

US Safety-Related
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TOSHIBA CORPORATION  
NUCLEAR ENERGY SYSTEMS & SERVICES DIV.

## NRW-FPGA-Based PRM System Qualification Project

### Document Title

### Acceptance Plan for Test Support Services

CUSTOMER NAME	None
PROJECT NAME	NRW-FPGA-Based PRM System Qualification Project
ITEM NAME	PRM Equipment
ITEM NO.	C51
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July 18, 2007	Monitoring System Engineering Group	<i>M. Arai</i> July 18, 2007	<i>Y. Sato</i> July 18, 2007	<i>T. Miyazaki</i> July 17, 2007	RS-5074049

**TOSHIBA CORPORATION** Nuclear Energy Systems & Services Division

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Acceptance Plan for Commercial Grade Dedication 商用品採用受領計画書		Sheet ( 1 / 6 )	
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<p>The purpose of this form is to document critical characteristics for acceptance of commercial grade items and services. This form should indicate the acceptance criteria and how each CCA will be verified (i.e., acceptance method), and include references to additional documents or procedures as needed. (本書式使用の目的は商用品及び役務の受領に対する決定的特性(CCA)を図書化するためである。本書式は CCA の合否基準及びその検証方法(受領方法)を示し、また、必要な追加図書または要領も含まなければならない。)</p>			
Acceptance Method 受領方法	Required Procedure 要求要領	Additional Documentation 追加図書	
Method 1 - Special tests and inspections 方法 1-特別試験及び検査	AS-200A111 or AS-200A112	Test/Inspection Plan, Test/Inspection Procedure, Test/Inspection Record 試験/検査計画, 試験/検査要領, 試験/検査記録	
Method 2 - Commercial grade survey 方法 2-商用サーベイ	AS-300A002	Source verification Report 立会検査報告書	
Method 3 - Source verification 方法 3-立会検査	AS-200A111 or AS-200A112	Surveillance Plan, Source verification Report サーベイ計画, 立会検査報告書	
Method 4 - Supplier/item performance record 方法 4-供給者実績/製品性能記録	AS-200A111	Supplier/Item Performance Record 供給者実績/製品性能記録	
Critical characteristic for acceptance (CCA) 受領に対する CCA	Acceptance criteria including tolerances 許容誤差を含む受領基準	Acceptance method(s) (Note1) 受領方法(注1)	Additional documentation prepared by Toshiba (NED) to support the acceptance method (note 2) (原子力)作成受領方法サポート追加図書(注2)
Quality of design and manufacture - QA staff and organization definition - QA procedures - Evidence that QA program was applied in the service	The specific quality assurance activities identified through a valid commercial grade survey are implemented effectively.	Method 2 Commercial Grade Survey	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>
Quality of Design - Document Control	<p>Following activities are performed in accordance with NICSD procedures:</p> <ul style="list-style-type: none"> <li>- Identification of controlled documents</li> <li>- Individual number is assigned to each document.</li> <li>- Documents are not issued or changed without review by a different person from the person who performs the actual design work.</li> <li>- Person who performs the design shall be trained for the work.</li> </ul>	Method 2 Commercial Grade Survey	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>
NICSD's ECWD Design Procedure	NICSD implements and follows an ECWD design procedure.	Method 2 Commercial Grade Survey	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>

(Note 1): Acceptance method shall include one or more of the above "Acceptance Method" and shall be described the first column of each method (受領方法には上記から選択し、空欄に記入すること。).

(Note 2): Required additional documentations are noted the above "Additional Documentation" for each method chosen. (要求された追加図書は選択された方法毎に追加図書を記入すること。)

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Personnel Qualification for Test System Integration	Person who performs the assembly shall be trained for the work.	Method 2 Commercial Grade Survey	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>
Calibration (Task2)	Resistors in Current Monitor Box must: <ul style="list-style-type: none"> <li>- be calibrated in accordance with QA procedure</li> </ul>	Method 2 Commercial Grade Survey,	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>
Calibration (Task2)	Resistors in Current Monitor Box must: <ul style="list-style-type: none"> <li>- be calibrated with instruments traceable to national standards</li> <li>- accuracies should satisfy conditions as shown in the acceptance criteria of resistors</li> <li>- have calibration record</li> </ul>	Method 3 Source Verification (Record Review)	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
General Wiring Design in ECWD (Task1)	Compliance with system design specified in PTER section 4.3.2.	Document Review	
Cable Selection in ECWD (Task1)	Compliance with the CCAs listed in PTER section 4.3.3.1.	Document Review	
Connection for Test System Integration (Task3)	Compliance with the ECWD	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Testing Area Provision (Task4)	Sufficient space for the test system assembly and testing (configured in accordance with the ECWD) shall be provided.	Method 1 Special Tests and Inspections	<ul style="list-style-type: none"> <li>System Validation Test Procedure</li> </ul>
Environmental Condition Maintenance for Testing Area (Task4)	Environmental conditions shall be maintained in accordance with the normal environmental requirements shown in ERS section 5.5.1.	Method 1 Special Tests and Inspections	<ul style="list-style-type: none"> <li>System Validation Test Procedure</li> </ul>
Power Supply Provision for System Integration Test (Task4)	The Power Supply shall have capability to operate the Test System as specified in the ECWD.	Method 1 Special Tests and Inspections	<ul style="list-style-type: none"> <li>System Validation Test Procedure</li> </ul>
Quality of Packaging (Task5)	Packaging is performed in accordance with ANSI N45.2.2 Level A.	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Environmental Requirements for Test Equipment (Task4)	Compliance with the applicable system requirements (ex. environmental conditions) specified in PTER Appendix B-2.	Method 1 Special Tests and Inspections	<ul style="list-style-type: none"> <li>System Validation Test Procedure</li> </ul>

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Critical characteristic for acceptance (CCA) 受領に対する CCA	Acceptance criteria including tolerances 許容誤差を含む受領基準	Acceptance method(s) (Note1) 受領方法(注1)	Additional documentation prepared by Toshiba (NED) to support the acceptance method (note 2) (原子力)作成受領方法サポート追加図書(注2)
Output of Trip Auxiliary Unit (Task3)	All Outputs from the Test Specimen shall be connected to relays.	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Input of Trip Auxiliary Unit (Task3)	All Inputs from the Test Equipment to the Test Specimen shall be connected to relays.	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Connectors of Trip Auxiliary Unit (Task2)	Connectors shall be compatible with the Test Specimen	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Internal Relay Logic in Trip Auxiliary Unit (Task2)	Internal Relay Logic shall be in accordance with the ECWD that NED has accepted. (NED will accept this ECWD by verifying that it meets all the requirements.) a.c	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Type of relay used in Trip Auxiliary Unit (Task2)	- Vendor: [ ] - Type Code: [ ] a.c	Method 3 Source Verification (Record Review)	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Power Supply for Trip Auxiliary Unit (Task2)	Voltage of DC power supply: +24VDC±0.24V	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Connectors of Current Monitor Box (Task2)	Following Connectors shall be provided - for the connection to LPRM/FLOW Signal Simulator. - for the connection to Test Specimen. - for the connection to Data Recorder to monitor the differential voltage across each resistor. Connections for connectors and terminals for each signal shall be established as shown in Figure 4-2 of PTER (FPG-DRT-C51-0001), Rev.4	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Value of Resistors in Current Monitor Box (Task2)	100Ohm±1%	Method 3 Source Verification (Record Review)	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Monitoring points provided by Current Monitor Box for Test Specimen (Task2)	The current monitor box shall be capable of monitoring the current signals fed to all LPRM modules and SQ-ROOT modules.	Document Review	

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Number of resistors in Current Monitor Box (Task2)	24 at least	Document Review		
Connection of Current Monitor Box to Data Recorder (Task2)	At least 24 pairs of signal terminals shall be provided to connect to both ends of each resistor.	Document Review		
Connection of Current Monitor Box to LPRM/FLOW Signal Simulator (Task2)	At least 24 Connectors shall be provided for the input from LPRM/FLOW Signal Simulator.	Document Review		
Connection of Current Monitor Box to Test Specimen (Task2)	At least 22 Connectors shall be provided for the 22 outputs to the LPRM modules. At least 2 pairs of terminals shall be provided for the 2 outputs to the SQ-ROOT module.	Document Review		
Mounting Capability of Rack (Task2)	The rack shall be designed to contain the three PRM Test Specimen Units and the Trip Auxiliary Unit, with provisions for mounting the Units in the rack.	Document Review		
Operator Access of Rack (Task2)	The rack must allow operator access as needed during testing.	Document Review		
Non-Enclosure of Chassis (Task2)	The rack shall not enclose the chassis of the units.	Document Review		
Allows Grounding of the Test Specimen (Task2)	The rack shall not prevent the grounding of the Test Specimen as shown in the ERS.	Document Review		
Does not prevent exposure of noise on test specimen (Task2)	The rack shall not protect the Test Specimen Units and cables from exposure to noise.	Document Review		
Quality of Storage (Task6)	The humidity of the storage area shall be kept under 80%RH, and the temperature of the storage area shall be kept under 40 degree Celsius. The humidity and the temperature of the storage area shall be recorded continuously.	Method 2 Commercial Grade Survey  Method 3 Source Verification	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>	

# Acceptance Plan for Commercial Grade Dedication

商用品採用受領計画書

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Quality of Storage (Task6)	Storage area shall be locked to control and limit the access only to personnel designated by responsible organization.	Method 2 Commercial Grade Survey  Method 3 Source Verification	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Quality of Storage (Task6)	Cleanliness and good housekeeping practices shall be kept at all times in the storage areas. The storage areas shall be cleaned as required to avoid the accumulation of trash, discarded packaging materials and other detrimental soil.	Method 2 Commercial Grade Survey  Method 3 Source Verification	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Quality of Storage (Task6)	Fire protection commensurate with the type of storage area and the material involved shall be provided and maintained.	Method 2 Commercial Grade Survey	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>
Quality of Storage (Task6)	Measures shall be taken to prevent the entrance of rodents and other animals into indoor storage areas or equipment to minimize possible contamination and mechanical damage to stored material.	Method 2 Commercial Grade Survey	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> </ul>
Quality of Storage (Task6)	All items shall be stored in such a manner as to permit ready access for inspection or maintenance without excessive handling, to minimize risk of damage.	Method 2 Commercial Grade Survey  Method 3 Source Verification	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Quality of Storage (Task6)	Items stacked for storage shall be arranged so that racks, cribbing or crates are bearing the full weight without distortion of the item.	Method 2 Commercial Grade Survey  Method 3 Source Verification	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Quality of Storage (Task6)	Storage items shall be identified by identification Tag.	Method 2 Commercial Grade Survey  Method 3 Source Verification	<ul style="list-style-type: none"> <li>Survey Plan</li> <li>Survey Report</li> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>

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Providing bus bar on the rack (Task7-1)	The rack shall provide copper bus bar which is connected to the rack body by flat braided wire.	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Change of ground cables (Task7-1)	The cable between Units' ground and the copper bus bar shall be flat braided wire.	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Modification of bracket (Task7-1)	The bracket which fixes noise filters in power supply line shall be provided on the back of the rack	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
Modification of bracket (Task7-1)	The bracket which fixes fuses shall be provided on the front of the rack.	Method 3 Source Verification	<ul style="list-style-type: none"> <li>Source Verification Check Sheet and Record</li> <li>Source Verification Report</li> </ul>
General Wiring Design in ECWD (Task7-2)	<ul style="list-style-type: none"> <li>The LPRM module model number "HNS011" shall be changed to "HNS011 or HNS013".</li> <li>The AO module model number "HNS511" shall be changed to "HNS511 or HNS515".</li> <li>The AO module model number "HNS512" shall be changed to "HNS512 or HNS516".</li> <li>The AO module model number "HNS513" shall be changed to "HNS513 or HNS517".</li> <li>The AO module model number "HNS514" shall be changed to "HNS514 or HNS518".</li> </ul>	Document Review	
Revision of Documents (Task7-2)	Compliance with modification per Task7..	Document Review	