

INVITED LECTURE

Assessment of Service worthiness of High Temperature Components in Thermal Power Plants

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ABSTRACT

Assessment of service worthiness aims at outlining the ability of an asset to perform its intended function effectively and efficiently while protecting health, safety and the environment over the whole life cycle. Assets have traditionally been built with an assumed nominal design/economic life of about 20-25 years. Depending upon the actual operating and environmental conditions, materials of equipment degrade as a function of service life due to one or more time dependent material damage mechanisms such as creep, fatigue, corrosion, erosion, wear and embrittlement. Due to operation and material related factors the actual useful life of components in service may well exceed or fall considerably short of design life. A component may prematurely fail due to operating conditions not envisaged originally in design as for example excessive thermal cycling, excessive temperature, environmental conditions, system stresses etc. It is , therefore, necessary to carry out the damage assessment of different vital components of unit approaching design life with acceptable level of safety and reliability. This paper, therefore, will discuss the various approaches for assessing the current condition of deteriorating components based upon the typical parameters which degrade during service. A few critical cases of components degradation shall also be presented in order to emphasise the need for periodic assessment studies of lives and service worthiness of elevated temperature components used in service.

Keywords: Service worthiness, exhausted life, oxide scale thickness, Hardness

