### **IAPWS-2017**

### August 27th -1st September 2017, Kyoto

- 102 participants from 13 countries
- Working Groups (WGs)
  - TPWS Thermophysical
    Properites of Water and Steam
  - IRS Industrial Requirements and Solutions
  - SCSW Sub-Committee on SeaWater
  - PCAS Physical Chemistry of Aqueous Solutions
  - PCC Power Cycle Chemistry

#### Purpose

 Connecting academia and industry to provide problems and research needs to researchers and to update engineers on research results

#### Outcome

- Releases/guidelines on physical and chemical properties
- TGDs for the power industry





## PCC & the work on TGDs

- TGDs released in 2016 (see <a href="http://www.iapws.org/techguide.html">http://www.iapws.org/techguide.html</a>)
  - HRSG High Pressure Evaporator Sampling for Internal Deposit
    Identification and Determining the Need to Chemical Clean
  - Application of Film Forming Amines in Fossil, Combined Cycle, and Biomass Power Plants

### Planned TGDs

- Demineralisation Plant Integrity (new, instrumentation, maintenance, supervision)
- Air In-Leakage (new, detection, consequences, SIAPWS involved)
- Corrosion Product Sampling and Analysis for Fossil and Combined Cycle Plants (revision, flexible plants, methods, uncertainty, SIAPWS involved)

## TGD on Corrosion Product Sampling and Analysis

Task group: Addison, Cook, McCann, Thomsen

Iron

transport

Full load

Steady-state

Iron

transport

Load variation

Initial operation

Start-up

Vision for flexible plants

to sample representatively, to analyse and interpret corrosion products, to take the correct cycle chemistry related actions, to minimise corrosion, corrosion product transport & deposition, and to minimize the risk of plant failures

Activity now – proxy methods

**Turbidity** 

Particle size/count Turbidity tracks transients 18-02-2018 23:53 19-02-2018 07:53 19-02-2018 15:53 19-02-2018 23:5

# TGD on Air-In-Leakage

Possible location acc. condenser type

Scientific background, i.e. gas solubility, Henry's constant QC of on-line measurement s

- •One or two instruments deviate or several?
- Check for exhausted cation resin(s)
- Run QC-check of deviating instrument(s)

Observe and assess

- •Evaluate CACE around the complete circuit
- •Evaluate variation over time tendencies, periodicity
- •Test observations against experience rules of thumb

Analyse for trace contaminants

- •On-site measurement of degassed conductivity
- •Analyse for trace anions (e.g. by ion chromatography)
- •Analyse for TOC/NVOC (e.g. by UV-degradation/NDIR-detection)

Evaluate

- Correlation between analysis results and CACE
- •Indication of the source of increased CACE

Rules of thumb

- Air-in-leakage
- -Organic cont.
- Salt cont.

Non-chemistry methods for AIL Vacuum-fall test

Methods for locating AILs

The AIL-team

- Organisation
- Tasks

# ICPWS-2018 in September in Prague

### Nordic contributions

- District Heat and Flue Gas Condensation
  Folmer Fogh
- Review of Experiences during the Last Decade on Flue Gas Condensation and the Re-use of the Condensate
  - Roger Lundberg and Karsten Thomsen
- Teething problems with Flow Gas Condensate Cleaning Technology
  Mats Hellman
- Microbial Growth in Membrane-Based Plants for Rinsing of Flue Gas Condensate
  Linda Wiig
- Experiences Regarding treatment and reuse of Flue Gas Condensate in waste incineration plant
  Jani Vuorinen
- Design of a new plant for flue gas condensation and treatment of condensate based on 23 years of field experience
   Niklas Berg
- Design considerations for UF filtration and demineralization of flue gas condensate for make-up water
  - T. Dalsgaard, J. Kastensson, A. Svensson, J. Hilden

## **SIAPWS Activities**

- Connection between the Nordic water chemistry communities and IAPWS
  - Power cycle chemistry guidance TGD's
  - Promoting experience with FGC treatment
- Central player for information and experience exchange in the Nordic countries
  - SIAPWS Water Chemistry Network
  - On-line courses/workshops → guidance/best practice

## SIAPWS information

- How to make SIAPWS visible?
  - On-line courses
  - Newsletters according to mailing list
  - Matarvattensektionen's newsletter (~ 4-5/year)
  - Facebook groups
    - Minutes of EC meetings
    - Adds for arrangements/courses
    - Experiences
    - Updates from IAPWS

## Next moves?

- Information
  - How to become more visible?
  - How to engage more colleagues?
- Cooperation with others
  - Matarvattensektionen in new form
  - Finnish VGB is closing down what to introduce instead could it be SIAPWS?
  - Danish industry associations for waste incineration and district heating?
  - Should we go for national arrangements (own language, easier travel)?