
ASME
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Addressing Technical Challenges – ASME's Role as a Neutral Convener

14th US-China Oil and Gas Industry Forum (OGIF)

Denver, CO, USA

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Outline

- ASME Overview
- ASME in China
- Standards and Certification
- Workforce Development
- International Conferences and Events

ASME Overview

Throughout its history, ASME has served as a neutral convener, a forum where technical experts can gather to share their experience and learn from each other. Today, through its programs of conferences, standards committees, technical groups and on-line collaborations, ASME is a world leader in promoting public safety and international commerce through technical advancements achieved by the cooperative contributions of experts from all over the world.

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ASME Overview

- Not-for-profit organization
- Established 1880; headquarters in New York, NY, USA
- >140,000 members from >150 different countries
- Traditional products and services include standards, certification, training, publications, conferences, government relations
- Standards & Certification (S&C)
  - ~500 standards, 700 committees
  - 12 conformity assessment programs (~50% international)
  - >5,200 volunteer subject matter experts (~17% international)
- Technical Events and Content (TEC)
  - >32 conferences annually, many international
  - >4,000 volunteer subject matter experts
- Workforce Development
  - >10,000 trained annually via >300 programs (>50% international)
  - >3,000 certified individuals (~15% international)
  - Accreditation Board for Engineering and Technology (ABET)

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ASME in China

- Strategic Initiative - Globalization
  - ASME will deliver locally relevant engineering resources to advance public safety and quality of life throughout the world. Specifically, ASME will provide locally relevant standards, certification, technical information, networking, and advocacy for business, government, academia and practicing engineers to positively impact the quality of life throughout the world.
- Standards & Certification Objectives in China
  - Greater understanding and acceptance of ASME standards leading to reference or adoption in local standards and regulations, emphasizing World Trade Organization (WTO) Technical Barriers to Trade (TBT) principles as needed
  - Demonstrating the role ASME Conformity Assessment plays in promoting safety
  - Communicating the value of participating in ASME standards development and the various methods of participation
  - Making ASME standards related training more available and relevant to local needs

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Consortium on Standards and Conformity Assessment (CSCA)

- Formed in 2004 – ASME, ASTM International, American Petroleum Institute (API), and CSA America; each member committed funds
- Primary aims:
  - advocate for use of U.S. based international standards and conformity assessment in China
  - promote the development of compatible Chinese standards
  - establish a presence in Beijing
  - build relationships with government, industry, professional and other institutions
  - promote conformance to international rules on standards and trade
- October 2004 – CSCA is granted a three year award from the U.S. Department of Commerce, International Trade Administration, Market Development Cooperator Program
- May 2005 - CSCA Beijing office established and opened
- December 2008 - CSCA dissolved

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ASME Asia Pacific, LLC (AP LLC)

- Established in November 2006
- February 2007
  - Registered by the Beijing Administration for Industry and Commerce
  - AP LLC Beijing Representative Office (BRO) opened
- Advance ASME objectives in China by leveraging ASME's name, heritage, and reputation, ASME Codes and Standards, and the global reach of the ASME volunteer network of subject matter experts to proactively identify the needs of industry and government and respond with market relevant products and services
- Overlap with CSCA enabled transition
  - CSCA Director served as initial Chief Representative of BRO
- Today's BRO staff includes:
  - Zhang, Qiang (John), Executive Director & Chief Representative
  - Fu, Ying (Leona), Manager of Operations
  - Sun, Yuanyuan (Erin), Office Administrator

Qiang (John) Zhang, Executive Director and Chief Representative

Measuring Success

- Growth in ASME Certificate Holders
- Translations of ASME standards into Chinese
  - Shanghai Power Equipment Research Institute (SPERI)
  - China Cooperative Network of ASME Code Items (CACI)
- Memoranda of Understanding (MOU's) have been established with government agencies, standards and inspection bodies, professional and industry organizations and large state owned enterprises to promote the use of ASME Standards
- Growth in experts from China participating in ASME standards development
- Sponsored/ participated in/ exhibited at/ attended many dozens of conferences, workshops and exhibitions in China
- Good relationships with government agencies
- China engagement metrics for year ending June 2014:
  - ASME.org web visits: 94,754 (+15%)
  - ASME Membership: 912 (+55%)
  - Training course attendees: 86 (-47%)
  - Conference attendees: 898 (-6%)
  - Certified manufacturers: 784 (+12%)
  - Standards committee members: 123 (+43%)

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MOU between ASME and SINOPEC

Standards and Certification

- One of the most important aspects of ASME in its role as neutral convener is its standards developing committees
- Most of ASME's standards are developed with the goal of maximizing safety and reliability of mechanical equipment
- Their technical superiority have made many of these standards de facto international standards that facilitate international trade
- ASME maintains the technical and global market relevance of its standards by encouraging and welcoming participation by experts from all over the world
- Chinese experts have begun to participate, and more will be joining

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Technologies and Topics Addressed by ASME Standards

- Authorized Inspection
- Bioprocessing
- Blanks
- Boilers
- Chains and Sprockets for Power Transmission
- Controls and Safety Devices for Automatically Fired Boilers
- Conveyors
- Cranes and Hoists
- Cutting, Hands, and Machine Tools
- Drawing, Terminology, and Graphic Symbols
- Elevators and Escalators
- Energy Assessment
- Fasteners
- Fitness-For Service
- Gauges / Gaging
- Geometric Dimensioning & Tolerancing
- High Pressure Systems Keys and Keyseats
- Limits and Fits
- Measurement of Fluid Flow in Closed Circuits
- Metal Product Sizes
- Metrology and Calibration of Instruments
- Non-Personnel & Personnel Lifting Devices
- Nuclear
- Performance Test Codes
- Piping and Pipelines
- Plumbing Materials and Equipment
- Post Construction of Pressure Equipment and Piping
- Pressure and Temperature Instruments
- Pressure Vessels
- Pumps
- Reinforced Thermoset Plastic Corrosion Resistant Equipment
- Risk Analysis
- Screw Threads
- Steel Stacks
- Surface Quality
- Turbines
- Valves, Fittings, Flanges, Gaskets
- Verification & Validation

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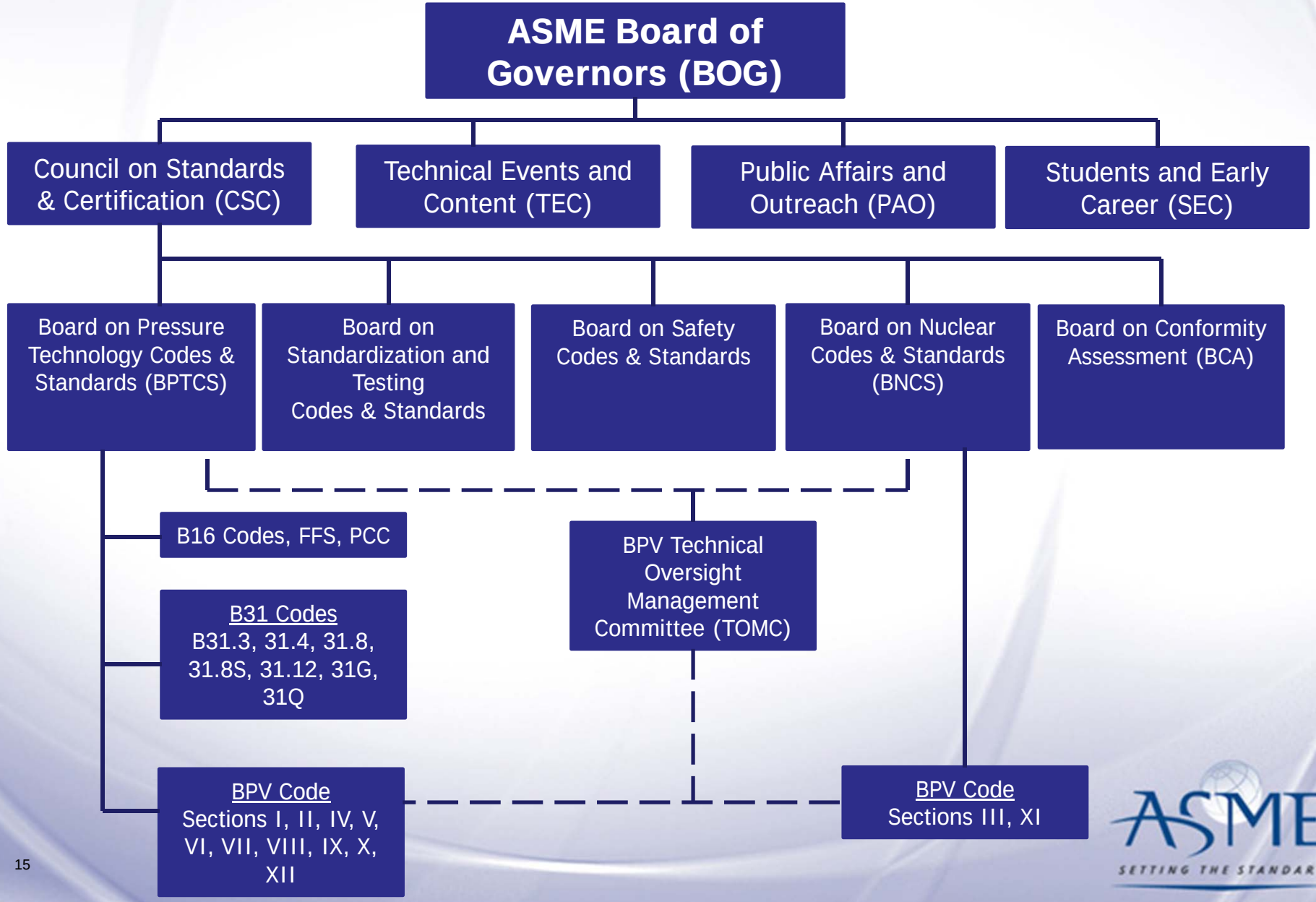
ASME Standards - Consensus Process

- Openness
- Transparency
- Balance of Interest
- Due Process
- Consensus
- Consistent with Principles of World Trade Organization (WTO) Technical Barriers to Trade (TBT) Agreement

ASME Organization



Some ASME Standards for Oil and Gas

- Boiler and Pressure Vessel (BPV) Code
  - Section II - Materials
  - Section V - Nondestructive Examination
  - Section VIII, Division 1 - Rules for Construction of Pressure Vessels
  - Section VIII, Division 2 - Alternative Rules for Construction of Pressure Vessels
  - Section VIII, Division 3 - Alternative Rules for Construction of High Pressure Vessels
  - Section IX - Welding, Brazing, and Fusing Qualifications
  - Section X - Fiber-Reinforced Plastic Pressure Vessels
  - Section XII - Rules for Construction and Continued Service of Transport Tanks
- Piping and Pipeline Codes
  - B31.3 - Process Piping
  - B31.4 - Pipeline Transportation Systems for Liquids and Slurries
  - B31.8 - Gas Transmission and Distribution Piping Systems
  - B31.8S - Managing System Integrity of Gas Pipelines
  - B31.12 - Hydrogen Piping and Pipelines
  - B31G - Manual for Determining the Remaining Strength of Corroded Pipelines
  - B31Q - Pipeline Personnel Qualification
- Post Construction
  - FFS-1 - Fitness-for-Service
  - PCC-1 - Guidelines for Pressure Boundary Bolted Flange Joint Assembly

Energy and Environmental Standards Advisory Board (EESAB)

- Reports to ASME Council on Standards & Certification
- Charter includes coordinating initiation of new standards development, workforce development, certification programs and related products and services addressing global energy and environmental needs
- EESAB developed and maintains a strategic and operational standards gap analysis
- Investigating potential standards needs relevant to the Oil & Gas industry:
  - Hydraulic Fracturing
  - Natural Gas (CNG/LNG)
  - Onshore Multi-wellhead Facilities

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International Participation

- 123 total Volunteers from China (holding 144 positions)
- ASME encourages international participation in its standards development committees
  - Individual Expert Members
  - Delegate Members
  - Contributing Members
  - International Interest Review Group
  - International Review Groups (B31.3, B31.8)
  - International Working Groups (BPV II, III, XI)
- International participation facilitated by use of electronic tools (C&S Connect) in standards development activity

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ASME CIWGs for BPV II and III

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S&C International Associates

- International Associates from organizations in China were hosted by ASME S&C staff in NY headquarters
  - 2007 - Standardization Institute of Shanghai (SIS)
  - 2008 - China Special Equipment Inspection and Research Institute (CSEI)
  - 2013 - Standardization Administration of China (SAC)
- The program allowed for information exchange and collaboration in the following areas
  - Standards development processes
  - Government Relations
  - Conformity Assessment
  - Training
  - Logistics of standards distribution

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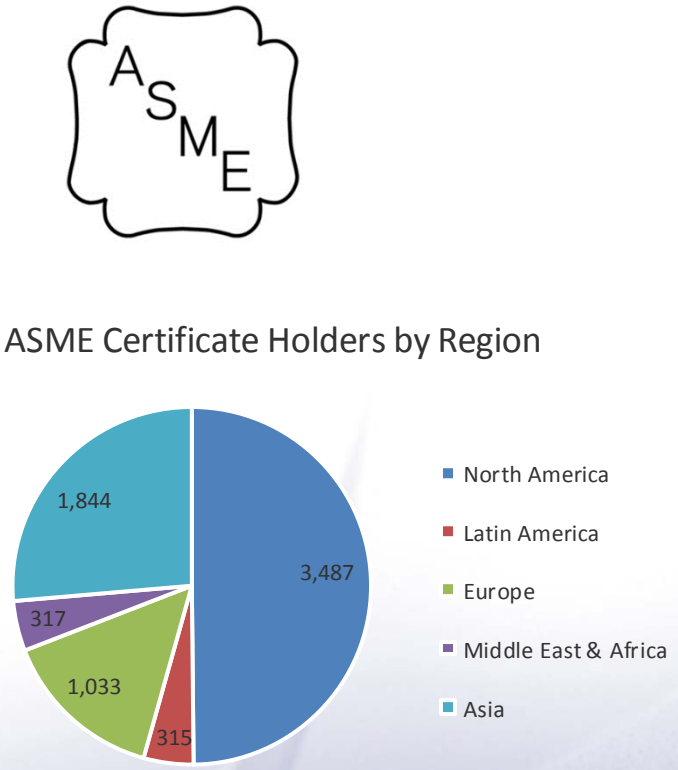
Pressure Equipment Manufacturing

- >5,000 boiler and pressure vessels manufacturers in China*
  - Boilers: 1,054
  - Pressure Vessels: 4,029
  - Cylinders: 136
  - Piping: 4,850
- ASME Certificate Holders
  - Total BPV Certificate Holders: 6,996
  - Total BPV Certificates: 12,611
  - ~50% International
  - ~25% from Asia
  - China
    - BPV Certificate Holders: 784 (11%)
    - BPV Certificates: 1,187 (9%)



* As reported by China Special Equipment Inspection and Research Center (CSEI), Chengdu conference, July 2013

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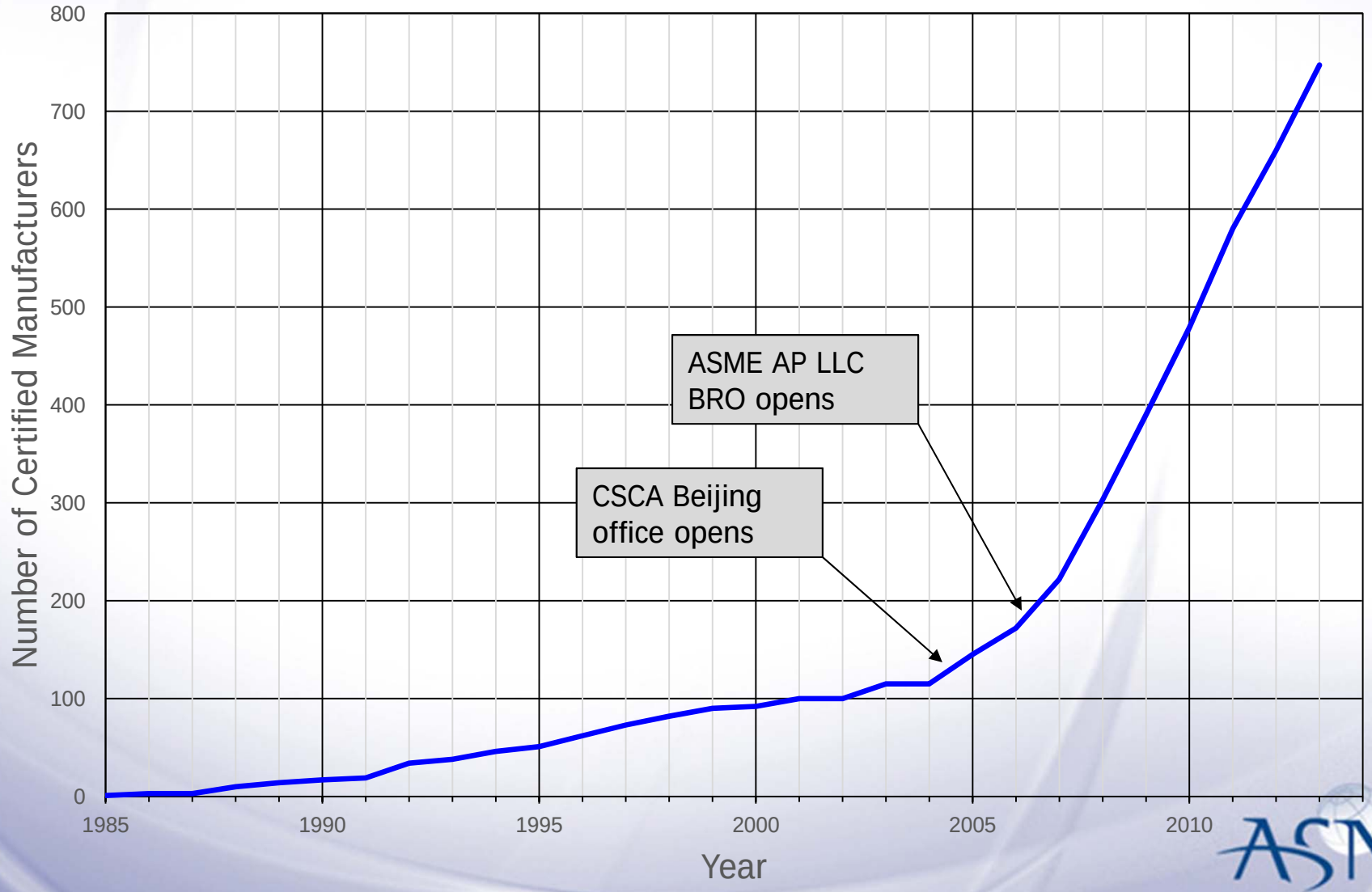
ASME BPV Certificate Holders in China



Workforce Development

- ASME engages senior technical experts as teachers and organizes classes for early career engineers as well as those looking to enhance their career path
- Students gather in classes that are in-person or by access to e-learning
- ASME also attracts individuals looking for technical certifications in their specific fields

ASME Training Resources for Oil & Gas

- Generally address ASME Standards-related topics
- Authorized by the International Association for Continuing Education and Training (IACET) to issue Continuing Education Units (CEUs)
- Face-to-Face resources:
  - Public Courses
  - In-Company Courses
  - Workshops
  - Master Classes
- eLearning resources:
  - Assessment Based Courses (ABCs)
  - Virtual Workshops
  - Instructor-Supported Courses
- Certificate Programs
  - Pipeline Operator Certificate Program in Corrosion (POCP-C)
  - Bolted Joint Specialist (in development)
  - Subsea Pipelines (under evaluation)

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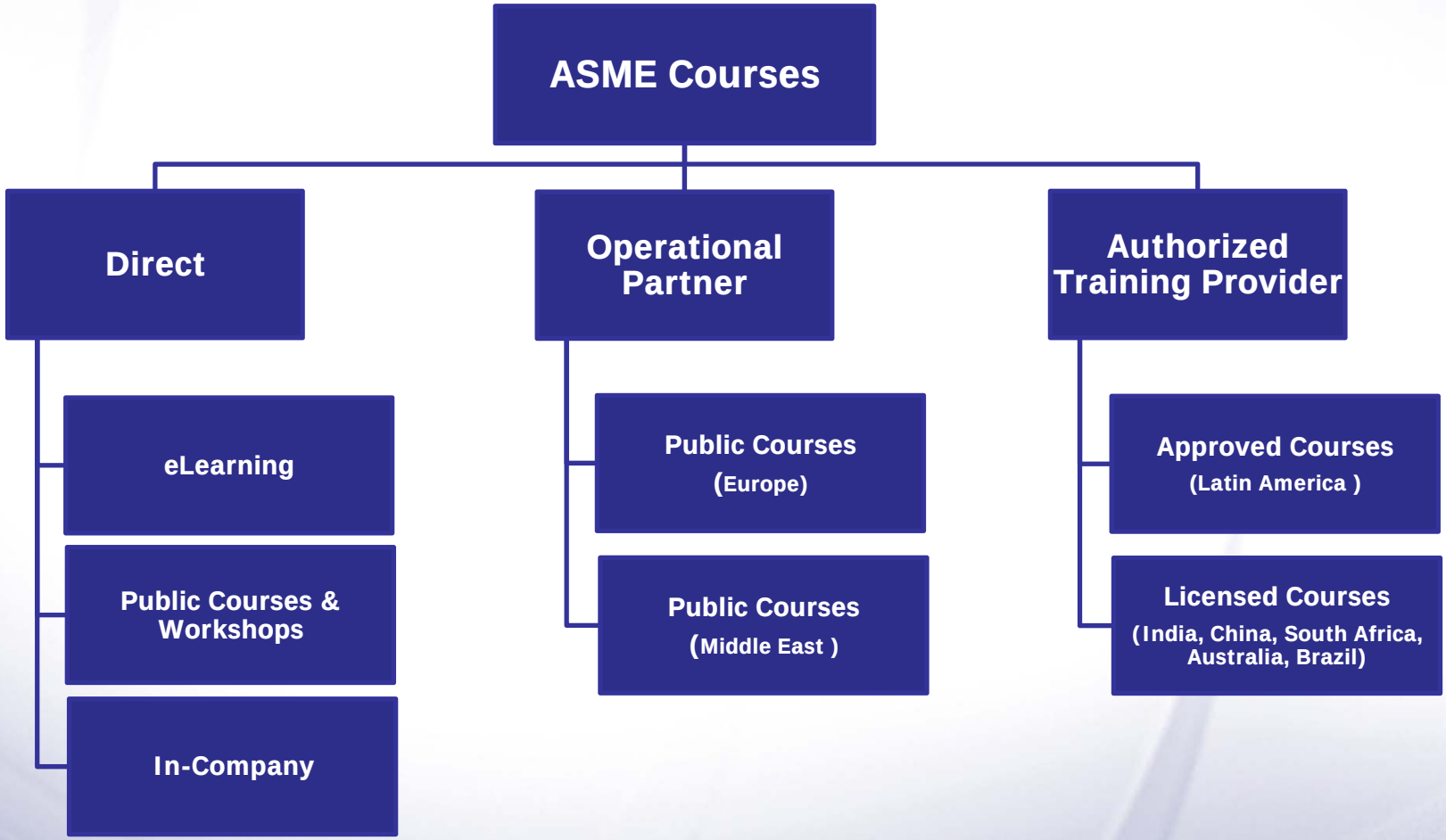
ASME Training Delivery Channels



ASME Training in China

- Authorized Training Provider (ATP)
  - Institute of Nuclear and New Energy Technology (INET), Tsinghua University
- Delivers ASME training under license, including nuclear certificate program (>50 certificates issued)
- Delivered in local language
  - ASME provided course materials in English
  - ASME trained the trainers
  - ATP translated to local language
- Content relevant to Oil & Gas, including ASME code courses
- ASME is open to new ATPs in China

ASME Personnel Certification

- Independent job-specific assessment of an individual's level of qualification
- Stakeholders establish the certification criteria
- Standardized and secure written/practical exams utilized for assessment
- Psychometric practices applied for validity, reliability, and fairness
- Certification is independent of training
- Documented training and experience prerequisites
- Certification is time limited; renewal requirements measure or enhance continued competence
- ASME credentials are issued to personnel passing the assessments

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ASME Personnel Certification

- Overall
  - 3,010 Total Certified Individuals
- Geometric dimensioning & tolerancing professionals (GDTP)
  - Technologist & Senior Certifications
  - 1,364 Certified Individuals
  - 38 from China
- Resource recovery facility operators (QRO)
  - Provisional and Operator Certifications
  - 1,551 Certified Individuals
- Operators of high capacity fossil-fuel fired (boiler) plants (QFO)
  - Basic Certification with 6 classes
  - 31 Certified Individuals
- Under Development
  - ASME Non-Destructive Examination (NDE) and Quality Control (QC) inspection personnel certification (ANDE)
  - Evaluating locally relevant programs for ASME standards users

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Engineering Education

- ASME is co-founding Society of the Accreditation Board for Engineering and Technology (ABET)
  - lead society responsible for 440 degree programs in Mechanical Engineering, Engineering Mechanics, Mechanical Engineering Technology and Mechanical Drafting & Design in 22 countries
  - co-lead society for Systems Engineering
  - cooperating society for Biological, Bioengineering / Biomedical, Electromechanical, Engineering Management, Environmental, Materials, and Welding
- China moving towards “Washington Accord” (multinational recognition of engineering education accreditation systems)
- China modeling after ABET accreditation, outcomes assessment, approach
- ASME Collaborative working relationship with Chinese Mechanical Engineering Society (CMES)
- Annual ASME International Mechanical Engineering Education Leadership Summit
  - 2006, 2012 - Beijing
  - 2011 - Hong Kong
  - Chinese delegations at U.S. Leadership Summits since 2006

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International Conferences and Events

- ASME conducts and sponsors many conferences and events that attract technical experts from all over the world
- Technical papers are presented introducing research results and latest applications of technology
- Thousands of engineers and technicians attend these conferences every year

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International Conferences and Events

- Oil & Gas Conferences:
  - Offshore Technology Conference (OTC)
  - International Pipeline Conference (IPC)
  - International Conference on Ocean, Offshore and Arctic Engineering (OMAE)
  - ASME International Mechanical Engineering Congress & Exposition (IMECE)
  - Pressure Vessel & Piping Conference (PVP)
- Conferences in China:
  - China International Petroleum & Petrochemical Technology and Equipment Exhibition (CIPPE)
  - China Chemical Industry Equipment Association (CCIEA) Annual Conference
  - China International Exhibition of Boiler, Pressure Vessel and Pressure Conduit Technology Exhibition
  - China International Pipeline Conference (CIPC)
- Other ASME events in China:
  - China-US Technical Workshop on Standards - jointly w/ ASTM, SPERI, SNERDI
  - Workshops on Elevated Materials in Power Plants - jointly w/ CMIF, CSEE, CSPE and CSEI

New Events

Serving Unconventional Oil and Gas: *Equipment and Technologies*

ASME HYDRAULIC FRACTURING 2015

17-19 March 2015, Houston, TX, USA

https://www.asme.org/events/hydraulic-fracturing-conference

SPE/ASME – LNG: From Well Head to Global Markets Workshop

23-24 October 2014, Vancouver, BC, Canada

http://www.spe.org/events/14avan/

ASME ENERGY FORUM

https://www.asme.org/events/asme-energy-forum

multi-media series exploring a broad range of energy sources and related technologies

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Join Us

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