



NRC Engineering Inspections

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Engineering Inspection Working Group – Background

- Background – Recent NRC Engineering Improvement Initiatives
- <https://www.nrc.gov/reactors/operating/oversight/rop-design-insp-review.html>
- Eight inspection procedures were considered for improvement



Engineering Inspection Working Group – Scope of Review

- IP 71111.05T, "Fire Protection (Triennial)," or IP 71111.05XT, "Fire Protection-NFPA 805 (Triennial)"
- IP 71111.07, "Heat Sink Performance"
- IP 71111.08, "Inservive Inspection Activities"
- IP 71111.12, "Maintenance Effectiveness"
- IP 71111.17T, "Evaluations of Changes, Tests, and Experiments"
- IP 71111.18, "Plant Modifications"
- IP 71111.21M, "Design Bases Assurance Inspection (Team)"
- IP 71111.21N, "Design Bases Assurance Inspection (Program)"




Principal Considerations

- Increase or maintain effectiveness
 - Independent oversight
 - Identification of latent conditions
 - Increase relevance to current challenges
- Increase efficiency
 - Eliminate overlap
 - Knowledge gained from inspection experience (Credible assessment of plant design based on 18 plus years of conducting independent inspections)



Overall Results – Maintains Reasonable Assurance of Safety

- Conduct independent NRC engineering inspections annually
- New suite of engineering inspection procedures
- Agile, flexible, relevant
- Reduced overlaps and addressed gaps



Objectives of Future Engineering Inspections

- Identify if latent design issues are introduced through design changes
- Verify SSCs continue to be capable of performing as designed through a emphasis on more relevant areas (aging, obsolescence, etc.)
- Verify changes do not introduce new or increased frequency of initiating events

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Types of Future Engineering Inspections

- Comprehensive Engineering Team Inspection (CETI)
- Focused Engineering Inspection (FEI)
- In-Service Inspection

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Current Engineering Inspections (Triennial Cycle)

Year 1	Year 2	Year 3
DBAI – Team Inspection BE 312 Hours Resources: 4 Inspectors / 3 Contractors Onsite Presence: 2 Weeks	Triennial Fire Protection BE 400 Hours Resources: 3-4 Inspectors Onsite Presence: 2-3 Weeks	DBAI – Programs BE 183 Hours Resources: 3 Inspectors Onsite Presence: 2 Weeks
Inservice Inspection BE 80 – 100 Hours Resources: 3-2 Inspectors Onsite Presence: 1-2 Weeks (4)	Heat Sink Inspection BE 60 Hours Resources: 3-2 Inspectors Onsite Presence: 1 Week	50.59 Inspection BE 52 Hours Resources: 3 Inspectors Onsite Presence: 1 Week
		Inservice Inspection BE 80 – 100 Hours Resources: 3-2 Inspectors Onsite Presence: 1-2 Weeks (4)

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Proposed Engineering Inspections (Quadrennial Cycle)

Year 1	Year 2	Year 3	Year 4
Comprehensive Engineering Team Inspection BE 350 Hours Resources: 5 Inspectors / 2 Contractors Onsite Presence: 2 Weeks	Focused Engineering Inspection #1 BE 210 Hours Resources: 3 Inspectors Onsite Presence: 2 Weeks	Focused Engineering Inspection #2 BE 210 Hours Resources: 3 Inspectors Onsite Presence: 2 Weeks	Focused Engineering Inspection #3 BE 210 Hours Resources: 3 Inspectors Onsite Presence: 2 Weeks
	Inservice Inspection BE 80 – 100 Hours Resources: 3-2 Inspectors Onsite Presence: 2 Weeks (4)		Inservice Inspection BE 80 – 100 Hours Resources: 3-2 Inspectors Onsite Presence: 2 Weeks (4)

Resource Implications

	Current 3 Year Cycle	Proposed 4 Year Cycle
Total Number of Inspections	7 Inspections	6 Inspections
Annual Onsite Weeks	3.66 weeks/yr (11 onsite weeks)	2.75 weeks/yr (11 onsite weeks)
Average Inspection Hours per Year	293 Hours	245 Hours

Future Considerations - Licensee Self Assessments

Recommendations:

- Continue dialog on self-assessments
- Industry develop self-assessment standard
- Consider implementation of a project demonstration with independent NRC oversight

Possible Inclusion of Licensee Self Assessment in Future ROP

Year 1	Year 2	Year 3	Year 4
Comprehensive Engineering Team Inspection <small>BE 350 Hours Resources: 5 Inspectors, 2 Contractors Onsite Presence: 2 Weeks</small>	Focused Engineering Inspection #1 <small>BE 210 Hours Resources: 3 Inspectors Onsite Presence: 2 Weeks</small>	Focused Engineering Inspection #2 <small>BE 210 Hours Resources: 3 Inspectors Onsite Presence: 2 Weeks</small>	Licensee Self-Assessment
Inservice Inspection <small>BE 30-100 Hours Resources: 2-3 Inspectors Onsite Presence: 3-2 weeks</small>		Inservice Inspection <small>BE 30-100 Hours Resources: 2-3 Inspectors Onsite Presence: 3-2 weeks</small>	NRC Inspector Oversight <small>BE TBD Resources: TBD Onsite Presence: TBD</small>



Future Milestones

- Finalize Engineering Inspection Working Group Recommendations (EIWG)
- Commission Paper (SECY)
- Develop New Inspection Procedures
- Pilot New Inspection Activities
- Implement Approved ROP Changes
