

Residual Life Assesement

Residual Life Assessment and Extension of Aging Structures

Residual life assessment of aging structures is an important fall out of the latest advances in the science of fracture mechanics, non-destructive testing / evaluation and non linear FEM analysis. A massive set of legacy assets in air force, civil aviation, power plants, off shore structures, naval and marine structures, piping and pressure vessels etc., which have been (or are due to be) retired can be put back into useful service after a careful scientific analysis of the remaining life and application of procedures for extension of life. Aging structures need to be studied for a rational assesment of their residual life. Methodologies have to be developed to arrive at rationalized procedures for extension of the service life of these structures. Such a process calls for an understanding of the following:

- Material behavior and degradation during the service
- Application of NDT for defect (flaw) detection and analysis
- Application of FEM simulation to predict:
 - The thermal and stress state of the system
 - Fracture mechanics parameters, stress concentration etc.
 - Crack growth kinetics and cycles to fail

Upon understanding of the remaining life, repair and surface treatment strategies can be determined. To extend the safe service life, efficiency of the repair techniques can be studied using the computer simulation technology.

reference: www.pro-sim.com