

MaMaSELF



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Corrosion inhibition of water-steam cycles in power plants by film forming amines

Good treatment program for steam cycle boiler feed water is crucial to the smooth operation of steam generators. Faulty treatment can cause damage to the plant, with attendant high costs. Conventional treatment programs have three components: oxygen scavengers, alkalising amines, and phosphate. In a treatment program based on film-forming amines (FFAs), the functions of both oxygen scavenger and phosphate are replaced by the FFAs. FFAs form a thin compact hydrophobic film on the metallic surfaces, preventing oxygen from coming into contact with the metal, and therefore preventing corrosion. FFAs have been successfully used in real applications for decades. Good results have sometimes been achieved even in cases where conventional treatment programs failed to provide satisfying results.

The operational regime of steam generators may demand short- or long-term shutdown, during which protective measure have to be taken to avoid damage of the equipment due to corrosion. Dry lay-up is recommended for long-term shutdown periods, but this type of procedure demand a significant effort and a plant design which is not always available or acceptable for the operator. Due to their specific mode of action, FFA provide an excellent potential for lay-up of steam generators.

Test specimens from carbon steel were used to simulate the real conditions of a long-term shutdown. Dividing the process into three steps: surface preparation, film-formation and exposure. The main objective of this investigation is to determine the duration of action of the protective film against corrosion, during stand-by periods in a power plant under typical conditions.

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