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Analysis of the Risk Material Degradation in the Oil and Gas Production Pipeline of the Era of Green Industry using PCM Model

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Most of the materials degradation of gas pipeline it will be usually correlated with leak risk factor that can impact to be consider environment pollution and its area performance of green industry. Pipeline Criticality Management (PCM) model is the method to make pipeline segmentation ranking based on the direct assessment of material degradation monitoring of gas production pipeline using MFL intelligent pig results. This research calculation using model of pipeline critical ranking (PCR), actual wall thickness (ta) by field UT measurement and required wall thickness calculated using common standard (tr), criticality confident factor (0.5), shear stress of erosion corrosion factor (w), acceleration of slope factor 0.0213, a constant factor of the model 1.2911

$$PCR = \frac{0.5\,(\,ta\text{-}tr)}{0.0213\tau_w}\,1.2911$$

The result of this research to indicated that this risk ranking calculation can be influenced to maintenance strategic and inspection planning which is very high risk segment ranking of the field area gas production indicated that schedule of inspection planning, testing method and area of inspection activity according to damage factor and damage mechanism which will be 480 segment of the pipeline which is very high criticality ranking the program of inspection planning will be year 2020, at 2 (two) segment of 28" PDP-TL-014/00, 20 segment 28" PDP-TL-014B/00 and 460 segment of 32" PBM-TL-014C/00. 1103 segment which is high critical ranking will be conducted by 2023 at 28" PDP-TL-014/00 and 200 segment at 28" PDP-TL-014B/00. This Risk evaluation by identifying the probability of material qualitative degradation. Green industry program from this risk management as of high consequences of failure (COF) high impact from the environmental condition of existing pipeline which is correlated with high financial impact (CEC), high operational impact (Cs), high environmental human safety impact (CL). Analysis of the pipeline segmentation criticality rating results from risk ranking which is correlated with low remaining life (RL).

Keywords: Gas production pipeline t, PCM model, risk management

Biography

Muhammad Yudi M. Sholihin is a lecturer for post graduated program of Mechanical and Industrial Engineering, in University of Pancasila, he has 38 Years experiences in the field research, scientific research specialty in Risk Based equipment of oil and gas plant, pipeline Distribution, Production and refinery Plant, top side and FPSO Facilities. He worked as a Principal Professional Engineer of the PII (The Institution of Engineers Indonesia) and Industrial Engineer at University of Jendral Achmad Yani in 1995. He did his MBA in Greenwich University Hilo, Hawaii in 1993 and MSc (Material Science, majoring in material risk management) at University of Indonesia in 2001. He did his Doctorate (DR) majoring in Risk Based Equipment at University of Indonesia (UI) in 2006.