Software Quality Assurance

FIRMWARE DEFECT IN PROGRAMMABLE LOGIC CONTROLLER

2010 – 08   **October 2010**

PURPOSE

This Safety Advisory provides information on a firmware defect in a programmable logic controller (PLC).

BACKGROUND

In July 2010, the Savannah River Site (SRS) experienced a failure in a safety significant PLC processor module for a tritium air monitor in the Metallography Test Facility. The triple modular redundant (TMR) T8110B PLC processor module [with firmware version build (b)115], which is designed to provide visual/audible alarms to alert workers of increased tritium activity, was displaying only a visual alarm in the process room. Investigation revealed that the processor had unexpectedly gone offline and the system, as designed, went to a safe configuration to energize the visual alarm.

The vendor ICS Triplex (a Rockwell Automation Company) had earlier issued a Product Notice in June 2010 which indicated that TMR T8110 processors with firmware versions b115 through b127 were defective. Since the installed system had a processor model TMR T8110B (with firmware version b115), no further action was taken because the Product Notice did not include model TMR T8110B.

Diagnostic information obtained from the processor was relayed to the vendor to assist with the failure analysis. At that time, the vendor informed SRS that the Product Notice also applied to the TMR T8110B processor with firmware version b115.

CAUSE OF THE PROBLEM

The vendor attributed the problem to a defect in the processor module firmware for versions b115 through b127. It therefore affected both TMR processor modules T8110 and T8110B with the same firmware version b115. The vendor provided an updated copy of the firmware (version b128) to SRS which corrected the problem.

ACTIONS TO BE TAKEN

Managers, supervisors and others should:

- be made aware of the problem with the referenced ICS Triplex PLC processor modules; and
- ensure that vendor product notifications are properly interpreted with respect to hardware and firmware versions.

ADDITIONAL SOURCES OF INFORMATION

Questions related to the ICS Triplex PLC processor should be directed to Tracy Waller at tracy.waller@srs.gov or Susan Messick at susan.messick@srs.gov. For other questions related to this Safety Advisory contact Subir Sen at subir.sen@hq.doe.gov.

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