

# Report on the SWAN/PPCHEM Power Cycle Instrumentation Seminar in Dubai, United Arab Emirates

After their successful introduction last year, Waesseri GmbH, publisher of PPCHEM, decided to continue organising the Power Cycle Instrumentation Seminars. For reports on two of the past seminars in 2012, see [1]. In the current year two seminars have already taken place, the first (March 12–13, 2013) in Kuala Lumpur, Malaysia, and the second (April 22–23, 2013) in Dubai, United Arab Emirates. Both events were held under the sponsorship of PPCHEM and SWAN Analytical Instruments.

This report focuses on the seminar held in Dubai as it was the first time the seminar series stopped over in the Middle East. Like the seminars held last year, the seminar consisted of a well-proven mixture of both presentations given by technical experts and a hands-on session in which the participants worked with real instruments. The presentations were topically divided into two groups, the first having a more general focus on the context of power cycle instrumentation requirements, and the second concentrating on analytical methods and instruments.

## AGENDA

### Context Session 1

The first session was opened by Michael Rziha, chairman of the IAPWS power cycle chemistry working group and member of several VGB workgroups. He took a look at chemical regimes and the respective monitoring requirements, citing from guidelines issued by IAPWS, EPRI and VGB. As a member of the VGB committee, Michael also explained the new aspects of the revised guideline VGB-S-010-2011 (formerly VGB R450 L). Information about the different guidelines may be downloaded at [2].

Manuel Sigrist, head of Swan Systems Engineering and leading member of the VGB workgroup for sampling and instrumentation, then presented an overview of typical pitfalls between the actual plant process and

correct online measurement values. First-hand examples helped to illustrate good and bad practice in sample extraction, transport, conditioning set-ups, instrumentation and signal transmission. After a short break special focus was placed on sample conditioning for water-steam samples, i.e. temperature and pressure regulation in consideration of the new VGB guideline [3] for sampling, sample conditioning and online instrumentation.

Michael Rziha continued the morning session by providing insight into the special instrumentation requirements during commissioning and start-up. The guidelines do not distinguish between normal operation and commissioning. However, some issues are specific to commissioning, such as the higher load of undissolved solids and the frequent clogging of sample lines.

The first session was completed by Marc de Wispelaere, cycle chemistry consultant at Laborelec and vice-chair of the IAPWS power cycle chemistry working group. He presented two case studies to illustrate the potential cost of substandard sampling and analysis systems. Both cases showed that the most important precondition for effective troubleshooting is the availability of good quality data. If the quality of the data is very poor, cycle chemistry troubleshooting becomes very difficult, if not impossible.

### Instrument Session

The afternoon session was dedicated to online instrumentation. Direct, acid and degassed conductivity, dissolved oxygen, silica and phosphate, pH, sodium, oxidising-reducing potential (ORP), hydrazine, and hydrogen were the parameters discussed in this session. Specialists gave an introduction to the analytical methods and the critical issues for each parameter with respect to operation, verification and calibration. For many participants this was a new way of looking at their instrumentation because the emphasis was on understanding the basic principles instead of focusing on specific brands.





## Context Session 2 and Instrument Session

The morning session of the second day refocused on the more general context of power cycle instrumentation. The session was opened by Marc de Wispelaere, who spoke about the role of the chemist in the trouble-free operation of boilers and heat recovery steam generators. The chemist's primary function is to prevent corrosion- and deposition-related failures in the power plant so that the plant is available to operate as and when required. At first glance this may be obvious, but there are several issues that need to be considered in order to establish a good chemistry control system.

Michael Rziha then reported on cooling water monitoring requirements. Keeping the cooling water system as clean as possible is essential for an efficient heat exchange in the condenser/primary heat exchanger area of the system or in the cooling tower. Scale development, corrosion and bacteria/microbiological growth are the key factors to be monitored.

The differences between the water-steam cycle chemistry and the cooling water cycle chemistry are

reflected in the different sampling system requirements. Therefore, Manuel Sigrist presented key design aspects for online sampling systems in main cooling water.

After a short break, attention was again drawn to online instrumentation. Chlorine, turbidity and total organic carbon (TOC) monitoring completed the list of the introduced parameters.

The list of speakers was concluded by Manuel Sigrist, whose presentation focused on quality assurance for online water-steam analysers.

## Hands On

The last session was dedicated to operation and maintenance. The participants worked in groups with real instruments under the guidance of experts. Quality assurance was the most important issue. "How do you know it's right?" was the most prominent question. Hopefully the session made many technicians feel more comfortable with their analysers.



## CONCLUSION

The seminar attracted over 60 station chemists, instrument technicians, designers and C&I-engineers from the Middle East. Linked to participation was a free e-paper subscription to PPCHEM for the next year.

The feedback from the audience was very positive. To expand the knowledge of cycle chemistry and the awareness of analytical instruments, the organisers have decided to repeat this kind of event on a regular basis.

Succeeding events are already being planned. The next "Power Cycle Instrumentation Seminar" will take place October 14–16, 2013, in Florida, USA.

## REFERENCES

- [1] Germann, R., *PowerPlant Chemistry* **2012**, 14(4), 244, and *Report on the SWAN/PPCHEM Power Cycle Instrumentation Seminar in Midrand, South Africa*, *PowerPlant Chemistry* **2012**, 14(10), 664.
- [2] EPRI: <http://my.epri.com>;  
IAPWS: <http://iapws.org>;  
VGB: <http://www.vgb.org>.
- [3] *Sampling and Physico-Chemical Monitoring of Water and Steam Cycles*, **2012**. VGB PowerTech Service, GmbH, Essen, Germany, VGB-S-006-2012-09-EN.



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