中国标准化（英文版）
CHINA STANDARDIZATION
JAN./FEB. VOLUME 119
BIMONTHLY
2023 NO.1
ISSN 1672-5700/CN11-5133/T

Spotlight

A review of China's standardization in 2022

2022年标准化社会关注度评议

Exclusive Interview

CEN/TC 10 Chairman Esfandiar Gharibaan: EU harmonised standards improve safety of lifts, reduce costs and facilitate trade

CEN/TC 10主席埃斯凡迪亚尔·加里班：欧洲协调标准能有力提高电梯安全性、降低成本并促进贸易

Special Report

Probe into standardization of intelligent manufacturing in China

《中国智能制造发展研究报告：标准化》发布

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“Two Sessions”
will be held in Beijing in early March, 2023.
全国两会将于3月初在北京召开
“Two Sessions” refer to the First Session of the 14th National People’s Congress (NPC) of the People’s Republic of China and the First Session of the 14th National Committee of the Chinese People’s Political Consultative Conference (CPPCC).

广告

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ISSN 1672-5700/CN11-5133/T

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Printing
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Administrated by
State Administration for Market Regulation (SAMR)

Hosted by
China National Institute of Standardization (CNIS)
China Association for Standardization (CAS)

Published by
China Standardization Press Co., Ltd. (CSP)

Serial Number:
CN 11-5133/T ISSN 1672-5700
General Distributor:
Beijing Bureau of the Distribution of Newspapers and Magazines
Subscription:
Post offices across the nation
Postal Subscription Code: 80-136
Overseas Distributor: China International Book Trading Corporation
Distribution Number: BM5708
Publishing date: January 10, 2023
Advertisement Operation License:
Advertisement Registration No. 20190002,
Market Regulation Bureau of Changping District, Beijing, China

Price
Domestic: RMB 50.00
International: USD 30.00

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Starting a new chapter

Learning from the past, we can live in the present and prepare for the future.

At the beginning of 2023, we selected 10 major events and 10 influential experts in the standardization field as well as 10 Chinese standards attracting the most attention in 2022, to display the outstanding achievements in the last year.

We also presented you the interview with Mr Esfandiar Gharibaan, Chairman of CEN/TC 10 and Vice President of Codes and Standards in KONE Corporation, who introduces the developmental trend of the lift and escalator industry, and the big role of EU Harmonised Standards in improving the safety of lifts and reducing costs. He also expounds on how experts from SMEs and consumers involve in developing an EU standard, and the cooperation between China and Europe in this field.

“European standardization is a transparent and inclusive process. All stakeholders and interested parties are welcome to join and to contribute to the work... Currently, European and Chinese standards are almost identical. This alignment is not only crucial for facilitating smoother trade between the two parties, but also essential for the trade worldwide,” said Gharibaan.

The SPECIAL REPORT column introduces a significant report on the standardization of intelligent manufacturing in China published in November 2022. It summarizes the developmental process of intelligent manufacturing and relevant standards from 2015 to 2022, and the vital role of standards in driving innovation and facilitating industrial development.

As China faces the population aging issue, the article in the STANDARDS PRACTICE column tells you what makes Foshan’s elderly care program stand out. Foshan city in South China’s Guangdong province uses standards to lay a solid foundation for senior care programs, and help build a world that the elderly could live in harmony, peace and love.

Now, let’s wave a goodbye to 2022 and embrace the New Year!

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Cai Wenhui, General Manager for North Region of SGS China

(The list is in no particular order)

CONTENTS

HEADLINE |

International Standardization Forum held in Guangzhou

The International Standardization Forum was held in hybrid form on January 5 in Guangzhou, Guangdong province, which is themed "High standards lead high-quality development of the manufacturing industry". The forum was directed by the Standardization Administration of China (SAC) and organized by Guangdong Administration for Market Regulation and Government of Nansha District, Guangzhou.

National and international officers, academicians and leading experts made keynote speeches, including Zhang Xiaogang, former ISO President, Sun Yu, Member of Chinese Academy of Engineering, Dennis Chew, Regional Director of IEC Asia-Pacific Regional Center, Chen Guangxue, Professor at South China University of Technology, etc.

Tian Shihong, Vice Minister of State Administration for Market Regulation (SAMR) and Administrator of SAC, addressed the forum via video. The forum plays an active role in cultivating the international standardization talents that are urgently needed in the manufacturing industry, and raises the internationalization level of the industry in Guangdong province. As part of the national fundamental system, standards prop up economic and social development technically, which is essential for the manufacturing industry, China's pillar industry, to develop in a high-end, intelligent and green way, said Tian.

According to Tian, efforts should be exerted on four aspects: implementing the *National Standardization Development Outline* to lead the construction of a modernized industrial system with high standards; highlighting the prominent role of enterprises to unleash their driving forces of making innovation and creating jobs with standards innovation; cultivating standardization talents needed in modern industries; and steadily expanding the institutional openness of standards to increase the level of opening-up.

Two workstation of Guangdong-Hong Kong-Macao Greater Bay Area Institute of Standardization and International Standardization Talent Cultivation Center were officially launched on the forum, which unveils Guangdong's further development of standardization.

“100 Billion Tons of Green Steel” Action kicks off in Beijing

The launch event of “100 Billion Tons of Green Steel” Action was held in hybrid form on January 13 in Beijing, which is a large-scale public service project jointly organized by a dozen of units, including the Tongzhou Canal Business District, China National Institute of Standardization (CNIS), China Iron and Steel Association, China Society of Technology Economics, China Metallurgical Information and Standardization Institute, etc.

Supported by green finance, the “100 Billion Tons of Green Steel” Action will follow standards on green steel and focus on green steel procurement to establish China’s first standardized carbon chain platform, which facilitates both upstream and downstream enterprises. Also, it assists all stakeholders of the industrial chain to realize goals of carbon peak and carbon neutrality.

Xiong Zhe, Director of Carbon Peak & Neutrality Division, Resource Conservation and Environment Protection Department, National Development and Reform Commission (NDRC), introduced the work plan of carbon peak & neutrality of NDRC in the following aspects: enhancing overall coordination; promoting the low-carbon and green-oriented transition of energy; boosting industrial upgrading and optimization; accelerating urban and rural construction and low-carbon and green-oriented transition of transportation; speeding up the innovation of green low-carbon technologies; completing green low-carbon policy system.

Lin Ling, Head of Resource and Environment Sub-institute, CNIS, introduced the green-oriented low-carbon standards system in the speech, and explained the role of standardization, standards system and relevant policies on carbon peak and carbon neutrality, the framework, index system and classification specification of green products.

The Action and related standardized carbon chain platform can be recognized as an innovative attempt to improve quality, enhance efficiency and realize high-quality development, which is also a typical case to establish a coordinated system of construction industrial chain. It will be further expanded to more products and fields such as transportation and chemical industry, which is expected to boost China’s green high-quality development.

Technical committee on agricultural products supply chain established in Beijing

Agricultural products are always the prior concern of a country, especially China, a populous country. Agricultural products not only feed people, but also play an important role in economy.

The Standardization Technical Committee on Agricultural Products Supply Chain (IETS/TC 1) was set up by International Economy and Trade Standardization Promotion Council (IETS) in Beijing recently, which is aimed at promoting the construction of standards system for agricultural products supply chain, supporting the high-quality development of agricultural products circulation industry and building a new pattern of agricultural trade.

Currently, the standardization work on agricultural products supply chain has neither been fully carried out nor attracted enough attention of enterprises. Crucial issues in this field should be solved as soon as possible. Moreover, the COVID-19 pandemic casts shadow on the standardization of cold chain when it comes to importing agricultural products.

Wang Jing, Vice Chair of SAC/TC 517, *Agricultural products purchase and sale*, pointed out that there are problems inside the agricultural products supply chain that should be solved via standardization methods. Since the committee shoulders arduous tasks, it is vital to negotiate with stakeholders at all levels, to better serve the industry and society.

IETS/TC 1 consists of 47 members from China's institutes, industrial associations, wholesale agricultural product market, cold-chain logistic enterprises, etc. To respond to market demands, the committee will initiate the collection of demands for association standards, address practical problems in the field of agricultural products supply chain, and boost the high-quality development of standardization in this field.

SAMR releases guidelines on identification of food for special medical purpose

For people, especially critically ill patients, who are unable to take regular food or fulfil their nutritional demands with regular food, the food for special medical purpose can be of life-saving importance.

Therefore, to guarantee the safety of food for special medical purpose, SAMR recently published the *Guidelines on the Identification of Food for Special Medical Purpose*. The Guidelines contains five parts, including basic requirements and requirements of content, layout, prohibition and others.

The Guidelines specifies 13 items that should be displayed on food labels and instructions, and lists requirements on warning notes and precautions. It puts forward for the first time that the "little blue flower" sign should be displayed on the minimum sales package of the food for special medical purpose.

The "little blue flower" sign consists of a clover formed by four hearts and two leaves, which symbolizes two hands holding the clover. Highlighting the characteristics of people who needs food for special medical purpose, the design of the sign indicates the spirit of passing on love, guarding health and gathering strength.

The Guidelines enables doctors and nurses to help patients better use the food for special medical purpose in clinical practice, which can be recognized as a supplement to regulations and standards in this area. Also, it regulates enterprises' behaviors, reduces consumers' confusion and avoids potential misleading information.

Yunnan issues China's first standards system on integration of culture and tourism

Southwest China's Yunnan province, meaning "the south of colorful clouds" in Chinese, attracts both national and international travelers with its rich tourism resources, including not only stunning natural scenery, but also exotic customs of various ethnic groups of China.

Yunnan Provincial Department of Culture and Tourism recently issued the *Guidelines on the Construction of Culture and Tourism Standards System of Yunnan Province (2021-2025)*. Yunnan made an unprecedented attempt to compile culture and tourism standards, in order to regulate the development of culture and tourism industry.

As of the end of 2021, Yunnan has published 17 local standards for tourism, 21 local standards for culture and 32 relevant association standards. By compiling existing 550 standards at all levels in this aspect, the Guidelines serves as a catalog of the development of tourism industry standardization. Standards listed in the Guidelines can be divided into two types, government-led standards, which includes mandatory and voluntary standards, and market-driven standards, including association standards and enterprise standards.

To be specific, the mandatory standards include safety specifications for large-scale recreation facilities, safety assessment of fire control, etc., while the voluntary standards cover multiple aspects, such as the guidelines on sustainable development of tourist attractions, symbols of Chinese cultural heritage, Dongba characters of the Naxi ethnic group, the Bai tie-dye skills and so on.

The Guidelines caters to the demands of Yunnan, and exploits the potentials for future development. It is expected to stimulate market vitality, optimize management and services of the culture and tourism industry, and promote the upgrading and high-quality development of Yunnan's culture and tourism industry.

China International Bamboo Industry Fair convened in Sichuan

The Chinese people are fond of bamboo for its toughness and tenacity. Thanks to its fast speed of growth, bamboo has become a popular low-carbon material globally.

Themed "Bamboo connects the world, creating and sharing a low-carbon future", the China International Bamboo Industry Fair was held on December 9-12, 2022 in Meishan city, Sichuan province.

The fair was jointly hosted by the International Bamboo and Rattan Organization (INBAR), International Center for Bamboo and Rattan, China Chamber of Commerce for Import and Export of Light Industrial Products and Arts-Crafts, and China Bamboo Industry Association (CBIA) and organized by Sichuan Bureau of Forestry and Grassland, and Meishan government. More than 400 national and international attendees gathered in Meishan city, including officers, experts, heads of associations, exhibitors and investors.

At the opening ceremony, the *Meishan Declaration of High-quality Standardization Development of China's Bamboo Industry* was released by CBIA, which has been accepted by other national bamboo industry associations.

With the most bamboo species, the largest bamboo stock and best processing and utilization technologies of the world, China has 43 national standards, 145 industry standards, 72 association standards and 235 local standards on bamboo by the end of 2021, according to the Declaration. It emphasizes the importance of standards, and urges stakeholders to facilitate the high-quality development of the bamboo industry with standards.

Further efforts will be made to establish a standards system and promote the implementation of standards for bamboo industry. The Declaration calls on practitioners to contribute to reaching the goals of carbon peak and carbon neutrality as well.

HIGHLIGHTS |

Belt and Road Regional Life Sciences Standardization Workshop held in Shenzhen

The Belt and Road Regional Life Sciences Standardization Workshop was held on December 16 at China National GeneBank (CNGB) in Shenzhen, South China's Guangdong province.

More than 200 attendees, including officials, experts and representatives of enterprises from countries and regions along the Belt and Road, joined in the workshop in hybrid form. Themed "Jointly developing regional standards for the Belt and Road Initiative", the workshop focused on the achievements and direction of regional standardization development.

Li Yubing, Deputy Director-General of Standards Innovative Management Department, SAMR, addressed the meeting online. She highlighted the important supporting role of standardization in implementing the Belt and Road Initiative. Standards can facilitate the connectivity of the Belt and Road region. More enterprises and organizations are expected to join the Belt and Road Life Sciences Economy Alliance to optimize the international standards system, according to Li.

Only by developing high standards can we lead the better development of global bioscience technology industry, said Shi Shizhen, Director of Standards Bureau of Shenzhen Administration for Market Regulation. He expected that the Belt and Road Regional Standardization Committee will set up more technical committees to cover more aspects, and carry out high-level standardization work with counterparts in countries and regions along the Belt and Road.

The newly established technical committees on medicinal plants and cell science & engineering technology will boost the high-quality development of bioscience technologies and products, and undoubtedly enhance the connectivity within the Belt and Road region, stressed Xu Xun, Chair of the Belt and Road Regional Standardization Committee and President of BGI Research.

Consisting of over 40 bodies from 10 countries, the Belt and Road Regional Standardization Committee has developed 6 regional standards and approved 11 proposals so far.

ISSCC hosts its 6th plenary meeting in Hangzhou

The international conference on case collection of sustainable development towards carbon emission peak and carbon neutrality and the 6th plenary meeting of the International Smart Sustainable City Club (ISSCC) were held in Hangzhou, Zhejiang province, on November 22 in hybrid form.

The event was jointly hosted by ISO/TC 268, *Sustainable cities and communities*, China Council for the Promotion of National Trade (CCPNT), ISSCC, and SAC/TC 567, *City sustainable development*. Attendees included representatives of member cities of ISSCC, along with officers and experts in the standardization area.

Yang Feng, Associate Researcher of China National Institute of Standardization (CNIS), presided over the 6th plenary meeting of ISSCC. Cities that joined the ISSCC have achieved fruitful results by deeply participating in international standardization work on sustainable development, addressed Bernard Gindroz, Chair of ISO/TC 268 and ISSCC. Representatives from member cities of ISSCC, such as a city of Madagascar, Qingdao of Shandong province, Xiaoyi of Shanxi province, CBD in Hangzhou, etc., shared their experience in this field.

Xing Liqiang, Director of Public Security Sub-institute of CNIS, presided over the international conference on case collection of sustainable development towards carbon emission peak and carbon neutrality. Tang Wanjin, Vice President of CNIS, introduced the newly released national standards and metrology system on carbon peak and neutrality. Qianjiang CBD of Hangzhou and Xiaoyi were granted to carry out the pilot projects of ISO 37101, *Sustainable development in communities*.

During the conference, the *Case Collection on Sustainable Development towards Carbon Emission Peak and Carbon Neutrality in 2022* was officially released, which were solicited globally by ISSCC, ISO/TC 268 and SAC/TC 567.

Supported by domestic and international standardization organizations including ISO, the United Nations Environment Programme (UNEP), the Standardization Administration of China (SAC) and AFNOR, the ISSCC was jointly established by China and France in Hangzhou in 2017. It now has 39 member cities, including 22 cities from the U.K., France, Russia, Brazil, etc, and 17 cities of China such as Beijing, Tianjin and Guangzhou.

HIGHLIGHTS |

Chinese experts support the development of CEN CWA 17953

The European Organization for Standardization (CEN) officially published a workshop agreement CWA 17953:2022, *Guidelines for dual-based training systems*, in December 2022, which is the first European standard on vocational education and training that Chinese experts have contributed to.

China Council for the Promotion of International Trade (CCPIT) Commercial Sub Council (CSC) was invited to participate in the development of CWA 17953, as Yao Xin, Secretary-General of CCPIT CSC, serves as the convenor of ISO/TC 286/WG 4, *University business collaboration*. And CCPIT CSC has contributed to the development of ISO/TS 44006.2, *Collaborative business relationship management—Guidelines for university business collaboration*.

Yao and other Chinese experts shared their experience in promoting ISO's work on standardization of university business collaboration, and provided China's practices as well. The CWA specifies quality criteria and guidelines for an effective dual training, aiming at simplifying the dual training process and including examples of best practices related to specific experiences and best practices in different countries and sectors.

China's newly revised *Vocational Education Law* came into effect in May 2022, which clarifies that organizations are important bodies to participate in, support or carry out vocational education, and requires an apprenticeship system with Chinese characteristics.

In response to national policies, CCPIT will further participate in the development of international standards, learn from European experiences, and make efforts to find a way to establish the apprenticeship system in China, said Yao.

WAPI Alliance contributes to the development of ISO/IEC 29167-16:2022

The Internet of Things (IoT) is gradually integrated into our daily life, which can be applied in vehicles, smart appliances, logistics, etc. As IoT brings benefits to people, its safety issues raise the alarm.

The Wireless Network Security Industry Alliance of Zhongguancun (WAPI Alliance) is the pioneer in this field. It has encouraged its members to develop the key safety protocol technology, tag and reader air interface security (TRAIS), which is adopted by the recently published ISO/IEC 29167-16:2022, *Information technology—Automatic identification and data capture techniques—Part 16: Crypto suite ECDSA-ECDH security services for air interface communications*.

The international standard offers a crypto suite based on elliptic curve cryptography (ECC) for the ISO/IEC 18000 series of standards. It specifies the use of elliptic curve Diffie-Hellman (ECDH) key agreement in a secure channel establishment and the use of elliptic curve digital signature algorithm (ECDSA) in an authentication mechanism.

Defined in alignment with existing air interfaces, crypto suite for ECDSA-ECDH for air interface for RFID systems is specified in the standard. Also, a mutual authentication method and cipher use methods are provided. ECDSA-ECDH cipher is a high-weight security protocol especially for active radio frequency identification (RFID) system, aiming at meeting the needs of those scenarios with high level security requirement.

ISO/IEC 29167-16:2022 indicates China's efforts in developing key IoT technologies, which can be applied globally to promote connectivity and shared governance. In total, China has contributed to the publication of 7 international standards covering safety of RFID and NFC technologies.

The standard will make global RFID products and systems more sound and reliable, so that users can enjoy the convenience brought by IoT, said Zhang Lulu, Secretary-General of the WAPI Alliance.

EU harmonised standards improve safety of lifts, reduce costs and facilitate trade

Interview with Mr Esfandiar Gharibaan, Chairman of CEN/TC 10 and Vice President of Codes and Standards in KONE Corporation

欧洲协调标准能有力提高电梯安全性、降低成本并促进贸易

访CEN/TC 10主席、通力电梯法规与标准副总裁
埃斯凡迪亚尔·加里班

Based on your years of international work experience, what are the main developmental trends of the global lift and escalator industry in the coming years?

Esfandiar Gharibaan: Safety remains the most important topic of standardization. We continuously revise our standards to reflect the state of the art in safety for design and operations.

Sustainability is another key focus point. In the past, for lifts and escalators, our focus has been on energy efficiency, and we have a set of international standards (EN ISO 25745-1/2/3) for this. However, international as well as national standardization organisations are developing many standards which address the life cycle of the products. Those standards may not directly cover lifts and escalators, but they will certainly have influence on these products. While we, as the lift industry, are following and participating in developing those standards, we are also considering whether specific standards may need to be developed on the subject of sustainability for lifts and escalators.

As more and more lifts and escalators are being connected to the Internet and other networks, another important topic is digitalization, and more specifically, connectivity. There has been a giant lip in the standardization for Internet-of-Things (IoT) and Machine-to-Machine (M2M) connectivity in general. Those standards affect lifts and escalators as well, but considering the specificities of lifts and escalators products, we need specific standards, at least for some aspects of the connectivity for these products. A good example is cybersecurity. And I am happy to see that ISO 8102-20 has been published recently. We may extend the work to other aspects as the needs are being identified and the technologies are maturing.

There have been extensive efforts to align, converge and harmonise requirements for lifts and escalators as defined by the national standards. This technical harmonisation among countries around the world greatly facilitates circulation of safe products and improves trade among those countries. ISO standards, when adopted by each country, provide an ideal means for such harmonisation. We see that more and more standards are developed at the ISO level with much input and contribution from the ISO members. It is important to note that there is a close cooperation between CEN and ISO and many of the standards from one organisation are adopted by the other and there are several joint projects on-going.

In view of these developmental trends, what are the plans and tasks of CEN/TC 10 today and in the future?

CEN/TC 10 has developed many standards (see Figure 1) which are being used internationally. The immediate task is to revise and update those standards in line with the latest technological and regulatory changes.

Technical harmonisation remains a key objective. We are working closely with ISO/TC 178 to make sure that the new items for standardization are developed as the global standards and avoid parallel or repetitive work in CEN or ISO. This is especially important for the digitalization and connectivity standards, where other markets, in particular China, are much more experienced than the European market and we can benefit from that experience.

We are also considering moving several EN standards, such as EN 81-70, to become global ISO standards.

We closely follow the regulatory and standardization activities on the topic of sustainability and in cooperation with the industry associations determining the relevance and impact for the lift industry and decide on the new work items in the future.

Which new standards can be expected soon? What key role will they play in the industry?

The current work program of CEN/TC 10 is shown in the Figure 1.

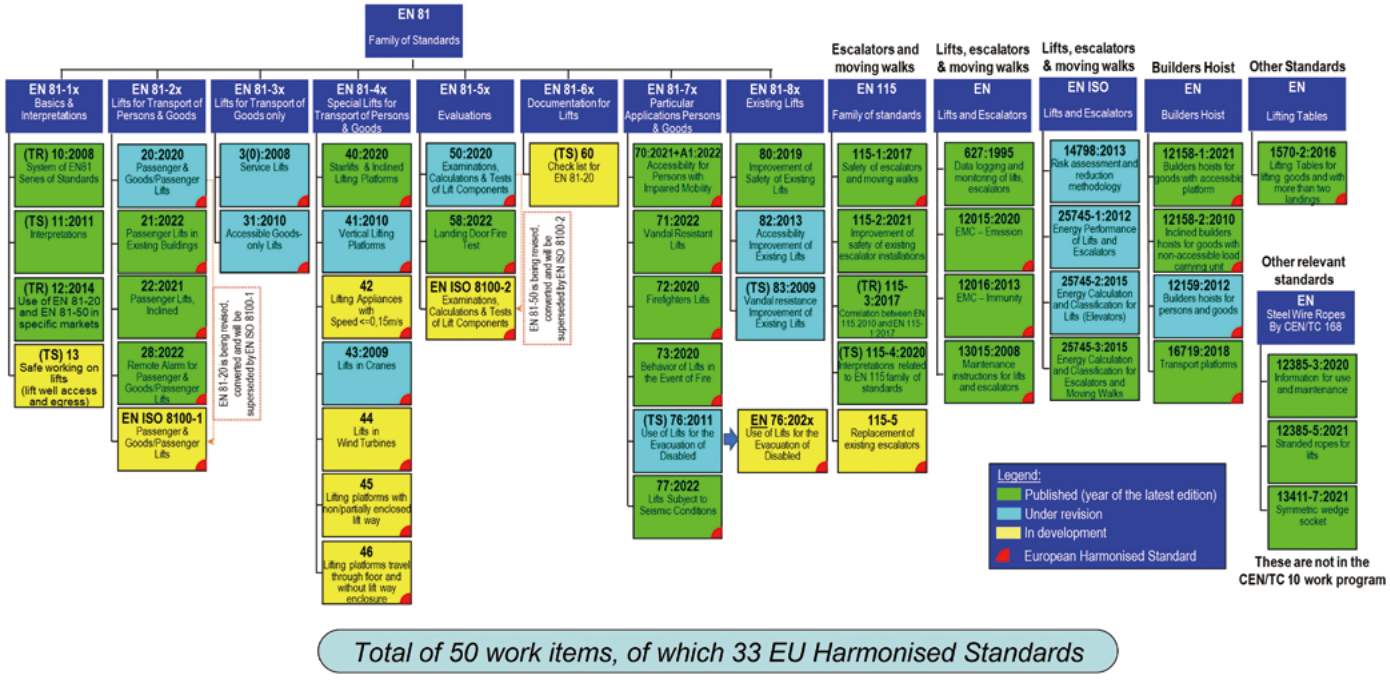


Figure 1: CEN/TC 10 work program

New standards under development are:

Standard	Title	Status / Planned publication date
EN ISO 8100-1/2	Disign rules for passenger and goods passenger lifts and calculation and tests of lift components	In drafting phase / Q1 2025
CEN/TS 81-13	Safe access to the lift well for lifts in service	In drafting Phase / TBD
EN 81-42	Vertical Lifting Appliance with enclosed carrier intended for use by persons, including persons with disability	In drafting phase / 2023-12-18
EN 81-44	Lifts in wind turbines	Preparation for publication / 2023-01-31
EN 81-45	Lifting platforms with non/partially enclosed lift way	In drafting phase / TBD
EN 81-46	Lifting platforms travel through floor and without lift way enclosure	In drafting phase / TBD
CEN/TS 81-60	Specification for means of determining compliance with EN 81-20	In drafting phase / TBD
EN 81-76	Evacuation of disabled persons using lifts	In drafting phase / 2024-01-04
EN 115-5	Replacement of existing escalators	In drafting phase / TBD

New standards will provide a solid basis for the technical harmonisation for lifts (EN ISO 8100-1/2) and will be a huge opportunity to improve efficiency of the industry. New standards also provide guidance in application of the EN standards (CEN/TS 81-13 and CEN/TS 81-60) as well as improving safety (EN 81-42, 44, 45, 46 and EN 115-5) and for the first time we will provide a standard for lifts used for the evacuation of buildings (EN 81-76).

What is EU Harmonised Standard? And which standards developed by CEN/TC 10 have been and will be recognized as EU Harmonised Standards? As Chairman of CEN/TC 10, how do you collaborate with the EU in this harmonisation process?

In the EU regulatory framework, the requirements in the technical regulations define the safety objectives to be reached. However, those regulations do not describe the technical specification to achieve those safety objectives. EU Harmonised Standards provide the necessary technical specifications to fulfill the safety objectives of the regulation.

EU Harmonised Standards are developed by the European Standardization Organisations, CEN, CENELEC (European Committee for Electrotechnical Standardization) and ETSI (European Telecommunications Standards Institute). Those standards are requested, checked, and approved by the EU Commission (EU regulators).

For example, the regulation for lifts (the EU Lifts Directive) requires that the lift landing doors have adequate strength, but it does not describe the technical specifications for the level or method to verify the adequate strength. The EU Harmonised Standard, EN 81-20, provides detailed technical specifications, testing and verification method for the lift landing doors. Therefore, a lift landing door designed according to EN 81-20 is considered to be in conformity with the regulatory requirements (safety objectives) for the lift landing doors.

Distinct and separate roles of the regulation, defining safety objective without describing technical specification, versus EU harmonised standard, defining technical specification which fulfills the safety objective, has many benefits. For instance, regulations are technology neutral, and they do not need to be revised regularly due to the changes in technologies and the market greatly benefits from the stable regulation. On the other hand, Harmonised Standards are continuously evolving and reflecting the latest state of the art, innovations, and technologies, thus ensuring that the products are in accordance with the latest safety specifications.

This approach to the regulatory framework clarifies the roles and responsibilities of the regulator versus standardization organisation, while requires and encourages cooperation between them.

The work program of CEN/TC 10 includes 50 standards (see Figure 1). 33 of those standards are the EU Harmonised Standards for lifts, escalators/moving walks, lifting platforms and building hoists.

As the chairman of CEN/TC 10, I work closely with the EU Commission to define the standardization need in support of the EU regulations, formulate the criteria for acceptance of the standards by the EU Commission and ensure that the development process and the content of the standards are in line with the expectations of the Commission. I also make sure that the questions, comments, and issues

raised by the EU Commission are adequately addressed, and if needed, the standards are aligned accordingly. In addition, I am a member of the EU Commission expert group which contributes to the development of the EU regulations for lifts.

Undoubtedly, experts from big companies play a key role in developing European standards at technical committees of CEN. How is the participation of small and medium enterprises (SMEs) in this process? What expertise and experience can they bring to European standards?

Members of the working groups and committees in CEN, the same as in ISO, are appointed by the CEN national members. Therefore, to directly participate in drafting of the standards, experts should be the members of their national standardization body. See Figure 2 for a simplified view of the structure and correlations between national and international committees and working groups.

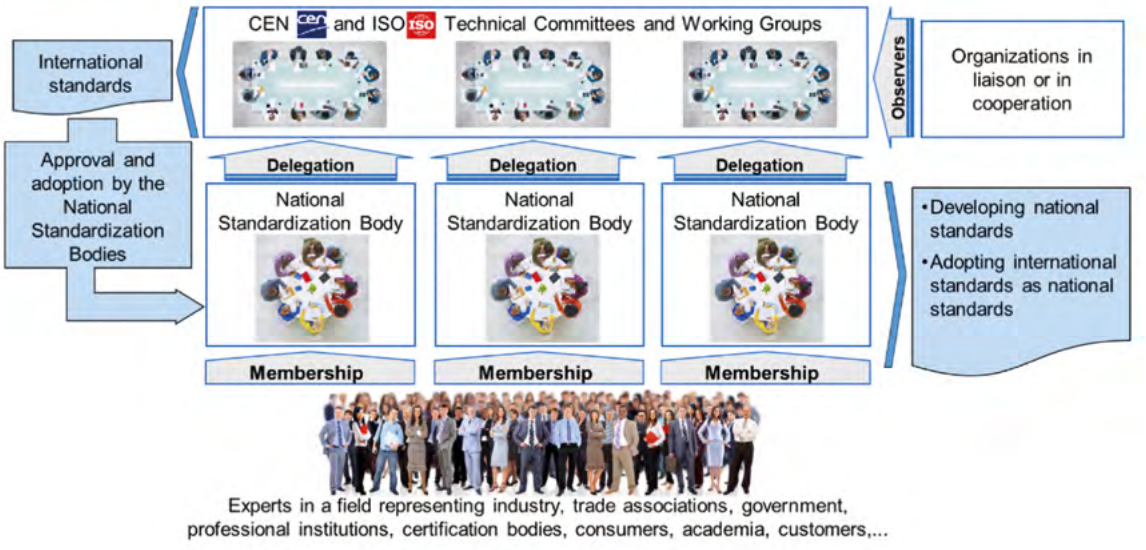


Figure 2: Participation to CEN committees and working groups

European standardization is a transparent and inclusive process. All stakeholders and interested parties are welcome to join and to contribute to the work. SMEs are especially welcome to join. I strongly believe that technical experts of SMEs have considerable expertise and technical competence that can greatly contribute to the standardization work. For example, many SMEs are providing customized solutions in the market, which requires deep understanding of the standards and their proper application. Most SMEs are operating in a national market, thus they are very much aware of the market needs and the technical requirements for the standards, as well as need for more accurate and precise formulation of the clauses of the international standards. Therefore, SMEs' contribution may help to ensure that the European/international standards provide relevant technical specifications, and the clauses are formulated clearly to avoid misunderstandings or misinterpretations of the content of the standards.

However, SMEs may have limited human or financial resources to participate at the European level. Therefore, SMEs are strongly encouraged to join their national standardization body. This will give them the opportunity to be fully aware of the standardization developments and the content as well as being able to provide comments during the development process and voting for acceptance of rejection of the standards.

In addition, organisations such as Small Business Standards (SBS) or European Federation for Elevator Small and Medium-sized Enterprises (EFESME), which are representing the interests of the SMEs, are actively participating in the standardization work and provide input from their respective members.

It is essential to listen to the voice of all stakeholders when developing a standard. How do consumers participate in the development of an European standard? Are their comments reflected in a standard? Please give an example.

Experts from the organisations representing consumers are also welcome to join the standardization work. Their participation may be achieved at the same structure as mentioned in Figure 2. However, the European consumer voice in standardization is the European Association for Coordinating Consumer Representation in Standardization (ANEC). ANEC enjoys strong support from the EU Commission and CEN and it is empowered to provide comments and cast a vote for accepting or rejecting the draft standards. ANEC is in liaison and in close cooperation with CEN/TC 10. ANEC experts participate in several working groups and provide their input and comments during the standardization process.

For example, ANEC has provided considerable number of requirements, comments and input related to the accessibility to lifts such as car dimensions for the wheelchair users, level of lighting inside the car or level of contrast for better visibility of the pushbuttons, etc. Those requirements have been incorporated into the EN 81-70 on accessibility to lifts for persons including persons with disability.

Why do we need so many standards? By adopting European standards, in particular EU Harmonised Standards, what benefits can it bring to lift or escalator manufacturers? How is the application of these standards in China's lift manufacturers or foreign lift manufacturers located in China?

Development and maintenance of standards is a time-consuming and complex process. In addition, lifts and escalators are complex machinery with many aspects, such as safety, accessibility, fire, influence by external electromagnetic fields, connectivity, maintenance, replacement, etc. Continuous technological progress regularly affects one or more aspects.

CEN/TC 10 standards are made based on the modular structure. In this structure, the main safety requirements applicable to all lifts are put into the main safety standards (EN 81-20/50). Other aspects, which may not be common for all lifts are put into auxiliary/supplementary standards. For example, specific requirements for the firefighter lifts are covered by EN 81-72. Modular structure helps the users to identify the standards applicable to their specific lift design and intended use. In addition, when due to technological or regulatory changes a specific aspect of the lift, e.g. firefighting,

needs to be reviewed and updated, this will affect only the supplementary standard (EN 81-72) rather than revising the main safety standards (EN 81-20/50). Therefore, the revision of the requirements for the firefighter lifts will be done faster and affects only the firefighter lifts. The same logic applies to other supplementary standards.

Use of Harmonised Standards has many benefits. As mentioned above, installers and manufacturers must comply with the regulatory requirements. But those requirements are safety objectives and do not describe the technical specifications to fulfil those objectives. Installers and manufacturers may use own technical specification to comply with the regulatory requirements, but then they must prove that their specifications provide adequate and the state-of-the-art safety for their products. This is a very complex, time consuming and costly conformity assessment procedure.

Design according to the EU Harmonised Standards is considered to be in conformity with the regulatory requirements. Therefore, the conformity assessment procedure is highly simplified, it is shorter and more cost effective.

In any case, the EU Harmonised Standards reflect the state of the art for safety and any other specifications must be evaluated against those standards. Installers and manufacturers must consider those standards even if they decide to apply their own or other specifications.

EU Harmonised Standards are adopted by many countries outside Europe and for many years. This is especially the case with EN 81-20/50, the main safety standards for lifts. Considering the extensive use of EN 81-20/50 around the world, ISO decided to adopt those standards as the identical ISO standards, ISO 8100-1/2:2019. These ISO standards are being adopted as the national standards around the world. For example, China GB/T 7588.1/2 or India IS 17900-1/2 are based on these ISO standards. It is estimated that more than 90% of the output of the lift industry is based on ISO 8100-1/2 (or EN 81-20/50), which have been adopted as national standards, identical or with small differences.

This extensive coverage of the common specification for safety (ISO 8100-1/2 or EN 81-20/50) has many advantages. It improves safety for users and workers around the world while it improves efficiency and reduces costs for manufacturing, installation, and maintenance with benefits for all stakeholders, including owners and operators for lifts.

As Chairman of CEN/TC 10 and Vice President of Codes and Standards in KONE Corporation, can you talk about the cooperation made between China and Europe in the lift and escalator industry? What is your advice for the cooperation in the future?

Cooperation between China's SAC/TC 196 and CEN/TC 10 began in mid-1990s with exchanging technical question and answers. That cooperation evolved into a cooperation agreement in 2005. Two TCs have been exchanging work programs and draft of the standards for comments and input as well as having regular technical exchange meetings with participation of many Chinese and European experts.

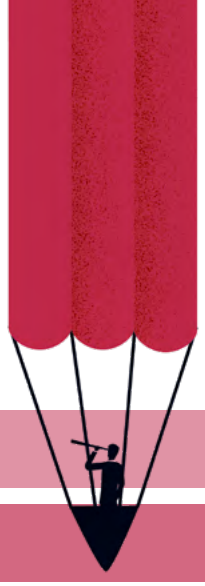
I truly believe that the cooperation has been mutually beneficial for China and Europe as well as the rest of the world in the form of ISO standards.

The cooperation was highly intensified during the development of EN 81-20/50 standards. SAC/TC 196 provided many comments and proposals for those standards and the two TCs had many meetings to discuss the draft of those standards. I strongly believe that these exchanges and input from SAC/TC 196 brought huge improvements to the EN 81-20/50 standards to the level that ISO decided to adopt those standards as global ISO standards. This is a unique achievement for these two TCs and the industry in general.

In 2019, the cooperation moved to a higher level by forming a joint working group. This joint working group is providing commonly agreed proposals for the safety requirements for standards as an input to ISO as well as European and Chinese standards.

I truly believe that the cooperation has been mutually beneficial for China and Europe as well as the rest of the world in the form of ISO standards.

We have also achieved strong alignment of the technical requirements. Currently, European and Chinese standards are almost identical. This alignment is not only crucial for facilitating smoother trade between the two parties, but also essential for the trade worldwide. We need to make all the efforts to maintain this alignment.



A review of China's standardization in 2022

2022年标准化社会关注度评议

10 major events 十大标准化新闻事件

Action plan released for implementing the Outline

Approved by the State Council, the *Action Plan of Implementing the National Standardization Development Outline* was jointly released by the State Administration for Market Regulation (SAMR) and other 15 national departments including Cyberspace Administration of China and National Development and Reform Commission (NDRC) on July 6.

The Action Plan consists of 33 articles, and provides specific requirements for relevant departments and local governments across the country to well put the Outline in place. It defines the key tasks by the end of 2023, which can orderly promote the implementation of tasks, and better exert the fundamental and guiding role of standardization in driving the modernization of China's system and capacity for governance.

The office for the Inter-Ministerial Conference on Standardization Coordination and Promotion of the State Council will make great efforts to strengthen the guidance, supervision and inspection of relevant work, and reach a consensus on promoting the effective implementation of various tasks.

Looking back at the past year, outstanding achievements have been made in China's standardization area. After the release of the *National Standardization Development Outline* (hereinafter referred to as the Outline), implementation documents have been formulated at both national and local levels, such as action plans for implementing the Outline.

There was also remarkable progress in the development, revision and management of national standards, with the efforts of Chinese experts who contributed their expertise to make standards more harmonized and applicable.

Here, we selected 10 major events, 10 influential experts, and 10 prominent standards to showcase a profile of the standardization development in China in 2022.

Promoting the high-quality development of association standards

To implement the Outline, regulate the association standardization work and promote the high-quality development of association standards, the *Opinions on Promoting the High-quality Development of Association Standards* was jointly released by 17 national departments including Standardization Administration of China (SAC) on February 23, which was approved by the Inter-Ministerial Conference on Standardization Coordination and Promotion of the State Council.

The Opinions proposes the guiding instructions in 10 aspects, such as improving the standardization capability of association standards bodies, establishing a demand-oriented mode for association standards development, and expanding the promotion and application of association standards.

According to the document, developing association standards can fully unleash the vitality of market entities, optimize the structure of standards supply, increase the competitiveness of products and services, as well as facilitate the high-quality economic and social development.

SAMR releases revised measures for national standards

The revised *Administrative Measures for National Standards* was released by SAMR on September 9, which will be officially implemented on March 1, 2023.

The revision aims to put the revised *Standardization Law of China*, the Outline as well as the *Plan for Deepening Standardization Work Reform* in place, and regulate the development, implementation and supervision of national standards.

The revised content mainly includes four aspects, i.e. adjusting the specific scope of national standards combined with national standardization practices, on the basis of the revised *Standardization Law of China*; further specifying the work requirements on procedures and phases of national standards development; defining the new requirements for development and revision procedure, organization and management, as well as implementation and supervision of national standards; and further improving the feedback mechanism and updating mechanism of national standards.

After the document comes into effect, a more effective work mechanism and related practices will take shape in the areas of management, application and promotion of national standards, better supporting the work related to national standards.

World Standards Day 2022 celebrated in Beijing

The themed activity of World Standards Day 2022 was held in Beijing on October 14 in virtual form, which reviewed the progress made since the Outline was implemented a year ago.

The event was addressed by Tian Shihong, Vice Minister of SAMR and Administrator of SAC. He emphasized that the theme of WSD 2022 was "a shared vision for a better world", which was in accordance with China's policy of promoting high-quality development and fulfilling people's wishes for a better life.

"Standardization in the digital era", the WSD theme in China, was designed to promote safer digital information and more effective digital connectivity, and create more reliable digital products and more preferable digital environment with standardization.

Improving the standards and metrology system on carbon peak and neutrality

The *Implementation Plan for Establishing the Standards and Metrology System on Carbon Peak and Neutrality* was jointly released by nine national departments including SAMR and NDRC on October 18.

The Implementation Plan, as one of the supporting plans for national carbon peak and neutrality and "1+N" policy system, specifies the overall deployment of related national standards and metrology system, which plays a guiding role in carrying out the construction work of the system in relevant industries, areas, regions and enterprises.

According to the document, by 2025, the standards and metrology system on carbon peak and neutrality will be basically established. By 2030, the system will be further improved. By 2060, a world leading system with more advanced technical level, higher management efficiency, and more efficient service capability will be fully established to serve the overall green transformation in economic and social development and vigorously support the realization of the carbon neutrality goal.

Chinese teams stand out in the 17th International Standards Olympiad

The 17th International Standards Olympiad was held in virtual form during August 23-25, which was attended by 40 middle and high school teams composed of 120 students from seven countries including China, Russia, South Korea, Indonesia, Rwanda, Japan and Singapore.

The four teams from China set a new record in the country's history by winning four awards including the platinum award, gold award, bronze award, and special award provided by ISO.

The International Standards Olympiad, organized by Korean Agency for Technology and Standards (KATS) and Korean Standards Association (KSA) since 2006, aims to raise the understanding of standardization and promote better communication among middle and high school students across the world.

Selected by China Association for Standardization, Chinese teams have participated in the international competition since 2018, and have won 10 awards so far.

World Telecommunication Standardization Assembly held

World Telecommunication Standardization Assembly (WTSA-20) was held from March 1 to 9 in Geneva, Switzerland, attracting nearly a thousand of participants from member states, staff of departments and regional telecommunication standardization bodies.

This Assembly discussed and determined the important topics such as the structure, tasks and leading posts including Chair and Vice Chair of ITU-T research groups in the 2022-2024 period.

The Chinese delegation actively participated in the international communication and discussion on key topics. And 13 Chinese experts from industries were elected as Chair or Vice Chair of related research groups in ITU-T, jointly pushing the revision of related resolutions on strengthening standardization activities in the area of telecommunication.

Held every four years, WTSA-20 is the highest-level conference of ITU-T, which is of great significance to the technical innovation, industrial development as well as international cooperation of global information communication.

Project on standardization of green and low-carbon transformation launched

The key consultation project on strategic research on standardization development of overall green and low-carbon transformation by 2035 was launched at a meeting held at the Chinese Academy of Engineering on March 1.

Focusing on the research on the strategic layout of overall green and low-carbon standardization by 2035, the project will establish the framework of related standards system with mutually replenished, harmonized and coordinated dual structure and the recommended lists for important standards projects by stages, and put forward the technical route for the coordinated layout of innovative technologies, international standards and market-oriented standards in cutting-edge areas. It will also determine the key directions for development and revision of international standards on addressing climate change, and highlight the development, implementation, supervision and evaluation mechanism of relevant mandatory standards.

The research findings will include the key tasks of putting the improved standardization support of green development in place and providing suggestions on policy advisory, which can effectively promote the project on improving the standardization of carbon peak and neutrality.

First national major project on technical regulations launched

A meeting on the opening report for "the research on technical regulations based on rule of law, national and global governance", a major project supported by the National Social Science Fund, was held successfully on July 23.

The project is in accordance with the requirement of establishing the institution for citation of standards in regulations, which has been proposed in the Outline and the *Plan for Market Regulation Modernization in the 14th Five-Year Plan Period (2021-2025)* issued in October 2021 and December 2021 respectively.

The project is designed to establish the coordination mechanism of laws, regulations and standards, and utilize standards to support the promulgation and implementation of laws and regulations with the support of technical regulations. Liu Jingwei, a renowned professor at China University of Political Science and Law, served as the chief expert of the project.

International Standardization (Chilin) Forum 2022 held in Nanjing

The International Standardization (Chilin) Forum 2022 was held on August 20 in Nanjing, capital of Jiangsu province, where the IEC International Standards Promotion Center (Nanjing) was established.

The Center will provide research support to meet the strategic demands of international standardization development, promote services for regional economic development, and work in close liaison with IEC and other international standards organizations, said Tian Shihong, Vice Minister of SAMR and Administrator of SAC.

He also emphasized a positive role of the Center in accelerating the improvement of relevant standards systems based on domestic conditions, jointly promoting the international standards for better sustainable development in the world, and creating a new situation for standardization work with concerted efforts.

During the forum held in hybrid form, speeches were given by Shu Yinbiao, President of IEC, Philippe Metzger, Secretary-General of IEC, Sergio Mujica, Secretary-General of ISO, and Zhao Houlin, Secretary-General of ITU. It was also attended by leaders from national departments and local governments in Jiangsu province, renowned enterprises, as well as national standards bodies of Germany and the U.K.

10 influential standardizers 十大标准化新闻人物

Shi Xuefa

Developing the geochemical standard reference material of deep-sea REE-rich sediment

Shi Xuefa, Research Fellow of the First Institute of Oceanography, Ministry of Natural Resources (MNR), led the research team of deep-sea rare earth element (REE) to successfully develop the geochemical standard reference material of deep-sea REE-rich sediment, which was graded as first-grade national standard reference material of deep-sea REE-rich sediment, the first of its kind at the international level, filling a gap in this field.

The development of the standard reference material of deep-sea REE sediment enriches the composition of China's standard reference materials of ocean sediment, which not only makes a breakthrough in this field both domestically and internationally, but also provides support for the investigation into deep-sea REE sediment, the evaluation and development of deep-sea rare earth minerals, sample test of ocean environment evaluation, and the quality management of relevant laboratories.

Zhang Xiaogang

Delivering a lecture about standardization on CCTV

Zhang Xiaogang, former ISO President, gave a lecture on the theme of "How to make standardization a powerful tool for high-quality development" in a TV program of China Central Television (CCTV) on March 27. Zhang exemplified abundant cases and shared his in-depth insights in the lecture, helping the audience easily understand how standardization can help facilitate high-quality development.

Zhang analyzed three main trends in the international standardization development in recent years. First, standards go first. In the past few years, a brand new commercial mode has emerged in the high-tech area, which is standards come first, then products and industrialization, which overturned the previous "product–standards–industrialization" commercial mode. Second, standards are being extended to the social governance area. In the past, standards only solved the problems related to product quality; however, now they begin to address the issues regarding social governance, government management and enterprise management. For instance, ISO's anti-bribery standards, social responsibility standards and conformity management standards all belong to social governance field. Third, utilizing standards as solutions to global environmental governance. For example, ISO published the carbon footprint standard as early as in 2013, which deserves the great attention of governments at all levels and enterprises in China, in particular export-oriented companies.

Huang Wenxiu

Xu Jianping

Winning the IEC Thomas A. Edison Award

The International Electrotechnical Commission (IEC) announced the winners of the IEC Thomas A. Edison Award in 2022. The award was granted to six officers from countries around the world, including two Chinese experts, Huang Wenxiu and Xu Jianping.

Huang Wenxiu is Chair of IEC/SC 59L on small household appliances, and Xu Jianping is Treasurer of IECEx System. Both of them have won the IEC 1906 Award twice, making great contributions to the construction of IEC international standards system, and the international mutual recognition of IEC conformity assessment system.

Created in 2010, the Thomas A. Edison Award is granted in recognition of dedicated services and exceptional individual contributions to the effective management of technical committees or IEC Conformity Assessment Systems. The award is destined for active TC/SC Officers (Chair, Secretary, Assistant Secretary) and Officers of the IEC Conformity Assessment Systems and their subsidiary bodies.

Liu Chengyang

Elected as member of CAG and convenor of WG 22 in ISO/COPOLCO

The ISO Committee on Consumer Policy (COPOLCO) held the first plenary meeting after the restructuring on May 24, 2022. COPOLCO is a policy development committee that proposes standards and related policy initiatives to deliver consumer protection.

The working groups (WGs) of COPOLCO include WG 1 "Chair's Advisory Group (CAG)", WG 21 "Communication and outreach", WG 22 "Consumer standards action", WG 23 "Capacity building and training", and WG 24 "Consumer safety". There are a total of 15 members in the CAG, who come from 13 member countries and 2 liaison organizations, including Liu Chengyang from SAC, ISO's member body of China.

In the plenary meeting, Liu was elected as the convenor of WG 22, which is responsible for core businesses of COPOLCO, covering the businesses of previous WG 5 on consumer protection and WG 18 on services.

Wu Hequan

"Standards digitalization is a milestone in its history since the Industrial Revolution."

Wu Hequan, Academician of Chinese Academy of Engineering (CAE) and Chair of China's National Standardization Expert Advisory Committee, said in the interview of China Standardization Press, "Standards digitalization, a milestone in the history of standardization development since the Industrial Revolution, is a main characteristic of standardization in the digital economy era. It creates a golden opportunity for innovation, boosts the reform of standardization methods and management system, and brings unprecedented challenges."

"There is a long way to go, as the task of standards digitalization is rather arduous. We must have a long-term plan and implement it in an orderly way. First of all, the top priority is to develop a standard for machine-readable standards. Second, a professional platform should be established to support machine readability. Third, attention should be attached to the training of standardization talents. Last but not least, management specifications for standards digitalization should be developed," said Wu.

Dong Mingzhu

Reelected as Chair of ISO/TC 86/SC 4

Dong Mingzhu, Chairperson of the Board and President of Gree Electric Appliances, Inc. of Zhuhai, was reelected as Chair of ISO/TC 86/SC 4 on testing and rating of refrigerant compressors after serving the first term since 2020.

The subcommittee has published one ISO international standard, ISO 916:2020, *Testing of refrigerating systems*, with three other standards under development. The reelection demonstrates the recognition of the achievements made by Dong in the first term, which means China can continue sharing its innovative achievements in the refrigerant compressor field with global partners.

Shu Yinbiao

"China has been practicing true multilateralism, contributing to protecting our common homeland and realizing sustainable development."

The 86th IEC General Meeting took place in San Francisco, the United States on November 4, 2022. Shu Yinbiao, IEC President, Academician of the CAE, and President of Chinese Society for Electrical Engineering, addressed the meeting.

IEC has been working on the development of standards system on carbon neutrality, and promoting the development of green & low-carbon technologies by using standardization approaches such as the IEC CO_2 emissions certificate. Facing various global challenges, China is aiming at achieving carbon peak before 2030 and realizing carbon neutrality before 2060. In this regard, China has been practicing true multilateralism, contributing to protecting our common homeland and realizing sustainable development, said Shu.

Zhu Hongru

Elected the Director of the BoD of W3C

According to the announcement of World Wide Web Consortium (W3C), the international authoritative organization in the field of Web on September 24, Zhu Hongru (Judy Zhu), Vice President responsible for standardization in Alibaba Group, was elected as the Director of the Board of Directors (BoD) of W3C, along with 6 elites from Intel Corporation, Apple Inc., Protocol Labs, etc.

After W3C turned into a public-interest non-profit organization on January 1, 2023, the BoD becomes the governing body of the Consortium, which has ultimate authority on the strategic direction, a legal obligation to ensure that W3C implements its mission to lead the Web to its full potential, and fiduciary responsibility over W3C as a whole.

Zhu has served as the member of Advisory Board of W3C consecutively for four terms from 2015 to 2022, contributing her expertise to the direction of W3C technical standards, globalization, the improvement of international standards procedures, etc. Zhu has also made great efforts to help Web international standards better meet the demands of industries in China, and introduce China's best practices and technologies to W3C, promoting the development and harmonization of Chinese and international Web standards.


Pu Jiangbo

Joining the IEC Council Board Task Force on Sustainable Development Goals

In February, Dr. Pu Jiangbo, the IEC Young Professional in 2021, who is from Biomedical Engineering Institute of Chinese Academy of Medical Sciences & Peking Union Medical College, was elected the member of the IEC Council Board Task Force on Sustainable Development Goals (CB TF3).

Dr. Pu is the first Chinese young expert who joins the task force of the IEC, which is a breakthrough made by young Chinese professionals in their participation in the IEC's international standardization activities.


Yao Xin

Assuming the convenor of ISO/TC 286/WG 4

In March, ISO officially set up the working group on university business collaboration at ISO/TC 286, *Collaborative business relationship management*. Yao Xin, Secretary-General of China Council for the Promotion of International Trade (CCPIT) Commercial Sub Council (CSC), and Member of National College Graduates Employment and Entrepreneurship Steering Committee, serves as the convenor of ISO/TC 286/WG 4, *University business collaboration*, which will be responsible for the development of international standards in the university business collaboration area across the globe.

The establishment of the working group was proposed by China, which will promote the standardization of university business collaboration and help develop more applicable international standards for education.

10 standards attracting great attention
十大最受关注标准

GB/T 29315-2022, *Security requirements for primary and secondary schools and kindergartens*

SAMR and SAC jointly released the voluntary national standard, GB/T 29315-2022, *Security requirements for primary and secondary schools and kindergartens*, on April 15, which came into effect on June 1, 2022. It is the first revised edition of GB/T 29315-2012 since its publication.

The revised national standard is the practice of following the instructions of Chinese President Xi Jinping on strengthening the protection of children and juveniles in schools and society, which is also an important measure to implement the national decisions on protecting minors. The 2022 edition solves the problems in the previous edition, such as the low requirements of personal and physical protection of minors, system technical indicators mismatching the application of new technologies, etc., which has a great value for improving the rules and system of safety protection in schools.

IRS 60680:2022, *Design of a high-speed railway infrastructure*

International Union of Railways (UIC) published the UIC standard, IRS 60680:2022 on the design of a high-speed railway infrastructure in July 2022, whose development was spearheaded by Chinese experts. It is the first international railway standard on the design of a high-speed railway infrastructure, which is also the second one of the series of UIC international standards on the design of high-speed railway after the publication of IRS 60681:2021, *Design of a high-speed railway—Communication and signaling*.

The publication of this international standard demonstrates China's contribution to promoting the internationalization of railway standards and enhancing the connectivity of systems.

ISO/PAS 24565:2022, *Petroleum and natural gas industries—Ceramic lined tubing*

In January 2022, ISO officially published ISO/PAS 24565:2022, *Petroleum and natural gas industries—Ceramic lined tubing*, which was developed by ISO/TC 67/SC 5, *Casing, tubing and drill pipe*. This document is applicable to ceramic lined tubing manufactured by centrifugal self-propagating high-temperature synthesis.

The Chinese expert from CNPC Tubular Goods Research Institute made great contributions to its development. It is the first international document whose research and development were participated in by Chinese experts in the tubing technology field with their experience and expertise.

GB 5749-2022, *Standards for drinking water quality*

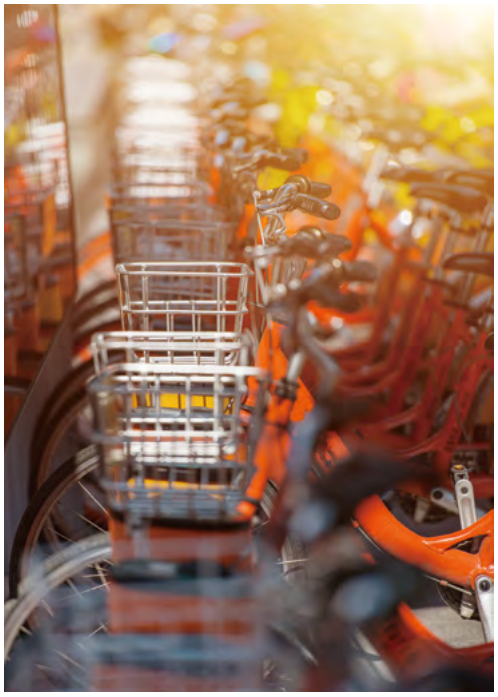
The mandatory national standard, GB 5749-2022, *Standards for drinking water quality*, was published on March 15, 2022, which will come into force on April 1, 2023. As an important evidence of the supervision and management of drinking water quality, the standard is the first revised edition of GB 5749-2006 that has been performed for nearly 15 years.

The standard specifies the requirements on drinking water quality, source of drinking water, hygiene of centralized water supply units, hygiene of secondary water supply, product hygiene requirements related to drinking water hygiene and safety, and testing methods of water quality. Compared with the previous edition, the indexes of water quality decrease from 106 to 97 items, including 43 regular indexes and 54 extended indexes. The reference indexes of water quality increase from 38 to 55 items.

ISO 14100:2022, *Guidance on environmental criteria for projects, assets and activities to support the development of green finance*

In September, ISO published ISO 14100:2022, *Guidance on environmental criteria for projects, assets and activities to support the development of green finance*. The international standard was jointly developed by ISO/TC 207/SC 4, *Environmental performance evaluation*, and ISO/TC 322, *Sustainable finance*.

It is the first ISO international standard on green finance. Li Pengcheng, Research Fellow from Resource and Environment Sub-institute, China National Institute of Standardization (CNIS), serves as the convenor of the working group on developing the standard, who made great contributions to its development.



ISO/TS 42502, *Sharing economy—Guidance for provider verification on digital platforms*

On October 27, ISO officially published ISO/TS 42502, *Sharing economy—Guidance for provider verification on digital platforms*, which was developed by ISO/TC 324 on sharing economy. Chinese experts from China Council for the Promotion of International Trade (CCPIT) Commercial Sub Council (CSC) made a big contribution to the development of this document.

It is the second international standard for sharing economy, which provides guidelines for sharing economy platform operators when verifying providers, including on-boarding, maintenance, and deactivation. Sharing economy has been developing rapidly in China, so China can provide best practices and solutions, and better participate in the international work in this area, according to Sun Xiao, Secretary-General of China Chamber of International Commerce.

Three national standards for digital textbooks of primary and middle schools

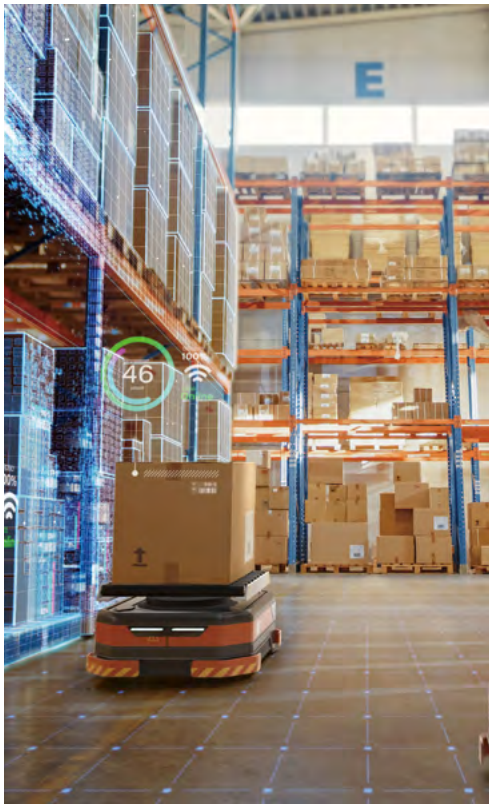
SAMR and SAC released three voluntary national standards on digital textbooks of primary and middle schools in April 2022, including GB/T 41471-2022, *Digital textbook—Publishing fundamental process of digital textbook for primary and secondary school*, GB/T 41469-2022, *Digital textbook—Metadata of digital textbook for primary and secondary school*, GB/T 41470-2022, *Digital textbook—Quality requirements and examination method of digital textbook for primary and secondary school*. The three standards have been implemented since November 1, 2022.

The standards define the basic publishing procedures, quality requirements, testing process and methods of digital textbooks of primary and middle schools, and offer a holistic solution compatible with requirements of both education and publishing areas, which lay a foundation for the large-scale publishing and promotion of digital textbooks in the future.

GB/T 30600-2022, *Well-facilitated farmland construction—General rules*

In March, SAMR and SAC jointly released the revised voluntary national standard, GB/T 30600-2022, *Well-facilitated farmland construction—General rules*, which was implemented on October 1, 2022. It is the first revision after the previous edition was published in 2014, which is also the first national standard on well-facilitated farmland construction whose drafting was led by the Ministry of Agricultural and Rural Affairs after the reform of Party and state institutions in 2018.

The revised standard addresses the deficiencies in the previous edition such as unreasonable setting of some indexes, which responds to the demands of scientific and normative management of farmland construction projects, and has great significance for further regulating the construction of well-facilitated farmland and improving their qualities.



IEC PAS 63441:2022, *Functional architecture of industrial internet system for industrial automation applications*

In November, the IEC published IEC PAS 63441:2022, *Functional architecture of industrial internet system for industrial automation applications*, whose development was spearheaded by Chinese experts. It is the first of its kind, and also the key fundamental standard in the industrial internet field.

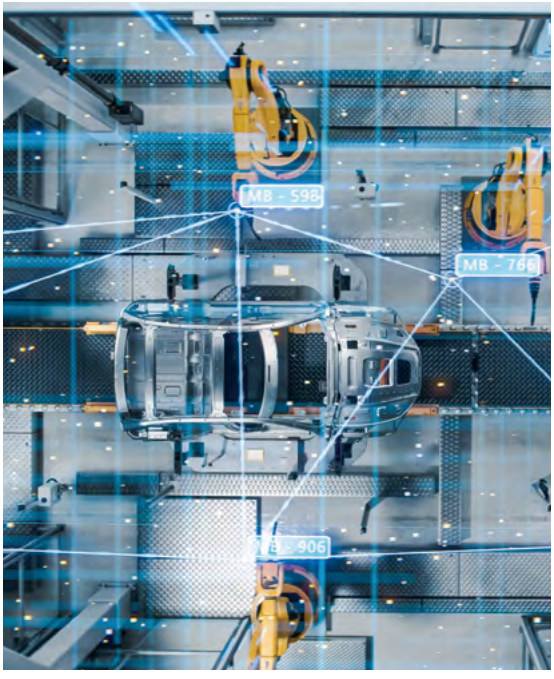
The document defines the functional architecture and functional model of the industrial internet system for industrial applications. It presents the models, structures, activities, and interaction contents between layers of the end, edge, and cloud: infrastructure as a service (IaaS), platform as a service (PaaS), and software as service (SaaS), respectively.

The standard project was proposed by China, and completed by Chinese experts from Instrumentation Technology and Economy Institute and Haier Group, together with experts from Germany, France, South Korea, etc.

GB/T 42021-2022, *Industrial Internet—General network architecture*

In October, the voluntary national standard, GB/T 42021-2022, *Industrial Internet—General network architecture*, was released by SAMR and SAC. It is the first national standard in the industrial internet field, representing that the construction of China's industrial internet system has taken a big step.

The standard defines the goals and functional requirements of network architecture inside and outside industrial internet factories, and puts forward the implementation framework and safety requirements for industrial internet network, which can help accelerate the building of quality industrial internet network architecture, improve the digitalization, networking and intellectualization of the whole industry, and has great value for accelerating industrial digitalization.



Probe into standardization of **intelligent manufacturing** in China

《中国智能制造发展研究报告：标准化》发布

Intelligent manufacturing, or smart manufacturing, is the key measure for establishing a modernized industrial system and realizing a new type of industrialization, which can boost China's strength in manufacturing.

Standards serve as the important technical support of intelligent manufacturing development, and play a fundamental and guiding role in reaching consensus, crystallizing achievements based on best practices, promoting technological innovation, and facilitating transformation and upgrading of enterprises.

Over the past years, a lot of achievements have been made in China's standardization work on intelligent manufacturing. As a result, the *Report on the Development of Intelligent Manufacturing in China: Standardization* came in being. Thanks to the leading efforts of China Electronics Standardization Institute (CESI), the Report was officially published at the main forum of World Intelligent Manufacturing Conference held in Nanjing, capital of East China's Jiangsu province, on November 23, 2022.

The Report is composed of four parts, namely foundation, development, practice and expectation. It summarizes the standardization achievements of intelligent manufacturing in China in the areas such as the establishment of standardization organizations, standards system planning, standards development and application, as well as international standardization.

Standards go first

In the complex international situation, intelligent manufacturing plays an irreplaceable role in empowering the real economy, ensuring the stable supply of key products and increasing the resilience of industrial chain and supply chain.

In recent years, major countries across the world have kept an eye on intelligent manufacturing. First proposing the concept of Industry 4.0 in 2011, Germany has taken standardization as its top priority, and published four editions of *Standardization Roadmap for Industry 4.0* to guide the standards development and international cooperation in the area.

Other countries and regions such as the US, Russia, Japan and the EU have released their strategic documents for the development of the manufacturing industry, which were designed to establish the path suitable for national or regional condition, focusing on the top-level design and building the environment for common development. These documents all emphasized the importance of standardization and the measures for participating in international standardization.

In the international arena, standardization organizations including ISO, IEC, ITU and IEEE have put more efforts to intelligent manufacturing standardization by setting up related committees and promoting the approval of important standards projects.

In ISO, the Smart Manufacturing Coordination Committee (ISO/SMCC) published a white paper on smart manufacturing in 2021, proposing the roadmap for smart manufacturing. In IEC, IEC/SyC SM was established in 2018 to coordinate the top-level design of smart manufacturing standardization and develop related fundamental standards. The two committees set up a joint working group to tease out the related international standards and terminologies. Furthermore, ISO/IEC JWG 21 was set up to create a unified reference model of smart manufacturing in the world.

By now, the relevant international standards have covered the fundamental and common requirements, smart equipment, smart factory and related technologies, such as IEC TR 63283-1:2022, *Industrial-process measurement, control and automation—Smart manufacturing—Part 1: Terms and definitions*, ISO 11593:2022, *Robots for industrial environments—Automatic end effector exchange systems—Vocabulary*, IEC 62832-1:2020, *Industrial-process measurement, control and automation—Digital factory framework—Part 1: General principles*, and ISO/IEC 20547-3:2020, *Information technology—Big data reference architecture—Part 3: Reference architecture*.

Bringing about remarkable effect

With the transformation, upgrading and high-quality development of the manufacturing industry, a work mechanism with Chinese characteristics has gradually taken shape in the intelligent manufacturing standardization in China. And the standardization work has gone through exploration and development periods, and now it is in the deepening period.

· Exploration period (2015-2017):

The standardization of intelligent manufacturing in China started almost at the same time as in the developed countries. With three years' efforts, China has explored a policy-guiding path that takes the construction of standards system as the main task, which is coordinated and promoted by multiple departments including Standardization Administration of China (SAC) and Ministry of Industry and Information Technology (MIIT).

In 2015, the *Guidelines for Establishing the National Standards System on Intelligent Manufacturing (2015)* was released as an important basis, which proposed the standards system framework in a scientific way. In 2016, the *Plan for the Development of Intelligent Manufacturing (2016-2020)* was released, which defined the scope of intelligent manufacturing, and specified the goals and tasks of standardization work in the period. And the working mechanism of coordination and promotion took shape based on the establishment of three national standardization working groups on coordination and promotion, overall work and expert consultation in August 2016.

In the period, **53 national standards** were published, together with the approval of **38 national standards projects**. With equal emphasis on international standardization, Chinese experts had participated in the development of **13 international standards**, contributing Chinese experience to international standardization organizations.

· Development period (2018-2020):

Since 2018, the standardization work on intelligent manufacturing had focused on improving the top-level design, developing standards in key areas and implementing sector standards. Remarkable progress had been made in international standardization.

The *Guidelines for Establishing the National Standards System on Intelligent Manufacturing (2018)* was released with improvement and adjustment. A total of **86 standards** were published in the period, increasing **62.26 percent** compared with the previous period. As the standardization work was further promoted, industrial standards systems were actively explored in the sectors such as shipping and printing.

In the international arena, **15 international standards** were published in the period, such as IEC TR 63164-1:2020, *Reliability of industrial automation devices and systems*. Besides international standardization work, Sino-German Standardization Working Group on Industry 4.0 has reached consensus on **63 areas of cooperation,** published **13 reports,** and compared and mutually recognized **36 standards**.

· Deepening period (2021-now):

The standardization work in this period focused on the development and application of standards in key fields. The *Guidelines for Establishing the National Standards System on Intelligent Manufacturing (2021)* added fundamental and common aspects and key technologies, and brought standards application to more areas for people's wellbeing. An innovative pattern of "national + industrial" standards systems came into being.

By October 31, 2022, **343 national standards** have been published with **72 ones under development,** and **15 sector standards** have been published with **14 ones under development** in 9 subdivided industries such as printing and electronics.

The standards have covered 16 specific application scenarios in terms of top-level planning, intelligent factory construction, intelligent production and management, as well as intelligent services, reaching preliminary effect. Meanwhile, sectors such as machine tools and shipping have explored to develop standards for industrial application.

In particular, Chinese experts have participated in the development of **44 international standards** with leading effort, among which **34** have been published. A batch of standards such as ISO 23218, *Industrial automation systems and integration—Numerical control systems for machine tools*, has demonstrated a breakthrough in China's participation in international standardization activities.

Using standards to lead development

The Report summarizes the practice and experience of standards application in 10 major scenarios based on the pilot programs in 2022, which rapidly facilitated production, operation, management and service in manufacturing enterprises by means of standardization, and exerted the role of standards to promote the transformation and upgrading and lead the innovation-driven development of the manufacturing industry.

1) Improving capability by evaluation

National standards such as GB/T 39116-2020, *Maturity model of intelligent manufacturing capability*, have basically established the method system for capability evaluation and improvement of intelligent manufacturing. After adopting the standards, an enterprise on mechanical equipment has established an intelligent factory with 15 others under construction, improved its capacity by **25.02 percent**, reduced the production cycle by **21.51 percent**, and raised the production efficiency by **13.45 percent**.

2) Accelerating digital process of factories

Multiple national standards such as GB/T 40654, *Intelligent manufacturing—Virtual factory information model*, cover the design, delivery and industrial application of intelligent factories. By using the standards, a project on intelligent factory design of new energy battery has effectively supported the construction of intelligent factories, and reduced their design period by **30 percent** by means of digital delivery.

3) Extending replication and promotion

A series of national standards such as GB/T 37393-2019, *Digital factory—General technical requirements*, specifies the fundamental requirements and indicator system for a digital factory. Guided by the standards, an instrument and apparatus company has greatly improved its production efficiency after the establishment of digital factory, with new sales reaching **over 11 billion yuan**. By now, the standards have been applied in **nearly 100 enterprises** in China.

4) Addressing information island

There are a lot of national standards on system integration with GB/T 40647-2021, *Intelligent manufacturing—System architecture*, as the guiding document. Through applying the standards, an automotive electronics enterprise has enabled all devices to be connected to the Internet and increased the automation rate of production lines to **47 percent**, providing reference for building a highly coordinated production system.

5) Increasing industrial data supply via interconnection

National standards such as GB/T 39561.1-2020, *Interconnection and interoperation of numerical control equipment—Part 1: General technical requirement*, can help to solve the problems such as inconsistent communication protocols and information island. For example, a compressor manufacturer has realized the interconnection of CNC equipment to provide agile services for users. It has also achieved the online monitoring and fault diagnosis of **more than 4,000 machine sets** for users, effectively safeguarding the safety of machines and economic interest of users.

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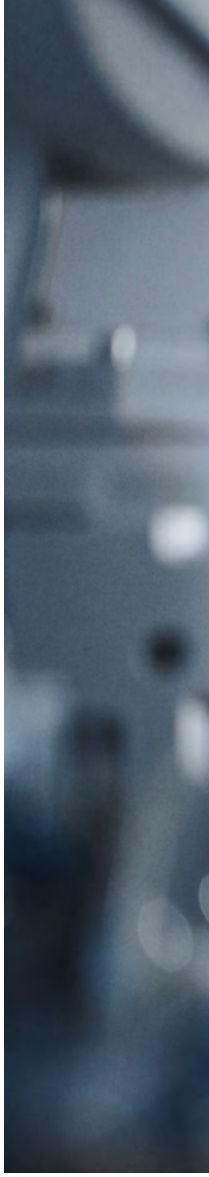


6) Raising logistics efficiency

National standards such as GB/T 41402-2022, *Logistics robots—General technical specification for information system*, contribute to the establishment of intelligent logistics system. By applying these standards, the main engine plant of an automobile enterprise has promoted the smart and flexible logistics by establishing **15 factories** and using more than **1,500 autonomous mobile robots (AMR)**. Thus, it can effectively ensure correct and timely delivery, greatly reduce labor costs, and improve the level of intelligence and feasibility.

7) Bringing quality inspection revolution

GB/T 40659-2021, *Intelligent manufacturing—Online detection system based on machine vision—General requirements*, has been published, and a few other relevant standards are under development. An automobile manufacturer, through the application of the standard, has carried out the visual inspection of **3 vehicle models** and **21 parts** in various scenarios, improved its inspection capability for many defects, and realized intelligent inspection for the exterior quality of parts.

8) Enhancing product competitiveness

A series of national standards on personalized mass customization can effectively guide the establishment of the system architecture in multiple industries, and realize the innovation of business model. For instance, a clothing manufacturer has made a breakthrough in key technologies, realized the data-driven model of personalized mass customization, and worked out a standardization production system. It has improved its production efficiency by over 30 percent, reduced its production costs by **more than 20 percent**, and sold its products to **97 countries** with an annual output of **1 million suits**.

9) Extending enterprise value chain

National standards such as GB/T 39837-2021, *Information technology—Remote operation and maintenance—Technical reference model*, can vigorously guide the development of new remote operation model. For example, an enterprise has transformed itself from a traditional machine tool manufacturer to an intelligent service provider, solved problems by using the service platform on remote operation and maintenance, connected **11,109 devices** and provided services to **more than 1,200 enterprises**.

10) Coordinating and reshaping supply and marketing businesses

Several national standards have been developed with GB/T 25103-2010, *Supply chain management business reference model*, as the core. By applying the standards, an equipment manufacturing group has established a system focusing on interconnectivity and improving management at all levels, and achieved the connection with many e-commerce companies, financial institutions and manufacturers. It now has **471 customers** on its supply coordination platform and **160,400 registered users** on its e-commerce platform, with a revenue of **121.1 billion yuan,** a year-on-year increase of **121 percent**.

Expectation for a better future

With the deep integration of the new generation of information technology and the manufacturing industry, intelligent manufacturing will bring revolution at an exponential rate. In the future, its development in China will be boosted by standards to reap more benefits.

The Report gives expectation for the better development of intelligent manufacturing in four aspects: first, the structure of "national and industrial" standards systems will be completed; second, the standards map based on typical application scenarios will be improved; third, the standards application and conversion of scientific and technological achievements will realize effective interaction; fourth, the cooperation of international standards will contribute to the "dual circulation" development paradigm.

As a blueprint has been drawn, the intelligent manufacturing industry in China will make innovation, implement pilot standards actions, and construct the standards system with Chinese characteristics with an optimized layout. Standards will continue to play its supporting and guiding role in driving the new journey of intelligent manufacturing.

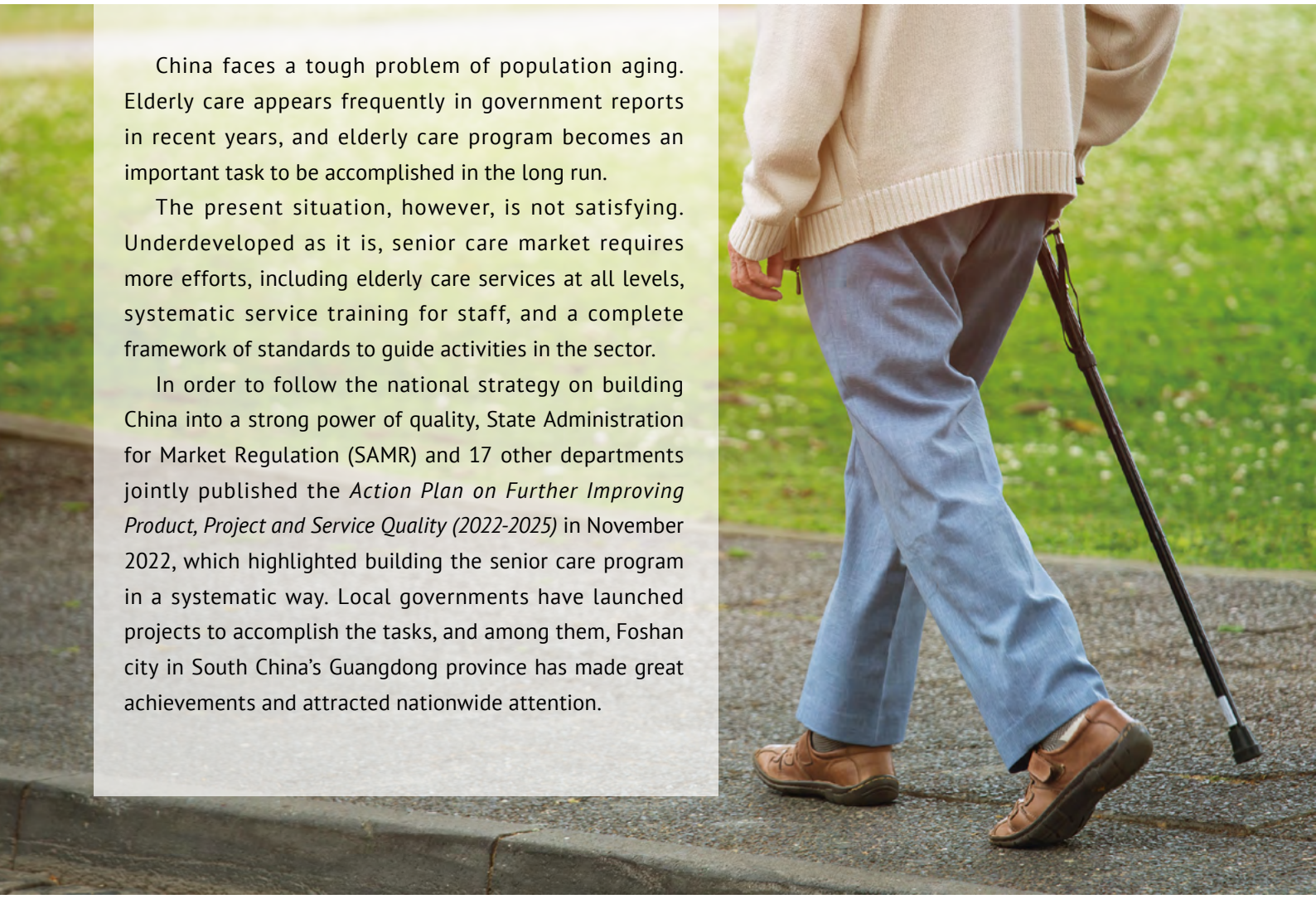
编译/靳吉丽

(Edited and translated by Jin Jili based on the Report in Chinese)

Implementing elderly care standards in Foshan

佛山制定实施养老系列标准 给老年人一个舒心有爱的晚年

By Liu Hongbo
文/刘宏博



China faces a tough problem of population aging. Elderly care appears frequently in government reports in recent years, and elderly care program becomes an important task to be accomplished in the long run.

The present situation, however, is not satisfying. Underdeveloped as it is, senior care market requires more efforts, including elderly care services at all levels, systematic service training for staff, and a complete framework of standards to guide activities in the sector.

In order to follow the national strategy on building China into a strong power of quality, State Administration for Market Regulation (SAMR) and 17 other departments jointly published the *Action Plan on Further Improving Product, Project and Service Quality (2022-2025)* in November 2022, which highlighted building the senior care program in a systematic way. Local governments have launched projects to accomplish the tasks, and among them, Foshan city in South China's Guangdong province has made great achievements and attracted nationwide attention.

Unique senior care program

What makes Foshan's elderly care program stand out? The answer is a precise system. From January 2021 to the end of 2022, Foshan had issued 63 technical specifications on the elderly care, from FSMZ/Z 1 to FSMZ/Z 63, which filled the gap in China. These documents are pioneering, indicating collective efforts on studying older people's needs for living, entertainment, education, tourism and shopping. And underscoring the key and urgent standards projects, a complete standards system took shape, covering general principles, industrial technology and equipment, senior care facility management, support and guarantee of senior care services.

Back in 2020, Foshan government issued its *Action Plan on Improving Elderly Care Service in Foshan (2020-2022)*. Based on the document and Foshan's specific features, Bureau of Civil Affairs of Foshan initiated the research project on system planning and roadmap of Foshan's senior care standards since January 2021. The research mobilized local senior care service providers, industrial associations and standardization technical committees to address the specific sore spots, weak links and issues that are key to development, based on the status quo of Foshan's senior care industry and its local characteristics. It is difficult to take the first step when you don't have examples to refer to, but it is also a wonderful chance to build something new. Foshan has taken the opportunity and received good feedback.

Although many parts have not been completed, the main body of the standards system, standards for industrial technology and equipment, and standards for senior care facility management, have sufficed the needs on standards in the most urgent and critical fields. Standards for industrial technology and equipment are comprised of standards on senior care manufacturing and the financing, health, culture and livability of older people. Standards for senior care facility management focus on the management on senior service facilities, especially on service realization, review and improvement. At the current stage, senior citizens in Foshan are in dire need of guarantees to get standardized and quality care services and products. So, standards for the elderly care facility management covered specifications on services, including daily care, emotional communication and consultation, health management, medical care, hospice service, social work, leisure and entertainment, culture and education, sojourn and vacation, and customized services. There are also standards focusing on the process of service improving, feedback, customer satisfaction, and complaint treatment.

These standards have laid a solid foundation for the future development of and research on elderly care program in Foshan, and even for the whole nation. They showcase the current situation of standardization and development trend in the industry, providing helpful information for administrative authorities and practitioners.

Standards application

Comparing with big cities such as Beijing, Shanghai, Guangzhou and Shenzhen, Foshan seemed to keep a low profile, but in 2020 its people aged over 60 years were about 999,600, accounting for 10.52 percent of the nearly 9.5 million permanent residents in the city, including more than 698,400 people older than 65, accounting for 7.35 percent. This figure is up 2.4 percentage points compared with that in 2010 census. According to UN criteria, Foshan is a typical aging city. Problems in various forms emerge in the elderly care work, and pose challenges for all in the implementation of standards.

To fight against the COVID-19 pandemic, the elderly care facilities in Foshan have applied closed-off management in the past two years. Due to the fact that staff working in the front line were too busy to receive off-job training, the Bureau of Civil Affairs of Foshan had developed multiple ways of training for them to facilitate the standards application in practical work. Staff could learn about and align their operation in work with the standards by taking online lessons in standardized operation teaching videos, online interpretation and explanation on standards, learning from standardization pamphlets, and organized offline training. By far, the bureau has filmed over 70 episodes of standardization teaching videos on senior care facility and community senior care services, and delivered training to more than 500 staff. These relentless efforts have helped staff increase their awareness on standardization, use the standards, and therefore improve working efficiency, management and service quality.

In the past, staff in elderly care facilities work by experience. Without standardized operation, it is possible for them to cause discomfort or even harm to aged clients. Pre-service training and continuous learning became increasingly important for the industry. Now guided by the standards, they are able to improve service quality in efficient training and provide services with quality and guarantee. For instance, FSMZ/Z 17-2021 gives detailed guidance on the operation of staff in terms of daily care, such as specific steps to move older people lying on bed to the stretcher.

Standards as benchmark

Upon completion of top-level design and implementation of standards, the next step for Foshan is to receive feedback, improve current standards, and promote standards with greater efforts. To fully implement standards, people need to be devoted to the practical application of standards in a long term, and take feedback from front line to optimize these standards.

On this basis, Foshan has turned its senior care standards system into one that is more consistent with the status quo of senior care system in Foshan, set up pilots and benchmark facilities excellent in the standardization work, and encouraged them to amplify their influence to the whole industry. With advanced standards widely accepted, Foshan took one step further and promoted project building to a higher level. In the past two years, a total of 16 standardization projects were launched in the elderly care sector at national, provincial and regional levels, and most of them are located in Foshan.

Take *Specifications on managing visits to the elderly care facilities* as an example. Led by Foshan Institute of Quality and Standardization, this standard was praised at the 6th China (Guangzhou) International Elderly Health Industry Expo in 2022. It also attracted attention from the whole province and even the Guangdong-Hong Kong-Macao Greater Bay Area (GBA). Its strengths lie in the detailed and comprehensive guidance on activities during visits.

Visits and visitors are important bonds for seniors living in a facility to contact with the outside world, so seniors can feel love from family members and warmth from the society. However, visits could bring potential risks. Visitors might accidentally bring items with potential safety risks or behave in a way that leads to security breach due to lack of knowledge on elderly care. On the other hand, against the special background of pandemic control, visit control and management is

essential for the safety and health of aged clients more than ever, because they are more prone to get infected by the virus than any others. The standard defines items concerning visiting in the elderly care facilities, including visiting mode, organization management, site and facility equipment management, staff management, management of on-site visit & online visit, review and improvement, and encourages facilities to explore ways of online and remote visiting so as to cope with public emergency and adapt to the new normal of work.

Elderly people' homes must not be neglected by the society. With proper management and aid of high-tech, older people can still be actively engaged in social activities. The standard helps facilities explore and develop new functions to interact with the public.

Standards going out

As highlighted in the report to the 20th National Congress of the Communist Party of China in October 2022, China is aiming at ensuring basic elderly care for the entire elderly population. It means when local governments develop the elderly care program, they must consider market demands from different perspectives.

In 2019, Foshan's GDP exceeded 1 trillion yuan, ranking the third in Guangdong province, only after Shenzhen and Guangzhou. People here are proud of the delicious local cuisines and beautiful scenery. A city like this won't be satisfied by basic elderly care only. The Civil Affairs Bureau has taken multiple measures to promote local elderly care services to transform from "living necessity" mode to the mode of enjoyment, development and involvement. There is no "one-size-for-all" solution for the entire market. But by leveraging the power of standards and market entities, Foshan is able to satisfy the demands of aged clients and their families, elderly care facilities, and local communities, and lay down a structure of elderly-care service supply integrating high-end, inclusive, and basic service solutions.

The bureau also encourages local service providers to lead or participate in the development of local and GBA standards. Besides the standard mentioned above, there are three other standards reviewed and enlisted in the first batch of GBA standards of 2022 after rounds of study, consultation and discussion. The standard, as an association standard widely accepted in the GBA, marked a great achievement of Foshan.

As the follow-up actions, the bureau will refine and promote the standardization achievements in Foshan, and strive to upgrade more local standards to regional standards and GBA standards. Elderly care facilities will be guided to adopt the standards and adapt them in daily operation. Feedback from service providers and institutions will also be collected and analyzed in order to continuously improve the standards.

In a world that no one could stay young forever, the way we treat the elderly today is the way we will be treated tomorrow. The seniors need to be treated with patience, carefulness and love. Standards can help us build a world that older people could live in harmony, peace and love.

IEC publishes implementation guidelines for city service continuity

Electricity is the backbone to modern life. It powers the many systems in our cities, from street lights to hospitals and transportation networks. As natural catastrophes, such as hurricanes, earthquakes and flooding occur more frequently and with greater intensity, they can have a devastating impact on cities and the many services that rely upon electricity.

IEC SRD 63152-2, *Smart cities—City service continuity—Implementation guideline and city service cases*, defines what to consider when designing guidelines for city service continuity. It includes templates and use cases to ensure that service providers address the requirements for a wide range of situations caused by disasters.

According to Tatsuya Shimoji, who led the project team on city service continuity, "We need to ask ourselves: if such a major disaster (possibly multiple disasters at the same time) causes a power outage, how can we, as a city, survive? This is the concept that we are trying to address."

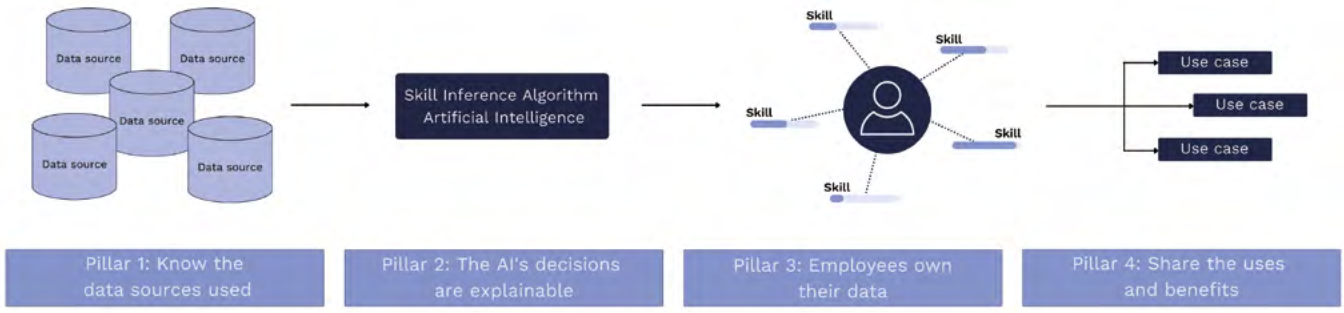
Continuity planning is a key factor to minimize cost and damage should critical infrastructure become inoperable. It ensures that potential disasters have been considered and local plans developed for the restoration of services. Because no city service can operate without electricity, getting the electricity supply to function again is the most urgent and important task following disasters.

As Mr Shimoji notes, "In order to secure services in a city at a minimum level during grid power loss due to disasters, each organization which provides services should establish a business continuity plan to secure its electricity supplies appropriately."

IEC 63152-2, which is a systems reference deliverable, includes city service use cases for various target organizations such as municipalities, developers, and building administrators. The city service cases included are applicable during an emergency as well as during non-emergency situations such as power outages based on normal service.

(Source: IEC)

Four pillars for using AI responsibly in a skill-based organization



The world is moving towards a skill-based approach and that increases AI's role in workforce decision-making. It's not a matter of if, but when AI comes to the skill-based organization. Set the right foundations by integrating the four pillars into your AI strategy. Without them, everything will come crumbling down.

It's vital that AI is used for good in the skill-based organization, or all of the effort put into shifting away from jobs will be for nothing. Forming the basis of this approach are four key pillars for using AI responsibly.

Pillar 1: Know your data sources

When evaluating data sources, organizations should keep four properties in mind: A final note on this, we mandate using non-invasive data sources to avoid infringing on employee privacy. Avoid using invasive data sources such as email, private chat or any other data sources that could be seen as prying.

Pillar 2: AI's decisions are explainable

In the EU, GDPR provides employees with the "right to an explanation" when algorithms measure or evaluate aspects related to them based on automated data processing. The AI Act is also making its way through the European Parliament. In the US, the National Institute of Standards and Technology has published its Four Principles of Explainable Artificial Intelligence.

Pillar 3: Employees own their data

Key to this is highlighting (and delivering on) the benefits of using skills for workforce decisions. Taking this approach suits employees, with 79% stating that they'd be okay with having their skills data collected by employers and a further 14% open to it, depending on the purpose.

Pillar 4: Share the uses and benefits

Let employees know how their data is collected, from where and how the AI uses it. You might need to do a bit of upskilling around AI to ensure all employees understand these points.

(Source: World Economic Forum)

7th Cybersecurity Standardization Conference "European Standardization in support of the EU Legislation"

February 7, Brussels, Belgium

The European Standardization Organizations, CEN, CENELEC and ETSI, are pleased to join forces with ENISA, the EU Agency for Cybersecurity, to organize the 7th Cybersecurity Standardization Conference "European Standardization in support of the EU Legislation".

The 2023 programme of this well-recognized conference will have dedicated sessions on standardization activities in the areas related to the emerging EU legislation: proposed Cyber Resilience Act, reviewed eIDAS Regulation, RED Directive, proposed EU Chips Act, Data Act, AI Act and others.

The conference aims to foster dialogue among policymakers, industry, research and standardization organizations, in view of an effective implementation of the EU cybersecurity legislation. Participation is open to all and free of charge upon mandatory registration.

For more information on the event website: **https://www.enisa.europa.eu/events/cybersecurity_standardisation_2023**

4th meeting of the Joint Coordination Activity on Digital COVID-19 Certificates (JCA-DCC)

JCA-DCC
24 February 2023

February 24, virtual

Digital COVID-19 Certificates (DCCs) are designed to prove that a person has either been vaccinated against COVID-19, tested for the virus, or recovered from COVID-19. It is recognized that digital certificates need to be suitable for use by both existing and emerging systems such as those based on decentralized identity (DID).

JCA-DCC coordinates standardization work on DCCs between relevant ITU-T Study Groups, external organizations and forums, to foster the use of compatible data architectures for sharing data, and promoting interoperability, agility and safety for users, and all relevant stakeholders involved.

For more information on the event website: **https://www.itu.int/en/ITU-T/jca/dcc/Documents/JCA-DCC_meeting4.pdf**

Joint ITU-R SG6 – EBU Workshop "Broadcasting in times of crisis - 2023"

March 9, Geneva, Switzerland

ITU published Report ITU-R BT.2299-3 "Broadcasting for public warning, disaster mitigation, and relief" in 2014. In the last 9 years since its publication, more crises happened both on the global level and regional level. Terrestrial broadcasting has played a role in mitigating the effects of these crises by providing reliable point-to-everywhere delivery of essential information and safety advice to the public, to first responders, and to others via widely available consumer fixed and mobile receivers. Looking to the future, 5G broadcasting systems are expected to be deployed so that critical information for public warning, disaster mitigation, and relief could be disseminated securely to IMT receiving terminals regardless of the status of IMT infrastructure.

Now that the question of the future of terrestrial broadcasting will be debated at WRC-23 under its agenda item 1.5 in November 2023, it is suitable to take stock of the situation and give an update about the important role of terrestrial broadcasting in times of crisis.

For more information on the event website: **https://www.itu.int/en/ITU-R/study-groups/workshops/sg6-itu-ebu-btc-2023/Pages/default.aspx#**

ETSI Summit on Sustainability

March 30, Sophia Antipolis, France

The ETSI Summit on Sustainability—How ICT developments and standards can enable sustainability and have a positive impact on society, will take place on March 30, 2023 and focus on the key role of the ICT industry and related standardization activities to support green initiatives.

As the telecoms industry looks to future challenges and opportunities, the topics of sustainability and particularly energy efficiency have emerged as among the highest priorities for the industry.

The ETSI Summit brings together key decision-makers from ETSI members and beyond, including operators, manufacturers, service providers, regulators and policymakers, end-user industry sectors and researchers.

It is a unique event where high-level management and technology experts may exchange and openly debate about standardization priorities, helping to shape the work of ETSI in the years to come.

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Standardization status of single-cell RNA sequencing technology in animal husbandry

单细胞转录组测序技术畜牧业标准化现状分析

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Abstract: Single-cell RNA sequencing technology (scRNA-seq) is an emerging, high-throughput, high-resolution big data production and analysis technology, which has helped some pioneering research and discoveries in the field of animal husbandry in recent years. This technology provides an essential basis for the early selection of livestock and poultry and the selection of excellent characters, showing that it has great application potential and broad prospects in animal husbandry research and production. Although scRNA-seq technology has established a wide range of commercial production services at home and abroad, the standardization status of this technology in animal husbandry needs further exploration, as it can provide clues and foundations for the application of scRNA-seq technology in animal husbandry.
Keywords: single-cell RNA sequencing technology, animal husbandry, standardization, genetic breeding

1. Introduction

Promoting variety cultivation, quality improvement, brand building, and standardized production are important measures to facilitate the high-quality development of animal husbandry. The standardization of industrial technology can strengthen technological innovation, promote the construction of industrial systems and management systems, and improve the core competitiveness of the industry[1].

Single-cell RNA sequencing (scRNA-seq), also known as single-cell transcriptome sequencing, is an emerging, high-throughput, high-resolution big data production analysis technology, which has been widely used in many fields such as human developmental biology, tumor, immunity, disease, intestinal microbiome, and the clinical application[2-3]. In recent years, some pioneering research results and discoveries in the field of animal husbandry have been achieved by using scRNA-seq technology, which provides an important basis for the early selection of livestock and poultry and the selection of excellent traits.

2. ScRNA-seq technology and its development

Cell is the most basic structural and functional unit of a creature. According to the central dogma of molecular biology, cell type and function are determined by its entire transcriptional expression profile, which can be obtained by single-cell transcriptome sequencing, thereby identifying cell types, cell states, and rare types of cells with high resolution[4]. With the improvement of the stability and sequencing throughput of scRNA-seq technology, it has been widely used in the fields of human developmental biology, tumor, immunity, disease, and intestinal microbes. And the clinical application transformation based on this technology is also being deeply explored[5-7].

The basic principle of scRNA-seq is to amplify the whole transcriptome of the isolated single cell, and then obtain the single-cell RNA expression profile through high-throughput sequencing[8]. In 2009, the *Nature Medicine* journal published the first research on the heterogeneity of mouse blastocyst cells based on single-cell transcriptome sequencing technology[9]. This project was led by a Chinese scientist. It is also the first time that scRNA-seq technology has been known by people. Over the past years, scRNA-seq technology and protocols have been developed. Most published scRNA-seq studies follow the same general workflow: single cells are isolated; cells are lysed, and the RNA is captured for reverse transcription into cDNA, and the cDNA is pre-amplified and then used to prepare libraries for sequencing and downstream analysis. ScRNA-seq technology has established a wide range of commercial production services at home and abroad, and there are more and more reports on animal genetics and breeding applications.

3. Application of scRNA-seq technology in animal husbandry research

Since the publication of the first single-cell transcriptome sequencing study in 2009, the technology has caused a huge stir and has also been rated as a technological milestone by the academic community for many years. It is worth noting that single-cell omics technology was selected as one of the top ten signs of progress in China's life sciences in 2019. ScRNA-seq technology has been continuously developed, and been widely used in scientific research in various fields, including animal husbandry.

In 2020, Estermann et al.[10] investigated the process of gonadal sex differentiation in chicken embryos using scRNA-seq technology. They found that the cell biological mechanisms of gonadal sex differentiation differed greatly between chicken and mouse, and identified two subpopulations of supporting cells with different transcriptomes, refreshing the knowledge of the complexity of gonadal cell lineage. In addition, unlike other vertebrates, the chicken embryo support cells do not originate from the chicken luminal epithelium, but from the mesenchymal-derived PAX2+/OSR1+/WNT4+/DMRT1+ cell population. More importantly, the chicken PAX2+ cells were traced back to their developmental migration from the middle kidney to the gonads.

In the same year, Qiu et al.[11] performed scRNA-seq on the muscles of lean and fat pigs and found that the characteristics of lean pig skeletal muscle were mainly the promotion of myocyte generation and the inhibition of adipocyte formation. Trajectory analysis showed that myogenic progenitor cells differentiated into satellite stem cells, followed by differentiation into satellite cells and myogenic cells, and myogenic cells further differentiated into myoblasts. Compared with obese pigs, the myogenic cells of lean pigs were closer to the

primitive stage of myogenic progenitor cells. This study explored the differentiation states of pig muscle and provided ideas for future pork quality improvement.

In 2021, Soto et al.[12] studied the characteristics of different cellular compartments during bovine gonadal development, the interrelationship between germ cells and their stroma, and factors that may affect germ cell development by scRNA-seq technology combined with real-time PCR and immunohistochemical analysis, analyzed the gene expression of primordial germ cells at early developmental stages, elucidated the mechanism of primordial germ cell genesis in cattle, and provided a basis for the development of methods to differentiate bovine gametes from pluripotent stem cells in vitro.

Yang et al.[13] identified all known germ cells (including early spermatocytes, late spermatocytes, round spermatozoa, elongated spermatozoa and spermatozoa) and somatic cells, as well as uncommon somatic cells with leukocyte characteristics, by single-cell transcriptome sequencing of more than 10,000 cells from adult sheep testes. Transcriptional expression profiling of different cell types identified several molecular markers specific to different stages of germ cells, such as EZH2, SOX18, SCP2, PCNA and PRKCD. It is the first comprehensive study on the transcriptional expression profiles of cells at different stages of spermatogenesis and contributes to a comprehensive understanding of spermatogenesis and sperm development in sheep.

In 2022, Wu et al.[14] studied cellular heterogeneity, metabolic characteristics and interactions in 10 different tissues of lactating dairy cows at the level of single-cell resolution and identified 55 major cell types from a single-cell transcriptome profile composed of more than 80,000 cells, finding heterogeneity in the uptake of different nutrients by different epithelial cell subtypes. Among the immune cell subsets, T helper 17 (Th17) cell was found to be specifically concentrated in the foregut tissue, and this cell type could interact with epithelial cell subtypes with high uptake of short-chain fatty acids through IL-17 signaling. This study laid the foundation for a deeper understanding of the metabolic characteristics of cow tissues and later selection of high-yielding breeds.

4. Standardization of scRNA-seq technology in animal husbandry

Nowadays, some national standards for high-throughput sequencing technology have been published in China, including GB/T 40664-2021, *General requirements for high-throughput sequencing technologies of detecting nucleic acid samples*, GB/T 40226-2021, *Detection of environmental microbial metagenome—High throughput sequencing*, GB/T 37870-2019, *Individual identification by high-throughput sequencing method*, GB/T 35890-2018, *Technical specification of high throughput sequencing data format*, GB/T 35537-2017, *Requirements of the high-throughput gene sequencing result evaluation*, GB/T 35890-2018, *Technical specification of high throughput sequencing data format*, GB/T 35537-2017, *Requirements of the high-throughput gene sequencing result evaluation*, GB/T 33681.1-2017, *Methods to prepare samples for high-throughput gene sequencing—Part 1: Preparing samples of animal tissues* and, GB/T 30989-2014 *Technical regulation of high-throughput gene sequencing*.

This shows that China's standardization work can keep pace with the times. The high-throughput sequencing technology is recognized by a wide range of industries, and the standardization of this technology has promoted the high-quality development of the whole high-throughput sequencing industry. Although the implementation and analysis of single-cell transcriptome sequencing differ from existing standard technologies, the need for a technical specification and standards system to facilitate the entire industry chain and the life

cycle is evident.

In the later stage, the development of the standards system of scRNA-seq technology in animal husbandry should focus on five directions covering the entire industry chain of scRNA-seq technology as follow: samples collection and handling, construction of transcription libraries and sequencing, sequence alignment and analysis, data storage and security, and database establishment and management.

After retrieving literature and research, the standards projects in each aspect are proposed as follows. Firstly, for the samples collection and handling, because single-cell sequencing sample preparation requires more technical operation, which needs the dissociation of organs or tissues into single cells, and the method and time for dissociation of organs or tissues varies among species. It is necessary to establish appropriate technical standards for collection and processing to guide the operation, thus improving the success rate of sample preparation for all types of domestic animals and poultry. Secondly, as DNA library preparation is a decisive factor for the success of sequencing, and high-throughput sequencing is a very mature technology, single-cell sample library preparation and quality control are urgent problems to be solved today. Thirdly, after sequencing, to obtain an effective gene expression matrix, the selection of reference genomes for various species and the selection of analysis algorithms are the core issues of the entire sequence alignment and analysis process. Fourthly, after the high-throughput sequencing data is generated, the methods and technical specifications related to data storage and security are also important. Lastly, downstream data sharing is usually carried out in the form of building a database, and the establishment, operation and maintenance of the database must also be considered.

5. Summary and outlook

The development of China's animal husbandry at various stages is closely linked to the transformation of the main social contradictions and the center of gravity of economic development. In the context of comprehensively promoting the rural revitalization strategy, the high-quality development of animal husbandry is an inevitable requirement to achieve the development goals at the current stage, which is also of great significance to promote the prosperity of rural industries, achieve green agricultural development and common prosperity[1]. The high-quality development of animal husbandry needs to rely on high-tech development and its standardization.

In livestock and poultry production, breeding technology is the core technology, which can improve efficiency, shorten time and improve genetic resources. With the development of biomolecular technology, animal genetic breeding is increasingly combined with molecular technology, and the advantages of genome-wide breeding, gene editing breeding and molecular design breeding are highlighted, and the application of scRNA-seq technology provides new technical methods for breeding practice[15].

ScRNA-seq technology has established extensive commercial production services at home and abroad, which has been increasingly reported in animal genetic breeding applications, as well as provided an important basis for early selection and selection of growth traits in animal husbandry. However, there is no relevant standard for the application of scRNA-seq technology in animal husbandry, and there is no systematic design and specification for samples collection and handling, construction of transcription libraries and sequencing, sequence alignment and analysis, data storage and security, and database establishment and management. As a result, it is very difficult to guarantee the reproducibility

and stability of scRNA-seq. Thus, scRNA-seq data cannot meet the end-use and discovery requirements, resulting in a serious waste of samples, human forces, funds and computational storage resources.

In a nutshell, the establishment of a unified standards system for the application of scRNA-seq technology in animal husbandry is of great significance to promote the standardized and orderly development of single-cell sequencing in China.

References

[1] Jun L, Li-Sha P. Main Contradictions and Solutions to the High-Quality Development of Animal Husbandry in the Context of Rural Revitalization [J]. *Jingji Zongheng*, 2022, (8): 58-64.
[2] Li X, Zhang Z, Liu M, et al. Establishment of a lncRNA-Based Prognostic Gene Signature Associated With Altered Immune Responses in HCC [J]. *Front Immunol*, 2022, 13:880288.
[3] Zhang B, Xia S, Liu M, et al. Interruption of Klf5 acetylation in basal progenitor cells promotes luminal commitment by activating Notch signaling [J]. *J Genet Genomics*, 2022, 49 (6): 579-582.
[4] Fletcher R B, Das D, Gadye L, et al. Deconstructing Olfactory Stem Cell Trajectories at Single-Cell Resolution[J]. *Cell Stem Cell*, 2017, 20 (6): 817-830.e8.
[5] Yilmaz S, Singh A K. Single cell genome sequencing [J]. *Curr Opin Biotechnol*, 2012, 23 (3): 437-43.
[6] Liu Y, Jeraldo P, Jang J S, et al.Bacterial Single Cell Whole Transcriptome Amplification in Microfluidic Platform Shows Putative Gene Expression Heterogeneity [J]. *Anal Chem*, 2019, 91 (13): 8036-8044.
[7] Wen L, Tang F. Recent advances in single-cell sequencing technologies [J]. *Precis Clin Med*, 2022, 5 (1): pbac002.
[8] Wang S, Karikomi M, Maclean A L, et al. Cell lineage and communication network inference via optimization for single-cell transcriptomics [J]. *Nucleic Acids Res*, 2019, 47 (11): e66.
[9] Tang F, Barbacioru C, Wang Y, et al. mRNA-Seq whole-transcriptome analysis of a single cell [J]. *Nat Methods*, 2009, 6 (5): 377-82.
[10] Estermann M A, Williams S, Hirst C E, et al. Insights into Gonadal Sex Differentiation Provided by Single-Cell Transcriptomics in the Chicken Embryo [J]. *Cell Rep*, 2020, 31 (1): 107491.
[11] Qiu K, Xu D, Wang L, et al. Association Analysis of Single-Cell RNA Sequencing and Proteomics Reveals a Vital Role of Ca (2+) Signaling in the Determination of Skeletal Muscle Development Potential [J]. *Cells*, 2020, 9 (4).
[12] Soto D A, Ross P J.Similarities between bovine and human germline development revealed by single-cell RNA sequencing [J]. *Reproduction*, 2021, 161 (3): 239-253.
[13] Yang H, Ma J, Wan Z, et al. Characterization of sheep spermatogenesis through single-cell RNA sequencing [J]. *FASEB* J, 2021, 35 (2): e21187.
[14] Wu J J, Zhu S, Gu F, et al. Cross-tissue single-cell transcriptomic landscape reveals the key cell subtypes and their potential roles in the nutrient absorption and metabolism in dairy cattle [J]. *J Adv Res*, 2022, 37: 1-18.
[15] Ritchie M E, Phipson B, Wu D, et al. Limma powers differential expression analyses for RNA-sequencing and microarray studies [J]. *Nucleic Acids Res*, 2015, 43 (7): e47.

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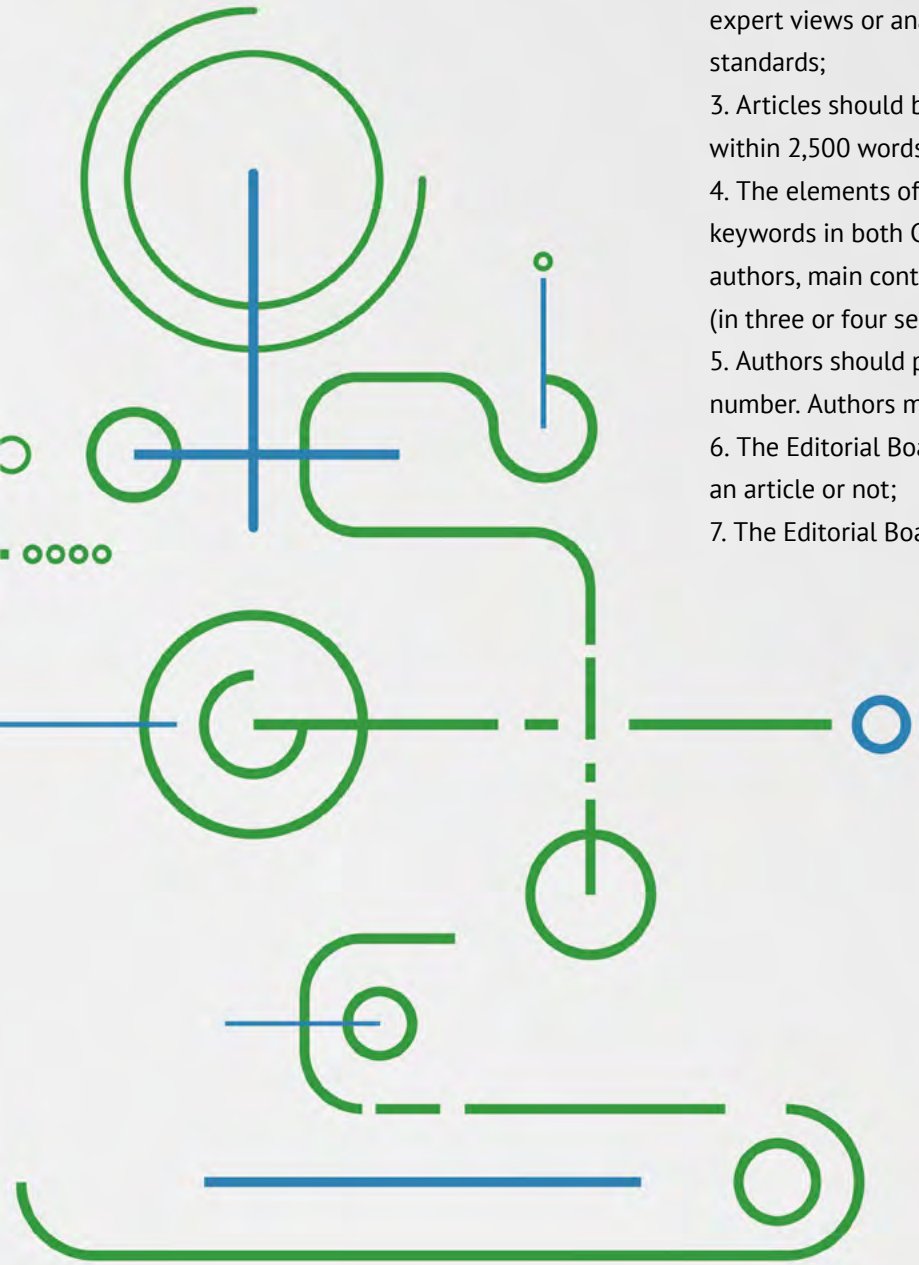

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ISSN 1672-5700
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9 771672 570238

Overseas Distributor: China International Book Trading Corporation
Distribution Number: BM5708
Postal Subscription Number: 80-136
Price: $30.00 ¥50.00