

SIEMENS

June 17, 1993

To: U.S. Nuclear Regulatory Commission
Operations Center
Attn: C. Gould

From: L. J. Maas *L. J. Maas*
MGR, Regulatory Compliance
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Subject: Bulletin 91-01 Reportable Criticality Safety Violation- Un-authorized Equipment Modification.

Background

Siemens Power Corporation (SPC) has three UO_2 pellet grinder lines. The grinders on each of the three lines are used to grind pellets to the desired diameter. Water is supplied to the grinder wheels to cool the grinder wheel and to wash UO_2 particles from the pellet and grinder wheel. The grinder line water systems are closed looped systems. The grinder water loop includes a heat exchanger, two filters, a centrifuge, and a centrifuge reservoir.

One of the criticality safety requirements for the centrifuge reservoir is for the maximum solution depth to be limited to 8.0 inches. The approved design for this system included an overflow at 8.0 inches to assure this limit is met. The overflow line consisted of a pipe and an ell to direct any overflow toward the floor.

Description

As part of an ongoing program to update the criticality safety analyses at SPC, SPC personnel identified that an ell on the end of each of the centrifuge reservoir overflow lines had been turned upward. The depth of solution before overflow in this configuration is about 10 inches.

The system was immediately returned to the approved configuration and design changes were initiated to modify the reservoir to include more positive methods of limiting the possible solution depth.

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A telephone report to NRC headquarters was made in accordance with NRC bulletin 91-01. This report was made because of a degradation in a controlled parameter. However, the actual solution depth had not been exceeded, the reservoir is equipped with functional level indication, and operators are instructed to limit the solution depth to between 5 and 6 inches. Furthermore the filtering system design and controls in place on the centrifuge operation make it very unlikely that even a safe mass (45% of minimum critical mass) of uranium would be present in the centrifuge reservoir. For these reasons a criticality accident in this system was not possible. K-eff at the 10 inch full configuration assuming optimum moderation and reflection was calculated to be $0.9658 \pm .0044$

Cause and Long Term Corrective Actions

The cause and long term corrective actions are under investigation and will be included in a written follow up report of this criticality safety incident.

cc: E. G. Adensam, NRC HQ
B. Faulkenberry, NRC Region V