

PERFORMANCE OF IRON-BASE HARDFACING ALLOYS IN GATE VALVES TESTED UNDER SIMULATED BWR CHEMISTRY CONDITIONS

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Objectives: Determine the behavior of several hardfacing alloys under autoclave BWR conditions.

Comments:

- 1) Both the PWR and the BWR phases of the valve hard facing testing program are completed.
- 2) The testing program has demonstrated the welding practicality of the alloys based on deposit hardness and chemical composition.
- 3) All alloys tested in the BWR phase had zero cold and hot leakage, with the exception of the valve with NOREM 04 which showed a persistent hot leakage. However, based on the various examinations it was concluded the hot leakage was the result of a fit-up problem rather than a deficiency of the deposit.
- 4) All alloys tested had similar resistance to sliding wear damage and galling which was comparable to that of the STELLITE 6 control standard.
- 5) With the exception of EB 5183, the candidate alloys had equal or superior corrosion resistance to STELLITE 6. EB 5183, however, was susceptible to pitting attack and therefore not suitable for applications in BWR primary circuits.
- 6) EVERIT 50, NOREM 01, and NOREM 04 meet or surpass the performance of the STELLITE 6 standard with respect to corrosion and material loss due to wear and maintenance of the valves sealing function. They have met the acceptance criterion established for this program and can be considered to be acceptable alternatives to STELLITE 6 for BWR valve hardfacing applications.

Remarks/Potential for dose limitation:

References: Murphy, E.V. and Inglis, I., "Performance of Iron-Base Hardfacing Alloys in Gate Valves Tested Under Simulated BWR Chemistry Conditions," *Radiation Field Control Seminar*, Electric Power Research Institute, Seattle, Washington, 1993.

Duration: from: 1992 to: 1993

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