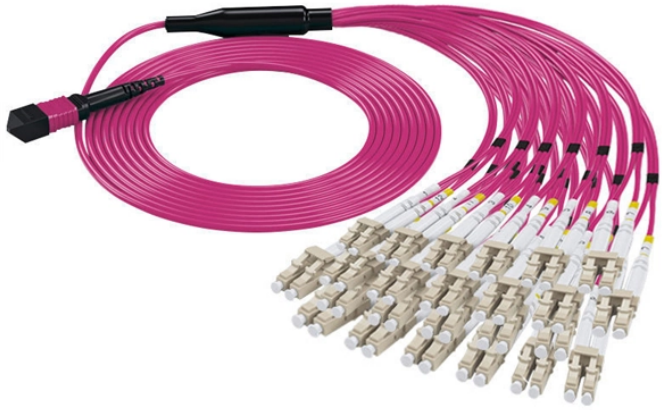
Analysis of the causes of pigtail bending and welding



Overview

This paper explains the cause of the failures, the follow up incident investigation and the actions taken to prevent recurrence of a similar failure. This case study details the failure of recently replaced inlet pigtail pipes for a hydrogen reformer furnace. The pigtail connection to the catalyst tube consisted of a ASME A-335 P22 pipe welded to an Incoloy 800HT weldolet. The weldolet was joined to the catalyst tube, which was an HP Modified. By Manikandan Palanisamy, Lead Engineer - Asset Integrity at OQ Base Industries, Ali Al Zawamri, Asset Integrity Manager at OQ Base Industries, and Abdullah Al Balushi, Asset Integrity Engineer at OQ Base Industries. A welded manifold pipe in a primary steam reformer used to transport hydrogen gas at about 873°C developed leakage in the weld fusion zone after about 22,000 h of operation. Agrium's Ammonia Plant #2 is located near Redwater, Alberta, Canada and the plant produces about 680 KMT per year of ammonia that is used to produce. The nipping of the pigtails is exercised and performed under slightly reduced plant load. Certain routines were established to do the nipping exercise in the safest way, having no leakages to the surroundings, nor endangering the people involved. However during one nipping exercise an

outlet. Bulk hydrogen production in a petroleum refinery by steam–methane reforming (SMR) utilizes high temperatures, moderate pressures and catalyst – filled tubes which generate high tube temperatures of up to 920 °C [1,690 °F]. Creep and pressure / temperature cycling imposes severe loading on the.

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The failure analysis study is described in detail in this paper, and the mechanism of the crack is identified and proper recommendation is given to avoid such issues in future operations.

In order to find out the cracking causes and mechanism, this paper presents the failure investigation on the welded joints of hydrogen reformer outlet pigtail tubes by visual inspection, ...

Detailed microstructural characterization using various electron-optical techniques and mechanical property evaluation were employed to determine the cause of ...

Pigtails are used to transfer syn-gas from reformer tubes to manifolds and experience high stresses from temperature and pressure. Common failure mechanisms include creep rupture, cracking at bends ...

It will also cover the causes of damage, appropriate inspection methods, and assessment methodologies adopted for estimating creep remaining life. All of this is presented in an ...

The pigtails do have a much smaller diameter than the reformer tubes, making them suitable to nipping. ''Nipping'' is the squeezing together of a tube, until it is completely flat and therefore restricts the gas ...

Detailed microstructural characterization using various electron-optical techniques and mechanical property evaluation were employed to determine the cause of failure. Selection of pipe material and ...

Although API 530 provides high temperature design guidance, API TR 942-A indicates many operators continue to experience unexplained repetitive incidents of creep rupture of outlet pigtails and ...

This case study details the failure of recently replaced inlet pigtail pipes for a hydrogen reformer furnace.

On the outlet header, an Alloy 800 HT pigtail failed by creep failure after 42,000 hours of service. This paper explains the cause of the failures, the follow up incident investigation and the actions taken to ...

Semantic Scholar extracted view of "Failure analysis of cracking in the welded joints of hydrogen reformer outlet pigtail tubes" by Gang Li et al.

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