Abstract

Purpose – The purpose of this paper is to identify the corrosion failure mechanism of a Cu tube in a hydraulic installation and recommend corrective actions to improve the reliability of the entire unit.

Design/methodology/approach – Failure investigation process includes mainly stereo-, light optical microscopy and scanning electron microscopy as the main analytical tools for material characterization and root-cause analysis.

Findings – The investigation findings, obtained by corroded surface analysis and metallographic evaluation in transverse sections, suggest strongly that the failure was caused by the operation of Type I pitting corrosion mechanism initiated from the inner side and propagated towards the outer tube surface, assisted by the flowing medium composition.

Originality/value – This paper deals with an applied failure analysis/case history, summarizes the stages involved in the mechanism of pitting corrosion Type I, taken place in cold water systems together with the main parameters and corrosive species that enhance corrosion rates, shortening pipeline operation life.