

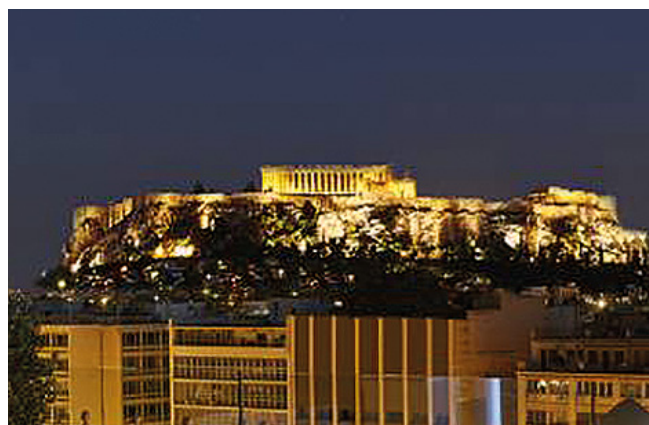


European HRSG Forum (EHF2019) Highlights and Press Release

A hugely successful sixth annual meeting of EHF was held on the 14th – 16th May 2019 in Athens, Greece chaired by Barry Dooley of Structural Integrity. EHF2019 attracted 76 participants from 17 countries.

EHF is supported by the International Association for the Properties of Water and Steam (IAPWS) and is held in association with the Australasian Boiler and HRSG Users Group (ABHUG) and the US HRSG Forum (HF). The 2019 EHF was sponsored by Public Power Corporation that was also the host organization with Mr. Dimitrios Metikanis, Chief Generation Officer, in attendance and providing the opening remarks. The conference was organized by BHT GmbH and the media partner was PPChem Journal.

This year the EHF included 26 presentations and a Workshop on Cycle Chemistry for Combined Cycle / HRSG Plants. The meeting provided a highly interactive forum for the presentation of new information and technology related to HRSGs, case studies of plant issues and solutions, and for open discussion among the plant users, equipment suppliers and industry consultants. The good mix of the different topics (chemistry, operational, processes, remaining life, inspection, cleaning) kept all the attendees interested, alert and participating. EHF again provided a unique opportunity for plant users representing 15 generators to discuss questions relating to all aspects of HRSG operation with the industry's international experts. These discussions underlined once more the urgent need for the international exchange on information, which is excellently provided by this IAPWS forum.



Highlights from EHF2019 included:

- International updates were presented on HRSG cycle chemistry, instrumentation and FAC as well as the recent IAPWS Technical Guidance Documents (TGD). The ranking order of Repeat Cycle Chemistry Situations worldwide was presented.
- The problems associated with carryover from HRSG drums were highlighted following a plant experience report.
- The emerging area of the application of Film Forming Substances (FFS) was covered with a very good HRSG application with markedly reduced corrosion products which was conducted directly in line with the IAPWS TGD. On the other hand, the participants heard about serious problems (increased HP evaporator deposits and under-deposit corrosion) when Section 8 of the IAPWS TGD is not applied.
- International updates were presented on the HRSG thermal transient aspects associated with attemperators, condensate return and superheater/reheater drain management. The ranking order of Thermal Transient Situations worldwide was presented.



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- New topics included: a) the use of ambient air injection, and b) CO₂ Capture activities in Greece and Europe.
- An interesting case study of HRSG Tube Failures (HTF) in a reheater were investigated by using the Oxide Growth and Exfoliation (OGE) data base to indicate that the tubes next to HRSG module gaps had operated at elevated temperatures compared to those in the middle of the module. It appeared that partial tube blockage had occurred with exfoliated oxide.
- A highly informative workshop on cycle chemistry was conducted in two parts: a) review of the oxides which grow on surfaces around a combined cycle / HRSG plant and are dependent or not on the cycle chemistry, and b) the influencing factors which need to be considered in determining the optimum chemistry for a plant.
- This year EHF included a number of presentations related to remaining life techniques and processes: a) fatigue crack growth assessments, b) Robin Condition Monitoring, and c) Risk Based Inspection (RBI) for ageing plant.
- The importance of cycle chemistry in combined cycle plants was covered in a number of presentations: a) the latest guidance from IAPWS, b) the use of Repeat Cycle Chemistry Situations (RCCS) in identifying future damage/failure, c) upgrading steam/water sampling systems, d) use of AI for monitoring the chemistry on plants, e) modification of the chemistry needed for plants with dry cooling systems with aluminium tubes, f) monitoring total iron corrosion products, and g) examples of optimum plant chemistry control practices.
- Two cases of the latest valve technologies and their impact on HRSG performance.
- Problems associated with by-pass systems were highlighted with the discussions continuing from previous forums in Australia, Europe and USA on how to identify and remedy the root cause of premature erosion in HP turbine bypass pressure control valves.
- The latest case studies on one of the gas-side cleaning processes using Pressure Wave Technology with a separate presentation providing validation that HRSG tubes were not damaged during application.
- The latest on expansion joints.
- Introduction of new technology, which included one of the latest HRSG designs in China with primary, secondary and tertiary superheaters.

The next EHF meeting will be in May 2020 at a location not yet decided.

Please contact Barry Dooley (bdooley@structint.com or bdooley@IAPWS.org) for further information and with suggestions for EHF2020.