

## ABSTRAK

*Pressure vessel* merupakan sebuah alat yang sangat penting sebagai tempat atau wadah yang dapat menangani *fluida* maupun gas bertekanan dalam jumlah banyak dengan beragam konstruksi dan kondisi. PT X mempunyai sebuah *Horizontal Pressure Vessel* tipe V-1700 *Closed Hydrocarbon Drain* yang harus diukur *corrosion rate* dan *remaining life*. Hasil perhitungan *corrosion rate* digunakan untuk menghitung *life time horizontal pressure vessel* dengan menggunakan standar API 510. Berdasarkan hasil analisis pengurangan ketebalan maka sisa umur *Horizontal Pressure Vessel Closed Hydrocarbon Drain* V-1700 adalah 484 tahun. Dengan *Corrosion rate* paling tinggi pada *shell* I B, II I, III J, III K, III N yaitu = 0,010mm. Hasil analisis dan perhitungan  $MAWP_{shell} = 1,52$  MPa,  $MAWP_{Head} = 1,84$  MPa lebih kecil dari tekanan desain (P) 1,033 MPa dengan interval waktu pengukuran ketebalan selanjutnya 4 tahun, kemudian hasil perhitungan  $\sigma_{max\ shell} = 93,57$  MPa, dan  $\sigma_{max\ head} = 77,38$  MPa nilainya lebih kecil dibandingkan dengan *Allowance Stress* (S) 137,895 MPa dan *yield strenght* material baja karbon ASME SA 516 Grade 70 = 262 MPa berdasarkan hasil perhitungan tersebut maka *Horizontal Pressure Vessel Closed Hydrocarbon Drain* V-1700 aman beroperasi dengan catatan kondisi lingkungan dan kebutuhan operasi tidak berubah.

**Kata Kunci:** *Corrosion rate, remaining life, Maximum allowable Working Pressure (MAWP),  $\sigma_{max}$  pressure vessel*

**ANALYSIS OF CORROSION RATE AND REMAINING LIFE OF  
HORIZONTAL PRESSURE VESSEL TO KNOW AND SAFETY OPERATION**

**ABSTRACT**

*Pressure vessel is a very important tool as a place or container that can handle pressurized fluids and gases in large quantities with various constructions and conditions. PT X has a Horizontal Pressure Vessel type V-1700 Closed Hydrocarbon Drain which must be measured for corrosion rate and remaining life. Corrosion rate calculation results are used to calculate the life time horizontal pressure vessel using the API 510 standard. Based on the results of thickness reduction analysis, the remaining Horizontal Pressure Vessel Closed Hydrocarbon Drain V-1700 life is 484 years. With the highest Corrosion rate in shell I B, II I, III J, II K that is = 0,010mm. The calculation and results of MAWP shell = 1,52 MPa, MAWP Head = 1,84 MPa smaller than the design pressure (P) 1,033 MPa with a thickness measurement interval then 4 years, then the calculation result  $\sigma_{max}$  shell = 93.57 MPa, and  $\sigma_{max}$  head = 77,38 MPa is smaller compared with Allowance Stress (S) 137,895 MPa and yield strenght of carbon steel material ASME SA 516 Grade 70 = 262 MPa based on the results of these calculations, the Horizontal Pressure Vessel Closed Hydrocarbon Drain V-1700 is safe to operate with a note that environmental conditions and operating requirements do not change.*

**Keywords:** *Corrosion rate, remaining life Maximum, allowable Working Pressure (MAWP),  $\sigma_{max}$  pressure vessel*