Risk based inspection (RBI) analysis of 2” diameter lean glycol process piping at dehydration unit (DHU) in gas production PT. X = Risk based inspection (RBI) analysis of 2” diameter lean glycol process piping at dehydration unit (DHU) in gas production PT. X

Shenia Arin Syahprida, author

Abstrak

Industri gas merupakan sektor penting di dalam pembangunan nasional baik dalam hal pemenuhan kebutuhan energi dan bahan baku industri di dalam negeri maupun sebagai penghasil devisa negara. Teknologi CO2 removal digunakan untuk mengurangi kandungan asam sehingga kandungan hidrokarbon pengotor maksimal 5% karena kemurnian LPG ±95% [1]. Salah satu metode pemurniannya adalah dengan absorbsi CO2 [2]. Salah satu unit penting dalam CO2 Removal adalah unit dehidrasi. Dalam studi ini, peristiwa korosi pada pipa lean glycol material A 106 Grade B diameter 2” dipelajari menggunakan analisa laboratorium dan analisa RBI. Berdasarkan hasil percobaan didapatkan Tsperc = 78.175,48 Psi, Ysperc = 56.129,59 Psi dan elongasi 26,66%. Dari nilai Tsperc didapatkan Sperc = 26.058,49 Psi.
Berdasarkan hasil analisa OEM didapatkan bahwa komposisi kimia sampel pipa masih dalam range standar untuk material A 106 Grade B. Dari analisa SEM, diketahui bahwa material pipa masih memiliki keuletan yang baik, meskipun dari analisa EDX diketahui telah terjadi korosi. Dari hasil uji korosi potensiostat didapatkan laju korosi (CR) sebesar 2,0741 mmpy (500C) dan 2,9298 mmpy (920C).
Berdasarkan hasil uji ultrasonik didapatkan bahwa posisi 6B memiliki ketebalan minimum. Posisi ini juga merupakan posisi dengan CR tertinggi (2.12 mmpy) dan RL terendah (1,29 tahun). Namun karena MAWP Posisi 6B masih lebih tinggi dari
working pressure, sehingga pipa masih aman untuk dioperasikan. Inpeksi selanjutnya direkomendasikan dilakukan pada 2021 dengan metode review proses
dan NDT eksternal. Pemodelan yang didapatkan dari penelitian ini RL = 8,1774 CR2– 25,081 CR + 19,993 dengan nilai R = 0,9547.

.....Gas industry is an important sector in national development both in terms of meeting energy needs and industrial raw materials in the country and as a source of foreign exchange. CO2 removal technology is used to reduce the acid content so that the maximum impurity hydrocarbon content is 5% due to the ± 95% purity of LPG [1]. One of the purification methods is CO2 absorption [2]. One of the important units in CO2 removal is dehydration unit. In this study, corrosion
phenomenon of 2” diameter lean glycol pipe A 106 Grade B was studied using laboratory analysis and RBI analysis. It was found that Tsperc = 78,175.48 Psi, Ysperc = 56,129.59 Psi and pipe elongation 26.66%, so that Sperc = 26.058.49 Psi. OEM result that chemical composition of sampel pipe is still in a range of standard pipe. From SEM analysis, it is known that the pipe material still has good ductility, although from EDX analysis it is known that corrosion has occurred. From EIS test,
corrosion rates (CR) are 2.0741 mmpy (500C) and 2.9298 mmpy (920C). Based on ultrasonic test, position 6B had a minimum thickness. It was obtained that this position also has the highest CR (2.12 mmpy) and the lowest RL (1,29 tahun). Morever MAWP is still higher than working pressure, so this pipe is still safe to operate. Further inspection should be done in 2021 using process review and NDT external methods.

Corrosion modeling equation obtained is RL = 8,1774 CR2–25,081 CR + 19,993, R = 0,9547.