

APPENDIX A

RISK-INFORMED BASELINE INSPECTION PROGRAM

1. OBJECTIVES

The baseline inspection program is an integral part of the U.S. Nuclear Regulatory Commission's (NRC) fuel cycle oversight process and supports the goals and objectives of that process. The objectives of the baseline inspection program are:

- a. To obtain factual information providing objective evidence to determine whether fuel cycle facilities are operated safely and licensee activities do not pose an undue risk to public health and safety.
- b. To determine the adequacy of a licensee's ability to identify, assess the significance of, and effectively correct issues commensurate with their risk significance.
- c. Provide a mechanism for the NRC to remain cognizant of plant status and conditions.

2. PHILOSOPHY OF RISK-INFORMED BASELINE INSPECTION PROGRAM

The baseline inspection program provides information used to determine whether a licensee is operating safely and securely and in accordance with NRC requirements. The program was developed using a risk-informed approach to determine a comprehensive list of areas to inspect within each cornerstone of safety. Those areas are identified as "inspectable areas." Baseline inspections will: (1) provide indications of licensee performance in the inspectable areas; and (2) inspect the effectiveness of licensee problem identification and resolution programs. In addition, the baseline program provides for the initial follow up to events.

- a. Basic Philosophy of the Baseline Program. The following are the philosophical underpinnings of the risk-informed baseline inspection program:
 - i. The program is primarily indicative and not diagnostic. The baseline program delineates specific inspection activities to evaluate aspects of licensee programs and processes and their implementation by identifying findings that are indicative of licensee performance problems. Inspection findings from the baseline program are evaluated for significance and used to assess licensee performance within the cornerstones. The baseline inspections are not diagnostic assessments of licensee performance leading to root cause determinations, except in the case of the biennial problem identification and resolution (PI&R) inspections. Those assessments and root cause determinations are intended to be reviewed or independently made during supplemental inspections that are outside the scope of the baseline inspection program.

- ii. The baseline inspection program is risk-informed. The risk-informed approach means that, safety inspectable areas were selected using the risk insights from integrated safety analyses (ISAs), operational experience, deterministic analyses insights, and regulatory requirements. The ISAs were not used in developing the baseline program in the security cornerstones because the ISA focuses on safety.

Risk has been factored into the baseline inspection program in four ways: (1) inspectable areas are based on their importance in measuring a cornerstone objective; (2) risk information from ISAs was used to determine the inspection frequency, how many activities to inspect, and average estimates of how much time it takes inspecting activities in each inspectable area for ISA-related cornerstones; (3) selection of activities to inspect in each inspectable area is informed by the potential for significance under the fuel cycle significance determination process (FCSDP); and (4) inspectors are trained in the use of ISA risk information as appropriate.

- iii. The baseline inspection program is the minimum inspection oversight. The overall objective of the program is to monitor all fuel cycle facility licensees with a consistent level of defined requirements to indicate whether a licensee's performance meets the objectives for each cornerstone of safety and security. The baseline inspection program defines the planned activities to monitor licensee performance at a minimum level of NRC effort over a 24-month period.

- b. Key Principles. Three key principles form the foundation of the baseline inspection program:

- i. Inspectable areas. Under the baseline inspection program, all areas where there is a need to inspect a licensee's performance are defined as inspectable areas.
- ii. Basis for inspectable areas. The inspection program basis document (see IMC-RFCOP-Basis) that will describe the scope of the inspectable area and why the area is included in the baseline program. Reasons for including might be that: (1) the area is linked to the NRC's mission, (2) the inspectable area involves a key attribute of a cornerstone of safety or security, or (3) risk information justifies including the area in the baseline inspection program.

The basis document discusses the basis for each inspectable area and includes risk insights, analyses of significant precursor events, and the risk-informed judgment of an expert panel of inspectors and risk analysts.

The baseline inspection procedures have been written to focus on the more risk-significant aspects of the inspectable areas as discussed in the basis documents, aspects that directly support the desired results and promote the important attributes of the cornerstones of safety.

- iii. Detailed planning. A third principle in the program is that the regional managers and inspectors plan the type and number of activities to inspect each year for each facility, based on the inspection requirements in the inspectable areas and risk informed guidance.

3. APPLICABILITY

The baseline inspections provide a sufficient examination of licensee activities to monitor licensee performance and identify risk-significant issues and to assess licensee safety and security performance. The baseline inspections are performed by the residents and/or region- or headquarters-based inspectors. It is the intent of the program that inspections of the cornerstones will be performed by inspectors qualified in the associated specialty areas in accordance with IMC 1247, "Formal Qualification Programs in the Nuclear Material Safety and Safeguards Program Area."

The baseline inspection procedures define effort and requirements necessary to obtain an adequate assessment of an inspectable area. For resource planning purposes only, each baseline inspection procedure includes an estimate of the inspection hours necessary to complete the procedure. These estimates are not goals, standards, or limitations; rather, they are included to assist in planning resource allocations, and may be revised periodically, based on experience. It is expected that the actual hours required to complete an individual inspection procedure at a particular facility will vary from the estimate. The program office (NMSS/FCSS or NSIR) provides the regional office with a band of expected effort (approximately 10 percent) for each baseline inspection procedure as a process control. Regional management is expected to review those situations when inspection effort falls outside of the control bands for possible programmatic insights and recommend changes to the program. Inspectors should inspect the number of samples specified by the baseline inspection procedures because the baseline program provides the insights necessary to assess performance in each cornerstone of safety and security. Variations are expected and allowed by the program for several reasons, including the availability of inspection opportunities of appropriate risk significance. If the only inspection opportunities for an inspection procedure have very little or no risk, safety, or security significance, then the procedure should not be used at that time. For example, if the only new temporary modifications the licensee has implemented since the last inspection of temporary modifications have no credible significance, the inspector should not spend time completing the inspection requirements on them.

Additional inspection samples may be included in the baseline if a high-risk activity occurs after the inspector has completed an inspection procedure. The reasons for any significant deviations from the sample sizes or estimated hours for completing an inspection should be understood by the inspectors' supervisor.

Significant findings (i.e. greater than green) from the baseline inspections can lead to supplemental inspection activities.

4. DESCRIPTION OF BASELINE INSPECTION PROGRAM

The risk-informed baseline inspection program is comprised of two parts. They are:

- Inspections of safety and security cornerstones
- Identification and resolution of problems
- a. Cornerstone-Based Inspections. The safety and security performance of fuel cycle facilities is assessed based on performance in each cornerstone. Determining whether a licensee meets the objectives of the cornerstones provides the information necessary to decide whether reasonable assurance that public health and safety is being protected and that the facility is secure. The inspectable areas defined in the baseline inspection procedures review aspects of key attributes for each of the associated cornerstones. The cornerstones to which each inspectable area is applicable and their link to the attributes they are measuring is depicted in the cornerstone table and charts in Attachments 1 and 2. Therefore, the baseline inspection program requires that most inspectable areas be reviewed at each fuel cycle facility each year. Several are reviewed at longer frequencies.

This portion of the baseline inspection program also accounts for initially screening events to determine, based on risk insights, which events will be followed up, and for screening all licensee event reports.

- i. Inspection within inspectable areas. Inspections within inspectable areas provide input for assessing licensee performance. The inspections are focused into the more risk important aspects of the plant and licensee activities. The basis for, and scope of, inspections within the inspectable areas are summarized in the inspection procedures.
- ii. Event follow-up. Events of low significance are reviewed by resident and/or region-based inspectors to determine whether the events are not complicated by loss of items relied on for safety (IROFS) or other safety or security controls including operator or security officer errors. Significant operational events (defined in Management Directive 8.3) are followed up by a graded response consisting of inspections outside of the baseline inspection program, such as those conducted by Incident Investigation Teams (IITs), Augmented Inspection Teams (AITs), and Special Inspections (SIs). MD 8.3 contains deterministic criteria which are evaluated in conjunction with risk insights to identify the appropriate level of NRC response. The risk chart in the ISA is a key item used to best reflect the full extent of any loss IROFS or controls from the event, regardless of whether the cause is due to licensee performance or otherwise. However, qualitative or numerical risk estimation by itself is not meaningful unless accompanied by an understanding of the most influential related assumptions and uncertainties.

The baseline inspection program event follow-up procedure focuses the inspector's initial evaluation of events on communicating details regarding the event to risk analysts for their use in determining risk significance. Inspectors will identify equipment malfunctions and unavailability, operator errors, and other complications.

The baseline event follow up procedure also allows for screening all licensee event reports. All event reports will be acknowledged in an inspection report, even if the event was not one that the inspectors needed to follow up.

- iii. Plant status reviews. An important aspect of the resident inspectors' job is maintaining an awareness of current conditions at the facility to which they are assigned. For licensees without resident inspectors, the project inspector maintains a level of awareness of plant conditions through frequent communications with licensee representatives, periodic on site inspection, and feedback from other inspectors at the completion of their inspections at the project inspector's assigned licensee. The plant status requirements are detailed in Appendix D.
- b. Identification and resolution of problems. The primary means by which licensees maintain an appropriate level of safety is through an effective problem identification and resolution program to correct deficiencies involving human performance, equipment, and programs and procedures. The NRC's confidence in a licensee's program for finding and fixing problems is one basis for closing Severity Level IV violations when a licensee enters them into its corrective action program. Therefore, the baseline inspection program includes periodic inspections of licensees' corrective action programs to gauge their effectiveness using inspection procedure (IP) 88152 and during the performance of individual baseline inspection procedures.

5. INSPECTION PLANNING

- a. Annual Inspection Planning. To facilitate management of inspection resource allocations and tracking of inspection programs, the regional office shall develop annual site-specific baseline inspection plans.

Inspections are planned annually for all applicable procedures in the baseline inspection program, adding supplemental inspection when a licensee crosses an Action Matrix column threshold, and for applicable temporary instructions. Planning for the baseline inspection program will be based on the estimated level of effort for each procedure. Resource planning will be based on the individual procedures, some of which cover more than one cornerstone. Adjustments of the level of effort among and within procedures may be made based on cornerstone performance.

- i. Resident inspection planning. For resident inspectors, several procedure requirements are dependent on plant activities and events. Resident inspectors should also target emergent work and infrequent evolutions.

Once a system or activity is selected for inspection by the resident inspectors, the inspectors need to establish which procedure or parts of procedures might be appropriate for inspection taking into account which parts of the individual procedures have been completed to date and which still need to be inspected to meet the goal of completing the applicable baseline procedures annually. The resident inspectors are encouraged to develop tools to help them schedule the inspections and monitor their completion.

- ii. Region Based Inspection Planning. Region based inspection activities shall be planned annually. The primary steps in annual planning are:
 - (1) Determine the procedures applicable for the specific licensee for the upcoming period. The procedure can be excluded from the inspection plan if there are no planned activities which can be inspected during the next 12 months.
 - (2) Schedule inspections of the procedures over the next 12 months.
 - (3) Multiple procedures may be performed by one inspector during one on-site inspection period.
- b. Level of effort. The level of effort in each inspection procedure describes the number, type, and frequency of inspections. Inspectors may vary the number or frequency of inspections in a particular procedure in the short term depending on plant conditions but should complete the required numbers of inspections and samples within the year.
- c. Adjustments. Periodic management reviews and updates of individual plans and the regional master inspection plan should be accomplished at least semi-annually as part of the mid-cycle review.
- d. Review of Open Allegation. Inspectors shall review all open allegations pertaining to areas which they will be inspecting as part of their inspection preparation.
- e. Completion status. Each baseline inspection procedure contains specific inspection requirements. These inspection requirements define those areas to be completed by the inspector to make a determination that the objectives of the procedure have been met. The inspection activities and minimum sample sizes must be completed to provide an adequate assessment for each cornerstone. However, when the number of samples specified in a procedure is not inspected because of a paucity of inspection opportunities, the procedure should be considered closed with the smaller sample.

Completion status will be documented in the NRC's Reactor Program System (RPS).

END

ATTACHMENT 1

BASELINE INSPECTION PROCEDURES

The baseline inspection program requires the inspectable areas below be reviewed at each fuel cycle facility. The inspectable areas verify aspects of key attributes for each of the associated cornerstones.

NOTE: AN EXPERT PANEL WILL DETERMINE KEY ATTRIBUTES AND INSPECTABLE AREAS THAT WILL FORM THE BASIS FOR INSPECTABLE AREAS AND PROCEDURES.

NOTE; MC&A PROCEDURES TO BE ADDED LATER.

Cornerstone	IP No.	Title	Frequency ¹						
			Cat I	Cat III FF	GDP	Enrich (not GDP)	Cat III assem bly	Conver sion De- convers ion	Other Cat II, III
PS	81XXX	Access Controls (Cat I)							
MC&A	TBD	TBD							
All	TBD	Adverse Weather Protection							
All	88010	Configuration Control (GDP - RI)							
PS	96001	Contingency Response – Annual Force-on Force Testing Category I Fuel Cycle facilities							
PS	81XXX	Detection and Assessment (Cat I)							
PSaf	88045	Effluent Control and Environmental Protection							
EP	88050	Emergency Preparedness							
EP	88051	Evaluation of Exercises and Drills							

All	88075	Event Followup							
All	88055	Fire Protection – Annual							
All	88054	Fire Protection – Triennial							
PS	81502	Fitness for Duty							
PS	81XXX	Fixed Site Physical Protection of MSNM - (Cat II)							
PS	81XXX	Fixed Site Physical Protection of LSM - (Cat III)							
All	88152	Identification and Resolution of Problems							
PS	88XXX	Information Protection (Cat I, II, III)							
PSaf	86740	Inspection of Transportation Activities							
ChS, CS	88025	Maintenance and Surveillance of Safety Controls							
ChS, CS	88103	Maintenance Observations (GDP – RI)							
CS	88017	Nuclear Criticality Alarm Systems							
CS	88015	Nuclear Criticality Safety Analyses and Evaluations							
CS	88016	Nuclear Criticality Safety Program							
All	88002	Operational Event Review and Feedback Programs at Fuel Cycle Facilities							
ChS, CS, OS	88020	Operational Safety							
All	88135	Operations (Cat I – RI)							
ChS, CS, OS	88010	Operator Training							
PS	81XXX	Other Security Areas (Cat I)							
All	88070	Permanent Plant Modifications							
PS	81XXX	Physical Protection Barriers (Cat I)							

ChS, CS, OS	88100	Plant Operations (GDP - RI)							
OS	88030	Radiation Protection							
PSaf	88035	Radioactive Waste Management							
All	88003	Reactive Inspection for Events at Fuel Cycle Facilities Program							
PS	81XXX	Reports of Safeguards Events (Cat I, II, III)							
ChS, CS, OS	88102	Surveillance Operations (GDP – RI)							
PS	81XXX	Training and Contingency Response (Cat I, II)							
PS	81XXX	Transportation Security (Cat III)							

Q = Quarterly, A = Annual, R = Refueling Outage, B = Biennial, T = Triennial, AN = As Needed

- EP – Emergency Preparedness
- ChS – Chemical Safety
- CS – Criticality Safety
- PSaf – Public Safety
- OS – Occupational Safety
- PS – Physical Security
- MC&A – Material Control and Accounting

To be developed by expert panel.

DRAFT

ATTACHMENT 3

Revision History – IMC-RFCOP-2600 Appendix A

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
NA	Xx/xx/10	Issued for use under the revised fuel cycle oversight process.			ML