UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NRC INSPECTION MANUAL

ECGB

INSPECTION PROCEDURE 62002

INSPECTION OF STRUCTURES, PASSIVE COMPONENTS, AND CIVIL ENGINEERING FEATURES AT NUCLEAR POWER PLANTS

PROGRAM APPLICABILITY: 2515

SALP FUNCTIONAL AREA: MAINTENANCE (MAINT)

62002-01 INSPECTION OBJECTIVES

01.01 Evaluate by visual examination and/or review of licensee documentation the condition of structures, passive components, and civil engineering features that are within the scope of Section 50.65 of Title 10 of the Code of Federal Regulations (10 CFR 50.65), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

01.02 Verify implementation of 10 CFR 50.65 (the maintenance rule) with regard to structures, passive components, and civil engineering features, herein referred to as "structures."

62002-02 INSPECTION REQUIREMENTS

02.01 Goal Setting and Monitoring, Preventive Maintenance, and Periodic Evaluation. Verify that the licensee has implemented goal setting and monitoring as required by paragraph (a)(1) of the maintenance rule. For those structures that are within the scope of the rule but are not monitored under paragraph (a)(1) of the rule, verify that the licensee has demonstrated the structure to be capable of performing its intended function through preventive maintenance under the terms in paragraph (a)(2) of the rule. For all structures monitored under paragraphs (a)(1) and (a)(2) of the rule, verify that the licensee is performing the evaluations and assessments required by paragraph (a)(3) of the maintenance rule.

To meet the requirements of the maintenance rule, structures, passive components, and civil engineering features may be categorized into 10 groups for inspection purposes, on the basis of maintenance requirements, expected degradation, and previous industry observations. Possible inspection groups are as follows:

(a) Containment structures
(b) Concrete (reinforced and prestressed) structures other than containment structures
(c) Intake and pumphouse structures
(d) Masonry walls

(e) Buried piping, pipe supports, and equipment anchorages
(f) Water storage tanks
(g) Steel structures and connections (including safety-related cranes, crane rails and supporting structures, and blowout panels)
(h) Dams, embankments, and canals
(i) Seismic Gaps
(j) Supports and anchorages for large equipment

02.02 Scope of the Rule. Verify that the licensee has identified those safety-related and non-safety-related structures that must be within the scope of the maintenance rule, as defined in paragraph 50.65(b) of the rule.

62002-03 INSPECTION GUIDANCE

General Guidance

As discussed in USNRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," the Commission's determination that the maintenance rule was needed arose from the conclusion that proper maintenance is essential to plant safety. As documented in the regulatory analysis for this rule,[1] there is a clear link between effective maintenance and safety as it relates to such factors as the number of transients and challenges to safety systems and the associated need for operability, availability, and reliability of safety equipment. In addition, good maintenance is also important in providing assurance that a failure of an other-than-safety-related structure, system, or component (SSC) that could initiate or adversely affect a transient or accident is minimized. Minimizing challenges to safety systems is consistent with the Commission's defense-in-depth philosophy. Maintenance is also important to ensure that design assumptions and margins in the original design basis are maintained. Thus, nuclear power plant maintenance is clearly important in protecting public health and safety. The maintenance of structures is an integral activity in ensuring that the plant can acceptably withstand challenges to safety-related systems.

Between September 1994 and March 1995, the NRC staff made pilot site visits to nine nuclear plants to review early implementation of the rule. The results of the site visits are documented in NUREG-1526, "Lessons Learned from The Early Implementation of The Maintenance Rule at Nine Nuclear Power Plants," dated June 1995. One of the staff's observations was that the licensees could not show that they were monitoring the effectiveness of maintenance of structures.

Between July 1991 and August 1992, the NRC staff performed site audits of six nuclear power plants to observe and assess the conditions of structures, passive components, and civil engineering features. The results of these site audits and other relevant information are documented in NUREG-1522, "Assessment of Inservice Conditions of Safety-Related Nuclear Plant Structures," dated July 1995. The general staff observation was that the licensees had not established adequate maintenance programs for structures, passive components, and civil engineering features. NUREG-1522 documents the degradation of structures, passive components, and civil engineering features based on the six site audits and previous industry experience.

[1] USNRC Memorandum to all Commissioners from J. Taylor on "Maintenance Rulemaking," June 27, 1991.

This inspection procedure provides guidance for the assessment of licensee-developed maintenance programs for structures at nuclear power plants. Where applicable, industry consensus and regulatory guidance documents are referenced that could be useful to licensees for developing a maintenance program for structures. However, these documents may not be all-inclusive, and the licensee may be required to develop additional provisions to meet the requirements of the maintenance rule. The NRC inspector should recognize such licensee-developed provisions and make a judgment regarding their acceptability by seeking expert advice from within the NRC or from outside the agency.

The inspector should note that an industry guideline for implementation of maintenance rule requirements, Nuclear Management and Resource Council (NUMARC) 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," has been developed. In addition, the Nuclear Energy Institute (NEI) has developed a draft industry guideline to specifically address the maintenance rule requirements for structures, NEI 96-03, "Guideline for Monitoring the Condition of Structures at Nuclear Power Plants." Licensees may have utilized the above-mentioned industry guidance in the development of their maintenance programs. Although the industry guidance documents may not have received formal approval from the NRC staff, the use of the industry guidelines by the licensees for implementing the maintenance rule should be assessed according to the guidance in this inspection procedure.

Specific Guidance

03.01 General and specific guidance for the inspection of licensee goal-setting and monitoring programs is documented in NRC Inspection Procedure (IP) 62706, "Maintenance Rule." The inspector should review the licensee's maintenance program, including goal-setting and monitoring procedures for structures. Goal setting is not required when the licensee can demonstrate that the condition of a structure is being effectively controlled through the performance of a periodic maintenance program. NRC IP 62706 also includes guidance for the inspection of the licensee's assessment and evaluation program.

03.01(a) Containment Structures

Inspection (examination, evaluation, repair, and/or replacement) of containment structures in accordance with Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants," and Subsection IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Plants," of the American Society Of Mechanical Engineers (ASME) Code Section XI, as endorsed in 10 CFR 50.55(a), will ensure containment integrity and assist licensees in meeting the requirements of the maintenance rule.

Inspection Procedure 6XXXX, "Inspection of Nuclear Power Plant Containments," (to be issued summer of 1997) provides guidance on the use of the ASME Code Section XI, Subsections IWE and IWL.

An acceptable licensee maintenance program should include the following measures for those areas not specifically covered in Subsections IWE and IWL:

- Inspection of containment supports in accordance with Subsection IWF of ASME Code Section XI, "Requirements for Class 1, 2, and 3 and MC Component Supports of Light-Water Cooled Plants"

- Demonstrated effectiveness of the foundation drainage system

- Settlement of the containment structure within the anticipated (design) limits

- Demonstrated integrity of the foundation structures (basemats, piles, and mechanical devices used to transmit loads to the foundation)

03.01(b) Concrete (Reinforced and Prestressed) Structures Other Than Containment Structures (e.g. fuel-handling buildings, spent fuel pool areas, diesel generator buildings)

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for concrete structures other than containment in accordance with the requirements of 10 CFR 50.65.

Concrete structures that are intended to support and transmit floor and equipment loads can be water-retaining structures, such as spent fuel pools, which could be challenged during both normal and accident conditions. These structures are normally Seismic Category I "safety-related" structures.

American Concrete Institute (ACI) 349.3R-96, "Evaluation of Existing Nuclear Safety-Related Concrete Structures," provides excellent guidance on various degradation mechanisms, the inspection of concrete structures, and specific evaluation criteria for metallic and nonmetallic liners of concrete, embedments, joints, coatings, and for prestressing tendon systems in prestressed concrete structures.

On the basis of previous industry experience documented in NUREG-1522, the following areas should be addressed, as a minimum, in maintenance programs:

(1) Condition of concrete slabs, beams, columns, base plates, and foundations
(2) Condition of the prestressing system (for grouted and greased prestressing elements)
(3) Condition of metallic and nonmetallic liners
(4) Leakage through water retaining structures and through portions of structures below grade
(5) Differential settlement of walls and foundation slabs

As with prestressed concrete containment structures, moisture accumulation and high stresses can cause cracking of anchor devices and corrosion of tendons. Grease leakage may affect the integrity of the prestressing tendons in the concrete. Concrete foundations, slabs, and basemats must be functional without excessive settlement or deterioration.

03.01(c) Intake and Pumphouse Structures

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for intake and pumphouse structures in accordance with the requirements of 10 CFR 50.65.

Fluid-retaining structures that provide water storage and transfer areas during normal operating, extreme environmental, and accident conditions are considered Seismic Category I "safety-related" structures.

ACI 349.3R-96 is useful in identifying degradation mechanisms and provides guidance on clarifying questionable conditions of concrete. As a minimum,

maintenance programs should address the following areas pertaining to intake and pumphouse structures:

Intake structures of coastal plants are typically exposed to harsh environmental conditions and /or brackish water. The result can be extensive cracking and corrosion of reinforced concrete walls, slabs, beams, and steel support members of the intake structures. Exposure to salt water accelerates chloride attack on concrete, thereby initiating degradation of concrete walls and structural elements. Licensees should include acceptance criteria for corrosion of metal components to be inspected under the maintenance rule.

Pump supports should properly transfer all loads from the pump to the parent structure. Anchorage systems (grout, base plates, anchor bolts, nuts, etc.) must be inspected to ensure that all required components are present. The anchorage system is functional if all components are present and capable of performing their intended function. Anchor bolts and support plates should have corrosion acceptance criteria. Grouted support chairs should be fully intact and capable of supporting the anchorage system.

Intake and discharge tunnels should be serviceable and should function properly. There should be no debris in the tunnels that appreciably restricts flow and no signs of appreciable differential settlement underwater that would exacerbate future degradation and settlement. Underwater parts of the structures could be susceptible to degradation.

03.01(d) Masonry Walls

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for masonry walls in accordance with the requirements of 10 CFR 50.65.

When masonry walls are used to support safety-related piping, raceways, and equipment, they are considered Seismic Category I "safety-related" structures.

IE Bulletin 80-11, "Masonry Wall Design," outlines the design provisions for masonry walls and NRC Information Notice (IN) 87-67, "Lessons Learned from Regional Inspections of Licensee Actions in Response to IE Bulletin 80-11," provides inspection experience. American Society of Civil Engineers (ASCE) 11-90, "Guideline for Structural Condition Assessment of Buildings," provides visual examination guidance for masonry construction, including the evaluation of the surface condition of the masonry, in order to determine deficiencies in joints, differential movement in joints, and warping, bulging, or sagging of components.

As a minimum, licensee maintenance programs should address the following topics pertaining to masonry walls:

Previous nuclear industry observations of masonry construction have indicated that masonry wall cracks are likely to be present at all plants. It should be noted that unreinforced masonry walls may have been design qualified, assuming no cracks in the walls. Therefore, the existence of cracking implies a loss of structural capability and/or margin.

Lateral supports have been installed on some unreinforced masonry walls to ensure seismic adequacy. Previous inspections have found these supports unanchored to the masonry construction.

Licensees should include acceptance criteria pertaining to the corrosion of metal components associated with masonry walls.

Bounding structural elements are the ceiling and floor slabs to which the masonry wall connects in order to secure the structure and transfer loading. These structural elements should be visually inspected to ensure that the masonry wall bounding elements have not been damaged under design-basis loadings.

03.01(e) Buried Piping, Pipe Supports, and Equipment Anchorages

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for buried piping, pipe supports, and equipment anchorages in accordance with the requirements of 10 CFR 50.65.

Seismic Category I buried piping should be able to perform its functions under vibratory loading caused by postulated seismic events. Anchorage systems must provide support to SSCs during normal, accident, and extreme environmental loading to prevent displacement, which could jeopardize the safety function of Seismic Category I SSCs.

The staff issued guidance in NRC IN 95-09, "Use of Inappropriate Guidelines and Criteria for Piping and Pipe Support Evaluation and Design," for the evaluation of Class 1, 2, and 3 piping and its structural supports.

As a minimum, the licensee's maintenance program should address the following topics for buried piping, pipe supports, and equipment anchorages:

NUREG-1522 documents previous walkdown inspections in which separation of grout material beneath equipment base plates, corrosion of anchor bolts, and extensive corrosion of support plates have been observed.

The cathodic protection system (CPS) (if present) should be functional. The inspector should review the licensee's documentation and surveillance to ensure that the system is protecting all elements served by the CPS. Licensees should include acceptance criteria for corrosion of piping, pipe supports, and anchorages.

Buried piping maintenance programs should include visual examinations when piping is accessible. Connections and joints of buried piping should show no signs of separation, environmental degradation, or leakage. There should be no appreciable settlement between the piping segments that could inadvertently cause pipe stress and leakage. Leakage through seams of large-diameter buried pipes could, if not corrected in a timely manner, lead to erosion of surrounding soil, development of a sinkhole, and other undesirable effects. When leakage is discovered in underground piping, the inspector should review the licensee's inspection methods and corrective actions should to ensure the licensee considered both leakage in and leakage out of the pipe in its evaluation.

03.01(f) Water Storage Tanks

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for water storage tanks in accordance with the requirements of 10 CFR 50.65.

Water storage tanks that provide safety-related water storage during normal operating and accident conditions are considered Seismic Category I "safety-related" structures. The attachments to water storage tanks should not apply unanticipated live or vibrational loads to the tank.

The guidance documents associated with the resolution of Unresolved Safety Issues (USIs) A-40 and A-46 provide background and guidance on evaluation criteria for the required walkdown inspection of water storage tanks. As a minimum, the licensee's maintenance program should address the following areas pertaining to water storage tanks:

Acceptance criteria pertaining to corrosion of all metal components and anchorages to be inspected under the maintenance rule.

Inspection of attachments to water storage tanks at their connection points to ensure secure attachment without damage. Pipes near the tank wall should not leak water or chemicals that could produce a detrimental environment.

Inspection of anchorage systems to ensure that all components, such as anchor bolt chairs, anchor bolts, support plates, washers, nuts, and saddle supports, do not show signs of degradation. During previous walkdown inspections of safety-related water tanks, these components were found to be completely missing. Tanks founded on concrete ring foundations, as opposed to flat concrete slabs, can experience foundation settlement and cracking.

Where practical, visual inspection of the inside and outside surfaces of the tank. Chapter 5 of ACI 349.3R-96 could be useful in evaluating the condition of concrete tanks.

Areas of stress concentration near the base of steel tanks and in areas with small radii of curvature should be visually inspected for bulges and depressions.

03.01(g) Steel Structures and Connections (including safety-related cranes, crane rails and supporting structures, and blowout panels)

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for steel structures and connections in accordance with the requirements of 10 CFR 50.65.

When steel construction is used to support and/or protect safety-related piping, raceways, and equipment, the construction is considered a Seismic Category I "safety-related" structure. Structural steel frames (beams, columns, trusses, etc.) provide support for carrying anticipated loads. This function requires that the chemical and physical properties of the steel remain acceptable for the expected loading conditions and lifetime of the structure, in as much the structural capacity of steel can be reduced by corrosion, physical damage, fatigue, excessive loading conditions, and exposure to fire.

Section 4 of ASCE 11-90 provides guidance and evaluation methods for steel structures. Electric Power Research Institute (EPRI) NP-5380, "Visual Weld Acceptance Criteria," provides additional guidance and evaluation methods for structural welds.

As a minimum, the licensee's maintenance program should address the following areas pertaining to steel structures and connections:

Safety-related cranes (hoists, trollies), monorails, and their supporting steel structures and anchorages.

The functionality of blowout panels when they are used to relieve the internal pressure of a structure caused by pipe breaks, high winds, or design-basis tornados. The maintenance program should verify that the panels have not been inadvertently secured (welded or bolted) to the structure such that the panels cannot properly function when required.

Acceptance criteria pertaining to corrosion of metal components and connectors to be inspected under the maintenance rule. Connectors are the means of making structural connections and may include welds, rivets, bolts and rods, studs, and wire ropes.

03.01(h) Dams, Embankments, and Canals

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for dams, embankments, and canals in accordance with the requirements of 10 CFR 50.65.

Fluid-retaining structures that provide water storage and transfer areas during normal operating, severe environmental, and accident conditions are considered Seismic Category I "safety-related" structures.

USNRC Regulatory Guide 1.127 provides inspection guidance for water-retaining structures that could be useful for reviewing their serviceability. The regulatory guide suggests the following criteria which, as a minimum, should be part of the licensee's maintenance program:

Settlement. Embankments and downstream toe areas should be examined for any evidence of unusual localized or overall settlement, depressions, or sinkholes.

Slope Stability. Embankment slopes should be examined for irregularities in alignment and variances from originally constructed slopes, unusual changes from original crest alignment and elevation, evidence of movement at or beyond the toe, and surface cracks that indicate significant internal movement.

Seepage. The downstream face of abutments, embankment slopes and toes, embankment-structure contacts, and the downstream valley areas should be examined for evidence of existing or past seepage. The sources of seepage should be investigated to determine the cause and the potential severity of effects on dam safety under all operating conditions. Animal burrows and vegetative growth on slopes that might cause detrimental seepage should be examined.

Drainage Systems. All drainage systems should be examined to determine whether the systems can freely pass discharge and to ensure that the discharge is not carrying embankment or foundation material. Systems used to monitor drainage should be examined to ensure they are operating correctly.

Slope Protection. The slope protection should be examined for erosion-formed gullies and wave-formed notches and benches that have reduced the embankment cross section or exposed less wave-resistant materials. The adequacy of slope protection against waves, currents, and surface runoff

that may occur at the site should be evaluated. The condition of vegetative or any other protective covers should be evaluated, when pertinent.

In general, all massive water-retaining structures should not have areas of differential settlement or construction joint gaps that allow water to leak beneath the structure thereby causing soil erosion and concrete deterioration. Concrete cracking around spillway gates of dams may be due to the high hydrostatic forces, differential settlement, and lack of maintenance. Reinforced and unreinforced concrete surfaces should be visually inspected in accordance with ACI Committee 207 Report, "Practices for Evaluation of Concrete in Existing Massive Structures for Service Conditions."

03.01(i) Seismic Gap Evaluation

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has goal setting, monitoring, and preventive maintenance for seismic gaps between structures in accordance with the licensee commitments in the Updated Final Safety Analysis Report (UFSAR) and the requirements of 10 CFR 50.65.

The licensee must maintain a seismic gap designed to prevent damage to the structure. Some variation is expected in the seismic gaps measured in plants because of construction tolerances, differential settlement, concrete volume changes, and temperature-related movement of structures.

NUREG-1522 documents previous inspection walkdowns in which seismic gaps were not in accordance with design. As a minimum, the licensee's maintenance program should address the seismic gap expansion filler to determine the condition of the joint and to note any indication of movement or distress. Fill materials have been found to experience degradation, thereby allowing moisture and debris to fill the seismic gap. In addition, a maintenance program should determine the adequacy of seismic gaps by direct measurement of the gaps and comparison to the design requirements and tolerances.

03.01(j) Supports and Anchorages for Large Equipment (e.g., steam generator supports, reactor vessel supports, Nuclear Steam Supply System (NSSS) piping supports)

Review the documentation constituting the licensee's maintenance program to ensure that the licensee has implemented goal setting, monitoring, and preventive maintenance for supports for large equipment in accordance with the requirements of 10 CFR 50.65.

Large equipment supports secure and protect safety-related equipment under normal operating, accident, and extreme environmental conditions.

Paragraph (g)(4) of 10 CFR 50.55(a) requires inservice inspections of Class 1, 2, and 3 components and their supports in accordance with the ASME Code, Section XI, and compliance with these inservice inspections constitutes meeting the requirements of the maintenance rule. Appendix C to USI A-46 General Implementation Procedure, Revision 2 (GIP-2), provides additional guidance for developing criteria for the inspection of anchorages. As a minimum, the licensee's maintenance program should address the following areas of large equipment supports:

Supports for large equipment that are usually of complex concrete and steel construction. In general, these components should support the large

equipment and be free of cracks in the concrete near embedded plates and structural steel.

Support anchorages. The NRC staff has observed degradation of support anchorages in various Class 2 and Class 3 piping supports. The staff has issued two generic communications to alert licensees regarding such degradations: Generic Letter (GL) 91-18 and IN 95-09. GL 91-18 gives information on resolving degraded and nonconforming conditions affecting all safety-related SSCs. The staff issued adequate guidance in IN 95-09 for the maintenance of Class 1, 2, and 3 piping and structural supports.

Thermal effects. Thermal effects may cause widespread cracking which can result in a loss of dynamic stiffness and/or concrete strength.

Acceptance criteria pertaining to corrosion of metal components to be inspected under the maintenance rule.

03.02 Scope of the Rule. The scope of SSCs that are required to be included within the rule is defined in 10 CFR 50.65(b). To verify that the licensee has correctly identified and documented structures, passive components, and civil engineering features at its facility, the inspector should perform the reviews outlined and discussed in Section 03.04 of USNRC IP 62706. Section 03.04 of IP 62706 clearly defines safety-related and non-safety-related SSCs in the scope of 10 CFR 50.65(b). The inspector should review the licensee's documentation and process for selecting structures, passive components, and civil engineering features included in the licensee's maintenance program. It is possible that there will be structures, passive components, and civil engineering features in addition to those in the performance groups listed in Section 03.01 of this inspection procedure.

62002-04 RESOURCE ESTIMATE

For planning purposes, the average estimated time to complete the requirements of this inspection procedure is 36 hours per nuclear power plant unit. This estimate is based upon the assumption that most of the licensee's inspection and maintenance documentation is available. This estimate assumes that the NRC inspector will review licensee documentation and perform spot checks of a few critical areas.

62002-05 REFERENCES

ACI Committee 207 Report, "Practices for Evaluation of Concrete in Existing Massive Structures for Service Conditions," reapproved 1985.

ACI 349.3R-96, "Evaluation of Existing Nuclear Safety-Related Concrete Structures," dated January 1996.

ASCE 11-90, "Guideline for Structural Condition Assessment of Buildings," dated June 1990.

ASME Code, Section XI, Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants."

ASME Code, Section XI, Subsection IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Plants."

ASME Code, Section XI, Subsection IWF, "Requirements for Class 1, 2, 3, and MC Component Supports of Light-Water Cooled Plants."

EPRI NP-5380, "Visual Weld Acceptance Criteria."

GIP-2, "Guidance on Walkdowns for Seismic Adequacy of Water Storage Tanks and Anchorages," dated February 1992.

NEI 96-03, "Guideline for Monitoring the Condition of Structures at Nuclear Power Plants," dated June 1996.

NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," dated May 1993.

NUREG-1522, "Assessment of Inservice Conditions of Safety-Related Nuclear Plant Structures," U.S. Nuclear Regulatory Commission, dated June 1995.

NUREG-1526, "Lesson Learned from Early Implementation of the Maintenance Rule at Nine Nuclear Power Plants," U.S. Nuclear Regulatory Commission, dated June 1995.

USNRC Inspection Procedure 62706, "Maintenance Rule," dated August 1995.

USNRC Regulatory Guide 1.35, "Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containments."

USNRC Regulatory Guide 1.35.1, "Determining Prestressing Forces for Inspection of Prestressed Concrete Containments."

USNRC Regulatory Guide 1.127, "Inspection of Water-Control Structures Associated with Nuclear Power Plants."

USNRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Related Documents:

USNRC IE Bulletin 80-11, "Masonry Wall Design," dated May, 1980.

USNRC IN 85-10, "Post-tensioned Containment Anchor Head Failure," dated February, 1985.

USNRC IN 86-99, "Degradation of Steel Containments," dated December, 1986.

USNRC IN 87-67, "Lessons Learned from Regional Inspections of Licensee Actions in Response to USNRC IE Bulletin 80-11," dated December, 1987.

USNRC IN 88-82, "Torus Shells with Corrosion and Degradation of Coatings," dated October, 1988.

USNRC IN 89-79, Supplement 1, "Degraded Coatings and Corrosion of Steel Containment Vessels," dated December, 1989.

USNRC IN 95-09, "Use of Inappropriate Guidelines and Criteria for Piping and Pipe Support Evaluation and Design," June, 1995.

END