

July 8, 2003

MEMORANDUM TO: Ledyard (Tad) Marsh, Acting Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM : Michael E. Mayfield, Director **/RA/**
Division of Engineering Technology
Office of Nuclear Regulatory Research

SUBJECT: EMERGING TECHNOLOGY REPORT (NUREG/CR-6812)

As part of the Office of Nuclear Regulatory Research's (RES's) research program on advanced instrumentation and control (I&C), as outlined in section 3.5 of the NRC Research Plan for Digital Instrumentation and Control (SECY-01-0155), the Division of Engineering Technology maintains an active effort to ensure awareness of the current state-of-the-art for technologies in this field and to enhance understanding of how advances in technology may effect the nuclear industry. The attached NUREG/CR-6812 presents the findings from a recent survey of emerging technologies in the digital I&C field. In particular, this NUREG/CR gives an overview of the state of the art in key technical focus areas, discusses the relevance of those technologies to nuclear applications of I&C, and identifies potential research needs arising from the prospective introduction of new technology within the nuclear power industry.

NUREG/CR-6812 is intended to serve as the first in a series of periodic reports documenting emerging technology in this field. The insights derived from this information, in conjunction with input from the I&C Technical Advisory Group, contribute to maintaining the effectiveness of the research program for digital I&C and to ensuring the timely development of key research products. This report satisfies one of the tasks in user need NRR-2002-17 which requests that RES identifies emerging technologies and new initiatives whose potential application by the industry could be included in license amendment applications or impact digital systems of nuclear plants. The purpose of this and subsequent emerging technology assessments is to provide the state of the art in key technical developments and new initiatives in digital I & C. This should contribute to maintaining safety in nuclear plants and to allow staff to make regulatory decisions more effectively and efficiently. Specifically, this report provides the technical background that should be helpful for NRR staff during its review of licensing applications involving advanced I & C upgrades in existing plants or in new advanced reactor designs.

Questions or comments regarding this report should be directed to Christina Antonescu (cea1@nrc.gov) (415-6792) of my staff.

Attachment: As stated

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