

Chemistry Services

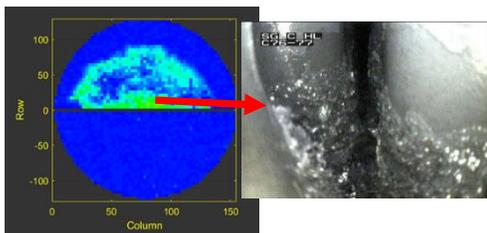
Background

Chemistry performance in a nuclear power plant strongly influences the efficiency of power operation, refueling outages, and routine maintenance. Utilities' chemistry needs range from approval of consumable compatibility to a complete range of chemistry support for operations and outages. Westinghouse has the resources and technology to provide services and products that will address our customers' most challenging needs.

Westinghouse provides a wide variety of chemistry services for our customers related to Pressurized Water Reactor (PWR) chemistry, including:

Steam Generator (SG) Asset Management and Secondary System Assessments

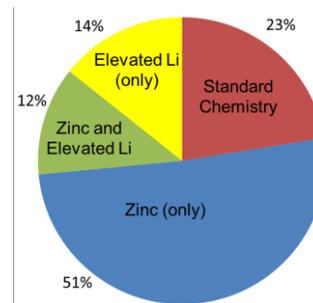
- Integrated engineering and field services approach to long-term services planning
- Secondary Side Condition Monitoring and Operational Assessment (SS-CMOA)
- Sludge and scale deposit evaluations
- Visual inspection planning
- Tube bundle Scale Profiling
- Dispersant evaluations
- Chemical cleaning planning
- Maintenance strategies
- Onsite outage support



Correlation of Top of Tubesheet Scale Profiling with Visual Inspections

Primary Chemistry and Fuels Support

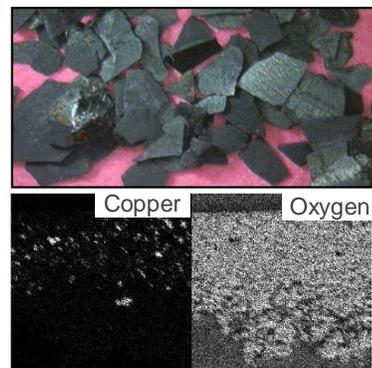
- Zinc Addition
- Elevated lithium/pH
- Potassium hydroxide for pH control
- Shutdown and restart chemistry optimization and consultation
- Hot functional testing chemistry



PWR Primary Chemistry for Westinghouse Fuel

Chemistry Consultation

- Consumables/materials qualification
- Foreign material and loose parts chemistry and corrosion evaluations
- Chemistry excursion evaluations
- Chemistry training
- Cleaning process qualification
- Post-accident / station blackout chemistry
- Online chemistry monitoring



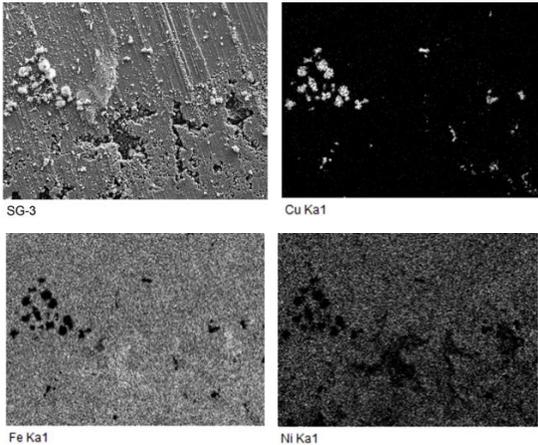
SG Tube Scale Flakes, Cross-Section Elemental Map



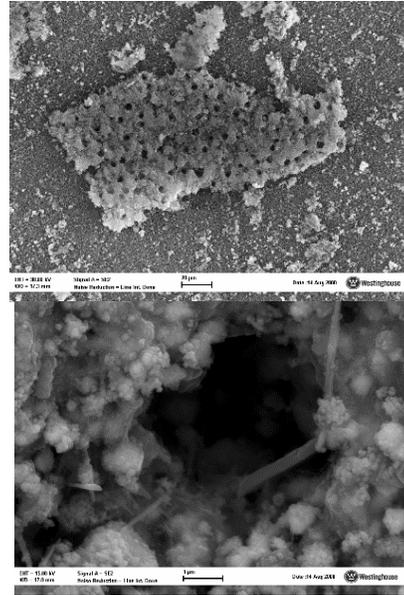
Autoclave Laboratory at Westinghouse Churchill Site

Laboratory Services

- Fuel crud and SG sludge analysis
- Metallurgical and failure examinations
- Microstructural characterization (Metallography, SEM, XEDS, FIB, TEM/STEM, XRD)
- Analytical chemistry (ICP-MS, ICP-OES, IC, LECO Carbon/Sulfur/Hydrogen, FTIR, UV-Vis)
- Autoclave corrosion and heated rod loop testing
- High temperature steam oxidation testing
- Customized research and development programs



SG Tube Scale Surface with Elemental Maps Showing Copper Particles on an Iron and Nickel-Rich Flake



Surface of Fuel Crud Showing Boiling Chimneys

Benefits

Westinghouse strives to exceed customer needs and expectations, providing a basis for utilities to operate more efficiently and competitively regarding:

- Daily monitoring and assessment of chemistry control
- Off-normal chemistry issues
- Consultation and evaluation of chemical applications online and offline

Experience

Westinghouse has provided water chemistry consultation to the PWR industry for more than 60 years, encompassing all areas of utility chemistry needs. This operating experience, knowledge, and expertise allows Westinghouse to provide the solutions that utilities need to optimize chemistry and long-term plant performance.