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SUBJECT: Discusses info on evaluation of lost part in RV such as CR interference,corrosion or adverse chemical reaction w/ other reactor matls,blocked flow,& fretting water due to the disintegration of the postulated lost part.

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June 9, 1993
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Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21**
EVALUATION OF LOST PART IN REACTOR VESSEL

On May 25, 1993, the loss of an aluminum sacrificial shield collar from a tool being used to clean jet pump number 2 was documented on a Problem Evaluation Request (PER). Analysis of the lost part was performed by General Electric (GE). GE concluded that no open technical items were found and that safe operation of the plant is maintained.

Siemens Power Corporation (SPC), and ASEA Brown Boveri - Combustion Engineering (ABB-CE) were asked to complete a review of the GE analysis and any possible impact on SPC and ABB-CE fuel assemblies in the WNP-2 core. Both organizations confirmed that the lost part evaluation falls within their previous analysis and does not compromise safe reactor operation with either SPC or ABB-CE fuel.

Supply System Engineering personnel also reviewed the three analyses and agree with the conclusions presented.

The evaluation of the lost part addressed four areas:

1) control rod interference,
2) corrosion or adverse chemical reaction with other reactor materials,
3) blocked flow to fuel bundle and subsequent overheating of the cladding, and
4) fretting wear due to the disintegration of the postulated lost part.

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EVALUATION OF LOST PART IN REACTOR VESSEL

The analysis concerning the interference with the control rods is not dependent on fuel assembly design. The GE evaluation concluded that the force of normal control rod motion is sufficient to overcome any potential interference with the control rod movement. The aluminum is expected to dissolve in approximately 10 hours at fluid temperatures of at least 450°F or higher. The residual chemical concentrations would be minuscule and should not result in any adverse chemical reaction with the fuel or other reactor materials. General Electric determined that any resulting flow blockage is less than 2% of the active flow area of the lower tie plate and much less than the flow blockage required to initiate boiling transition. Siemens and ABB-CE determined that these conclusions bound their separate evaluations.

Although the evaluations showed that there is no concern for potential fuel damage due to the aluminum sacrificial shield lost in the WNP-2 reactor vessel, it is recognized that the intrusion of foreign material into a fuel assembly can result in fuel damage. The potential for fretting wear due to the disintegration of the lost part exists for each fuel type in the WNP-2 core. However, it is considered to be extremely unlikely since the aluminum part is expected to completely dissolve before the reactor is operated with high core flow rates. If fuel rod cladding failure occurs, the release of fission gas would be detected by the reactor off-gas monitors. Appropriate actions would be taken to assure the health and safety of the public is maintained.

In conclusion, the evaluation shows that safe reactor operation is maintained if the aluminum sacrificial shield is lost inside the reactor vessel. There is no concern for potential fuel damage due to blocked bundle flow and subsequent over heating of the fuel, interference with control rod operation, or adverse chemical reaction with other reactor materials. The potential for fretting wear exists when foreign material becomes trapped against the fuel. However, the aluminum collar is not considered to have a significant potential for damage because of its size and material composition.

Sincerely,

J. V. Parrish (Mail Drop 1023)
Assistant Managing Director, Operations

MGE/bk

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