

# Remaining Life Assessment of Critical Pipe Lines in Thermal Power Plant

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## **ABSTRACT**

Authors describe a methodology and present a case study of remaining life assessment of critical pipelines such as main steam (MS), cold re-heat and hot re-heat (CRH and HRH), HP & LP Bypass Piping (HPBP & LPBP) systems, in a thermal power plant. A finite element analysis (FEA / FEM) based procedure is used to determine as per fitness for service rules ASME FFS-1/ API 579, in conjunction with other ASME B&PV codes (e.g. B31.1 & Section VIII). Data obtained by NDT measurements of the pipelines are used in the analysis. Authors describe difficulties that arise in the data compilation, interpretation of codes and arriving at retire/ repair/ reuse decisions during such critical RLA studies. Methods to overcome these difficulties are explained.

Due to operational loads, pipelines undergo degradation due to fatigue, creep, generation of internal voids, surface defects, weld defects, erosion, corrosion etc. Plant observations are made using NDT to thickness variance of pipeline, local thickness, microscopic defects, macroscopic defects in the pipe and welds, etc. Creep rupture data in terms of Larsen Miller Parameter (LMP) is derived. Creep strength reduction factor as per API 579-1 is derived. Remaining life available is calculated considering appropriate factor of safety, as guided by ASME codes (e.g. B31.1).