

---

## INSPECTION PROCEDURE 88143

---

### PIPE SUPPORTS AND RESTRAINTS

PROGRAM APPLICABILITY: 2630

#### 88143-01 INSPECTION OBJECTIVES

01.01 To determine whether the technical requirements detailed or referenced in the facility Construction Authorization Request (CAR), associated with pipe supports and restraints in Seismic Category I (SC-I) and SC-II systems, have been adequately addressed in the construction specifications, drawings, and work procedures.

01.02 To determine whether requirements and commitments, in the approved Quality Assurance (QA) Plan, have been addressed in QA plans, instructions, and procedures, for pipe supports, and restraints, in SC-I and SC-II systems, and whether they have been established and installed, in accordance with construction specifications, drawings, and facility requirements.

01.03 To determine through direct observation and independent evaluation of work, whether the licensee's work control system is functioning properly and whether the installation of pipe supports and restraints in SC-I and SC-II systems are in compliance with U.S. Nuclear Regulatory Commission (NRC) requirements, licensee commitments, and applicable codes.

01.04 To determine whether: (1) the licensee is adequately implementing the QA program associated with, pipe supports and restraints, including preparing, reviewing, and maintaining a system of quality records; (2) the records reflect work accomplishment consistent with NRC requirements, CAR commitments, and the QA Plan; and (3) the records indicate any potential generic problems, management control inadequacies, or other weaknesses that could have safety significance.

#### 88143-02 INSPECTION REQUIREMENTS

Note: These requirements should be implemented so that each major contractor constructing pipe supports and restraints in SC-I and SC-II systems is inspected. The number of samples and attributes reviewed may be adjusted on management approval, depending on the number of contractors and specific work being performed. Approximately three-quarters of the samples reviewed should be in SC-I systems.

02.01 Review of QA Implementing Procedures. Review QA Manual and implementing procedures associated specifically with pipe supports and restraints, to determine whether the commitments in the approved QA Plan are being implemented as follows:

- a. Adequate QA audit procedures have been established for this activity, in accordance with, the approved QA Plan including: (1) scope and frequency of audits; (2) audit criteria; (3) reporting requirements; (4) followup action; and (5) resolution of findings by those audited.
- b. Provisions have been made to ensure that those engaged in conducting audits are qualified and have been adequately trained. Provisions must ensure that auditors do not have direct responsibility in the areas being audited.
- c. Means have been established to verify that technical requirements, including material and component specifications (including traceability and marking requirements for nuts, bolts and other fastener items), acceptance criteria, and required documentation are specified in design and procurement documents.
- d. Means have been established to verify that any significant design and field changes from approved drawings are adequately controlled and processed commensurate with the original design.
- e. Provisions have been established to ensure that quality requirements are met (including documentation that quality requirements of materials and components are met before installation or use) and that deviations, nonconformances, and defects are adequately documented and processed through to complete resolution.
- f. The licensee has established a program for ensuring that all craft, nondestructive examination (NDE), and inspection personnel associated with the installation of pipe supports and restraints have been trained, or otherwise qualified to the work procedures involved. Specific attention should be directed toward those engaged in the installation and testing of concrete expansion anchors, if these are used.

02.02 Review of Work Procedures.

- a. Determine whether procedures and instructions (e.g., drawings, specifications, manufacturers' instructions, etc.) pertaining to pipe supports and restraints have been reviewed and approved. Make this determination by reviewing an appropriate sample of work procedures.

The sample should include procedures and instructions for supports on various-size piping, and instrumentation lines.

- b. Determine whether work procedures incorporate the following:
  - 1. Controls to ensure that the type and classification of pipe supports and restraints comply with approved drawings and/or specifications and meet licensee commitments.
  - 2. Instruction and precautions to ensure that welding, cutting, forming, heat treating, and machining are performed in a manner that will prevent the

impact properties of the material from being degraded below specified values.

3. Provisions for ensuring that required pre-installation and in-process inspections, as discussed in Section 02.03a, are performed at the appropriate time.
4. Means to ensure that bolts, nuts, and washers (including lubricant, if used) are of the proper type, size, and material, with required identification-markings; are correctly installed; and, where required, bolt pre-loading (torquing), minimum bolt embedment, and thread engagement criteria are imposed.

02.03 Observation of Work and Work Activities. By direct observation, interviews, and independent evaluation of work performance, work in progress, and completed work, determine whether activities regarding pipe support and restraint systems are being accomplished, in accordance with NRC requirements, CAR commitments, and licensee procedures.

- a. Pre-installation Activities. Select three to five supports or shock suppressors and confirm performance of the following:
  1. Pre-installation checks are made to ensure hydraulic units are not installed if there is evidence of excessive leakage of hydraulic fluid (possible damage or deterioration of seals), physical damage, or corrosion of polished sliding surfaces. (Not required if hydraulic snubbers are not used.)
  2. Pre-installation check on variable type supports are performed for obvious damage, rust, or other conditions that may interfere with their proper operation.
  3. Pre-installation checks are made to ensure that bolts, nuts and other fastener items are available and are of the correct type, size, and material with required identification markings.
  4. Any pre-installation field repairs or adjustments to the units are performed in accordance with the manufacturers' instructions and specifications, to ensure that performance requirements are met.
  5. Installation equipment such as torque wrenches and other testing and measuring devices are properly controlled, calibrated, and adjusted at specified periods.
  6. Personnel engaged in the installation of pipe supports and restraints have received adequate training to perform special processes contained in relevant work performance and inspection procedures.

b. Installation Activities.

1. Witness portions of the installation activities of five to ten pipe supports to verify the following:
  - (a) The latest issue (revision) of applicable drawings or procedures is available to the installers.
  - (b) Appropriate personnel approve significant modifications to supports, before implementation.
  - (c) The use of jacks or rigging to pull piping into position for hanger installation or welding does not exceed cold-spring allowances for that particular material, size, and length of pipe run.
  - (d) Clearances existing between the pipe and restraints are as specified.
2. Witness portions of the installation and testing of concrete anchor bolts for five to ten component-support elements (of various types and pipe sizes), to verify that anchor-bolt type, diameter, embedment length, shoulder-to-cone measurements, and torque requirements meet installation requirements.

c. Dynamic Pipe Supports. Select a total of five to 10 installed restraints covering at least three different load classifications and at various degrees (easy or difficult) of accessibility; and determine, by visual examination, whether the following conditions meet applicable requirements:

1. Components are free from corrosion or other signs of deterioration.
2. Support plates, extension rods, and connecting joints are not bent, deformed, loose, or otherwise out of specification.
3. Bolts, nuts, washers, locking devices, and other fasteners are tight and secure and are of the correct type, size, and material, with required identification markings. Where required, bolt-tension specification requirements have been met through the use of properly calibrated bolt-torquing wrenches and torque multipliers.
4. Bleed holes are open and free from foreign material.
5. Lubricants and sealants are applied as specified and there does not appear to be excessive leakage.
6. Seals are not deteriorated (if visually observable without dismantling).
7. Connecting joints, moving parts, piston shafts, seals, etc., are free from foreign material such as concrete, dropped paint, excessive dust and dirt, or other material that may obstruct proper operation.

d. Rigid, Constant, and Variable-Type Supports.

1. Select a total of five to 10 installed spring-hanger assemblies covering three different load ratings and observe the following:
  - (a) Hanger rods for supporting (2-inch) pipe are not less than (3/8-inch) diameter, and for (2-1/2-inch) pipe or larger, not less than (1/2-inch) diameter.
  - (b) Spring hangers are provided with indicators to show the approximate "hot" or "cold" position, as appropriate.
  - (c) Spring hangers enclosed in spaces that will be subjected to high ambient temperatures during facility operation have suitable service ratings to accommodate the expected operating-temperature range.
  
2. Select a total of five to 10 installed pipe supports of different sizes (load rating) and at various degrees of accessibility. Determine, by visual examination, whether the following conditions exist:
  - (a) No deformation or forced bending is evident.
  - (b) No deterioration or corrosion is evident.
  - (c) Where pipe clamps are used to support vertical lines, shear lugs are welded to the pipe (if required by installation drawings) to prevent slippage.
  - (d) Movements of pipe from vibration, thermal expansion, etc., will most likely not cause contact with other pipes, supports, equipment, nor components. (As best as can be determined after installation, but before initial operation.)
  - (e) Sliding or rolling supports are provided with material and/or lubricants suitable for the environment and compatible, sliding-contact surfaces.
  
3. Select at least four small-bore or instrumentation lines that have been designed by a simplified seismic criterion. Determine, by visual examination, whether the following conditions meet applicable requirements:
  - (a) The functional restraint direction is proper and in accordance with the design drawings.
  - (b) The gaps between the piping and support appear adequate to allow thermal axial expansion.
  - (c) The gaps between the piping and support are not excessive for dynamic loads.

- e. Component Supports. Select a total of five to 10 installed component supports, including at least two multiple pipe supports, and ascertain, by visual examination, whether the following conditions exist:
1. Component-support elements are located and installed as specified on the drawings.
  2. The surfaces of welds meet applicable Code requirements. Check weld surfaces for grooves, abrupt ridges, valleys, undercuts, cracks, discontinuities, or other detrimental indications that appear to exceed Code limitations.
  3. Materials used in the construction of the component supports have been certified by reviewing material-test reports or a certificate of compliance.
  4. Where special bolting materials are specified, check for compliance with specifications including preload (torquing) requirements.
  5. Support clearances are as specified.
- f. As-Built Configuration.

1. Select three to seven as-built/final design-pipe-support structural drawings and compare several selected supports with the actual installation.

Discrepancies observed may result from in-process changes, such as those initiated in the field. If in-process changes are involved, determine whether the licensee has properly controlled and documented these changes on a current basis for engineering review, approval, and subsequent incorporation into final as-built drawings.

2. Select a total of three to seven pipe-anchor locations on the as-built drawings [piping (2-1/2 inches) in diameter and greater]. These anchor locations are designed to restrict individual pipe movement in all directions. Visually examine these anchors and compare them with the drawings, to ensure agreement as to their location and function.

#### 02.04 Review of Records.

- a. Review licensee and contractor requirements covering the span of records for piping supports and restraints. Determine the initiation point for those records sampled and, importantly, the effectiveness of those responsible for reviewing the records for accuracy and completeness and ensuring that the recorded information meets documentation requirements. To determine the effectiveness of the licensee or contractor system for documenting work in this area, review the records for three dynamic pipe supports or restraints and three fixed pipe supports in the following areas:
1. Type and classification of pipe support or restraint comply with appropriate

drawings and specifications.

2. Location, spacing, and critical clearances meet licensee's specifications and have been verified by licensee QA/quality control (QC) inspection.
  3. The required scope of licensee QA/QC inspections was met.
  4. Weld identification/location corresponds to respective weld card, drawing, work order, or other welding documentation.
  5. Welding material used corresponds to the material specified.
  6. Welders were qualified to the welding procedures used and welding procedures were qualified in accordance with Code requirements.
  7. The records confirm that for welding activities where attachments are welded directly to piping, the welding specifications used are the same or equivalent to the ones used for pipe welding, including preheat, postweld-heat treatment, and NDE examinations.
  8. The examination records are complete and meet the inspection and/or NDE procedure requirements.
- b. Review the licensee/contractor system for reporting and disposition of non-conforming materials, parts, and components -- and process or installation deficiencies, associated with pipe supports and restraints. Review approximately five to 10 nonconformance/deviation reports to determine whether:
1. The records adequately document current status of nonconformances and deviations.
  2. The records are legible, complete, and indicate that reports are promptly reviewed by qualified personnel for evaluation, disposition, and prioritization.
  3. The records are routinely being processed through established channels for resolution of the immediate problem, as well as for generic implications.
  4. The records are being properly identified, stored, and can be retrieved in a reasonable time.
  5. Nonconformance reports include the status of corrective action or resolution.
  6. Resolution of nonconformances is appropriate and demonstrates good engineering practice.
- c. To determine whether qualified licensee, contractor, craft, and inspection personnel are being used on those special processes associated with pipe support and restraint installation work, review a sampling of personnel qualification records (four to six) covering several different disciplines as follows:

1. Determine whether a system of personnel qualification records, meeting stated requirements, exists and is being maintained in current status.
  2. Determine if the records are sufficient to reasonably support qualification in terms of certification, experience, proficiency, training, testing, etc., as applicable.
  3. Review the action taken by responsible licensee/contractor organizations to independently authenticate the employment, training, and qualification history of newly hired personnel.
- d. Review relevant portions of licensee and contractor audit reports concerning the installation of pipe supports and restraints. Review two to four reports to determine whether:
1. The required audits have been performed in accordance with schedule and functional areas in established audit plans.
  2. Audit findings have been reported in sufficient detail to permit a meaningful assessment by those responsible for corrective action, final disposition, and trending.
  3. The licensee/contractor has taken proper follow-up action on those matters in need of correction.

## 88143-03 INSPECTION GUIDANCE

### General Guidance.

- a. This procedure pertains to all pipe supports and restraints in SC-I and SC-II systems. Pipe supports include pipe hangers, restraints, supports, shock and sway suppressors, etc., that directly support the pipe. Pipe whip restraints, such as structural steel or concrete barriers that do not normally contact the pipe, are not covered by this procedure. Additionally, it should be noted that some welding inspections are included in this inspection procedure (IP). Assistance to the inspectors in this area may be required. This matter should be considered during inspection preparation.



- b. Applicable portions of the CAR and Quality Assurance Plan (QAP) should be reviewed, to determine licensee commitments, regarding construction and inspection requirements, before performing this inspection. The inspectors should then use these CAR and QAP sections during the review of the licensee's implementing construction specifications, drawings, work procedures, and QA implementing procedures. Most of this review can be completed during inspection preparation, after these procedures have been obtained from the site. The NRC inspectors also should review applicable portions of the applicable Code.
- c. It is recognized that the construction installation work associated with this IP may be carried out over an extended period of time, which may require a series of inspections to fully complete this procedure. Additionally, some licensee contracting arrangements may be such that several different contractors will be involved in the installation work. If this is the case, selected parts of this procedure may have to be repeated, to adequately cover the total effort. Regional evaluations and appropriate adjustments to this procedure are necessary to ensure inspection continuity, during the extended period of time involved, and to accommodate the various contracting arrangements encountered.
- d. Considerable impact on the development and structure of this IP has resulted from a series of problems NRC has encountered at nuclear power plants in the area of pipe supports and restraints. These problems and concerns are best summarized in Inspection and Enforcement (IE) bulletins, circulars, and information notices that have been issued over the years. These documents are listed in the reference section below. Information contained in these issuances may be beneficial to the inspectors during implementation of this IP.
- e. Findings from this inspection activity should address each element as being satisfactory, being unresolved and requiring resolution, or being in violation and requiring correction. When significant inadequacies are identified, indicating weakness within the responsible organization, the inspectors should inform cognizant Regional supervision. The issue should be addressed also at the appropriate level of licensee management.
- f. Particular attention should be given to the traceability of material and equipment, to prevent the use of incorrect or defective materials, parts, and components. The inspectors should review 10 CFR Part 50, Appendix B, Criterion VIII, "Identification and Control of Materials, Parts and Components," and applicable codes and specifications. The inspectors should verify that the licensee has established measures for the identification and control of materials, parts, and components, and for traceability to the approved design basis and to the source. The inspectors should assure that required identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item, as required, and that required markings are on the item.

The inspectors should note markings on material and equipment and verify that the markings represent material and equipment as specified by the design drawings and specifications. In the case of fasteners, compliance with the applicable material specification [e.g., (American Society for Testing and Materials or American Society of Mechanical Engineers(ASME)), material and grade] should be verified by required markings on bolts and nuts and certified material test reports or certificates of conformance, as required by the applicable procurement drawings and specifications, and/or by the applicable codes and specifications. In the case of vendor-supplied equipment assemblies containing fasteners, samples should be inspected to verify compliance with approved vendor drawings and specifications, and other information, such as materials used for equipment qualification tests and/or analyses. Caution should be exercised to ensure that the required markings on material and equipment, including fasteners, not only exist, but that the markings indicate the correct material and grade, as specified.

03.01 Specific Guidance.

- a. Inspection Requirements 02.01a and b. Audit procedures and/or checklists for pipe supports and restraints systems should provide for checks of each type of system used and should, if possible, include representative samples from all suppliers of components. Audit procedures or criteria should address the qualifications needed by those performing the audits.
- b. Inspection Requirement 02.01f. The inspectors should determine specific steps the licensee has taken, or plans to take, to ensure that only qualified personnel are permitted to perform work associated with the installation of pipe supports and restraints. This effort may tie in with the review of the licensee's audit plans specific to this area of work.
- c. Inspection Requirement 02.02b2. Most of the welding, cutting, and forming operations covered by this procedure pertain to component-support structures, support members, and brackets, and do not require pre-heat-treatment nor postweld heat treatment. However, those pipe supports, support flanges, or support brackets that are directly welded to Quality Level (QL-1) pipe may be subject to preheat and/or postheat treatment. Applicable heat-treatment procedures are necessary for this type of installation. Records of heat treatment (time, temperature) must be generated and reviewed for Code compliance.
- d. Inspection Requirement 02.03b2. Refer to IE Bulletin No. 79-02 (and revisions), "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts," for general information.
- e. Inspection Requirement 02.03e3. The material certificate and identification should meet the requirements of the applicable Code/Standard.

- f. Inspection Requirement 02.03f. The intent is to determine whether pipe supports and restraints are being installed according to properly approved drawings -- either the original design drawings or properly approved revisions -- and, if revisions are in process, that these changes are properly handled in accordance with established procedures.

Appropriate standards can be used as a guide in this area. For example, ASME NQA-1 requires that where changes to previously verified designs have been made, design verification shall be required for the changes, including evaluation of the effects of those changes on the overall design.

Further, ASME NQA-1 states that records that correctly identify the as-built condition of items in the nuclear facility shall be maintained and stored for the life of the particular item, while it is installed in the facility. Additionally, 10 CFR Part 50, Appendix B, Criterion III, states in part, that design and field changes shall be subject to the same design-control procedures as the original design.

Changes may be made to these supports, during construction, that are different from the original CAR design. Such changes will result in the accumulation of various types of design-change documents and/or marked-up drawings. Since these changes reflect as-built conditions, they should be adequately controlled so they will be readily available for use with affected original design documents, during future evaluation on the effect other design changes have on the overall design. Additionally, the as-built process should result in proper and timely updating of the original/master drawings and specifications to incorporate such changes.

- g. Inspection Requirement 02.04. The inspectors should bear in mind that NRC's inspection sample covers only a very small portion of the records involved. Thus, substantive errors, or departure from requirements identified in NRC's sample, raise the issue of whether the licensee is adequately controlling the process. In this connection, particular attention should be given to reviewing the adequacy of those records dealing with the qualification of personnel and QA audits. Problems noted in these two areas should be viewed as prime indicators of the licensee's involvement in the work and the effectiveness with which the licensee maintains control over the work in progress.

03.02 Prevalent Errors and Concerns. This section is included to provide background on past problems of a generic nature, that have been identified at nuclear power facilities. This section is for information only.

- a. Welders not properly qualified to applicable Code, and records not properly maintained.
- b. Personnel-qualification records, including indoctrination, training, examinations, and certifications, either not being maintained, invalid, or nonexistent for some employees.

- c. Field-design work (redesign, modifications) not being processed through appropriate review and approval route.
- d. Nonconformance reports not being processed fully in accordance with established procedures.
- e. Personnel assigned to licensee audit function not appropriately trained in the assigned audit areas nor independent from areas audited.
- f. Licensees and contractors conduct some audits on schedule, but may postpone or omit others entirely. Although audits are carried out to some extent and may be adequately performed, in many instances the audit findings and recommendations are ignored or are filed without appropriate consideration or follow-up action.
- g. Refer to Appendix A of IE Bulletin 79-14, for additional problem areas. Other IE bulletins, circulars, and information notices listed below in the reference section of this IP contain additional information about problem areas.

### 03.03 Definitions.

Dynamic Pipe Supports. A pipe-support assembly or restraint, with a hydraulic or mechanical control unit--designed to prevent unrestrained pipe motion during an earthquake -- or vibratory pipe movements brought on by the actuation of a water hammer, steam hammer, pump/start/stop, or safety and relief valve. Thermal expansion of piping is not restrained by dynamic supports (snubbers, shock suppressors, etc.).

Rigid, Constant, and Variable Type Supports. Pipe support assemblies used for mounting pipes without hydraulic or mechanical control units (hangers, base supports, saddle supports, spring hangers, sliding and rolling supports, etc.).

Component Supports. Metal elements that transmit loads between plant components and the building structure and whose function includes carrying the weight of components or providing them with structural stability.

Component Standard Supports. Pipe-support assemblies consisting of one or more units usually referred to as catalog items and generally mass-produced (anchors, guides, restraints, rolling or sliding supports, spring hangers, snubbers, sway braces, vibration dampeners, clamps, etc.).

### 88143-04 RESOURCE ESTIMATE

This IP is expected to take, on the average, 32 to 64 hours of inspection effort per major contractor. The construction installation work associated with this procedure may be carried out over an extended period of time, which may require a series of inspections, to fully complete this procedure. Additionally, some licensee contracting-arrangements may be such that several different contractors will be involved in the installation work. If this is the case, this procedure may have to be repeated, in order to adequately cover the total effort.

## 88143-05 REFERENCES

Duke, Cogema, Stone and Webster, "Mixed-Oxide Fuel Fabrication Facility, MOX Project Quality Assurance Plan (MPQAP)," Docket Number 070-03098, under U.S. Department of Energy Contract DE-AC02-99-CH10888, latest revision accepted by the NRC.

Duke, Cogema, Stone and Webster, "Mixed Oxide Fuel Fabrication Facility Construction Authorization Request," latest revision accepted by NRC.

U.S. Code of Federal Regulations, Title 10, Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."

U.S. Code of Federal Regulations, Title 10, Part 70, "Domestic Licensing of Special Nuclear Material."

U.S. Code of Federal Regulations, Title 10, Part 21, "Reporting of Defects and Noncompliance."

American Society of Mechanical Engineers, ASME NQA-1-1994, Parts I and II, "Quality Assurance Requirements for Nuclear Facility Applications," as revised by the ASME NQA-1a-1995 Addenda.

American Society of Mechanical Engineers, ASME B31.3-2002, "Process Piping."

American Welding Society, AWS D1.1, "Structural Welding Code."

American Society of Civil Engineers, ASCE 4-98, "Standard Seismic Analysis of Safety-Related Nuclear Structures."

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.28, "Quality Assurance Program Requirements (Design and Construction)," Revision 3.

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.61, "Damping Values for Seismic Design of Nuclear Power Plants," October 1973.

American National Standards Institute/American Institute of Steel Construction, (ANSI/AISC) N690-1994, "Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities (SC I)."

The following references describe problems at nuclear power facilities and are for background information only:

Inspection and Enforcement Bulletin, (IE) Bulletin 73-03 (and revision), "Defective Hydraulic Shock Suppressors and Restraints."

Inspection and Enforcement Bulletin, (IE) Bulletin 73-04 (and revision), "Defective Bergen-Paterson Hydraulic Shock Absorbers."

Inspection and Enforcement Bulletin, (IE) Bulletin 73-07, "Failure of Structural or Seismic Support Bolts on Class 1 Components."

Inspection and Enforcement Bulletin, (IE) Bulletin 74-03, "Failure of Structural or Seismic Support Bolts on Class 1 Components."

Inspection and Enforcement Bulletin, (IE) Bulletin 75-05, "Operability of Hydraulic Shock and Sway Suppressors."

Inspection and Enforcement Bulletin, (IE) Circular 76-05, "Hydraulic Shock and Sway Suppressors."

Inspection and Enforcement Bulletin, (IE) Circular 76-07, "Damaged Components of Bergen-Paterson Hydraulic Test Stand."

Inspection and Enforcement Bulletin, (IE) Bulletin 78-10, "Bergen-Patterson Hydraulic Shock Suppressors Accumulator Spring Coils."

Inspection and Enforcement Bulletin, (IE) Information Notice 79-01, "Bergen-Paterson Hydraulic Shock and Sway Arrestors Reported Failures."

Inspection and Enforcement Bulletin, (IE) Bulletin 79-02 (and revisions), "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts."

Inspection and Enforcement Bulletin, (IE) Bulletin 79-07, "Seismic Stress Analysis of Safety-Related Piping."

Inspection and Enforcement Bulletin, (IE) Information Notice 79-10, "Nonconforming Pipe Support Struts."

Inspection and Enforcement Bulletin, (IE) Bulletin 79-14 (and revisions), "Seismic Analysis for As-Built Safety-Related Piping Systems."

Inspection and Enforcement Bulletin, (IE) Circular 79-25 (and supplement), "Shock Arrestor Strut Assembly."

Inspection and Enforcement Bulletin, IE Information Notice 79-28, "Overloading of Structural Elements Due to Pipe Support Loads."

Inspection and Enforcement Bulletin, (IE) Bulletin 81-01 (and revision), "Surveillance of Mechanical Snubbers."

Inspection and Enforcement Bulletin, (IE) Circular 81-05, "Self Aligning Rod End Bushing for Pipe Supports."

Inspection and Enforcement Bulletin, (IE) Information Notice 82-12, "Surveillance of Hydraulic Snubbers."

END

ATTACHMENT 1

Revision History for IP 88143

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	07/25/07 CN 07-023	IP 88143 is a newly issued procedure. Issued for MOX inspection program to improve effectiveness and efficiency by incorporating and consolidating inspection requirements involving pipe support and restraints inspection activities.	None	N/A	ML071720296