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

Gentlemen:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Technical Specification Change Request No. 164
Additional Information

GPU Nuclear Corporation (GPUN) submitted Technical Specification Change Request (TSCR) No. 164 on March 31, 1988. This TSCR proposed revised specifications regarding recirculation loop operation. In subsequent telecon discussions with the NRC Staff, the Staff requested GPUN to provide additional information. The information is contained in the attachment to this letter.

Very truly yours,

E. E. Fitzpatrick
Vice President & Director
Oyster Creek

EEF/crb
TSCR#164

Attachment
cc: Administrator
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ATTACHMENT

Technical Specification Change Request No. 164
Additional Information

TSCR No. 164 was submitted on March 31, 1988 and proposed revised specifications regarding recirculation loop operability in Section 3.3 of the Oyster Creek Technical Specifications. Additional information was requested by the NRC Staff in subsequent telecon discussions. The requested information is provided below.

NRC Request

1) Discuss the consequences of a spurious isolation of the single unisolated recirculation loop when in a hot shutdown condition.

GPUN Response

It is very unlikely that all recirculation loops would remain isolated, while in a hot shutdown condition, for a period of time sufficient to significantly affect reactor water level. Proposed specification 3.3.F.4 would require at least one fully open recirculation loop while in hot shutdown. If, as the NRC staff has postulated, a spurious isolation of the fifth recirculation loop occurs when the other four have already been isolated, the loop closure alarm would reflash and the operator would take immediate action to unisolate at least one loop. There would be no significant reactor water level perturbation during the several minutes the above scenario would take to happen. If, as the NRC staff further postulates, a recirculation loop could not be unisolated for some reason, the resulting water level transient would depend upon decay heat generation, reactor coolant makeup capability and initial conditions.

As mentioned above, the recirculation loop closure alarm annunciates in the control room when the fourth recirculation loop is isolated. This alarm will reflash when the fifth loop isolates. The alarm alerts the operator to unisolate at least one loop. In addition to the alarm, the operator has other indications, including recirculation loop valve position indication and individual loop flow indication, to ascertain or verify loop status. If, as postulated, all recirculation loops remain isolated as a result of a spurious condition, the operator will be directed by symptom-based emergency operating procedures to utilize available coolant makeup sources if core region water level is decreasing. When recirculation pumps are not operating, fuel zone level instrumentation senses water level directly from the bottom of the core region and has an upper range of 180 inches top of active fuel (TAF), so that the operator can note a decreasing trend from the normal operating reactor water level range. Also, triple low level (4' 8" TAF), which is sensed from inside the core region, is annunciated in the control room. With all recirculation loops isolated, feedwater and condensate pumps can flood the reactor vessel annulus allowing coolant to spill back through the steam separators into the core region. The core spray and control rod drive systems can provide makeup directly to the core region. In addition, the fire suppression water system can be manually aligned to provide makeup via core spray piping.

The core region makeup sources are supplemented by the limited flow available through hydraulic communication with the annulus via any open recirculation loop discharge bypass valves and associated suction valves. If the shutdown cooling system is operable, forced flow from the annulus to core regions is possible when reactor pressure is less than 150 psig and coolant temperature is less than 350°F.

Whether a shutdown is performed normally or is a result of a scram with no concurrent or resultant recirculation pump trip, operating recirculation pumps are normally kept in operation while remaining in a hot shutdown condition or while a cooldown is in progress. This assures uniform recirculation pump cooldown and thus minimizes pump seal temperature and stress cycles. In addition, if all operating recirculation pumps trip during power operation, the operator is directed to scram the reactor and verify that the loops associated with the tripped pumps remain unisolated. Operation in the above manner tends to minimize the time the plant would be in a hot shutdown condition with only one recirculation loop unisolated.

In conclusion, the preceding discussion indicates that a spurious isolation of all recirculation loops while in hot shutdown can be detected with mitigating measures available to the operator. We believe that such a spurious isolation combined with the inability to unisolate at least one recirculation loop is of extremely low probability and there is no basis to so postulate.

NRC Request

2) What advantages are there in maintaining one rather than two recirculation loops fully open when plant conditions permit?

GPUN Response

Shutdown cooling system (SDC) effectiveness is improved with one rather than two loops open. Each open loop provides a path for SDC flow to recirculate from the lower plenum backward through the loop to the annulus where SDC takes suction. This flow bypasses the core when the loop's recirculation pump is not operating. Fewer open loops results in less SDC flow bypassing the core region. As a result, lack of core decay heat removal leading to thermal stratification and inadvertent vessel pressurizations or steaming are minimized. Of course, operating recirculation pumps would also preclude thermal stratification and the potential for steaming. However, operating recirculation pumps at low pressures for extended periods reduces pump seal life.