

ENCLOSURE 3

Non-Proprietary handout used during June 19, 2012 meeting

**Toshiba Field Programmable Gate Array (FPGA)
Based Safety Related I&C Platform**

Non Proprietary Version

June 19th 2012
NRC White Flint Offices

Toshiba Corporation
Instrumentation & Control Systems Design and Engineering Department
Isogo Nuclear Engineering Center

Agenda

- ☐ 11:00 am - 11:10 am Introductions/Opening Remarks
- ☐ 11:10 am - 11:30 pm Clarification of NRC comments
- ☐ 11:30 am - 12:30 pm TR Content
 - Scope and Purpose
 - ISG - 04 compliance
 - IEEE Std 603 Compliance
 - Proprietary Markings
- ☐ 12:30 pm - 1:30 pm Lunch
- ☐ 1:30 pm - 3:00 pm TR Content (Continuation) and Project Schedule
- ☐ 3:00 pm - 3:45 pm Discussion/Questions/Comments
- Adjourn

Personnel

- Robert Schrauder TANE Licensing VP
- Akira Fukumoto Toshiba Senior Fellow
- Naotaka Oda Toshiba Control System
Group Manager
- Shigeru Suzuki TANE Senior VP
- David Herrell MPR Associates
- Craig Swanner MPR Associates

Meeting Objectives

- ☐ Discuss NRC comments on Toshiba Topical Report
- ☐ Present Toshiba Responses
- ☐ Discuss the actions and schedule to proceed

Scope and Purpose(1/2)

☐ **NRC comments/question:**

- a. Does Toshiba want NRC to conduct the platform review or application system review?

☐ **Toshiba Response:**

1. Toshiba requests NRC to review the platform and its development process provided in the TR. The Toshiba NRW-FPGA based system is application specific because signal processing NRW-FPGA and boards are different depending on the application. However, the development process, design principles and CGD process do not change with the application.
2. Toshiba requests the NRC to review the PRM and OPRM example applications of the NRW-FPGA development process
3. Toshiba requests the issuance of an SER to permit use of the NRW-FPGA and this development process in nuclear safety related applications

Scope and Purpose (2/2)

☐ **NRC comments/question:**

- b. Does Toshiba want the NRC to review the following documents?
 - Unapproved Topical/Technical reports
 - Toshiba Internal Procedures

☐ **Toshiba Response:**

- 1. Toshiba will delete the reference to the unapproved topical and technical reports.
 - “Technical Report for the Toshiba FPGA-based Safety-Related Instrumentation and Control System Design Process” Rev. 4
 - Topical Report “NRW-FPGA-Based I&C System Design Process” Rev. 0
 - Topical Report “NRW-FPGA-Based Power Range Monitor (PRM) System Qualification” Rev. 0
- 2. Toshiba internal AS standards and NQ standards are referenced in the TR. If NRC wants to review these standards, they are available to the NRC on an as needed basis but can not be docketed.

Compliance to IEEE Std 603-1991

- ☐ 10 CFR 50.55a(h), “Protection and Safety Systems,” requires compliance with IEEE Std 603 (BTP 7-14)
- ☐ FPGA-based Safety-Related I&C Systems are designed to comply to the requirements of IEEE Std 603
- ☐ Appendix C of the Topical Report includes a table documenting conformance to IEEE Std 603

Compliance to USNRC DI&C ISG-04

- USNRC DI&C ISG-04 includes the following three chapters:
 1. Interdivisional Communications
 2. Command Prioritization
 3. Multidivisional Control and Display Stations
- NRW-FPGA-based Safety-Related I&C Systems meet ISG-04 with fiber optic links featuring:
 1. Point-to-point communication,
 2. Fixed length, fixed format data transmission,
 3. Cyclic message transmission ensuring deterministic message transfer, and
 4. Intensive error checking
- Toshiba will provide a compliance matrix for ID&C ISG-04 with the Topical Report as a new appendix.
- Toshiba will add a section for discussion on communication in the topical report.

Proprietary vs. Non-Proprietary

☐ **NRC comments/question:**

Too little non-proprietary information.

☐ **Toshiba Responses:**

Toshiba reconsidered the proprietary content and will reduce the proprietary information and revise the TR.

- Table of contents will be changed to NP.
- Redaction will be made by paragraphs and may not include entire sections.
- The section titles will be changed to NP with revision as needed.
- Information about Toshiba organization remains proprietary.

Project Schedule

Project Milestones



(e)

TOSHIBA

Leading Innovation >>>