

عنوان مقاله:

Failure Analysis of Thermowell's Support Pipes Installed on the Main Feed Gas Pipelines of the South Pars Gas Complex

محل انتشار:

دهمین همایش مشترک و پنجمین کنفرانس بین المللی انجمن مهندسی مواد و متالورژی و انجمن علمی ریخته گری ایران (سال: 1395)

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خلاصه مقاله:

Critical failures of the gas pipelines or the refinery facilities could lead to the plant shutdown. In fact, stopping the gas production and causing the environmental impacts are the two serious consequences of an unexpected gas plant shutdown. The present work studies the failure of thermowell weldments occurred in the main gas pipelines of a gas refinery plant that made a number of emergency shutdowns happen. After the failure description and an extensive literature survey, visual and penetrant tests were performed to identify the crack locations. Then, the fractured surface and its cross-sections were investigated by stereo, optical and scanning electron microscopes. Besides, atomic emission spectroscopy was used to evaluate the chemical composition of the different weld zones. Also, their micro-hardness profile was determined. Based on the results, there were not any unusual issue in the micro-structure, micro-hardness profile, and chemical composition of the weld zones. But, the macroscopic images showed the ratchet and beach marks that were initiated from the lack of penetration defects and propagated through a fatigue process. At the end, a repair procedure was performed and some hints were proposed to mitigate the fatigue failure

کلمات کلیدی:

Thermowell, TT, TG, Fatigue, Beach Marks, Ratchet Marks

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