APR 16 1986

Docket No. 50-219

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Mr. P. B. Fiedler
Vice President and Director
Oyster Creek Nuclear Generating Station
Post Office Box 388
Forked River, New Jersey 08731

Dear Mr. Fiedler:

SUBJECT: RECIRCULATION LOOP INTERLOCK SCOPE CHANGE (TAC 59758)
Re: Oyster Creek Nuclear Generating Station

By letters dated September 19, 1985, and January 30, 1986, you requested a scope change for the modification originally proposed for the Recirculation Loop Interlock. This is TMI Action Plan Item II.K.3.19 of NUREG-0737 dated November 1980. You have proposed to install an alarm to indicate that a fourth recirculation loop has been isolated instead of electrical interlocks to prevent isolation of more than three recirculation loops. You stated that the reduced scope modification, reduced from what you originally committed to in Confirmatory Order dated March 14, 1983, on post-TMI related issues, has the advantage of not requiring an additional switch for the interlock bypass and additional indications on the control room board of a bypass condition. You stated that this would greatly reduce the complexity of the valve control circuitry thereby minimizing the effect on circuit reliability and simplifying training requirements and procedural changes for control room operators.

We have reviewed your submittals and conclude that your proposed modification scope change for the Recirculation Loop Interlock is acceptable. Enclosed is the Safety Evaluation for this action.

We agree with you that the above scope change does change the requirement specified in the Confirmatory Order dated March 14, 1983. Therefore, based on the enclosed Safety Evaluation, we will revise this requirement in the Confirmatory Order to agree with the above acceptable scope change. This revision will not change the schedule for implementing the Confirmatory Order. Therefore, the alarm must be installed and be operational, the procedures written to use the alarm, and the operators trained before the restart from the Cycle 11 Refueling outage to meet the Confirmatory Order. Also, as requested in our letter dated May 30, 1985, on Generic Letter 83-02, you are to propose appropriate technical specifications on this alarm before the restart from this outage.

Sincerely,

Original signed by

John A. Zwolinski, Director
BWR Project Directorate #1
Division of BWR Licensing

Enclosure:
Safety Evaluation

cc w/enclosure: See next page

DRL:PD#1	DRL:PD#1	DRL:PD#1
CJamerson	JDonohew:tm	JZwolinski
4/11/86	4/8/86	4/15/86

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 16, 1986

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Vice President and Director
Oyster Creek Nuclear Generating Station
Post Office Box 388
Forked River, New Jersey 08731

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John A. Zwolinski, Director
BWR Project Directorate #1
Division of BWR Licensing

Enclosure:
Safety Evaluation

cc w/enclosure: See next page

Mr. P. B. Fiedler
Oyster Creek Nuclear Generating Station

Oyster Creek Nuclear
Generating Station

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO RECIRCULATION LOOP INTERLOCK SCOPE CHANGE FOR CYCLE 11R OUTAGE

GPU NUCLEAR CORPORATION

JERSEY CENTRAL POWER AND LIGHT COMPANY

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-219

1.0 INTRODUCTION

In submittals dated September 19, 1985, and January 30, 1986, GPU Nuclear Corporation (the licensee) requested a scope change for the modification originally proposed for the Recirculation Loop Interlock. This is TMI Action Item II.K.3.19 of NUREG-0737 dated November 1980. The licensee proposed to install an alarm to indicate that a fourth recirculation loop has been isolated instead of electrical interlocks to prevent isolation of more than three recirculation loops. This modification is required to be installed in the Cycle 11 Refueling (Cycle 11R) outage by NRC Confirmatory Order dated March 14, 1983.

2.0 DISCUSSION

The staff's position on TMI Action Item II.K.3.19 in NUREG-0737 was that interlocks should be installed on nonjet pump plants (other than Humboldt Bay) to assure that at least two recirculation loops are open for recirculation flow for modes other than cold shutdown. This is to assure that the level measurements in the downcomer region are representative of the level in the core region.

The licensee presented that the Recirculation Loop Interlock requirement resulted from the evaluation of feedwater transients and small break loss of coolant accidents in General Electric boiling water reactors presented in NUREG-0626, "Generic Evaluation of Feedwater Transients and Small Break LOCA in GE-Design Operating Plants." For nonjet pump plants like Oyster Creek, isolation of all five recirculation loops results in inadequate communication of coolant between the downcomer and core regions in the reactor vessel. Interlocks were recommended to assure that at least two recirculation loops are open for recirculation flow for modes other than cold shutdown so that level measurements in the downcomer region are representative of the level in the core region.

The licensee presented that the interlock, as originally proposed, consisted of an electrical interlock which would prevent closure of valves to isolate no more than three out of five recirculation loops. The modification also included an alarm to warn the operator that the interlock has been activated and a bypass switch and circuit to allow isolation of loops when conditions permit.

During the review of the interlock design, the licensee determined that by simplifying the modification to an alarm only the interlock functional requirements could be adequately met. The licensee stated the alarm provides positive active indication to the operator that a fourth loop has been isolated. Since isolation of a fourth loop does not cause any short-term problems with core inventory, the operator has adequate time to recognize and correct the problem indicated by the alarm, therefore, a preventive electrical interlock is not necessary.

The licensee presented that the reduced scope modification has the advantage (1) of not requiring an additional control switch for electrical interlock bypass and additional indications on the control board of a bypass condition, (2) of greatly reducing the complexity of the valve control circuitry thereby minimizing the effect on circuit reliability and (3) of simplifying training requirements and procedural changes for operators.

The licensee presented that the NRC staff evaluation, presented in NUREG-0626, did not take into consideration a fuel zone level monitoring system for Oyster Creek vintage plants. During the 1979-80 Cycle 9 refueling outage wide range fuel zone level indication and recorder were installed. With recirculation pumps tripped this instrumentation provides the reactor operator with level indication in the core region. Also, the lo-lo-lo water level trip for automatic depressurization system initiation, concurrent with drywell pressure, is sensed within the core region.

The fuel zone level indication at Oyster Creek is discussed in the staff meeting minutes dated February 25, 1985.

Oyster Creek Technical Specifications require that at least two recirculation loop suction valves and their associated discharge valves be in the full open position during all modes of operation except when the reactor head is off and the reactor is flooded to a level above the main steam nozzles. This requirement is addressed in plant operating procedures and licensed operator training.

The licensee also presented that the Human Factors review of this modification determined that the functional requirements of preventing core region isolation from the downcomer can be met by the reduced scope modification which adds alarm capabilities and that the electrical interlock provides additional complexity not justified by the benefit gained. The licensee stated that the reduced scope modification will be installed during the upcoming Cycle 11 Refueling outage in accordance with the NRC Confirmatory Order dated March 14, 1983.

3.0 EVALUATION

NUREG-0737 Item II.K.3.19 states that interlocks should be installed on nonjet pump plants (other than Humboldt Bay) to assure that at least two recirculation loops are open for recirculation flow for modes other than cold shutdown. The purpose of the requirement is to assure that the level measurements in the downcomer region are representative of the level in the core region. Isolation of all five recirculation loops results in inadequate communication of coolant between the downcomer and core regions in the reactor vessel.

The interlock, as originally proposed, consisted of an electrical interlock which would prevent closure of valves to isolate no more than three out of five recirculation loops. The modification also included an alarm to warn the operator that the interlock has been activated and a bypass switch and circuit to allow isolation of loops when conditions permit.

During the review of the interlock design, the licensee determined that by simplifying the modification to an alarm only, the functional requirements could be adequately met. The alarm provides positive active indication to the operator that a fourth loop has been isolated. Since isolation of a fourth loop does not cause any short-term problems with core inventory, the operator has adequate time to recognize and correct the problem indicated by the alarm, therefore, a preventive interlock is not necessary.

The reduced scope modification has the advantage of not requiring an additional control switch for electrical interlock bypass and additional indications on the control board of a bypass condition, of greatly reducing the complexity of the valve control circuitry, thereby minimizing the effect on circuit reliability and of simplifying training requirements and procedural changes for operators. The alarm will alert the operator that the Safety Limit has been exceeded and that procedures have been violated. In addition, an alarm reflash capability has been incorporated into the annunciator design to indicate closure of the fifth recirculation loop.

In the control room, there is the following indication of the status of the recirculation pump loops to the operators: (1) recirculation inlet/outlet valve indication being opened or closed, (2) flow indicating ampmeter for each pump, (3) frequency meter for each motor generator set for each pump and (4) a tag on the board above the valve position indicators that states that the operators must have at least two recirculation loops open (Ref.4). This is sufficient indication to the operator for the operator to react to the alarm and reopen a recirculation loop.

The alarm-only modification meets the functional requirements of providing an active warning of a potentially unsafe condition, thus preventing accidental isolation of the recirculation loops. Even with the addition of an electrical interlock, operators would still have the ability to isolate more than three of five recirculation loops. This could be done using the interlock bypass feature. The bypass would be necessary to allow isolation of more than three loops when conditions permit. With the alarm-only modifications, an operator would have to disregard his training, violate procedures and ignore the posted warning, and be unaware of the significance of the control switch covers in order to exceed the Safety Limit.

4.0 CONCLUSION

We have reviewed the proposed change for the II.K.3.19 requirement and we find it to be acceptable. One open recirculation loop is sufficient to assure adequate communication between the core and downcomer regions. The alarms plus adequate training should suffice to maintain one open loop.

We also conclude that the reduced scope change does not change the schedule for implementing the Confirmatory Order dated March 14, 1983. Therefore, the alarm must be installed and be operational, the procedures written to use the alarm, and the operators trained before the restart from the Cycle 11 Refueling outage. Also, as requested in our letter dated May 30, 1985, on Generic Letter 83-02, you are to propose appropriate technical specifications on this alarm before the restart from this outage.

5.0 REFERENCES

1. Letter from R. F. Wilson of GPU Nuclear to J. A. Zwolinski of NRC, "Recirculation Loop Interlock," September 19, 1985.

2. Letter from R. F. Wilson of GPU Nuclear to J. A. Zwolinski of NRC, "Recirculation Loop Interlock," January 30, 1986.

3. NUREG-0737, Clarification of TMI Action Plan Requirements, dated November 1980.

4. Telephone call between J. Donohew, USNRC, and J. Rogers, GPU Nuclear, on March 31, 1986.

Principal Contributors: W. Hodges and J. Donohew.

Dated: April 16, 1986