Research of ASME Standards Development Policy and its Enlightenment

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Abstract. The standard developing policy of ASME is studied from the aspects of organizational structure, division of responsibilities, standard developing principle and standard developing procedures of ASME. In addition, it analyzes the characteristics of ASME standard developing process and its enlightenment to Chinese standardization work in order to give some enlightenment to social organizations who carry out standardization work.

Keywords: ASME, Association standards, Standard developing policy, Appeal mechanism

1 Introduction
With the deepening of standardization reform in China, association standards have developed rapidly, and are highly valued by the Chinese government and social organizations from all walks of life. Compared with the association standards in the early stage of China's development, the voluntary standard system abroad has a longer history. For example, the American voluntary standard system has a history of more than one hundred years. Although the association standard is still a new thing in our country, in fact the association standard has developed for more than 100 years in foreign countries [1]. The United States, Britain, Germany, Japan and Russia are the early countries in the international standardization work. Foreign social organizations have a long history, and many social organizations have developed standards. Not all organizations are established because of developing standards, but according to the research and statistics of foreign institutions, developing standards, as a business item of the organization, has ranked in the top three positions in terms of importance and business volume [2]. Foreign organizations have a long history of developing standards, with the voluntary standards of the United States being the most typical. According to statistics from ANSI's official website, there are hundreds of traditional standard-setting organizations in the United States. In addition, there are also hundreds of unconventional standard-setting organizations, such as Consortia [3]. In this paper, the American Society of Mechanical Engineers (ASME), a typical standardization organization in the United States, is selected to analyze its organizational structure, standardization technical organization and standard development policy, so as to provide reference and help for the development of organization standardization in China.
2 Introduction of ASME
ASME is a world-renowned standardization organization in all areas of engineering. ASME serves global community to achieve the goal of improving the quality of life and communicating engineering achievements[4].

ASME standards have a wide impact in the world. ASME develop, maintain, and promote the use of these ASME products and services world about[5].

3 ASME Organizational Structure and Division of Responsibilities
ASME's top governing body is the Board of Governors (BOG) [6], which is elected by members and has full control of ASME's social activities in accordance with the constitution, rules and social policies. The ASME BOG has eight BOG Committees[7], include:

3.1 Audit Committee

3.2 Committee on Finance and Investment, COFI

3.3 Committee on Honors

3.4 Committee on Organization and Rules, COR
COR promotes some of the board's most important tasks in the governance of ASME.

3.5 Committee on Past Presidents, CPP
ASME established a board of directors to act under BOG's direction.

3.6 Executive Director Evaluation and Staff Compensation, EDESC
Pension Plan Trustees are established under EDESC Consists.

3.7 Strategy Advisory Committee

3.8 Sector Management Committee, SMC
The Sector Management Committee (SMC) has been charged by the Board of Governors to provide a consolidated oversight of the Sectors’ execution of programs and strategic initiatives, business operations and planning. The SMC reviews and validates the business cycle activities for each of the Sectors, facilitates cross-sector communication and collaboration, and attempts to alleviate duplication of efforts. The SMC is responsible for nine activities as outlined in the SMC and BOG Operating Guides.

4 Standards Development Principles of ASME
Participation on ASME's standards developing committees is free and open to technically qualified individuals with a willingness and ability to contribute. ASME's standards development process operates on five principles including: Openness, Transparency, Inclusion/Balance of interest, Due process, Consensus. These principles are consistent with those established by the World Trade Organization's Technical Barriers to Trade Committee[8].

Currently, more than 5,000 technical experts from around the world work with ASME worldwide to publish some 550 standards. These professionals play a vital role in defining the norms and benchmarks of their industries and of mechanical engineering.

5 ASME Standard Development
ASME standards development activities are conducted according to procedures accredited by the American National Standards Institute (ANSI). ASME has also created codes and standards guidelines and policy documents to aid in preparing committee agendas, minutes, manuscripts, and technical revisions.
The task of these committees is to combine technological advances with practical experience to ensure that standards are still applicable to the industries concerned. The members of the ASME standards and certification committee are a group of people with technical qualifications who are willing to participate in standards related work.

ASME has a special development and maintenance procedures of code and standards. All ASME standards are developed and modified in accordance with the standards development procedures. Any individual or organization can put forward the need to develop standards. After the drafting of the standard is completed by the proposer or a special technical group, the draft standard will be considered and voted on according to the prescribed procedures. After the approval of the voting committee, the draft standard will be released to the public for comments.

The standard development and revision procedures of ASME include the necessity review of standard establishment, drafting of standards by subcommittees or task groups, completion of draft or revision into final draft, review and approval of technical content, review and approval of standard procedures, and publication and distribution. ASME is a standards developing organization recognized by ANSI, which means that the procedures adopted by the standard development organization meet the basic requirements of ANSI for openness, balance, consensus and due process. There are certainly other requirements (e.g. patent policy, record retention, etc.). ANSI-approved standards development organizations can be "traditional" or "non-traditional," such as coalitions. As of November 2017, more than 240 standards development organizations have been accredited by ANSI [9].

For ASME machinery manufacturing codes and standards to be elevated to the United States national standard, the standard-proposer collects comments or letter ballot from the relevant organizations, and then submits the standard to ANSI for consideration together with the result of comments. ANSI mainly reviews whether any opinions are omitted and whether the objections are resolved before deciding whether to approve them as the national standards of the United States. Of course, when collecting opinions, it is also necessary to submit them to the public for their views.

In the United States, the publication of enterprise and industry standards is not restricted. Standard copyrights are generally owned by companies or industry associations that have established standards. According to the ANSI Basic Requirements: Due Process Requirements for US National Standards, Standards approved for US national standards should be published as soon as possible, generally no more than 6 months after being approved as a national standard. The standard copyrights belong to the standard development organization, and the organization can also give the publication copyright to ANSI. If it has not been published within 6 months of being approved as a national standard, the organization should submit an application to ANSI's Executive Standards Council (ESC) for a postponement of publication. Otherwise, ANSI's ESC will issue an announcement to revoke the standard as a national standard on Standards Dynamics. In addition, the standard must be designed in the prescribed national standard format and publish the standard publication announcement on Standard Dynamics as required.

ASME standards development procedures must reflect key principles. Committee meetings dealing with technical issues must be open to the public and use procedures to manage deliberations and votes. The commissions must represent the balance of the parties concerned and all comments on technical documents must be considered during the final approval process. Any person may appeal against any act or omission of the committee in respect of its membership or any code or standard promulgated by the committee.

6 Analysis and Enlightenment
By analyzing the organizational structure, standard developing principles, standard developing procedures and characteristics of ASME, some inspirations can be drawn to provide reference and help for the development of association standards in China.
6.1 The Importance of Following Fair Procedures
In the standard developing process, ASME emphasizes open participation, balances the interests of all parties, avoids monopoly advantage, and standards development must listen to public opinions and reach a majority consensus. At the same time, it is necessary to give a written response to the comments and suggestions. For unmediated objections, proposal motions and substantive amendments to the text, before the final vote, they are submitted to the consensus body for review. ASME's standards development process fully follows these characteristics, enabling ASME to produce high quality standards with significant impact worldwide.

6.2 Effective appeal procedures
ASME provides detailed appeal procedures, which ensure that the interests of all parties can be effectively maintained during the standard development process, and fully demonstrate the concept of balancing the interests of all parties in ASME standards. China has formally put forward cultivating and developing association standard since March, 2015. At present, the development of association standard is still in the primary stage. China's more than 300,000 social organizations witnessed the association standard from shaping to existing, and experienced from can do to how to do the association standardization work. The appeal procedure is that most of the social organizations are deficient in the system construction. In order to ensure that the interests of all parties in the standardization process can be effectively maintained, it is suggested that social organizations should establish an appeal mechanism at the beginning of the association standardization work and establish an appeal procedure suitable for their own development.

6.3 Focus on the Combination of Association Standards and Conformity Assessment
ASME has established 12 conformity assessment procedures, and conformity assessment is an important means for the implementation of standards. China's national standard GB/T 20004.1-2016 mentioned in the promotion and application of association standards that social organizations should establish conformity assessment system based on their association standards, formulate relevant conformity assessment schemes, conformity marks and other conformity assessment system documents and relevant technical documents, and absorb the participation of conformity assessment institutions in the development process. It can be seen that the combination with the conformity assessment is a good behavior of association standardization [10]. The social organization should fully consider the combination with conformity assessment system in the formulation stage of association standard.

7 Conclusion
ASME has established a very perfect standardized management and operation system, and its standards have been widely used in the world. China's social organizations should fully absorb the excellent experience of ASME, pay more attention to the fairness of standard development procedures, establish an effective appeal system, and pay attention to the combination of association standards and conformity assessment, for making the standardization of social organizations constantly develop towards good practices for social organization standardization.

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References
[1] Zhu Xianghua, Wang Yiyi, Xu Qing. Guidelines and Good Practices for Social Organization Standardization [M], 2-4.
[2]. PANG Zheng-hu. Organization standards have prospects [J]. China environmental protection industry, 2016(12): 24-27.

[3]. https: //www.ansi.org/about_ansi/introduction/introduction.aspx?menuid=1(2019.01.05)

[4]. http://asmedigitalcollection.asme.org/（2019.1.16）

[5]. https://www.asme.org/about-asme（2019.1.17）

[6]. https://www.asme.org/about-asme/who-we-are/governance（2019.1.17）

[7]. https://community.asme.org/board_of_governors/default.aspx?_ga=2.160891838.2064800775.1547633178-532904901.1545191893

[8]. https://www.asme.org/about-asme/standards(2019.1.17)

[9]. https://www.ansi.org/standards_activities/overview/overview?menuid=3(2019.01.08)

[10]. GB/T 20004.1-2016<Social organization standardization—Part 1: Guidelines for good practice>