

SIEMENS

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Document Control Desk
ATTN: Chief, Planning, Program and Management Support Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

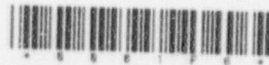
BWR Seal Spring Justification

- Ref.: 1. Letter, H. D. Curet (SPC) to NRC Document Control Desk, "Notification of Potential Existence of a Defect Pursuant to 10 CFR 21.21," HDC:97:084, August 11, 1997.
- Ref.: 2. Telecon, L. E. Hansen and H. D. Curet (SPC) to L. E. Phillips and S. Wu (NRC), "Kuosheng Fuel Examination Results," November 24, 1997.
- Ref.: 3. XN-NF-85-67 (P)(A), "Generic Mechanical Design for Exxon Nuclear Jet Pump BWR Reload Fuel," September 1986.

As previously noted in Reference 1, during fuel inspection and channel management operations at Gundremmingen, it was noted that a number of seal springs were bent, broken, or missing from SPC fuel assemblies (8 out of 67 assemblies examined). Some seal springs were cracked at the bend at the top of the 0.3" flat, later determined to be due to Intergranular Stress Corrosion Cracking (IGSCC). Others were also broken at the bottom of the seal spring near the weld to the lower tie plate, and individual seal spring fingers were missing completely in some places. All of the damaged seal springs were of a single material lot 35963, were of seal spring design with 0.3" flats, and were on assemblies with 47 months of exposure and above.

Subsequent examinations were performed at WNP-2, Susquehanna-2, and both Kuosheng reactors on assemblies supported by the 0.3" flat and 0.2" seal spring designs, and included 0.3" flat seal spring design parts made from the same material heat treat as the damaged Gundremmingen seal springs. Damaged seal springs were also discovered at Susquehanna-2 on high burnup assemblies (45 months exposure) with the same material heat treat and the 0.3" flat seal spring design (6 out of 24 assemblies examined). The damaged seal springs at Susquehanna-2 were cracked at the bend at the top of the flats. No damaged seal springs were found at Susquehanna-2 with other material heat treat lots or with the 0.2" flat seal spring design or at WNP-2. There were no seal spring failures found during the fuel examinations at the Kuosheng reactors for fuel designs which included different material lots and both seal spring designs. (Note: Kuosheng results were discussed during the Reference 2 telecon.)

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Until further notice, SPC is reverting back to the lower tie plate seal spring with the 0.2" flat design for the following reasons:

- Seal spring failures have been discovered at Gundremmingen and Susquehanna with the 0.3" flat seal spring design used since 1989,
- Even though root cause of the seal spring failures at Gundremmingen and Susquehanna has been determined to be the result of IGSCC, investigation of possible causal factors that contributed to initiation of IGSCC is continuing,
- SPC has extensive experience with the previously approved (Reference 3) 0.2" flat seal spring design with no problems encountered, and
- Analyses have shown that the fuel channel engagement will be maintained through end-of-life conditions with the current fuel designs with the 0.2" flat seal spring design.

If you have any questions or if I can be of further assistance, please call me at (509) 375-8563.

Very truly yours,



H. Donald Curet, Manager
Product Licensing

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cc: Mr. T. E. Collins (USNRC)
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Project No. 702