

Toshiba Corporation

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No. TOS-CR-FPG-2015-0008
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10 CFR 2.390

NRC Project Number: PROJ0729

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U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Reference: NRC Letter Dated July 6, 2015: Request for Additional Information for "Licensing Topical Report for Toshiba NRW [Non Re-Writable]-FPGA [Field Programmable Gate Array]-Based Instrumentation and Control system for Safety-Related Application," UTLA 0020P, Revision 0 (TAC No. ME9861)

Subject: Submittal of Documents Required in NRC RAI Letter Dated July 6, 2015 (TAC No. ME9861)

Enclosed are documents required in the NRC Request for Information (RAI) contained in the referenced letter.

This submittal contains proprietary information of Toshiba Corporation. An affidavit setting forth the basis on which the information identified as proprietary may be withheld from public disclosure is provided in Enclosure 1. Accordingly it is requested that Enclosures 2-33 be withheld from public disclosure in conformance with the requirements of 10 CFR Section 2.390, as amended, of the Commission's regulations. Enclosure 34-74 provides the non-proprietary version. If this letter becomes separated from the proprietary material it is no longer proprietary.

Communication with respect to the proprietary aspects of the application for withholding or the Toshiba affidavit should be addressed to Robert W. Schrauder at 704-548-7640 or Robert.Schrauder@toshiba.com.

Sincerely,

Masahiko Hamada
Aug 26, 2015

Masahiko Hamada
Senior Manager
Electrical System Design & Engineering Dept.
Nuclear Energy Systems & Services Division
Power Systems Company
Toshiba Corporation

*Proprietary-Withhold from public disclosure pursuant to 10 CFR 2.390.
Upon removing Enclosures 2-33, this document can be made public.*

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PROPRIETARY

Attachment: Commitments

- Enclosures:
- (1) 10 C.F.R. § 2.390 Supporting Affidavit
 - (2) FPG-RQS-C51-0001 Rev.7, Equipment Requirement Specification of FPGA based Units (Proprietary version)
 - (3) FPG-PLN-C51-0003 Rev.3, Qualification Plan (Proprietary version)
 - (4) FPG-DRT-C51-0001 Rev.10, Preliminary Technical Evaluation Report (Proprietary version)
 - (5) FPG-PLN-C51-0008 Rev.1, Acceptance Plan for Test Specimen Units, Interconnecting Cables (Proprietary Version)
 - (6) FPG-PLN-C51-0010 Rev.5, Acceptance Plan for Test Support Services (Proprietary Version)
 - (7) FPG-PLN-C51-0025 Rev.1, Acceptance Plan for Test Specimen Modules (Proprietary version)
 - (8) FPG-PLN-C51-0005 Rev.3, Master Test Plan (Proprietary version)
 - (9) FPG-DRT-C51-0102 Rev.0, Final Technical Evaluation Report (Proprietary version)
 - (10) FPG-TRT-C51-0101 Rev.0, Qualification Test Summary Report (Proprietary version)
 - (11) FPG-DRT-C51-0018 Rev.0, Requirements Definition Phase Hazard Analysis Report (Proprietary version)
 - (12) FPG-TRT-C51-0002 Rev.0, Availability/Reliability Analysis Report (Proprietary version)
 - (13) FC51-3002-1000 Rev.4, Equipment Design Specification for Power Range Neutron Monitor (Proprietary version)
 - (14) 9B8K0046 Rev.3, Commercial Dedication Instruction PFC (Power Factor Correction module) (Proprietary version)
 - (15) 9B8K0047 Rev.3, Commercial Dedication Instruction CELL module (Proprietary version)
 - (16) 9B8K0048 Rev.3, Commercial Dedication Instruction AGRD module (Proprietary version)
 - (17) 9B8K0049 Rev.3, Commercial Dedication Instruction PBD module (Proprietary version)
 - (18) 9B8K0050 Rev.3, Commercial Dedication Instruction DAT/ST module (Proprietary version)
 - (19) 9B8K0051 Rev.3, Commercial Dedication Instruction Sub rack including middle plane for OPRM Unit (Proprietary version)
 - (20) 9B8K0053 Rev.2, Commercial Dedication Instruction DIO module (Proprietary version)
 - (21) 9B8K0054 Rev.5, Commercial Dedication Instruction TRN module (Proprietary version)
 - (22) 9B8K0055 Rev.5, Commercial Dedication Instruction RCV module (Proprietary version)
 - (23) 9B8K0056 Rev.2, Commercial Dedication Instruction LVPS module (Proprietary version)
 - (24) 9B8K0057 Rev.1, Commercial Dedication Instruction for Dedication of Modules

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Upon removing Enclosures 2-33, this document can be made public.*

- from Commercial Supplier (Common Requirements) (Proprietary version)
- (25) FC51-1505-1000 Rev.0, Preliminary Technical Evaluation Report for FPGA-based Safety-Related Systems (Proprietary version)
 - (26) FC51-7012-1000 Rev.2, Nuclear Instrumentation & Control Systems Department Equipment Qualification Test Plan for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
 - (27) FC51-7012-1001 Rev.4, Nuclear Instrumentation & Control Systems Department EMC Qualification Test Plan for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
 - (28) FC51-1505-1001 Rev.0, Final Technical Evaluation Report for FPGA-based Safety-Related Systems (Proprietary version)
 - (29) FC51-3704-1101 Rev.2, Nuclear Instrumentation & Control Systems Department Software Safety Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Design Phase) (Proprietary version)
 - (30) FC51-3809-1000 Rev.0, Availability/Reliability Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
 - (31) FC51-7513-1003 Rev.0, Nuclear Instrumentation & Control Systems Department Dynamic Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
 - (32) FC51-7513-1000 Rev.0, Nuclear Instrumentation & Control Systems Department Environmental Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
 - (33) FC51-7513-1001 Rev.0, Nuclear Instrumentation & Control Systems Department EMC Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
 - (34) FPG-RQS-C51-0001 Rev.7, Equipment Requirement Specification of FPGA based Units (Non-proprietary version)
 - (35) FPG-PLN-C51-0003 Rev.3, Qualification Plan (Non-proprietary version)
 - (36) FPG-DRT-C51-0001 Rev.10, Preliminary Technical Evaluation Report (Non-proprietary version)
 - (37) FPG-PLN-C51-0008 Rev.1, Acceptance Plan for Test Specimen Units, Interconnecting Cables (Non-proprietary Version)
 - (38) FPG-PLN-C51-0010 Rev.5, Acceptance Plan for Test Support Services (Non-proprietary Version)
 - (39) FPG-PLN-C51-0025 Rev.1, Acceptance Plan for Test Specimen Modules (Non-proprietary version)
 - (40) IM-2014-001234 Rev.0, Compliance to EPRI NP-5652 and EPRI TR-106439 (Non-proprietary)
 - (41) FPG-PLN-C51-0005 Rev.3, Master Test Plan (Non-proprietary version)
 - (42) FPG-DRT-C51-0102 Rev.0, Final Technical Evaluation Report (Non-proprietary version)
 - (43) FPG-TRT-C51-0101 Rev.0, Qualification Test Summary Report (Non-proprietary version)
 - (44) FPG-PLN-C51-0002 Rev.2, Software Quality Assurance Plan (Non-proprietary)
 - (45) FPG-PLN-C51-0006 Rev.4, Verification and Validation Plan (Non-proprietary)
 - (46) FPG-DRT-C51-0018 Rev.0, Requirements Definition Phase Hazard Analysis Report (Non-proprietary version)

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- (47) FPG-TRT-C51-0002 Rev.0, Availability/Reliability Analysis Report (Non-proprietary version)
- (48) FPG-TRT-C51-0003 Rev.0, Setpoint Support Analysis Report (Non-proprietary)
- (49) FC51-3002-1000 Rev.4, Equipment Design Specification for Power Range Neutron Monitor (Non-proprietary version)
- (50) FA32-7021-1000 Rev.1, Commercial Grade Dedication Plan for FPGA-based Safety-Related Systems (Non-proprietary)
- (51) 9B8K0046 Rev.3, Commercial Dedication Instruction PFC (Power Factor Correction module) (Non-proprietary version)
- (52) 9B8K0047 Rev.3, Commercial Dedication Instruction CELL module (Non-proprietary version)
- (53) 9B8K0048 Rev.3, Commercial Dedication Instruction AGRD module (Non-proprietary version)
- (54) 9B8K0049 Rev.3, Commercial Dedication Instruction PBD module (Non-proprietary version)
- (55) 9B8K0050 Rev.3, Commercial Dedication Instruction DAT/ST module (Non-proprietary version)
- (56) 9B8K0051 Rev.3, Commercial Dedication Instruction Sub rack including middle plane for OPRM Unit (Non-proprietary version)
- (57) 9B8K0053 Rev.2, Commercial Dedication Instruction DIO module (Non-proprietary version)
- (58) 9B8K0054 Rev.5, Commercial Dedication Instruction TRN module (Non-proprietary version)
- (59) 9B8K0055 Rev.5, Commercial Dedication Instruction RCV module (Non-proprietary version)
- (60) 9B8K0056 Rev.2, Commercial Dedication Instruction LVPS module (Non-proprietary version)
- (61) 9B8K0057 Rev.1, Commercial Dedication Instruction for Dedication of Modules from Commercial Supplier (Common Requirements) (Non-proprietary version)
- (62) FC51-1505-1000 Rev.0, Preliminary Technical Evaluation Report for FPGA-based Safety-Related Systems (Non-proprietary version)
- (63) FC51-7012-1000 Rev.2, Nuclear Instrumentation & Control Systems Department Equipment Qualification Test Plan for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary version)
- (64) FC51-7012-1001 Rev.4, Nuclear Instrumentation & Control Systems Department EMC Qualification Test Plan for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary version)
- (65) FC51-1505-1001 Rev.0, Final Technical Evaluation Report for FPGA-based Safety-Related Systems (Non-proprietary version)
- (66) FA32-3701-1001 Rev.1, Nuclear Instrumentation & Control Systems Department Software Quality Assurance Plan for FPGA-based Safety-Related Systems (Non-proprietary)
- (67) FA32-3709-1000 Rev.7, Nuclear Instrumentation & Control Systems Department Verification and Validation Plan for FPGA-based Safety-Related Systems (Non-proprietary)
- (68) FC51-3704-1101 Rev.2, Nuclear Instrumentation & Control Systems Department Software Safety Analysis Report for Safety-Related Oscillation Power Range Monitor

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- (OPRM) (Design Phase) (Non-proprietary version)
- (69) FC51-3809-1000 Rev.0, Availability/Reliability Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary version)
 - (70) FC51-1505-0002 Rev.0, Setpoint Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary)
 - (71) FC51-7513-1003 Rev.0, Nuclear Instrumentation & Control Systems Department Dynamic Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary version)
 - (72) FC51-7513-1000 Rev.0, Nuclear Instrumentation & Control Systems Department Environmental Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary version)
 - (73) FC51-7513-1001 Rev.0, Nuclear Instrumentation & Control Systems Department EMC Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary version)
 - (74) FC51-1505-0001 Rev.0, Aging Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Non-proprietary)

Contact Information:

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Attachment

Toshiba Response to NRC RAI Letter Dated July 6, 2015 (TAC No. ME9861)

Commitment Description

Due Date

None

None

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Enclosure 1
Letter No. TOS-CR-FPG-2015-0008
Affidavit for Withholding Confidential and Proprietary Information from Public Disclosure
under 10 CFR § 2.390

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

AFFIDAVIT

I, Robert W Schrauder, hereby affirm and state that I am the Vice President, Licensing US ABWR Projects & Technologies, Toshiba America Nuclear Energy Corporation, and I have been authorized to execute this affidavit on behalf of Toshiba to file with the Nuclear Regulatory Commission the following application for withholding Toshiba Corporation's confidential and proprietary information from public disclosure; that I am familiar with the content thereof; and that the matters set forth therein are true and correct to the best of my knowledge and belief.

In accordance with 10 CFR § 2.390(b)(ii), I hereby state, depose, and apply as follows on behalf of Toshiba Corporation:

- (A) Toshiba Corporation seeks to withhold from public disclosure the document entitled and identified as follows and all information identified as "Proprietary" therein;
- FPG-RQS-C51-0001 Rev.7, Equipment Requirement Specification of FPGA based Units (Proprietary version)
 - FPG-PLN-C51-0003 Rev.3, Qualification Plan (Proprietary version)
 - FPG-DRT-C51-0001 Rev.10, Preliminary Technical Evaluation Report (Proprietary version)
 - FPG-PLN-C51-0008 Rev.1, Acceptance Plan for Test Specimen Units, Interconnecting Cables (Proprietary Version)
 - FPG-PLN-C51-0010 Rev.5, Acceptance Plan for Test Support Services (Proprietary Version)
 - FPG-PLN-C51-0025 Rev.1, Acceptance Plan for Test Specimen Modules (Proprietary version)
 - FPG-PLN-C51-0005 Rev.3, Master Test Plan (Proprietary version)
 - FPG-DRT-C51-0102 Rev.0, Final Technical Evaluation Report (Proprietary version)
 - FPG-TRT-C51-0101 Rev.0, Qualification Test Summary Report (Proprietary version)
 - FPG-DRT-C51-0018 Rev.0, Requirements Definition Phase Hazard Analysis Report (Proprietary version)
 - FPG-TRT-C51-0002 Rev.0, Availability/Reliability Analysis Report (Proprietary version)
 - FC51-3002-1000 Rev.4, Equipment Design Specification for Power Range Neutron Monitor (Proprietary version)
 - 9B8K0046 Rev.3, Commercial Dedication Instruction PFC (Power Factor Correction module) (Proprietary version)
 - 9B8K0047 Rev.3, Commercial Dedication Instruction CELL module (Proprietary version)

- 9B8K0048 Rev.3, Commercial Dedication Instruction AGRD module (Proprietary version)
- 9B8K0049 Rev.3, Commercial Dedication Instruction PBD module (Proprietary version)
- 9B8K0050 Rev.3, Commercial Dedication Instruction DAT/ST module (Proprietary version)
- 9B8K0051 Rev.3, Commercial Dedication Instruction Sub rack including middle plane for OPRM Unit (Proprietary version)
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- 9B8K0054 Rev.5, Commercial Dedication Instruction TRN module (Proprietary version)
- 9B8K0055 Rev.5, Commercial Dedication Instruction RCV module (Proprietary version)
- 9B8K0056 Rev.2, Commercial Dedication Instruction LVPS module (Proprietary version)
- 9B8K0057 Rev.1, Commercial Dedication Instruction for Dedication of Modules from Commercial Supplier (Common Requirements) (Proprietary version)
- FC51-1505-1000 Rev.0, Preliminary Technical Evaluation Report for FPGA-based Safety-Related Systems (Proprietary version)
- FC51-7012-1000 Rev.2, Nuclear Instrumentation & Control Systems Department Equipment Qualification Test Plan for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
- FC51-7012-1001 Rev.4, Nuclear Instrumentation & Control Systems Department EMC Qualification Test Plan for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
- FC51-1505-1001 Rev.0, Final Technical Evaluation Report for FPGA-based Safety-Related Systems (Proprietary version)
- FC51-3704-1101 Rev.2, Nuclear Instrumentation & Control Systems Department Software Safety Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Design Phase) (Proprietary version)
- FC51-3809-1000 Rev.0, Availability/Reliability Analysis Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
- FC51-7513-1003 Rev.0, Nuclear Instrumentation & Control Systems Department Dynamic Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
- FC51-7513-1000 Rev.0, Nuclear Instrumentation & Control Systems Department Environmental Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)
- FC51-7513-1001 Rev.0, Nuclear Instrumentation & Control Systems Department EMC Qualification Report for Safety-Related Oscillation Power Range Monitor (OPRM) (Proprietary version)

(B) The Confidential Information is owned by Toshiba Corporation. In my position as Vice President, Licensing US ABWR Projects & Technologies Toshiba America Nuclear Energy Corporation, I have been specifically delegated the function of reviewing the Confidential Information and have been authorized to apply for its withholding on behalf of Toshiba Corporation.

(C) This document provides Toshiba's lifecycle process and qualification activities for developing and qualifying Non-Rewritable (NRW) Field Programmable Gate Array (FPGA) Based Safety I&C systems

to the Nuclear Regulatory Commission. The Confidential Information which is entirely confidential and proprietary to Toshiba Corporation is identified as "Proprietary" in the document.

- (D) Consistent with the provisions of 10 CFR § 2.390(a)(4), the basis for proposing that the Confidential Information be withheld is that it constitutes Toshiba Corporation's trade secrets and confidential and proprietary commercial information.
- (E) Public disclosure of the Confidential Information is likely to cause substantial harm to Toshiba Corporation's competitive position by (1) disclosing confidential and proprietary commercial information about the design, manufacture and operation of the FPGA based I&C platform for nuclear power reactors to other parties whose commercial interests may be adverse to those of Toshiba Corporation, and (2) giving such parties access to and use of such information at little or no cost, in contrast to the significant costs incurred by Toshiba Corporation to develop such information.

Toshiba Corporation has a rational basis for determining the types of information customarily held in confidence by it, and utilizes a system to determine when and whether to hold certain types of information in confidence.

The basis for claiming the information so designated as proprietary is as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Toshiba Corporation's competitors without license from Toshiba Corporation constitutes a competitive economic advantage over other companies.
- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Toshiba Corporation, its customers or suppliers.
- (e) It reveals aspects of past, present, or future Toshiba Corporation or customer funded development plans and programs of potential commercial value to Toshiba Corporation.
- (f) It contains patentable ideas, for which patent protection may be desirable.
- (g) It contains security information that could reasonably be expected to be useful to a potential adversary.
- (h) It contains privacy act and personally identifiable information.

There are sound policy reasons behind the Toshiba Corporation system which include the following:


- (a) The use of such information by Toshiba Corporation gives Toshiba Corporation a competitive

advantage over its competitors. It is, therefore, withheld from disclosure to protect the Toshiba Corporation competitive position.

- (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Toshiba Corporation ability to sell products and services involving the use of the information.
- (c) Use by our competitor would put Toshiba Corporation at a competitive disadvantage by reducing his expenditure of resources at our expense.
- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Toshiba Corporation of a competitive advantage.
- (e) Unrestricted disclosure would jeopardize the position of prominence of Toshiba Corporation in the world market, and thereby give a market advantage to the competition of those countries.
- (f) The Toshiba Corporation capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (g) SECY-04-0191 states that security information should be withheld from public disclosure.
- (h) Personally identifiable information is required to be protected from public disclosure by 10 CFR § 2.390.

Further, on behalf of Toshiba Corporation, I affirm that:

- (i) The Confidential Information is confidential and proprietary information of Toshiba Corporation.
- (ii) The Confidential Information is information of a type customarily held in confidence by Toshiba Corporation, and there is a rational basis for doing so given the sensitive and valuable nature of the Confidential Information as discussed above in paragraphs (D) and (E).
- (iii) The Confidential Information is being transmitted to the NRC in confidence.
- (iv) The Confidential Information is not available in public sources.
- (v) Public disclosure of the Confidential Document is likely to cause substantial harm to the competitive position of Toshiba Corporation, taking into account the value of the Confidential Information to Toshiba Corporation, the amount of money and effort expended by Toshiba Corporation in developing the Confidential Information, and the ease or difficulty with which the Confidential Information could be properly acquired or duplicated by others.


Robert W Schrauder

8/24/2015
Date

Vice President, Licensing
US ABWR Projects & Technologies
Toshiba America Nuclear Energy Corporation