

**STEAM GENERATOR INSPECTIONS: FASTER, CHEAPER AND BETTER,  
ARE WE THERE YET?**

Eliminado: AECL  
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**ABSTRACT**

Degradation of steam generator tubing due to both mechanical and corrosion modes has resulted in extensive repairs and replacement of steam generators (SG) around the world. The variety of degradation modes challenges the integrity of the SG tubing and therefore the stations' reliability. Inspection and monitoring aimed at timely detection and characterization of the degradation is a key element for ensuring tube integrity.

Up to the early 70s, the in-service inspection of SG tubing was carried out using single-frequency eddy current (EC) bobbin coils, which were adequate for the detection of volumetric degradation. By the mid-80's, additional modes of degradation such as pitting, intergranular attack (IGA), axial and circumferential inside and outside diameter stress corrosion cracking had to be addressed. The need for timely, fast detection and characterization of these diverse modes of degradation motivated the development in the 90's of inspection systems based on advanced probe technology coupled with versatile instruments operated by fast computers and remote communication systems.

SG inspection systems have progressed in the new millennium to a much higher level of automation, efficiency and reliability. The increasingly competitive market of electricity production and the demands of economic globalization required shorter and more cost effective inspections. Also, the role of Non Destructive Evaluation (NDE) evolved from simple detection tools to diagnostic tools that provide input into integrity assessment decisions, fitness-for-service and operational assessments. This new role was motivated by tighter regulatory requirements to assure the safety of the public and the environment; better SG life management strategies and often self-imposed regulations. It led to the development of advanced probe technologies, more reliable and versatile instruments and robotics, better training and qualification of personnel and better data management and analysis systems.

This paper provides a brief historical perspective regarding the evolution of SG inspections and analyzes the motivations behind that evolution. It presents an overview of regulatory issues and the current scope of SG inspections and inspection technology.

Key words: steam generator, SG, eddy current, NDE

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