IAPWS Seventh Meeting of the European HRSG Forum (EHF2021) Highlights and Press Release

The seventh annual IAPWS European HRSG Forum was held on the 18th and 20th May 2021 as a virtual event. It was chaired by Barry Dooley of Structural Integrity and Bob Anderson of Competitive Power Resources. EHF2021 attracted 90 participants from 17 countries and included 55 users.

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 2021 EHF had two sponsors: Trace Analysis and Swan Analytical Instruments. The conference was organized by PPCHEM AG.

This year the EHF included 18 presentations. The meeting provided a forum for the presentation of new information and technology related to HRSGs, case studies of plant experiences and solutions, and for open discussion among the plant users, equipment suppliers, and industry consultants. The mix of the different topics (materials, chemistry, operation, valves, tube failures and assessment techniques, inspection, cleaning) kept 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 of information, which is excellently provided by this IAPWS forum.

IAPWS Seventh Meeting of the European HRSG Forum (EHF2021) Highlights and Press Release

Highlights from EHF2021 included:

- HRSG tube failures (HTF) remain a major concern and the following aspects were discussed:
  a) Flow-accelerated corrosion (FAC) with discussion on clarification of the effect of oxygen levels and the use of oxidizing treatments (no reducing agents) in addressing single-phase FAC
  b) The major features associated with creep and creep-fatigue because while HRSGs experience both cyclic and steady operation it does not mean that failures are due to 'creep-fatigue'
  c) The importance of metallurgical analysis to identify/confirm the mechanism of failure was again emphasized as the first important step in addressing HTF
  d) Pressure part failure in superheaters and reheaters relating to condensate, drains and attemperators.
- International updates on HRSG cycle chemistry included:
  a) The latest chemistry influenced reliability statistics referred to as Repeat Cycle Chemistry Situations (RCCS) which showed for the first time in ten years an overall improvement
  b) An update of the application of Film Forming Substances (FFS) (both amine (FFA) and non-amine (FFP) based) which reminded the users that markedly reduced corrosion products can be achieved, but that tube failure problems and deposits ("gunk") can occur if the FFS is not applied with guidance
  c) Assessment tools and instruments for monitoring film-forming amines (FFA) using OLDA were introduced
  d) The latest IAPWS Technical Guidance Documents for combined cycle/HRSG plants, and
  e) A good example of optimizing the cycle chemistry on a dual pressure HRSG.
- An overview of the problems associated with HP by-pass valve erosion by wet steam were highlighted based on a successful recent workshop held on the topic at HF. This highlighted the need for plant designers to focus more attention on providing a means of providing sufficient warming steam flow in the HP piping between the HPSH outlet and the isolation valve at the HP common manifold.
- This year EHF included a number of presentations related to materials of construction and analysis:
  a) The challenges of introducing CSEF steels in HRSGs including T/P 91 and 92. Some discussion was included on the relatively new "zinc effect" which has caused cracking in welds where zinc-based paint was employed to protect material prior to fabrication. A poll of EHF2021 users indicated only a small percentage had knowledge of this application and failure/damage
  b) A compilation of different failure modes associated with welds, and the good and bad welding and repair practices
  c) Advanced component fatigue evaluation approaches.
- The latest research and case studies on one of the fireside cleaning processes using Pressure Wave Technology. Some discussion was also focused on the possibility of internal oxide/deposit dislodgement.
- The latest approach in design and fabrication of large sidewall casing penetration seals.
- An update on drum level instrumentation and regulatory requirements.
- Introduction of new technology, which included small (<100MW) modular once-through boilers providing flexible operation and retrofit.

Please contact Barry Dooley (bdooley@structint.com or bdooley@IAPWS.org) or Bob Anderson (anderson@competitivepower.us) with any comments and for further information.