

GIRAFFE QUALITY ASSURANCE PLAN
(TOGE-110 TEST PROGRAMS)

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Toshiba Corporation
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This document describes the TOSHIBA quality assurance (QA) plans specified for the Passive Containment Cooling System (PCCS) heat removal test programs using the Toshiba GIRAFFE facility, which will be newly conducted under the TDP program (defined as TOGE-110 herein).

1. STANDARDS APPLIED

This document summarizes the Toshiba GIRAFFE test QA plans specified for the TOGE-110 test programs. The TOGE-110 tests, using the GIRAFFE facility, will be conducted in conformance with the following QA documents.

JEAG 4101-1990 "Guide for Quality Assurance of Nuclear Power Plants" (in Japanese)
Toshiba Energy System Group (ESG) Standard Code No. 4401 (1991)
"Quality Assurance Fundamental Code" (in Japanese)
4401-1 (Rev.0) "Nuclear Quality Manual (in Japanese)"
AS-50092 (Rev. 1) "QUALITY ASSURANCE PROGRAM FOR SIMPLIFIED
BOILING WATER REACTOR"

2. ORGANIZATION

As for the organization, its construction is generally based on the AS-50092 (Rev. 1). Specifically for the TOGE-110, following organization s are composed:

(a) Test organization and technical control

The TOGE-110 test organizations involved are identified by the block diagram illustrated in Fig. 2-1.

The technical matter for the GIRAFFE PCCS tests is verified by the Toshiba responsible engineer of the TOGE-110.

The TOGE-110 responsible engineer for the Toshiba side is Dr. S. Yokobori, senior specialist of the Core and Fuel Technology Group of Toshiba Nuclear Engineering Laboratory (NEL) and the final approver is Mr. T. Tanzawa, senior manager of the Core and Fuel Technology Group of Toshiba NEL.

The test responsible engineer is Mr. T. Tobimatsu, deputy manager of the Core and Fuel Technology Group of Toshiba NEL, who has a license for QA inspection inside Toshiba Nuclear Energy Division (NED).

(b) Contract matter administration

As for the contract matter for the TOGE-110, Mr. J. Tashima, manager of Toshiba NED, is responsible for it.

(c) Quality assurance control

As for the TOGE-110 test QA activities, Mr. K. Watanabe, manager of the Nuclear Quality Assurance Department in Toshiba NED, is responsible and approves.

3. TEST OPERATOR TRAINING

The GIRAFFE TOGE-110 test operation requires to highly technical skills. As for the training of the test personnel, the test responsible engineer is also responsible for both education and training. He teaches the test procedures and trains the operational

procedures on the facility site and finally approves the test personnel. The records of the education, training and tester approvals are retained in the Toshiba test DRF.

4. DOCUMENT CONTROL

All documents regarding the TOGE-110 tests are controlled in conformance with following documents:

- Toshiba ESG Standard Code No. 4403 (1991) "Document Control Code for the Nuclear Equipment" (in Japanese)
- Toshiba ESG Standard Code No. 4809 (1991) "Code for Technical Documents Transaction" (in Japanese)
- AG-001A001 (Rev. 8) "Enactment and transaction for technical standards in Toshiba NED"
- AG-120A001 (Rev. 1) "Preparation procedure for the meeting minutes (inside company)"
- AG-120A002 (Rev. 0) "Preparation procedure for the meeting minutes (outside company)"
- AG-120A003 (Rev. 1) "Preparation procedure for the Engineering Communication Sheet (ECS)"
- AG-220A007 (Rev. 0) "Control procedure for the technical document"
- AL-A20G142 (Rev. 1) "Preparation procedure for the technical report at Nuclear Engineering Laboratory"

Especially for the TOGE-110 tests, following control procedures are planned.

(a) Design Record File (DRF)

All documents regarding the TOGE-110 tests are center-filed in the "Design Record File (DRF)" at the test divisions in the Toshiba NEL. The documents in the DRF are stored so as to trace back the modification.

In the DRF, not only design drawing, specification, test data sets but also all documents such as design approval report, letter and faxes should be included. Moreover, all documents are referred by the "DRF sheet" as attached (Table 4-1).

(b) Technical report: Test Plan and Procedures (TP&P), Apparent Test Report (ATR) and Final Test Report (FTR)

The technical information obtained under the TOGE-110 are prepared by the test responsible engineer as the TOGE technical report and issued after verification by the responsible engineer and approved by the responsible manager. The preparation and modification of the TP&P will be performed in accordance with the GIRAFFE Test Specification (25A5677, Rev. 0). The ATR and FTR preparation procedures are based on the guideline of AL-A20G142, entitled as "Guideline to write the technical report of the Toshiba Nuclear Engineering Laboratory".

The informations are further reported as the technical report of TOGE-110 after reflecting the GE test requester's comments and distributed to GE. These are labeled "TOGE110-TXX" for classification.

(c) Control of documentation revision

When some portion of the TOGE-110 documents should be modified, the revised documents are controlled by the same procedure as those applied to the original documents.

(d) Language

The language used for TOGE-110 tests in Toshiba is Japanese. According to the TOGE-110 contract, the documents transmitted to General Electric Company (GE) is translated into English, while in some cases, only document summaries are translated into English.

5. DESIGN CONTROL

The TOGE-110 design control is generally applied using the following Toshiba NED documents:

- AE-002B001 (Rev. 2) "Design Review (in Japanese)"
- AE-002B002 (Rev. 4) "Manual of Design Review (in Japanese)"
- AE-003A001 (Rev. 3) "Design Change Control (in Japanese)"

The GIRAFFE construction was completed in 1990 and the facility shakedown including the plant characterization were already completed through several stages of modification. The design of the existing GIRAFFE facility was verified by the Design Reviews. The Design Review records are documented in the DRF.

In the TOGE-110 tests, the continuous helium gas supply system will be newly fabricated, while both steam supply lines and direct noncondensable gas sampling lines will be modified. The design control specified for the GIRAFFE tests are summarized in the following:

(a) Design verification and validation control

Prior to the tests, the Toshiba responsible manager checks whether the GIRAFFE as-built facility (see section 8) satisfies the TOGE-110 test specifications (TS, GE document No. 25A5677 revision 0) requirements and approves.

The review reports are recorded and documented in the DRF in accordance with the TP&P. A design review of the report results is required.

(b) New design verification

In case of facility modifications for the TOGE-110 tests, the modification portion should be specifically reviewed according to the determined design control procedures. After the modification, the design verification and validation control, described as item of (a), should be applied and verified.

6. PROCUREMENT CONTROL

The components necessary for the TOGE-110 tests are purchased to fulfill the technical specification and/or drawing in conformance with the following standards:

- QS-160A37 (Rev. 0) "Procurement control"
- QS-860A37 (Rev. 0) "Supplement for the procurement control"
- AL-A20G139 (Rev. 1) "Procedure for procurement specification preparation"

All procurement materials are ordered through the Toshiba R&D Center procurement division. When ordered components are delivered to Toshiba, they are tested by the test engineer on site and it is verified that the purchase specification is satisfied.

The test evidences are recorded and approved. Evidence of tests will be documented in the Toshiba test DRF.

7. MATERIAL AND COMPONENT CONTROL

The control measures used for materials and component control for the fabrication of the GIRAFFE facility will be documented in the DRF. For M & TE, and wire and cable documentation and verification requirement, see Section 9c.

8. FABRICATION, INSTALLATION AND INSPECTION CONTROL

For the construction and modification of the GIRAFFE facility, control measures for fabrication, installation and inspection were established and are documented in the DRF. Facility shakedown tests that were performed for GIRAFFE phase 2 tests are documented or referenced in the DRF. Prior to the performance of the TOGE-110 helium tests, facility shakedown and plant characterization tests will be performed in accordance with the TP&P.

In case of facility modification for the TOGE-110 tests, it has to be verified that the fabrication and/or installation are in accordance with the specification and drawing as well as verification of the appropriate fabrication control.

The final modification has to be verified and validated and the verification results are recorded. The as-built facility configuration validation will be documented in drawings and documents, verified and approved in accordance with procedure (i.e. AE-003A001). These verified drawings and documents will be filed in the DRF.

9. INSTRUMENTATION AND TEST CONTROL

(a) Test control

The test plans (TPs) for TOGE-110 are reported as the technical report in Toshiba after approval by the responsible manager.

This test plan for TOGE-110 is also reported as the technical report to GE after approval by the GE responsible manager. The documents are composed of the following:

TOGE110-T07 (Rev. 0) "GIRAFFE TEST PLAN AND PROCEDURES"

The tests are conducted under these guidelines.

The test responsible engineer verifies whether the tests are proceeded in accordance with the guidelines. The Toshiba responsible manager finally approves using the Toshiba's check list.

(b) Test results evaluation

Raw test data sets are compiled and documented as the apparent test reports after each test is completed. Test data sets are recorded by the plotted figures, digital tables and magnetic tapes. Final test reports (FTRs) should include evaluation and consideration of the data and be approved by the Toshiba NEL responsible manager after the verification and review in Toshiba NED.

After that, this will be sent to GE and approved after GE's verification and review.

The apparent test reports (ATRs) are sent to GE immediately after each test is completed (i.e. within two weeks after the test completion), as described in the Test Specification (TS, GE document No. 25A5677 rev. 0).

(c) Calibration and control of measuring instruments and test equipment

All measurement and test equipment (M&TE) used in the GIRAFFE PCCS tests are controlled according to the Toshiba R&D Center Instrumentation Standard (C-h-801 and 803, Rev. 0).

All M&TEs are controlled by numbering and are documented in verified lists.
The instrumentation calibration is performed under the above standard per the interval described in the above standard, and is documented in the M&TE lists.
All of the M&TE verified instrumentation lists are included in the TP&P and the DRF.
Wire and cable lists are prepared and verified for all M&TE. These lists are filed in the DRF.

(d) Software control

Such softwares as the programs used for the data recording and reduction are verified in accordance with the TP&P to confirm that the software satisfies the requirements prior to the tests.

Verification procedures for software control will be specified in the TP&P. The verification results should be recorded in the DRF.

10. NONCONFORMANCE CONTROL AND THE CORRECTIVE ACTIONS

The nonconformance items for the TOGE-110 tests are controlled in accordance with the following procedures:

Toshiba ESG Standard Code No. 4405 (1993) "Nonconformance control and Action to prevent recurrence"

QS-160A16 (Rev. 3) "Procedure for the nonconformance control and actions to prevent recurrence"

As for the GIRAFFE tests, the nonconformance items that appear during the shakedown test or helium tests, and the approved corrective actions are recorded in the DRF in accordance with the TP&P.

11. RETENSION OF QA DOCUMENTS

All activities, especially all data sets regarding the TOGE-110 test programs including the calibration records are stored and filed in the Design Record Files (DRFs).

The retention period of the DRF documents is 60 years.

Test records maintained by GE will be permanently stored (60 years).

cf. QS-160A15 (Rev. 1) "Procedure of preparing for the QA record"

The original sheets of DRF are stored in NEL, while their microfilms are stored in the Isogo Nuclear Engineering Center (IEC).

12. INTERNAL AUDIT

As for the internal audits in Toshiba NED, the annual audit systems have been introduced since 1994, which is in accordance with the following standards:

Toshiba ESG Standard Code No. 4426 (1994) "Internal Audit" (in Japanese)

Toshiba ESG Work Instruction 4426A (1994) "Qualification Procedure for Internal Auditor" (in Japanese)

QS-160A25 (Rev.3) "Procedure for the internal audit"

QS-860A25 (Rev. 2) "Supplement for the internal audit procedure"

QS-160A39 (Rev. 0) "Education manual for internal auditor"

QS-860A39 (Rev. 0) "Supplement for education manual"

· As for the TOGE-110 test, the audit will be performed by the QA manager, K. Watanabe prior to the tests.

The audit results are finally approved by the TOGE-110 responsible manager of the Senior Manager of the Core and Fuel Technology Group of NEL. The responsible manager can make the appropriate correction procedures if necessary.

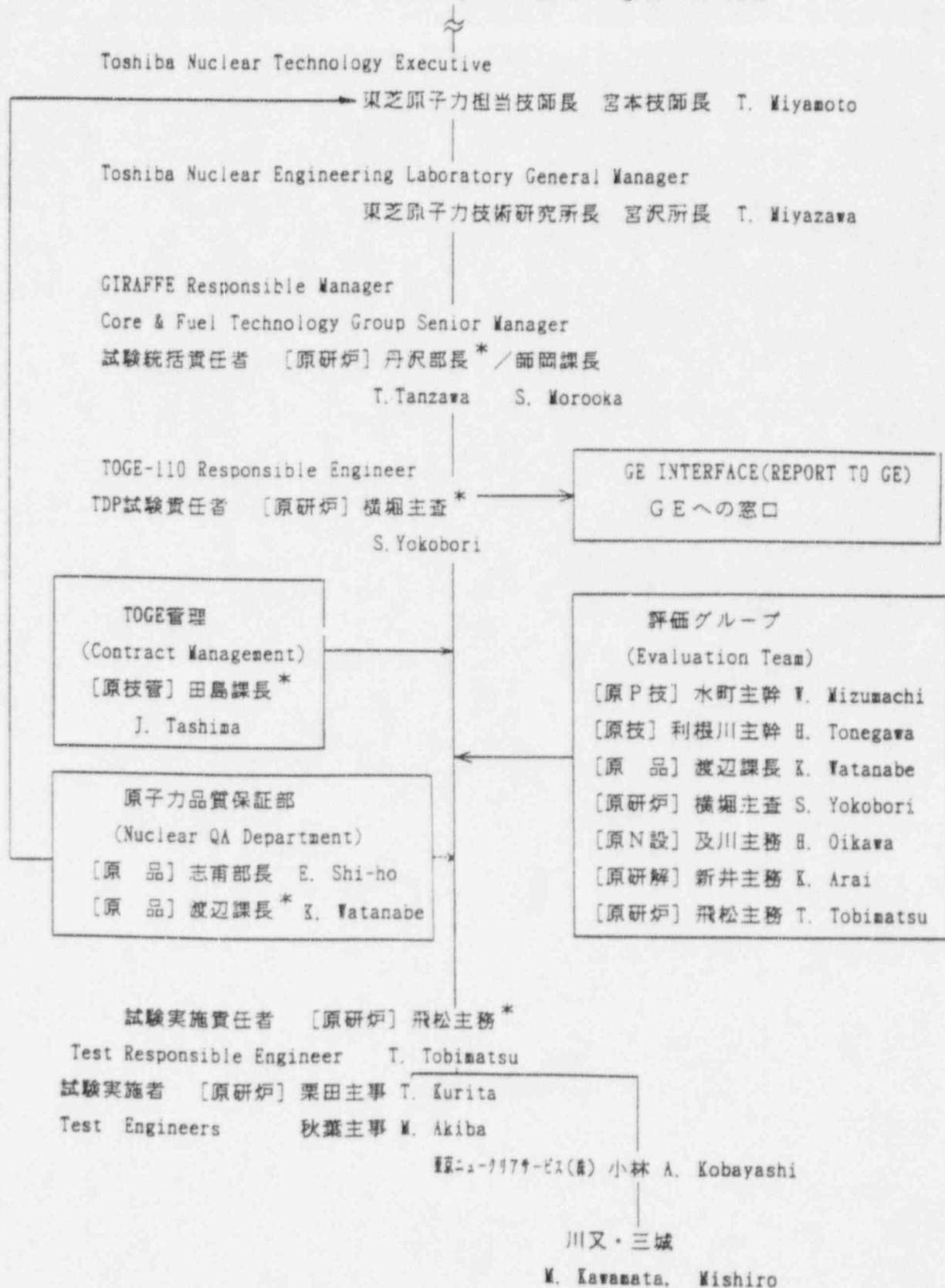
All audit results are reported to the Toshiba Nuclear Technology Executive through the Toshiba QA department senior manager and verified by the Technology Executive.

Table 4-1 GIRAFFE Design Record File Control Sheet (Toshiba)
(LIST OF DOCUMENTS)

FILE Group NO	Subgroup	Subject	Rev	Updated date	Remarks

添付表 1 TOGE-110試験実施体制 (東芝内)
(Fig. 2-1 GIRAFFE TEST ORGANIZATION in Toshiba)

See. AS-50092 (Rev. 1) "Quality Assurance Program for SBWR"



(.....QA Work without reporting to test engineer / * 承認者 approver)