November 16, 2012

MEMORANDUM TO: Sheldon D. Stuchell, Acting Chief
                   Licensing Processes Branch
                   Division of Policy and Rulemaking
                   Office of Nuclear Reactor Regulation

FROM: Joseph J. Holonich, Sr. Project Manager   */RA Jonathan Rowley for/*
                   Licensing Processes Branch
                   Division of Policy and Rulemaking
                   Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF MEETING WITH TOSHIBA CORPORATION
                   REGARDING TOPICAL REPORT ON FIELD PROGRAMMABLE GATE
                   ARRAY

On October 19, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff met with
representatives of Toshiba Corporation (Toshiba). The purpose of the meeting was for Toshiba
to present information on the revisions it made to its topical report (TR) covering the field
programmable gate array (FPGA)-based instrumentation and control system. Enclosed is a list
of attendees at the meeting. Copies of the presentations from the meeting can be found in the
Agencywide Documents Access and Management System at ML12299A005.

After some introductory remarks by the NRC staff, a representative from Toshiba reviewed the
two meeting objectives which were to discuss the TR outline and the actions and schedule to
proceed with the TR review. During this part of the presentation, Toshiba representatives
informed the NRC staff that the revised TR had been submitted on October 9, 2012. The NRC
staff noted that the start date for the review would be October 9, 2012, because the original TR
had been withdrawn and a revision submitted.

The NRC staff also asked the Toshiba representatives if the scope of the report stayed the
same in that it covered a generic safety system. The Toshiba representatives noted that the
report scope stayed the same. Toshiba also discussed the outline of the TR and noted that the
report was split into parts to help facilitate the NRC's review.

The presentation on Part 1 of the report provided information on the purpose and scope of the
TR. Also discussed were systems that were examples of the Toshiba FPGA safety-related
system. Two examples provided were the Power Range Monitor (PRM) for the Boiling Water
Reactor (BWR) 5 design and the Oscillation Power Range Monitor for the Advanced BWR.

As part of this discussion the NRC staff inquired if Toshiba had looked at Interim Staff Guidance
(ISG)-6 and Toshiba confirmed yes and that a compliance matrix with ISG-6 was included in the
TR. Also discussed in the Part 1 presentation was the Toshiba organization and the FPGA
lifecycle overview.

The next presentation on Part 2 of the TR covered the Toshiba FPGA-based platform description. Diagrams for the FPGA-based system and PRM module and unit configuration were presented and discussed. Tables providing more detailed information on modules and systems were also part of the presentation.

Discussions in the Part 3 presentation covered the qualification results for the PRM. An overview of the qualification tests, applied standard, the procedure Toshiba used, and reference to the master test plan. In addition, the qualification test sequence was presented along with information on the verification and validation (V&V) activities. The latter discussion provided information on when during the lifecycle phases V&V activities were performed. It also provided the conclusion in V&V final report that all requirements for the PRM system were fulfilled in the final.

Compliance with codes and standards are in Part 4 of the TR and were covered in the next presentation. A short summary of the Institute of Electrical and Electronics Engineers Standards was the main thrust of the Part 4 presentation. Similarly the Part 5 presentation was a short discussion of the PRM V&V report as well as its application in different lifecycle phases.

Following the presentations, the NRC staff and Toshiba representatives discussed the schedule for completing the review of the TR. The NRC staff informed Toshiba that the goal was to complete the review of a TR in two years. The first step was to do an acceptance review to ensure the TR was complete enough to allow a technical review to proceed.

In addition, the NRC staff told Toshiba representatives that, if the TR were found acceptable for review, the next activity would be for the NRC staff to issue requests for additional information (RAIs). The NRC staff further stated that RAIs took approximately 6-8 months to develop and issue. The NRC staff then explained that next part of the schedule was dependent on how quickly Toshiba responded to the RAIs.

The NRC staff noted that it usually requested a response within 90 days after the RAIs had been issued. Once the response was received, the NRC staff would then complete its draft safety evaluation (SE) and provide it to Toshiba to ensure no proprietary information was inadvertently placed in the SE. Once this was done the NRC staff would issue the final SE.

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ADAMS Accession Nos.: ML12305A340 (Summary); ML12277A004 (Notice);
ML12299A005 (Presentations); ML12277A003 (Package)   **NRR-106**

OFFICE	DPR/PLPB/PM	DPR/PLPB/LA	DE/EICB	DPR/PLPB/BC(A)	DPR/PLPB/PM
NAME	JHolonich	DBaxley	SWyman	(Jonathan Rowley for) SStuchell	(Jonathan Rowley for) JHolonich
DATE	10/31/2012	11/15/2012	11/16/2012	11/16/2012	11/16/2012

OFFICIAL RECORD COPY

List of Attendees

MEETING WITH TOSHIBA CORPORATION (TOSHIBA) REGARDING TOPICAL REPORT

ON FIELD PROGRAMMABLE GATE ARRAY

October 19, 2012

Name	Organization
Craig B. Swanner	MPR Associates Inc. (MPR)
David Herrell	MPR
Akira Fukumoto	Toshiba
Naotaka Oda	Toshiba
Robert Schrauder	Toshiba
Tadashi Miyazkaki	Toshiba
Yuya Aoyagi	Toshiba
Joseph Holonich	U.S. Nuclear Regulatory Commission (NRC)
Rich Stattel	NRC
Stephen Wyman	NRC