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Writer's Direct Dial Number:

May 14, 1984  
5211-84-2119

Dr. Thomas E. Murley  
Region I, Regional Administrator  
U. S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA. 19406

Dear Dr. Murley:

Three Mile Island Nuclear Station, Unit I (TMI-1)  
Operating License No. DPR-50  
Docket No. 50-289  
Operational Readiness Evaluation (Inspection No. 50-289/84-05)

On April 2, 1984, Mr. Robert Keller, Chief Section 1D, DPRP, Region I, conducted an exit brief for an Operational Readiness Evaluation which was conducted at TMI-1 on February 8 & 9, 1984. The result of the evaluation was that licensed personnel at TMI-1 were found to be knowledgeable and well trained. This evaluation consisted of twenty-six (26) individual two hour interviews by NRC staff of Licensed Operators or Senior Operators. During the exit brief, individual operator weaknesses in thirteen (13) topics were addressed. The NRC indicated that these weaknesses were due to inexperience with an operating facility.

In order to upgrade the operational knowledge of the licensed operators at TMI-1 these thirteen (13) topics will be addressed in the requalification training program, a three day simulator program, or during on shift training. Additionally, a restart qualification card (Attachment I) for all crews has been instituted that will be used during Hot Functional Testing (HFT), Zero Physics Testing (ZPT) and the Power Escalation Test (PET) program. The PET program contains time periods at 40% and 75% power levels designed to allow all crews an opportunity to participate in hands on performance of items identified on the restart qualification card.

Attachment 2 specifically addressed training on the thirteen (13) topics and includes information on the simulator training that is presently being conducted at the Babcock and Wilcox Simulator.

Sincerely,  
*H. D. Hukill*  
H. D. Hukill,  
Director, TMI-1

8508120643 850703  
PDR FOIA  
REBER85-419 PDR

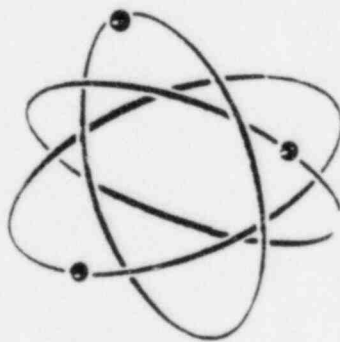
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Attachments (2)  
GPU Nuclear Corporation is a subsidiary of the General Public Utilities Corporation  
cc: CARIRS\_TMI

3.

**GPU NUCLEAR**

**THREE MILE ISLAND  
NUCLEAR GENERATING STATION**



UNIT 1

RESTART

QUALIFICATION CARD

PRIMARY

	SRO/CRO	Date	A0	Date	A0	Date
L. CRD - Transfer rods to aux. power supply. (I)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
CRD - Walk thru dropped rod recovery & location of S2 bypass, safety, rod out bypass, dilution permit bypass. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
CRD - Adjust relative rod position in C.R. (I)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			

PRIMARY

	SRO/CRO	Date	AO	Date	AO	Date
4. RCPs - Verify prerequisites			N/A		N/A	
for pump start (seal flow,			N/A		N/A	
IC flow etc.) & set up pump			N/A		N/A	
for startup including oil			N/A		N/A	
system operation. Discuss			Comments:			
starting interlocks. (I)						
RCPs - Operate RC pumps			N/A		N/A	
in parallel with the DH			N/A		N/A	
removal system. (C)			N/A		N/A	
			N/A		N/A	
			Comments:			
Int. Closed Cooling -			N/A		N/A	
Shift int. closed pump. (C)			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			Comments:			

PRIMARY

	SRO/CRO	Date	A0	Date	A0	Date
7. Int. Closed Cooling - Verify						
proper $\Delta P$ across CRDM						
filters: discuss limits.						
(C)						
			Comments:			
Int. Closed Cooling - Walk	N/A					
thru or perform CRD filter	N/A					
isolation & draining.	N/A					
(Do this in groups of	N/A					
2 at a time)	N/A		Comments:			
	N/A					
	N/A					
	N/A					
Makeup & Purif. - Establish			N/A		N/A	
normal makeup & letdown -			N/A		N/A	
review limits on number of			N/A		N/A	
filters & demins. vs.			N/A		N/A	
letdown flow. (C)			Comments:			

PRIMARY

	SRO/CRO	Date	AO	Date	AO	Date
10. Makeup & Purif. - Shift	_____	_____	N/A	_____	N/A	_____
makeup pumps including trans-	_____	_____	N/A	_____	N/A	_____
fer of B pump breakers to	_____	_____	N/A	_____	N/A	_____
alt. bus. (I - if possible)	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
11. Makeup & Purif. - Verify	N/A	_____	_____	_____	_____	_____
proper seal injection &	N/A	_____	_____	_____	_____	_____
return filter $\Delta P$ . Discuss	N/A	_____	_____	_____	_____	_____
how to isolate & change	N/A	_____	_____	_____	_____	_____
supply & return filters.	N/A	_____	Comments:			
Review limits. (I)	N/A	_____				
	N/A	_____				
12. Makeup & Purif. - Establish	_____	_____	_____	_____	_____	_____
daisy chain letdown & makeup	_____	_____	_____	_____	_____	_____
paths thru the bleed tanks	_____	_____	_____	_____	_____	_____
to clean the RCS system. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				

PRIMARY

	SRO/CRO	Date	A0	Date	A0	Date
1. Makeup & Purif. - Regulate	N/A					
RCP seal leakoff adjustment	N/A					
at PI-39. (I)	N/A					
	N/A					
	N/A		Comments:			
	N/A					
	N/A					
	N/A					
2. Makeup & Purif. - Make an			N/A		N/A	
addition to the makeup tank.			N/A		N/A	
Include a calculation to			N/A		N/A	
deborate by 2 ppm. Use			N/A		N/A	
batch controller & discuss			Comments:			
interlocks. (I)						
3. Makeup & Purif. - Regulate			N/A		N/A	
makeup tank overpressure.			N/A		N/A	
Discuss reason for max.			N/A		N/A	
makeup tank pressure. (I)			N/A		N/A	
			Comments:			



PRIMARY

	SRO/CRO	Date	A0	Date	A0	Date
16. Pressurizer - Control pwr. spray & heaters. Discuss input signal source. (C)			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			Comments:			
17. Pressurizer - Discuss new T.S. on PORV operability. (C)			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			Comments:			
18. Pressurizer/RCS - Control RCS press. in bank to allow simultaneous operation of RCP's & DH removal sys. (C)			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			Comments:			



PRIMARY

	SRO/CRO	Date	AO	Date	AO	Date
19. RCS - Plot l/m curve during rod withdrawal & deboration. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
_____	_____					
_____	_____					
20. Pressurizer - Discuss how to shift signal inputs to pressurizer controls & ICS inputs. (I)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
_____	_____					
_____	_____					
21. Pressurizer - Transfer group 8 or 9 heater to P or S 480v bus. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
_____	_____					
_____	_____					

PRIMARY

	SRO/CRO	Date	AO	Date	AO	Date
2. Participate in plant	_____	_____	_____	_____	_____	_____
heatup & cooldown as	_____	_____	_____	_____	_____	_____
specified by operating	_____	_____	_____	_____	_____	_____
procedures. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				

SECONDARY

	SRO/CRO	Date	AO	Date	AO	Date
Startup/Shutdown C.W. Sys.	_____	_____	_____	_____	_____	_____
(C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
Place amertap in service and	_____	_____	_____	_____	_____	_____
secure. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
Place C.W. Cl & Acid Sys.	N/A	_____	_____	_____	_____	_____
in service & secure. (C)	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	Comments:			
	N/A	_____				
	N/A	_____				
	N/A	_____				

SECONDARY

	SRO/CRO	Date	AO	Date	AO	Date
4. Establish condensate sys. on	_____	_____	_____	_____	_____	_____
recirc. Shift one condensate	_____	_____	_____	_____	_____	_____
pump. (No flow thru heaters	_____	_____	_____	_____	_____	_____
unless authorized.) (C)	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
Fire Aux. boilers & perform	N/A	_____	_____	_____	_____	_____
valve lineup to support	N/A	_____	_____	_____	_____	_____
vacuum operation (to seals).	N/A	_____	_____	_____	_____	_____
(C)	N/A	_____	_____	_____	_____	_____
	N/A	_____	Comments:			
	N/A	_____				
	N/A	_____				
	N/A	_____				
Place condensate chemical	N/A	_____	_____	_____	_____	_____
feed in service & secure.	N/A	_____	_____	_____	_____	_____
(C)	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	Comments:			
	N/A	_____				
	N/A	_____				
	N/A	_____				

SECONDARY

	SRO/CRO	Date	AO	Date	AO	Date
1. Place main turbine on turning gear. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
Place main feed pumps on turning gear. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
. Demonstrate how to regulate main turbine exhaust hood spray. (I)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				

SECONDARY

	SRO/CRO	Date	AO	Date	AO	Date
15. Shift to standby main & aux. vacuum pumps. (C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
16. Demonstrate how to makeup to the condensate head tank. (C)	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	Comments:			
	N/A	_____				
	N/A	_____				
17. Run one feed pump turbine on aux. steam (uncoupled or coupled - as directed). (C)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				

SECONDARY

	SRO/CRO	Date	AO	Date	AO	Date
16. Run one powdex vessel thru a regen. cycle (with or without resin - as directed). (C)	N/A					
	N/A					
	N/A					
	N/A					
	N/A		Comments:			
	N/A					
	N/A					
N/A						
17. Establish F.W. heating & flow thru heaters (if authorized). (C)						
			Comments:			
18. Run one cond. booster pump or recirc. (if authorized). (C)			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			Comments:			



SECONDARY

	SRO/CRO	Date	AO	Date	AO	Date
9. Operate the powdex system	_____	_____	N/A	_____	N/A	_____
bypass valve from the control	_____	_____	N/A	_____	N/A	_____
room. Verify holding pump	_____	_____	N/A	_____	N/A	_____
operation on a powdex vessel.	_____	_____	N/A	_____	N/A	_____
(C)	_____	_____	Comments:			
	_____	_____				
	_____	_____				

# POWER EXCALATION/PHYSICS TESTING EVOLUTIONS

	SRO/CRO	Date	AO	Date	AO	Date
Participate in or observe natural circulation. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				

Startup & parallel a main feed pump with a running pump. (I If possible)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				

Place a powder vessel in service. Cool the vessel removed. Operate the backwash recovery system. (I)	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	_____	_____	_____	_____
	N/A	_____	Comments:			
	N/A	_____				
	N/A	_____				

POWER EXCALATION/PHYSICS TESTING EVOLUTIONS

	SRO/CRO	Date	AO	Date	AO	Date
Walk thru or complete a plant precritical checkoff per 1102-2. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____

Comments:

Complete a turbine plant  
startup. This includes  
bringing Rx power up,  
putting turbine & generator  
on line & increasing power  
to approximately 40%. (C)

Comments:

Complete main turbine &  
feed pump valve testing.  
(C)

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

Comments:

SURVEILLANCES

	SRO/CRO	Date	AO	Date	AO	Date
1. 1303-4.11			N/A		N/A	
HPI/LPI logic & analog			N/A		N/A	
channels. (C)			N/A		N/A	
			N/A		N/A	
			Comments:			
1403-4.14			N/A		N/A	
Rx. Bldg. 30 psig analog			N/A			
channels. (C)			N/A			
			N/A			
			Comments:			
1303-4.19			N/A		N/A	
HPI/LPI analog channels.			N/A		N/A	
(C)			N/A		N/A	
			N/A		N/A	
			Comments:			

# SURVEILLANCES

	SRO/CRO	Date	AO	Date	AO	Date
1303-5.1			N/A		N/A	
Rx. bldg. cooling & isolation			N/A		N/A	
logic channel & component			N/A		N/A	
test. (C)			N/A		N/A	
			Comments:			
1303-5.2			N/A		N/A	
Loading sequence & component			N/A		N/A	
test. (C)			N/A		N/A	
			N/A		N/A	
			Comments:			
1303-11.8			N/A		N/A	
HPI injection. (C)			N/A		N/A	
			N/A		N/A	
			N/A		N/A	
			Comments:			

SURVEILLANCES

	SRO/CRO	Date	AO	Date	AO	Date
1303-11.9	_____	_____	N/A	_____	N/A	_____
Rx. Bldg. emergency cooling.	_____	_____	N/A	_____	N/A	_____
(C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
1303-11.10	_____	_____	N/A	_____	N/A	_____
ESAS sequence & power	_____	_____	N/A	_____	N/A	_____
transfer. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
1303-11.54	_____	_____	N/A	_____	N/A	_____
LPI injection. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				

# SURVEILLANCES

	SRO/CRO	Date	AO	Date	AO	Date
1. 1302-1.1	_____	_____	N/A	_____	N/A	_____
Power range calibration	_____	_____	N/A	_____	N/A	_____
CRO portion only.	_____	_____	N/A	_____	N/A	_____
(C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
2. 1303-4.1	_____	_____	N/A	_____	N/A	_____
Rx protection sys. (C)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
2. 1301-1 (Shift & Dailys)	_____	_____	N/A	_____	N/A	_____
Perform in cold shutdown.	_____	_____	N/A	_____	N/A	_____
(I)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				



SURVEILLANCES

	SRO/CRO	Date	AO	Date	AO	Date
3. 1301-1 (Shift & Dailys)	_____	_____	N/A	_____	N/A	_____
Perform in hot shutdown.	_____	_____	N/A	_____	N/A	_____
(I)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				
	_____	_____				
4. 1301-1 (Shift & Dailys)	_____	_____	N/A	_____	N/A	_____
Perform at 40% power.	_____	_____	N/A	_____	N/A	_____
(I)	_____	_____	N/A	_____	N/A	_____
	_____	_____	N/A	_____	N/A	_____
	_____	_____	Comments:			
	_____	_____				
	_____	_____				

## ATTACHMENT 2

An Operational Readiness Evaluation (Inspection No. 50-289/84-05) was conducted, at TMI-1 on February 8 & 9, 1984. Based on the results of this evaluation, individual operator weaknesses were identified in thirteen (13) topics which were indicative of inexperience with an operating facility. These topics are being addressed during the current regualification training cycle. A summary of the training on these topics is detailed in the following paragraphs.

The following topics have been incorporated into classroom training for the licensed operator regualification program. This classroom training commenced on April 9, 1984, and will be completed the week of May 14, 1984.

<u>INSPEC. ITEM</u>	<u>SUBJECT</u>
No. 2	Transient Analysis for Loss of Main Feedwater and a Deboration (Moderator Dilution) Accident.
No. 4	Calculation of the boron change required for a power change.
No. 5	Calculation of Heat Balance without a Computer.
No. 8	Manipulation of the Makeup and Purification System to reposition Control Rods.
No. 9	Basis of Limit Settings Incorporated into the Integrated Control System.
No. 11	Logic and Control of Control Rod Drive Circuit Breakers.
No. 12	Construction and Operation of an RCP Seal Package.
No. 13	Predicting Indication of NIs during a reactor startup.

In addition to the training being conducted as described above, classroom instruction will be conducted on Reactivity Coefficient effects while at power during Licensed Operator Regualification Training Cycle 84-2, (Insp. Item No. 1). This training will be conducted commencing the week of May 28 thru July 2, 1984. Incorporation of this training into the present regualification schedule could not be accomplished due to higher priority training. All licensed operators have been directed to review the applicable sections of the TMI Training reference material.

(13)

Training on Predicting Indication of NIs during a Reactor Startup, is being conducted on the Basic Principles Simulator at TMI.

Licensed Operator Regualification Training is presently being conducted at the Babcock and Wilcox Simulator in Lynchburg, VA. This training is being conducted to emphasize both the use of the ATOG procedures and normal operations. The topics listed below have been incorporated into this training:

<u>INSP. ITEM</u>	<u>SUBJECT</u>
No. 3	Plant Manuevering when placed in a situation not covered by procedures.
No. 6	Methods of Controlling the plant cooldown rate following reactor trips.
No. 7	Methods of Controlling Xenon oscillations.

Training being conducted on the ATOG procedures emphasizes the operator response during abnormal transients. The philosophy of ATOG and the basis of the procedures developed include operator's actions on item nine above.

Due to the constraints of the regualification scheduling, formal classroom training is not being conducted on Control Functions of the Electrohydraulic Control System. (Insp.Item. No. 10). All licensed operators are required to review the EHC section of the TMI-1 Operations Plant Manual. This material is to be included in regualification weekly quizzes during cycle 84-2.

# Training Content Record

Lesson Course Title

Number

Lesson Plan Title

Number

Rev

CALCULATIONS FOR BORON CHANGES

## Objectives

Following instruction, the student should be able to:

1. Using Procedure 1103-4, perform hand calculations involving additions of fluids to the RCS that;
  - a. Dilute the boron concentration (rods move in, in auto).
  - b. increase the boron concentration (rods move out in auto).

Responsibility

Signature

Title

Date

Origination

*M. J. [Signature]*

*Adm Nuc Tech Trg*

*4/6/84*

Review/Concurrence

*[Signature]*

*Supervisor Op Trg 1*

*4/6/84*

Approval

Objectives

*[Signature]*

*Acting Director*

*4/6/84*

Final

# Training Content Record

Lesson Course Title

Number

Lesson Plan Title

MANIPULATION OF MAKEUP SYSTEM TO REPOSITION CONTROL RODS

Number

Rev

## Objectives

Given the necessary procedures for reference, each student would be able to explain the makeup system manipulations required to borate, deborate or dilute the RCS to achieve a predetermined rod position.

Responsibility

Signature

Title

Date

Origination

*CR Federick*

Super Rec Op Trn TMI-1 4/4/84

Review/Concurrence

Approval

Objectives

*CR Federick*

Acting Hqr Op Trng

4/6/84

Final

## Training Content Record

Lesson Course Title	Number	
Lesson Plan Title HEAT BALANCE CALCULATIONS	Number	Rev

### Objectives

Following instruction, the student should be able to:

1. Perform a hand calculation "Heat Balance" for the core thermal power in accordance with procedure 1103-16.

Responsibility	Signature	Title	Date
Origination	<i>M. J. Sullivan</i>	Pdr. Nuc Tech Trg	4/6/84
Review/Concurrence	<i>Ed. Fedeev</i>	Sup. Nuc Op Trg	4/6/84
Approval	<i>Ed. Fedeev</i>	Acting Nuc Op Trg	4/6/84
	Objectives		
	Final		

# Training Content Record

Lesson Course Title

Number

Heat Bal (Electrical) Manual

15.2.07

Lesson Part Title

Number

Rev

HEAT BALANCE CALCULATIONS

## Objectives

Following instruction, the student should be able to:

1. Perform a hand calculation "Heat Balance" for the core thermal power in accordance with procedure 1103-16.

Responsibility

Signature

Title

Date

Origination

Review/Concurrence

Approval

Objectives

Final

*[Signature]*

*[Signature]*

4/6/09

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# Training Content Record

Lesson Course Title

Number

Lesson Plan Title

CONSTRUCTION AND OPERATION OF RCP SEAL PACKAGE

Number

Rev.

## Objectives

At the conclusion of this lesson, each student should be able to:

- Given a simplified drawing of the reactor coolant pump seal package, label the components indicated, show seal water flowpaths, and indicate approximate flow rates during normal operation.
- State the purpose of the No. 1 seal bypass valve, and list or identify the conditions under which the valve may or may not be opened.
- Identify the correct range of back pressure to be maintained on the No. 1 seal return line and describe how, where, and why it is maintained. (As read on MU-PI39).
- State the purpose of the standpipe and identify normal, low alarm, and high alarm levels.
- Describe reactor coolant pump seal flow during a loss of normal seal injection, and explain how given seal package monitored parameters will change during this condition. (i.e., temperatures, flows, D/P's).
- State the temperatures of the No. 1 seal outlet and radial bearing which require pump shutdown.
- State at what RCS pressure and temperature seal injection is required to the reactor coolant pumps.

Responsibility

Signature

Title

Date

Origination

Review/Concurrence

Approval

Objectives

Final

6210 AUM 121001-1 (12-82)

# TRAINING CONTENT RECORD

Lesson Course Title

*Basic Principles Trainer*

Number

*15.2.04*

Lesson Plan Title

BPT INTRODUCTION/ORIENTATION FOR LICENSED OPERATORS

Number

re

OBJECTIVES Following instruction, the student should be able to:

BPT INTRODUCTION/ORIENTATION FOR LICENSED OPERATORS  
REFERENCE FILE DJLP#1

1. AFTER INSTRUCTION AND DEMONSTRATION EACH PARTICIPANT SHALL BE ABLE TO IDENTIFY THE BASIC COMPONENTS OF THE BPT AS: MIMIC AND CONTROL PANEL, PLANT CONTROL SYSTEM, TRAINEE GRAPHICS SYSTEM INTERFACE, AND INSTRUCTOR CONSOLE.

## 1.0 GENERAL DESCRIPTION OF THE DRILL

LICENSED OPERATOR INTRODUCTION: STARTUP TO 15% REACTOR POWER.

- A. USING BPT OP-3 INCREASE REACTOR POWER FROM 1E-8 AMPS TO 15% RATED POWER AT 10% PER HOUR WITHOUT CAUSING A REACTOR TRIP.
- B. DURING REACTOR STARTUP TO 15% RATED POWER CONTROL PRESSURIZER LEVEL BETWEEN THE LIMITS OF OP-3 FIGURE 1 (ALLOWABLE PRESSURIZER LEVEL LIMITS FOR REACTOR POWER INCREASE FROM 0-15%).
- C. DEMONSTRATE AND CORRECTLY (AS DEFINED IN THE OPERATOR TRAINING MANUAL) EXPLAIN FUEL AND TEMPERATURE REACTIVITY EFFECTS ON REACTOR CORE SUR AND KEFF WHEN REACTOR POWER IS RAISED TO THE POINT OF INITIAL SENSIBLE FISSION HEAT PRODUCTION.
- D. DEMONSTRATE AND CORRECTLY EXPLAIN WHY CRITICAL ROD POSITION CHANGES AS REACTOR POWER IS INCREASED IN THE POWER RANGE.
- E. TREND VALUES OF RCS TAVE, THOT, TCOLD AND MAIN STEAM TEMPERATURE, AND CORRECTLY EXPLAIN THE EFFECTS DUE TO OTSG LEVEL CONTROL ON REACTOR STARTUP TO 15% RATED POWER.
- F. ROLL, SYNCHRONIZE, AND INITIALLY LOAD THE MAIN TURBINE GENERATOR UNTIL ALL TURBINE BYPASS VALVES ARE CLOSED (IN AUTOMATIC) WHILE MAINTAINING TURBINE HEADER PRESSURE AT 885 PLUS/MINUS 50 PSIG.

RESPONSIBILITY

SIGNATURE

TITLE

DATE

ORIGINATION

*A. Dennis J. Batts*

*Supervisor, Simulator Training*

*4/6/84*

REVIEW/  
CONCURRENCE

*A. Dennis J. Batts*

*Supervisor, Simulator Training*

*4/6/84*

*approved*

*W. J. Sedberry*

*System Operator Training Manager*

*4-18-84*

APPROVAL

OBJECTIVES

*W. J. Sedberry*

*Simulator Development Manager*

*4/18/84*

FINAL

6210 10M-1210.01-1 (12/82)

## Training Content Record

Lesson Course Title

Number

Lesson Plan Title

LOGIC AND CONTROL OF CRD BREAKERS

Number

Rev.

### Objectives

Following instruction, the student should be able to:

1. Given a combination of breaker and/or electronic trips, state whether;
  - a. The reactor is fully tripped
  - b. (If not fully tripped), what the control rods's configuration in the core is (i.e., which groups inserted)
2. State the configuration of the rods and UV coil circuits on a loss of:
  - a. one vital busses
  - b. all vital busses
3. State that any two out of four RPS channel trips result in full reactor trip (assuming only single failure on CRD breaker/elect. trip systems).
4. How the following operate to open the breakers that use them;
  - a. Undervoltage coils
  - b. Shunt trip coils
5. How the "E" ("F") relays operate to trip the reg groups.
6. Why APSR's do not drop on reactor trip.

Responsibility

Signature

Title

Date

Origination

*Michael J. Tucker*

Adm Nuc Tech Training

4/12/84

Review/Concurrence

*EL Frederic*

Supv Lic Op Training

4-12-84

Approval

Objectives

*EL Frederic*

Acting Op Train Mgr

4-12-84

Final

# TRAINING CONTENT RECORD

Lesson Course Title

Number

Lesson Plan Title

Number

Rev.

BASIS OF LIMIT SETTING INCORPORATED INTO I.C.S.

11.2.01.055

0

OBJECTIVES Following instruction, the student should be able to:

1. EXPLAIN THE BASIS FOR THE FOLLOWING LIMITS ASSOCIATED WITH THE INTEGRATED CONTROL SYSTEM:

- a. HIGH LOAD LIMIT
- b. LOW LOAD LIMIT
- c. LOAD RATE OF CHANGE
- d. BTU LIMIT
- e. LOW LEVEL LIMIT
- f. HIGH LEVEL LIMIT
- g. CROSS LIMITS
- h. REACTOR DEMAND HIGH/LOW LIMITS

RESPONSIBILITY

SIGNATURE

TITLE

DATE

ORIGINATION

*Ed. Fiedler*

Superior Op Trng TMI-1

4-6-84

REVIEW/  
CONCURRENCE

APPROVAL

OBJECTIVES

FINAL

*Ed. Fiedler*

Acting Op Trng Mgr

4/6/84

# Training Content Record

Lesson Course Title <i>Safety Analysis - FSAR Chapter 14</i>		Number <i>15.2.04</i>	
Lesson Plan Title <i>MODERATOR DILUTION AND LOSS OF FEEDWATER</i>		Number	Rev.

## Objectives

- A. At the completion of the training, the trainees should be able to:
1. Identify the correct present plant response to a LOFW or a Moderator Dilution.
  2. Identify the correct final plant conditions for the LOFW and Moderator Dilution accident.
  3. State why the FSAR cannot be used to describe transients based on present plant descriptions.
  4. Indicate the effect of changing an assumed value of a parameter on the severity of the accident (Dilution or LOFW).

Responsibility	Signature	Title	Date
Origination	<i>Frank Perry</i>	TECHNICAL PROG. SPEC.	4/17/84
Review/Concur	<i>Ch. Fiedler</i>	Sup. Lic. Op. Train. Mgr.	4-17-84
Approval	Objectives <i>Ch. Fiedler</i>	Acting Op. Train. Mgr.	4-17-84
	Final <i>1.0</i>		



# Training Content Record

Lesson Course Title	Number	
Lesson Plan Title Reactivity Coefficients	Number 11.2.01.124	Rev 0

## Objectives

At the conclusion of this lesson the student will be able to:

- A. Describe each of the major reactivity coefficients, their mechanisms for reactivity feedback, approximate values, and the varying effects of temperature changes and Core Age.
- B. List the factors most affected by changes in the moderator-to-fuel ratio, describing the direction and magnitude of these effects during a plant heatup or cooldown.
- C. Define the terms:  
Over Moderated, Under Moderated and Power Defect.
- D. Explain in detail how the presence of boron in the moderator makes the reactor core appear to be over moderated.
- E. Explain how and why the Power Defect changes over the life of the core.
- F. Explain how and why fuel temperature varies with fuel burnup - even with a constant thermal power level.
- G. Define point of Initial Sensible Heat Production, list its contributing factors, and explain why its value can change.
- H. Describe the response of the Excore Nuclear Detectors to core void formation during accident or transient conditions.
- I. Describe how a Reactor Coolant pH change can induce a reactivity change.

Responsibility	Signature	Title	Date
Origination	<i>Daryl L. Wilt</i>	Admin. Proc. Tech. Dir.	5/7/84
Review/Concurrence	<i>Ed. G. ...</i>	Supv. Op. Training	5/8/84
Approval	<i>Bruce Leonard</i>	Operator Training Manager	5-8-84
	Objectives		
	Final		

# Training Content Record

Lesson Course Title	Number	
Lesson Plan Title	Number	Rev
Methods of Controlling Xenon Oscillations		

## Objectives

At the completion of this lecture, each student should be able to explain how the operator can recognize and control axial or radial xenon oscillations.

Responsibility	Signature	Title	Date
Origination	<i>ER Fedor</i>	<i>Sup Rec Op Tang TMI-1</i>	<i>4-2-84</i>
Review/Concurrence			
Approval	Objectives	<i>Bruce Leonard</i>	<i>Operator Training Manager 4-2-84</i>
	Final		



# Training Content Record

Lesson Course Title	Number	
Lesson Plan Title	Number	Rev.
Methods of Controlling Plant Cooldown following a Reactor Trip		

## Objectives

At the completion of this simulator session each student should be able to list the methods of plant cooldown following a reactor trip in order of prioritization (preference).

Responsibility	Signature	Title	Date
Origination	<i>Ed. Fiedler</i>	Supv. Rec. Op. Training	4-2-84
Review/Concurrence			
Approval	Objectives	<i>Bruce Leonard</i>	Operator Training Manager 4-2-84
	Final		

# Training Content Record

Lesson Course Title	Number	
Lesson Plan Title	Number	Rev

## Objectives

After reviewing Procedures 1102-2 and 1550-02, each student should be able to:

1. Explain the basis for each limitation and precaution listed in each Procedure.
2. Given a step in either Procedure, identify approximate power level step is performed; and for verification steps, identify how and where the verification is made.

Responsibility	Signature	Title	Date
Origination	<i>Frank J. [unclear]</i>	<i>A. N. T. T.</i>	<i>3/15/84</i>
Review/Concurrence	<i>E. R. Frederick</i>	<i>Supv. of Op. Trng TMI-1</i>	<i>3-15-84</i>
Approval	Objectives	<i>Bruce Lemard</i>	<i>Operator Training Manager 3/16/84</i>
	Final	<i>Bruce Lemard</i>	<i>Operator Training Manager 3/16/84</i>

# Training Content Record

Lesson Course Title

Number

Lesson Plan Title

OPERATING CURVES

Number

Rev

## Objectives

At the completion of this training, each student should be able to:

1. Explain the basis for and identify areas of permissible, restricted and/or prohibited operation on each of the following operating curves:

Rod Position Limits (Reg & APSR)  
Power Imbalance Envelope  
LOCA Limited Maximum Allowable LHR  
1210-10 Figure 1  
1102-1 Figure 1 and 1A

2. For the operating curves listed above, state the action(s) required when operation occurs outside the permissible area.
3. Identify specific operating circumstances which allow intentional operation outside permissible areas on the curves listed in Objective #1.

Responsibility

Signature

Title

Date

Origination

*E. R. Frederick*

*Supv. Rec. Op. Trng TMI-1*

*3-14-84*

Review/Concurrence

*R. N. T. T.*

*R. N. T. T.*

*3-14-84*

Approval

Objectives

*Bruce Leonard*

*Operator Training Manager*

*3-16-84*

Final

*Bruce Leonard*

*Operator Training Manager*

*3-16-84*

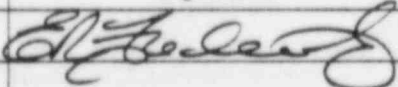
## Training Content Record

Lesson Course Title	Number	
Lesson Plan Title REVIEW OF JANUARY/FEBRUARY 1984 SIMULATOR ATOG EXPERIENCE	Number	Rev.

### Objectives

At the end of this lesson, the student should be able to state the following:

- A. Major training issues that were addressed during previous ATOG training session(s).
- B. Philosophy of ATOG in emphasizing priorities and operator interface with the procedures.
- C. Emphasis of ATOG on the crew concept and command authority.

Responsibility	Signature	Title	Date
Origination		Supr. Lnc Op Trng TM1-1	3-14-84
Review/Concurrence			
Approval	Objectives Final	Operator Training Manager Operator Training Manager	3-14-84 3-14-84

INSTRUCTORS NUCLEAR TRAINING CENTER

HARVEY DAUGHERTY  
HARRY HEILMEIER  
FRANK OBER  
TERRY MCKELLIPS  
KEN FYFFE

GPU NUCLEAR  
3 DAY REQUALIFICATION  
WEEK 1 OF 1  
CHARGE #AT40/R74

Class Room Schedule

MIKE ROSS  
FRANK KACINKO  
HENRY SHIPMAN  
DENNY BOLTZ  
DARRYL WILT  
ED FREDERICK  
BRUCE LEONARD

Control Room Schedule

Day No.	Day/Date	Time	Subject	Reference Instructor	Time	Operation	Reference Instructor
1	MONDAY 3/26/84	1600 TO 1930	ATOG PROCEDURE REVIEW	HD	2000 TO 2400	PLANT STARTUP 3 RCP's SAFETIES OUT TO 4% PLANT STARTUP 3 RCP's 15% TO 40% ATOG DRILLS CRD OPERATIONS AT FULL POWER	TM
2	TUESDAY 3/27/84	1600 TO 1930	ROD INDEX CURVES (2 HRS.) P-T CURVES (HEATUP & COOLDOWN LIMITS) FUEL PIN IN COMPRESSION PTS CURVES ATOG WINDOW (1.5 HRS.)	BRIAN DELANO HH	2000 TO 2400	PLANT S/D FROM FULL POWER SECURE RCP AT 75% ATOG DRILLS MANUAL ICS OPERATIONS (30 MIN.)	KF
3	WEDNESDAY 3/28/84	1600 TO 1930	PROCEDURE REVIEW (2.5 HRS.) STARTUP SHUTDOWN QUIZ (1 HR.)	FO	2000 TO 2400	PLANT OPERATIONS (2 HRS.) OPERATIONAL EVALUATION (2 HRS.)	HH

GPUN

Customer

Babcock & Wilcox  
Nuclear Training Center  
Lynchburg, Virginia