

Smart-LCM™

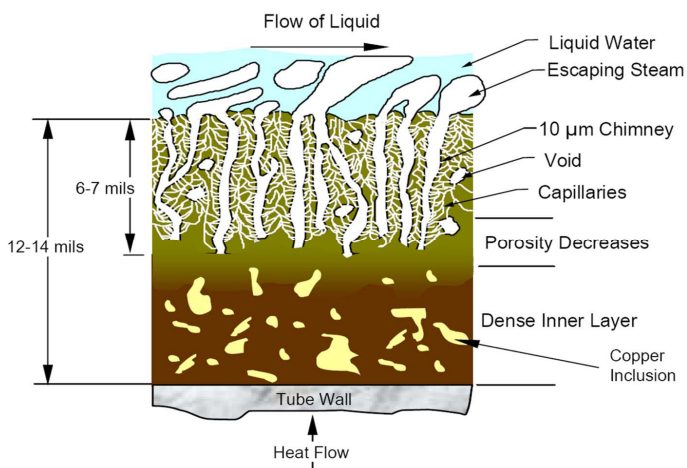
Optimized Life Cycle Management of Nuclear Components

Background

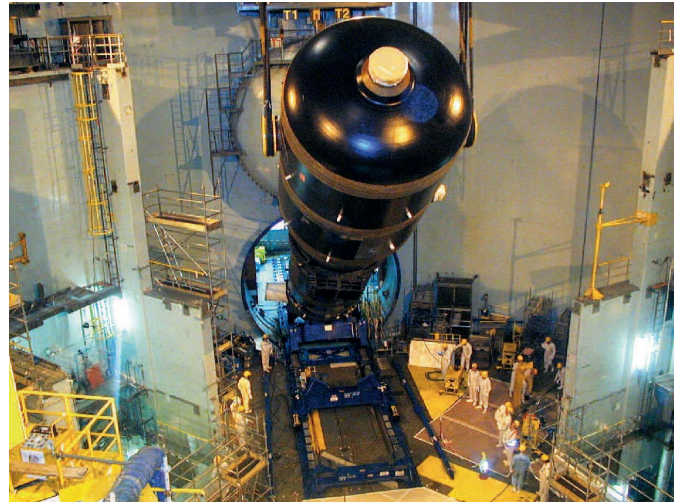
When planning maintenance activities for major nuclear components such as steam generators and other balance-of-plant heat exchange equipment, decision making can seem daunting and subjective, and may result in differing opinions by different stakeholders. Determining whether to replace a component or perform maintenance, and the optimal timing to do so, requires accurate projection of future degradation in component performance and reliability.

Description

DEI's SMART-LCM™ tool simplifies the decision making process by simultaneously projecting future thermal performance, material degradation, component reliability and other technical metrics for the component of interest, while combining economic analysis of the costs and downtime anticipated for candidate maintenance strategies. This analysis is then simplified into actionable recommendations that support objective decision making. To date, SMART-LCM™ studies completed by DEI have saved nuclear utilities on the order of 100 MUSD in O&M costs through optimized life cycle management of nuclear components.



Modeling of heat transfer through fouling layers in heat exchange equipment



Replacement of PWR steam generator

Industry Experience

- >100 Smart-LCM™ studies completed for steam generators and other heat exchange equipment (condensers, MSRs, turbines, etc.)
- 100 MUSD in O&M costs saved through optimized life cycle management of nuclear components

Benefits

- Independent quantitative analysis to compare candidate maintenance strategies, including component repair vs. replacement
- Accurate projection of future material degradation and thermal performance losses in major components based on theoretical modeling and empirical use of industry experience
- Combined economic analysis to identify optimal maintenance strategy that minimizes cost, while ensuring component reliability
- Identification of optimal timing and application frequency for maintenance activities
- Periodic updates based on actual component performance to facilitate updates to LCM plan

For more information, contact Marc Kreider (mkreider@domeng.com), or Dale Vines (dvines@domeng.com)