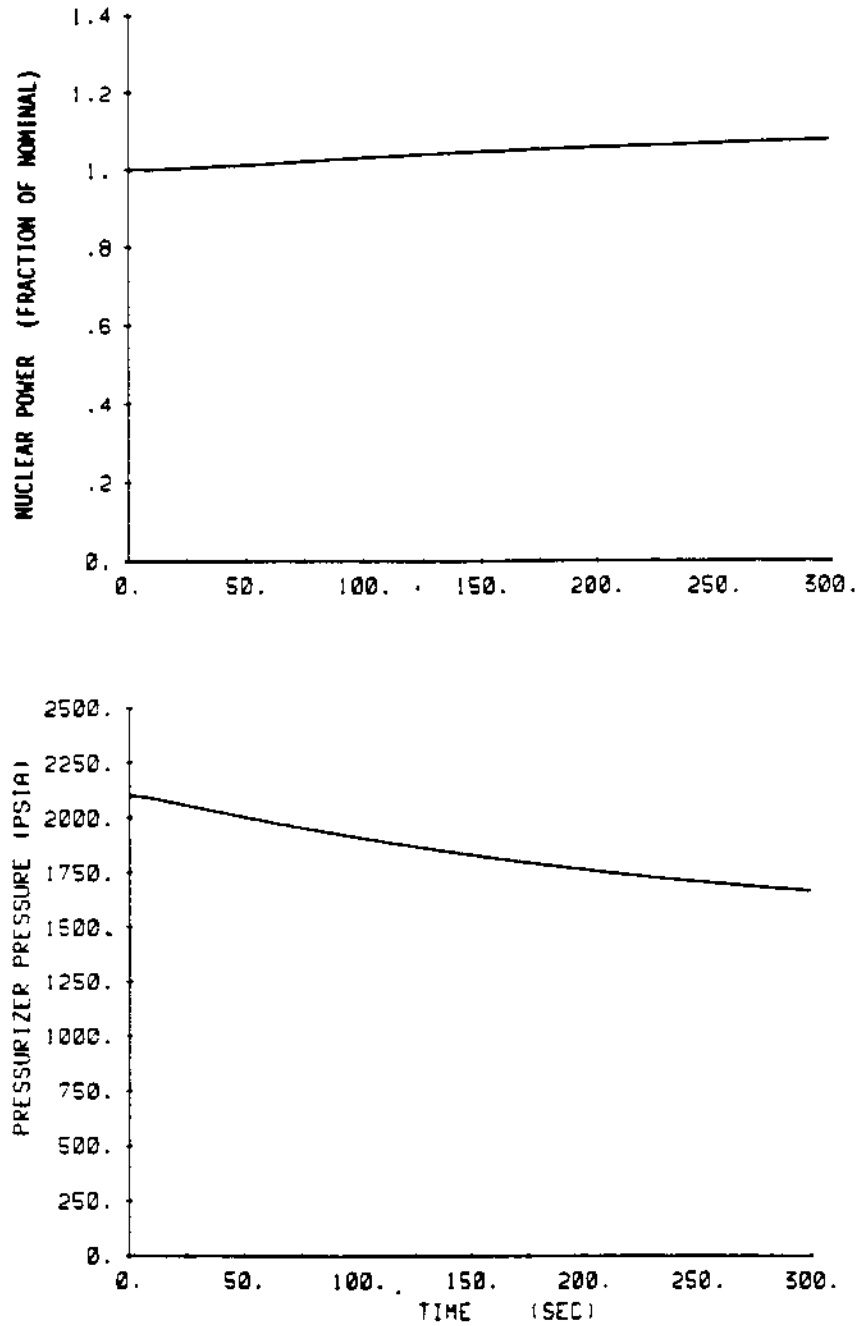


FIGURE 14.1.11-1 Nuclear Power and Pressurizer Pressure Versus Time for Excessive Load Increase Minimum Reactivity Feedback with Manual Rod Control

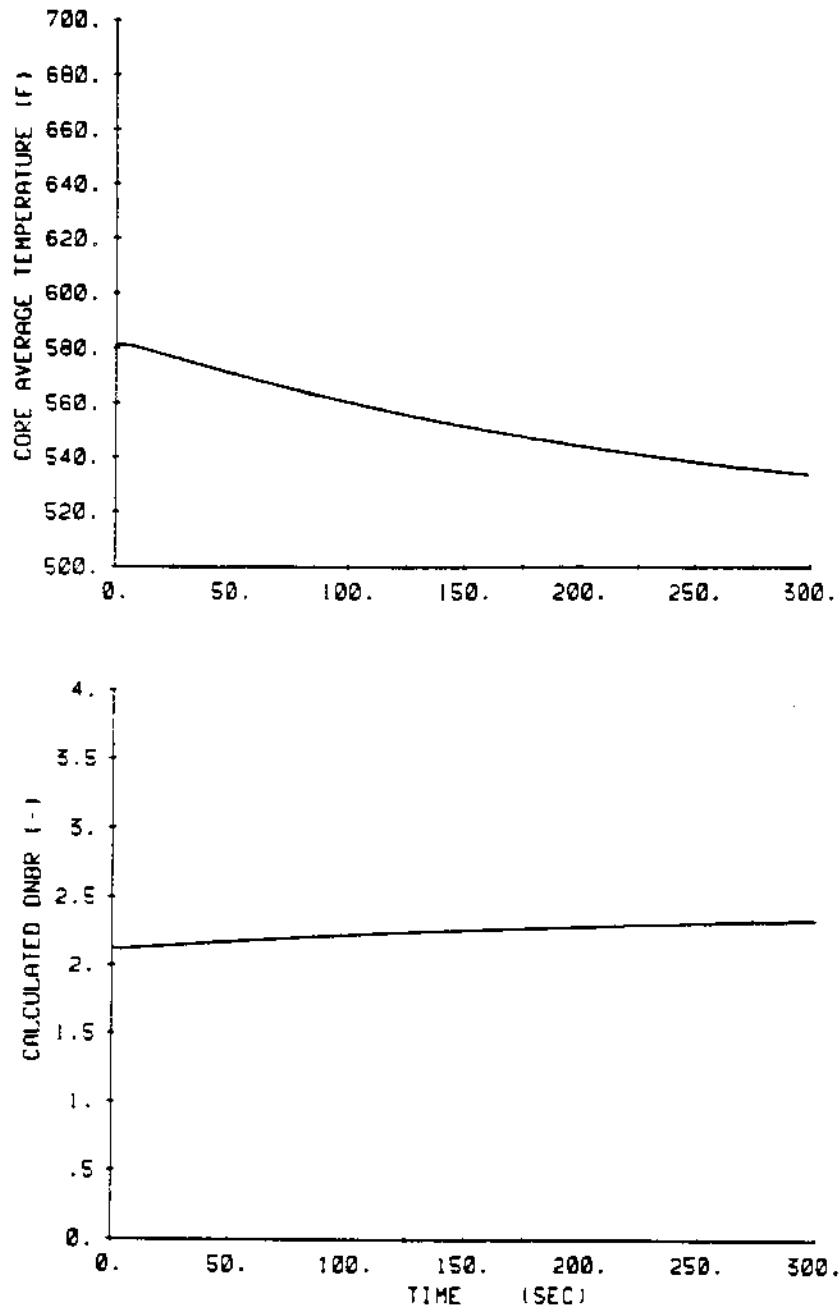


FIGURE 14.1.11-2 Core Average Temperature and DNBR Versus Time for Excessive Load Increase Minimum Reactivity Feedback with Manual Rod Control

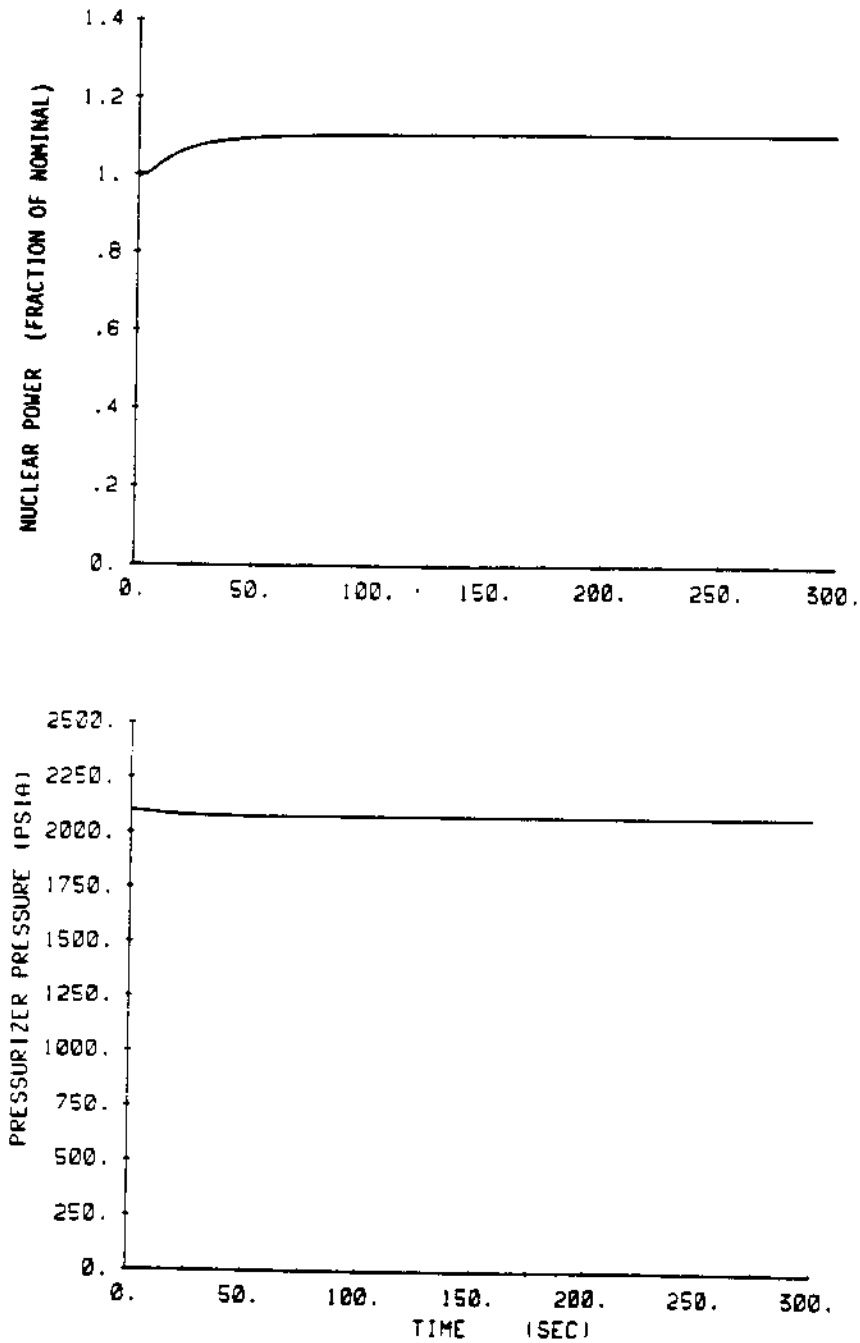


FIGURE 14.1.11-3 Nuclear Power and Pressurizer Pressure Versus Time
for Excessive Load Increase Maximum Reactivity
Feedback with Manual Control

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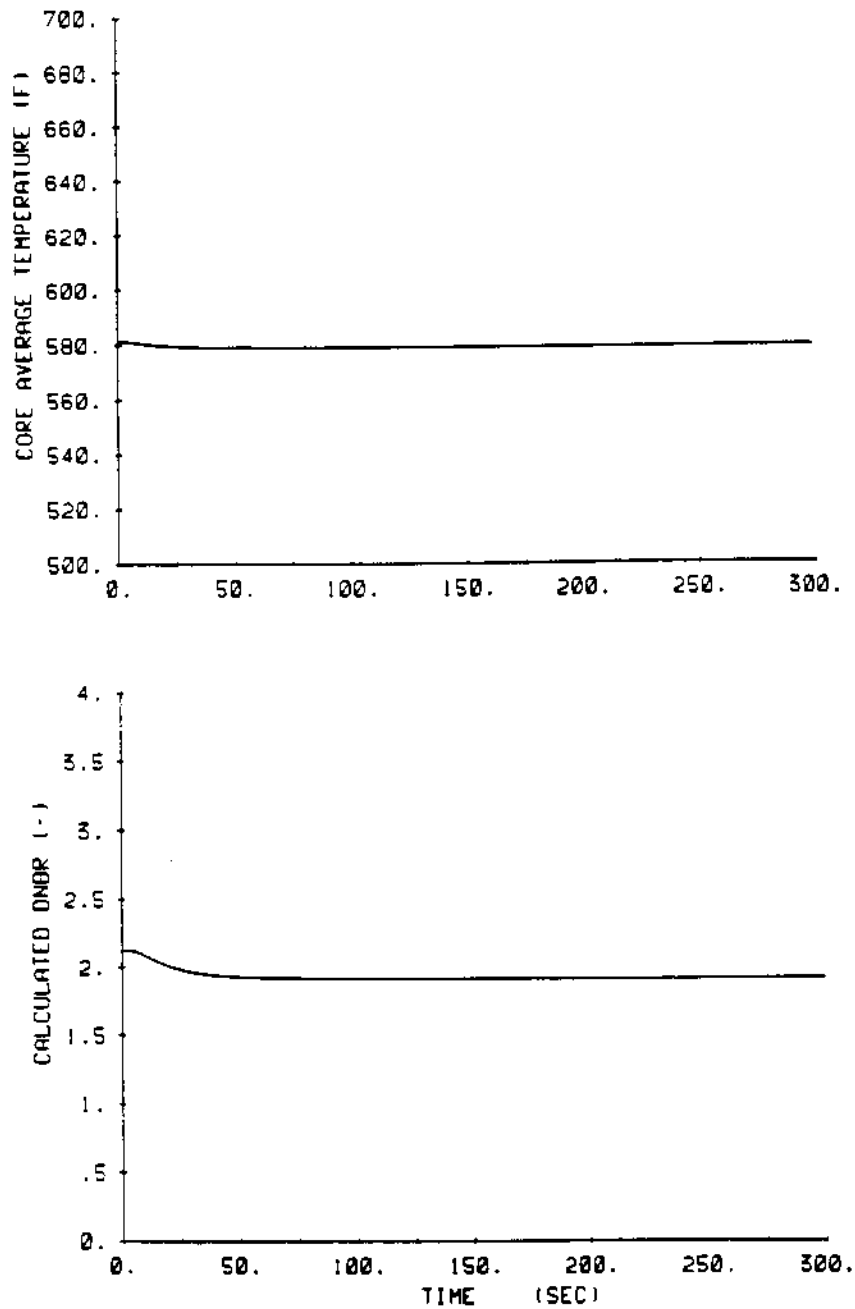


FIGURE 14.1.11-4 Core Average Temperature and DNBR Versus Time for Excessive Load Increase Maximum Reactivity Feedback with Manual Control

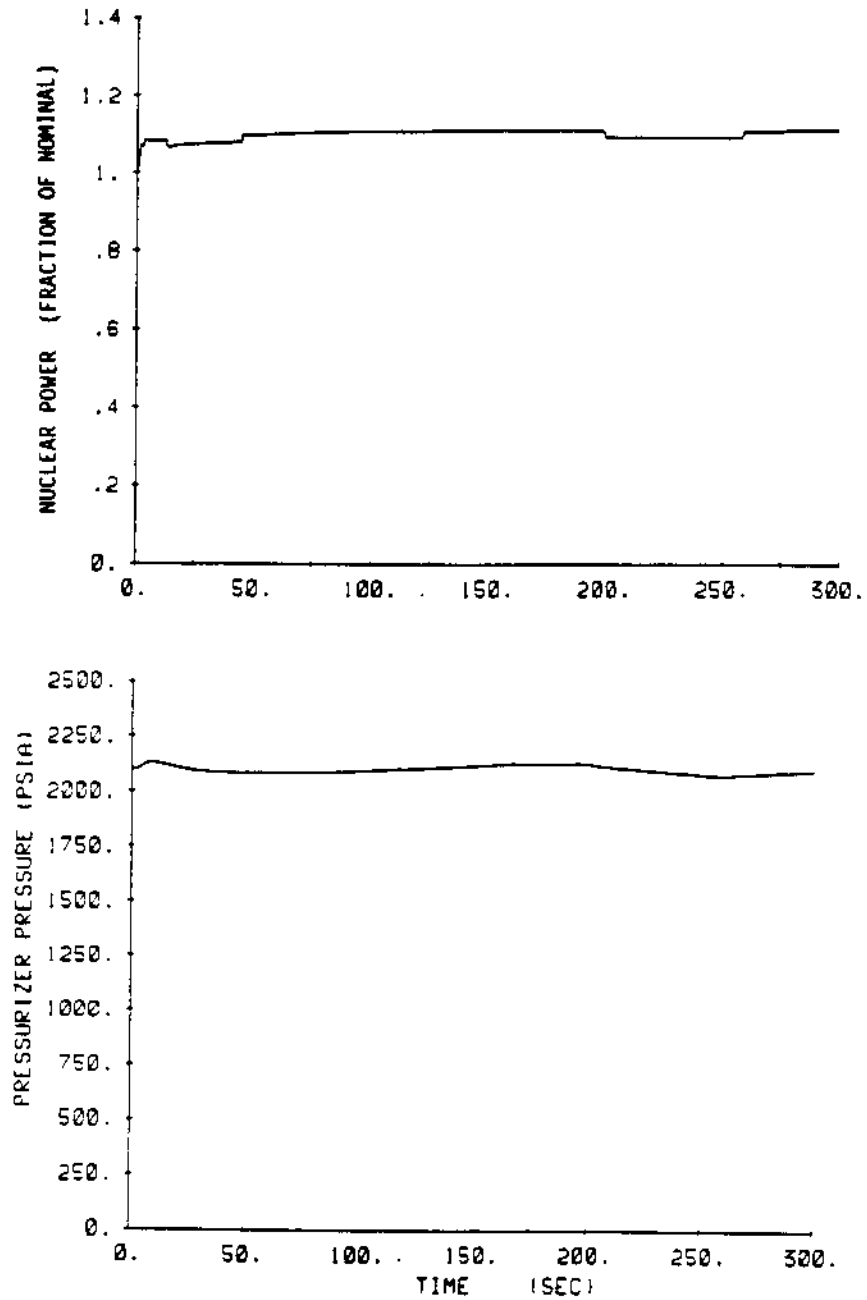


FIGURE 14.1.11-5 Nuclear Power and Pressurizer Pressure Versus Time for Excessive Load Increase Minimum Reactivity Feedback with Automatic Rod Control

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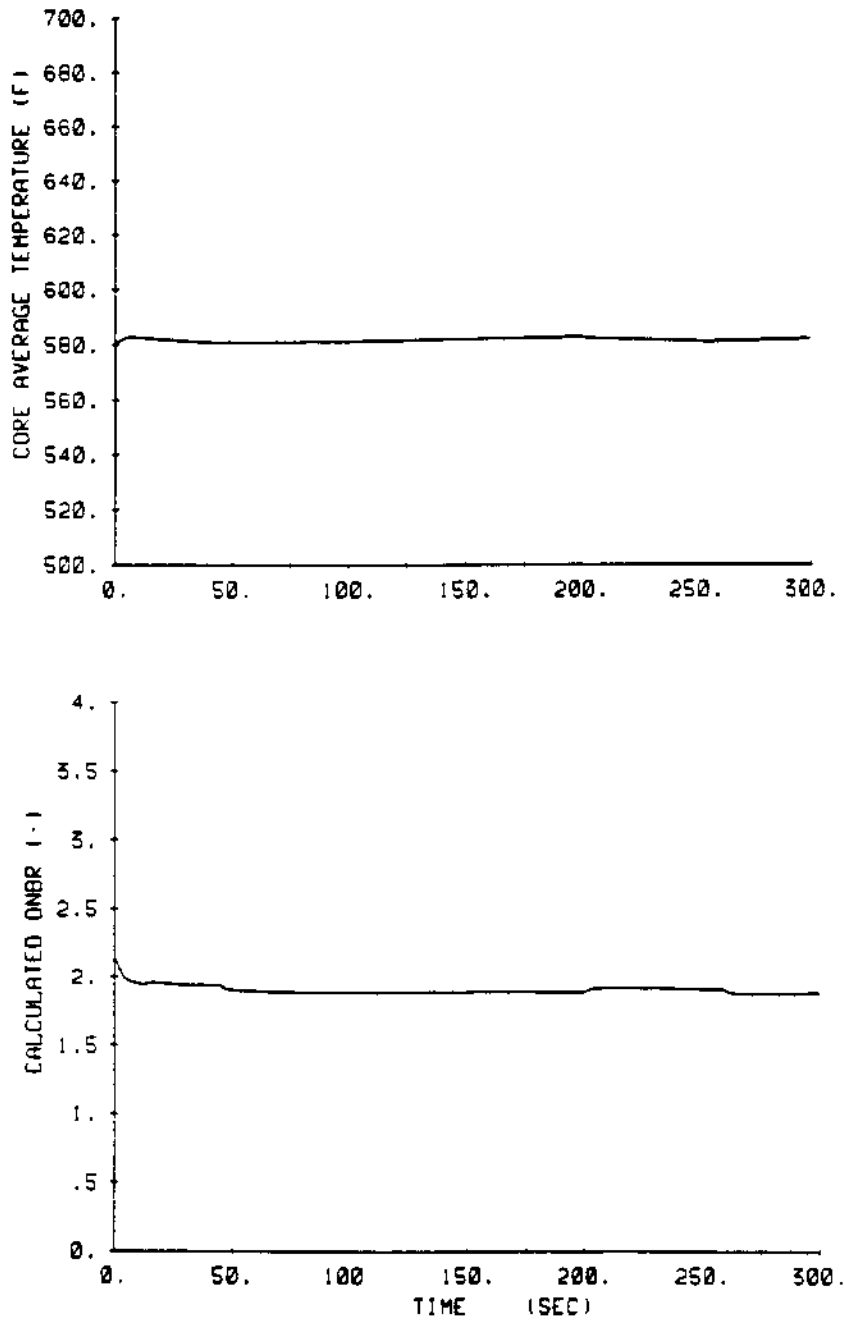


FIGURE 14.1.11-6 Core Average Temperature and DNBR Versus Time for Excessive Load Increase Minimum Reactivity Feedback with Automatic Rod Control

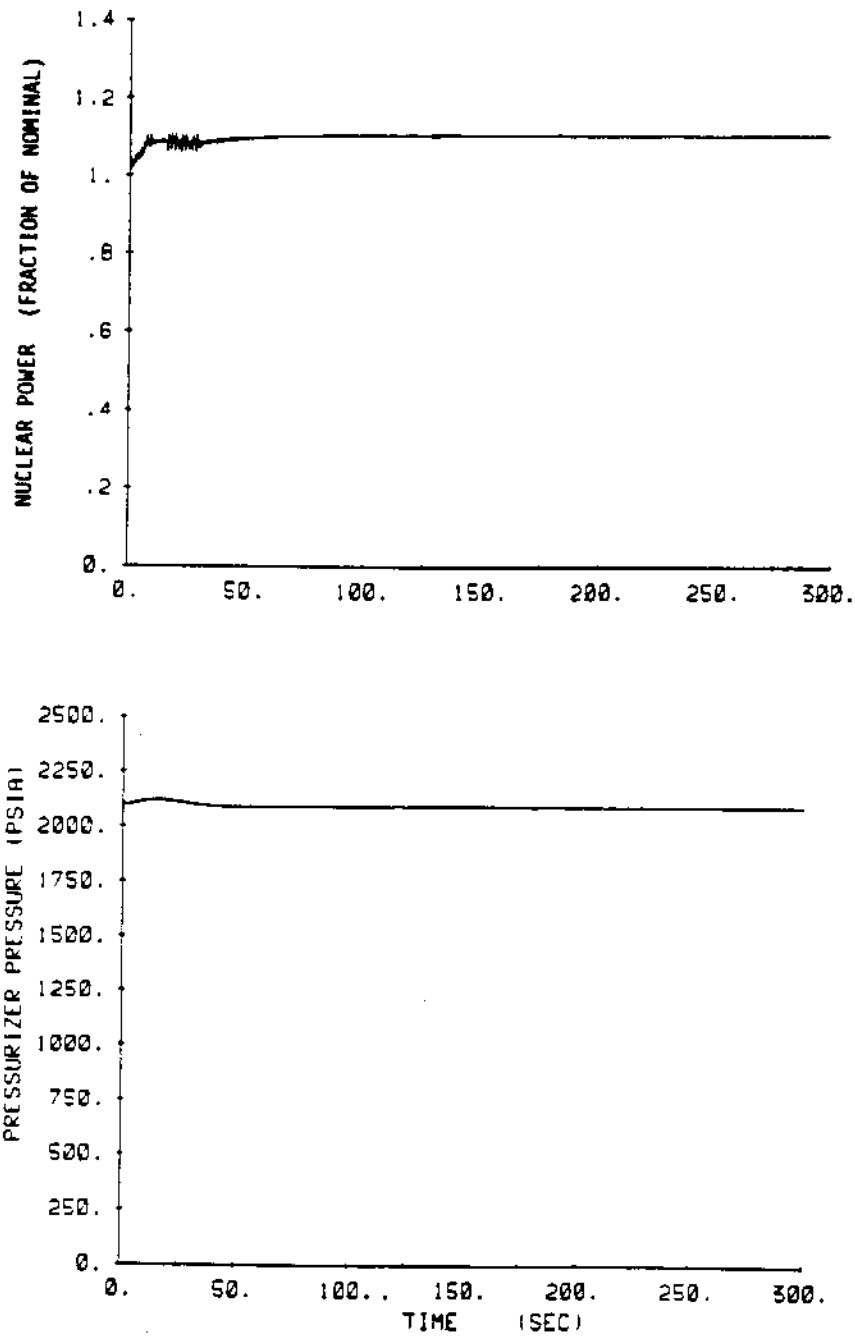


FIGURE 14.1.11-7 Nuclear Power and Pressurizer Pressure Versus Time for Excessive Load Increase Maximum Reactivity Feedback with Automatic Rod Control

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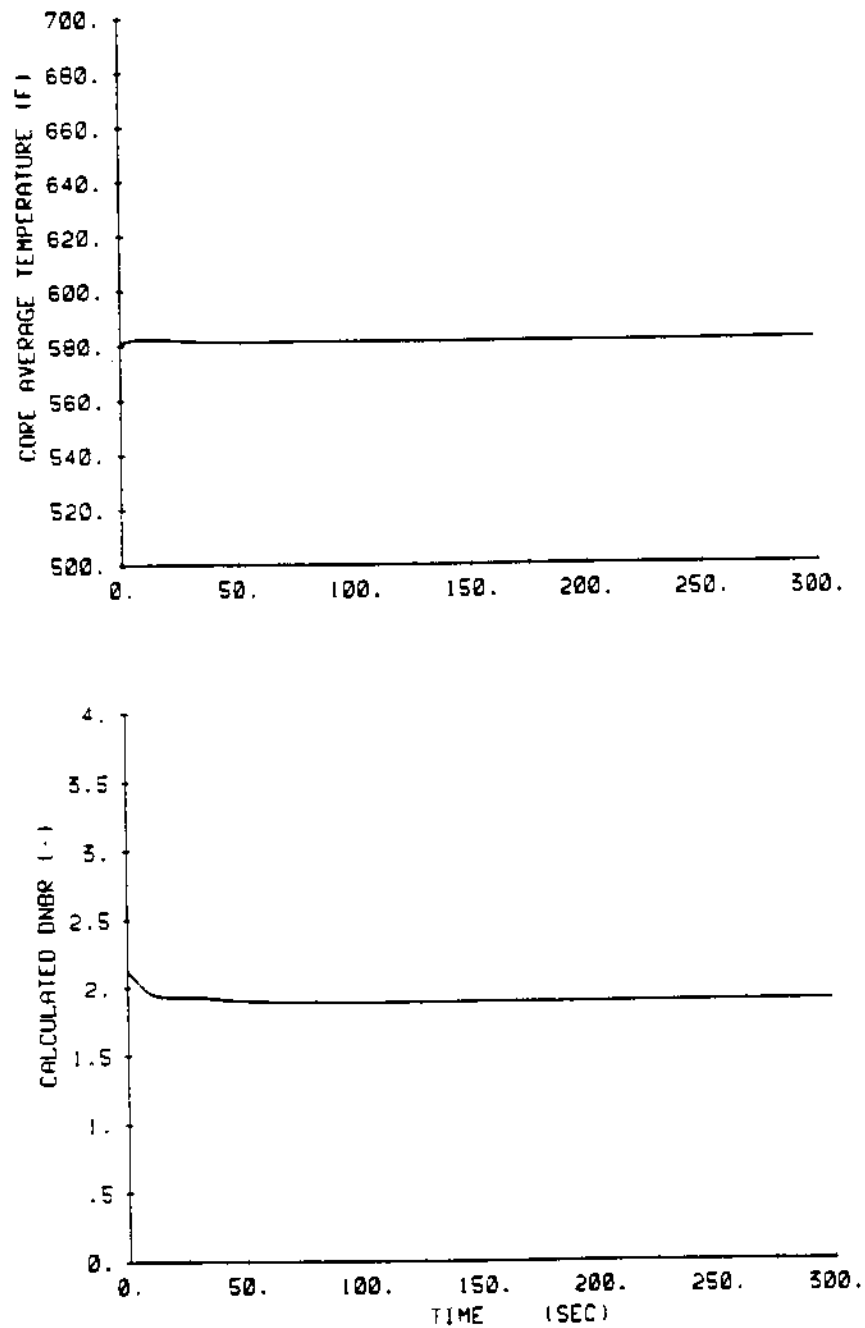
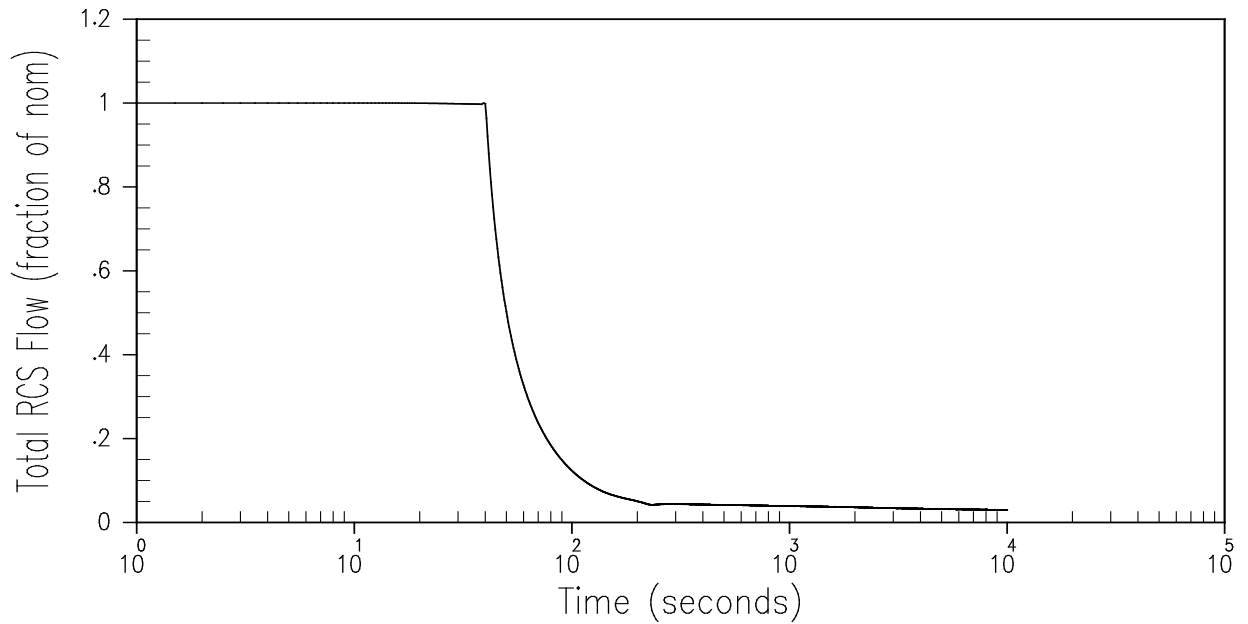
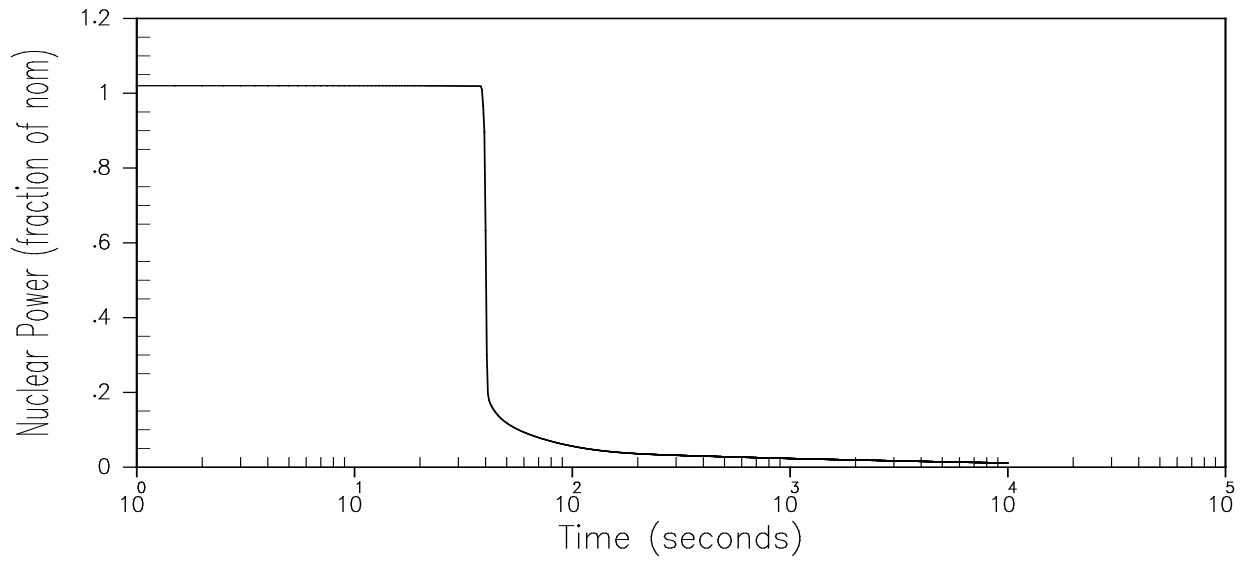



FIGURE 14.1.11-8 Core Average Temperature and DNBR Versus Time for Excessive Load Increase Maximum Reactivity Feedback with Automatic Rod Control

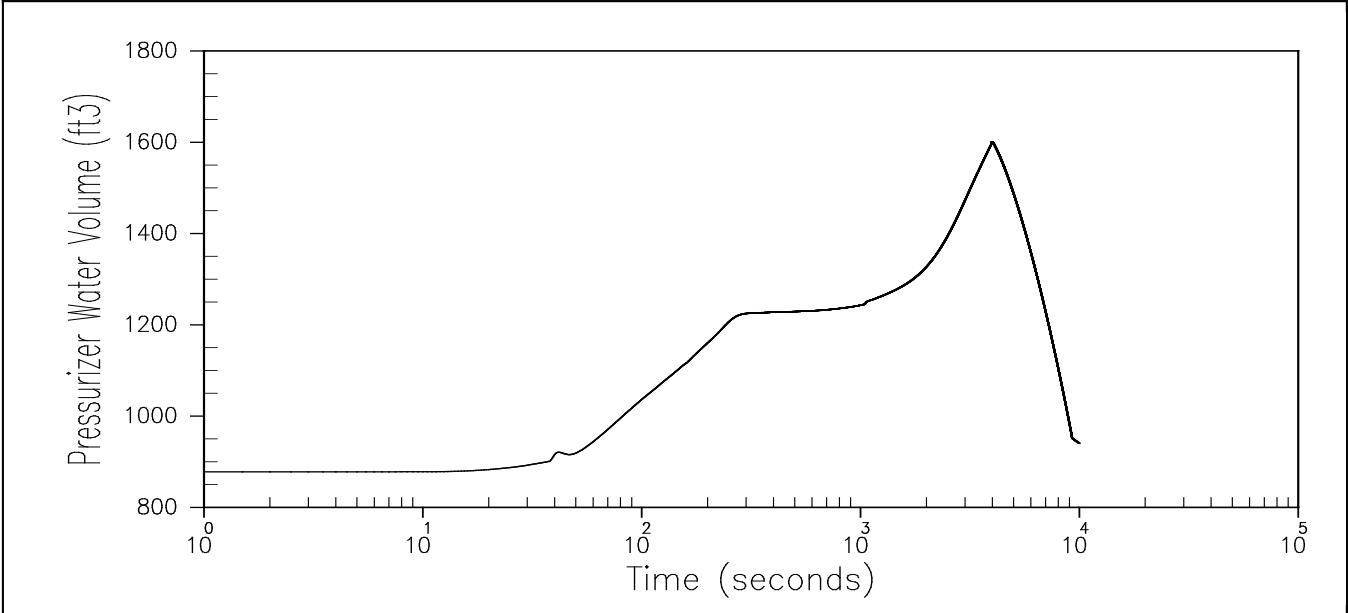
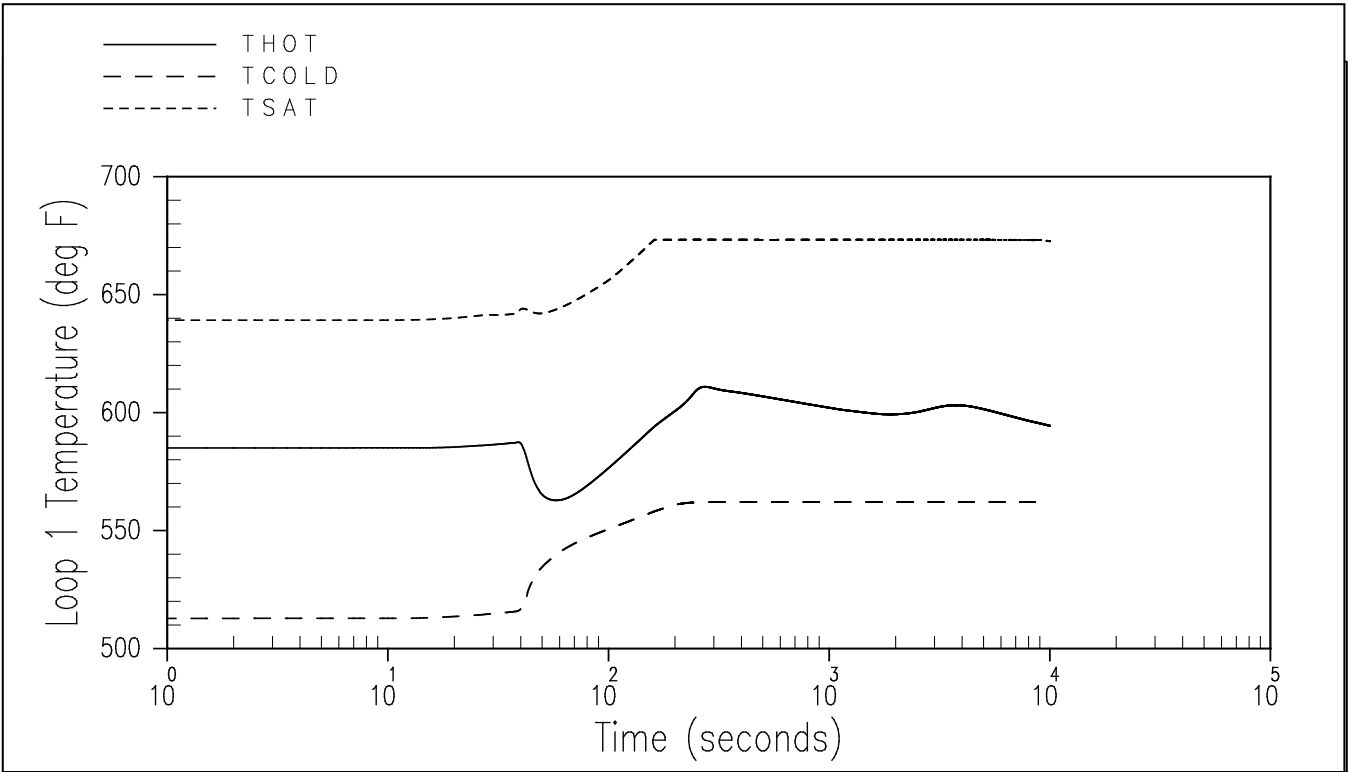
UFSAR Revision 30.0




UNIT 1

16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Nuclear Power and Core Flow vs. Time (Loss of Offsite Power)		
	DWG. NO. UFSAR FIG 14.1.12-1		SH 1 of 1

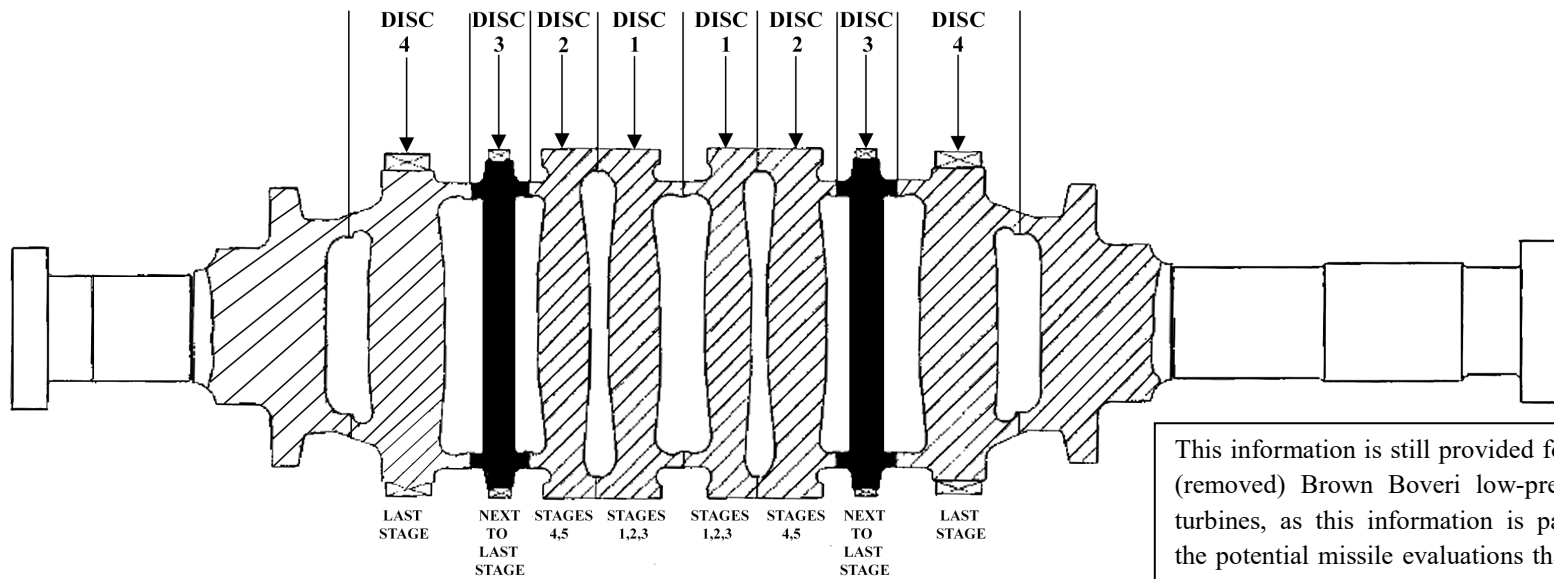
UFSAR Revision 30.0



UNIT 1

16.6	Revised per 99-UFSAR-1540		
REV. NO	Description		
Revision			
 <i>An AEP Company</i>	Title: Loop Temperature and Pressurizer Water Volume vs. Time (Loss of Offsite Power)		
	DWG. NO. UFSAR FIG 14.1.12-2		SH 1 of 1

 <p>An AEP Company</p>	<p style="text-align: center;">INDIANA AND MICHIGAN POWER</p> <p style="text-align: center;">D. C. COOK NUCLEAR PLANT</p> <p style="text-align: center;">UPDATED FINAL SAFETY ANALYSIS REPORT</p>	<p>Revised: 28.0</p> <p>Chapter: 14</p> <p>Sheet: 1 of 1</p>
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This information is still provided for the (removed) Brown Boveri low-pressure turbines, as this information is part of the potential missile evaluations that are included in structural design criteria as shown in Table 5.1-1.

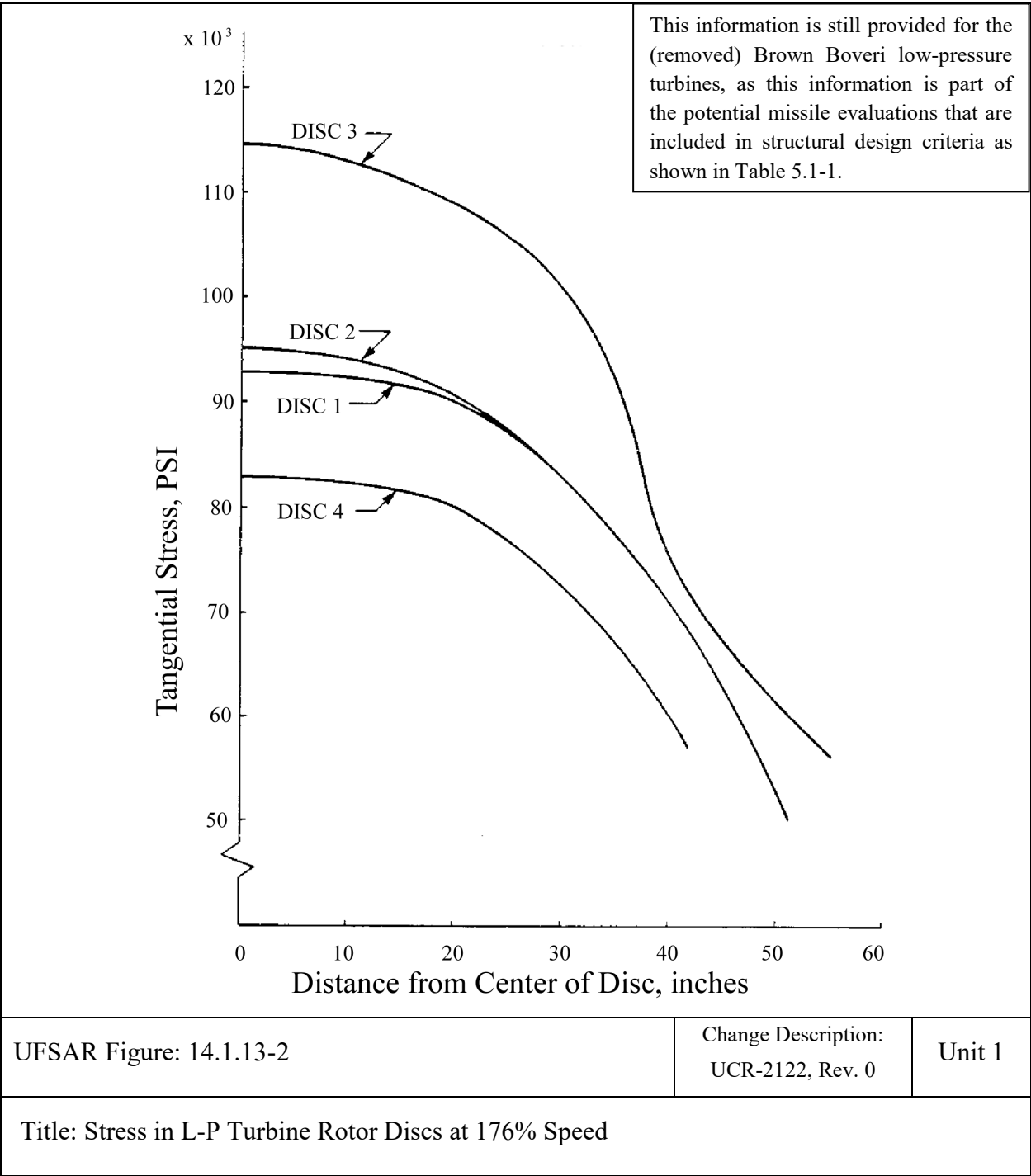
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Change Description:
UCR-2122, Rev. 0


Unit 1

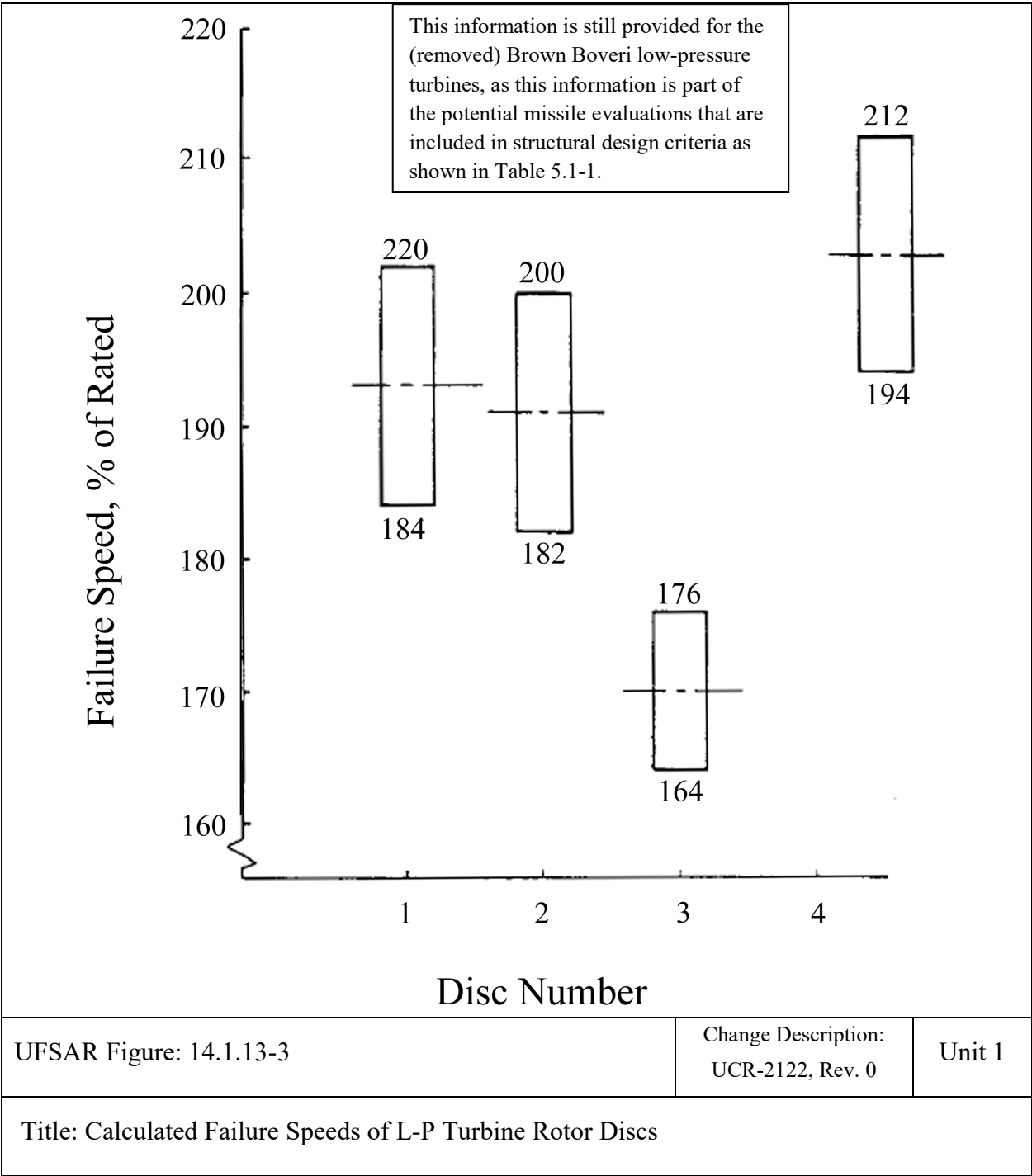
Title: Cross Section – L.P. Turbine Rotor (Unit 2) (Shown without Blades)

 <p>INDIANA MICHIGAN POWER</p> <p>An AEP Company</p>	<p>INDIANA AND MICHIGAN POWER</p> <p>D. C. COOK NUCLEAR PLANT</p> <p>UPDATED FINAL SAFETY ANALYSIS REPORT</p>	<p>Revised: 28.0</p> <p>Chapter: 14</p> <p>Sheet: 1 of 1</p>
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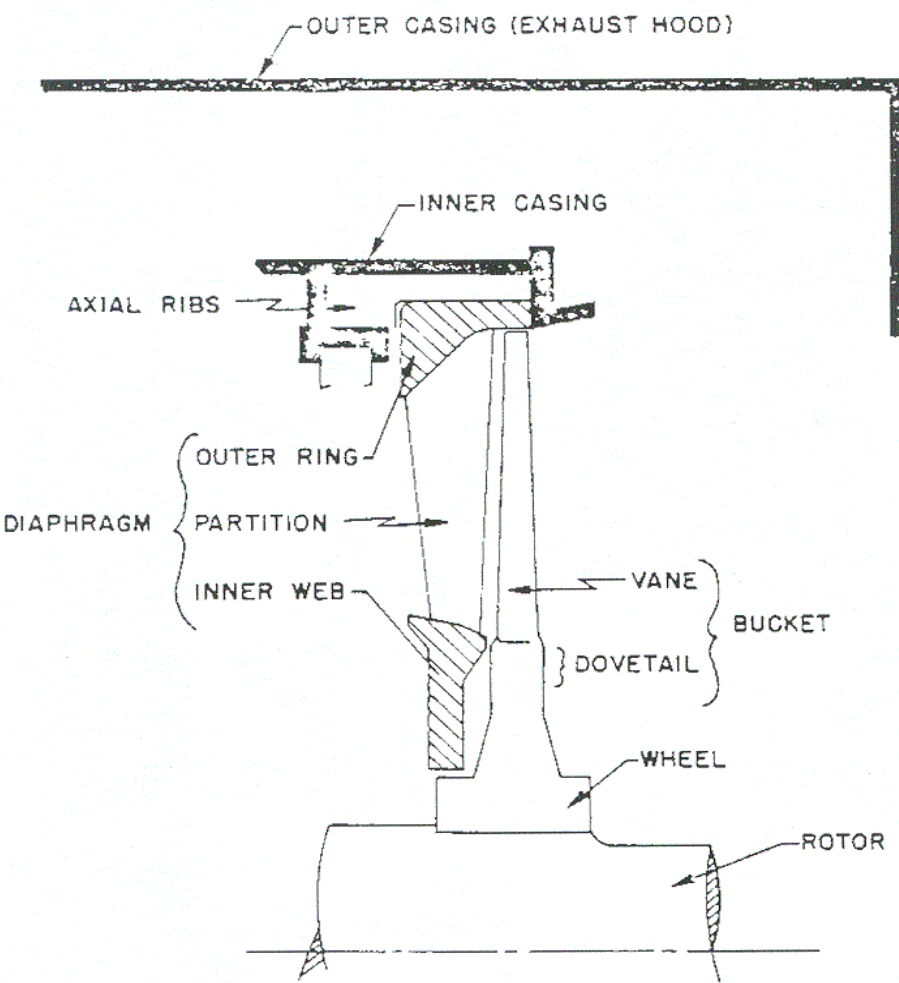


UFSAR Revision 30.0

 An AEP Company	<p style="text-align: center;">INDIANA AND MICHIGAN POWER D. C. COOK NUCLEAR PLANT UPDATED FINAL SAFETY ANALYSIS REPORT</p>	<p>Revised: 28.0 Chapter: 14 Sheet: 1 of 1</p>
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UFSAR Revision 30.0



This information is still provided for the (removed) General Electric low-pressure turbines, as this is the analysis that bounds other Unit 1 rotating elements. This figure is for the (removed) General Electric low-pressure turbines.

Revision: 24.0

Change Description: UCR-1977, Rev. 0

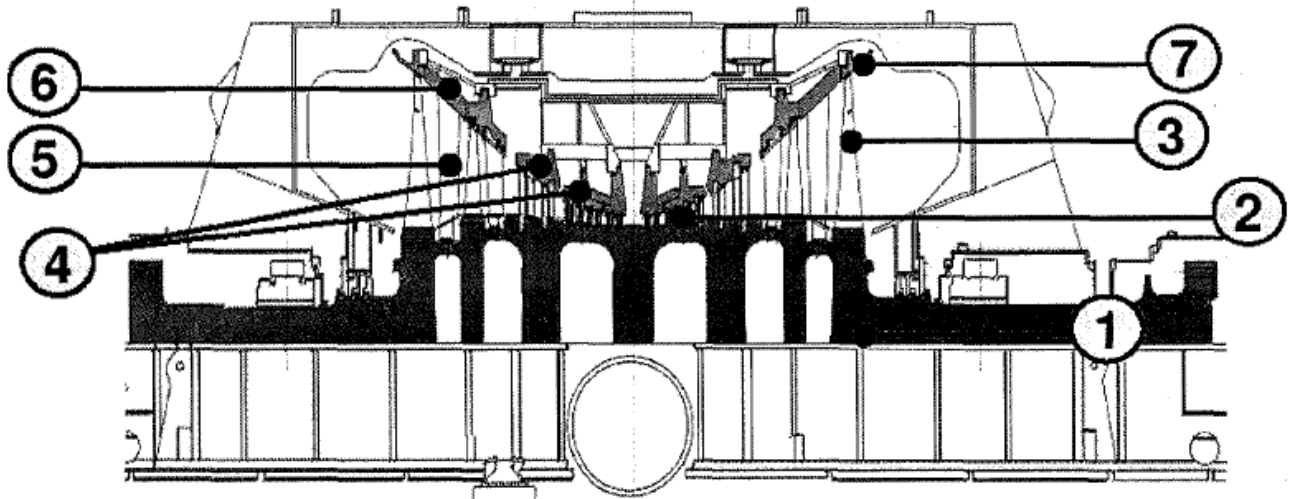


Title: Sketch of Last Stage Region – L.P. Turbine Unit 1

UFSAR Figure: 14.1.13-4

Sheet 1 of 1

**DONALD C. COOK NUCLEAR PLANT
SKETCH OF THE LOW PRESSURE TURBINE UNIT 1**



1. 7 piece Welded Rotor (ST565S), with integral couplings
2. 8 Reaction front stages
3. RS56R Rear Stages (L-1 and L-0 stages)
4. 2 Blade carriers (L-4 to L-9 and L-2 to L-3), per flow
5. G0 diaphragm
6. G1 hooked into G0 diaphragm outer ring
7. Diffuser bolted to existing inner casing

This figure shows the Unit 1 low pressure turbine retro-fitted with the low pressure turbine manufactured by Alstom Power, Inc. It is typical for all three low pressure turbines.

Revision: **24.0**


Change Description: **UCR-1977, Rev. 0**

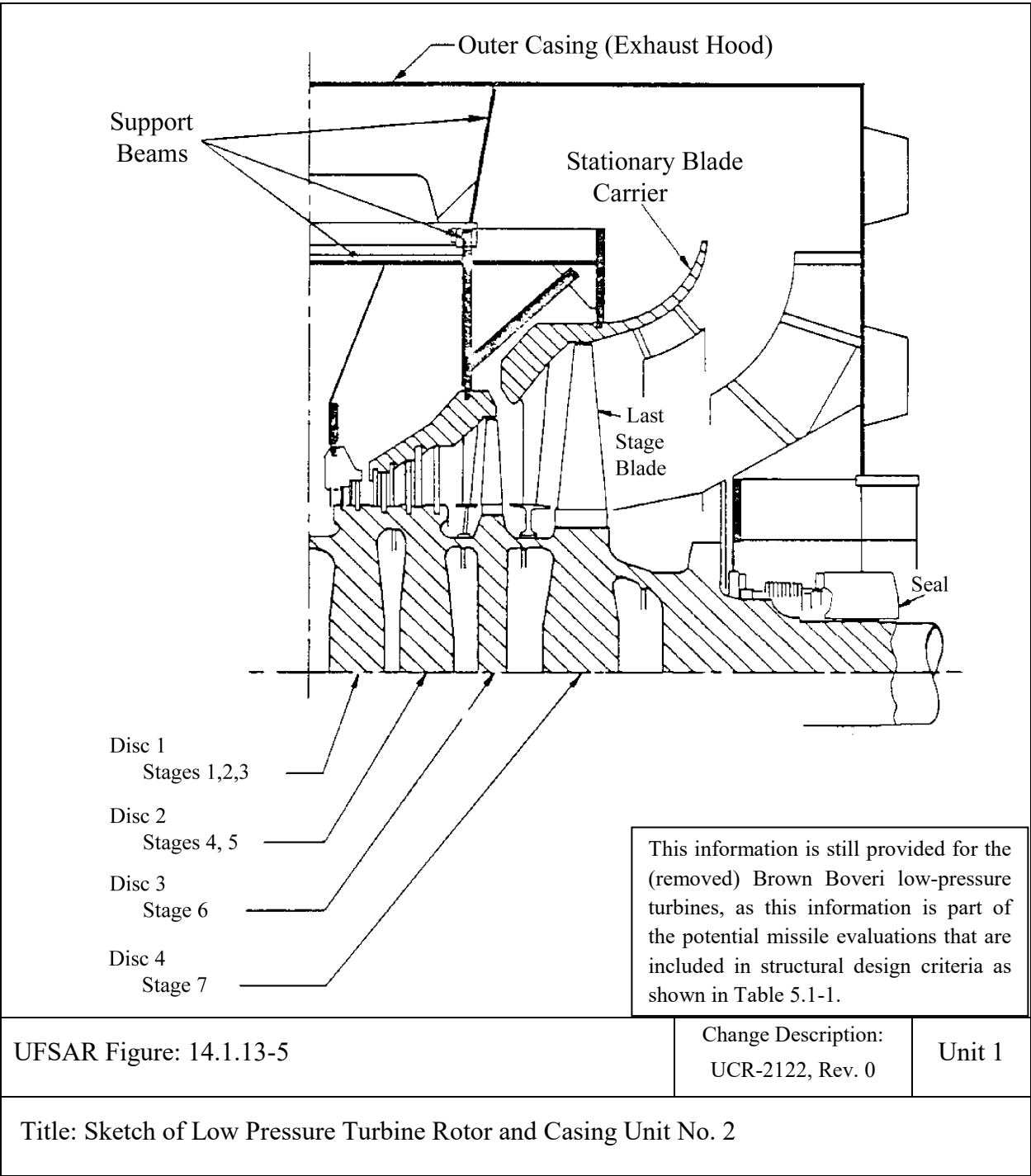


Title: **SKETCH OF THE LOW PRESSURE TURBINE
UNIT 1**

UFSAR Figure: **14.1.13-4a**

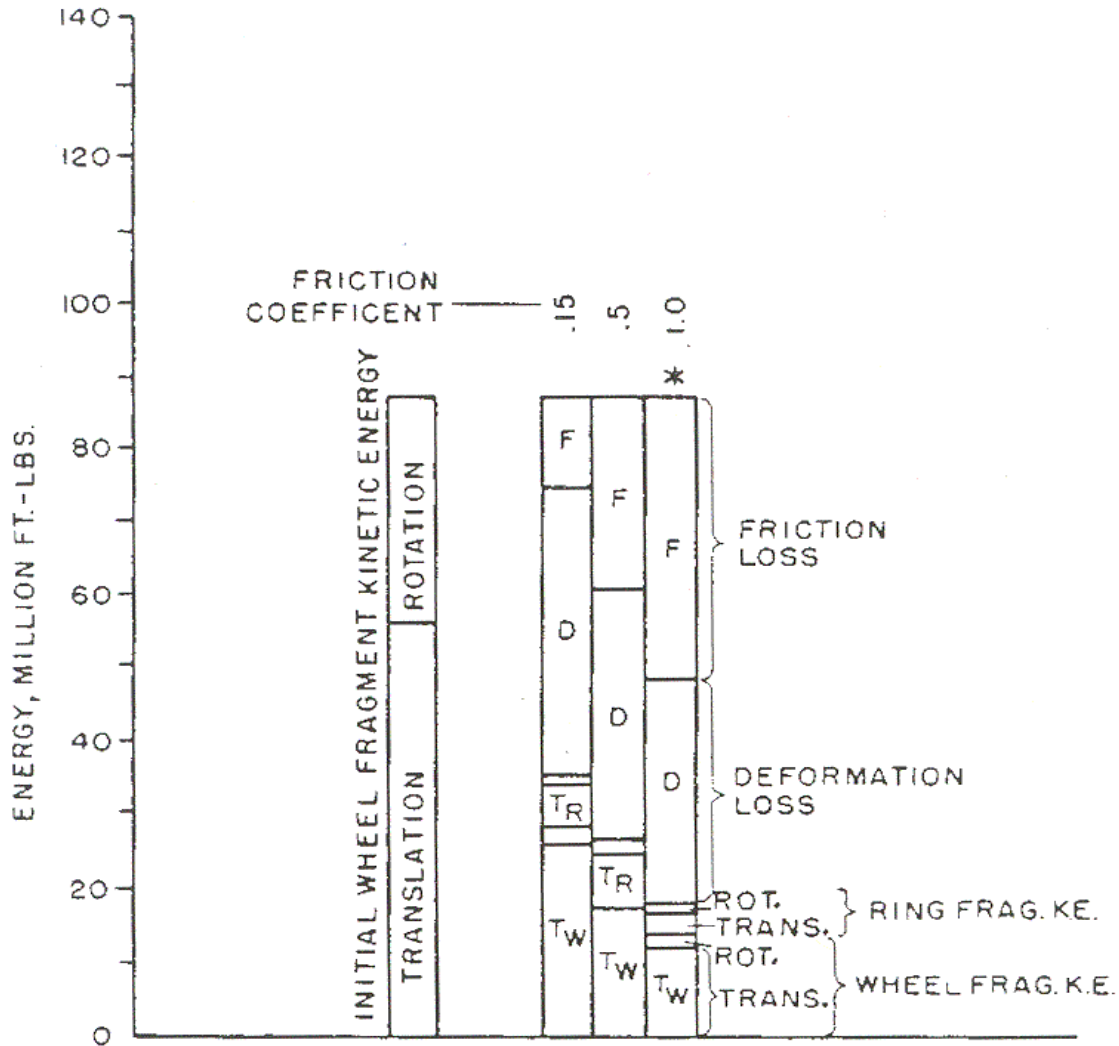
Sheet 1 of 1

 <p>INDIANA MICHIGAN POWER</p> <p>An AEP Company</p>	<p>INDIANA AND MICHIGAN POWER</p> <p>D. C. COOK NUCLEAR PLANT</p> <p>UPDATED FINAL SAFETY ANALYSIS REPORT</p>	<p>Revised: 28.0</p> <p>Chapter: 14</p> <p>Sheet: 1 of 1</p>
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UFSAR Revision 30.0

DONALD C. COOK NUCLEAR PLANT UNIT 1 TURBINE LAST STAGE WHEEL KINETIC ENERGY OF 120° FRAGMENT AFTER INNER CASING IMPACT 43" WHEEL, ZERO RESTITUTION, CASE "C" SECOND PHASE IMPACT (RING IN PARTICLES)



This information is still provided for the (removed) General Electric low-pressure turbines, as this is the analysis that bounds other Unit 1 rotating elements. This figure is for the (removed) General Electric low-pressure turbines.

Revision: 24.0

Change Description: UCR-1977, Rev. 0



Title: UNIT 1 TURBINE LAST STAGE WHEEL

UFSAR Figure: 14.1.13-6

Sheet 1 of 1