

RESEARCH NOTE

The PRC's Evolving Standards System: Institutions and Strategy

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EXECUTIVE SUMMARY

This research note examines the Chinese standards system, including its management system and institutions, and the procedures for the development of national standards. In addition, China's technical standards development strategy is covered at length, including its overall goals and methods of implementation.

MAIN FINDINGS

- The core task of China's technical standards development strategy is to improve the adaptability and competitiveness of China's technical standards, taking China from a position of net importer of foreign developed standards to an exporter of Chinese standards to the international market. The official timeline calls for this reversal to occur before 2020.
- China's current standards system consists of a vertical hierarchy of four levels—national standards, trade standards, local standards, and enterprise standards—as well as a horizontal array of complementary institutions.
- Private enterprise and the needs of the market will play a leading role in improving and causing China's standards to adapt to market conditions.
- In order to improve the competitiveness of Chinese standards in the international market, independent technological content in standards will be increased as China competes to produce more international standards.
- China's new approach to standardization includes such goals as creating an environment conducive to innovation, the large-scale adoption of international standards, the creation of a system that ensures that standards are responsive to the market, and the promotion of legal reform.

Along with China's increasing economic influence and current high level of integration with the world economy, both Chinese standards and approaches to setting these standards have become prominent issues in the minds of the business and policymaking communities alike. From a historical perspective, the approach to standardization in the People's Republic of China (PRC) has been through three main stages. The earliest efforts, from 1949 to 1960, emphasized the adoption of technical standards and conformity assessment from the Soviet Union in order to ensure product quality and safety. A second phase, featuring a turn toward the importation of international standards from select institutions, began around 1960 amidst increasing diplomatic tension with the Soviet Union and gained momentum only after the 1978 launching of reforms. By 1984 China had implemented its first commodity inspection regime, heralding the country's entry onto the world stage as a player in international trade; during this phase China promulgated its first standardization law (1989). China's acceptance into the WTO in 2001 ushered in a third wave of drastic overhauls to its national standards structure, this time largely in response to the hefty compliance requirements of the WTO agreement on Technical Barriers to Trade (TBT).

As the PRC has continued this impressive forward drive, China's economic environment has become increasingly diverse, and extra-governmental parties have begun to exert influence on key regulatory processes. At present there exists a dizzying plurality of agents, from government and academic realms to members of the business community, that all have a hand in the rapidly evolving Chinese standards development process. This article seeks to outline the current structure and processes in Chinese standards and overview China's strategy to move the country from a position of net importer of international standards to that of producer of standards for international consumption. Much of the information presented in this research note is drawn from the Study on Development Strategies of China's Technical Standards, a multi-agency report recently produced by, among others, the China National Institute of Standardization (CNIS) and the Standardization Administration of China (SAC).¹

Behind the systematic overhaul of the Chinese standards process is the observation that economic globalization is a developing worldwide trend, and that as part of this process traditional tariff barriers between countries

¹ The study on Development Strategies of China's Technical Standards is an important component of the Key Technical Standards Project under the Mega-projects of Science Research for the 10th Five-Year Plan. Researchers on the project included CNIS, SAC, and other government institutions, companies, and research institutes. The project passed its acceptance check on November 30, 2005.

are gradually breaking down. The demise of barriers to trade has ushered in a rising tide of international competition in which dominant technical standards play a key part in national competitiveness. To date the major benefactors of this competition have been developed countries, who have managed to increase their strength and dominance in the international economy through the creation and dissemination of standards, presenting a serious competitive hurdle to developing countries who wish to follow a similar trajectory.

In recognition of this, China has formulated new development strategies and concepts, and technical standards are expected to be an important means by which China's national development goals are attained. They are seen as a bridge to translate research achievements into productive forces, guide the development of the high-tech sector (especially IT),² and—coupled with balanced social and economic development rules—realize the goal of balanced overall development. China has arrived at a new stage of economic and social development, and this in turn necessitates the creation of a new technical standards strategy.

This essay is divided into six sections.

- ≈ pp 66–68 describes China's current standards hierarchy
- ≈ pp 68–75 discusses the current standards institutions
- ≈ pp 75–78 examines the current standards procedures
- ≈ pp 78–83 analyses the goals and strategies of standards bodies
- ≈ p 83 presents conclusions³
- ≈ an **Appendix** (pp 84–87) offers a complete listing of trade standards codes and classifications by industry

THE STANDARDS HIERARCHY

Standards Types

The Standardization Law of the People's Republic of China, which took effect April 1, 1989, divides Chinese standards into four levels: national

² For a comparative analysis of six prominent Chinese technology standards cases, see Richard Suttneier, Xiangkui Yao, and Alex Zixiang Tan, "Standards of Power? Technology, Institutions, and Politics in the Development of China's National Standards Strategy," National Bureau of Asian Research, *NBR Special Report*, June 2006 ≈ <http://nbr.org/publications/issue.aspx?ID=163>.

³ This essay seeks to provide a descriptive examination of the current state of standards setting in China and thus refrains from evaluating the efficacy of these institutions, focusing instead on the intended effects of institutions and strategies.

standards, trade standards, local standards, and enterprise standards. The first three levels are listed in order of descending precedence, such that newly promulgated national standards always supersede correlating trade standards and so on down the chain.

At the top of the standards hierarchy, *national standards* are those requiring consistency nationwide, as in telephone network protocols and police radio frequencies. The Standardization Administration of China (SAC) holds ultimate responsibility for the technical aspects of implementing these standards, including the planning and drafting stages as well as examination, approval, and publication.

Trade standards meet the needs of industries for which no national standard exist, but which still require standardization. In the formulation of trade standards, the aforementioned duties are taken on by administrative departments and trade associations operating under the State Council but reporting directly to SAC. A complete listing of trade standards codes and classifications by industry appears in the **Appendix**.

In the absence of both national and trade standards, and in situations where safety and sanitation requirements for industrial goods require local unification, *local standards* may come into play. With local standards, all activities relating to the creation, publication, and dissemination of standards are handled by the local bureau of quality and technical supervision, which then reports directly to both SAC and relevant departments under the State Council.

Finally, *enterprise standards* are formulated by a specific corporate entity as a basis for organizing production and are filed locally in that enterprise's province, autonomous region, or municipality. Since enterprise standards are often stricter than the corresponding higher level standard, companies are encouraged to formulate and implement them on their own.

In addition to the above four levels of classification, national standards and trade standards can be divided into two additional categories: compulsory and voluntary standards. *Compulsory standards* are those dealing with the safeguarding of human health and ensuring the safety of person and property. Additional compulsory standards can be prescribed by law or administrative regulation. Any standards not meeting the above conditions are considered *voluntary standards*. One exception is local standards concerning safety and sanitation or requirements for industrial products, which are always considered compulsory standards within their respective administrative areas.

Standards by the Numbers

An overview of some of the statistics relating to standards setting in China is instructive. By the end of 2004, a total of 21,342 national standards had been established.⁴ Of these, 3,045 are compulsory standards and 18,297 are voluntary standards, accounting for 14.3% and 85.7% of the total, respectively. National standards are distributed as follows: 8,775 method standards (accounting for 41.1% of the total); 6,318 product standards (29.6%); 4,043 basic standards (19%); 765 hygienic standards (3.6%); 713 safety standards (3.3%); 495 management standards (2.3%); 144 environmental protection standards (0.7%); and 89 other standards (0.4%). (See **Figure 1.**)

Among the aforementioned 21,342 Chinese national standards, 9,381 represent the adoption of international standards and advanced foreign standards (44% of the total). Among these, 2,590 (12.1%) were identical; 432 (2.0%) were modified; 2,820 (13.2%) were equivalent; and 3,539 (16.6%) were not equivalent. Of the 9,381 adopted international standards, 4,917 were International Organization for Standardization (ISO) standards and 1,902 were International Electrotechnical Commission (IEC).⁵ By the end of 2004, more than 37,850 trade standards and 15,800 local standards had been registered at SAC. (See **Figure 2.**)

The number of national standards broken down by year from 1992 to 2004 is presented in **Figure 3.**

STANDARDS INSTITUTIONS

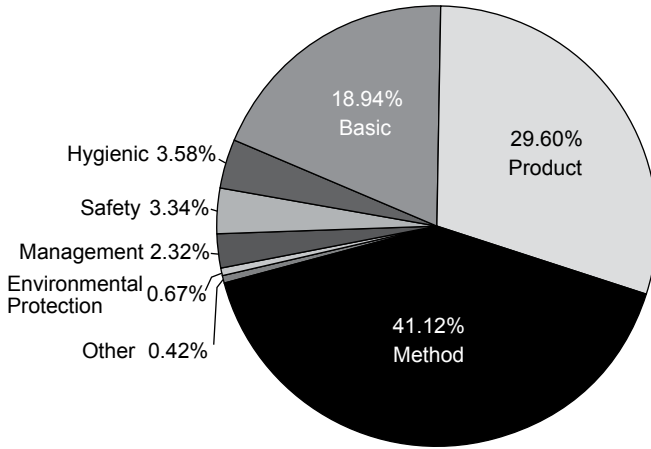
At each level, national to local, there exists an array of institutions with responsibilities ranging from the drafting of documents and promulgation of standards to technical oversight and the research on standards-related issues. The following section delves into this complex milieu, beginning with the organization at the top—SAC—then describing the role of technical committees, research organizations and associations, and trade standards bodies.

⁴ Statistics in this section are derived from the *2005 Yearbook of General Administration of Quality Supervision, Inspection, and Quarantine of the People's Republic of China*, 72–73

⁵ The ISO is an international organization composed of national standards bodies from over 75 countries. The IEC, an organization that sets international electrical and electronics standards, is made up of national committees from over 60 countries.

FIGURE 1

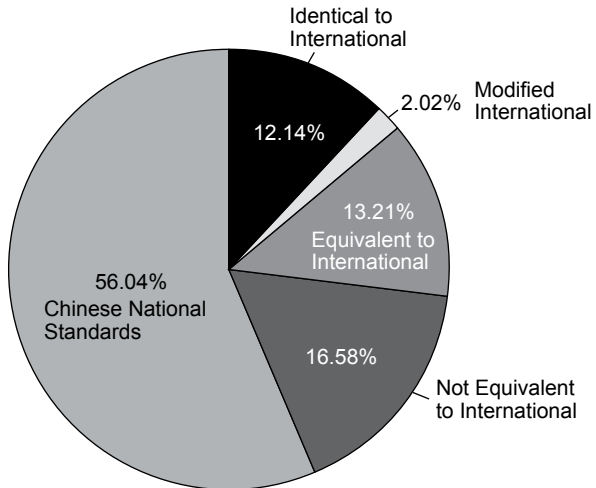
Distribution of National Standards in the PRC (2004)



Source: 2005 Yearbook of General Administration of Quality Supervision, Inspection, and Quarantine of the People's Republic of China, 72-73.

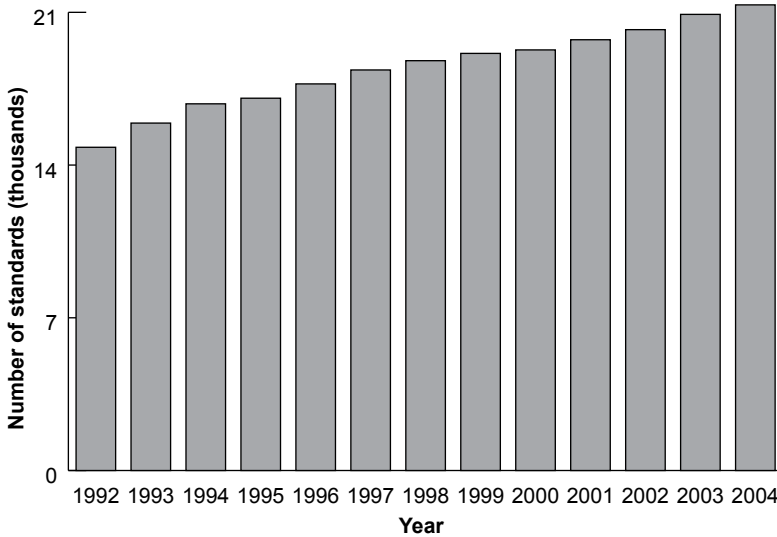
FIGURE 2

International Standards Adopted by the PRC (2004)



Source: 2005 Yearbook of General Administration of Quality Supervision, Inspection, and Quarantine of the People's Republic of China, 72-73.

FIGURE 3

Number of National Standards in the PRC (1992–2004)

Source: 2005 Yearbook of General Administration of Quality Supervision, Inspection, and Quarantine of the People's Republic of China, 72–73.

The National Level: The Standardization Administration of China

As a condition of admission to the WTO in 2001, Beijing was required to reform China's national standards system through the creation of a new national-level standards setting body. To meet this requirement, China consolidated two institutions with overlapping authority—the State Administration for Entry-Exit Inspection and Quarantine (CIQ) and the State Quality and Technical Supervision Bureau (QTSB)—to form the General Administration for Quality Supervision Inspection and Quarantine (AQSIQ). In April 2001, AQSIQ formed the Standardization Administration of China (SAC), the body currently charged with establishing and overseeing national standards in China. As a vice-ministerial organization directly subordinate to AQSIQ, SAC carries authorization from the State Council to act as the centralized administration for standardization throughout the country.

As the main national standards body, the responsibilities of SAC are broad and far-reaching. At the front end of the standards process, SAC is charged with the drafting and revision of state laws and regulations as well as the formulation and implementation of relevant policy (including national administrative rules, systems development, and the organization and implementation of standardization laws). SAC also oversees the creation of

development programs concerning national standards in China and provides organizational and coordinative oversight. As a developing national standard nears completion, SAC is also responsible for the examination, revision, approval, and subsequent publication of the standard.

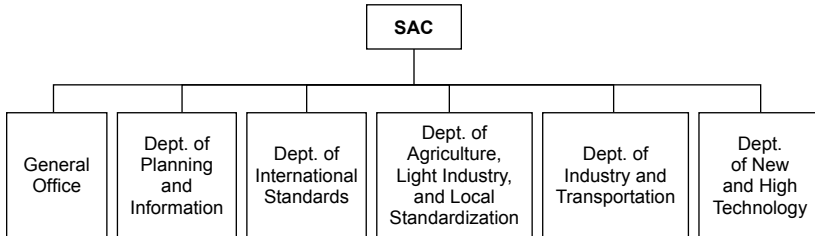
SAC also takes on several management and coordination roles. Among the former is the delegation of funds for not only standards development and revision but also for research on standards and associated activities. Scientific and technical guidance also fall under the auspices of SAC, along with any necessary training and education initiatives. The administration plays a central coordinating role, being at the axis of the horizontal coordination of national technical committees and the vertical coordination of trade and local standards, providing guidance and registration functions for the latter. Ultimately, SAC has sole responsibility for the dissemination, implementation, and popularization of national standards. Two of the more prominent arms of SAC—the National Technical Committee on Standardization (TC), which deals with technical fields, and the China National Institute of Standardization (CNIS), which is the main standards research institute—are described in greater detail below.

The roles of the SAC depicted above have predominantly centered on the Administration's internal characteristics—i.e., as a controlling organ for China's domestic standards push. This organization also provides, however, several external functions as the main interpreter and point of contact regarding China's adherence to the stipulations of the WTO Agreement on Technical Barriers to Trade. SAC is China's official representation within the ISO, IEC, and many other international and regional standardization organizations. Responsibilities in this regard include the organizing of the Chinese National Committee for ISO and IEC, organizing domestic local participation in international standards, and oversight of international cooperation agreements related to standardization (such as exchange projects and any other international activities).

The functions encompassed by SAC cover a spectrum of responsibility daunting for a single organization. Due to the breadth of its activities across the political spectrum, as well as the depth of its involvement in standards setting, SAC serves as an umbrella over several subordinate administrative offices, as illustrated in **Figure 4**.

By the end of 2004, SAC represented China in twelve international and regional standardization organizations, including ISO, IEC, and the Pacific Asia Standards Congress (PASC). China is a participating member (P-member) of 145 technical committees and an observing member (O-

FIGURE 4

Institutions Under Direct Supervision of SAC

member) of 356 subcommittees in ISO, participating member of 89 technical committees and 88 subcommittees in IEC, and undertakes 3 secretariats of ISO technical committees and 6 secretariats of ISO subcommittees, as well as 2 secretariats of IEC technical committees.

TCs: Managing the Details

China's National Technical Committees of Standardization (TC) were established under the SAC in order to deal with national standardization involving technical fields. Unified planning for TCs is undertaken by SAC itself, but corresponding administrative departments under the State Council, trade associations, or large group companies may also be entrusted with the management of TCs in specialized fields. In keeping with the Charter of National Technical Committee of Standardization, each TC is composed primarily of technical experts in production, utilization, research, and sales. Technical administrators comprise no more than one-eighth of the committee, while utilization and sales experts must make up at least one-fourth of the membership. Each member serves a five-year term, carries voting rights, and has access to documents and data of the TC. The TC may also decide on organization members and liaison members, with the former all counting as TC members and not to exceed one-third of the total number of TC members. Liaison members and their representatives may also access data and documents, be invited to meetings, make suggestions, and express opinions in those meetings, but ultimately have no voting right. There is no limitation to the number of liaison members.

The overall structure of each TC must be approved by SAC, and each TC must have its own secretariat, established within the unit, that carries jurisdiction over the TC. The secretariat handles routine tasks, taking direct guidance from the chairman and secretary general of the TC.

When a specific TC requires broad technical coverage, subcommittees may also be established to fill specific niches (for example TC46, Household Electric Appliances, has seven such subcommittees), and working groups may be established to draft and revise standards. The top down structure of TCs is also flexible enough to promote inter-committee collaboration. In the event that the work of two or more TCs overlaps or is closely related, contact staff is appointed to liaise between the groups and ensure coordination. By the end of 2004, SAC had established 264 TCs, 386 subcommittees, and 4 national working groups, with more than 30,000 experts invited to act as members of TCs and subcommittees.

Standards Research Bodies and Associations

As the largest national standards research body, the China National Institute of Standardization (CNIS) is directly subordinate to AQSIQ and supports SAC, the Ministry of Science and Technology (MoST), and other ministries. The primary responsibilities of CNIS include conducting comprehensive, strategic, and integrated research for standardization issues for economic and social development; developing fundamental standards; and providing authorized standard information service.

In addition to CNIS, which is the highest-level standards research institute in China, the 16 ministries preside over 26 additional trade standardization research institutes. For example, the China Electronic Standardization Institute (CESI), a nonprofit institution engaged in standardization and conformity assessment activities in the field of electronic information technologies, is directly subordinate to the Ministry of Information Industry (MII). Below these institutes and spread across the country are 158 local-level standards research institutes, including the Shanghai Institute of Standardization (SIS) and the Shenzhen Institute of Standards and Technology (SIST).

A major function of standards associations in China is to aid in the promotion of standards to industry and enterprise. Sitting atop the structure is the China Association for Standardization (CAS), a state-level standardization association directly subordinate to AQSIQ. CAS encompasses 7 professional branches for standardization,⁶ as well as 4 secretariats that work

⁶ Directly subordinate to the Standing Board of Directors of CAS, the seven professional branches (sub-associations) for standardization are as follows: Enterprise, Automobile Industry, Metallurgical Industry, Chemical Industry, Fiber Inspection, Media Coverage Investigation, E-Commerce, and Modern Logistics.

for national technology committees such as National Lightning Protection (mirroring IEC/TC81), National Reference Materials (mirroring ISO-REMCO), and National Anti-counterfeiting standardization.⁷ In addition, there are 12 trade standardization associations, the China Association for Engineering Construction Standardization (CECS), the Chinese Electronics Standardization Association (CESA), and the China Communications Standards Association (CCSA). Moreover, there are 257 local-level standardization associations throughout the country, such as the Shanghai Association for Standardization (SAS).

Trade Standards Institutions

The bodies overseeing standardization at the trade standard level include both the previously diagrammed administrative authorities directly under the SAC and certain trade associations bearing State Council authorization. In addition to organizing the development of trade standards, these bodies may also draft national standards.

There are a total of 62 codes for trade standards (which are all listed in the Appendix), the management of which takes on a tri-partite division. First, there are 41 fields of trade standards that are managed directly by the corresponding government department (e.g., the Ministry of Construction and the Ministry of Information Industry). In these cases the government departments play a direct role in each step of oversight for trade standards in trades that fall under their auspices. Further down the hierarchy, the National Development and Reform Commission (NDRC) has primary oversight of sixteen fields of trade standards. Drafting, technical examination, and all activities through to publication are handled by trade associations (federations) and enterprises as appointed by NDRC (e.g., the China Machinery Industrial Federation and the China National Offshore Oil Corporation). Finally, five fields of trade standards—ship, nuclear industry, aviation, space, and civilian products from the arms industry—fall under the direction of the Commission of Science, Technology, and Industry for National Defense (COSTIND). In this case, large group companies under direct supervision of COSTIND (e.g., China

⁷ Technical Committee TC81 (Lightning Protection) of the International Electrotechnical Commission (IEC) is responsible for requirements for the design and installation of Lightning Protection Systems (LPS) for structures and buildings, the protection from lightning strikes of services entering buildings, and the protection of electrical and electronic systems. ISO-REMCO is the committee on reference materials of the International Organization of Standardization (ISO) and was formed in 1975 to carry out and encourage the harmonization and promotion of certified reference materials and their production and applications.

North Industries Group) manage the organization and development of trade standards.

Finally, at the local level within each respective administrative area, the Quality and Technical Supervision Bureau (QTSB)—at the level of the provinces, autonomous regions, and municipalities under the central government—is in charge of the unified administration of local standards. The QTSB participates directly in the drafting of national standards, helping both to promote the implementation of national, trade, and local standards and to file enterprise standards. With the primary standards institutions having been outlined above, the next section delineates the official process for creating standards in the PRC today.

THE CURRENT STANDARDIZATION PROCESS

The procedure for standards development in China can be divided into nine stages. As spelled out in GB/T 16733-1997 Stage Division and Code of Procedure for the Development of National Standards, these stages are: preliminary, proposal, preparatory, committee, voting, approval, publication, review, and withdrawal.

Keeping pace with the rapid development of IT infrastructure in China, in 2005 SAC made moves to push the application process onto the Internet, an effort that has not only resulted in a marked acceleration of the development and revision of national standards but has also helped to improve market relevance of many of these projects. Since 2005, all applications and approvals have taken place over the Internet via SAC's online application system, allowing any sector or individual to submit a proposal for a national standard project at any time.

Generally speaking, SAC will annually issue some sort of guidance on key fields in order to encourage national standard development to fall in line with national economic and social development. Any sector or TC may directly submit national standards projects, and any individual may submit proposals for national standards projects. As a matter of process, when submitting a national standard development project, the new project proposal and standard draft must be submitted simultaneously.

After project submission, SAC itself performs a preliminary examination of the necessity and feasibility of the project proposal and determines whether or not the proposal is preliminarily acceptable. SAC will then designate a relevant TC to analyze the necessity and feasibility of the proposal and make a suggestion as to whether it should be accepted in the project plan.

The project proposal to be accepted will be publicized on the SAC website so as to collect opinions from the public. After taking the various feedback into account, SAC then reviews and decides whether to approve the project proposal. Finally, SAC first determines and then issues the project program on the SAC website. Although projects under the program are usually issued quarterly, urgently needed project proposals can be accepted and approved at any time.

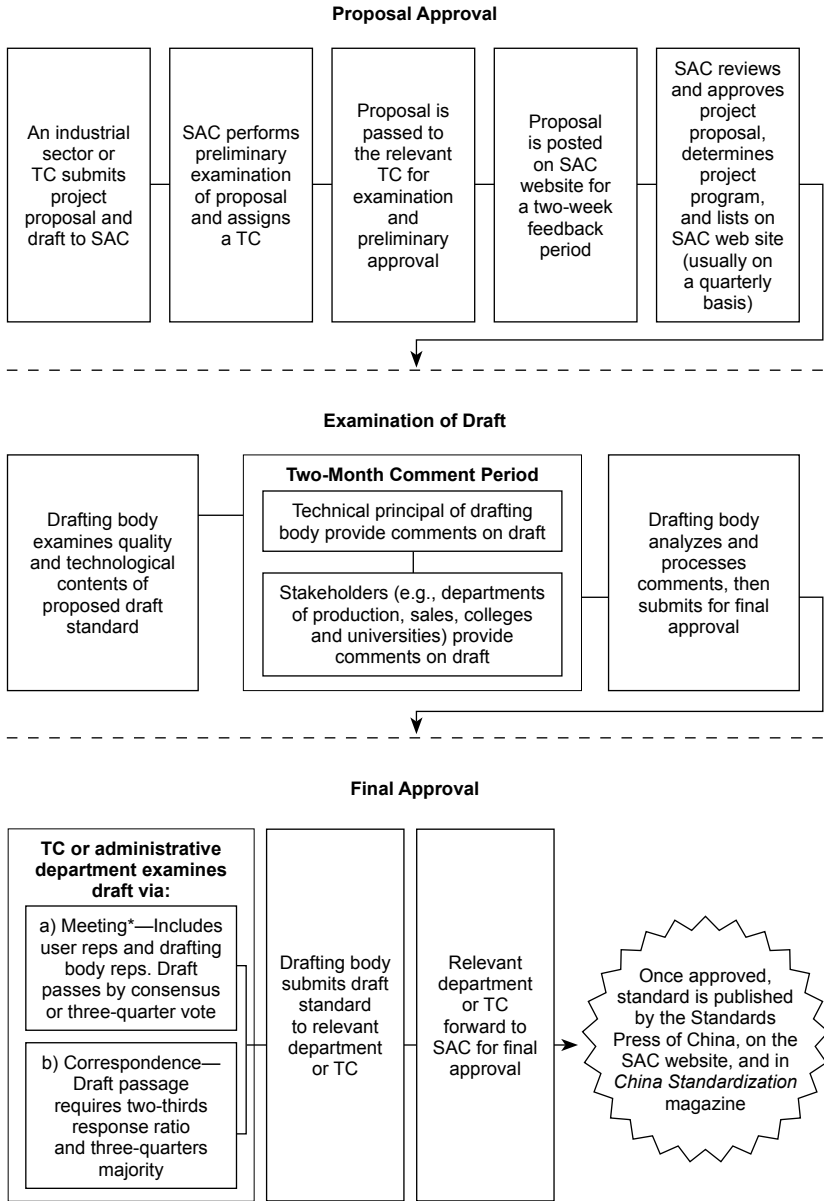
After the proposal approval process, the various administrative departments under the State Council and TC organize the implementation of the project. First, a drafting body takes responsibility for the quality and technological contents of the drafted national standard.⁸ The draft standard is then subjected to a two-month period of comments, first going to the technical principal of the drafting body and then to the stakeholders (i.e., departments of production, sales, utilization, and research and testing, as well as universities and colleges). The drafting body then analyzes and processes the collected comments and submits the draft standard for examination.

At this point, the TC or the relevant administrative department examines the draft standard either through meetings or correspondence, (as determined by) the organizer. Should the draft standard be vital to technology or the economic health of the country, a meeting examination with a wider coverage will be undertaken. The meeting participants should be comprised of no less than one-fourth user representatives, and a consensus on the draft must be reached. Special procedures must also be followed when a draft requires voting. For one, a draft is not deemed to pass unless it receives a three-quarter majority of participant votes. Also, the drafter may not participate in the voting, and representatives from the drafting body cannot exceed one-fourth of the voters. The process for correspondence examination of draft standards is similar to a meeting in that the standard still requires a three-quarter majority vote, and requires a re-examination when the correspondence reply ratio fails to reach two-thirds. Once all the votes are tallied, the drafting body is responsible for submitting the draft standard to the relevant department of the State Council or TC, who then forwards it to SAC for final approval. Once approved by SAC, the standard will then be published by the Standards Press of China and publicized on the SAC website and in the monthly magazine “China Standardization.” This process is outlined in **Figure 5**.

⁸ The “quality” of the drafted national standard refers to how well the text and layout of the drafted standard conforms to current SAC practices (such as GB/T 1.1-2000 *Directives for Standardization—Part 1: Rules for the Structure and Drafting of Standards* [*biao zhun hua gong zuo dao ze di yi bu fen: biao zhun de jie gou he bian xie gui ze*]).

FIGURE 5

The Standards Approval Process in the PRC



* All technical standards and standards relating to the economic health of the country must undergo approval by the meeting function.

Even after final approval, the standard is still not necessarily safe from criticism. Once the standard is implemented, the departments relevant to the standard organize regular reviews of the national standard for a total period not in excess of five years. This final review process carries three possible outcomes: the standard can be confirmed as effective, revised, or withdrawn completely. Understanding the structure and current procedures of the Chinese standards process is helpful in assessing roles and functions of actors in the decisionmaking process in China today. Given that the system is, however, rapidly evolving, the next section thus presents current thinking from CNIS regarding goals and general strategies for the future development of China's standards system.

CHINA'S TECHNICAL STANDARDS DEVELOPMENT STRATEGY

Both the specific goals for their standardization system and the functional strategies to attain them are presented in the Study on Development Strategies of China's Technical Standards, a collaborative publication of CNIS, SAC, and other institutions. This document carries as its central theme the notion that scientific development is the leading element through which China hopes to spur domestic innovation and indigenous creation of exportable standards. The study states clearly that China's standardization push should be "guided by the government, taking the enterprise as the major player, and be market oriented." The content of this section is drawn directly from that document.

China's overarching goal by 2010 is to establish a technical standards system with proper structure, stressed priorities, and market adaptability. Concurrently, China plans to make every effort to bring the technological level of indigenous standards up to the level of international standards while increasing the proportion of Chinese technology in key international standards.

By 2020, China plans for the market adaptability of their technical standards to be greatly improved, with Chinese standards displaying more indigenous innovative content. The overall goal is to see an increasing presence of international standards drawing on Chinese standards. To this end, China has sought to upgrade the technical level of their standards to international levels and, beyond that, to become a leader in certain key areas.

In setting these goals, China is aiming for nothing less than a complete reversal of position from a standards consumer to a standards trendsetter. This objective will have enormous ramifications for the international community

as China moves ever closer toward this ideal. What means will China use to bring about such drastic change in their system? Current strategies for standards development in China as expressed in the above-mentioned study center around four principles: innovation, adoption of international standards, market orientation, and legal reform.

Innovation

First, there is a need to create and foster a system of innovation in China in order to develop the critical link between innovation and standards development. Establishing this link will require the use of economic, legislative, and policy measures as well as the integration of the standards development system and technological R&D systems into an organic unit. This will allow the standards development system to become an important part of the national knowledge innovation system, increasing the likelihood that independent innovative achievements will be translated into technical standards. Laying stress on the development of technical standards containing indigenously spawned innovation will also help to improve the adaptability and competitiveness of Chinese standards.

What concrete steps can be taken to create an environment that is conducive to the creation of innovative achievements? At the most basic level, cultivating a consciousness of standards via changes to educational institutions, including the creation of several new institutions, will prove to be an important aspect of encouraging innovative thought. The establishment of a specialized training system for standards talent will be initiated at the college level through new undergraduate course work and master's degree curriculum development. Training centers focusing on international standards talent will also be constructed, helping to strengthen the knowledge of standards personnel and members of technical committees. Additionally, a nationwide standardization popularization project will be undertaken in order to heighten awareness and create a social atmosphere in which standards are respected out of habit rather than compulsion. The government will use its vast nationwide media network, in addition to local seminars and knowledge contests, to disseminate details and popularize the project.

In terms of changes to the institutional framework that are conducive to innovation, there are several ways to create an incentive structure while stimulating self-reliant innovative activity. For one, a procedure will be established to accelerate the translation of scientific and technological achievements into technical standards. An approach to implementing this

procedure would be to simultaneously perform preliminary research on standards development and development of scientific projects that are deemed promising for industrialization. Also, China plans to put an integrated system for the promotion of standards and scientific and technological achievements into practice. Such a system will be used to translate scientific and technological achievements into productive forces according to the chain: scientific/technological achievements → experimental demonstration → technical standards development → application and promotion. Finally, intermediate agencies are to be established and given responsibility both for the integration of pilot projects with standards development and for the expeditious translation of scientific and technological achievements into useful application. The intermediate agencies will also be encouraged to develop standards and promote them to enterprises and associations.

Adoption

China also plans to alter international standardization activities to reflect both adoption of international standards and greater competition. By continuing to adopt international standards, China enhances the accessibility of Chinese products and technologies on the international market. At the same time, increased participation in international standards will steer these standards in a direction that more aptly reflects Chinese technical requirements. When creating technical standards Beijing will, in order to reap the benefits of international economic competition, place greater emphasis on areas in which China currently enjoys technical advantages. This should prove to be the key point of impact if China is to make a transition from nationalizing international standards to internationalizing national standards.

All of this will require the formation of a system capable of tracking, evaluating, and adopting international standards into the Chinese system. Such a system would include the construction of a national-level information platform for evaluating standards from international standards organizations and China's major trade partners. Extending this concept, both policy input and funding will be tapped to build an information-sharing platform to better integrate the varied standards information resources. A nationwide system to share information on standards will aid in the elimination of redundancies and serve to complement the functions and services of standards management organizations, standards information service agencies, research institutes, consultative agencies, and enterprises. This information platform will then

be integrated with the national scientific and technological information platforms, allowing China to realize a unified resource-sharing system between standards, science, and technology.

The level of practical involvement in international standardization activities will also become one of the key factors in assessing the performance of technical committees. To this end China is creating favorable policies and providing funds to support strategically important international standards proposals. Further, and perhaps most importantly, an environment amenable to international standards competition needs to be cultivated. This is being accomplished by building expert teams and ensuring their participation in international standardization activities while persistently trying to take up key tasks in international standards organizations. China intends to take full advantage of favorable policies for developing countries while establishing strategic partnerships with the international community.

Market Orientation

China is also establishing a supportive structure between technological R&D and the standards system, a structure such that standardization agencies and relevant scientific and technological departments support standards development projects that not only have a strong scientific foundation but are also highly responsive to market demand. As part and parcel of the system's market orientation, the Chinese standards system is also being shifted toward a voluntary system, letting enterprise play a major role in developing technical standards and thus potentially enhance their market adaptability. By taking advantage of market mechanisms to develop standards, technical regulations will serve as the legal bond, standards work as the technical criteria, and CAP (Conformity Assessment Procedure) as quality assurance, creating a synergy that provides an interrelated means of regulating the market.

The key to ensuring a successful transition to voluntary standards rests on the government's ability to work out an incentive structure to encourage non-government associations to get involved in developing standards. Establishing a system adapted to the market should aid this effort by specifying market-related features (e.g., demand and sales) as factors in the approval or disapproval of a standards proposal. Hand in hand with the strengthening of markets is the strengthening of patent and copyright, which both will allow for clear ownership rights to a standard and will in turn guarantee that royalties become a source of revenue for China's standardization organizations. A market-oriented standards system should also provide representation on the

technical committee for interested stakeholders, including any enterprises, associations, test agencies, scientific research institutes, consumers, or government sectors that are involved. By embracing a market-oriented approach, China hopes that sectors and individuals such as those listed above will be encouraged to participate in the standards development process. Finally, a mechanism will be formed requiring that technical regulations and CAP be based on standards. By doing this, a technical regulation might specify only basic requirements but, by requiring conformity with current standards, would utilize a large body of highly descriptive requirements. Standards development organizations should also take into account the requirements of regulatory and conformity assessment bodies when creating standards. By inviting these parties to participate in the process, coordination between them can be established, creating a smooth communication channel that facilitates regular contact.

Legal Reform

A primary consideration—and the one with perhaps the greatest overall impact on the ultimate success of the implementation of China's standards strategy—is the reform of standardization laws and regulations as presented in the Standardization Law of China and in the Regulation for Adopting International Standards. These reforms will include formulation of, and administrative regulation for, practical participation in international standardization. The reforms will also aid in creating an environment in which the government is encouraged to make full use of standards by employing them as a tool in development strategy, programs, and policies. In this regard, national standards will be used as a basis for decisions on government economic activities such as procurement and invitation to tender on key national projects. Policy tools in the form of preferential tax and financial benefits will also be used to encourage enterprise participation in standardization activities at all levels. Furthermore, the government will set aside special funding to encourage enterprises both to put forward international standards proposals and to participate in international standardization activities, while relaxing the formalities for standardization personnel to travel abroad. The new Standardization Law of China is currently being drafted and revised.

Supporting enterprise activities, establishing educational institutions, and widely disseminating information on standards to a nation of over one billion are all resource-intensive activities. The government will need to find

a way to ensure the provision of stable funds for the various programs it plans to implement. A good start is the plan for the expansion of funding sources by diverting the profits of standards sales and conformity assessment. This plan will, however, require that China first reach a critical mass of marketable standards that will in turn produce revenue streams sufficient to support their projects. The extent to which China is able to come up with such funding will likely have a major impact on the country's ability to attain its stated goal of capturing a place as a major contributor to world standards.

CONCLUSION

The current structure of China's national standards system to a large extent reflects domestic conditions surrounding China's bid to join the WTO. As a full-fledged member, China is now beginning to reorient its system toward fulfilling the desire to build a controlling stake in international standards, action punctuated by the Study on Development Strategies of China's Technical Standards. The plan articulated in this study and overviewed in this research note represents major departures from China's standards procedures to date, including bold initiatives covering a diverse spectrum of regulations and institutions. In light of the changes and strategies currently in the offing at CNIS, SAC, and various other bodies, China is revising the unified national standards system to include a more integrated top-down approach to the administration of standards. The resulting system will contain an outward component designed to influence the international standardization process as well as an internal one that supports education, enterprise, and local standardization attempts at going global. By relying on innovation, adoption of international standards, market orientation, and institutional reform, China hopes to create an internationally competitive standardization system that is centrally controlled, and with Chinese characteristics.

APPENDIX

Codes of Chinese Standards

Note: The codes for compulsory standards are as shown in the tables below. Voluntary standards are indicated by adding “/T” after the compulsory code (a shortened version of the Chinese word for voluntary, “tujian”). As an example, the code for agricultural compulsory standards would be “NY,” while agricultural voluntary standards are “NY/T.”

1. National Standards Codes

No.	Code	Content	Competent Department
1	GB	compulsory national standards	Standardization Administration of China (SAC)
2	GB/T	voluntary national standards	Standardization Administration of China (SAC)

2. Trade Standards Codes

No.	Code	Content	Approval and Promulgation Body	Organizing and Development Body
1.	AQ	work safety	The State Administration of Work Safety	The State Administration of Work Safety
2.	BB	packaging	National Development and Reform Commission	China Packaging Federation
3.	CB	ship	Commission of Science, Technology, and Industry for National Defense	China State Shipbuilding Corporation
4.	CH	surveying	State Bureau of Surveying and Mapping	State Bureau of Surveying and Mapping
5.	CJ	urban construction	Ministry of Construction	Ministry of Construction
6.	CY	press and publication	General Administration of Press and Publication	General Administration of Press and Publication
7.	DA	archives	State Archives Administration	State Archives Administration
8.	DB	earthquake	China Earthquake Administration	China Earthquake Administration
9.	DL	power	National Development and Reform Commission	China Electricity Council
10.	DZ	geology mineral	Ministry of Land and Resources	Ministry of Land and Resources
11.	EJ	nuclear industry	Commission of Science, Technology, and Industry for National Defense	China National Nuclear Corporation

No.	Code	Content	Approval and Promulgation Body	Organizing and Development Body
12.	FZ	textiles	National Development and Reform Commission	China National Textile and Apparel Council
13.	GA	public security	Ministry of Public Security	Ministry of Public Security
14.	GH	supply and marketing	All China Federation of Supply and Marketing Cooperatives	All China Federation of Supply and Marketing Cooperatives
15.	GY	radio, film, and TV	State Administration of Radio, Film, and Television	State Administration of Radio, Film, and Television
16.	HB	aviation	Commission of Science, Technology, and Industry for National Defense	China Aviation Industry Corporation
17.	HG	chemical industry	National Development and Reform Commission	China Petroleum and Chemical Industry Association
18.	HJ	environmental protection	State Environmental Protection Administration	State Environmental Protection Administration
19.	HS	customs	General Administration of Customs	General Administration of Customs
20.	HY	ocean	State Oceanic Administration	State Oceanic Administration
21.	JB	machinery	National Development and Reform Commission	China Machinery Industrial Federation
22.	JC	building materials	National Development and Reform Commission	China Building Materials Industries Association
23.	JG	construction industry	Ministry of Construction	Ministry of Construction
24.	JR	finance	People's Bank of China	People's Bank of China
25.	JT	communication	Ministry of Communications	Ministry of Communications
26.	JY	education	Ministry of Education	Ministry of Education
27.	LB	tourism	National Tourism Administration	National Tourism Administration
28.	LD	labor and labor safety	Ministry of Labor and Social Security	Ministry of Labor and Social Security
29.	LS	grain	State Administration of Grain	State Administration of Grain
30.	LY	forestry	State Forestry Administration	State Forestry Administration
31.	MH	civil aviation	General Administration of Civil Aviation	General Administration of Civil Aviation

No.	Code	Content	Approval and Promulgation Body	Organizing and Development Body
32.	MT	coal	National Development and Reform Commission	China National Coal Association
33.	MZ	civil affairs	Ministry of Civil Affairs	Ministry of Civil Affairs
34.	NY	agriculture	Ministry of Agriculture	Ministry of Agriculture
35.	QB	light industry	National Development and Reform Commission	China National Light Industry Council
36.	QC	automobiles	National Development and Reform Commission	China Association of Automobile Manufacturers
37.	QJ	space	Commission of Science, Technology, and Industry for National Defense	China Aerospace Industry Corporation
38.	QX	meteorology	China Meteorological Administration	China Meteorological Administration
39.	SB	commerce	National Development and Reform Commission	China General Chamber of Commerce
40.	SC	water product	Ministry of Agriculture	Ministry of Agriculture
41.	SH	petrol chemical industry	National Development and Reform Commission	China Petroleum and Chemical Industry Association
42.	SJ	electronics	Ministry of Information Industry	Ministry of Information Industry
43.	SL	water resources	Ministry of Water Resources	Ministry of Water Resources
44.	SN	commodity inspection	General Administration of Quality Supervision, Inspection, and Quarantine	Certification and Accreditation Administration
45.	SY	petroleum gas	National Development and Reform Commission	China Petroleum and Chemical Industry Association
46.	SY (>10,000)	oceanic petroleum gas	National Development and Reform Commission	China National Offshore Oil Corporation
47.	TB	railways transportation	Ministry of Railways	Ministry of Railways
48.	TD	land administration	Ministry of Land and Resources	Ministry of Land and Resources
49.	TY	sport	General Administration of Sport	General Administration of Sport
50.	WB	goods	National Development and Reform Commission	China Federation of Logistics and Purchasing
51.	WH	culture	Ministry of Culture	Ministry of Culture

No.	Code	Content	Approval and Promulgation Body	Organizing and Development Body
52.	WJ	civilian products from arms industry	Commission of Science, Technology, and Industry for National Defense	China North Industries Group Corporation
53.	WM	foreign trade	Ministry of Commerce	Ministry of Commerce
54.	WS	hygiene	Ministry of Health	Ministry of Health
55.	XB	rare earth	Office of Rare Earth, National Development, and Reform Commission	Office of Rare Earth, National Development, and Reform Commission
56.	YB	ferrous metallurgy	National Development and Reform Commission	China Iron and Steel Association
57.	YC	tobacco	State Tobacco Monopoly Administration	State Tobacco Monopoly Administration
58.	YD	telecommunication	Ministry of Information Industry	Ministry of Information Industry
59.	YS	non-ferrous metallurgy	National Development and Reform Commission	China Nonferrous Metals Industry Association
60.	YY	medicine	State Food and Drug Administration	State Food and Drug Administration
61.	YZ	posts	State Post Bureau	State Post Bureau
62.	ZY	traditional Chinese medicine	State Administration of Traditional Chinese Medicine	State Administration of Traditional Chinese Medicine

3. Local Standards Codes

No.	Code	Content	Competent Department
1	DB + *	compulsory local standards	provincial-level Bureau of Quality and Technical Supervision
2	DB + */T	voluntary local standards	provincial-level Bureau of Quality and Technical Supervision

Note: * represents Province code.

4. Enterprise Standards Codes

No.	Code	Content	Competent Department
1	Q + *	enterprise standards	enterprise

Note: * represents Enterprise code.

