

PROFESSIONAL DEVELOPMENT COURSES



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PROFESSIONAL DEVELOPMENT COURSES

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CODES AND JURISDICTIONAL REQUIREMENTS

OBJECTIVE:

This two-day course provides an overview of the Federal government requirements applicable to pressure retaining systems and components in CANDU Nuclear Power Plants. It reviews the Canadian Standards that have been developed for the CANDU Nuclear Power Plants and discusses the interaction between the Regulations and these Standards.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <p>CANADIAN LICENSING REQUIREMENTS</p> <ul style="list-style-type: none"> • Authority and Responsibility; Canadian Approach to Nuclear Safety; Nuclear Standards - Regulatory Documents; Safety Analysis Requirements; CNSC relationship with other Jurisdictions; The Future <p>PROVINCIAL REQUIREMENTS</p> <ul style="list-style-type: none"> • Boiler and Pressure Vessels Act B51 - M1997: Boiler, Pressure Vessels, and Pressure Piping Code <p>SPECIFIC FEDERAL REQUIREMENTS</p> <ul style="list-style-type: none"> • Obtaining Code Classification Approval; Code Classification of Systems & Components; Code Effective Date <p>CNSC/TSSA RELATIONSHIPS</p> <ul style="list-style-type: none"> • Jurisdictional Agreements 	<p>DAY 2:</p> <p>QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR NUCLEAR POWER PLANTS</p> <ul style="list-style-type: none"> • CAN3 - N286 Series <p>GENERAL REQUIREMENTS FOR PRESSURE-RETAINING SYSTEMS & COMPONENTS IN CANDU NUCLEAR POWER PLANTS</p> <ul style="list-style-type: none"> • N285 Series • CAN3 - N285.0 <p>PROCUREMENT QUALITY ASSURANCE</p> <ul style="list-style-type: none"> • CSA Z299 Series / ISO - 9000 <p>CORPORATE QA PROGRAM</p>
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WHO SHOULD ATTEND?

This course is excellent training for those persons whose work activity requires them to apply the various requirements of these Codes and Standards. It will enhance their understanding of why various elements are required and enable them to conform more readily to these requirements. The course will be useful to the many disciplines that are required to understand and implement code requirements. The people in these disciplines include designers, inspectors, purchasing agents, maintenance personnel and operation personnel.

EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

1. An understanding of the relationship between the safe regulation of Nuclear Power Plants and the Codes and Standards developed for the nuclear program.
2. An understanding of the concepts of Code Classification and the relationship between the CSA Standards for Pressure Boundary and the ASME Standards with emphasis on CSA N285.0.
3. An understanding of the QA programs associated with the nuclear program and their importance in the overall approach to safety. An example of the application for the participant of the program is developed.

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INTRODUCTION TO THE CSA STANDARDS USED IN THE CANADIAN NUCLEAR PROGRAM

OBJECTIVE:

This one day course is a preliminary introduction to the CSA Standards that have been jointly developed by industry and the regulatory authorities to provide for a safe Nuclear Power Program in Canada. There are approximately 50 standards with requirements to be met in the areas of pressure boundary, seismic design, concrete containment, instrumentation, and quality assurance. The course introduces the participants to these standards. A manual is provided that can be used by the participants after the course to refresh their knowledge of the contents of each of the standards and refresh their understanding of the concepts and principles upon which the Standards are based.

CONTENTS: A one-day course that will cover the following series of Standards:

<ul style="list-style-type: none">• CSA N285 Series• CSA N286 Series• CSA N287 Series• CSA B51• CSA N288 Series• CSA N289 Series• CSA N293 Series	<ul style="list-style-type: none">• CSA N290 Series• CSA Z299 Series• ISO-9000 Series• CSA Q396 Series• CSA S-16• NFPA Standards• Building Codes
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WHO SHOULD ATTEND?

The course will be useful to the many disciplines that are required to understand and implement code requirements. These disciplines include designers, inspectors, purchasing agents, and maintenance and operation personnel.

INTRODUCTION TO JURISDICTIONAL REQUIREMENTS FOR PRESSURE BOUNDARIES

OBJECTIVE:

This course is a basic course designed to introduce participants to the Canadian Federal Laws and Regulations as they apply to the Pressure Boundary of Nuclear Power Plants. It provides an understanding of these laws and their relationship to the concept and role of Code Classification. The course covers the structure and content of the Canadian Standards and their relationship to the ASME Codes on Pressure Boundary.

CONTENTS: A one day course consisting of the following:

- Why Codes and Standards are required in the nuclear industry
- The Nuclear Safety Control Act and the role of the Canadian Nuclear Safety Commission (CNSC)
- Third party inspection and the role of the Technical Standards and Safety Authority (TSSA)
- The CSA N285 Series of Standards on the CANDU Pressure Boundary
- Relationship between Canadian Standards for Nuclear Power Plants and the ASME Codes and Standards.
- Basic structure of the ASME Code on Nuclear Power, Section III
- Basic structure of other Pressure Boundary Standards, CSA B51, ASME Section VIII and ASME B31.1
- Role of Quality Assurance and the programs associated with Pressure Boundary components

WHO SHOULD ATTEND?

This course will be of interest to personnel in the many roles and disciplines of the Nuclear Power Plant industry. It is particularly useful as introductory training for personnel at most levels who are entering the nuclear industry. This course is very useful for people requiring an introductory understanding of the relationships between the Codes and Standards and the legal requirements to meet the needs of their position. Personnel who interact in various ways with the Pressure Boundary of a CANDU Nuclear Power Plant and who require an understanding of the importance of the different Code classes have found this course to be very useful. The course has been offered many times at the Canadian Nuclear Utilities to introduce participants to the above concepts.

EXPECTATION:

At the completion of this training session the participants will have attained the skills to:

1. Have a working knowledge of the Codes and Standards associated with the construction, installation and operation of Pressure Boundary systems and items for use at the Nuclear Power Plant.
2. Define and understand the term Pressure Boundary
3. Define the role of the Regulator and the Authorized Nuclear Inspector
4. Define the term Department as it is used in the CSA Standard
5. Identify the key documents required by the Department for the purpose of Design
6. Explain how the various books of ASME Section III are compiled
7. Identify and explain the relationship of the various Codes and Standards used in CANDU Pressure Boundary application (ASME and CSA).

INTRODUCTION TO NUCLEAR POWER PLANTS

OBJECTIVE:

The content of this course is introductory in nature. Its focus is to introduce the participants to the basics of the Nuclear Power Plant (NPP). This one-day course has two aspects to it;

1. The first part of the course covers the basic functioning of a NPP; an introduction to the basic principles behind the production of electricity from the fission reaction, layout of a typical NPP, the basic process systems required, the safety systems, regulatory requirements, operational aspects of the NPP, and accident considerations.
2. The second part reviews the differences between the two concepts under consideration for new construction in Ontario today; CANDU Enhanced Heavy Water Reactor, CANDU-6 and the Westinghouse Pressurized Light Water Reactor (PWR), AP-1000.

CONTENTS: A one day course consisting of the following:

- **INTRODUCTION TO A NUCLEAR POWER PLANT**
 - How a NPP Works; Fission to Electricity; Fission Reaction
 - Steam Production; Electricity Generation
- **LAYOUT OF A NPP**
- **REGULATORY REQUIREMENTS**
- **BASIC SYSTEMS**
 - Process Systems; Safety Systems; Auxiliary Systems
- **OPERATION OF A NPP**
 - Startup; Steady State; Shutdown
- **ACCIDENT CONDITIONS**
- **SPECIFIC CONCEPTS**
 - CANDU Heavy Water Reactor
 - *Reactor; Fuel Type; Containment; Other Systems*
 - Westinghouse Pressurized Water Reactor
 - *Reactor; Fuel Type; Containment; Other Systems*

WHO SHOULD ATTEND?

This course is aimed at personnel who have little or no knowledge on how the typical NPP works. With the revival of the nuclear industry underway in North America, organizations wanting to participate in this new development will gain an understanding of the basics. This will allow them to communicate with a level of understanding as to how they may participate in this new round of construction. It will also be a very useful introduction for staff who will be supporting the various activities of their companies providing them with the opportunity to participate on a more complete and useful level.

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ASME B31.1 MATERIALS, FABRICATION & EXAMINATION

OBJECTIVE:

The objective of this course is to provide participants with an understanding of the existing materials, fabrication, and inspection/examination rules of B31.1 and their basis. There will be references, as appropriate, to the design requirements as they relate to these rules. Emphasis will be given to the importance of building the piping systems to the B31.1 Code and the design specification. The course will also cover the basis for the rules by discussing how materials respond to fabrication processes. Fabrication (particularly welding) and examination processes and their implementation and control will be discussed. Slides and videos will be shown to emphasize the discussion points. The course will also provide ample opportunity to discuss issues raised by the participants. An overview of the Canadian requirements for pressure retaining systems will be presented and the fact that B31.1 is a legal requirement in Canada will be discussed.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <ul style="list-style-type: none"> • Introduction to B31.1 • Impact of Provincial Laws <ul style="list-style-type: none"> • Hierarchy of documents • Role of the regulator (CNSC - nuclear and TSSA - non-nuclear) • Application of N285.0 and B51 • Use of B31.1 • Materials <ul style="list-style-type: none"> • Chapter III rules for acceptability of materials • Chapter IV rules for acceptable standard components • Materials selection • Metallurgy of Steels <ul style="list-style-type: none"> • Structure • Alloying • Hardenability • Effect of welding • Residual stresses 	<p>DAY 2:</p> <ul style="list-style-type: none"> • Fabrication <ul style="list-style-type: none"> • Chapter V Rules for Fabrication • Design Assumptions • Special processes <ul style="list-style-type: none"> • Welding & brazing • Bending & forming • Preheat & PWHT • Fabrication <ul style="list-style-type: none"> • Stamping • Assembly • Welding Qualification <ul style="list-style-type: none"> • Section IX Overview • Inspection, Examination & Testing <ul style="list-style-type: none"> • Inspection <ul style="list-style-type: none"> • By owner • By authorized inspector • Examination <ul style="list-style-type: none"> • Visual • Penetrant • Magnetic particle • Radiography • Ultrasonic • Testing <ul style="list-style-type: none"> • Hydrostatic • Other methods
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WHO SHOULD ATTEND?

This course is excellent training for persons whose work activity requires them to review the B31.1 Code for Power Piping, particularly in the materials, fabrication, and examination/inspection areas. It is targeted at the personnel who are responsible for meeting the design requirements of the Code and of the design specifications while actually building the piping systems. Designers and engineers responsible for the design of the piping systems would also find this course useful. Persons involved in the above work in both the fossil or the nuclear power industry as well as those that are working on industrial or institutional power piping systems would also find this course useful. It will enhance their understanding of what is behind the various requirements and enable them to conform more readily to these requirements. The course will be useful to the people in the many disciplines that are required to understand and implement Code requirements. The people in these disciplines include construction managers, designers, engineers, fabrication supervisors, inspectors, and maintenance personnel.

EXPECTATIONS:

Course participants with adequate experience will have attained the following by the end of the course:

1. An understanding of the B31.1 Rules concerning materials, fabrication, and inspection/examination.
2. An understanding of the basis for these rules.
3. A basic knowledge of how steels react to fabrication processes.
4. A basic knowledge of how fabrication special processes are qualified and controlled.
5. An understanding of the rules for inspection, examination, and testing.
6. A basic knowledge of typical nondestructive examination processes.

ASME B31.1 POWER PIPING DESIGN & FABRICATION

OBJECTIVE:

The objective of the B31.1 piping course is to provide participants with an understanding of the basis of the design requirements for piping and their relationship with the materials, fabrication and examination requirements which are closely related in B31.1. The course will include group discussion on the application of the Code to practical situations in industry. The knowledge gained in attending the CSA B51 course compliments the knowledge gained in the ASME B31.1 course for Canadian practice.

CONTENTS: A two day course consisting of the following:

DAY 1:	DAY 2:
<ul style="list-style-type: none"> • Introduction to piping design • Jurisdictional limits • Review of content of B31.1 • Loadings • Selection of material, components and joints • Primary stress protection <ul style="list-style-type: none"> - pressure design of components 	<ul style="list-style-type: none"> • Layout of piping system <ul style="list-style-type: none"> - support location • Flexibility analysis <ul style="list-style-type: none"> - collapse protection - stress intensification factors - flexibility factors • Fatigue • Interaction of fabrication and examination with design

WHO SHOULD ATTEND?

The B31.1 course is directed toward piping designers and personnel who are required to interact with and to understand the design documents associated with piping either in an industrial settings or in an operational Nuclear Power Plant. Those attending should have a reasonable degree of familiarity with the Code and its application. This course is directed more to the development of personnel who have some experience.

EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

1. An understanding of the concepts used by the B31.1 Code to maintain Pressure Boundary integrity and operate in a safe manner at the design conditions.
2. A working knowledge of the relationship between the design of the piping system, its layout, the impact of Code requirements on these elements including techniques that a designer can use to meet these requirements.

ASME B31.3 PROCESS PIPING

OBJECTIVE:

The objective of this course is to provide participants with an understanding of the design requirements, the basis for these requirements and their relationship with the materials, fabrication, and examination requirements.

CONTENTS: A two day course consisting of the following:

DAY 1:	DAY 2:
<ul style="list-style-type: none">• Introduction• Scope of B31.3• Responsibilities• Fluid Services• Safeguarding• Allowable Stress• Design Qualifications• Loadings	<ul style="list-style-type: none">• Standard Components• Loadings• Pressure Design• Flexibility• Pressure Relief Systems• Material - Design• Fabrication – Design• Category Specific

WHO SHOULD ATTEND?

The B31.3 course is directed toward designers and personnel who are required to understand the basis for the design requirements of this code. Personnel attending should have some understanding of piping design and a willingness to participate in discussion activities related to the Code requirements.

EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

1. An understanding of the concepts used in the B31.3 Code to maintain Pressure Boundary Integrity and operate in a safe manner when subjected to the specified loading conditions.
2. A working knowledge of the relationship between the design of the piping systems and the response of piping components to loading.

ASME SECTION II - CLASSIFICATION & SELECTION OF MATERIALS & THEIR USE IN CODE CONSTRUCTION

OBJECTIVE:

This two-day course provides an in-depth review of the materials which are acceptable to the ASME Boiler and Pressure Vessel (B&PV) Code, Sections I, III, IV and VIII and the B31 Piping Codes, B31.1 and B31.3. It will provide an understanding of the approaches to classification, the relationship of the materials to the various construction codes, and how the codes are organized and relate to the material sections of the various codes. It will examine special requirements and limitations, discuss corrosion concerns and their prevention and examine sources of equipment failure and how to avoid them. The practical examples used in the course will help the participants to learn more about the use of the Codes and will allow them to become familiar with the techniques used to gain the necessary information. Because of the need for class participation and interaction with the lecturer, the number of participants in this course will be limited.

****This class will be limited to 20 people****

CONTENTS: A two day course consisting of the following:

- **Classification of Materials:** - Metallic, Non-metallic, Ferrous, Non-ferrous, Wrought and Cast. The terminology used in the descriptions of materials (e.g., heat, lot, terms related to chemical analysis, steel ingots, castings, thermo-mechanical processing, etc.) will be discussed. The unified numbering system for alloys will be covered and the participants will be introduced to the "Moen Index" - a book by the lecturer - to assist in understanding and simplifying the classification of materials for ASME Section II.
- **Material Requirements in Various Code Books:** The course will review the scope, acceptable materials and location of materials for the various Code books, e.g. Section I, III, IV, VIII & B31.1 and B31.3
- **Review of Section II and the stress and property tables of B31.1 & B31.3:** The course will review the structure of the four parts of Section II, the material tables of B31.1 and B31.3, and the structure of material specifications using examples to help participants become familiar with and use these documents.
- **Other Aspects:** The course will examine the basis of stress criteria found in Section II and the B31 Codes. It will examine specific statements in Section VIII with respect to various materials, limitations on materials in the B31 Codes, and the impact of environmental effects as discussed in Section III. It will also review the ASME Metals Handbook, discussion and recommendations on corrosion concerns and their prevention, as well as fundamental sources of equipment failure and how to avoid them.

WHO SHOULD ATTEND?

This course is excellent training for persons whose work activity requires them to review the material specifications in Section II and/or the B31 Codes. People involved with the purchase, inspection, approval and control of materials, as well as the use of the material information in design, and those whose jobs require them to review paperwork associated with materials and to apply the various requirements of the Codes and Standards would find this course to be very useful. This is particularly true for people involved in the above work in the nuclear industry. It will enhance their understanding of what is behind the various requirements and enable them to conform more readily to these requirements. The course will be useful to the individuals in the many disciplines that are required to understand and implement Code requirements. These individuals include designers, inspectors, purchasing agents, maintenance and operation personnel.

ASME SECTION III – AN OVERVIEW

OBJECTIVE:

The objective of the course is to introduce participants to an overview of Section III of the ASME Boiler and Pressure Vessel (B&PV) Code. The course examines the concepts and principles that are the basis of the requirements in Section III for the materials and components used in the Pressure Boundary of a Nuclear Power Plant and how their requirements are applied in Canada. It examines the Section III requirements for the Certification of Documents, particularly the Design Specification, and reviews the Section III Code Articles of which a working knowledge is required for Canada.

CONTENTS: A three-day course consisting of the following:

DAY 1:	DAY 2:	DAY 3:
<ul style="list-style-type: none"> • Introduction <ul style="list-style-type: none"> - Review of participant needs and understanding of Section III • Basic Concepts and Terminology <ul style="list-style-type: none"> - Structure of B&PV Code - Scope of Section III - Service Loadings and Limits - Code Class - Review of Concepts in the Glossary - Comparison with N285.0 • Materials <ul style="list-style-type: none"> - Definition - Control - Concepts of traceability and Certification - Section III Material - Requirements 	<ul style="list-style-type: none"> • Components <ul style="list-style-type: none"> - Owner Responsibilities - Manufacturer - Certificates of Authorization - Design Specifications - Certification Requirements of N285.0 and Section III Design Reports - N285.0 Clause 7 Comparison • Quality Assurance, Inspection and Stamping <ul style="list-style-type: none"> - Basic Elements of QA for Section III - Code Requirements for Inspectors - Concepts Behind Stamping and its use in Canada • Design and Overpressure Protection <ul style="list-style-type: none"> - Jurisdictional Boundaries 	<ul style="list-style-type: none"> • Design and Overpressure Protection (cont'd) <ul style="list-style-type: none"> - Design by analysis - Design by rule - Discussion of failure mechanisms - Welded vessels - Requirements for overpressure - Comparison with N285.0 • Fabrication, Examination and Testing, and Other Subsections of Section III, Div. 1 <ul style="list-style-type: none"> - Review of Content - Connection with Design Welded Vessels - Requirements for Temporary Attachments • ASME and Canadian Standards <ul style="list-style-type: none"> - Brief Overview of the Relationship Between Legal Requirements and Codes and Standards comparing the United States with Canada • Checkout

WHO SHOULD ATTEND?

This course will introduce the participants to the fundamentals of Section III of the ASME Code. It is an intermediate course directed toward personnel such as Designers, Inspectors, Maintenance and Operations Personnel and Management who need to have an understanding of the Code concepts and how they are integrated into the Canadian regulatory system. Minimal experience with the Code and its application is desirable. It will allow persons required to certify Design Documents as required by the Section III, Division 1, to count this course as part of their experience base in accordance with the requirements in Appendix XXIII of Section III, Division 1.

EXPECTATIONS:

At the completion of this training session the participants with adequate experience will have attained the skills to:

1. Have an understanding of the concepts used by the Section III, Div. 1 Code to maintain Pressure Boundary integrity and to operate in a safe manner at the design conditions.
2. Have a working knowledge of the relationship between the various Subsections and Articles of the Section III, Div. 1 Code for Pressure Boundary components and its relationship with the corresponding Canadian Standard CSA N285 and how the Canadian requirements are integrated into the system.
3. Identify how the various books are structured and to summarize the scope of Section III.
4. Define the concept of classification with regards to ASME Section III and CSA N285.
5. Identify the duties and responsibilities for the various parties (Owner Certificate Holder).
6. Identify the specific material requirements associated with the construction class and how to compare material requirements when Code editions and Addenda are of an earlier version than the current Code.
7. Identify and select the correct QA program associated with the construction of Pressure Boundary Components.

CSA B51 PART 1 - BOILER, PRESSURE VESSEL & PRESSURE PIPING CODE

OBJECTIVE:

The objective of the CSA B51 course is to introduce participants to the requirements and application of CSA B51 Part 1 to Boilers, Pressure Vessels and Pressure Piping. It will explore the relationship of CSA B51 to the ASME Boiler and Pressure Vessel Code and B31.1 Power Piping. In addition it will introduce the Canadian requirements for pressure piping systems. The CSA B51 course will be of interest to personnel involved with Class 6 systems and components in the nuclear industry.

CONTENTS: A one day course consisting of the following:

REVIEW OF CONTENT OF CSA B51

- Regulatory Framework in Ontario
- Registration
- **Specific requirements for:**
 - boilers, pressure vessels, piping & fittings, other equipment
- **Specific Topics:**
 - fabrication, inspection, welding
 - manufacturers' data reports, quality control programs and repairs & alterations

WHO SHOULD ATTEND?

The CSA B51 course is directed toward designers, manufacturers, owners and users of boilers, pressure vessels and pressure piping systems as they apply in Ontario and other Canadian Boiler and Pressure Vessel jurisdictions. These are people who require familiarity with the Canadian requirements for Pressure Boundary in industrial settings or for Class 6 pressure boundaries in Nuclear Power Plants. The course material will concentrate primarily on the requirements in the Standard and not the requirements in the referenced documents.

EXPECTATIONS:

At the end of the course Participants should understand the structure, scope, objectives and implementation of the Code by the Canadian regulatory authorities; including its relationship to the ASME Codes referenced in the Standard.

CSA N285 (SERIES) GENERAL REQUIREMENTS FOR PRESSURE RETAINING SYSTEMS & COMPONENTS IN CANDU NUCLEAR POWER PLANTS

OBJECTIVE:

This course will introduce participants to the concepts and practices that form the basis of the N285 approach to maintaining the integrity of the Pressure Boundary. Participants will have the opportunity to discuss the basic elements in order to assist them in their understanding of the concepts. The course will review the detailed requirements for Code Class, Registration of Design, and the Documentation Requirements, in particular, the documents associated with the design and manufacture of Pressure Boundary products.

The course will explore the importance of the N285 Series to the Regulator and the close relationship between CSA Standards and the ASME Boiler and Pressure Vessel Code. It will present an overview of concepts associated with the requirements for spares, replacements, modifications and periodic inspection. However, in-depth coverage of the requirements for these areas is covered in a subsequent course due to the detailed and complex nature of these subjects which require considerably more time to discuss.

CONTENTS: A two day course consisting of the following:

DAY 1:	DAY 2:
<ul style="list-style-type: none"> • Safety & Pressure Boundary Integrity • Regulatory Requirements • Scope of CSA Pressure Boundary Standard N285.0 • Other N285 Standards • Fundamental Concepts: Control of Activities, Third Party Inspection and Compliance • ASME SEC III & the N285 Series • Classification • Design Registration 	<ul style="list-style-type: none"> • Plant Requirements • System Requirements • Component Requirements • Code Responsibilities • Documentation Requirements • Specific CANDU Components • Specific CANDU Containment Requirements • Periodic Inspection (overview) • Spare, Replacements & Modifications (overview) • Checkout

WHO SHOULD ATTEND?

The N285 Series, in particular the upper tier standard CSA N285.0, impacts on the many disciplines in the field of Pressure Boundary. This course will be a valuable tool for the individuals in these disciplines by aiding in their understanding of the requirements that must be met. Personnel working in the disciplines of design, inspection, fabrication, procurement, quality assurance, operation and maintenance will find this course beneficial in that it will help them to better understand their roles and responsibilities. Attendance at this course is considered as meeting part of the requirement for updating their qualifications in accordance with Appendix XXIII.

EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

1. An understanding of the importance of the CSA N285 Series of Standards to the Regulator.
2. An understanding of the fundamental concepts underlying the Codes and Standards for Pressure Boundary in a Nuclear Power Plant and how they are embodied in the N285 Series.
3. A basic knowledge of the documentation packages required for the approval of Component Classification, Registration of Design and Fabrication compliance for the CANDU Nuclear Power Plant
4. An understanding of the relationship between N285 and the ASME Code, Section III, Div.1, and how the Canadian requirements are integrated into the system.

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CSA STANDARD N286-05 - MANAGEMENT SYSTEM REQUIREMENTS FOR NUCLEAR POWER PLANTS

OBJECTIVE:

The objective of this course on the CSA N286-05 Standard is to provide participants with an understanding of the concepts and the application of the Quality Management System. It will help participants to understand the basic elements addressed in the N286-05 Standard, including the additional specific requirements identified in the Standard as well as those associated with the different parts of the life-cycle. The course addresses the difference in philosophy between the earlier N286 Series of Standards and the new N286-05 Standard which now replaces the N286 Series. The workshop sessions provide participants with the opportunity to examine in detail the elements required in the implementation of the program, review approaches to implementation as well as providing an understanding of the process. Finally, the scope and relationship of the N286 Standard to the quality assurance requirements of the N285.0 Standard on Pressure Boundary and the other Quality Assurance Programs used in the nuclear industry, (Z299 & ISO), will be reviewed.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <p>BASIC CONCEPTS</p> <ul style="list-style-type: none"> • What is Quality Assurance(QA) • What is Quality Control • Quality Management System(QMS) <p>N286-05 Standard</p> <ul style="list-style-type: none"> • Organization • Basic Structure • Good Business Practices • Comparison with the N286 Series <p>WORKSHOP</p> <ul style="list-style-type: none"> • Principles versus Practises <ul style="list-style-type: none"> - Application of the Principles <p>BASIC REQUIREMENTS</p> <ul style="list-style-type: none"> • Key Elements <ul style="list-style-type: none"> - Review of the Basic Elements - Their Interpretation and Application <p>WORKSHOP</p> <ul style="list-style-type: none"> • Application of the Elements in the Workplace • Presentation and discussion of the results of the application exercise. 	<p>DAY 2:</p> <p>SPECIFIC REQUIREMENTS</p> <ul style="list-style-type: none"> • Review of the Specific Requirements • Review of the Mandatory Appendices <p>WORKSHOP</p> <ul style="list-style-type: none"> • Application of the Specific requirements in the Workplace • Presentation and discussion of the results of the application exercise. <p>RELATIONSHIP OF CSA N285.0 WITH N286</p> <ul style="list-style-type: none"> • Owner • Design • Procurement • Fabrication <p>RELATIONSHIP OF OTHER QUALITY PROGRAMS WITH N286</p> <ul style="list-style-type: none"> • CSA Z299 and ISO • ISO 9001:2008
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WHO SHOULD ATTEND?

This course is directed toward personnel from management, engineering, procurement, operations and quality assurance. **Those organizations providing services to a utility operating within the scope of the N286-05 Standard would benefit from this course.**

EXPECTATIONS:

Course participants with adequate experience will have attained the following by the end of the course:

1. An understanding of the basis of the new N286-05 Standard and its implementation within the diverse levels of management.
2. To work effectively within a Quality Management System.
3. A working knowledge of the relationship between the various Standards.

**PROFESSIONAL
DEVELOPMENT COURSES**



ASME SECTION III DESIGN OF CLASS 1 COMPONENTS

(Excluding Piping)

OBJECTIVE:

At the completion of the course, the participant will have gained a working knowledge of what forms the basis of the Design Requirements given in Section III Division 1 of the ASME Code for Class 1 Components.

NOTE: Piping is excluded. It is a separate 2-day course covering design requirements for Class 1, 2 & 3.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <p><i>The first day will cover (approximate timing based on questions and discussion)</i></p> <p>SESSION 1</p> <ul style="list-style-type: none"> • Certification Requirements • Design Specification <p>SESSION 2</p> <ul style="list-style-type: none"> • Design Criteria, basis for NB-3200 rules <p>SESSION 3</p> <ul style="list-style-type: none"> • NB-3200 Definitions, Pressure Design, Design Limits <p>SESSION 4</p> <ul style="list-style-type: none"> • NB-3200 Primary & Secondary Stress Limits 	<p>DAY 2:</p> <p><i>The second day will cover (approximate timing based on questions and discussion)</i></p> <p>SESSION 5</p> <ul style="list-style-type: none"> • NB-3200 Shakedown, Fatigue <p>SESSION 6</p> <ul style="list-style-type: none"> • NB-3200 Inelastic Design • NB-3300 Vessel Design <p>SESSION 7</p> <ul style="list-style-type: none"> • NB-3500 Valve Design <p>SESSION 8</p> <ul style="list-style-type: none"> • NB-3400 Pump Design
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WHO SHOULD ATTEND?

This course is directed towards Class 1 component designers and those personnel in operations at Nuclear Power Stations who are required to interact with designers and understand the design documents associated with the Class 1 components. Those attending should have a reasonable degree of familiarity with the Code and its application. **This is a development course in the design requirements of Section III, Division 1 for experienced personnel. It will allow persons required to certify Design Reports to count this course as part of their experience base in accordance with Appendix XXIII of Section III, Division I.** A prerequisite for this course is the ASME Section III - Overview course which introduces participants to the overall basic philosophy of Section III, Division 1 of the ASME Boiler and Pressure Vessel Code.

EXPECTATIONS:

Course participants with adequate experience will have attained the following by the end of the course:

1. The ability to identify where specific Design Requirements can be found within the Code Section.
2. The ability to discuss the various types of stress limits associated with the various types of Design; vessel, piping valves etc.
3. The ability to discuss in detail the certification requirements associated with the Design Specification.
4. A clear understanding as to their responsibilities with respect to review and certification of the design report.

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ASME SECTION III - DESIGN REQUIREMENTS FOR NUCLEAR PIPING

OBJECTIVE:

The objective of this course is to provide participants with an understanding of the existing rules of NB/NC/ND-3600 and their basis. There will be references, as appropriate, to the use of NB-3200 Design by Analysis in the design of piping. Emphasis will be given to the importance of the Design Specification in assuring Code satisfaction and the basis of the new Seismic rules will be discussed. The course will also cover design requirements for the interface between piping and its supports from the piping designer perspective. This course has been designed, in combination with the Section III - An Overview course, to assist the participants required to certify Design Reports to meet the qualification requirements of Appendix XXIII. The requirements for piping in the CSA Standard, CSA N285.0-95, will be covered so that participants will understand the relationship of the ASME Code to nuclear piping in Canada. The course will provide ample opportunity to discuss issues raised by the participants.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <p>CLASS 1 PIPING:</p> <ul style="list-style-type: none"> • Introduction to Piping Design • Importance of the Design Specification • Discussion of Design by Analysis <ul style="list-style-type: none"> - NB-3200 Criteria versus Piping Design • Primary Stress Protection <ul style="list-style-type: none"> - Minimum thickness, Standard Fittings, Fabricated branch connections • Collapse Protection <ul style="list-style-type: none"> - B Indices, Loadings-Design - Level A, Level B, Level C, Level D • Seismic Rule Discussion • CSA CN285.0 Requirements 	<p>DAY 2:</p> <p>CLASS 1 PIPING (continued):</p> <ul style="list-style-type: none"> • Fatigue <ul style="list-style-type: none"> - C and K Indices, Shakedown, Inelastic Cycling, Usage Factor Determination <p>CLASS 2 AND 3 PIPING:</p> <ul style="list-style-type: none"> • Background • Primary Stress Protection • Collapse Protection <ul style="list-style-type: none"> - Stress Intensification Factors, B Indices versus 0.75i • Loadings • Fatigue • SUPPORT/PIPING INTERFACE <ul style="list-style-type: none"> - Piping designer perspective - Interaction between piping and supports - Discussion on areas of concern
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WHO SHOULD ATTEND?

This course is directed towards piping designers and the personnel who are required to interact with and to understand the design documents associated with piping in the operation of Nuclear Power Stations.

EXPECTATIONS:

The course will provide participants with an excellent explanation of the requirements for nuclear piping in Section III, and the basis for these requirements and their application to piping systems.

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ASME SECTION III DIV. 1 - SUBSECTION NF CODE REQUIREMENTS FOR COMPONENT & PIPING SUPPORTS

OBJECTIVE:

The objective of this course is to provide participants with a comprehensive overview of the requirements in Section III, Div. 1 for supports of the Nuclear Pressure Boundary. The scope of this course will cover more than design since it will cover the full construction of supports (i.e., materials, design, fabrication & examination), intended to conform to the requirements for Classes 1, 2, 3 and MC construction of Section III, Div. 1. It has been developed in combination with the Section III - Overview Course, to assist participants who are required to certify Design Reports to meet the qualification requirements of CSA N285.0 /Section III, Appendix XXIII. The requirements for supports in the CSA Standard, CSA N285.0-95, will be covered so that participants will understand the relationship and application of the ASME Code to nuclear supports as required in Canada. The course will provide ample opportunity to discuss issues raised by the participants.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <ul style="list-style-type: none"> • General <ul style="list-style-type: none"> - Scope of NF - Types of Supports - Intervening Elements and Boundaries of Jurisdiction • Materials <ul style="list-style-type: none"> - Permitted Materials, Exempt Materials - Certification - Impact Testing - Quality Systems Program • Design 1 <ul style="list-style-type: none"> - Loadings and Service Conditions - Code Class and Design Procedures - Stress Intensities and Allowable Stresses • Design 2 <ul style="list-style-type: none"> - Plate & Shell Supports - Linear Supports, Standard Supports - Component and Piping Supports • Design 3 <ul style="list-style-type: none"> - Snubbers - Welding and Bolting - Load Rating - High Cycle Fatigue, Limit Analysis • Functional Requirements 	<p>DAY 2:</p> <ul style="list-style-type: none"> • Fabrication <ul style="list-style-type: none"> - General Requirements - Form Fitting and Aligning - Welding - Heat Treatment and Boiling • Examination <ul style="list-style-type: none"> - Methods - Acceptance Standards - Special Considerations • Stamping <ul style="list-style-type: none"> - NPT Stamp - Data Report - NS Certificate • Canadian Requirements <ul style="list-style-type: none"> - CSA N285.0 - Design Registration and Document Certification • Engineer Qualification Requirements • NF Appendices • Interpretation • Code Cases • Sample Problems - Plate & Shell Analysis • Linear Analysis • Load Rating Analysis
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WHO SHOULD ATTEND?

This course is directed toward piping designers, component & piping support designers and personnel required to review with and to understand the design documents associated with nuclear supports piping in operational Nuclear Power Stations. It will allow individuals who are required to certify Design Documents as required by the Section III, Division 1, to count this course as part of their experience base in accordance with the requirements in Appendix XXIII of Section III, Division 1.

EXPECTATIONS:

Course participants with adequate experience will, by the end of the course, have attained the skills to:

1. Identify the various types of supports found in piping systems.
2. Compare the differences between the Canadian Standard and the ASME Code.
3. List the material requirements and any special requirements conflicting with permitted material specifications.
4. Explain and discuss the general design requirements for acceptability of support design.
5. Define the fabrication and installation requirements.
6. Identify the appropriate type of examination to be administered during fabrication.
7. List the type of records to be supplied with the support.

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ASME SECTION III QA REQUIREMENTS: NCA-4000/NQA-1

OBJECTIVE:

This two-day course provides an in-depth review of the Quality Assurance (QA) requirements of Section III of the ASME Boiler and Pressure Vessel Code, for the design and manufacture of components used in the Pressure Boundary of Nuclear Power Plants. It will review and discuss the requirements for planning, managing and conducting QA programs for controlling the activities performed under the jurisdiction of Section III. It will examine the rules governing the evaluation of such programs prior to the issuance of Certificates of Authorization for construction of Pressure Boundary components.

Section III has adopted the NQA-1 Standard with some additions and caveats as appropriate. The course will provide an understanding of the basic requirements of the ASME NQA-1a - 2009 Standard referenced in Section III, including the modification to these requirements in NCA-4000 as they apply to N-type Certificate holders.

CONTENTS: A two day course consisting of the following:

DAY 1:	DAY 2:
<ul style="list-style-type: none"> BACKGROUND AND INTRODUCTION TO NCA-4000, including scope and applicability, definitions, establishment and implementation and the NQA-1 structure THE QUALITY ASSURANCE ORGANIZATION and the QUALITY ASSURANCE PROGRAM, including the Quality Assurance Manual. DESIGN CONTROL, INSTRUCTIONS, PROCEDURES, and DOCUMENT CONTROL. RELATIONSHIP BETWEEN ASME AND CANADIAN QUALITY STANDARDS AND THEIR APPLICATION - N285, N286, 10 CFR 50 Appendix B, and ASME. 	<ul style="list-style-type: none"> PROCUREMENT DOCUMENT CONTROL, CONTROL OF PURCHASED ITEMS AND SERVICES. IDENTIFICATION AND CONTROL OF ITEMS, CONTROL OF SPECIAL PROCESSES, INSPECTIONS, TEST CONTROL, CONTROL OF MEASURING & TEST EQUIPMENT, HANDLING, STORAGE & SHIPPING, INSPECTION, TEST & OPERATING STATUS CONTROL OF NON-CONFORMING ITEMS, CORRECTIVE ACTIONS, QA RECORDS, AUDITS. NCA-3800, NCA-3900, INQUIRIES, including a question and answer period.

WHO SHOULD ATTEND?

This course will provide excellent training for persons whose work activity requires them to apply these Codes and Standards. It will enhance their understanding of why QA is fundamental to the nuclear program. The course will be useful to the many disciplines that are required to understand and/or implement Code QA requirements. These include design, inspection, purchasing, manufacturing, regulation, operations and maintenance.

EXPECTATIONS:

At the end of the course participants should understand the approach to quality adopted by Section III, as well as the relationship between the elements of the quality program used in Section III of the ASME Boiler and Pressure Vessel Code.

ASME SECTION IX WELDING & BRAZING QUALIFICATIONS

OBJECTIVE:

The objective of this course is to provide participants with an understanding of the rules of ASME Section IX in controlling the welding qualifications for pressure containing components and the bases for these rules. There will be references, as appropriate, to how these rules apply to the design and fabrication requirements of the construction codes. Emphasis will be given to the importance of using engineering judgment in the application of the welding procedures and welder performance qualifications during the construction of pressure containing components. The course will also cover the bases for the rules by discussing how materials may be affected by the welding processes. Welding processes and their implementation and control will be discussed. Slides and videos will be shown to emphasize the discussion points. The course will also provide ample opportunity to discuss issues raised by the participants. An overview of the Canadian requirements for welding qualifications will be presented and explaining how Section IX is a legal requirement in Canada.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <ul style="list-style-type: none"> • Introduction to ASME Section IX <ul style="list-style-type: none"> - Organization - Special Processes - Purpose of Control of Welding - Qualification - Design Assumption • Impact of Provincial Laws • Metallurgy of Steels <ul style="list-style-type: none"> - Structure - Alloying - Hardenability - Effect of Welding - Residual Stresses • Welding Processes <ul style="list-style-type: none"> - Discussion of Process Characteristics • Section IX Variables <ul style="list-style-type: none"> - Essential Variables - Nonessential Variables - Supplementary Essential Variables • Material Groups <ul style="list-style-type: none"> - P Numbers - F Numbers - A Numbers 	<p>DAY 2:</p> <ul style="list-style-type: none"> • Section IX Welding Documents <ul style="list-style-type: none"> - Welding Procedure Specification (WPS) - Procedure Qualification Record (PQR) - Welder Performance Qualification Record (WPQ) - Welding Operator Performance Qualification Record (WOPQ) • Welding Procedure Qualification <ul style="list-style-type: none"> - Making a Plan - Selecting a Base Material - Select Filler Metal - Making the Weld and Recording Variables - Testing • Writing the WPS <ul style="list-style-type: none"> - Standard Forms - Variations in Style • Performance Qualification Testing <ul style="list-style-type: none"> - Making a Plan - Selecting Base Metals - Selecting the Filler Metal - Making the Weld and Recording Variables - Testing • Maintaining Qualification <ul style="list-style-type: none"> - Periodic Usage (Continuity) - Revoking Qualification for Reason
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WHO SHOULD ATTEND?

This course is excellent training for persons whose work activity requires them to interact with the ASME Section IX Welding & Brazing Qualification Code. It is targeted at the personnel that have responsibilities for meeting the fabrication requirements of the Code and of meeting the design specifications while actually building the piping systems. Inspection personnel and designers and engineers responsible for the design of the piping systems would also find this course to be very useful. This is true for any people involved in the above work in the fossil or the nuclear power industry as well as those that are working on industrial or institutional systems involving pressure retaining components. It will enhance their understanding of what is behind the various requirements and enable them to conform more readily to these requirements. The course will be useful to the many disciplines that are required to understand and implement Code requirements. These disciplines include construction managers, designers, engineers, fabrication supervisors, inspectors, and maintenance personnel.

EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

1. An understanding of the ASME Section IX rules concerning welding procedure and performance qualification.
2. An understanding of the bases for these rules.
3. A basic knowledge of how the properties of steels are affected as a result of welding.
4. A basic knowledge of how the special process of welding is qualified and controlled.
5. An understanding of an approach to welding procedure qualification.
6. An understanding of an approach to welder performance qualification.

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CSA N285.0 & ASME SECTION III CLASS 1 REQUIREMENTS AS APPLIED TO DESIGN REPORT/STRESS ANALYSIS REPORT

OBJECTIVE:

This course will introduce basic concepts of and practices of ASME Code Section III Sub-sections NB, NF; and Standards CSA N285.0 and CSA N289.3 requirements pertinent to the analysis for the preparation of Design Report/Analysis Report. Background and basic requirements will be discussed in the class and the participants will have the opportunity to discuss the basic elements of various Clauses associated with the stress analysis of pressure boundary components.

The course will cover the basics concepts and requirements for the analysis of components. An overview of the analysis process will be provided and relationship between the analysis results and meeting the Standard or the code will be discussed.

CONTENTS: A two day course consisting of the following:

DAY 1:	DAY 2:
<ul style="list-style-type: none"> Brief Introduction to CSA Standard N285.0 requirements. ASME Section III, Subsection NB Vessel and Components Applied to Stress Analysis: <ul style="list-style-type: none"> (a) Background, Class 1 requirements and various operating conditions. (b) Basic concepts of limiting stresses for various service conditions Seismic Analysis – CSA Standard 289.3 Seismic requirements and Brief Introduction to Appendix N (Dynamic Analysis Methods) 	<ul style="list-style-type: none"> Supports; CSA N285.0 and ASME Section III, NF requirements Introduction to ASME Section III Mandatory and Non Mandatory Appendices: Appendix 1, Appendix III, Appendix XXIII, Appendix A, Appendix F, Bolting Requirements Requirements and concepts for performing design analysis and its applicability in meeting CSA Standard N285.0 and ASME Code Section III, Class I components and requirements.

WHO SHOULD ATTEND?

This course touches important aspects of CSA Standard N285.0, N289.3 and ASME Code Section III, Subsection NB as applicable to analysis requirements in the preparation of Design Report/Stress Report. This course is a valuable resource for new employees and designers, who would like to understand how the codes and standards are applied to meet the CSA/ASME code requirements. Attendance at this course is considered as meeting part of the requirement for updating their qualifications in accordance with Appendix XXIII.

EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

- An understanding of the importance of the CSA N285 Series of Standards as applicable to stress analysis requirements.
- An understanding of the fundamental concepts underlying the Codes and Standards for Pressure Boundary in a Nuclear Power Plant as they are applied in the preparation of Design Report or Stress Report.
- An understanding of the relationship between N285 and the ASME Code, Section III, Div.1, and how the Canadian requirements are integrated into the analysis of components in meeting Standard/Code requirements.

PRE-REQUISITE:

Participants are expected to have completed the **CSA N285 (Series)** and **ASME Section III – An Overview** courses.

CSA N285 - REFURBISHMENT/MAINTENANCE A WORKSHOP ON REPAIRS, REPLACEMENTS, MODIFICATIONS AND TESTING

INTRODUCTION:

One of the more difficult exercises is the application of pressure boundary Codes and Standards to the issues that arise during refurbishment and maintenance. This course directly addresses the issues that arise and provides an understanding of the concepts on which the Codes and Standards are based and how these concepts can be used to apply the requirements in the code or standard to resolve the issue.

OBJECTIVE:

To introduce participants to the applicable Codes and Standards and regulatory requirements for replacement, repair, refurbishment, maintenance and modification of systems and components in pressurized systems as specified in the station's Operating License and in the referenced Codes and Standards.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <p>Review of basic concepts, principles, regulatory requirements and code requirements that govern in a repair, replacement, and refurbishment and modification activity. This includes:</p> <ul style="list-style-type: none"> • License requirements, definition of repair, replacement and modifications; code classification, effective date; design registration, overpressure protection. • Documentation requirements, design documents, system classification list, design specification, system flowsheets, design reports, instrumentation requirements. • Material reconciliation; Quality Assurance requirements; • Review of CSA N285.0 requirements for, replacements, repairs, refurbishment, modifications and testing. • Question Period. 	<p>DAY 2:</p> <p>WORKSHOP</p> <p>A series of class exercises have been developed based on actual experiences of projects. PARTICIPANTS ARE ALSO INVITED TO PRESENT THEIR OWN CASE STUDIES FOR DISCUSSION IN LIEU OF CLASS EXERCISES</p> <ol style="list-style-type: none"> 1. The methodology consists of establishing discussion groups to discuss and develop resolution to the issues raised. 2. The solutions are then discussed in class and the proposed resolution examined for correctness and completeness. 3. Checkout to establish understanding of the principles discussed during the course.
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WHO SHOULD ATTEND?

This course will be of interest to personnel working in the maintenance and refurbishment of CANDU nuclear industries. This includes personnel involved in:

- The design and preparation of documentation for repairs, replacements, refurbishment, maintenance and modification
- Maintenance personnel at nuclear power plants including maintenance engineers, maintenance supervisors, procurement personnel.
- Personnel involved in the refurbishment of Nuclear Power Plants
- Manufacturers of pressure vessels and heat exchangers used in nuclear power plants.
- Manufacturers/installers of piping components such as pipe connection, flanges, valves, expansion or flexible joints (bellow and hose), filters, strainers and trap, relief valves or rupture discs for use in the nuclear power plants.

EXPECTATIONS:

Course participants should attain the skills to:

1. Identify when an activity is a replacement, repair, refurbishment or modification.
2. Identify approaches to resolving issues based on the Code requirements.
3. How to apply the requirements of CSA N285.0
4. Identify when registration is required for an alteration the scope of the registration requirements.
5. Determine the scope and need for testing.

PRE-REQUISITE:

Participants are expected to have completed the **CSA N285 (Series)** and **ASME Section III – An Overview** courses, **OR at the very least** have a solid understanding of the basics concepts covered in these two course.

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REFURBISHMENT/MAINTENANCE PROJECTS APPLICATION OF CSA Z299 STANDARDS TRAINING WORKSHOP

INTRODUCTION:

Canadian Utilities evaluate the quality assurance programs of potential manufacturers and suppliers for the supply chain of their Nuclear Power Plants using the requirements of the CSA Z299 Series of Quality Assurance Standards. With the continued refurbishment and maintenance of the plants in Canada, manufacturers and suppliers who want to be part of this activity will most times be required to meet these requirements. This course provides an in-depth basis for understanding these requirements. Using the knowledge gained from this program, manufacturers and suppliers will be able to evaluate their existing programs to determine the gaps that need to be addressed.

OBJECTIVE:

This two day course will lead the participants, through active discussion, to a clear understanding of the current interpretation of the Z299 standards. A practical example, with an actual product, is used in a group environment to help the participants determine which Z299 program would apply to sub-suppliers of materials and components using the preferred prescribed method in the CSA standard Z299.0.

CONTENTS: A two day course consisting of the following:

<p>DAY 1:</p> <p>FRONT END ACTIVITIES</p> <ul style="list-style-type: none"> • What does all the front end information of the standard mean? • How independent is "independent" for Z299? • Indoctrination and training of staff. <p>FOR EACH OF THE Z299 ELEMENTS</p> <ul style="list-style-type: none"> • What does the standard say? • What does it mean? <p>DISCUSSION OF EACH ELEMENT</p> <ul style="list-style-type: none"> • Control of Quotation & Customer PO's • Design • Control of Documents • Measuring & Test Equipment • Control of Purchased Goods from Vendors • Inspection and Test Plans • Incoming, In-Process & Final Inspections and their Status • Identification and Traceability Requirements • Handling and Storage 	<p>DAY 2:</p> <p>CONTINUATION OF DISCUSSION</p> <ul style="list-style-type: none"> • Control of Production • Special Processes • Control of Packaging & Shipping • Quality Records • Non-Conformance and Corrective Action • Control of Customer Supplied Items • Statistical Control Including Sampling, Lots, Batches • Audits of Self and Suppliers <p>Lots of Time for Questions and Answers</p> <p>SELECTING THE RIGHT Z299 PROGRAM</p> <ul style="list-style-type: none"> • Using a Practical Example, Select the Right Z299 Program for Products Supplied by Vendors. <p>RELEVANT RELATED TOPICS</p> <ul style="list-style-type: none"> • Why is ISO 9001 Inadequate for Nuclear Application? • Environmental Qualification • Commercial Grade Dedication
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WHO SHOULD ATTEND?

Persons requiring an in-depth knowledge of the Z299 series of QA standards and how to apply them. This workshop will be useful to the many disciplines involved in the manufacturing and utility industries supporting the refurbishment projects. The personnel in these disciplines include managers, supervisors, designers, inspectors, QA officers, manufacturers and regulators.

EXPECTATIONS:

Course participants will be expected to actively participate in the discussions with both questions and comments. These discussions are expected to allow the participants to understand the details of the Z299 QA standards as well as preparing them to be able to select the appropriate Z299 standard for any product.

ISO 9001 - 2008 COMPARISON WITH Z299.1-1985

OBJECTIVE:

This one day workshop provides information that allows participants to understand the differences between ISO 9001 and Z299 programs. It will consist of:

- a review of the similarities followed by a detailed examination of the differences in the requirements
- a review and discussion to understand the differences between Quality Assurance and Quality Management
- a review and discussion of the additional requirements of a Quality Management standard
- brief discussion on the future direction of Quality Assurance in the Nuclear industry

CONTENTS: A two day course consisting of the following:

<p>WORKSHOP CONTENT:</p> <p>SESSION 1</p> <ul style="list-style-type: none"> • A Brief History Of ISO 9000 • New Terminology In 2000 • The Major Differences <p>SESSION 2</p> <ul style="list-style-type: none"> • Z299.1 And ISO 9001 • Similarities Between The Two • Detailed Differences Between The Two <p>SESSION 3</p> <ul style="list-style-type: none"> • References To 299.2, Z299.3 & Z299.4 	<p>WORKSHOP CONTENT (Continued):</p> <p>SESSION 4</p> <ul style="list-style-type: none"> • New Requirements Of ISO 9001 • Customer Focus & Satisfaction • Continual Improvement <p>SESSION 5</p> <ul style="list-style-type: none"> • Future Of QA In Nuclear Industry
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WHO SHOULD ATTEND?

Persons with an understanding of the Z299 QA Program requirements and have completed the [CSA Z299 Training Workshop](#) course. This workshop will be useful to many disciplines involved in assessing nuclear QA Programs. These disciplines include managers, supervisors, designers, inspectors, QA officers, procurement agents, analysts, manufactures, regulators.

EXPECTATIONS:

Course participants will be expected to actively participate in the discussions with both questions and comments. These discussions are expected to allow the participants to understand any shortcoming which may be encountered if a particular QA program is required but an alternative one is proposed.

NUCLEAR QA LEAD AUDITOR EXAMINATION: NCA-4000/NQA-1

OBJECTIVE:

This written examination has been developed to meet one of the requirements of Section III, Division 1 for qualification of a Lead Auditor.

EXAMINATION:

- This is a written examination as required by Section III NCA 4000/NQA-1. It is a supervised, open book examination conducted over a 4 hour period.
- The examination is a test of the participants' knowledge of the attributes and skills required of a Nuclear Lead Auditor. It is also a test of the basic technical knowledge required by a Nuclear Lead Auditor to develop an appropriate Audit Plan and Audit Team capable of conducting an effective survey and/or audit.

PREREQUISITE FOR PARTICIPANTS:

Participation in this examination is limited to:

- Persons who have successfully participated in an NCA-4000/NQA-1 course at ANRIC Enterprises Inc. or those who have proof of training in this subject from another recognized institution.
- Persons who can provide objective evidence of training in Lead Auditor skills and attributes.
- Persons who can provide objective evidence of auditor experience and/or appropriate qualification with a utility operating nuclear power plants or a company involved in the construction of nuclear components or subassemblies.

PREPARATION WORKSHOP FOR THE LEAD AUDITOR EXAMINATION

OBJECTIVE:

This one-day workshop has been developed to provide participants with an overview of the scope and nature of the Lead Auditor Exam and a review of the knowledge base required by a lead auditor (Section III NCA 4000/NQA-1). This overview is combined with practical experience in researching and developing adequate responses to sample questions that are typical of the questions asked in the written examination.

WHO SHOULD ATTEND?

The course will be useful to those with a strong knowledge of Code Requirements and Code Philosophy who require practical guidance to meet the expectations for successful completion of the ASME Section III Lead Auditor Exam.

EXPECTATIONS:

This workshop is NOT an explanation of Code Requirements and Code Philosophy. It is expected that all participants have obtained this knowledge base through other training. The workshop is designed to assist participants preparing to write the Lead Auditor Exam by reviewing typical exam questions and by providing examples on the preparation of appropriate answers. It will provide participants with this opportunity in a workshop environment.

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SKILLS TRAINING FOR NUCLEAR QA AUDITOR/LEAD AUDITOR

OBJECTIVE:

This one-day course provides an in-depth working knowledge of the requirements and guidelines of NCA-4000/NQA-1 used in the construction of pressure retaining components for Nuclear Power Plants for the qualification of Auditors/Lead Auditors.

The course:

- Contains many examples of specific Do's and Do Not's of Auditor/Lead Auditor attributes
- Introduces the subject of Internal Self-Assessments
- Provides knowledge of topics to aid in passing a Lead Auditor Examination

It focuses on the NCA-4000/NQA-1 expectations for Lead Auditors and provides participants with a deeper understanding of what is expected of persons working and training to be Lead Auditors in the Quality Assurance programs for the Nuclear Industry.

CONTENTS: A one day course consisting of the following:

<p>WORKSHOP CONTENT:</p> <ul style="list-style-type: none"> • Background and Introduction of ASME NQA-1 Requirements of ASME Boiler & Pressure Vessel Code, Section III NCA-4000 • Quality Assurance Program Requirements • Nuclear Audit Requirements • Audits vs Surveillance or Inspection • Qualification of QA Program Audit Personnel • Qualification of Lead Auditors 	<p>WORKSHOP CONTENT (Continued):</p> <ul style="list-style-type: none"> • Maintenance of Qualification and records • Supplemental Requirements for Audits including: <ul style="list-style-type: none"> – Education & experience of Lead Auditors – Guidance on Audits • Compliance vs Performance-Based Audits • Auditing Do's & Do Nots • Lead Auditor Attributes • Internal Self-Assessments
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WHO SHOULD ATTEND?

This course will provide excellent training for persons whose work activity requires them to prepare for, conduct and follow up on nuclear QA audits. It will enhance their understanding of the importance of well-planned and executed audits. The course will be useful to those involved in performing nuclear audits including technical experts and those who are recipients of audits including: managers, supervisors, designers, inspectors, purchasing agents, manufacturers, regulators, nuclear operators and maintenance personnel.

EXPECTATIONS:

Course participants should understand the auditing requirements, and be provided with the knowledge to aid them in passing a Lead Auditor examination based on the material covered in this course.

PROFESSIONAL DEVELOPMENT COURSES

For all course inquiries, please contact Frank Guerreiro at
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