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Please fill in your manuscript title.	A Case Study of Line Pipe Material Qualification for Extreme Sour Service Application

Please fill in your author name(s) and company affiliation.

Given Name	Surname	Company
Tribhuwan Singh	Kathayat	Welspun Corp Limited
Atul	Srivastava	Welspun Corp Limited
Bhavin	Mapara	Welspun Corp Limited
Rashmitha Bhanu	Palle	Welspun Corp Limited
Makkhan Lal	Saini	Welspun Corp Limited

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Abstract

The Oil and Gas industry is facing the challenges of using TMCP plates for transportation of ExtremeSour Service Gas where the combination of the gas is H₂S and CO₂. Hence, a detailed Qualification program of Line Pipematerial has been performed considering those technical challenges in Extreme Sour Gas conditions.

The deeper reserve have more sour gas, with a high percentage of H₂S and CO₂ which has the significant risk of corrosion and eventually can cause the failures affecting the Safety and Quality of TMCP rolled CarbonSteel pipelines. Sulphide stress cracking and Hydrogen Induced cracking has always been the major concern of line pipesteel during the extreme sour service performance. To sustain this type of environment and avoid such failures, the premiumquality of the line pipe with advanced TMCP plates rolling practices, inclusion shape control technologies and strict control of Sulphur and Manganese content shall be adapted.

Looking to the outcome of the current challenges it is important to revise the existing NACE Standards being used for Extreme Sour Service Gas transportation in Region 3 Zone as per the Figure1 in ISO 15156-2, which plots the Regions of environmental severity with respect to the SSC of carbon and low-alloy steels.

To overcome the challenges, TMCP rolled steel plates were tested in Region 3 as per NACETM0177 and NACE TM0284, NACE TM0316 standards to understand the behavior. The steel and Pipe with size of 28" (711mm) OD x 1.18"(30 mm) WT DNV GL SAWL450 SFD/API 5L X65MO PSL2 grade was manufactured under controlled steelmaking, continuous casting and rolling parameters including Hard spots identification and Inspected by Eddy current method.

Keywords : Sulphide Stress Cracking; Hydrogen Induced Cracking; Extreme Sour Service ; Hard spots ; TMCP