Machinery Failure Prevention Technology – Technical Article

FIBER OPTIC DISTRIBUTED TEMPERATURE SENSOR FOR NAVAL SHIPBOARD ELECTRICAL SWITCHBOARD MONITORING

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# ABSTRACT

Optical Fiber Distributed Temperature Sensing (DTS) technologies have been in use in the commercial sector for over 25 years to monitor electrical cables and machinery, detect fluid and gas leakages in pipelines, detect fires in buildings and tunnels, monitor conveyor belt systems, and monitor oil and gas drilling operations. Projects funded by the National Shipbuilding Research Program (NSRP) have identified DTS systems for real time, remote monitoring of the temperature of bolted connections in U.S. naval combatant electrical switchboards for the early detection of faults before they become critical.

This paper describes the Raman based optical principles of the DTS system, the design efforts undertaken to adapt the DTS for a shipboard installation and covers the applications and benefits.

The paper describes the steps required for full-scale evaluation to optimize the monitoring and detection of temperature related failure conditions and to reduce ship maintenance and operating and support (O&S) costs.

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