

Summary of MELTAC Platform QA

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Signature History

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Revision History

Revision	Date	Section	Description
0	December 2014	All	Initial issue
1	March 2015	1.0 2.0 3.0 4.0 Table 1	<ul style="list-style-type: none"> -Revised ESC Procedure N-G000 from Rev. N to Rev. P in section 4.0 and Table 1. -Removed revision references on ESC Procedure N-G000 in all sections except 4.0 and Table 1. -Corrected the titles of procedures ESC N-0704 and N-0931 in Table 1. -Changed “No.” to “Cat. No.” in Table 1 and added “20” and “30”. -Removed ESC Procedure N-0000 from Table 1. -In section 1.0 changed Mitsubishi Electric Company (MELCO) to Mitsubishi Electric Corporation (MELCO). -In sections 3.4, 3.7 and 3.23 added Commercial Grade Services to the scope of MELCO ESC’s Commercial Grade Dedication activities.

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1.0 INTRODUCTION

This summary document describes the Quality Assurance Program (QAP) that governs the development, production and testing of the Mitsubishi Electric Corporation (MELCO) Energy Systems Center (ESC) Mitsubishi Electric Total Advanced Controller (MELTAC) Platform. The MELCO ESC QAP complies with 10 CFR 50 Appendix B and 10 CFR 21. The QAP is based on the requirements and recommendations in ASME NQA-1-1994. The MELCO ESC QAP encompasses the MELTAC Platform hardware and the basic software, which includes the firmware and FPGAs on all MELTAC modules. Commercial Grade Dedication (CGD) activities are also performed under the MELCO ESC QAP.

This document supports the “Safety System Digital Platform - MELTAC - Topical Report” (JEXU-1041-1008) and satisfies the commitment made under Table 1, section 1.2 of the document “Mapping of MELTAC Platform Licensing Documents to the DI&C-ISG-06 Guidance” (JEXU-1041-1012).

2.0 OBJECTIVE

This document has the following objectives.

- Provide a list of all current MELCO ESC Manuals and major QAP procedures.
 - ❖ Table 1 “MELCO ESC Manuals and Major QAP Procedures” identifies each document.
- Provide information to supplement the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000) necessary to establish compliance to 10 CFR 50 Appendix B by clarifying commitments made to ASME NQA-1-1994.
 - ❖ Sections 3.1 through 3.18 provide the required supplemental information.
- Provide information to supplement the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000) necessary to identify the programmatic requirements for the following topics.
 - ❖ Training and Qualification Criteria - Quality Assurance
 - Section 3.19 provides the required supplemental information.
 - ❖ Training and Qualification Criteria - Inspection and Test
 - Section 3.20 provides the required supplemental information.
 - ❖ QA Program Commitments
 - Section 3.21 provides the required supplemental information.
 - ❖ 10 CFR Part 21 Programs for Reporting Defects and Noncompliance
 - Section 3.22 provides the required supplemental information.
 - ❖ Commercial Grade Dedication (CGD)
 - Section 3.23 provides the required supplemental information.
 - ❖ Digital Equipment Software Verification and Validation Quality Controls
 - Section 3.24 provides the required supplemental information.
 - ❖ Nonsafety-Related SSC Quality Controls
 - Section 3.25 provides the required supplemental information.

3.0 MELCO ESC QAP SUMMARY

The MELCO ESC QAP is based on the requirements and recommendations in ASME NQA-1-1994. The following sections provide information to supplement and clarify the commitments made in the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000).

3.1 Organization

The MELCO ESC Organization is described in Part II, Section 1 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its organizational structure, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 1 and Supplement 1S-1

3.2 Quality Assurance Program

The MELCO ESC Quality Assurance Program is described in Part II, Section 2 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Quality Assurance Program, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 2 and Supplements 2S-1 through 2S-4

Exceptions

- ASME NQA-1-1994, Supplement 2S-1
In lieu of Nonmandatory Appendix 2A-1, MELCO ESC may not establish levels of qualification/ certification for all inspection personnel. Instead, MELCO ESC establishes initial qualification requirements and determines individual qualification through evaluation of education, training and experience, and through demonstration of capability in performing the type of inspections expected on the job.

3.3 Design Control and Verification

The MELCO ESC Design Control and Verification requirements are described in Part II, Section 3 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Design Control and Verification requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 3, Supplement 3S-1 and Subpart 2.7 for computer software

Exceptions

- ASME NQA-1-1994, Subpart 2.7
In lieu of the standards referenced in Subpart 2.7, MELCO ESC commits to the Nuclear Regulatory Commission (NRC) endorsed standards as described in the MELCO ESC “MELTAC Platform Software Program Manual” (JEXU-1041-1016).

3.4 Procurement Document Control

The MELCO ESC Procurement Document Control requirements are described in Part II, Section 4 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Procurement Document Control requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 4 and Supplement 4S-1

Exceptions and Clarifications

- ASME NQA-1-1994, Supplement 4S-1
 - ❖ Section 2.3 of this Supplement 4S-1 includes a requirement that procurement documents require vendors to have a documented QAP that implements NQA-1-1994, Part 1. In lieu of this requirement, MELCO ESC may require vendors to have a documented vendor QAP that is determined to meet the applicable requirements of 10 CFR 50, Appendix B, as appropriate to the circumstances of the procurement.
 - ❖ With regard to service performed by a vendor, MELCO ESC procurement documents may allow the vendor to work under the MELCO ESC QAP, including implementing procedures, in lieu of the vendor having its own QAP.
 - ❖ Section 3 of supplement 4S-1 requires procurement documents to be reviewed prior to bid or award of contract. The quality assurance review of procurement documents is satisfied through review of the applicable procurement specification, including the technical and quality procurement requirements, prior to bid or award of contract. Procurement document changes (e.g., scope, technical or quality requirements) will also receive the quality assurance review.
 - ❖ Procurement documents for Commercial Grade Items and Services that will be procured by MELCO ESC for use in safety-related applications shall contain technical and quality requirements such that the procured item or service can be appropriately dedicated.

3.5 Instructions, Procedures, and Drawings

The MELCO ESC Instructions, Procedures, and Drawings requirements are described in Part II, Section 5 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Instructions, Procedures, and Drawings requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 5

3.6 Document Control

The MELCO ESC Document Control requirements are described in Part II, Section 6 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Document Control requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 6 and Supplement 6S-1

3.7 Control of Purchased Material, Equipment, and Service

The MELCO ESC Control of Purchased Material, Equipment, and Service requirements are described in Part II, Section 7 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing its Control of Purchased Material, Equipment, and Service requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 7 and Supplement 7S-1

Exceptions and Clarifications

- ASME NQA-1-1994, Supplement 7S-1
 - ❖ MELCO ESC considers that 10 CFR 50 licensees which may provide items or services to MELCO ESC are not required to be evaluated or audited.
 - ❖ MELCO ESC considers documents that may be stored in approved electronic media under MELCO ESC or vendor control and not physically located on the plant site but which are accessible from the respective nuclear facility site as meeting the ASME NQA-1-1994 requirement for documents to be available at the site. Following completion of projects, MELCO ESC will turn over to the customer sufficient as-built documentation to support operations. The MELCO ESC records management system will provide for timely retrieval of necessary records.
 - ❖ Controls for Commercial Grade Items and Services are established in MELCO ESC documents using 10 CFR 21 and the guidance of EPRI NP-5652 as discussed in NRC Generic Letter 89-02 and NRC Generic Letter 91-05.
 - ❖ For Commercial Grade Items and Services, special quality verification requirements are established and described in MELCO ESC documents to provide the necessary assurance an item or service will perform satisfactorily. The MELCO ESC documents address determining the critical characteristics that ensure an item or service is suitable for its intended use, technical evaluation of the item or service, receipt requirements, and quality evaluation of the item or service.
 - ❖ MELCO ESC will also use other appropriate approved regulatory means and controls to support MELCO ESC CGD activities. Examples of this are:
 - Electric Power Research Institute (EPRI) Topical Report TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," dated July 1997.
 - Electric Power Research Institute (EPRI) Topical Report TR-107330, "Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants," dated December 1996.
 - ❖ MELCO ESC will assume 10 CFR 21 reporting responsibility for all items or services that it dedicates as safety related.

3.8 Identification and Control of Materials, Parts, and Components

The MELCO ESC Identification and Control of Materials, Parts, and Components requirements are described in Part II, Section 8 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing its Identification and Control of Materials, Parts, and Components requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 8 and Supplement 8S-1

3.9 Control of Special Processes

The MELCO ESC Control of Special Processes requirements are described in Part II, Section 9 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing its Identification and Control of Special Processes requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 9 and Supplement 9S-1

3.10 Inspection

The MELCO ESC Inspection requirements are described in Part II, Section 10 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing its Inspection requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 10 and Supplement 10S-1

3.11 Test Control

The MELCO ESC Test Control requirements are described in Part II, Section 11 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing its Test Control requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 11, Supplements 11S-1, 11S-2 and Subpart 2.7.
 - ❖ MELCO ESC will establish and implement provisions to assure that computer software used in applications affecting safety are prepared, documented, verified and tested, and used such that the expected output is obtained and configuration control maintained. To this end, MELCO ESC commits to compliance with the requirements of ASME NQA-1-1994, basic requirement 11, Supplement 11S-2 and Subpart 2.7 to establish the appropriate provisions.

Exceptions

- ASME NQA-1-1994, Subpart 2.7
In lieu of the standards referenced in Subpart 2.7, MELCO ESC commits to the Nuclear Regulatory Commission (NRC) endorsed standards as described in the MELCO ESC "MELTAC Platform Software Program Manual" (JEXU-1041-1016).

3.12 Control of Measuring and Test Equipment

The MELCO ESC Control of Measuring and Test Equipment (M&TE) requirements are described in Part II, Section 12 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing Control of Measuring and Test Equipment requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 12 and Supplement 12S-1

Exceptions and Clarifications

- ASME NQA-1-1994, Supplement 12S-1
 - ❖ The out-of-calibration conditions described in paragraph 3.2 of Supplement 12S-1 refers to when the M&TE is found out of the required accuracy limits (i.e., out-of-tolerance) during calibration.
 - ❖ M&TE will not be marked with the calibration status where it is impossible or impractical due to equipment size or configuration (such as the label will interfere with operation of the device) provided the required information is maintained in suitable documentation traceable to the device.

3.13 Handling, Storage, and Shipping

The MELCO ESC Handling, Storage, and Shipping requirements are described in Part II, Section 13 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing Handling, Storage, and Shipping requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 13, Supplement 13S-1, Subpart 2.2 and Subpart 2.3

Exceptions and Clarifications

- ASME NQA-1-1994, Subpart 2.2 and Subpart 2.3
 - ❖ Subpart 2.2 establishes criteria for classifying items into protection levels. Instead of classifying items into protection levels, MELCO ESC may establish controls for the packaging, shipping, handling, and storage of such items on a case-by-case basis with due regard for the item's complexity, use, and sensitivity to damage. Prior to installation or use, the items are inspected and serviced as necessary to assure that no damage or deterioration exists which could affect their function.
 - ❖ Subpart 2.2, section 5, "Receiving" MELCO ESC will establish controls for the receiving of items. The characteristics inspected for each item will be established in approved procedures and may vary depending on the item being received.
 - ❖ Subpart 2.2, section 6.6, "Storage Records:" This section requires written records be prepared containing information on personnel access. As an alternative to this requirement, MELCO ESC documents establish controls for storage areas that describe those authorized to access areas and the requirements for recording access of personnel. However, these records of access are not considered quality records and will be retained in accordance with administrative controls.
 - ❖ Subpart 2.3, Section 2.2 requires the establishment of five zone designations for housekeeping cleanliness controls. Instead of the five-level zone designation, MELCO ESC bases its control over housekeeping activities on a consideration of what is necessary and appropriate for the activity involved. The

controls are implemented through procedures or instructions which, in the case of maintenance or modification work, are developed on a case-by-case basis. Factors considered in developing the procedures and instructions include cleanliness control, personnel safety, fire prevention and protection, radiation control and security. The procedures and instructions make use of standard janitorial and work practices to the extent possible.

3.14 Inspection, Test, and Operating Status

The MELCO ESC Inspection, Test, and Operating Status requirements are described in Part II, Section 14 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing Inspection, Test, and Operating Status requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 14

3.15 Nonconforming Materials, Parts, or Components

The MELCO ESC Nonconforming Materials, Parts, or Components requirements are described in Part II, Section 15 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing Nonconforming Materials, Parts, or Components requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 15 and Supplement 15S-1

3.16 Corrective Action

The MELCO ESC Corrective Action requirements are described in Part II, Section 16 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing Corrective Action requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 16

3.17 Records

The MELCO ESC Records requirements are described in Part II, Section 17 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing Records requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 17 and Supplement 17S-1

Exceptions

- ASME NQA-1-1994, Supplement 17S-1
 - ❖ Section 4.2(b), requires records to be firmly attached in binders or placed in folders or envelopes for storage in steel file cabinets or on shelving in containers. For hard-copy records maintained by MELCO ESC, the records are suitably stored in steel file cabinets or on shelving in containers, except that methods other than binders, folders, or envelopes may be used to organize the records for storage.

3.18 Audits

The MELCO ESC Audit requirements are described in Part II, Section 18 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing Audit requirements, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 18 and Supplement 18S-1

3.19 Training and Qualification Criteria – Quality Assurance

The MELCO ESC Training and Qualification Criteria for Quality Assurance are described in Part II, Section 2 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Training and Qualification Criteria for Quality Assurance, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 2 and Supplements 2S-3 and 2S-4

Clarifications

- The minimum qualifications of the QA Manager are an engineering or related science degree and a minimum of four years of related experience including two years of nuclear experience, one year of supervisory or management experience, and one year of experience performing quality verification activities. Special requirements shall include management and supervisory skills and experience or training in leadership, interpersonal communication, management responsibilities, motivation of personnel, problem analysis and decision making, and administrative policies and procedures. Individuals who do not possess these formal education and minimum experience requirements should not be eliminated automatically when other factors provide sufficient demonstration of their abilities. These other factors are evaluated on a case-by-case basis and approved and documented.
- The minimum qualifications of the individuals responsible for planning, implementing, and maintaining the programs for the QAP are that each has a high school diploma or equivalent and a minimum of one year of related experience. Individuals who do not possess these formal education and minimum experience requirements should not be eliminated automatically when other factors provide sufficient demonstration of their abilities. These other factors are evaluated on a case-by-case basis and approved and documented by management.

3.20 Training Qualification – Inspection and Test

The MELCO ESC Training and Qualification Criteria for Inspection and Test personnel are described in Part II, Section 2 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). In establishing its Training and Qualification Criteria for Inspection and Test personnel, MELCO ESC commits to compliance with the following.

- ASME NQA-1-1994, Basic Requirement 2 and Supplements 2S-1 and 2S-2

Exceptions

- ASME NQA-1-1994, Supplement 2S-1
In lieu of Nonmandatory Appendix 2A-1, MELCO ESC may not establish levels of qualification/ certification for all inspection personnel. Instead, MELCO ESC establishes initial qualification requirements and determines individual qualification through evaluation of education, training and experience, and through demonstration of capability in performing the type of inspections expected on the job.

3.21 QA Program Commitments

MELCO ESC commits to the following Regulatory Guides and Standards as part of the QAP.

- Regulatory Guide 1.28, [Revision 3, August 1985], Quality Assurance Program Requirements (Design and Construction)
 - ❖ MELCO ESC has not committed to Regulatory Position C.2 and Table 1 in RG 1.28 with regard to QA records and retention times. MELCO ESC is an equipment/services vendor. Measures will be established that ensure that sufficient records of completed items and activities affecting quality are appropriately stored. Records of activities and their retention times are defined in appropriate procedures. The records and retention times may be specified by the customer in contractual and purchasing documentation.

- Regulatory Guide 1.54, [Revision 1, July 2000] - Service Level I, II, and III Protective Coatings Applied to Nuclear Power Plants
 - ❖ Regulatory Guide 1.54 provides guidance for the application of protective coatings within nuclear power plants to protect surfaces from corrosion, contamination from radionuclides, and for wear protection. MELCO ESC will comply with the requirements in this regulatory guide when requested by the customer.

- Software Related Regulatory Guides and Standards
 - ❖ MELCO ESC commits to the Nuclear Regulatory Commission (NRC) Regulatory Guides and endorsed standards as described in the MELCO ESC "MELTAC Platform Software Program Manual" (JEXU-1041-1016).

- ASME NQA-1-1994 Edition – Quality Assurance Requirements for Nuclear Facility Applications
 - ❖ MELCO ESC commits to NQA-1-1994, Parts I, II, and III, as described in the foregoing sections of this document.

3.22 10 CFR Part 21 Programs for Reporting Defects and Noncompliance

The MELCO ESC 10 CFR Part 21 Programs for Reporting Defects and Noncompliance are described in Part II, Sections 15, 16 and 20 of the MELCO ESC "Quality Manual based on U.S. Nuclear Regulations" (N-G000). In establishing its 10 CFR Part 21 Programs for Reporting Defects and Noncompliance, MELCO ESC commits to compliance with the following.

- 10 CFR Part 21 "Reporting of Defects and Noncompliance"

3.23 Commercial Grade Dedication

The MELCO ESC Commercial Grade Dedication (CGD) Program is described in Part II, Section 7 of the MELCO ESC “Quality Manual based on U.S. Nuclear Regulations” (N-G000). The MELCO ESC CGD Program is subordinate to the MELCO ESC QAP. In establishing its CGD Program, MELCO ESC commits to compliance with the following.

- 10 CFR Part 21 “Reporting of Defects and Noncompliance”
- EPRI NP-5652 “Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications,” dated June 1988 as discussed in NRC Generic Letter 91-05.

For Commercial Grade Items and Services, special quality verification requirements are established and described in MELCO ESC documents to provide the necessary assurance an item or service will perform satisfactorily. The MELCO ESC documents address determining the critical characteristics that ensure an item or service is suitable for its intended use, technical evaluation of the item or service, receipt requirements, and quality evaluation of the item or service.

MELCO ESC will also use other appropriate approved regulatory means and controls to support MELCO ESC CGD activities. Examples of this are the Electric Power Research Institute (EPRI) Topical Report TR-106439, “Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications,” dated July 1997 and Electric Power Research Institute (EPRI) Topical Report TR-107330, “Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants,” dated December 1996.

3.24 Digital Equipment Software Verification and Validation Quality Controls

The MELCO ESC Software Program is described in the MELCO ESC “MELTAC Platform Software Program Manual” (JEXU-1041-1016). The MELCO ESC Software Program is subordinate to the MELCO ESC QAP. MELCO ESC commits to the Nuclear Regulatory Commission (NRC) Regulatory Guides and endorsed standards as described in the MELCO ESC “MELTAC Platform Software Program Manual” (JEXU-1041-1016).

3.25 Nonsafety-Related SSC Quality Controls

MELCO ESC may utilize the existing ISO-9001 “Quality Management Systems” compliant QAP for Nonsafety-Related structures, systems and components (SSC) quality controls. Contractual requirements will be considered when determining what quality requirements to apply to internally produced Nonsafety-Related SSCs.

4.0 REFERENCES

1. N-G000, "Quality Manual based on U.S. Nuclear Regulations"
2. JEXU-1041-1016, "MELTAC Platform Software Program Manual"
3. JEXU-1041-1008, "Safety System Digital Platform - MELTAC - Topical Report"
4. JEXU-1041-1012, "Mapping of MELTAC Platform Licensing Documents to the DI&C-ISG-06 Guidance"
5. 10 CFR 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants"
6. 10 CFR Part 21, "Reporting of Defects and Noncompliance"
7. Regulatory Guide 1.28, [Revision 3, August 1985], "Quality Assurance Program Requirements (Design and Construction)"
8. Regulatory Guide 1.54, [Revision 1, July 2000] - Service Level I, II, and III Protective Coatings Applied to Nuclear Power Plants
9. NRC Generic Letter 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products (Generic Letter 89-02), March 21, 1989"
10. NRC Generic Letter 91-05, "Licensee Commercial Grade Procurement and Dedication Programs (Generic Letter 91-05), April 9, 1991"
11. ASME NQA-1-1994 Edition, "Requirements for Nuclear Facility Applications"
12. EPRI NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications", dated June 1988
13. Electric Power Research Institute (EPRI) Topical Report TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications", dated July 1997
14. Electric Power Research Institute (EPRI) Topical Report TR-107330, "Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants", dated December 1996.
15. ISO-9001, "Quality Management Systems"

Table 1 “MELCO ESC Manuals and Major QAP Procedures”

Table 1 “MELCO ESC Manuals and Major QAP Procedures”			
Cat. No.	Requirement Category	Procedures	Procedure No.
-	Manual	Quality Manual based on U.S. Nuclear Regulations	ESC N-G000
		MELTAC Platform Software Program Manual	JEXU-1041-1016
0	General	10 CFR 50 Appendix B Quality Assurance Program and ESC Procedure Number Assignment Procedure (NQA-1)	ESC N-0001
		ESC N Procedure Distribution Procedure (NQA-1)	ESC N-0002
1	Organization	Organization Procedure (NQA-1)	ESC N-0100
2	Quality Assurance Program	Quality Assurance Activity Management Procedure (NQA-1)	ESC N-0200
		Nondestructive Examination Personnel Qualification Procedure (NQA-1)	ESC N-0201
		Inspection and Test Personnel Training Procedure (NQA-1)	ESC N-0202
		Auditors Qualification Procedure (NQA-1)	ESC N-0203
		Supplier Commercial Grade Survey Personnel Qualification Procedure (NQA-1)	ESC N-0204
		Special Process (Welding) Personnel Qualification Procedure (NQA-1)	ESC N-0205
3	Design Control	Software Quality Monitoring Procedure (NQA-1)	ESC N-0210
		Design Control Procedure (NQA-1)	ESC N-0300
		Qualification Procedure for Design and Design Verification Personnel (NQA-1)	ESC N-0301
		QC Flow Chart Procedure (NQA-1)	ESC N-0302
		Guideline for creating Project Plan (NQA-1)	ESC N-0310
		Quality Management Individual Plan Procedure (NQA-1)	ESC N-0311
		Documentation Tree Procedure (NQA-1)	ESC N-0312
		Design Interface Control Procedure (NQA-1)	ESC N-0313
		Requirement Specification Procedure (NQA-1)	ESC N-0314
		Design Input and Output Control Procedure (NQA-1)	ESC N-0320
		Design Document Tracking List Procedure (NQA-1)	ESC N-0331
		Design Review Procedure (NQA-1)	ESC N-0332
		Qualification Test Procedure (NQA-1)	ESC N-0333
		Quality Plan Review Procedure (NQA-1)	ESC N-0334
		Safety System Hardware Configuration Management Procedure (NQA-1)	ESC N-0340
		Design Change Control Procedure (NQA-1)	ESC N-0341
		Software Management Procedure (NQA-1)	ESC N-0350
		Procedure for Software Lifecycle Activity (NQA-1)	ESC N-0351
		Safety System Software V&V Procedure (NQA-1)	ESC N-0352
		Safety System Software V&V Implementation Procedure (NQA-1)	ESC N-0353
		Safety System Software Configuration Management Procedure (NQA-1)	ESC N-0354
Safety System Software Coding Rule (NQA-1)	ESC N-0355		
Safety System Software Registration Control Procedure (NQA-1)	ESC N-0356		
Safety System Software Cyber Security Procedure (NQA-1)	ESC N-0357		
Development Environment Control Procedure (NQA-1)	ESC N-0380		
Software Safety Analysis Procedure (NQA-1)	ESC N-0390		

Cat. No.	Requirement Category	Procedures	Procedure No.
4	Procurement Document Control	Procurement Document Control Procedure (NQA-1)	ESC N-0400
		Procurement Specification Procedure (NQA-1)	ESC N-0401
5	Instructions, Procedures, and Drawings	ESC Standards Procedure (NQA-1)	ESC N-0500
		Standard Item Description Preparation Procedure (NQA-1)	ESC N-0510
		Order and Item List Preparation Procedure (NQA-1)	ESC N-0512
		Parts List Preparation Procedure (NQA-1)	ESC N-0513
		Production Drawing Preparation Procedure (NQA-1)	ESC N-0514
		Design Document Issuance Procedure (NQA-1)	ESC N-0520
6	Document Control	Document Control Procedure (NQA-1)	ESC N-0600
7	Control of Purchased Items and Services	Purchased Items and Services Control Procedure (NQA-1)	ESC N-0700
		Supplier Selection Procedure (NQA-1)	ESC N-0701
		Supplier Quality Audit Procedure (NQA-1)	ESC N-0702
		Supplier Performance Evaluation Procedure (NQA-1)	ESC N-0703
		Supplier Document Exchange Control Procedure (NQA-1)	ESC N-0704
		Purchased Items Acceptance Procedure (NQA-1)	ESC N-0710
		Nonconforming Purchased Items Control Procedure (NQA-1)	ESC N-0711
		Commercial Grade Item Acceptance Procedure (NQA-1)	ESC N-0721
		Supplier Commercial Grade Survey Procedure (NQA-1)	ESC N-0722
		Special Test and Inspection Procedure for Commercial Grade Item Acceptance (NQA-1)	ESC N-0723
		Purchased Items Registration Procedure (NQA-1)	ESC N-0729
		Commercial Grade Service Acceptance Procedure (NQA-1)	ESC N-0731
		Supplier Commercial Grade Survey Procedure for Commercial Grade Service Acceptance (NQA-1)	ESC N-0732
		Special Test and Inspection Procedure for Commercial Grade Service Acceptance (NQA-1)	ESC N-0733
Source Verification Procedure for Commercial Grade Service Acceptance (NQA-1)	ESC N-0735		
		Procured Service Registration Procedure (NQA-1)	ESC N-0739
8	Identification and Control of Items	Item Identification and Control Procedure (NQA-1)	ESC N-0800
9	Control of Processes	Process Control Procedure (NQA-1)	ESC N-0900
		Manufacturing Environment Control Procedure (NQA-1)	ESC N-0901
		Documentation and Labeling Procedure for Printed Wiring Board Assembly Process (NQA-1)	ESC N-0910
		Component Collecting Procedure for Printed Wiring Board Component Mounting (NQA-1)	ESC N-0911
		ROM Writing Procedure (NQA-1)	ESC N-0912
		Printed Wiring Board Component Surface Mounting Procedure (NQA-1)	ESC N-0913
		Printed Wiring Board Component Insertion Procedure (NQA-1)	ESC N-0914
		Printed Wiring Board Soldering and Assembly Procedure (NQA-1)	ESC N-0916
		Printed Circuit Assembly Coating Procedure (NQA-1)	ESC N-0918
		Finished Printed Circuit Assembly Inspection and Forwarding Procedure (NQA-1)	ESC N-0919

Cat. No.	Requirement Category	Procedures	Procedure No.
		Printed Wiring Board Components Receipt Inspection Procedure (NQA-1)	ESC N-0920
		Visual Inspection Procedure (NQA-1)	ESC N-0930
		Printed Circuit Assembly Solder Joint Inspection Procedure (NQA-1)	ESC N-0931
		Cabinet and Unit Check Procedure (NQA-1)	ESC N-0940
		Product Appearance Check Meeting Procedure (NQA-1)	ESC N-0941
		Cabinet and Unit Traveler Procedure (NQA-1)	ESC N-0951
		Cabinet and Unit Component Collection and Manufacturing Procedure (NQA-1)	ESC N-0952
		Cabinet and Unit Pre-Test Check Procedure (NQA-1)	ESC N-0953
		Crimping Procedure (NQA-1)	ESC N-0954
		Screw Tightening Procedure (NQA-1)	ESC N-0955
		Soldering Procedure (NQA-1)	ESC N-0956
		Wire Wrapping Procedure (NQA-1)	ESC N-0957
		Traveler Preparation Procedure for Sheet Metal Fabrication Process (NQA-1)	ESC N-0980
		Drawing and Document Assembly Procedure for Sheet Metal Fabrication Process (NQA-1)	ESC N-0981
		Sheet Metal Machining Procedure (NQA-1)	ESC N-0982
		Welding Procedure (NQA-1)	ESC N-0983
		Acceptance Criteria for Sheet Metal Fabrication and Coating Processes (NQA-1)	ESC N-0984
		Sheet Metal Coating Procedure (NQA-1)	ESC N-0985
10	Inspection	Inspection Procedure (NQA-1)	ESC N-1000
11	Test Control	Test Control Procedure (NQA-1)	ESC N-1100
12	Control of Measuring and Test Equipment	Measuring and Test Equipment Control Procedure (NQA-1)	ESC N-1200
13	Handling, Storage, and Shipping	Handling, Storage, and Shipping Control Procedure (NQA-1)	ESC N-1300
14	Inspection, Test, and Operating Status	Inspection, Test, and Operating Status Control Procedure (NQA-1)	ESC N-1400
15	Control of Nonconforming Items	Nonconforming Items Control Procedure (NQA-1)	ESC N-1500
16	Corrective Action	Corrective Action Procedure (NQA-1)	ESC N-1600
17	Quality Assurance Records	Quality Assurance Record Control Procedure (NQA-1)	ESC N-1700
18	Audits	Audit Procedure (NQA-1)	ESC N-1800
		Software Audit Procedure (NQA-1)	ESC N-1810
20	Order Entry	Order Entry Procedure (NQA-1)	ESC N-2000
30	10 CFR 21	Procedure for Reporting of Defects and Noncompliance (10CFR21) (NQA-1)	ESC N-3000