



Short communication

Remaining life assessment of platforming reactor vessels

K.M. Deen^{a,*}, I.H. Khan^b, R. Ahmad^a, Z.H. Rizvi^b, J. Ahmad^a^a Department of Metallurgy & Materials Engineering, CEET, University of the Punjab, Lahore 54590, Pakistan^b Institute of Chemical Engineering & Technology, University of the Punjab, Lahore 54590, Pakistan

ARTICLE INFO

Article history:

Received 10 November 2010

Received in revised form 2 March 2011

Accepted 4 March 2011

Available online 12 March 2011

Keywords:

Steel

Hardness measurement

Microscopy

1. Introduction

The petrochemical plants commonly operate for a period substantially in excess of the design life. Consequently there is an increasing need for a reliable approach to assess the remaining life of processing plant [1]. The remaining life assessment of in service process equipment is an important aspect in terms of economics and continuity of safe operation. The life assessment procedure should provide accurate remaining life prediction and sufficient confidence in the predicted life to enable sound running, repair and if needed replacement strategy formation. The strategic planning should always be emphasized more than the tactical approach to the problems as they arise.

The necessary repair or replacement schedule must be compatible with the normal operating cycle. Accurate long term remaining life prediction does not mean that operator neglect regular inspection within the predicted life span. However, short term abnormal transient condition during the operation may impose great threat to the life of process equipments. During the last three decades there have been much evidence of material failures and changes occurred in aging refineries and petrochemical plants [2].

In refining and petrochemical industries the creep cracking and hydrogen damage of Cr–Mo steel alloys have raised serious safety problems in the past. The degradation of mechanical properties of low Cr–Mo steels weldments has produced a significant impact on economical aspects of smooth plant operation [3].

The frequent environmental degradation of pressure vessel steel may be reduced by careful designing and fabrication methods but we often live with the problem. This implies to the catastrophic failure and retirement of equipment material from service, as defects and flaws retained in them inherently by their metallurgical origins. The threat from these inherent

* Corresponding author. Tel.: +92 429 9232256; fax: +92 429 9231159.

E-mail address: Kashif_mairaj83@yahoo.com (K.M. Deen).