KINS-IAEA Workshop on Safety Review & Inspection Methodologies for Quality Assurance, 13 ~ 17 May 2019, KINS, Korea

Quality Assurance

QA Criteria II

(3.Design; 5.Instructions, Procedures & Drawings; 6.Document Control)

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Quality Assurance Requirements

(KEPIC QAP 2011 Addenda = ASME NQA-1 2009 Addenda)

1. Organization
2. QA Program
3. **Design Control**
4. Procurement Document Control
5. **Instructions, Procedures and Drawings**
6. **Document Control**
7. Control of Purchased Items and Services
8. Identification and Control of Items
9. Control of Special Processes
10. Inspection
11. Test Control
12. Control of Measuring and Test Equipment
13. Handling, Storage and Shipping
14. Inspection, Test, and Operating Status
15. Control of Nonconforming Items
16. Corrective Actions
17. QA Records
18. Audits

Quality Assurance Requirements

(KEPIC QAP 2011 Addenda = ASME NQA-1 2009 Addenda)

전 력 산 업 기 술 기 준
Korea Electric Power Industry Code

QA 품질보증 Quality Assurance

QAP 원자력 품질보증

Nuclear Quality Assurance

[ASME NQA-1 ; 2008 Edition + 2009 Addenda : 일치 / IDT]

2011년 추록
2011. 11. 30 발행

2011 Addenda
Issued on November 30, 2011

KEPIC 정 책 위 원 회
기술품질전문위원회

Board of KEPIC
Quality Assurance T/C

QAP-1

원자력 품질보증 계획요건

REQUIREMENTS FOR QUALITY ASSURANCE PROGRAMS FOR NUCLEAR FACILITIES

QAP-2

원자력 품질보증 기술요건

QUALITY ASSURANCE REQUIREMENTS FOR NUCLEAR FACILITY APPLICATIONS

QAP-3

임의부록

NONMANDATORY APPENDICES

(From Former QAP-1 and QAP-2)

Quality Assurance Requirements
(KEPIC QAP-1 / ASME NQA-1)

3. Design Control

Contents

- ☐ **Area of Review**
- ☐ **Requirements**
- ☐ **Verification Practices**
- ☐ **Case of Deviation (KINS Inspection Findings)**

Requirement 3. Design Control

- Area of Review

- *Define the Design*
  - Technical Requirements
  - Design Process
  - Design Output Documents
- *Verification of Design adequacy*
- *Interface Control of Design*

Requirement 3. Design Control

- Requirements

100 BASIC

The design shall be defined, controlled, and verified.

Design inputs shall be specified on a timely basis and translated into design documents.

Design interfaces shall be identified and controlled.

Design adequacy shall be verified by individuals other than those who designed the item or computer program.

Design changes shall be governed by control measures commensurate with those applied to the original design.

Requirement 3. Design Control

- Requirements

200 Design Input

Applicable design inputs shall be identified and documented, and their selection reviewed and approved.

The design input shall be specified to the level of detail necessary

- to permit the design activities to be carried out in a correct manner and
- to provide a consistent basis for making design decisions, accomplishing design verification measures, and evaluating design changes.

Requirement 3. Design Control

- Requirements

- Definition

Design Inputs

Those criteria, performance requirements, codes and standards, design bases, regulatory requirements, or other design requirements upon which detailed final design is based

Design Outputs

Drawings, specifications, and other documents used to define technical requirements of structures, systems, components, and computer programs

Requirement 3. Design Control

• Requirements

300 Design Process

(a) The responsible design organization shall prescribe and document the design activities to the level of detail necessary to permit verification that the design meets requirements. Design documents shall support facility design, construction, and operation. Appropriate quality standards shall be identified and documented, and their selection reviewed and approved.

(b) The design methods, materials, parts, equipment, and processes that are essential to the function of the items shall be selected and reviewed for suitability of application. Applicable information derived from experience, as set forth in reports or other documentation, shall be made available to cognizant design personnel.

Requirement 3. Design Control

• Requirements

300 Design Process (continued)

(c) The final design shall

(1) be relatable to the design input by documentation in sufficient detail to permit design verification.

(2) specify required inspections and tests and include or reference appropriate acceptance criteria.

(3) identify assemblies and/or components that are part of the item being designed. When such an assembly or component part is a commercial grade item (CGI*), the critical characteristics of the item to be verified for acceptance and the acceptance criteria for those characteristics shall meet the requirements of QAP-2 Subpart 2.14, Quality assurance Requirements for Commercial Grade Items and Services.

Requirement 3. Design Control

Definitions from QAP-2 Subpart 2.14

CGI : a structure, system, component, or part thereof that affects its safety function, that was not designed and manufactured as a basic component.

Basic Component : a structure, system, component, or part thereof that affects its safety function, that was designed and manufactured in accordance with the requirements of this Standard, or CGIs which have successfully completed the dedication process.

Dedication : an acceptance process to provide reasonable assurance that a CGI or commercial grade service will perform its intended safety function, and in this respect, is deemed equivalent to an item or service designed and manufactured or provided under the requirements of this Standard.

* For more information, refer to the Requirement 4. Procurement Document Control, and Requirement 7. Identification and Control of Purchased Items on CGI and CGI dedication

Requirement 3. Design Control

• Requirements

400 Design Analysis

Design analyses shall be sufficiently detailed such that a person technically qualified in the subject can review and understand the analyses and verify the adequacy of the results without recourse to the originator.

401 Use of Computer Programs

To extent required in paras. 401(a) and (b), computer program acceptability shall be pre-verified or the results verified with the design analysis for each application. Pre-verified computer programs shall be controlled in accordance with the requirements of this Standard.

(a) The computer program shall be verified to show that it produces correct solutions for the encoded mathematical model within defined limits for each parameter employed.

(b) The encoded mathematical model shall be shown to produce a valid solution to the physical problem associated with the particular application.

Requirement 3. Design Control

• Requirements

402 Documentation of Design Analysis

Documentation of design analyses shall include the following:

(a) The objective of the analyses

(b) Design inputs and their sources

(c) Results of literature searches or other applicable background data

(d) Assumptions and indication of those assumptions that must be verified as the design proceeds

(e) Identification of any computer calculation, including identification of the computer type, computer program name, and revision, inputs, outputs, evidence of or reference to computer program verification, and the bases (of reference thereto) supporting application of the computer program to the specific physical problem

(f) Review and approval

Requirement 3. Design Control

•Requirements

500 Design Verification

(a) The responsible design organization shall identify and document the particular design verification method(s) used. The results of design verification shall be documented with the identification of the verifier clearly indicated. Design verification shall be performed by any competent individual(s) or group(s) other than those who performed the original design but who may be from the same organization.

This verification maybe performed by the originator's supervisor, provided

(1) the supervisor did not specify a singular design approach or rule out certain design considerations and did not establish the design inputs used in the design; or

(2) the supervisor is the only individual in the organization competent to perform the verification.

Cursory supervisor reviews do not satisfy the intent of this Standard.

(b) Design verification shall be performed prior to releasing the design for procurement, manufacture, construction, or use by another design organization, except where this timing can not be met, such as when insufficient data exist. In those cases, the unverified portion of the design shall be identified and controlled.

Requirement 3. Design Control

• Requirements

500 Design Verification (continued)

(c) If the design is modified to resolve verification findings, the modified design shall be verified prior to release for use.

(d) Extent of Design Verification.

The extent of the design verification shall be a function of the importance to safety, the complexity of the design, the degree of standardization, the state of the art, and the similarity with previously proved design. Where the design has been subjected to a verification process in accordance with this QAP-1, the verification process need not be duplicated for identical designs.

However, the applicability of standardized or previously proven designs, with respect to meeting pertinent design inputs, shall be verified for each application.

Requirement 3. Design Control

• Requirements

501 Design Verification Methods

Acceptable verification methods include, but are not limited to, any one or a combination of the following;

(a) Design reviews

(b) Alternate calculation

(c) Qualification testing

Testing shall demonstrate adequacy of performance under conditions that simulate the most adverse design conditions.

Requirement 3. Design Control

• Requirements

501.1 Design Reviews

Design reviews shall provide assurance that the final design is correct and satisfactory by addressing, where applicable, paras. 501.1(a) through (g)

(a) Were the design inputs correctly selected?

(b) Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are complete?

(c) Were appropriate design methods and computer programs used?

(d) Were the design inputs correctly incorporated into the design?

(e) Is the design output reasonable compared to design inputs?

(f) Are the necessary design inputs for interfacing organizations specified in the design documents or in supporting procedures or instructions?

(g) Have suitable materials, parts, processes, and inspection and testing criteria been specified?

Requirement 3. Design Control

• Requirements

501.2 Alternate Calculations

Alternate calculations shall use alternate methods to verify correctness of the original calculations or analyses. The appropriateness of assumptions; input data used; and the computer program, its associated computer hardware and system software, or other calculation method used shall also be reviewed.

501.3 Qualification Tests

Testing shall demonstrate adequacy of performance under conditions that simulate most adverse design conditions. Operating mode and environmental conditions shall be considered in determining the most adverse conditions. Where the test is intended to verify only specific design features, the other features of the design shall be verified by other means. Where tests are being performed on models or mockups, scaling laws shall be established and verified. The results of model test work shall be subject to error analysis, where appropriate, prior to use in the final design.

Requirement 3. Design Control

• Requirements

600 Change Control

(a) Changes to design inputs, final design, field changes, and temporary and permanent modifications to operating facilities shall be justified and subject to design control measures commensurate with those applied to original design.

These measures shall include evaluation of effects of those changes on the overall design and on any analyses upon which the design is based.

The evaluation shall include facility configurations that occur during operation, maintenance, test, surveillance, and inspection activities.

Changes shall be approved by the same affected groups or organizations that reviewed and approved the original design documents.

When the organization originally responsible for review and approval of the original design documents is no longer responsible, the owner or his designee shall have responsibility or designate a new responsible organization.

The design organization approving the change shall have demonstrated competence in the specific design area of interest and have an adequate understanding of the requirements and intent of the original design.

Requirement 3. Design Control

- Requirements

600 Change Control (continued)

(b) When a design change is approved other than by revision to the affected design documents, measures shall be established to incorporate the change into these documents, where such incorporation is appropriate.

(c) Where a significant design change is necessary because of an incorrect design, the design process and verification procedure shall be reviewed and modified as necessary.

Requirement 3. Design Control

• Requirements

601 Configuration Management of Operating Facilities

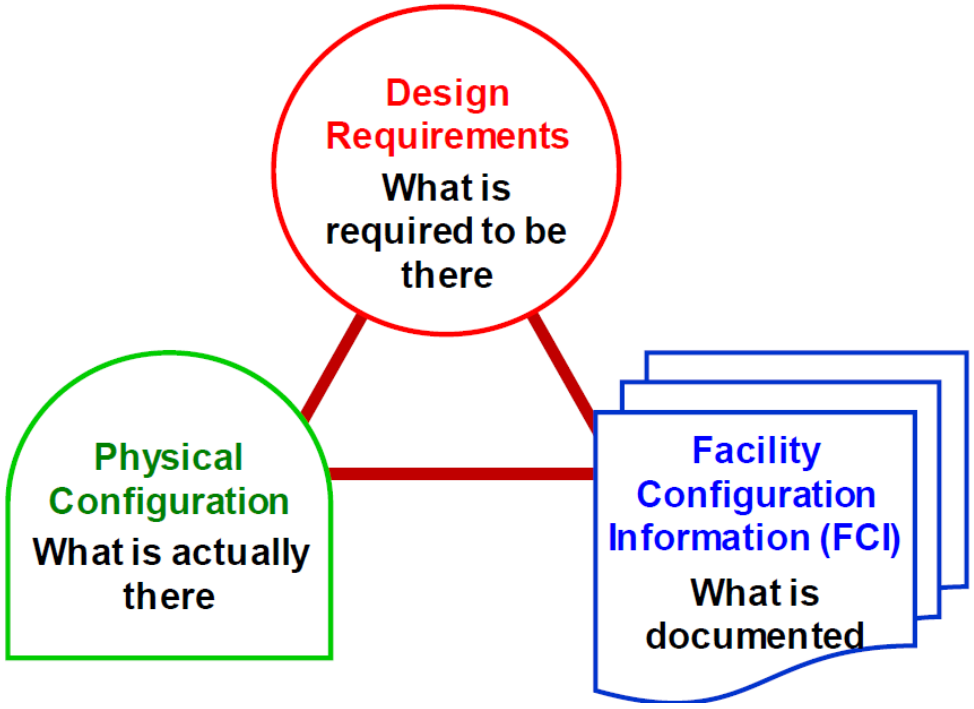
Procedures implementing configuration management requirements shall be established and documented at the earliest practical time prior to facility operation. These procedures shall include the responsibilities and authority of the organizations whose functions affect the configuration of the facility including activities such as operations, design, maintenance, construction, licensing and procurement.

- Definition

Configuration Management is the process that controls the activities, and interfaces, among design, construction, procurement, training, licensing, operation, and maintenance to ensure that the configuration of the facility is established, approved, and maintained

Requirement 3. Design Control

Three Elements of Configuration Management



Requirement 3. Design Control

• Requirements

601.1 Configuration management requirements shall include measures to ensure changes that may affect the approved configuration are recognized and processed.

601.2 The configuration shall be established and approved at the earliest practical time prior to initial operation of the facility and maintained for the life of the facility

601.3 The configuration shall include, as applicable, characteristics derived from regulatory requirements and commitments, calculations and analyses, design inputs, installation and test requirements, supplier manuals and instructions, operating and maintenance requirements, and other applicable sources

Requirement 3. Design Control

• Requirements

601.4 Interface controls shall include the integration of activities of organizations that can affect the approved configuration.

601.5 Documentation shall identify the design bases and the approved configuration for the approved modes of operation.

601.6 Measures shall be established and implemented to ensure that proposed changes to the configuration are evaluated for their conformance to the design bases.

601.7 The implementation sequence for approved configuration changes shall be reviewed to determine that the configuration conforms to the design bases.

Requirement 3. Design Control

• Requirements

601.8 Approval by the design authority shall be required prior to implementation of a change to the design bases.

601.9 The configuration of the facility shall be documented in drawings, specifications, procedures, and other documents that reflect the operational status of the facility.

The process used to control the current revision and issuance of these documents shall take into account the use of document and the need for revision in support of operation.

Requirement 3. Design Control

- Requirements

700 Interface Control

Interface controls shall include assignment of responsibility and establishment of procedures among participating organizations for review, approval, release, distribution, and revision of documents involving design interfaces.

Design information transmitted across interfaces shall identify the status of design information of documents provided and identify incomplete items that require further evaluation, review, or approval.

Where it is necessary to initially transmit design information orally or by other informal means, the transmittal shall be confirmed promptly by a controlled documents.

Requirement 3. Design Control

- Requirements

800 Software Design Control

The requirements section 800 apply to computer software design control and shall be used instead of section 200, Design Input; section 300, Design Process; section 500, Design Verification; and section 600, Change Control.

QAP-2 Subpart 2.7*, Quality Assurance Requirements for Computer Software for Nuclear Facility Applications, provides work practice requirements to implement the requirements of this paragraph.

Requirement 3. Design Control

- Requirements

* KEPIC QAP-2, Subpart 2.7, Quality Assurance Requirements for Computer Software for Nuclear Facility Applications

100 General

200 General Requirements

300 Software Acquisition

400 Software Design Method

500 Standards, Conventions, and other Work Practices

600 Support Software

700 References

Requirement 3. Design Control

- Requirements

801 Software Design Process

Software design process shall be documented, approved by the responsible design organization, and controlled.

This process shall include the activities described in paras. 801.1 through 801.5 of this Requirement.

801.1 Identification of Software Design Requirements.

Software design requirements shall be identified and documented and their selection reviewed and approved. This software requirements shall identify the operating system, function, interfaces, performance requirements, installation considerations, design inputs, and any design constraints of the computer program.

Requirement 3. Design Control

• Requirements

801.2 Software Design

The software design shall be documented and shall define the computational sequence necessary to meet the software requirements.

The documentation shall include, as applicable, numerical methods, mathematical models, physical models, control flow, control logic, data flow, process flow, data structures and process structures. This documentation may be combined with the documentation of the software design requirements, or the computer program listings resulting from implementation of the software design.

801.3 Implementation of the Software Design

The software design shall be translated into computer program(s) using the programming organization's or design organization's programming standards and conventions.

Requirement 3. Design Control

• Requirements

801.4 Software Design Verification

The software design verification shall be performed by competent individual(s) or group(s) other than those who developed and documented the original design, but who may be from the same organization.

This verification may be performed by the originator's supervisor, provided

(a) The supervisor did not specify a singular design approach or rule out certain design considerations and did not establish the design inputs used in the design, or

(b) The supervisor is the only individual in the organization competent to perform the verification.

Cursory supervisory reviews do not satisfy the intent of this Standards.

The results of verification shall be documented with the identification of the verifier indicated. Software verification methods shall include any one of a combination of design reviews, alternate calculations, and tests performed during computer program development. The extent of verification and the methods chosen are a function of the complexity of the software, the degree of standardization, the similarity with previously proved software, and the importance to safety.

Requirement 3. Design Control

• Requirements

801.5 Computer program testing

Computer program testing shall be performed and shall be in accordance with Requirement 11.

802 Software Configuration Management

Software configuration management includes, but is not limited to configuration identification, change control, and status control. Configuration items shall be maintained under configuration management until the software is retired.

Requirement 3. Design Control

• Requirements

802.1 Configuration Identification

A software baseline shall be established at the completion of each activity of the software design process.

Approved changes created subsequent to a baseline shall be added to the baseline. A baseline shall define the most recently approved software configuration.

A labeling system for configuration items shall be implemented that

(a) Uniquely identifies each configuration item

(b) Identification changes to configuration item by revision

(c) Provides the ability to uniquely identify each configuration of the revised software available for use

Requirement 3. Design Control

• Requirements

802.2 Configuration Change Control

Change to software shall be formally documented. The documentation shall include

(a) A description of the change

(b) The rationale of the change

(c) The identification of affected software baselines

The change shall be formally evaluated and approved by the organization responsible for the original design, unless an alternate organization has been given the authority to approve the changes. Only authorized changes shall be made to software baselines.

Appropriated verification activities shall be performed for the change.

The change shall be appropriately reflected in documentation, and traceability of the change to the software design requirement shall be maintained. Appropriate acceptance testing shall be performed for the change.

Requirement 3. Design Control

• Requirements

802.3 Configuration Status Control

The status of configuration items resulting from software design shall be maintained current.

Configuration item changes shall be controlled until they are incorporated into the approved product baseline.

The controls shall include a process for maintaining the status of changes that are proposed and approved, but not implemented.

The controls shall also provide for notification of this information to affected organizations.

Requirement 3. Design Control

• Requirements

900 Documentation and Records

Design documentation and records shall include not only final design documents, such as drawings and specifications, and revisions to those documents, but also documentation that identifies the important steps in the design process, including sources of design inputs that support the final design.

Requirement 3. Design Control

• Verification Practices

- *Design Plan*:
  Used to define responsibilities, design inputs (regulatory requirements, etc.), verification method, interfaces, change control, and design output documents

- *Design output documents*:
  Design report, technical specifications, drawings, system description, manufacturing & assembling specification, operation instruction, etc.

Requirement 3. Design Control

[Sample of Design Plan]

1. Design Schedule	Design Output		Duration or Completion Date
	1) Design Drawing Preparation		
	2) Calculation Preparation		
	3) ASME / KEPIC Design Report Preparation		
	4) Design Report Owner Review		
2. Assigned Engineer	Activity	Cognizant Engineer	Reviewer
	Design Drawing		
	Calculation/Design Report		
3. Design Input	1) Design Specification No ; Rev ☐☐☐☐		
	2) ASME or KEPIC Code ;		
4. Design Verification Method	( ) Design Review, ( ) Alternate Analysis, ( ) Qualification Test		
5. Internal & External Design Interface Organizations			

Requirement 3. Design Control

[Sample of Design Verification Report]

Korea Valve Co. Ltd.	Design Verification Report (DVR)	DVR No. : Page: of
Customer:	Project Name:	
Code Class:	Design Specification No.:	Rev.
Reviewed Document No.:	Design Input & Output Data Review Document No.:	Rev.
Design Report No.:	Seismic Qualification Report No.:	Rev.

Methods

☐ Design Review ☐ Alternate Calculation ☐ Qualification Test

Conclusion :

Attachments:

Verified by : Date:

Requirement 3. Design Control

[Sample of Design Review Sheet]

Korea Valve Co. Ltd.	Design Review Sheet	Rev. No.:			
		Page: of			
Review Items	Para. No. in Document	Acceptable			Remarks
		Yes	No	N/A	
1. The preparer, reviewer and approver are identified.					
2. The report is certified by a registered professional engineer (RPE) in accordance with the KEPIC as requested.					
3. Assumptions necessary to perform the design activity are adequately described and reasonable.					
4. Assumptions are identified for subsequent reverification when the detailed design activities are completed, where necessary.					
5. Were appropriate design methods used?					
6. Were appropriate computer program used?					
7. The design inputs were correctly selected and incorporated into the design?					
8. The design output is reasonable compared to design inputs.					
9. Any drawings resulting from the design addressed in the report are identified.					
10. Any calculations, analysis, test results and other information that were the basis for the report are referenced.					
11. It is conformed that the requirements of the Code and Design Specification are met.					
12. References used in the report are clearly identified.					
13. Sources of factors, equations and Codes are identified throughout the report to provide traceability to each reference.					
14. Are the necessary design inputs for interfacing organization specified in the design documents or in supporting procedures or instructions.					
15. Have suitable materials, parts, processes, and inspection and testing criteria been specified?					

Requirement 3. Design Control

- Case of Deviation (KINS Inspection Finding)

Title	Inadequate Preparation of Design Calculation Report (Issued in June 2016)
Nonconformance	According to the Procedure on Design Calculation Report Management(EP-6.15, Rev.4), Design calculation report shall include design assumption matters. However, the four design calculation reports drawn up for the safety-related instrument sensing line, etc. of a nuclear reactor did not include design assumptions in the design calculations. This is the violation of the Procedure mentioned above.

Requirement 3. Design Control
(KEPIC QAP-1 / ASME NQA-1)

- Case of Deviation (KINS Inspection Finding)

Title	Inconsistency of Off-site Dose between PSAR and Design Calculation sheet (Issued in July 2018)
Nonconformance	According to the quality assurance procedure on Design Procedure (0-030-B433-003) EP-6.05(rev.2), 5.1.4, the contents of PSAR (Preliminary Safety Analysis Report) shall be consistent with the relevant design documents and PSAR and/or the design document shall be revised as necessary. However, the Off-site Doses of the EAB (Exclusive Area Boundary) and LPZ (Low Populated Zone) for MSLB (Main Steam Line Break) and SGTR (Stream Generator Tube Rupture) accidents for a nuclear reactor were posted differently as shown below in the PSAR and in the Calculation Sheet, respectively.

	Pre-accident Off-site Dose (Iodine eruption assumed)		Post-accident Off-site Dose (Iodine eruption assumed)	
	PSAR	Calculation sh.	PSAR	Calculation sh.
EAB (Thyroid)	5.44E+00	1.34E+00	4.17E+00	1.24E+00
LPZ (Thyroid)	7.56E-01	3.24E-01	1.05E+00	5.31E-01

Quality Assurance Requirements
(KEPIC QAP-1 / ASME NQA-1)

5. Instructions, Procedures, and Drawings

Contents

- ☐ **Area of Review**
- ☐ **Requirements**
- ☐ **Verification Practices**
- ☐ **Case of Deviation (KINS Inspection Findings)**

Requirement 5. Instructions, Procedures and Drawings

• Area of Review

- *Contents of instructions, procedures and drawings:*

  1) Description of work

  2) References and Material/Equipment to be utilized

  3) Prerequisite for the activity

  4) Acceptance Criteria

Requirement 5. Instructions, Procedures and Drawings

•Requirements

100 BASIC

Activities affecting quality and services shall be prescribed by and performed in accordance with documented instructions, procedures, or drawings that include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished.

The activity shall be described to a level of detail commensurate with the complexity of the activity and the need to assure consistent and acceptable results.

The need for and level of detail in written procedures or instructions shall be determined based upon complexity of the task, the significance of the item or activity, work environment, and worker proficiency and capability (education, training, experience).

Requirement 5. Instructions, Procedures and Drawings

• Verification Practices

- KINS inspection focuses on the status of establishment and implementation of Instructions, Procedures and Drawings

  - Work affecting quality is only performed by written Instructions(or Orders, etc.), Procedures, and Drawings that are commensurate with the significance and importance of the respective work?

  - Instructions, Procedures and Drawings include acceptance criteria to determine the adequacy of the performed work?

  - The latest versions of the Instructions, Procedures and Drawings are used?

Requirement 5. Instructions, Procedures, and Drawings

- Case of Deviation (KINS Inspection Findings)

Title	Inadequacy of Approval Process of Temporary Procedures (Issued in March 2017)
Nonconformance	According to the Operational Procedure on PNSC of a certain reactor, all procedures affecting nuclear safety shall be reviewed and approved by the PNSC (Plant Nuclear Safety Committee) before use. However, the following two temporary procedures of the reactor were not reviewed and approved by the PNSC review and used with only being reviewed and approved by the pertinent Department Manager who used the temporary procedures. - Test Procedure for the power supply duplication of the Solenoid Operated Valve in Main Steam Isolation Valve (Temporary Procedure No. 6514) - Test Procedure for the Installation of the HSIM Alarm in Interface Logic System (Temporary Procedure No. 6722)

Requirement 5. Instructions, Procedures, and Drawings

- Case Study (KINS Inspection Finding)

Title	Drawings used without due review and approval (Issued in September 2018)
Nonconformance	According to the quality assurance manual of a reactor, each quality related organization shall establish relative instructions, procedures, and drawings and approve before performing the relevant tasks and use of them. However, the drawings drawn up for the design change of duplication of power supply in emergency feed-water system of the reactor were used without review and approval by the responsible person.

Quality Assurance Requirements
(KEPIC QAP-1 / ASME NQA-1)

6. Document Control

Contents

- ☐ **Area of Review**
- ☐ **Requirements**
- ☐ **Verification Practices**
- ☐ **Case of Deviation (KINS Inspection Findings)**

Requirement 6. Document Control

- Area of Review

- *Document control by authorized personnel including Changes*

Preparation and review of adequacy; approval for release

Requirement 6. Document Control

- Requirements

100 BASIC

The preparation, issue and change of documents that specify quality requirements or prescribe activities affecting quality such as instructions, procedures, and drawings shall be controlled to ensure that correct documents are being employed.

Such documents, including changes thereto, shall be reviewed for adequacy and approved for released by authorized personnel.

Requirement 6. Document Control

- Requirements

200 Document Control

The following controls shall be applied to documents and changes thereto:

(a) The identification of controlled documents

(b) The specified distribution of controlled documents for use at the appropriate location

(c) The identification of individuals responsible for the preparation, review, approval, and distribution of controlled documents

(d) The review of controlled documents for adequacy, completeness, and approval prior to distribution

(e) A method to ensure the correct documents are being used

Requirement 6. Document Control

•Verification Practices

Exhibit 1. Document Control Table

Sect (장)	Document Title (문서 제목)	작성 Pr. /배포 Dt.	Review (검 토)	Approval (승 인)	Recipient (수신처)	Organization /Position Code (조직/직위별 약호)
2.0	QC Manual (품질관리계획서)	4	3	2	1~13	1.사장(President & CEO) 2.품질보증담당(QA Vice President) 3.품질보증팀장(QA Team Gen. Mgr.) 4.품질보증팀(QA Team) 5.비파괴검사부(NDE Dept) 6.품질관리부서(QC Dept) 7.구매팀(Procurement Team) 8.기술지원부(TAS Dept) 9.설계팀(Design Team) 10.물류지원부(LS Dept) 11.정비기술부(Maintenance Dept) 12.고객(Customer) 13.해당부서(Applicable Organization)
3.0	Customer Documents (고객 문서)	-	-	-	6, 9, 13	
	Design Documents (설계 문서)	9	9	9	-	
	Manufacturing Drawings (제작도)	9	9	9	6	
4.0	QCP(품질관리절차서)	4	4	3	1~13	
5.0	Purchase Spec. for Item/Manufacturing Services (제품/외주용역 구매사양서)	9, 13	9, 13	9, 13	6, 7, 13	
	Purchase Spec. for Welding Material (용접자재 구매사양서)	-	-	-	6, 7, 13	
	PR, 재고이동 요청서 (PTR)	9, 10	9, 10	9, 10	6, 7	
	PO(발주서)	7	6	6	6, 7	
	Cutting Plan(커팅 플랜)	9	9	9	6	
	Traveller(트래블러)	-	6	6	6	
	WPS, PS & WI for Welding (PWHT),Weld Map [용접절차사양서, 용접(용접후열처리)에 관한 사양서, 용접맵]	-	-	-	6	

Requirement 6. Document Control

• Discussions

Characteristics of Documents and Records

Documents	Records
- Provide written information about policies, processes, and procedures - Communicate information to all persons who need it - Must me changed when a processes, or procedure, etc. changes - Establish formats for recording and reporting information by the use of standardized forms	- Collected information produced by the users of the documents - Need to be easily retrieved and accessed - Contain information that is permanent and does not require updating - Not to be revised - Become an evidence showing how the past work done

Requirement 6. Document Control

- Case of Deviation (KINS Inspection Findings)

Title	Inadequacy Document Control in Main Control Room (Issued in June 2017)
Nonconformance	According to the ANSI/ANS 3.2-1994, Managerial, administrative, and Quality Assurance controls for the operation phase of NPPs, Chap. 6, 5.2.18, ".. The use of outdated or inappropriate documents shall be avoided." However, the outdated Quality Assurance Manual (QAM) were distributed and used in the Main Control Room of a reactor as shown below; - latest version : Revision No. 28-2 - the distributed and in use version : Revision No. 26-1

Requirement 6. Document Control

- Case of Deviation (KINS Inspection Findings)

Title	Mismanagement of Document Control (Issued in March 2017)
Nonconformance	According to the QA Manual Chap. 6, Document Control, 6.3.4, of a certain reactor, "Quality Assurance Department shall control documents to ensure that any discarded or outdated documents are not in use." However, the following three outdated drawings were used in the reactor • P&IDs (Piping and Instrumentation Drawings) - 71410-1-2-OF - 71410-1-2-OF - 71920-1-1-OF

Always we keep watching our Atomic Power

Thank You

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