

# CRANE CLEAN ENERGY CENTER/THREE MILE ISLAND UNIT 1 RESTART INSPECTION PLAN

## LIGHT-WATER REACTOR INSPECTION PROGRAM FOR RESTART OF REACTOR FACILITIES FOLLOWING PERMANENT CESSATION OF POWER OPERATIONS

### Inspection Manual Chapter 2562

#### Inspection Objectives

This series of inspections will provide input for developing an objective and documented basis for a U.S. Nuclear Regulatory Commission (NRC) decision to transition the Crane Clean Energy Center/Three Mile Island, Unit 1 to the Reactor Oversight Process (ROP) and resume power operations following the certification of permanent cessation of plant operations and removal of fuel from the reactor. These inspections shall sample and assess key aspects of licensee operational readiness in a risk-informed manner across the three ROP cornerstones strategic performance areas of reactor safety, radiation safety, and safeguards to support reasonable assurance of adequate protection of public health and safety.

#### Applicable Inspection Procedures

Existing inspection procedures (IPs) for ROP baseline inspections, decommissioning inspections, and construction inspections will be used in full or in part to accomplish the inspection activities identified in the inspection plan. If a new or temporary instruction needs to be created to accomplish the inspection activities, it will be created in accordance with Inspection Manual Chapter 0040, "Preparation, Revision, Issuance, and Ongoing Oversight of NRC Inspection Manual Documents." If a discontinued IP or temporary instruction is needed, the regional Team Leader will coordinate with the applicable group in the Office of Nuclear Reactor Regulation to restore the procedure or instruction for use.

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## INSPECTION PLAN DETAILS

I **Inspectors:** Qualified resident inspectors, reactor inspector specialists, operator licensing examiners, and experts from the regional offices and headquarters will be utilized to accomplish the inspection goals.

### II **Detailed Inspection Schedule**

**Inspection Preparation:** Each inspection team point of contact (POC) or inspector shall coordinate with the Crane Restart Team (CRT) to establish a POC with the licensee. The inspection POC/inspector will then communicate directly with the licensee POC to establish needed communications for the inspection activity, including coordinating updates for any schedule changes. The inspector(s) will also request through the POC(s), with a Request for Information or through discussion, required documentation needed for the inspection. The inspector(s) will finally create a specific inspection plan for the activity being conducted, which will include the IP(s) used and applicable portions, inspection objectives, and details on the activities being inspected. This inspection plan will be approved by the CRT Team Leader and the inspector's Branch Chief. The CRT Team Leader and Branch Chief review should ensure risk insights were appropriately applied in the selection of activities and components for review and in the depth of review. The CRT Team Leader and Branch Chief should further determine that inspection plans implement performance-based approaches in review.

When resident inspectors are assigned fulltime at the Crane/TMI Unit 1 facility, the senior resident inspector will develop risk-informed, performance-based inspection plans for CRT Team Leader and Branch Chief concurrence at least quarterly or more often as plant restart activities commence. The senior resident inspector will lead in onsite inspection planning communication and coordination.

**Onsite Inspection:** Onsite inspection will continue until readiness for restart is confirmed and all inspection objectives have been accomplished. This is currently targeted in the second half of 2027 but could move based on the licensee's schedule.

**Entrance Briefing/Meeting:** Each inspection activity should conduct either an inspection entrance meeting or briefing with the licensee to describe the inspection activities and establish coordination and communication.

**Debriefs/Exit Meetings:** Each inspection activity or set of activities shall conduct either a technical debrief and/or exit meeting to conclude the inspection activity with the licensee. The inspector(s) shall also debrief regional management/the CRT Team Lead and respective Branch Chief of the results of the inspection activity and any noteworthy observations, findings, and/or violations identified.

**Inspection Reports:** Quarterly or standalone reports will be issued for each group or individual inspection activity (to be determined by regional management). See Section V for more details on documentation.

### III Inspection Activities

#### **01. Decommissioning Activities**

Decommissioning inspections will continue until the NRC determines that they are no longer needed, or the Commission directs the staff to no longer implement the program. The established decommissioning inspection plan shall be reviewed to determine potential areas of overlap and adjusted as applicable to ensure all requirements are still met while most efficiently using inspection resources. Existing ROP baseline IPs can be used in lieu of decommissioning procedures to inspect licensee activities that are being conducted in support of restarting the unit. To increase efficiency, dual credit shall be used, where appropriate, for the inspections and documented in a combined inspection report.

For example, the licensee might use the same radiation protection program procedures for ALARA planning in both decommissioning and restart activities. The inspector(s) will determine the most appropriate IP(s) to use for reviewing and observing these activities and assessment of the activities will be used for credit towards the completion of decommissioning program requirements and a restart determination, as applicable.

#### **02. Restart Activities**

All restart inspection and licensing activities will be planned, scheduled, and tracked using the Reactor Program System – Inspection (RPS-Inspection) module

##### **02.01 Inspections Across All Cornerstones of Safety Using Baseline Inspection Procedures**

The inspector(s) shall select appropriate sections of IPs to perform a variety of inspection activities across all strategic performance areas and the associated cornerstones and attributes to verify operational readiness.

- 02.01.a) Reactor Safety Cornerstones**
  - i. Initiating Events – Design Control, Protection Against External Factors, Configuration Control, Equipment Performance, Procedure Quality, Human Performance
  - ii. Mitigating Systems – Design Control, Protection Against External Factors, Configuration Control, Equipment Performance, Procedure Quality, Human Performance
  - iii. Barrier Integrity (RCS, Containment, Cladding) – Design Control, Configuration Control, Equipment Performance, Procedure Quality, Human Performance
- 02.01.b) Emergency Preparedness (EP) Cornerstone – Emergency Response Organization (ERO) Readiness, Facilities and Equipment, Procedure Quality, ERO Performance, Offsite EP**
- 02.01.c) Radiation Safety Cornerstones – Occupational & Public – Facilities, Equipment, and Instrumentation; Programs/Process; Human Performance**

- 02.01.d)** Security Cornerstone – Physical Protection, Access Authorization, Access Control, Response to Contingency Events, Material Control and Accountability, Protection of Safeguards Information, Cyber Security

## **02.02 Safety Culture**

Safety Culture is the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals. Inspectors observe a licensee’s Safety Culture as it is demonstrated in meetings, pre-job briefings, during work activities, and in interactions amongst leaders and individual contributors. A Safety Conscious Work Environment (SCWE) is a work environment where employees are encouraged to raise safety concerns and where concerns are promptly reviewed, given the proper priority based on their potential safety significance and appropriately resolved with timely feedback to the originator of the concerns and to other employees as appropriate. Inspectors can observe SCWE through the corrective action program, during meetings and interactions, and by reviewing allegations data.

The Crane Restart Panel, based on inspection assessments and inputs from inspectors, will determine if NRC management discussion with licensee management on any safety culture aspect is required. This would encourage licensee action to address safety culture aspects before significant performance degradation occurs.

## **02.03 Corrective Action Program**

- 02.03.a)** The Crane Restart Panel, based on a recommendation from the CRT Team Leader, will determine the size, scope, and timing of a corrective action program team inspection prior to authorization of restart. Corrective action program performance insights in decommissioning and restart inspections will be a consideration.
- 02.03.b)** This inspection shall be conducted in accordance with the applicable portions of IP 71152 and will be documented in a standalone inspection report.
- 02.03.c)** This inspection should be scheduled at an appropriate time to ensure the licensee has sufficient run-time to verify appropriate implementation of the program.
- 02.03.d)** This program shall be reviewed against the Quality Assurance criteria to ensure that all changes made from decommissioning to operating status have been appropriately incorporated.

## **02.04 Other Items**

- 02.04.a)** Restoration of Structures, System, and Component Processes – Perform reviews necessary to verify licensee performance to systematically review and address their deferred licensing actions, corrective actions, operational condition monitoring, and maintenance backlog from prior to shutdown to determine work scope necessary to meet regulatory requirements. Verify on a

sampling basis the adequacy of the licensee's Restoration System Group (RSG) process. Complete risk-informed sampling of:

- i. Open items from prior to shutdown and ensure licensee has a plan for resolution if issue is determined to be necessary for restart.
- ii. Deferred licensing actions and corrective actions to determine appropriate implementation plans and actions to resolve.
- iii. Historic site-specific issues for timely and effective resolution.
- iv. Examination, maintenance and modification activities are planned to the technical standards and requirements in the operating reactor licensing basis.

#### **IV HRMS and Time Charge Information**

The attachment describes projected amounts (+/- 15%) of inspection time for these activities. The activities are split by inspection area and resources needed for the specific task(s). The projections were made using the applicable IP guidance to estimate the amount of time needed for each activity (either in full or in part). Some activities will take more or less time depending on the level of review needed and any unforeseen issues that arise. Time shall be charged in accordance with Inspection Manual Chapter 0306 using the cost activity codes (CAC) associated with those used under the ROP.

|                            |                                |
|----------------------------|--------------------------------|
| Travel:                    | <b>AT (CAC 000503)</b>         |
| Preparation/Documentation: | <b>BIP (CAC 000473)</b>        |
| Communications:            | <b>COM (CAC 000501)</b>        |
| Inspection:                | <b>Use assigned CAC for IP</b> |

#### **V Documentation**

Inspection reports should be integrated as much as practical to document restart inspections completed in accordance with Inspection Manual Chapter 2562 and Inspection Manual Chapter 2561. This should be accomplished through combined inspection reports.

Unless otherwise specified, all inspections will be documented in RPS. The inspection reports/inputs shall document the applicable IPs (or sections within) completed, which structures, systems, and components or programs were reviewed, findings/violations, open or unresolved items, specific notable items related to the samples (as Observations), documents reviewed, and any debrief/exit meetings. Any noteworthy observations, open or unresolved items, and identified findings and violations shall be dispositioned per the applicable guidance documents and tracked in RPS as inputs into the final operational readiness assessment.

Note: Follow-up inspection of open or unresolved items will be tracked in RPS-Inspection module and completed per existing NRC guidance. Follow-up inspection of identified findings and violations will be completed through individual issue review or as part of a Problem Identification and Resolution inspection, depending on the significance of the issue and within an appropriate timeframe to ensure effective resolution. Any items required to be resolved prior to restart will be identified as such in the writeup.

## VI Inspection Activity Examples

The inspectors, with CRT Team Leader and Branch Chief oversight, shall select appropriate sections of IPs to perform a variety of inspection activities across all the strategic performance areas and associated cornerstones to verify operational readiness. The following are examples of activities already screened to be scheduled for review and inspection:

- Initiating Events Cornerstone
  - Review risk-informed sample of RSGs that support the initiating event cornerstone objective of limiting the likelihood of upset plant stability such as maintaining offsite power
  - “Open Phase” NRC Temporary Instruction TI-194 inspection (to close out actions)
- Mitigating Systems Cornerstone
  - Review risk-informed sample of RSGs that support the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Include RSGs for reactor protection system, emergency core cooling systems, decay heat removal systems, and unit electric power system (including onsite emergency diesel generators and station batteries). For each RSG:
    - Verify system maintenance and surveillance testing meet the quality assurance program requirements and provide for all required design and licensing basis functions (IPs 71111.12, 71111.15, and 71111.24)
    - Observe system maintenance and testing activities (IP 71111.24)
    - Verify open work orders and corrective actions have been addressed prior to system startup
    - Review modifications to the system during decommissioning to ensure components and functions are restored to an operational state (IPs 71111.04, 71111.18, and 71111.21N)
  - Conduct inspections that support review of actions to address resolution of Generic Letter 2004-02, “Potential Impacts of Debris Blockage on Emergency Recirculation During Design Basis Accidents at PWRs”
  - Licensed Operator Training
    - Inspect readiness of Main Control Room Simulator for acceptable use in training activities (IP 41502)
    - Observe INPO re-accreditation activities for Licensed Operator Training program (as part of MOU)
    - Verify licensed operator requalification training program re-establishment meets all requirements and guidance (IP 71111.11)
    - Observe licensed operator requalification training activities (IP 71111.11)

- Barrier Integrity Cornerstone
  - Review risk-informed sample of RSGs that support the barrier integrity cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Include the following:
  - Reactor Pressure Vessel, Reactor Vessel Internals, Reactor Coolant System Components, and Steam Generators (IP 71111.08)
    - Observe and review data from inservice inspections and examinations to verify integrity
      - Ensure programs and procedures meet current regulatory requirements and industry standards
      - Verify appropriate qualification of examiners and reviewers for non-destructive examination activities
      - Verify proper calibration and testing of equipment
      - Verify on a sampling basis license renewal commitments and assumptions in time limited aging analyses
  - Containment Building
    - Observe and review data from inservice inspections and tests
    - Verify on a sampling basis completion of license renewal commitments for monitoring of tendon prestress
- Emergency Preparedness Cornerstone
  - Observe and evaluate licensee emergency preparedness exercise(s) and drill(s) for implementation of the operating emergency plan (IPs 71114.01 and 71114.06)
  - Review proposed changes to the operating emergency plan and verify site procedures are updated appropriately
- Occupational Radiation Safety Cornerstone
  - Review risk-informed sample of RSGs that support the occupational radiation safety cornerstone objective to ensure adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. RSGs to be considered include effluent monitors, waste processing systems, and installed radiation monitors.
  - Primary Coolant System Decontamination Process (IP 71124.01)
    - Verify the work is planned per ALARA standards
    - Observe pre-job briefs and workers in the field to verify practices are implemented as required
    - Verify licensee programs and procedures meet regulatory requirements (including technical specifications and program requirements)



- Public Radiation Safety Cornerstone
  - Review risk-informed sample of RSGs that support the public radiation safety cornerstone objective to ensure adequate protection of public health and safety from exposure to radiation from radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. RSGs to be considered include environmental monitors, effluent monitors, and waste processing systems.
  
- Security Cornerstone
  - Perform inspections in coordination with NRC headquarters staff reviewing licensing related actions. Include the following:
    - Verify transition from decommissioning plan to operational plan
    - Review modifications to plan to ensure no degradation in safety margin
    - Observe implementation testing of modifications
  - Observe and evaluate licensee training and force-on-force drills to verify operational readiness of new security plan
  - Inspect changes to Target Sets as applicable



## Attachment

As highlighted in Section IV, this attachment describes projected amounts of direct inspection time for anticipated activities throughout the restart phase. This does not include indirect inspection time such as travel, preparation, and documentation. The activities are split by inspection area and resources needed for the specific task(s). The projections were made using the applicable inspection procedure (IP) guidance to estimate the amount of time needed for each activity (either in full or in part).

Activities covered by Individuals conducting Baseline Inspections: 3745 hours (3200-4300)

- Resident Inspectors, Reactor Inspectors, Health Physics Inspectors, Emergency Preparedness Inspectors, and Security Inspectors in applicable areas.
- Includes activities to assess cornerstones of safety. For example, resident inspector baseline inspections, radiation protection baseline, operating security plan re-implementation, and emergency preparedness operating plan reviews and exercises.
- Covers items not included in team reviews, such as modifications to structures, systems, and components; return-to-service system reviews; maintenance; modifications; and surveillance testing.
- Also, can include assistance from subject matter experts for review of specific issues.

Activities covered by Team Inspections: 4035 hours (3500-4700)

- Initial License Operator Examination (2 classes of 30 each are estimated to require 2600 hours. This activity alone comprises the majority of the team inspection estimate.
- Teams will consist of qualified inspectors in the specific areas plus any required subject matter experts for those areas.
- Emergency Preparedness (observe and evaluate operating emergency plan exercise).
- Fire Protection (modified team to review stand up of program and processes).
- Cyber Security (modified team to review re-implementation of operating requirements).
- License Renewal Phase IV (Team to review risk-informed sample of Aging Management Programs required for renewed license period. Consider plant specific experience and conditions during decommissioning. To include cable monitoring, buried pipes, tanks, and structures monitoring).
- Open Phase Temporary Instruction inspection (to close out actions).
- FLEX (modified team to review re-implementation of FLEX program).
- Problem Identification and Resolution (modified team to review implementation of corrective action program for an operating unit, may include safety culture focused review).
- Inservice inspection (multiple inspectors covering for example, licensee performance of examinations of the reactor vessel, reactor vessel internals, reactor coolant system pipes, components and steam generators).