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NOREM WEAR-RESISTANT ALLOYS: AN EPRI PROGRAM UPDATE

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Project Manager:

Objectives:

- 1) reduce major source of background radiation
- 2) provide utilities with a cobalt-free hardfacing alloy which exhibits wear & corrosion properties equivalent to Alloy 6
- 3) develop welding product forms suitable for in-situ application

Comments:

Existing NOREM Product Forms:

- 0.045 diameter solid & metal-cored wires for automatic GTAW deposition
- 3/32 & 1/8 diameter rod for manual GTAW deposition
- gas atomized powder for PTAW & HIP sintering

NOREM Weldability Program - Project Goals:

- Develop & successfully deposit NOREM with the GTAW, GMAW, & FCAW processes
- Demonstrate multi-layer crack-free welds on carbon steel & stainless steel substrates which yield wear properties equal to Stellite 6
- Develop welding parameters which require no preheat
- Demonstrate a localized repair employing NOREM

NOREM GTA Weldability (B1) Current Status:

- Successfully demonstrated on stainless steel at ambient temperature
- Successfully demonstrated on wrought carbon steel with 309 Butter and with 200°F preheat
- Successfully demonstrated repairs on SS & CS with 200°F preheat

Remarks/Potential for dose limitation:

NOREM PTA Weldability Current Status:

- B1 & B4 successfully demonstrated on SS at ambient temperature
- B1 & B4 successfully demonstrated on wrought CS with 800°F preheat
- B1 successfully demonstrated on cast CS with 309 Butter layer and 800°F preheat

NOREM Weldability Program 1993 Milestones:

- Develop a chemistry which can be deposited without preheat or a Butter layer on CS with the automatic GTAW process
- Establish utility advisory committee

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- Support Dragon Valve & Union Electric with a "first use" application
- Provide technical support to EPRI membership
- Conduct a NOREM demonstration workshop

References: Phillips, M., "NOREM Wear-resistant Alloys: An EPRI Program Update," *Radiation Field Control Seminar*, Electric Power Research Institute, Seattle, Washington, 1993.

Duration: from: 1992 to: 1995

Funding: N/A

Status: In progress

Last Update: January 4, 1993