
ASME
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ASME Nuclear Early Career Technical Seminar ICONE 16

Overview – ASME Nuclear Codes & Standards / Bridging The Gap Between College and Career

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What is ASME?

- Educational and technical society of mechanical engineers
- Non-profit organization founded in 1880
- 125,000 members worldwide, including 24,000 student members
- Staff of over 350 people with headquarters in New York City
- Local sections in many cities across the USA, including 429 student sections, and 17 local sections outside North America

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ASME Vision and Mission

Vision: To be the premier organization for promoting the art, science and practice of mechanical and multidisciplinary engineering and allied sciences to our diverse communities throughout the world.

Mission: To promote and enhance the technical competency and professional well-being of our members, and through quality programs and activities in mechanical engineering, better enable its practitioners to contribute to the well-being of humankind.

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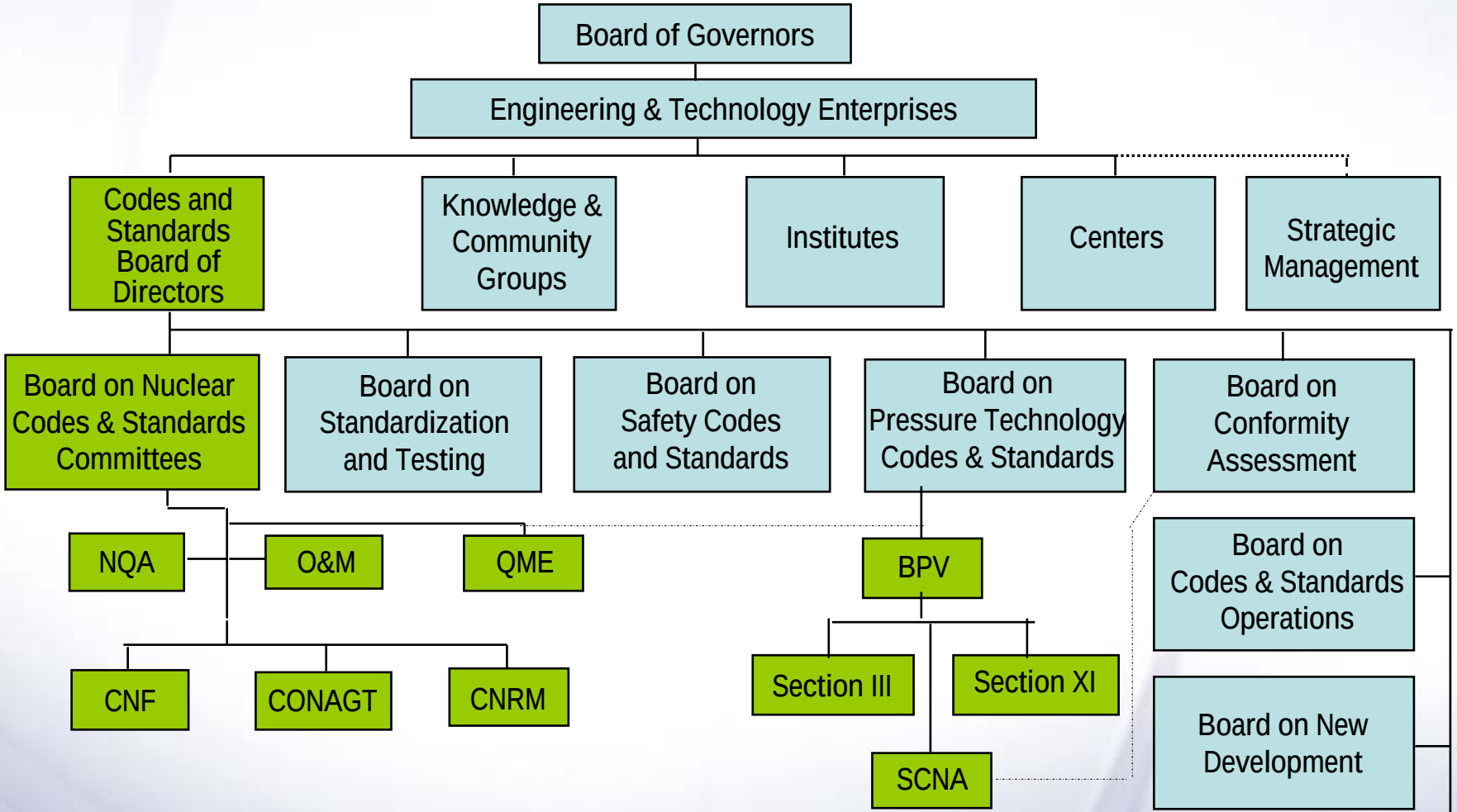
ASME Organization – Codes and Standards



Nearly 4,000 Volunteers Participate in This Process

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ASME Board on Nuclear Codes & Standards (BNCS)

Standards Committees

- Operation & Maintenance
- Qualification of Mechanical Equipment
- Nuclear Air & Gas Treatment
- Nuclear Quality Assurance
- Nuclear Risk Management
- Nuclear Cranes

Boiler & Pressure Vessel (BPV) Standards Committee – Nuclear Subcommittees

- III – Nuclear Power
- XI – Inservice Inspection
- Nuclear Accreditation

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ASME Nuclear Codes and Standards Consensus Process

- People
  - Good technical people
  - Approximately 900 engineers participate (50% are ASME members)
  - Participants are supported by their employers
- Process
  - Formal procedures
  - Balance of interest
  - Open to all
  - Procedural due process
- Product
  - Technically superior product
  - Willing to sacrifice schedule to achieve it

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ASME Nuclear Codes and Standards Consensus Process

- Establish project team(s) through the appropriate standards committees after review by BNCS
- Team members include:
  - Technical experts
  - Industry leaders
  - Academic community
  - International industry leaders
  - Manufacturers
  - Regulators and other government representatives
- Develop working draft for review and comment.
- Voting
- Resolution of objections
- Public review
- Time frames
- Process applies to introduction of new technology

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ASME Nuclear Codes and Standards Consensus Process

BNCS	Provides procedural oversight for all NCS activities
Standards Committees	Establishes consensus on all technical matters
Subcommittees	Provides recommendations on technical matters to the standards committee in a given subject area – e.g., nuclear components
Subgroups	Develops proposal in a given specialty – e.g., design
WGs, TGs, PTs	Develops detailed proposals in a specific field – valve design

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ASME Nuclear Codes and Standards Consensus Process

Products

- **Code –** A standard which has been adopted by governmental bodies, either local, state, or federal, or which is cited in a contractual agreement, and which has the force of law
- **Code Case –** Documents that clarify the intent of existing Code requirements or provide alternative requirements
- **Standard –** A set of technical definitions and guidelines developed so that items can be manufactured uniformly and provide for safety and interchangeability
- **Guide –** A suggested practice, process or method that is not mandatory and may be used as a whole or in part

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ASME Nuclear Codes and Standards Consensus Process

Participation

- Voluntary participation
- ASME Codes and Standards relies on industry supporting participation by knowledgeable experts
- ASME provides the structure and administrative support

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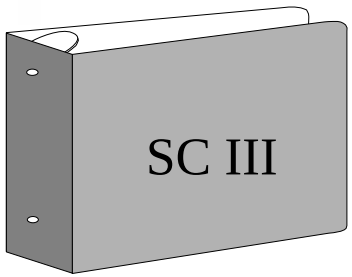
ASME Nuclear Codes and Standards



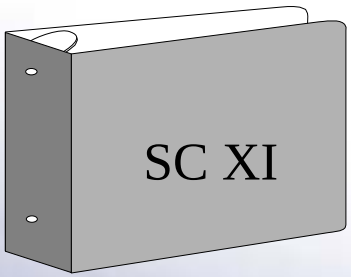
Boiler and Pressure Vessel Code, Section III

Rules for Nuclear Components

Division 1 – 8 Subsections for Components, Piping, Supports, Core Supports

Division 2 – Concrete Containments

Division 3 – Transport Packaging



Boiler and Pressure Vessel Code, Section XI

Inservice Inspection

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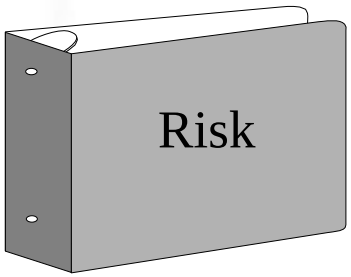
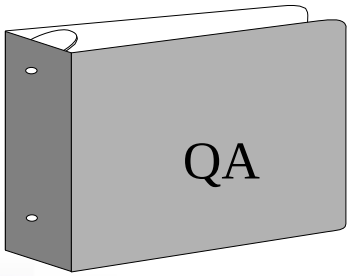
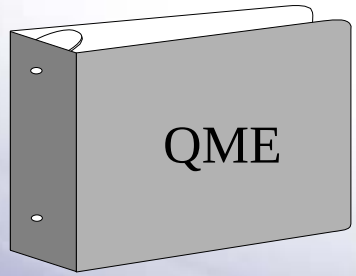
ASME Nuclear Codes and Standards



Probabilistic Risk Assessment – RA-S



Nuclear Quality Assurance – NQA -1



Qualification of Mechanical Equipment – QME-1

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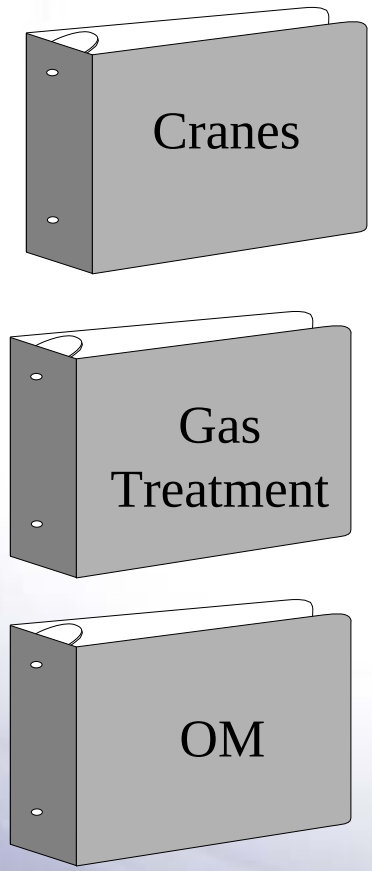

Overhead and Gantry Cranes – NOG-1
Underhung and Monorail – NUM-1

Air and Gas Treatment – AG-1

Operation and Maintenance – OM
Standards and Guides – SG

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ASME Subcommittee on Nuclear Accreditation

- Oversight of nuclear certificate program – ASME Boiler and Pressure Vessel Code, Section III
- ASME accredits the Manufacturers' quality assurance programs
  - Manufacturers are required by the Code to have third party inspectors
  - Manufacturers and the third party inspectors certify Code compliance and the ASME Stamp is applied for –
    - Components
    - Parts/Appurtenances
    - Supports
    - Installation
- ASME accredits Material Organizations' quality assurance programs
  - Material Manufacturers
  - Material Suppliers

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ASME Board on Nuclear Codes and Standards Task Group Efforts

- Evaluate technical needs for new reactor technology
- Globalization
  - Make Nuclear Codes & Standards easier to use in the international community
  - Encourage worldwide stakeholders to participate in the ASME codes and standards development technical consensus process
- Apply risk technology to Nuclear Codes & Standards
- Facilitate regulatory endorsement of Nuclear Codes & Standards

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Nations Turning to Nuclear Energy

France	2	Slovakia	2	Bulgaria	1	Russia	42
Lithuania	1	Slovenia	1	Turkey	2	Ukraine	2
Czech Rep.	2	Romania	3	Armenia	1	Kazakhstan	1

Canada	2
USA	32
Mexico	2
Argentina	1
Brazil	1

Japan	12
North Korea	1
South Korea	7
China	63
India	23
Vietnam	2
Indonesia	1

Nations have planned or proposed building more than 220 power reactors

Egypt	1	Israel	1
South Africa	25	Iran	5
		Pakistan	4

★***Visits by ASME***

Source: World Nuclear Association (as of Dec. 8, 2006)
in *Nuclear Energy Insight,* January 2007

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Some Current Initiatives in ASME Nuclear Codes and Standards – New Reactors

- General
  - DOE Gen IV New Reactor Materials Program
  - Participate in Multi-national Design Evaluation Program
- Section III
  - Obtaining NRC endorsement of piping seismic design rules
  - Reaching consensus on treatment of environmental fatigue
  - Subgroup on Graphite for Core Components
- Section XI
  - Develop risk-informed ISI requirements for High Temperature Gas-Cooled Reactors
- Committee on Nuclear Risk Management
  - Development of PRA standards for new reactors

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Bridging The Gap Between College and Career

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Impressions of ASME in College vs. Professional Position

- College
  - Social Events
  - “Mechanical Engineering” Magazine
- Professional Position
  - Professional Development
  - Networking
  - Codes and Standards

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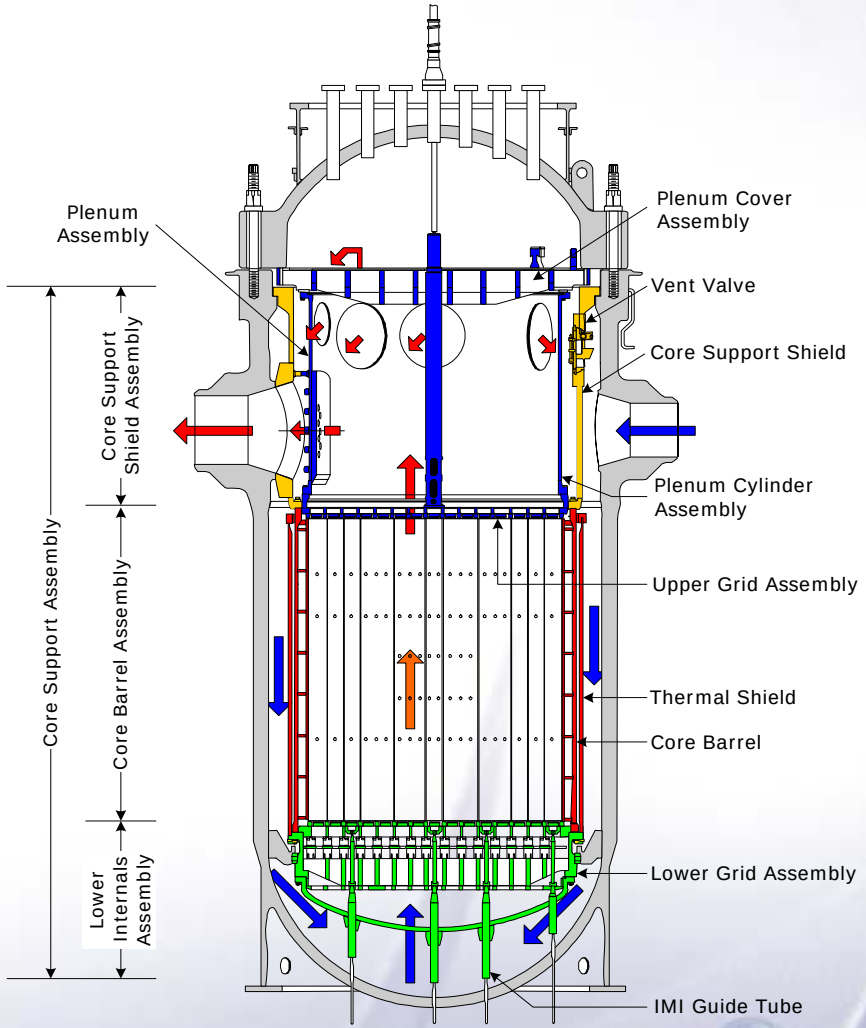
Initial ASME Code Involvement

- Participated on a project to develop a Code Case to extend the inservice inspection interval for certain reactor vessel welds – N-691
- Worked with colleagues experienced in the Boiler and Pressure Vessel (BPV) Code
- Learned:
  - BPV Code structure
  - Code Case development process
  - Code requirements
  - Code “Speak”



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Getting Involved

- Assisted colleagues with Code activities
  - Development of Code Cases
  - Review and comment on letter ballot actions
- Attended ASME BPV Code meetings:
  - Participated in discussions
  - Volunteered to be responsible for action items
  - Developed relationships and contacts
  - Continued to learn Code requirements and process from experienced Code members
- Became a member –
  - Subcommittee XI Working Group - Implementation of Risk-Based Examination
  - Subcommittee III Working Group - Probabilistic Methods in Design

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How I Have Benefited

- Became knowledgeable of areas of the Code not gained through work experience
- Mentored by technical experts outside of my company and around the world
- Being knowledge of pending Code revisions and Code Cases
- Being knowledgeable of industry issues
- Assisted in promotion to Senior Engineer

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How My Employer Has Benefited

- Knowledge of Code has allowed me to better perform my job and to assist others in performing their work and addressing issues
- Participation on Code committees allows consideration of my employers interests
- Contacts have been resources in solving technical problems
- Knowledge of pending Code actions has enabled better business planning

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Staying Involved

- Member on two working groups – Secretary of SC III WG – Probabilistic Methods in Design
- Occasional alternate on Subcommittee XI Subgroup Water-Cooled Systems
- Leading several key action items
  - Risk-Informed Safety Classification – Code Case N-720
  - Risk-Informed Inservice Inspection for new reactors
- Continue to assume new responsibilities
- Continue to build relationships
- Continue to learn

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ASME Nuclear Codes and Standards Engineer Mentoring Program

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ASME Nuclear Codes and Standards Engineer Mentoring Program

- Focus on engineers 0 – 10 years out of college or more experienced engineers new to the industry
- Interested engineers screened to determine technical interest and technical development needs
- Will be assigned to participate on an appropriate Codes and Standards Committee
- Engineer will be assigned a mentor who will assist in your development
- Provides significant benefits to you and your employer

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Summary

- ASME has a number of initiatives underway to address new reactor developments and to enhance collaboration with worldwide stakeholders
- ASME Nuclear Codes & Standards are used and accepted internationally
- ASME Codes and Standards are developed and maintained by nearly 4,000 of the world's best engineers
- With appropriate mentoring, an engineer right out of college can make key contributions to ASME Codes and Standards initiatives
- An ASME Nuclear Codes and Standards Engineer Mentoring Program is being launched

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Questions

Feel free to contact Kevin Ennis, Director, ASME Nuclear Codes and Standards by email at ennisk@asme.org or by phone at 212-591-7075

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