Mitigation of Copper Corrosion and Agglomeration in APS Process Water Systems*

R. Dortwegt, C. Putnam, and E. Swetin

Argonne National Laboratory, Advanced Photon Source (APS)
9700 S. Cass Ave., Argonne, IL 60439 (USA)
Phone: 630-252-6058; Fax: 630-252-5948
E-mail: dortwegt@aps.anl.gov

Abstract

Copper corrosion has been observed in the APS process water systems dating to the early post-commissioning phase of the project. In time, copper corrosion products agglomerated significantly in certain preferred locations. Significant agglomerations can occur in copper cooling passages such as magnet conductors and x-ray absorbers having relatively large length-to-diameter ratios and where heat is removed by water cooling. Such agglomerations also occur at restrictions found in noncopper flow control components such as valve seats and fixed orifices. Modifications to the APS process water system that significantly reduce the rate of copper corrosion are discussed. These modifications have not prevented corrosion altogether, however. Other means used to prevent component clogging and malfunction as a result of current copper corrosion rates are listed.

Keywords: copper, corrosion, water, cooling

Presentation: Oral

* Work supported by the U.S. Department of Energy under Contract No. W-31-109-ENG-38.