



**TRAINING ON INSERVICE TESTING
OF NUCLEAR POWER PLANT
SYSTEMS AND COMPONENTS**

INSTRUCTOR:

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**A PROFESSIONAL DEVELOPMENT PROGRAM
PRESENTED BY:**

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Background

This IST training course is to provide an introduction to the requirements of the U. S. Nuclear Regulatory Commission, and ASME Operations and Maintenance (O&M) Standards for the inservice testing of nuclear power plant systems and components. Specific emphasis will be placed on the ASME Code boundary classification process, Owner's responsibilities, test and examination plans, and detailed requirements for inservice testing of pumps and valves. Several examples will be used to illustrate the correct application of the technical requirements.

IST Training Outline

- Purpose of Inservice Testing
- U. S. Nuclear Regulatory Commission Requirements
- ASME Code Classification System for Components
- ASME Operations & Maintenance Standards and Guides
- General Test Requirements
- Pump Testing Requirements
- Valve Testing Requirements
- Dynamic Restraints (Snubbers) Testing Requirements
- Specific Topics Include:
 - ASME Code Introduction and Background
 - Regulatory Requirements
 - ASME Code Classifications for Components
 - The ASME OM Committee
 - ISTA – General Test Requirements
 - ISTB – Pump Testing Requirements
 - Mandatory Appendix V – Pump Periodic Verification Test Program
 - ISTC – Valve Testing Requirements
 - Mandatory Appendix I – Safety and Relief Devices
 - Mandatory Appendix II – Check Valve Condition Monitoring
 - Mandatory Appendix III – Motor Operated Valves
 - ISTD – Snubber Testing Requirements
 - NUREG-1482, Revision 2
 - USNRC Generics
 - USNRC Regulatory Guides 1.192 and 1.193
- Classroom Discussion

Instructor

Ronald C. Lippy

Mr. Lippy has more than 40 years of professional experience in nuclear power plant operation, maintenance, inspection, and testing including experience in ASME Codes and Standards, regulatory requirements, and licensing and design basis activities. Related career highlights include:

- Inservice Inspection Coordinator (ISI Coordinator, (ASME Section XI Repair/Replacement, ISI Examinations, Pressure Testing)
- Appendix J Integrated Leak Rate (ILRT) and Local Leak Rate Testing (LLRT)
- Inservice Test (IST) Coordinator
- Level III Startup and System Test Engineer
- Senior Reactor Operator (USN)
- Engineering Watch Supervisor (USN)
- Chairman of the ASME Operations and Maintenance (OM) Standards Main Committee
- Ex-Officio Member of the ASME Board of Nuclear Codes and Standards
- Member of the ASME Regulatory Interface Group
- Previous Chairman New Reactor OM Code Task Group
- Member of the ASME OM Sub-Committee on Pumps and Valves

NOTICE

The instructor for this training is a recognized expert in their field and has extensive experience in the subject matter. However, the views expressed by the instructor do not necessarily represent the views of the American Society of Mechanical Engineers or the U. S. Nuclear Regulatory Commission. Attendance at this training session should not be construed to provide preferential treatment or advantage for the attendees or their organizations in any matter involving the ASME Boiler and Pressure Vessel Code Committee, the Operations and Maintenance Standards Committee, or the U. S. Nuclear Regulatory Commission.

These notes are intended for use as educational material and are not intended to replace the applicable edition and addenda of the ASME Boiler and Pressure Vessel Code or the OM Code or, regulations set forth by the U. S. Nuclear Regulatory Commission. All requests for interpretation or other inquiries relative to the ASME Boiler and Pressure Vessel Code or, the OM Code, should be addressed to the Secretary, Boiler and Pressure Vessel Committee, American Society of Mechanical Engineers, United Engineering Center, Three Park Avenue, New York, NY 10016. Comments and questions related to the USNRC rulemaking may be addressed to Mr. Wallace E. Norris, U. S. Nuclear Regulatory Commission, Mail Stop 07D4, Washington, DC 20555, Telephone: (301) 415-3266, E-mail: wen@nrc.gov.

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INSERVICE TESTING TRAINING COURSE SYLLABUS

- IST Historical Perspective
- Federal Law
- OM Codes
- ISTA – General Requirements
- ISTB/ISTF – Pumps
- ISTC – Valves
- ISTD – Snubbers/Supports
- Appendix I – Relief/Safety Valves
- Appendix II – Check Valve Condition Monitoring
- Appendix III – Motor Operated Valve IST Testing Requirements
- Appendix V – Periodic Pump Verification
- Inservice Testing Overview
- Program Description (Scope & Purpose)
- IST Implementation – Pumps
- IST Implementation – Valves
- Instrumentation Requirements
- IST Implementation – Dynamic Restraints (Snubbers)
- Regulatory Allowances

INSERVICE TESTING TRAINING COURSE OUTLINE

- IST Program Plan
- Philosophy / Narrative
- Valve / Pump Test Matrices
- Relief Requests
- Cold Shutdown / Refueling Outage Justifications
- IST Basis Document
- Post Maintenance / Modification Testing Requirements
- Implementation / Regulation of IST
- IST and Plant Technical Specifications
- NRC Guidance:
 - GLs 87-06, 89-04, 90-06, 91-18, 96-06, 2008-01
 - NUREG 1482
 - Information Notices (INs) 91-56, 97-16, 97-90, 2000-21, 2012-014
 - USNRC Inspection Procedure 73756
 - Examples of recent industry issues/violations
- IST Interface with other Plant Programs:
 - ISI, Repair / Replacement
 - 10 CFR 50, Appendix J
 - IWE / IWL

INSERVICE TESTING TRAINING COURSE OUTLINE

- Future IST Perspective / Code Changes:
 - Performance Based Testing
 - General Requirements (ISTA)
 - Pumps (ISTB)
 - Valves (ISTC)
 - Check Valves (ISTC Appendix II)
 - MOVs (ISTC Appendix III)
 - AOVs (ISTC Appendix IV)
 - Safety and Relief Valves (Appendix I)
 - Dynamic Restraints (Snubbers) (ISTD)

TABLE OF CONTENTS

NOTE: A complete set of reference appendices have been placed on the TNC website for each attendee to download. Select pages from the below listed references that will be used during the course have been included in hard-copy.

APPENDIX A: 10 CFR 50, Appendix B, Requirements
10 CFR 50.2, Definitions

APPENDIX B: 10 CFR 50.55a Requirements

APPENDIX C: IST Bases Examples

APPENDIX D: Regulatory Guides

- RG 1.192, *Operation and Maintenance Code Cases Acceptability, ASME OM Code*
- RG 1.193, *ASME Code Cases NOT Approved for Use*

APPENDIX E: USNRC NUREGs:

- NUREG-1482, Revision 2 Final Report

APPENDIX F: USNRC Generic Letters:

- GL 87-06, *Periodic Verification of Leak Tight Integrity of Pressure Isolation Valves*
- GL 90-06, *Power Operated Relief Valves and Block Valves and LTOP*
- GL 96-05, *Periodic Verification of Design Bases Capability of Safety-Related Motor-Operated Valves*
- GL 89-10, *Safety-Related Motor Operated Valve Testing and Surveillance*
- GL 2008-01, *Managing Gas Accumulation in SR Systems*
- GL 89-04, *Guidance on Developing Acceptable Inservice Testing Programs*

TABLE OF CONTENTS

APPENDIX G: USNRC Information Notices:

- IN-2001-014, *Problems With Incorrectly-Installed Swing-Check Valves*
- IN-2012-014, *Motor Operated Valve Inoperable Due to Stem-Disk Separation*
- IN-2003-01, *Failure of a Boiling Water Reactor Target Rock Main*

Steam Safety/Relief Valve

- IN-2003-017, *Reduced Service Life of Automatic Switch Company (ASCO) Solenoid Valves with BUNA-N Material*
- IN-91-56, *Potential Radioactive Leakage to Tank Vented to Atmosphere*
- IN-97-16, *Preconditioning*
- IN-97-90, *Non-Conservative Acceptance Criteria in IST Pump Tests*

APPENDIX H: NRC Regulatory Information Summaries:

RIS-2004-012, *Clarification on Use of Later Editions and Addenda to the ASME OM Code and Section XI*

RIS 2005-020, Rev. 2, *Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety"*

RIS 2005-020. *Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and On Operability"*

RIS-2012-08, *Developing Inservice Testing and Inservice Inspection Programs Under 10 CFR Part 52"*

RIS-2012-10, *NRC Staff Position on Applying Surveillance Requirements 3.0.2 and 3.0.3 to Administrative Controls Program Tests"*

APPENDIX I: USNRC Workshop Summary – 1997

APPENDIX J: Examples of ASME/OM Code Inquiries

APPENDIX K: NRC Inspection Manual 0326

APPENDIX L: Technical Specifications Task Force Improved Standard Technical Specifications Change Traveler (**refer to flashdrive for document**)

APPENDIX M: INPO Engineering Program Guide IST Program (**refer to flashdrive for document**)

APPENDIX N: NRC Proposed Rule Making 2015

APPENDIX O: Abbreviations