ASME International

the Mark

Volume 3, Issue 2
October 2001

PUBLISHED FOR ASME'S CERTIFICATE HOLDERS BY THE ASME CODES AND STANDARDS CONFORMITY ASSESSMENT DEPARTMENT

# ASME – Chinese Nuclear Codes and Standards Meetings

## New Venture

An ASME-sponsored team, consisting of John H. Ferguson, Vice President of ASME Nuclear Codes and Standards (NC&S), Gerry M. Eisenberg, ASME Staff Director of Nuclear Codes and Standards, Rick Swayne, and C. Wesley Rowley, visited China during the period May 22-30, 2001. The ASME Team visited Beijing, including the China National Nuclear Corporation (CNNC), the Institute for Standardization of Nuclear Industry (ISNI), the National Nuclear Safety Administration (NNSA), the Nuclear Safety Center (NSC), and the Institute of Nuclear Energy Technology (INET), Tsinghua University. In Shanghai, they visited the Shanghai Nuclear Engineering, Research, and Design Institute (SNERDI) and the Qinshan Nuclear Power Plant site. Mr. FU Manchang, the Director-General of the Department of Science, Technology, and International Cooperation (DSTIC) of CNNC was the primary host for the ASME Team's visit in China.

The purpose of the visit was to accomplish the following:

**1.** Initiate a partnership agreement in China in the effort to enhance communications with appropriate Chinese regulatory and industry groups, and assist in development of nuclear mechanical codes and standards programs in China;

**2.** Discuss training programs in China to foster understanding and implementation of ASME nuclear codes and standards;

**3.** Visit nuclear plants in China under construction or in current operation and manufacturing facilities;

**4.** Encourage Chinese participation in ASME nuclear codes and standards activities, particularly on the Board on Nuclear Codes and Standards (management level);

**5.** and understand the organizational structure in the Chinese government and industry relationships.

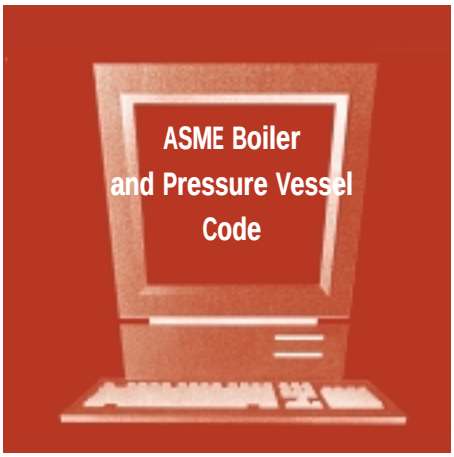
## Chinese Organization Background

**The China National Nuclear Corporation (CNNC)** has responsibility for both civilian and military nuclear activities at all levels of the nuclear fuel cycle. CNNC is responsible for China's nuclear power production and waste disposal facilities, including a significant research and development capability. The CNNC is the successor to the Ministry of Nuclear Industry. Directly under the State Council, the CNNC is a national industrial conglomerate, comprising over 200 enterprises and institutions with advanced technology and equipment and a total of approximately 280,000 employees, of whom 78,000 were scientific research, engineering and technical personnel in various disciplines.

The CNNC is in charge of foreign affairs, international conference and Sino-foreign co-operation and exchanges in nuclear field. CNNC has established scientific and economic ties with forty countries and regions worldwide.

**The Institute for Standardization of Nuclear Industry (ISNI)** was founded in 1983, is governed by the Bureau of Science and Technology of China National Nuclear Corporation (CNNC), and has about 100 staff members and is growing in size and responsibility. It is the Chinese information and research center for nuclear industry standards. ISNI is also coordinating nuclear standardization and quality control. Their responsibility includes:

- Reviewing Chinese and international standards
- Establishing and maintaining current Chinese nuclear standards
- Implementing the Chinese standards infrastructure (developmental process)




# On-Line Data Base of ASME Interpretations

ASME has made arrangements with CASTI Publishing, Inc. to provide an on-line database of interpretations of the ASME Boiler and Pressure Vessel Code, and the two most popular pressure piping codes, B31.1 Power Piping and B31.3 Process Piping.

This service, expected to be available in October, allows users to search, organize, and print 6,000+ Code Interpretations. Standard options include searching by interpretation number, interpretation subject, volume number, keyword, or paragraph number. More advance search options are also available.

The interpretations can be accessed anywhere an internet connection is available. Subscribers are issued a username and password which can be shared amongst colleagues. However, access is limited to on logon user at any one time. Multiple usernames are available at a discount. For further information, go to **www.casti.ca.**

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- Monitoring adequacy of standards implementation in design, construction, and manufacturing
- Publishing nuclear standards information
- Acting as the ISO & IEC representative for China

**The National Nuclear Safety Administration (NNSA)** was established in 1984 and has a role in China equivalent to Nuclear Regulatory Commission (NRC) in the United States. NNSA is led by a Director-General and a Deputy Director-General, and has 6 Divisions and 4 Regional offices. NNSA uses NRC practices such as Regulatory Guides for domestic nuclear power plant designs and operations.

**The Nuclear Safety Center (NSC)** reports to the State Environmental Protection authority (SEPA) and is the technical arm of NNSA. NSC was established in 1989, has 12 divisions, and employs 100 personnel. NSC is a technical support organization. It is administratively under the State Science & Technology Commission. The eight technical divisions are:

1. Regulations & Information Division
2. Reactor System & Accident Analysis Division
3. Mechanical Component & Quality Assurance Division
4. Electrical Power / Instrumentation & Control Division
5. Siting & Civil Construction Division
6. Nuclear Material & Radioactive Waste Division
7. Nuclear Installation Operation Safety Division
8. Radiation Protection & Emergency Response Division

**The Institute of Nuclear Energy Technology (INET)**, at Tsinghua University, was founded in 1960 as one of the pioneer nuclear research and experimental bases in China. INET is now a comprehensive research center with multi disciplinary research, design and development projects mainly concentrated on nuclear technology. According to INET, they are the largest institute under the State Education Commission and have combined teaching, research and production together. Some important national construction projects and key scientific research projects are undertaken by INET.

**Shanghai Nuclear Engineering, Research, & Design Institute (SNERDI)** was formed in 1970. Today SNERDI is a key research and design institute under the direct administration of CNNC. SNERDI has about 700 engineers and is organized into six technical departments as follows:

- Department of Reactor Physics & Thermal Hydraulics
- Department of Component Design
- Department of Nuclear Systems
- Department of Electrical / I&C
- Department of Civil Engineering & Public Utilities
- Department of Architectural Design

## Discussion and Developments

Perhaps the most significant achievement of this meeting was the historic signing of a Memorandum of Understanding between ASME and CNNC, foreshadowing a significant growth in ASME-China cooperation in development, translation, and use of ASME Nuclear Codes and Standards. Two additional MOUs, with NSC and INET, are currently being discussed.

In addition, China National Nuclear Corporation (CNNC), National Nuclear Safety Administration (NNSA), Nuclear Safety Center (NSC), Institute

of Nuclear Energy Technology (INET) were interested in seminars, training courses, consulting, or other guidance from ASME to assist in the use of Nuclear Codes and Standards in China. As well, the ISNI continues to canvass the Chinese industry to determine interest in courses such as Nuclear Cranes, Air and Gas Treatment, Risk Technology, and others previously given. The next opportunity for conducting these will be in the Spring of 2002.

The ASME Team visited the CNNC Qinshan site, an operational 300 MW plant with and additional four units under construction, and the INET pebble bed research High Temperature Gas Reactor (HTGR). The Qinshan visit identified that Section XI (ISI), OM Code (IST), OM Part 7 (Thermal Expansion of Piping), and OM Part 3 (Vibration of Piping) are being used at Qinshan I and II. The research performed by INET on the pebble bed research HTGR has the potential to greatly expand the coverage by Section III / Division 1 and Section XI / Division 2.

Other discussions took place about the desire for use of B&PV Code Section III and Section XI for domestic (and U.S. if ordered) reactor projects. NNSA is using Section III as a model for design, fabrication, and installation for all their Nuclear Power Plants (NPPs). Although use of ASME Nuclear Codes and Standards is not mandatory for Chinese NPPs, general compliance is strongly encouraged by NNSA.

These four organizations entered into a dialogue about the Nuclear Codes & Standards application process and their role as a participant in that process. All three organizations committed to providing feedback to the ASME committees in the form of technical inquiries for either interpretation or modification of the Code. Their participation as members will be decided at a later date.

Finally, there is a strong interest in translation of ASME Nuclear Codes & Standards (especially Section III, Section XI, and OM Code) into Chinese.

### Conclusion

The ASME – China meeting was a success. The ASME team gained great insight into how the Chinese nuclear industry is organized and how it operates, which will aid future deliberations. In addition, many new opportunities for cooperation and interaction between expert ASME Nuclear Codes and Standards volunteers and Chinese engineers have now become available, as expressed by the great interest in ASME-sponsored seminars, training courses, consulting, or other guidance in application of ASME Nuclear Codes and Standards in China. As a result of the discussions, the NNSA communicated a strong desire to maintain a cooperative relationship with ASME on an informal basis, as they currently have an MOU was with their U.S. counterpart, the U.S.N.R.C. Perhaps most noteworthy, all of these organizations expressed a strong desire to use ASME Nuclear Codes & Standards to ensure nuclear power plant safety in China.

# New ASME Standard for Bulk Solid Containers

Structures for the storage and processing of raw and refined bulk solid materials are used in virtually every industry that produces consumables for the world's population. This includes multi-billion dollar industries, where millions of dollars are invested in the structures to store and handle the various bulk solids involved. Since the value of most bulk solids is dependent on the quality of the product, advances in storage technology that improve or maintain the natural quality of the product continue to drive the need for new bulk solids structures.

Currently, these structures are typically metal plate or concrete containers ranging in size from shop-fabricated containers of a few cubic meters to field-erected structures of thousands of cubic meter capacity. In addition, there are also many bulk solids containers constructed of synthetic materials, such as polystyrene and fiberglass reinforced plastic, usually on the smaller end of the size range. Most bulk solids containers are vertically cylindrical in form, but there are other forms commonly used. Terms commonly associated with these containers include "tanks", "silos", "bins", "bunkers", and others. Variations of the basic form include ground-supported or flat bottom containers and elevated containers supported on braced columns or cylindrical skirts, often incorporating a conical bottom or "hopper".

The applications of the bulk solids structures range from the storage of grains and refined products, such as

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sugar, in the food industry, through various bulk chemical products, such as powders used in the production of synthetic fibers, to building materials and fuels, such as sand, aggregate and coal. Operating conditions for these structures range from simple storage of a material at ambient temperatures and pressure to controlled temperature, controlled moisture conditions, and pressurized atmospheres within the container structure. Thus the risks associated with building and operating such structures can vary over a fairly wide spectrum.

Although the safety risks and consequences of a failure are generally lower with the storage and handling of bulk solids than with the storage and handling of most liquid materials, there are just as many considerations to be made in the design and construction of bulk solids structures to ensure the safety of the public and the reliability of the structure for the operator. Some of these considerations are related to the inherent nature of the bulk solid material itself, and others are related to the environment in which the product is contained or the manner in which it is handled. Some of these safety risks are not immediately obvious. Loss of life and property continues to occur in cases where these conditions were not fully addressed in the design and construction of bulk solids containers. Consequently, there is a need for standards for the design and construction of bulk solids containers to ensure the safety of the public, the protection of the environment, and the protection of the interests of the containers' owners and operators.

The need for bulk solids structures standards has long been recognized and has been partially met by the application of the principles of standards that currently exist for the design of liquid storage containers and pressure vessels. But these existing standards are not intended for the purpose of designing and constructing bulk solids structures. Thus, their provisions fall short in many cases, and the intent can be easily misinterpreted in many other cases. Thus, in addition to the need for general standards, there is a need for standards specifically intended for bulk solids container design and construction.

In response to this specific need, ASME has chartered a Standards Committee to write a new standard for bulk solids storage containers. The Committee, known as the Structures for Bulk Solids Standards Committee, or SBSSC, includes members representing users, manufacturers, designers and others with expertise in the bulk storage industry. The membership also represents various international locations.

The purpose of the new standard is to establish best industry practices for the design and construction of these structures and to prescribe minimum requirements to ensure the safety and maintainability of these structures.

Initially, the standard will address both bolted and welded cylindrical storage containers, commonly known as silos, bins, or tanks. Concrete structures will not be included in the new standard. Likewise, structures of non-axisymmetric geometry will be excluded from the standard, at least initially.

The Committee is subdivided into eight separate Project Teams, each with a Team Leader. In some cases, Committee members serve on more than one Project Team. Each Project Team is assigned the responsibility to develop the content of the standard in one of the following areas:

### 1. General

This section will describe the scope and applicability of the standard, its organization and other general issues, such as relative responsibilities of the parties involved.

### 2. Design & Materials

This section of the standard will provide rules for selecting materials for the construction of the container, as well as the equations for the structural design of the container and its components for the specified internal and external loads.

### 3. Examination & Testing

This section will provide rules for the non-destructive examination and testing of the container. Examination and testing requirements are likely to be patterned after those found in recognized standards for industrial tanks such as those of the ASME Boiler and Pressure Vessel Code and the American Petroleum Institute (API); but with adjustments to consider the special nature of the contained materials and the different risks involved with bulk solids storage and handling.

### 4. Fabrication & Erection

This section will provide rules for fabrication and erection and will address issues such as welding, personnel qualifications, tolerances, safety and others. Similar to the sections addressing design, materials, examination and testing, this section will likely be similar in format and content to existing standards for liquid storage tanks and pressure vessels.

### 5. Solids Flow & Solids Loading & Other Live/Dead Loads

One of the greatest challenges in bulk storage container design is to characterize the wide range of loading conditions possible for any given bulk solid or granular material. The bulk solid material characteristics and resulting loads are dependent on many factors, both internal and external to the material. They are also dependent on the configuration and material of the container itself. This section of the standard will provide the rules necessary to character-

ize the stored material properties and range of loadings, including consideration of the interaction of the bulk material with the container.

### 6. Coatings & Linings

This section will provide guidelines for the proper selection and application of exterior coatings and interior linings for the purpose of corrosion and abrasion control. The guidelines will likely be patterned after those of SSPC and NACE standards.

### 7. Overpressure Protection

This section will provide guidelines for the evaluation of overpressure protection requirements and for the selection of overpressure protection devices, when such devices are necessary. The guidelines in this section will likely be patterned after those of NFPA Standards 68, 69 and 654.

### 8. Foundations

This section will provide guidelines for foundation design and construction. The scope of the standard will be limited to aboveground structures but will include both grade-supported and elevated structures.

The Committee has made a good start on the project, but there is a lot of work yet to do before the standard will be available to the public. Committee volunteer information may obtained from Umberto D'Urso at (212) 591-8535. General Questions about the project may be directed to ASME's Umberto D'Urso or to the Committee's Chairperson, John Lieb of Tank Industry Consultants at (630) 226-0745 or lieb@tankindustry.com.

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# Frequently Asked Questions (FAQ) on Boiler and Pressure Vessel Accreditation (Non-Nuclear) Procedures

The questions and replies listed below were developed by ASME Staff in response to general inquiries received from Certificate Holders relating to accreditation process activities. These responses reflect current ASME Accreditation processes, and are subject to revision. Depending on the circumstances and facts relating to the Certificate Holder's request, approval by the ASME Subcommittee on Boiler and Pressure Vessel Accreditation may be required.

## RELOCATION OF SHOP FACILITY

### *QUESTION 1*

I am relocating my Shop facility (currently listed on the ASME Certificate of Authorization) to a new location. Do I need an ASME relocation review at the new shop facility in order to have my ASME Certificate of Authorization revised to show the new shop location?

### *REPLY 1*

If the relocation does not involve a change in jurisdiction and the Certificate Holder's AIA of record at the previous shop location is maintained at the new location, ASME will allow an audit by the AIA of record to be substituted for an ASME relocation review under the following provisions:

The Certificate Holder's AIA of record will be required to provide ASME with written verification of the following:

1. Confirmation of the address of the new shop and the distance from the previous shop location;
2. That the AIA of record has a contract to provide inspection service to the company at the new shop location;
3. That there has been no significant changes in upper management, QC personnel, or the company workforce;
4. That there has been no change in the company QC manual, other than to show the new shop location;
5. That there has been no change in the scope of fabrication activities as currently listed on the Certificate Holder's Certificate(s) of Authorization; and
6. That the company's AIA has witnessed the implementation of the Certificate Holder's QC System, as described in the company QC manual, and is satisfied that the company can fabricate ASME stamped components in compliance with the applicable requirements of the ASME Boiler Code. ASME expects the AIA of record to perform an implementation similar in scope to that performed during an ASME review.

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## QUESTION 2

How does a Certificate Holder comply with the requirements in Question 1, if they are not required by the code to use the services of an AIA?

## REPLY 2

**a)** For Certificate Holder's of V, HV, UV, UV3 and UD Certificates of Authorization, ASME will require the ASME Designated Organization to provide written verification of the following:

1. The address of the new location, its distance from the previous shop location and that the new shop location is within the same jurisdiction as the current shop location listed on the Certificate(s) of Authorization;
2. That there has been no significant change in upper management, QC personnel or workforce;
3. That there has been no change in the scope of manufacturing activities as currently listed in the scope of the Certificate(s) of Authorization;
4. A summary of the audit conducted by the ASME Designated Organization at the new shop location to ensure that the Certificate Holder is implementing their Quality Control System, previously accepted at the last ASME review; and
5. That the ASME Designated Organization has tested two pressure relief devices per test medium manufactured/assembled at the new shop location and the tested pressure relief devices have met the applicable requirements of the ASME Boiler Code.

**b)** For "H" (Cast Iron) Certificate of Authorization Holders, where ASME conducts annual renewal reviews at the Certificate Holder's shop location, the procedure for approval of a request for relocation change are as follows:

The Certificate Holder would be required to provide ASME with written verification of the following:

1. The new shop location is within the same jurisdiction as the shop location currently listed on the Certificate(s) of Authorization;
2. Submittal of the revised Quality Control Manual to ASME for acceptance;
3. That there is no significant change to upper management, QC personnel or workforce;
4. That the product line will remain the same and the scope of Code activities as listed on the Certificate(s) of Authorization remains unchanged.

## QUESTION 3

Due to a postal re-designation of the address of our current shop address, I need to obtain a revised Certificate of Authorization. What procedure do I need to follow to obtain a revised Certificate of Authorization?

## REPLY 3

The Certificate Holder needs to contact the ASME Conformity Assessment Department and inform ASME of the address change due to Postal re-designation of building number, street name, zip code, etc. ASME will issue a revised Certificate of Authorization provided the Certificate Holder's AIA of record provides sufficient documentation to ASME to support the Certificate Holder's request. Where there is no AIA involved in the Certificate Holder's Code activities, documentation from the Postal Authority and/or the jurisdictional authorities where the shop is located would be needed to support the request.

There is no charge to revise Certificates of Authorization due to postal redesignation.

## QUESTION 4

What are the general procedures a Certificate Holder shall follow to obtain a revised Certificate of Authorization due to re-location of the shop?

## REPLY 4

Approximately two months prior to relocating to a new shop location, the Certificate Holder should submit a letter* to the ASME Conformity Assessment Department informing them of the intent to relocate.

ASME will acknowledge your request and inform your AIA of record or the ASME Designate Organization of your planned relocation of your shop. It is up to the Certificate Holder to arrange with his AIA of record or the ASME Designated Organization for the date of the shop audit.

On receipt of a satisfactory report and the applicable fees, ASME will issue the revised Certificate(s).

***Note:** Your initial request should also include the cost of revising your Certificate of Authorization ($150.00 per Certificate), to prevent any delay in issuing a revised Certificate. It should also be noted that the relocation audit would not extend the current expiration date of your Certificate of Authorization.

## CHANGE OF AUTHORIZED INSPECTION AGENCY (AIA)

### QUESTION 1

I recently changed my AIA of record. Do I need to inform ASME or does the AIA take care of notifying ASME?

### REPLY 1

It is the Certificate Holder's responsibility to immediately inform ASME as soon as they make a change in the AIA of record at the shop/address listed on the Certificate of Authorization. Also, ASME should receive notification from the previous AIA of record that they no longer have an inspection agreement with the Certificate Holder and a letter from the new AIA of record indicating that the new AIA has a contract to perform inspection services at the plant facility located at the address listed on the Certificate Holder's Certificate of Authorization.

The Certificate Holder may be required to provide ASME with sufficient documentation to verify that they had a valid contract with an AIA at the time that all components were ASME Code Symbol stamped. This may be required if there is a gap between notification of the change of AIA of record and the date the new inspection contract is signed.

**Note:** ASME copies the Certificate Holder's AIA of record on most correspondence to the Certificate Holder. Failure to provide ASME with the name of your current AIA of record may result in the new AIA not receiving notification of important information that concerns the Certificate Holder's Code activities which may require the AIA of record's involvement or advice.

## ASME REVIEWS

### QUESTION 1

I have just completed an ASME review and the Team Leader's recommendation is to issue (new or renew) my Certificate of Authorization. How long will it take for ASME to issue the Certificate following the completion of the review?

### REPLY 1

As a minimum, it could take one month, but should take no longer than 2 months. This will depend on the processing of the Qualification Review Report (QRR). Listed below is the process:

1. Once the review is completed, the ASME Team Leader will forward the QRR to ASME for review. This could take a few weeks depending on the number of reviews the Team Leader is conducting and the location of the reviews.
2. On receipt of the QRR, two independent ASME Staff personnel from the Conformity Assessment Department review the QRR and take the following action:
   - **a)** Issue the Certificate(s), if all fees have been paid, and there is no disagreement or objection with the Team Leader recommendation to issue;
   - **b)** If there are questions that arise from the information provided in the QRR, ASME will contact the Team Leader to obtain clarification before issuance of the Certificate(s);
   - **c)** If there is a disagreement or objection, and there is no resolution, the QRR will be submitted to the ASME Subcommittee on Boiler and Pressure Vessel Accreditation for resolution.

### QUESTION 2

I just had my renewal review and my Certificate of Authorization will expire next week. The Team Leader recommendation was to renew my Certificate of Authorization. What steps can I take to ensure that I can continue to fabricate and Code stamp components until my new Certificate of Authorization are received?

### REPLY 2

Listed below are the steps you can take in order to maintain the validity of your Certificate of Authorization:

1. Prior to the renewal review you should contact the ASME Conformity Assessment Department and request an extension to cover the period of time until you obtain the renewal of your Certificate showing the new expiration dates. Requests for extensions must be in writing to ASME.
2. Request the Team Leader to fax the QRR to ASME.
3. Requests for extensions should be made prior to the actual review if the Certificate Holder's review is less than two months from the expiration date on the Certificate of Authorization.

**LOOK FOR FUTURE FAQ TOPICS IN THE MARK:**

ASME Reviews, Extensions, Name Changes, Due Process, ASME Procedure for Handling Allegations of Code Non-Conformance and obtaining additional Certificates without an ASME review. The above information was prepared by Kenneth I. Baron, Staff Secretary, Subcommittee on Boiler and Pressure Vessel Accreditation, ASME C&S - Conformity Assessment Department.

**ASME International**

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New York, NY 10016

Non-Profit Org.
U.S. Postage
PAID
New York, NY
Permit No. 2245

*The Mark – a newsletter published for ASME's Certificate Holders by the ASME Codes and Standards Conformity Assessment Department*

**www.asme.org/codes**