Laboratory on Corrosion of Nuclear Materials toward Understanding Aging Mitigation in Light Water Reactors at Missouri University of S&T

Executive Summary

We propose to create a set of lecture/laboratory practices on corrosion and aging mitigation of nuclear materials where students will receive, besides the fundamentals of corrosion (electrochemistry) of nuclear components, also a practical component on electrochemical instrumentation and applicability of those principles. This series of lectures will be complemented with experiments done in a laboratory and will provide the students with an understanding of the aging mechanisms on light water reactor systems and components. These lectures and lab practices will have a total duration of 4 to 6 weeks of class time ending with a project presented by students, where they demonstrate, in groups, a practical aspect of environmental degradation, corrosion, or mitigation of damage in nuclear materials. All produced material will be made available on the Internet in an open but moderated format (wiki) such that other nuclear engineering programs (as well as the nuclear industry training programs) can benefit from it and contribute to its improvement over time. At the completion of this project, our program will produce nuclear engineers with the set of skills required to better understand the problems of dealing with our aging nuclear fleet, as well as dealing with potential real life problems present in light water reactors today.

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