

Water Chemistry Laboratory Services



Laboratory Services BWR Water Chemistry Control

Laboratory analytical services performed at GEH Vallecitos Nuclear Center support optimum BWR water chemistry performance. Facility license and on-site hot cell capabilities enable processing of irradiated artifact samples.

Irradiated Artifact Platinum Characterization Analyses

GEH will retrieve irradiated BWR artifacts (e.g., fuel bundle channel fastener, etc.) and perform Scanning Electron Microscope (SEM) surface platinum deposition imaging and total sample platinum loading in support of asset protection inner granular stress corrosion cracking (IGSCC) mitigation programs.

Mitigation Monitoring System (MMS) Durability Coupons Platinum Loading Analyses

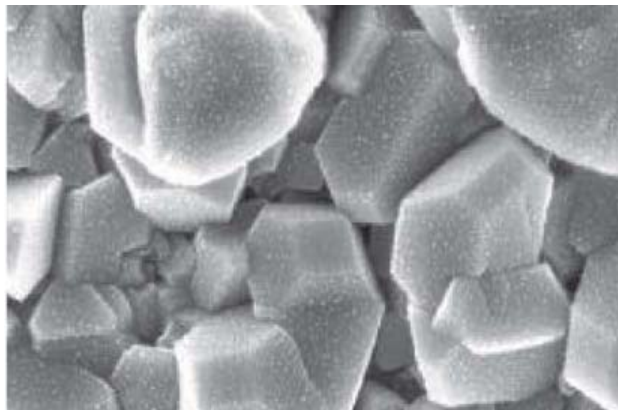
GEH will provide analysis services for MMS coupons used to monitor noble metal durability (one is typically analyzed ~annually), performing elemental analysis of the sample(s) to determine the amount of noble metal loading on the sample(s). For each sample received, GEH will perform the analysis and provide the loading result(s) in a simple letter. GEH will also process the radioactive waste generated from the analysis and will dispose of the test specimen. Detailed assessments and interpretation of results are available.

Electrochemical Corrosion Potential (ECP) Artifact Characterization

GEH will analyze artifacts for electrochemical corrosion potential surface measurement in its test facility replicating BWR water chemistry conditions.

Summary of Laboratory Service Areas:

- Laboratory analytical services for irradiated coupons and artifacts
 - Inductively Coupled Plasma Mass Spectroscopy (ICP-MS)
 - Scanning Electron Microscope (SEM)
- Laboratory test facility (aka "Loop") replicating BWR water chemistry parameters, including temperature and pressure, for components
 - Electrochemical Corrosion Potential (ECP) Electrode Qualification
- Radioactive material processing
- Facility locations in California & North Carolina



Mitigation Monitoring System (MMS) Scanning Electron Microscope (SEM) Imaging Analyses

GEH will provide imaging and analysis service for MMS coupons used to monitor noble metal durability (one is typically analyzed ~annually). GEH will perform SEM analysis of the sample(s) to determine the platinum deposition characteristics on the coupon surface. For each sample received, GEH will perform the imaging service and analysis, and provide the result(s) in simple letter. GEH will process the radioactive waste generated from the analysis and will dispose of the test specimen.

Typical SEM imaging services include the following:

- **Energy Dispersive X-Ray Spectroscopy (EDS) Analysis** of each selected point
- **Secondary Electron (SE) (U) Images** – 10X, 100X, 250X (for standard number of points on a coupon piece)
- **Yttrium Aluminum Garnet Backscattered Electron (YAG BSE) Images** – 10X, 100X, 250X (for standard number of points on a coupon piece)
- **Software Image Analysis** - 100X and 250X (for standard number of points on a coupon piece)
- **Particle Diameter Population Curve and Associated Statistics** - 100X and 250X (for standard number of points on a coupon piece)
- **Particle Density Calculation** - 100X and 250X (for each selected point on a coupon piece)
- **Particle Density Calculation** - 100X and 250X (total for the coupon piece, averaging all points from the previous bullet)



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For more information, contact your GE Hitachi Nuclear Energy sales representative or visit us at nuclear.gepower.com