History of Engineering Team Inspections

Timeframe	Inspection Name	Scope
1985 to 1995	Safety System Functional Inspection (SSFI) (Inspection Procedure (IP) 93801)	As a result of a loss of feedwater at Davis-Besse Nuclear Power Station, the U.S. Nuclear Regulatory Commission (NRC) created the SSFI, which was designed to determine whether other nuclear plants experienced similar problems. This inspection had the following objective: • Assess the operational performance capability of selected safety systems through an in-depth, multidisciplinary engineering review to: – Verify that the selected systems were capable of performing their intended safety functions. – Ensure that generic safety-significant findings were pursued across the system boundaries on a plantwide basis.
1985 to 1988	Safety System Outage Modification Inspection (SSOMI) (IP 93803)	Developed at the same time as the SSFI, the SSOMI had the following objectives: • Verify the licensee had established appropriate programmatic controls for accomplishing changes, modifications, and repairs. • Verify that the licensee was conducting activities related to design changes, modifications, and repairs in accordance with established procedures, commitments, and regulatory requirements. • Verify that completed modifications had been properly designed, installed, inspected, and tested to ensure the adequate performance of the modified systems and components. • Determine that the design margins of the modified safety-related systems and components had not been reduced. • Verify that the modified systems and components were ready for safe startup and operation of the plant.
1991 to 1993	Electrical Distribution System Functional Inspection (EDSFI) (IP 93811)	During multidisciplinary inspections such as SSFIs or SSOMIs, the NRC identified a number of deficiencies related to electrical distribution systems (EDS). As a result of these deficiencies, the NRC developed the EDSFI to specifically evaluate the EDS. The EDSFI had the following objectives: • Assess the capacity of the EDS to perform its intended functions during all plant operating and accident conditions. • Assess the capability and performance of the licensee's engineering organization in providing engineering and technical support. • Examine the interfaces between the technical disciplines internal to the engineering organization and the interfaces between the engineering organization and the technical support groups responsible for the operability of the EDS.
1993 to 1995	Service Water System Operational Performance Inspection (SWOPI) (IP 93810)	Challenges to the thermal performance capability of safety-related open cooling water system heat exchangers were a major reason the agency issued Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment," dated July 18, 1989. GL 89-13 requested that licensees and applicants ensure their service water systems (SWSs) were in compliance and maintained in compliance with General Design Criterion (GDC) 44, "Cooling water," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities"; GDC 45, "Inspection of cooling

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		water system"; GDC 46, "Testing of cooling water system"; and 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Section XI, "Test Control." The SWOPI was a specialized version of the SSFI that focused on the SWS. Some of these were licensee self-assessments that the NRC credited. The SWOPI had the following objectives: • Verify that the SWS was capable of fulfilling its thermal and hydraulic performance requirements and was operated consistent with its design bases. • Assess the SWS operational controls, maintenance, surveillance, and other testing and personnel training to ensure the SWS was operated and maintained so as to perform its safety-related functions.
1995 to 1998	Safety System Engineering Inspection (SSEI) (IP 93801)	The SSEI enhanced the core inspection program in the engineering functional area. It was intended to improve the agency's overall ability to identify various engineering design issues discovered through several team inspections at several nuclear facilities.
1996 to 1998	Architect Design Engineering Inspection 10 CFR 50.54(f)	Based on the review of licensee responses to a 10 CFR 50.54(f) letter (requesting reactor licensees to describe their programs and processes established to control and maintain operations within their facilities' design bases in accordance with 10 CFR 50.54(f), which requires licensees to submit written statements, signed under oath or affirmation, to enable the Commission to determine whether or not the license should be modified, suspended, or revoked), the staff concluded that while licensees had established programs and processes to maintain their facilities' design bases, the NRC needed to implement plant-specific follow-up activities. This determination was based upon the staff having identified (1) instances in which licensees failed to reconcile regulatory performance with their assertions that their programs and processes were effective in maintaining their design bases, or (2) that the agency needed to gain a better understanding or to validate a particular aspect of a licensee's programs and processes. SECY-97-160, "Staff Review of Licensee Responses to the 10 CFR 50.54(f) Request Regarding the Adequacy and Availability of Design Bases Information," dated July 24, 1997, referred to the above-mentioned follow-up activities. They were to be a combination of architect-engineer design team inspections led by the Office of Nuclear Reactor Regulation and region-led inspections such as SSFIs and SSEIs.
2000 to 2004	Safety System Design and Performance Capability Inspection (SSDPC) (IP 71111.21)	This was the first time the NRC conducted SSFI-type inspections at all plants on a regular basis, and they were performed biennially.
2005 to 2017	Component Design-Basis Inspection (CDBI) (IP 71111.21)	The CDBI procedure replaced the SSDPC based on the number of engineering-related problems identified at Davis-Besse Nuclear Power Station after the discovery of significant boric acid-induced corrosion in the reactor head, as described in SECY-04-0071, "Proposed Program To Improve the Effectiveness of the NRC Inspection of Design Issues,"

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		dated April 29, 2004. This was a triennial inspection starting in 2008 (it was biennial before 2008), conducted at all plants.
2017 to 2020	Design Bases Assurance Inspections (DBAIs) (IP 71111.21M, IP 71111.21N)	The NRC piloted the reduce-scoped (2- vs. 3-week onsite inspection) DBAI in calendar year (CY) 2015 and CY 2016 to address industry feedback that the NRC had adequately verified the licensees' original design bases over previous decades and to address feedback that licensees' preparation for and support of CDBIs impacted their engineering organization for about 3 months (excessive regulatory burden). The NRC also piloted the new DBAI environmental qualification inspection, IP 71111.21N, "Design Bases Assurance Inspection (Programs)," dated February 5, 2019, to address the internal lessons-learned action item from the Browns Ferry Nuclear Plant red finding* that recommended that the NRC periodically review licensees' engineering programs. Although the environmental qualification inspection was new, overall inspection burden on the licensee was maintained neutral because the scope of the CDBI was reduced. The NRC commenced using new inspections IP 71111.21M, "Design Bases Assurance Inspection (Team)," and IP 71111.21N, both originally issued December 8, 2016, at all sites in CY 2017.
2020 to Present	DBAIs (IPs 71111.21N, 71111.21N.02, 71111.21N.05)	In 2020, the DBAI environmental qualification inspections (DBAI-EQ) had been completed at all licensees, and a new DBAI (Programs) inspection commenced (IP 71111.21N.02, "Design-Basis Capability of Power-Operated Valves under 10 CFR 50.55a Requirements," dated October 9, 2020) (DBAI-POV). The new DBAI-POV inspection incorporated lessons learned from a self-assessment of the DBAI-EQ inspections (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19183A063). Additionally, the NRC revised the triennial fire protection inspection and renamed it IP 71111.21N.05, "Fire Protection Team Inspection (FPTI)," dated June 12, 2019. DBAI-EQ, DBAI-POV, and FPTI are representative of FEI engineering inspections.

*In a letter dated May 9, 2011 (ADAMS Accession No. ML111290482), the NRC issued the Tennessee Valley Authority a red finding at Browns Ferry Nuclear Plant because the licensee failed to maintain the Unit 1 outboard low-pressure coolant injection valve in an operable condition, which rendered a low-pressure emergency core cooling system injection/spray subsystem (the residual heat removal loop subsystem) inoperable while Unit 1 was operating in Mode 1.