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USNRC

Mr. Gabriel Taylor
U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Division of Risk Analysis Fire Research Branch
Washington, D.C. 20555-0001

SUBJECT: Public Comment on Draft Project Plan for Fire Induced Modes and Effects Testing of Direct Current Driven Control Circuit Cables (NRC Project Code N6579)

Dear Mr. Taylor:

Enclosed please find a copy of the written comments for the subject matter by Engineering Planning and Management, Inc. (EPM). We hope that you find these comments helpful.

Should you have any questions regarding the comments, please do not hesitate to call me at (508) 875-2121.

Very truly yours,

Robert Kalantari

Robert Kalantari
Director of Engineering

Enclosure

SUNSI Review Complete
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Add=G. Taylor (GJT)

Public Comment on Draft Project Plan for Fire Induced Modes and Effects Testing of Direct Current Driven Control Circuit Cables (NRC Project Code N6579)

Comment No 1)

The circuit testing should consider the effects of elevated temperature on instrumentation circuits. Currently, the industry assumes all electrical cable will not fail if exposed to temperatures of 400 F for Thermoplastic and 625 F for Thermoset cables. While the increased temperature due to fire may not fail such cables from carrying the electrical signal, the increased (or decreased) temperature may well affect the instrumentation circuits that operate in the 4 to 20 mA range. These circuits are calibrated for plant anticipated ambient temperatures which are far less than can be experienced during a postulated fire. Variations from such temperature may well effect the instrument indication due to cable resistance changes as a result of high temperatures, as such provide erroneous indication or function.

It is suggested the circuit testing consider the affect of elevated temperature on instrument circuits.

Comment No 2)

In general, DC distribution system is ungrounded in most plants. It is suggested that the tests monitor effects of multiple DC grounds (in ungrounded DC system) caused by the initiating fire with respect to circuit failure modes. The test should monitor DC grounding during fire to assess if DC resistance through metallic conduit/raceway is sufficiently low that will result in fuse clearing, and will this failure mode generally occur prior to other circuit failures, or if not, how soon after other circuit failure modes will this occur. The purpose of this is to obtain enough data to conclude how ungrounded DC systems will act during fire. It should be noted that in order to obtain adequate a defendable results that correlate to typical plant configuration, the test configuration will require multiple DC circuits (energized from the same battery, with conductors energized by positive and negative polarity) runs in the tray or conduits exposed to the test fire.

Comment No 3)

For Appendix E and F, control circuits for solenoid valves should also be configured with the valve limit switches and indicating lights flipped – i.e., explore if spurious pickup of the solenoid is possible due to internal cable failure mechanisms given that the voltage drop across the indicating light resistance may be sufficient to preclude pickup of the solenoid coil.

Comment No 4)

Cable resistance plays a significant part in determining (limiting) available fault currents. Cable length has major role in determining the cable resistance. As such, the test should represent real plant configurations. Adequate cable length representative of actual plant configuration should be considered during testing.