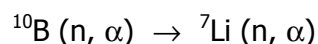


**Abstracts****Ivan D. Dobrevski, Neli N. Zaharieva, Katia F. Minkova, and Radka A. Ivanova  
The Concentration of the Coolant  $^7\text{Li}$  in Kozloduy Nuclear Power Plant Operating with Potassium Hydroxide as an Alkalizing Reagent (Possible Impact on the Occurrence of Axial Offset Anomaly)**

The phenomenon of axial offset anomaly (AOA) has occurred in a number of PWRs operating with extended fuel cycles and high boiling duty cores. Up to now AOA has been observed in PWRs operating with lithium hydroxide as the alkalizing reagent used for pH adjustment in boric acid water solutions. Since AOA is connected with the  $\text{LiBO}_2$  precipitation in porous corrosion product deposits on the fuel cladding surfaces, we could presume that the replacement of lithium hydroxide with potassium hydroxide will avoid AOA.

Nowadays there is a lack of observed AOA in VVER, i.e., a lack of formation of lithium metaborate ( $\text{LiBO}_2$ ) deposits on the fuel element surfaces by coolant alkalization with potassium hydroxide. Nevertheless, the concentrations of  $^7\text{Li}$  appear in the coolant, as a product of the neutron reaction with boron:



As a consequence the possibility it is not excluded of  $\text{LiBO}_2$  formation in VVERs with potassium hydroxide water chemistry.

The aim of this study is to inform the reader about the development of the concentration of the coolant lithium concentration during the fuel cycles of VVERs and to discuss the possibility of  $\text{LiBO}_2$  formation under VVER operation conditions.

**Jean-Louis Drommi and Frédérique Mesnage  
How to Prevent Hollow Conductor Plugging: EDF's Solution for Aerated Systems**

Between the early 1980s and 1995, Electricité de France (EDF) faced several plugging problems on its aerated water-cooled generators causing significant production losses due to reduced load operation and unscheduled outages for off-line cleaning: up to 150 days per year. As an ultimate solution, several stators were rewound.

In 1995, research and metallurgical investigations led to a better understanding of the plugging phenomenon and allowed EDF to design and implement a soft on-line treatment: cationic purification.

Since 1995, on-line cationic purification has enabled 100 % availability of the generator cooling function. As a proactive policy to prevent hollow conductor plugging, EDF has undertaken, on 95 % of its 58 PWRs, significant modifications of the generator winding cooling system so that the water chemistry parameters avoid the buildup of cupric oxide ( $\text{CuO}$ ).

**Robert Svoboda, Claudio Picech, and Herbert Hehs**  
**Experience with Stainless Steel Hollow Conductors for Generator Stator Water Cooling**

Copper is a traditional material for hollow conductors. As a future tendency, stainless steel is a proven alternative as a hollow conductor material. In our almost 30 years of experience we have not encountered any failures related to cooling water chemistry with this material. We recommend the use of high purity water with no restriction on oxygen content.

**Albert Bursik**  
**AVT Guidelines for Drum Boilers and the pH at Temperature**

pH values measured at 25 °C are used for controlling the boiler water treatment. The question arises as to whether this practice is correct. The paper shows that the difference between the actual pH and the neutral pH, both at the boiler water temperature, decreases extremely with increasing temperature in boilers operated on all-volatile treatment. Even slight anionic contamination may cause the pH(t) to move into the dangerous acidic region. In this connection, the VGB guideline AVT limit for the cation conductivity of the boiler water ( $< 3 \mu\text{S} \cdot \text{cm}^{-1}$ ) seems to be too high. Many examples demonstrate this statement.

**Robert Svoboda, Hans-Dieter Pflug und Thomas Warnecke**  
**Untersuchungen zur Zusammensetzung des Erstkondensates in Dampfturbinen**

Die vorliegende Arbeit berichtet über Untersuchungen der Konzentrationseffekte im ersten Kondensat. Die Einrichtungen und Analysenverfahren unterscheiden sich nur wenig von den früheren Messungen. In den vorliegenden Versuchen wurden jedoch gezielt verschiedene Kontaminanten, wie NaCl, in kleinen Mengen in den Kreislauf dosiert, um die Genauigkeit der Analysen zu erhöhen. Dabei wurde darauf geachtet, die Säureleitfähigkeit im Rahmen der VGB-Spezifikationen zu halten. Ferner wurde im Vergleich zu den früheren Messungen der Umfang der analytischen Parameter erweitert.

Wenn man von Ungenauigkeiten in der analytischen Bestimmung sowie der Probenahme bei sehr kleinen Dampfständen absieht, kann man folgende Schlussfolgerungen ziehen:

- bei starken Elektrolyten, wie Salze von Natrium, Kalium und Calcium, zeigt die Konzentration eine reziprok-lineare Abhängigkeit von der Dampfstände,
- bei anorganischen und organischen Säuren beeinflusst deren Flüchtigkeit die Abhängigkeit der Konzentration von der Dampfstände,
- mit Ammoniak und Kohlensäure konnte keine Abhängigkeit der Konzentration von der Dampfstände beobachtet werden.

Die Ergebnisse der Untersuchungen können helfen, das Schadenspotential an Dampfturbinen durch Kohlensäure und organische Säuren besser zu beurteilen.

**Ladislav Bursik**

**PowerPlant Chemistry-Seminar "Chemische Fahrweise von Kesselanlagen und Kombianlagen – Kraftwerke, Industrie, Heizkraftwerke und Müllverbrennungsanlagen"**

PowerPlant Chemistry GmbH hat am 27. und 28. März d.J. zum zweitenmal ihr Seminar über die chemische Fahrweise von Kesselanlagen und Kombianlagen veranstaltet. Abweichend vom ersten Seminar (in Mannheim, in November 2000) wurde in diesem Seminar nicht nur die Speisewasser- und Kesselwasserkonditionierung in Industrie- und Heizkraftwerken, Müllverbrennungsanlagen und Kombianlagen, sondern auch in konventionellen Kraftwerken behandelt.

In diesem Beitrag werden die einzelnen Seminarmodule und die drei im Rahmen des Seminars durchgeführten Diskussionsforen besprochen.

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