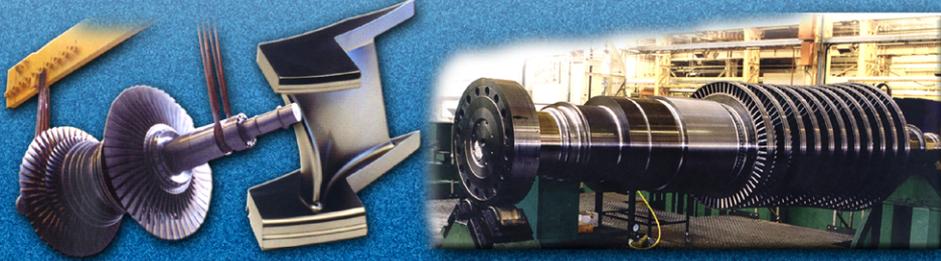
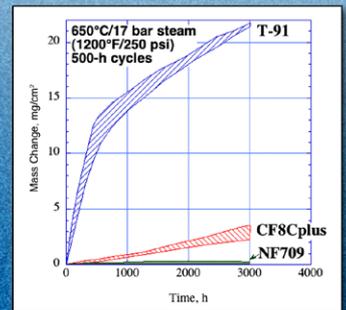
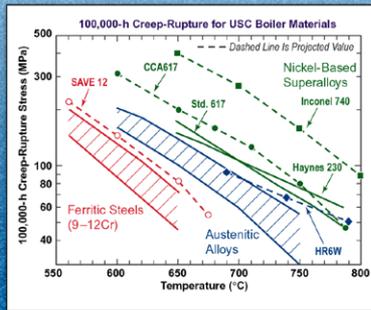
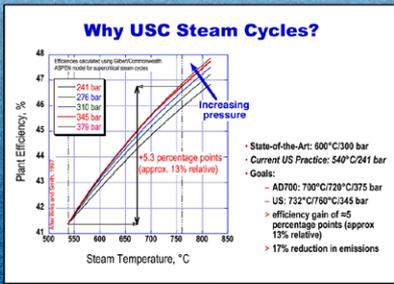


# Materials for Ultra-Supercritical Steam Turbines

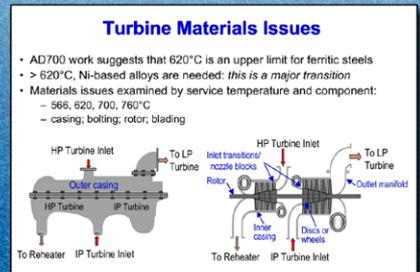
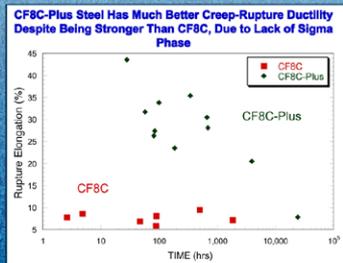
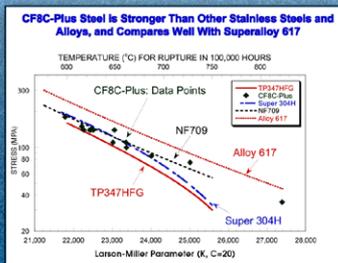
**Purpose:** The enabling materials technology is being developed for ultra-supercritical (USC) pulverized coal power plant steam turbines capable of operating with steam conditions up to 760°C (1400°F) and 35 MPa (5000 psi). These plants will have substantially higher efficiencies than current plants.



## Strength and Steam Oxidation Limit Ferritic Steels to Below 620°C



## Austenitic Stainless Steels and Alloys must be Considered with Superalloys to Balance Cost and Performance



**Progress:**

- Consensus developed on USC steam turbine materials by NETL, ORNL, Siemens -Westinghouse, Alstom, and General Electric
- Consortium of ORNL and turbine companies organized by Energy Industries of Ohio (EIO) and EPRI
- Multi-year contract award made to EIO/EPRI consortium

### Funding Sources



### Consortium Members

### Research & Development

OAK RIDGE NATIONAL LABORATORY  
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY