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April 13, 1993  
C311-93-2054

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

Subject: Three Mile Island Nuclear Station, Unit I (TMI-1)  
Operating License No. DPR-50  
Docket No. 50-289  
Monthly Operating Report for March 1993

Enclosed are two copies of the March 1993 Monthly Operating Report for Three Mile Island Nuclear Station, Unit 1.

Sincerely,

*T. G. Broughton*  
T. G. Broughton  
Vice President and Director, TMI-1

WGH

Attachments

cc: Administrator, Region I  
TMI Senior Resident Inspector

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PDR ADOCK 05000289  
R PDR

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*JEH*

## OPERATIONS SUMMARY

### March 1993

The plant entered the month operating at 100% power producing 860 MWe. It continued full power operation until March 12 when a plant trip occurred. An intermittent failure of the output relays in the Reactor Coolant Pump Power Monitor for the 1C Reactor Coolant Pump occurred during the performance of a Heat Sink Protection System Surveillance. The failure and the momentary de-energizing of the 1D Reactor Coolant Pump output relays during a switch manipulation provided the trip signal to the Reactor Protection System. The plant responded as designed.

The plant was restarted and criticality was achieved on March 14. Fifty percent power was reached on March 15 and the plant was maintained at that level until the completion of the condenser cleaning. The plant returned to full power operation on March 17 and remained at that level through the end of the month.

### MAJOR SAFETY RELATED MAINTENANCE

During March, the following major safety related maintenance was performed:

#### Reactor Trip Outage Maintenance Actions

The following maintenance activities were performed while the plant was off-line following the reactor trip:

- A bistable and time delay relay, the Reactor Coolant Pump Power Monitor components likely to have caused the plant trip, were replaced. Higher than expected contact resistances were measured on Reactor Coolant Pump Power Monitor switches. As a result, the switch contacts in the monitor units were cleaned.
- Miscellaneous valve maintenance was performed as follows:
  - a) CW-V-106A and HD-V-3B were repacked,
  - b) a hinge pin leak was repaired on HD-V-18A,
  - c) a threaded fitting leak on HD-V-1126 was repaired and
  - d) the stroke was reset on the FW-V-17B positioner
- An outboard seal leak on HD-P-1B was repaired.
- An oil leak on EHC-PS-100A was repaired.
- A "Hot Spot" connection was repaired on the 1J 480 volt bus.
- The Circulation Water Pump auto-trip function on Main Condenser waterbox high pressure was removed. Two of the three pressure switches on each waterbox were also removed. The remaining pressure switch was wired to provide a high pressure alarm.

#### Station Blackout Diesel Air Start Compressor EG-P-11B

The Station Blackout Diesel air start compressor EG-P-11B was removed from service because the unloader valves were sticking. While the unit was disassembled to rebuild the unloader valves, the discharge valves and hydraulic unloader were cleaned. EG-P-11B was reassembled, satisfactorily tested and returned to service.

#### Spent Fuel Valve SF-V-16

Spent Fuel Cooler discharge valve SF-V-16 was found to be leaking through. The diaphragm was replaced. Retesting is in progress and will continue into April, 1993.

#### Enhancements Initiated by the Security Event

Recommendations developed from study of the February 7, 1993 Intruder Event at the unit resulted in the implementation several security enhancements to minimize the vulnerability of the plant to sabotage.

# OPERATING DATA REPORT

## OPERATING STATUS

DOCKET NO. 50-289  
 DATE April 13, 1993  
 COMPLETED BY W G HEYSEK  
 TELEPHONE (717) 948-8191

1. UNIT NAME: THREE MILE ISLAND UNIT 1  
 2. REPORTING PERIOD: MARCH 1993  
 3. LICENSED THERMAL POWER: 2568  
 4. NAMEPLATE RATING (GROSS MWe): 871  
 5. DESIGN ELECTRICAL RATING (NET MWe): 819  
 6. MAXIMUM DEPENDABLE CAPACITY (GROSS MWe): 834  
 7. MAXIMUM DEPENDABLE CAPACITY (NET MWe): 786

## NOTES:

8. IF CHANGES OCCUR IN (ITEMS 3-7) SINCE LAST REPORT, GIVE REASONS: \_\_\_\_\_

9. POWER LEVEL TO WHICH RESTRICTED, IF ANY (NET MWe): \_\_\_\_\_

10. REASONS FOR RESTRICTIONS, IF ANY: \_\_\_\_\_

		THIS MONTH	YR-TO-DATE	CUMMULATIVE
11. HOURS IN REPORTING PERIOD	(HRS)	744.0	2160.0	162865.0
12. NUMBER OF HOURS REACTOR WAS CRITICAL	(HRS)	678.3	2094.3	87571.0
13. REACTOR RESERVE SHUTDOWN HOURS	(HRS)	0.0	0.0	2283.8
14. HOURS GENERATOR ON-LINE	(HRS)	674.3	2090.3	86490.4
15. UNIT RESERVE SHUTDOWN HOURS	(HRS)	0.0	0.0	0.0
16. GROSS THERMAL ENERGY GENERATED	(MWH)	1653587	5284328	211331032
17. GROSS ELECTRICAL ENERGY GENERATED	(MWH)	553924	1781489	71126563
18. NET ELECTRICAL ENERGY GENERATED	(MWH)	518763	1678193	66780500
19. UNIT SERVICE FACTOR	(%)	90.6	96.8	53.1
20. UNIT AVAILABILITY FACTOR	(%)	90.6	96.8	53.1
21. UNIT CAPACITY FACTOR (USING MDC NET)		88.7	98.8	52.2
22. UNIT CAPACITY FACTOR (USING DER NET)		85.1	94.9	50.1
23. UNIT FORCED OUTAGE RATE	(%)	9.4	3.2	41.3
UNIT FORCED OUTAGE HOURS	(HRS)	69.7	69.7	60759.4
24. SHUTDOWNS SCHEDULED OVER NEXT 6 MONTHS (TYPE, DATE AND DURATION OF EACH):				

25. IF SHUT DOWN AT END OF REPORT PERIOD, ESTIMATED DATE OF STARTUP: \_\_\_\_\_

AVERAGE DAILY UNIT POWER LEVEL

DOCKET NO. 50-289  
 UNIT TMI-1  
 DATE April 13, 1993  
 COMPLETED BY W G HEYSEK  
 TELEPHONE (717) 948-8191

MONTH: MARCH

DAY AVERAGE DAILY POWER LEVEL  
 (MWe-NET)

1	816
2	816
3	816
4	816
5	818
6	818
7	817
8	817
9	816
10	818
11	819
12	11
13	-41
14	-35
15	338
16	346

DAY AVERAGE DAILY POWER LEVEL  
 (MWe-NET)

17	681
18	816
19	814
20	812
21	812
22	811
23	812
24	811
25	811
26	810
27	807
28	804
29	803
30	804
31	804

## UNIT SHUTDOWNS AND POWER REDUCTIONS

REPORT MONTH March 1993

DOCKET NO. 50-289  
 UNIT NAME TMI-1  
 DATE April 13, 1993  
 COMPLETED BY W. G. Heysek  
 TELEPHONE (717) 948-8191

No.	Date	Type <sup>1</sup>	Duration (Hours)	Reason <sup>2</sup>	Method of Shutting Down Reactor <sup>3</sup>	Licensee Event Report#	System Code ' & '	Component Code ' & '	Cause & Corrective Action to Prevent Recurrence
93-01	3/12/93	F	69.7	A	3	93-003	JC	MON	While in the process of securing from the Heat Sink Protection System quarterly surveillance, a failure of the 'A' train RC Pump Power Monitor wrongly made it appear that two pumps were off when all four were running. The reactor immediately tripped on "flux to pumps". The power monitor failure cleared itself approximately an hour later and was not reproducible during subsequent testing. The suspect components of the power monitor were replaced. Additional corrective actions include replacing the time delay relays in the other train and revising the surveillance procedure to include a caution to check indicating lights prior to performing switching actions.

1  
 F Forced  
 S Scheduled

2  
 Reason  
 A-Equipment Failure (Explain)  
 B-Maintenance or Test  
 C-Refueling  
 D-Regulatory Restriction  
 E-Operator Training & Licensing Examination  
 F-Administrative  
 G-Operational Error (Explain)  
 H-Other (Explain)

3  
 Method  
 1-Manual  
 2-Manual Scram  
 3-Automatic Scram  
 4-Other (Explain)

4  
 Exhibit G - Instructions for  
 preparation of Data Entry Sheets  
 for Licensee Event Report (LER)  
 File (NUREG-0161)  
 5 Exhibit 1 same source  
 6 Actually used exhibits F & II NUREG 0161

### REFUELING INFORMATION REQUEST

1. Name of Facility: Three Mile Island Nuclear Station, Unit 1
2. Scheduled date for next refueling shutdown: September 10, 1993 (10R)
3. Scheduled date for restart following current refueling: NA
4. Will refueling or resumption of operation thereafter require a technical specification change or other license amendment? YES

In general, these will be:

- a) Use of urania-gadolinia fuel in Cycle 10 and B&W Fuel Corporation (BWFC) changes in core physics methods may require change to T.S. 6.9.5.2 which lists approved analytical methods references to support the Core Operating Limits Report values to include reference to BAW-10180, Rev. 1, NEMO. Use of the gadolinium integral burnable poison may also require changes to the Reactor Core fuel descriptions in T.S. 5.3.1.
  - b) Based on higher fuel loadings planned for Cycle 10 and beyond, it was previously reported that the borated water storage requirements of T.S. 3.2 would need to be increased. BWFC final boron results have confirmed that no change is necessary. However, for TS 3.3, BWFC results show that an increased boron concentration is necessary for the BWST as part of the ECCS.
5. Scheduled date(s) for submitting proposed licensing action and supporting information:
    - a) Per 4a above, a GPUN TSCR for any necessary changes to T.S. 6.9.5.2 and T.S. 5.3.1 will be submitted in May 1993 (this was previously estimated to occur in April).
    - b) The ECCS BWST boron TSCR will be incorporated with and submitted as part of the the TSCE described in 5a above.
  6. Important licensing considerations associated with refueling, e.g. new or different fuel design or supplier, unreviewed design or performance analysis methods, significant changes in fuel design, new operating procedures:
    - a) BWFC and GPUN have completed the fuel cycle design for cycle 10, which is scheduled for startup in October 1993. As stated in 4a above, this design incorporates reload fuel that contains urania-gadolinia. Use of urania-gadolinia fuel will need to be supported by approval of BWFC topical reports on reload design methods revisions that account for the Gd effects in the analyses. The NEMO, Rev 1 physics code, noted above, has been approved. Approval of BAW-10184P, GDTACO is also required to support fuel thermal analysis. To ensure that no delays occur to reload analyses, fuel manufacturing and plant startup schedules, approval of these topicals was requested for April 1, 1993. In subsequent



discussions, the USNRC committed to a completion date for GDTACO of May 1993 with review started early enough to identify any major concerns by March. It is GPUN's understanding that this review is in progress.

- b) TMI-1 will use the new Mark B9 fuel assembly in the Cycle 10 reload batch. This design is an upgrade of the Mark B8 assembly used in Cycles 8 and 9. The Mark B9 provides improved fuel thermal limits (LOCA, DNBR, CFM) and repair capabilities. The Mark B9 design meets current BWFC fuel design criteria and has been used previously at other B&W 177 FA plants.
- c) BWFC has a licensing change under USNRC review for certification of the Siemens fuel assembly shipping container design for shipment of two BWFC Mark B fuel assemblies up to 5.0 wt/o  $U^{235}$ . This change is necessary to support the TMI-1 Cycle 10 fresh fuel receipt by reducing the number of fuel shipments and fuel handling activities. The risk of fuel damage is also minimized. Based on the 12/3/93 BWFC/NRC meeting on this issue, approval was expected by March 1993. GPUN has been informed that the expected approval has been deferred to May 1993 due additional information submitted by BWFC. Cycle 10 fuel shipments will start in June 1993.
- d) GPUN is in the process of withdrawing TSCR No. 200 to modify the TMI-1 Technical Specifications to permit the substitution of Zr-4 or stainless steel replacement rods for failed fuel rods, in accordance with USNRC Generic Letter 90-02, dated February 1, 1990. Generic Letter 90-02, Supplement 1 was issued on July 31, 1992, to clarify limitations on the application of currently-approved analytical methods and withdraw and replace the model TS recommended by Generic Letter 90-02. The B&W Owners Group Core Performance Committee submitted Topical Report BAW-2149, "Evaluation of Replacement Rods in BWFC Fuel Assemblies" in December 1991 and responses to NRC reviewer questions on November 2, 1992 and January 12, 1993. This report justifies the use of up to ten replacement stainless steel rods located anywhere in a single fuel assembly based on currently-approved methodology. Completion of the NRC review is expected in the first quarter of 1993. Approval of BAW-2149 will provide the basis for reconstitution repairs of BWFC Mark B assemblies which may be done under the provisions of 10 CFR 50.59 (i.e., the repair does not represent an unreviewed safety question). A new TSCR will be submitted in response to Generic Letter 90-02, Supplement 1 referencing BAW-2149 upon approval. A TSCR review completion date consistent with the next TMI-1 refueling outage in September 1993 will be requested.

7. The number of fuel assemblies (a) in the core, and (b) in the spent fuel storage pool: (a) 177 (b) 521



8. The present licensed spent fuel pool storage capacity and the size of any increase in licensed storage capacity that has been requested or is planned, in number of fuel assemblies:

The present licensed capacity is 1990. Phase I of the reracking project to increase spent fuel pool storage capacity permits storage of 1342 assemblies. Upon completion of Phase II of the reracking project, the full licensed capacity will be attained.

9. The projected date of the last refueling that can be discharged to the spent fuel pool assuming the present licensed capacity:

Completion of Phase I of the reracking project permits full core off-load (177 fuel assemblies) through the end of Cycle 14 and on completion of the rerack project full core off-load is assured through the end of the current operating license and beyond.