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Metal Dusting Led Failure in a High-Temperature Condenser

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Abstract

Corrosion is a metallurgical problem that occurs frequently in a power plant, plant inevitable, especially in the present days, since higher efficiency of a power plant is required and thus the process temperature is increasing. Choosing the right materials for pipeline is very crucial since it is affecting the service life and operational reliability. The research is done to study the oxidation behaviour of ferritic alloy for power plant. A failed component from a gas combined cyclic thermal power plant was received and a failure analysis is done to investigate the cause of failure of the equipment. Results from the analysis suggested that the pipe was exposed to high temperature oxidation and metal dusting. Metal dusting mechanism and how it affects materials in high temperature condition is then identified and explained in this work. © 2023, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author Keywords

Metallurgical piping failure; Oxidation behaviour; P11 ferritic alloy

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Corrosion, Ferrite, Metals, Outages, Thermoelectric power plants, Thermooxidation; Ferritic alloys, Higher efficiency, Highest temperature, Metal dusting, Metallurgical piping failure, Operational reliability, Oxidation behaviours, P11 ferritic alloy, Process temperature, Thermal-power plants; Failure (mechanical)

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