July 21, 2010

MEMORANDUM TO: John R. Jolicoeur, Chief
Licensing Processes Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

FROM: Eric E. Bowman, Project Manager **/RA/ by HCruz for**
Licensing Processes Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JUNE 30, 2010, CLOSED MEETING WITH DRS CONSOLIDATED CONTROLS

On June 30, 2010, a closed meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of DRS Consolidated Controls (DRS) at NRC Headquarters, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss the submittal of a topical report on the PIμS 32 Distributed Control System (PIμS 32). A list of attendees is provided as Enclosure 1.

Scope

This meeting was a follow-up meeting to the December 17, 2009 meeting in order to provide clarification of the communication aspects of the PIμS 32 platform with special emphasis on compliance to Digital Instrumentation and Controls Interim Staff Guidance (DI&C-ISG-04), "Highly-Integrated Control Rooms – Communications Issues," Agencywide Documents Access and Management System (ADAMS) Accession No. ML083310185. Proprietary slides used in the presentation are available in ADAMS as Accession Nos. ML100980416, ML100980423, and ML100980424. Nonproprietary versions of the slides are available as ADAMS Accession No. ML100980417.

As was the case with the prior meetings with DRS, this was a Phase 0 meeting following the phased approach of draft DI&C-ISG-06, "Licensing Process," ADAMS Accession No. ML101800172, held in advance of DRS submittal of their Topical Report (TR) for a safety related applications platform. The design as presented in this meeting satisfied some of staff's major concerns.

The PIμS 32 design has several layers of communication such as communications within a cabinet, communications between cabinets of the same division (i.e. intra-divisional communication), inter-divisional communications using one-way communication paths, and communication between safety and non-safety systems using one-way (hardware based) communication paths. In addition, DRS plans to implement dedicated divisional safety-related

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Video Display Units (VDUs) for operator interface.

DRS does not seem to fully follow the guidance of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," Criterion 24, "Separation of protection and control systems," which requires that interconnection of protection and control systems shall be limited so as to assure that safety is not significantly impaired. The NRC staff informed DRS that they would need to clarify as to how they meet this criterion.

DRS agreed to provide their documentation submission plan to confirm conformance with DI&C-ISG-06.

Technical discussion items:

1. DRS uses application-specific integrated circuits (ASICs) as part of the design. The NRC staff informed DRS that NRC considers ASICs, field programmable gate arrays (FPGAs), programmable logic devices (PLDs), etc. to be software based devices. DRS stated that their ASICs were not software based however they will confirm whether or not any software is used in the design and development of ASICs. The NRC staff further stated that the software for such devices should follow the review guidance of NUREG-0800, "Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants," Branch Technical Position (BTP) 7-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems," ADAMS Accession No. ML070670183.

2. The NRC staff noted that the DRS design concepts lend themselves to many possible implementation schemes. In the topical report DRS will need to make it clear as to what types of systems they are seeking to license.

3. The NRC staff advised DRS to provide supplemental information in their TR regarding the possibility of data flooding in the redundant networks whether the data flooding is caused by hardware or any other failure. Data flooding should be addressed for all networks within the system.

4. DRS uses a Modbus protocol for communication. The NRC staff advised DRS to explain the type of Modbus protocol that is planned to be used with sufficient explanation of how it works.

5. The NRC staff advised DRS to address (in the TR) whether the PIμS 32 system is diverse by itself or whether users of the system would need to provide a diversity and defense-in-depth (D3) analysis.

6. DRS uses terminology which is different from the terminology used in the nuclear power plant industry due to their background and experience with military work. The NRC staff advised DRS that they will need to clarify their terminology with respect to nuclear power plant industry normal use terminology in order to prevent confusion.

7. The NRC Staff requested that DRS include the application guidance document as one of the documents to be provided as part of the TR. This will provide reviewing staff and the future users with a better understanding of how a safety related nuclear application will be implemented in the proposed system. DRS agreed to this request.

8. DRS explained their plans for meeting the guidance of DI&C-ISG-04 for interdivisional communications; however, the information presented was not adequate to satisfy concerns for all 20 points of ISG-4. The NRC staff informed DRS that additional clarification will be necessary to show how their design will meet this guidance.

Miscellaneous

Please direct any inquiries to me at 301-415-2963, or Eric.Bowman@nrc.gov.

Enclosure:
As stated

cc w/encls: See next page

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Miscellaneous

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Enclosure:
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NAME	EBowman	EHylton	WKemper	JJolicoeur	EBowman
DATE	7/7/2010	7/9/10	7/12/10	7/19/10	7/21/10

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MEETING WITH DRS CONSOLIDATED CONTROLS TO DISCUSS SUBMITTAL OF A

TOPICAL REPORT ON THE PLμS 32 DISTRIBUTED CONTROL SYSTEM

JUNE 30, 2010

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