"Cycle Chemistry Monitoring Practices"

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A high level of emphasis has been placed on cycle chemistry surveillance and control at most cogeneration and independent power producer facilities. This approach is taken despite relatively low design pressures (typically 900-1500 psig), compared to traditional fossil utility units.

Design features commonly present include use of stainless steels and other copper-free materials in feedwater heater and (to a lesser extent) condenser tubes, use of demineralized water makeup, inclusion of condensate polishers and provision of state-of-the-art sampling systems and on-line chemistry analyzers.

Treatment approach and corresponding control limits may be based on use of generic and /or proprietary chemicals. Designation of sample points and selection of on-line analyzers is often based on consideration of guidelines published by the Electric Power Research Institute (1-4), providing for surveillance of treated makeup, condensates, boiler feedwater, boiler water and steam.

Typically, water and steam samples are directed to a centralized sample panel where the pressure is reduced and temperature adjusted to 25°C (77°F). The conditioned sample is then routed through the on-line analyzers to provide continuous surveillance of chemistry. Instrument output is usually transmitted to the control room for use by operating personnel.

This approach is taken to minimize the time required to detect and respond to deviations from normal chemistry, thereby avoiding more severe excursions. Although plant labor applied to chemistry surveillance and control may be reduced, it is still necessary to periodically collect and analyze grab samples, increasing test frequency during periods of cycle contamination.

General trends with respect to application of on-line analyzers at cogeneration and independent power producer facilities are presented in tabular form. The figure on the back page overviews a specific application for a cogeneration system installed at an industrial facility.

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