Analisis korosi material baja karbon SA-210 grade a1 wall tube boiler pembangkit listrik tenaga uap = Corrosion analysis of carbon steel material SA-210 grade a1 wall tube boiler steam power plant

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Abstrak

Kegagalan material pipa boiler yang disebabkan oleh berbagai jenis korosi akan mengakibatkan unit pembangkit berhenti beroperasi, sehingga menimbulkan kerugian yang besar sebagai akibat produksi listrik yang terhenti. Hal ini pernah terjadi pada material pipa SA-210 Grade A1 di Boiler furnace wall tube PLTU Suralaya 8 yang mengalami korosi hydrogen damage. Penelitian ini ditujukan untuk menganalisa proses korosi hydrogen damage sampel material pipa SA-210 Grade A1. Pengujian terdiri dari analisis struktur mikro, uji mekanis, serta laju dan produk korosi yang dihasilkan. Pada analisis struktur mikro ditemukan banyak kavitas pada material. Pada uji mekanis didapatkan penurunan hardness, tensile strenght, yield strength, dan elogation. Pada analisis laju korosi didapatkan nilai 0,01-0,074 mm/tahun. Analisis XRD menunjukkan bahwa terdapat kandungan korosi berupa magnetite, hematite dan wustite. Dari hasil berbagai analisis dan uji pada material tersebut disimpulkan terjadi proses korosi hydrogen damage yang masih berlangsung hingga saat ini.

<hr>Boiler tube material failure caused by various types of corrosion will lead to power plant shutdown, consequently causing great loss as a result of halted electicity generation. It was happened to the tube material SA-210 Grade A1 in the boiler furnace wall tube Suralaya 8 that experiencing hydrogen damage corrosion. This study aimed to analyze the hydrogen damage corrosion process of tube SA-210 Grade A1 material sample. The analysis consisted of microstructure analysis, mechanical properties analysis, also corrosion rate and products analysis. The microstructure analysis found many cavities in the material. The mechanical properties analysis found a decrease in hardness, tensile strenght, yield strength, and elogation. The corrosion rate obtained from 0.01 to 0.074 mm/year. XRD analysis showed the content of corrosion in the form of magnetite, hematite and wustite. From the results of various analyzes and tests on the material, we concluded a hydrogen damage corrosion process was happened and still continues until today.