THERMAL SCIENCE
International Scientific Journal

Milorad Zrilić, Radoslav Aleksić

THE EFFECT OF LONG TERM EXPOSURE TO ELEVATED TEMPERATURE ON STEAM LINE STEEL PROPERTIES

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ABSTRACT

Premature failure of pipes presents serious problem in the service of steaminess, produced of steel 14MoV6 3, developed for steam high temperature (540oC) for at least 100,000 service hours. Experimental research with specimens, taken from virgin and used material (117,000 service hours), is performed for better understanding of the effect of long-term exposure to high temperature and high stresses on this steel properties. In addition to classical testing method (tensile test, impact toughness test), local approach to fracture is applied, offering detail analysis of changes caused in service. New designed extensometer is applied for measurement of contraction in the specimen root radius at elevated temperature. The differences between virgin and used steel properties, noticed in tensile test results, are described in better way by local approach method. The premature failure can not be attributed completely to revealed reduction in 14MoV6 3 steel properties after used and further research is necessary for complete explanation of premature in-service failure of pipes, produced of 14MoV6 3 steel.

KEYWORDS

fracture mechanics, local approach, ductile fracture, steam line

PAPER SUBMITTED: 2003-04-24

PAPER REVISED: 2003-05-12

PAPER ACCEPTED: 2003-05-16

CITATION EXPORT: view in browser or download as text file

THERMAL SCIENCE YEAR **2003**, VOLUME **7**, ISSUE **1**, PAGES [33 - 46]

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