

# **PENENTUAN LAJU KOROSI DAN SISA UMUR PAKAI PIPA (REMAINING SERVICE LIFE / RSL) PADA JALUR PIPA TRANSPORTASI SOLAR TBBM TASIKMALAYA – TBBM UJUNG BERUNG DI PT PERTAMINA TBBM TASIKMALAYA KECAMATAN TAWANG, KOTA TASIKMALAYA**

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## **SARI**

PT Pertamina TBBM (Terminal Bahan Bakar Minyak) Tasikmalaya merupakan terminal penyangga kebutuhan BBM solar. BBM solar didistribusikan ke Jawa Barat bagian timur, salah satunya TBBM Ujung Berung. Pada proses transportasi solar, PT Pertamina TBBM menggunakan pipa baja untuk mentransportasikan solar TBBM Tasikmalaya – TBBM Ujung Berung. Pada penggunaannya pipa transportasi dapat terjadi kerusakan atau kebocoran pada pipa akibat korosi sehingga sisa umur pakai pipa menjadi rendah. Korosi merupakan penurunan kualitas material logam yang disebabkan oleh reaksi elektrokimia antara material logam dengan ion – ion yang terdapat di lingkungan.

Penelitian korosi pada pipa transportasi solar bertujuan untuk mengetahui jenis korosi yang terjadi, metoda pengendalian korosi yang diaplikasikan, laju korosi dan sisa umur pakai pipa.

Pada penelitian ini, kondisi lingkungan jalur pipa transportasi solar TBBM Tasikmalaya – TBBM Ujung Berung memiliki suhu 22,6°C - 25,2 °C, kelembaban relatif 39% - 75%, pH tanah 5,8 – 6,8 dan resistivitas tanah 460 – 19.850 ohm.cm. Pengukuran tebal aktual pipa dilakukan dengan menggunakan alat *Ultrasonic Thickness Gauge* (GE *Inspection Technologies* DM5E) pada 191 titik pengukuran dengan panjang total jalur pipa adalah 105 km. Berdasarkan data pengurangan ketebalan pipa, maka dapat dihitung laju korosi dan sisa umur pakai pipa.

Jenis korosi yang terjadi pada pipa transportasi solar yaitu korosi merata dan korosi sumuran. Metoda pengendalian korosi yang diaplikasikan adalah metoda *coating* jenis *one layer coating* menggunakan *Rust-oleum Stop Rust Yellow*, metoda *wrapping* menggunakan polyken 942 dan metoda proteksi katodik menggunakan anoda korban magnesium (Mg). Laju korosi pipa berkisar 0,06 – 0,167 mm/tahun dan termasuk ke dalam kategori *good – excellent* berdasarkan standar *corrosion of MPY with equivalent metric rate expression*. Sedangkan sisa umur pakai pipa transportasi solar adalah 12,1 – 111,5 tahun.

Kata kunci : Pipa Transportasi Solar, Tebal Aktual, Laju Korosi, Sisa Umur Pakai, *Ultrasonic Thickness Gauge DM 5E*

# DETERMINATION OF CORROSION RATE AND REMAINING SERVICE LIFE / RSL ON TRANSPORTATION PIPELINE OF DIESEL TBBM TASIKMALAYA – TBBM UJUNG BERUNG AT PERTAMINA TBBM TASIKMALAYA, TAWANG SUB-DISTRICT TASIKMALAYA CITY, WEST JAVA PROVINCE

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## ABSTRACT

PT Pertamina TBBM (Fuel Oil Terminal) Tasikmalaya is a buffer terminal for fuel needs. This fuel is distributed to the eastern part of West Java, one of which is Ujung Berung TBBM. In the solar transportation process, PT Pertamina TBBM uses steel pipes to transport the Tasikmalaya TBBM diesel - Ujung Berung TBBM. In the use of transportation pipes there can be damage or leakage in the pipe due to corrosion so that the lifetime of the pipe is low. Corrosion is a decrease in the quality of metal materials caused by electrochemical reactions between metal materials and ions contained in their environment.

Corrosion research on solar transportation pipes aims to determine the type of corrosion in the pipe, to know the corrosion control method applied to the pipe, the corrosion rate on the pipe and to know the remaining life of the pipe. The TBBM Tasikmalaya solar transportation pipeline - Ujung Berung TBBM is below 105 km long.

In this study, the environmental conditions of the TBBM Tasikmalaya solar transport pipeline - Ujung Berung TBBM have a temperature of 22,6°C - 25,2 °C relative humidity of 39% - 75%, soil pH value 5,8 - 6,8 and resistivity land between 460 – 19.850 ohm.cm. The activity of measuring the actual thickness of the pipe was carried out using Ultrasonic Thickness Gauge (GE Inspection Technologies DM5E) at 191 measurement points with a total length of 105 km of pipeline. Based on data on pipe thickness reduction, the corrosion rate and the remaining life of the pipe can be calculated.

The types of corrosion that occur in diesel transportation pipes are uniform corrosion and pitting corrosion. Corrosion control methods applied were one layer coating method using Rust-oleum Stop Rust, wrapping method using polyken 942 and cathodic protection method using magnesium sacrificial anode (Mg). Pipe corrosion rate ranges from 0.06 to 0.167 mm / year and is included in the good - excellent category based on the corrosion standard of MPY with equivalent metric rate expression. While the remaining service life of the solar transportation pipe is 12.1 - 111.5 years .

*Keywords : Transportation Pipeline of Diesel, Actual Thickness, Corrosion Rate, Remaining Service Life, Ultrasonic Thickness Gauge DM 5E*