IAPWS Certified Research Need – ICRN

Dew Point for Flue Gas of Power-Plant Exhaust

Closing Statement

In 2008, the IAPWS Working Groups "Thermophysical Properties of Water and Steam" and “Industrial Requirements and Solutions” examined the published work in the area of dew-point prediction for power-plant exhaust and recognized that there is a requirement for work to be pursued in this field. This resulted in the formulation of ICRN-23, Dew Point for Flue Gas of Power-Plant Exhaust. ICRN-23 was approved in September 2008 at the IAPWS annual meeting in Berlin, Germany, with an expiration date of September 2011. At the 2012 annual meeting in Boulder, Colorado, USA after a one-year extension, it was decided to allow this ICRN to expire.

Members of the Japanese national committee to IAPWS had been working for the possibility of a new investigation for development of a dew point equation and/or data accumulation since 2007, and ICRN-23 was started in 2008.

During the time ICRN-23 was in effect, two interesting papers [1,2] were published in the Oil and Gas Journal proposing new equations with better accuracy but with more terms; the author was at the Teheran Academic Institute. However, this work could not be evaluated as we were unable to communicate with the author about the condition of experimental data and the comparisons.

Through several meetings and discussions on the extension for evaluation by comparisons with ASHRAE data and old equations, we have reached to the conclusion that industry requires not only accuracy but also simplicity with some theoretical background for designing boiler equipment, etc. In fact, a Japanese equation [3] has been in use for more than fifty years because it is a very simple equation with reasonable results.

Future work will be directed at reconsidering old equations with modification and understandable backgrounds for the possibility of issuing a new ICRN.

Boulder, October 2012

References

[1] ZareNezhad, B., New correlation predicts flue gas sulfuric acid dewpoints, Oil and Gas Journal, Vol. **107**, 35 (2009).

[2] ZareNezhad, B., New correlation predicts dewpoints of acid combustion gases, Oil and Journal, Vol. **108**, 7 (2010).

[3] Ohtsuka, T., CRIEPI report, Chemical 61001 (1961).