

An Indian-Australian research partnership

Improved design data for mitigation of stress corrosion cracking (SCC)

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The problem

Caustic and Chloride Stress Corrosion Cracking of Steels: Reaction vessels and pipes as well as common structures in various industries are often exposed to aggressive caustic, chloride or acidic environments, which in conjunction with applied or residual stresses can cause SCC failures. Welded structures are particularly prone to SCC. SCC occurs in a rather narrow window of synergistic action of tensile stress and solution electrochemistry. Hence an effective mitigation of a given SCC problem necessitates understanding of the role of the specific process variables.

Raman's group has been very actively running two streams of R&D for investigation of the role of process variables: (a) role of solution chemistry in caustic SCC of vessels and pipes in alumina processing industry (the project has been supported by a consortium of alumina processing companies, viz., Alcoa, Worsley, Alcan and QAL) and (b) role of a specific additive in chloride SCC and pitting in stripping column of a major PVC processing plant. These projects have received ARC Linkage grants, and led to some lead publications.