



## INCONEL 625 VALVE SEAT HARD FACING MATERIAL

### Background

Fast acting steam turbine valves, increased temperatures and vibration create significant operational challenges for valve seat components, thus leading to delamination of the CoCr layer from the high Chromium (9%-12% Cr) base material.

Delaminated seat particulates have been responsible for downstream damage of the steam path.

Studies into the root cause of the problem identified the different heat expansion coefficient combined with the Heat Affected Zone (HAZ) of the base material and the overlay are the chief causes for the problem.



### Previous Solution Method:

1. Removal of the existing CoCr facing material
2. Application of Inconel buffer layer
3. Application of CoCr facing material on the Inconel layer

**Would include machining, welding, and stress relieving between layers.**

### New & Improved Solution:

1. Removal of the existing CoCr facing material
2. Application of Inconel 625 hard facing material -instead of two process combination of Inconel buffer layer and CoCr facing material

**Eliminates the extra machining, welding, and stress relieving associated with the dual layer application**

### Inconel 625 vs. CoCr Material

	CoCr Alloy with Buffer Layer	Alloy 625
Oxidation Resistance	++	++
Resistance to Solid Particle Erosion	+	+
Impact Resistance	0	++
Form Stability	+	+
Sliding Wear Resistance	+	+

### Benefit to Customers

By eliminating the additional manufacturing steps associated with a dual layer of inconel/CoCr, a high quality repair is more easily achieved, and the **outage duration and cost could be significantly reduced.**

### End Result

Valve seat face is now Inconel 625 material with improved bonding capabilities to reduce the risk of liberation during operation

