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

Inspection Planning & Reporting

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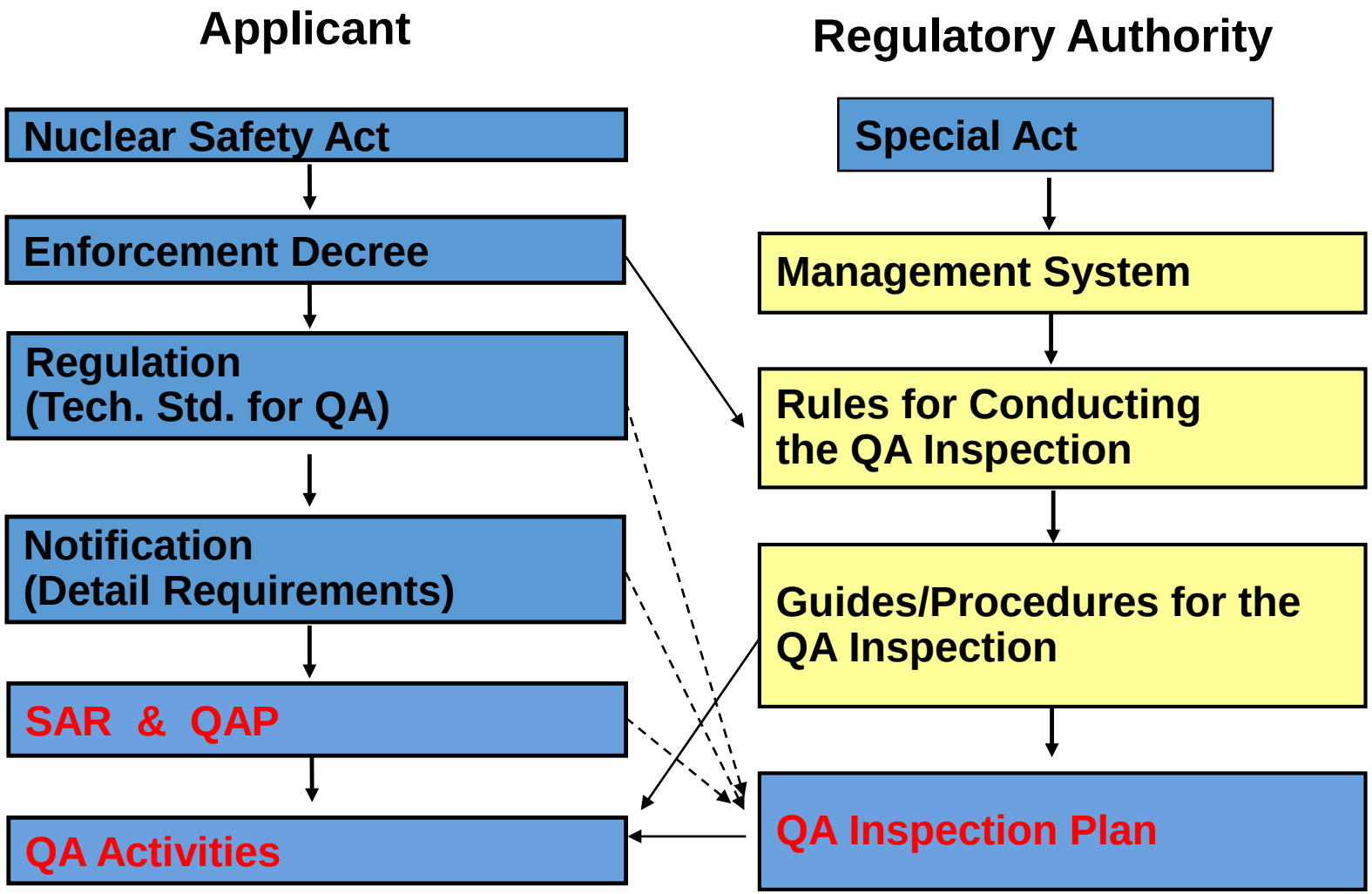
- **Regulatory Activities**



1. Inspection Planning

- **Safety Review**
  - Safety related regulatory requirements under Nuclear Safety Act are strictly observed in the design, fabrication, construction, and operation
  - Safety review of the adequacy of quality assurance program for CP and OL
- **Changes and Modification**
  - Revised QAP submitted to KINS via NSSC in accordance with Nuclear Safety Act
  - Reviewed by KINS and approved by NSSC
- **Routine and Reactive QA Inspection**
  - For evaluation of the QA activities of utility in accordance with approved QA program and KINS Guidance

1. Inspection Planning

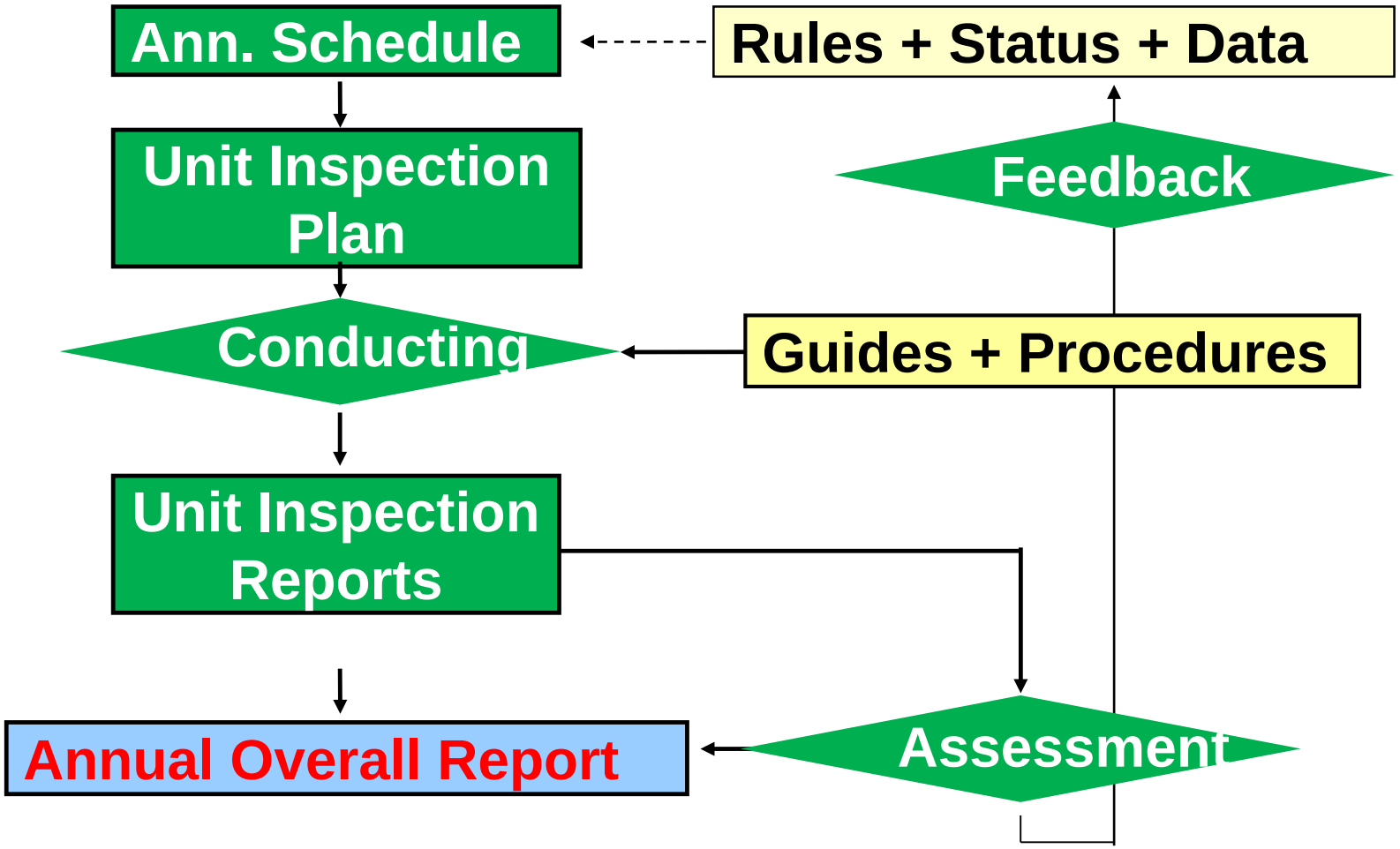
- **Objectives of Inspection**
  - ❍ To verify that ***QA program of Objects are complying with*** applicable codes, standards, and reg. requirements.
  - ❍ To verify ***effective implementation*** of QA program
  - ❍ To verify ***identification of root cause of problems*** such as non-conformances, and ***adequacy of corrective actions***

1. Inspection Planning

- **Objects of Inspection**
  - ***Licensee*** : Reactor licensee (KHNP, KAERI)
  - ***Design organizations*** : Supplies design service to reactor licensee or vendors (KEPCO E&C, DAEWOO E&C)
  - ***Construction organization*** : Supplies construction of reactor facilities (Consortium of construction companies)
  - ***Vendors*** : Supplies material, major components, or reactor fuel to reactor licensee (Doosan, KNF, etc.)

1. Inspection Planning

- **QA Inspection Flowchart**



1. Inspection Planning

- **Code of Conduct**
  - ❍ Notification of Inspection Schedule for a Year
  - ❍ Notification of Unit Inspection Plan
  - ❍ Selection of the Inspection Team
  - ❍ Pre-inspection meeting of Inspectors
  - ❍ Conducting of the Unit Inspection
  - ❍ Reporting
  - ❍ Follow-up Actions

1. Inspection Planning

- **Conduct of Inspection**

  - Opening meeting
  - Document review & tracing
  - Interviews
  - Gathering associated information
  - Team meeting for daily wrap-up
  - Daily debriefing
  - Exit Meeting

1. Inspection Planning

- **QA Inspection Planning**

Type	Frequency	Inspection Objects
Reactor Licensee	Annual	Reactor Construction & Operation
	Biannual	Research Reactor, Overseas Inspection bureau of Licensee
Vendors	Annual	Supplier (Major component Supplier), Design Organizations
	Non-periodical	Each year selected Vendors (Items important to safety),
Fuel Processing Plants	Annual	NPP Fuel Manufacturer

1. Inspection Planning

- **Assessment**
  - Effectiveness of QA programs
  - Weakness and good practices
  - Trend analyses
  - Database for feed-back
- **Reporting**
  - Debriefing of inspection result to Reactor Licensee and Vendors
    - ***Violations, Non-conformances and Recommendations***
  - Unit inspection report with findings
  - Annual report of overall inspection result to NSSC

1. Inspection Planning

❖ *Most Common Non-conformances*

1. Quality plan is not sufficient
2. Activities are performed without written instruction or with inadequate information
3. Personnel are not following existing procedures and instructions.
4. Unauthorized changes are found in all types of controlled drawings and documents
5. Standard repair and rework instructions and procedures are not available
6. Quality Assurance has been bypassed
7. Corrective action systems do not receive top management support

1. Inspection Planning

❖ *Most Common Non-conformances*

8. Corrective action concerning suppliers on defective materials is inadequate
9. Change control systems do not provide for the removal of obsolete prints and documents
10. Measuring and Test Equipment (M&TE) are overdue for calibration
11. Storerooms have material which is unidentified, unprotected, nonconforming, exceeded shelf-life, and/or degraded
12. Internal audits are not planned and/or performed
13. Audits are not performed on subcontractors

I. Inspection Reporting

2. Reporting

- **Reporting Format**

  - Written Report
    - ***Executive summary***
    - ***Highlight of findings***
    - ***Inspection results with background material***
  - Distribution of reports
    - ***cover letter***
    - ***Request for corrective action***

2. Reporting

❖ *An Example of Inspection Report*

❍ *Scope of Inspection*

- ***Design process and design document control***
- Subcontractor control
- Instructions, procedures, and drawings
- Identification and control of items
- Inspection of product testing
- Nonconformance control and corrective actions

2. Reporting

❖ *An Example of Inspection Report (continue)*

❍ *Executive Summary*

- Purpose of Inspection : To ***verify the implementation*** of company's QA program
- Inspection Basis :
  - ***KEPIC QAP and MNA 4000*** endorsed by the Notice of NSSC
  - KINS QA Inspection Procedure
  - company's QA Manual

2. Reporting

❖ *An Example of Inspection Report (continue)*

❍ *Inspection Finding*

- Registered Control Number: 19-2-030
- Title: Improper Control of Design Change
- Description: Design change (Material change for the core shroud guide lug) was made on March 25, but ***design review committee was held on July 3.***
- Basis of Finding : KEPIC QAP-1 SR 3S-1 “Design change shall be justified.”
- Corrective Action Requested : To ***verify validity and effectiveness*** of design change; and to *indoctrinate* the related personnel ***to prevent recurrence***

❖ *An Example of Inspection Report (continue)*

❍ *Recommendation*

- Registered Control Number: 09-2-007
- Title: Improve the Repair Traveler for Nonconforming Item
- Recommendation: the repair traveler was described to remove weld defects by gouging/grinding, it was ***difficult to identify the actually applied process*** whether gouging or grinding
- Basis of Finding : KEPIC QAP-1 SR 9S-1 “Process shall be controlled by travelers.”

2. Reporting

❖ *An Example of Inspection Report (continue)*

❍ *Inspection Result of Design Process and Design Document Control*

- *Introduction of inspection item*

- *Sampling* :
  - ✓5 drawings for the review of design change process
  - ✓5 Registered Professional Engineers (RPE) and 5 design engineers to verify the qualification
  - ✓3 purchase order related dedication to review dedication process of Commercial Grade Item (CGI)

2. Reporting

❖ *An Example of Inspection Report (continue)*

❍ *Inspection Result of Design Process and Design Document Control*

- *Verification of documents*:

✓ QM-200(Rev. 14) QA Manual for ASME Ⅲ and KEPIC MN & SN Construction and Material Organization Applications

✓ NQCP-0304 D(Rev. 0) Procedure for Design Change Review Committee

✓ NQCP-0202(Rev. 4) Qualification & Duties of Specialized Professional Engineer

✓ NQCP-0302 D(Rev. 2) Design Certification by Registered Professional Engineers

❖ *An Example of Inspection Report (continue)*

❍ *Inspection Result of Design Process and Design Document Control*

- *Conclusion of inspected item*:

With ***the exception of the finding (Finding No 19-2-030)***, the KINS inspection team concluded that the design process and design document control to ***correct inclusion of technical and contractual requirements***, ***qualification of registered professional engineers/design engineers*** **and** ***dedication process of CGI*** were performed effectively at company and complied with the Korean regulatory requirements.

2. Reporting

- ***Follow-up Action***

  - Inspection response status monitoring
  - Verification of corrective action
  - Closeout

Always we keep watching our Atomic Power

Thank You

KINS 한국원자력안전기술원
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