

# Research Reactor Inspection and Enforcement

## U.S. Practices

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# Inspector Qualifications and Training

- Technical Degree
- May be experienced or entry level
- NRC Technical Training Center
  - Engineering Fundamentals
  - Modified Operator Training
  - Inspecting for Performance Course
- Qualification Cards - supervisor signs off on:
  - ◆ knowledge of regulations, procedures
  - ◆ inspection accompaniment

# U.S. Inspection Concepts

- Performance Based Inspection (PBI)
  - Observation (and evaluation) to determine whether program activities are executed in a manner that ensures accomplishment of safety
- Performance
  - Accomplishing the objectives of the program

# A Matter of Emphasis

- Initial Phase of Activity
  - ◆ Review program documents
- Implementation Phase of Activity
  - ◆ Observe program performance

# Inspection Sequence

- Compliance based

- ◆ Programs and policies
- ◆ Processes and activities
- ◆ Products and results

- Performance Based

- ◆ Products and results
- ◆ Processes and activities
- ◆ Programs and policies

# Compliance

- Identify and ensure correction of compliance issues
- Compliance with the intent of the regulation is more likely achieved through a performance based inspection

# U.S. Inspection Process

- Plan
- Perform inspection
- Evaluate findings
- Report

# Inspection Planning - 1

- List activities (of personnel or equipment) performed in the area to be inspected
- Assign a priority to each activity listed
- Identify organizations with primary responsibility for the activities listed
- Identify organizations that support or are supported by the primary organizations

# Inspection Planning - 2

- Select the inspection methods for each activity
  - ◆ Direct observation
  - ◆ Document reviews
  - ◆ Interviews
  - ◆ Demonstration or walk-through
  - ◆ Combination of methods

# Inspection Planning - 3

- Identify specific elements and observable aspects of the activities
- Sources
  - ◆ Your own experience
  - ◆ Inspection supervisor input
  - ◆ Previous inspections and inspection reports
  - ◆ IAEA notices/databases
  - ◆ Equipment performance histories

# Inspection Planning - 4

- Skills and knowledge needed for the inspection
- Within the expertise of the assigned inspector?
  - ◆ Additional preparation time
  - ◆ Additional inspectors
  - ◆ Outside assistance

## Worksheet for Planning an Inspection - 1

List the activities that the company and facility perform in the area to be inspected

Using relative risk assign a priority to each activity listed

Identify the company and facility organizations with primary responsibilities for each of the activities listed

Identify organizations that support or are supported by the primary organization

Select the methods of inspection for the highest priority activities and note your reasons (direct observation, document review, interviews, walkthroughs)

## Worksheet for Planning an Inspection - 2

Select specific elements to be evaluated for each high-priority activity
Elements for Activity 1
Elements for Activity 2
Elements for Activity 3
Skills and knowledge needed to evaluate the activity elements (Does your team have the capabilities needed?)
Consider limitations imposed by schedule constraints on desired element evaluation
Using the information developed above, write a brief inspection plan on a separate page (time frame, inspection sequence, inspection personnel, the initial company personnel to be contacted, and applicable documents). The written plan should identify the principal activity elements to be observed as well as parallel observations of lower priority elements that can be made as feasible.

# Conduct the Inspection

- Observe activity elements
- Identify problems
- Address problems with facility staff
  - ◆ 80% of apparent problems resolved by more information
- Determine problem extent
- Begin program evaluation

# Evaluate Inspection Results

- Follow-up discussions
  - ◆ Process/program reasons for problem
  - ◆ Degree of significance
- Address “Why did this happen?”
  - ◆ Several times if possible
- Is facility root cause analysis threshold exceeded?
- Risk significance of problem

# Report Inspection Results

- Communicate results clearly
  - ◆ Positive as well as negative
- Support findings, conclusions, observations with facts
- Conclusions
  - ◆ Effectiveness of activities and programs
  - ◆ Context - scope of inspection and size of sample
  - ◆ Risk significance of results

## Inspection Report Review Worksheet - 1

(Write the reason for the rating under each attribute)

Attribute	Strong	OK	Weak
“Areas inspected” subsections are presented clearly and concisely			
Thresholds of significance (in determining what to document) are appropriate			
Findings are clearly developed			
- Main ideas are clearly presented			
- Observations are placed in context (e.g., sample size)			
- Assertions are supported by facts			
- Requirement or standard is included, where appropriate			

**Inspection Report Review Worksheet - 2**  
 (Write the reason for the rating under each attribute)

<b>Attribute</b>	<b>Strong</b>	<b>OK</b>	<b>Weak</b>
- Line management response to findings is included, where appropriate			
Underlying causes or process problems are identified, when determined			
Level of detail is appropriate (based on significance, complexity, and reader awareness)			
Conclusions are of appropriate scope			
- Conclusions are substantiated, and appropriate findings are referenced			
- Risk significance of findings are provided, when determined			
- If the scope of the inspection is substantial, an assessment of the adequacy of the programs supporting the area inspected			

# NRC Inspection Manual References for Research Reactors

- Manual Chapter 2545: Research and test reactor inspection program (02/03/04)
- Inspection Procedure 69001: Class II research and test reactors (02/03/04)
- Inspection Procedure 69005: Class I research and test reactor experiments (02/03/04)
- Part 9900: 10CFR 50.59 Changes, tests and experiments (3/13/01)

# Finding Categories - 1

- Report
  - ◆ Observation
  - ◆ Finding
  - ◆ Follow-up item
  - ◆ Apparent violation
  - ◆ Conclusion

# Finding Categories - 2

- Observation - any fact noted during inspection
- Finding - observation that is placed in context
  - ◆ Requirement or standard
  - ◆ Positive or negative
  - ◆ Significance
    - ◆ Actual or potential safety problem
    - ◆ Trend?
    - ◆ Corrective actions
    - ◆ Facility response

# Finding Categories - 3

- Follow-up item
  - ◆ Observation or finding
  - ◆ Will be tracked and followed
- Apparent Violation
  - ◆ Non-compliance with a licensing requirement
    - ◆ Technical Specifications
    - ◆ Regulation

# Finding Categories - 4

- Non-cited Violations
  - ◆ Minor safety, environmental and regulatory concern
  - ◆ Licensee finding handled in corrective action program
  - ◆ Whether documented in report has varied over time

# Finding Categories - 5

- Conclusions
  - ◆ Relate findings to broader context of facility program
  - ◆ Limited based on scope and depth of inspection
  - ◆ Concrete and supportable

# Finding Categories - 6

- Violations (separate letter)
  - ◆ Level IV - LCO time exceeded
  - ◆ Level III - Safety equipment not available
  - ◆ Level II - Safety function not available
  - ◆ Level I - Safety function not performed when called on in actual event

# Other Regulatory Tools

- Civil Penalty (fine)
- Confirmatory Action Letter (CAL)
- 50.54(f) letter
- Order
- Investigation (criminal law)
- Periodic Assessment Process

# NRC Impact on Safety and Performance

- New information brought to facility attention
  - ◆ May be appropriate for corrective action program
- Violation
  - ◆ Written response required
    - ◆ root causes
    - ◆ corrective action
    - ◆ risk significance
- Follow-up inspection
  - ◆ Corrective action
  - ◆ Extent of problem (program causes)