

4.1.9. NDE AND MATERIAL EVALUATION FOR LIFETIME ASSESSMENT OF POWER PLANT COMPONENTS

Abbasi W.A., Rahman S., Metala M.J., Siemens Energy, Inc., Pittsburgh, USA

In recent years there has been a strong push from electric utilities to assess the condition of their power generating equipment beyond the usual inspection for fitness. This push has mainly been to evaluate the condition of the equipment as it remains in service at or beyond its designed life. This push has been further reinforced due the global economic conditions as plant operators continue to maintain and operate installed units instead of adding new installed capacity.

To perform the condition evaluation and subsequently lifetime assessment, a combination of NDE and Material Evaluations are needed. A combination of these evaluations provides information that is needed to evaluate the presence of flaws in components, assess their lifetime, and with proper engineering analyses, sometime provide a component remaining life. This cycle of evaluation provides the plant operators the ability to continue the operation of their equipment in a prudent manner. This paper discusses a variety of NDE techniques and methods that are used in the process of lifetime assessment. While the discussion contained herein methods is mainly limited to new advances in a variety of techniques it does not imply that the traditional methods (such as PT, MT) are not equally important in the NDE of these components. Additionally, the paper discusses the material evaluation methods that are used to determine the structural life of the components. These methods involve the evaluation of microstructure of components as well as analysis of other non-destructive tests such as micro-hardness testing.