

Scientific Insight Review of Corrosion Methods and Corrosion Control of Pre-Stressed Concrete Cylinder Pipes

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Abstract : The main purpose of this study is to the occurrence of several failures in four-meter diameter pre-restressed concrete cylinder pipes, which transport a huge quantity of water from the Libyan Sahara Desert to the populated coastal area in the north. This study will help to address the problems related to corrosion of the pre-stressed concrete cylinder pipes and methods of controlling it. The methodologies used depended on reviewing the design and fabrication of pre-stressed concrete cylinder pipes and studying the cause of the corrosion, which resulted in the failure of the pre-stressed concrete cylinder pipe Man-Made River project in Libya. The chloride-induced corrosion penetrating through the mortar coat was the main reason for corrosion. The beginning of the occurrence of corrosion, its causes, and the mechanisms of its development in pre-stressed concrete pipes since 1937 have been reviewed and are continuing until now. Manufacturing technology control corrosion and all associated problems and technology to control it have been demonstrated, including variables during manufacture, the use of a modified coating, and cathodic protection systems. It has been revised and is still based on international standards. The development of these standards and the change in some of their technical contents reflect the world's interest in the problems of corrosion and the cost of maintenance and replacement.

Keywords : PCCP corrosion, international standard, coating system, failure assessment

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