

Comments on “Study on People's Republic of China (PRC) Policies and Influence in the Development of International Standards for Emerging Technologies”

Submitted response to Federal Register by the U.S. Technical Advisory Group

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Comments on PRC standards policies and competitiveness

1. We noted in roughly the 2015 timeframe (start of “Made in China”) an increase in the number of technical papers authored by PRC Subject Matter Experts (SMEs).
 - a. We generally noted during journal peer reviews that these papers have at times been very similar in content to other papers, algorithms, and process papers published in technical literature, at times by our own U.S. authors. We have noted this in our peer review submissions.
 - b. It has been observed when chairing technical conference sessions that impedances such as difficulty in obtaining visas significantly limits PRC participation in conferences where papers had been accepted as being worthy of presentation. This in turn has led to an above average withdrawal rate for PRC conference papers.
2. PRC experts working on the technical details of making space standards work are "civilian" professionals. They are career professionals, spanning recent university graduates up to those readying for retirement who have never worn a uniform. They are proud of their country and their personal roles as engineers and scientists. Science and Technology Mobilization is a part of all Chinese thrusts.
3. PRC continues to establish itself as a major player in the global space industry. From their perspective China has been a space pioneering country, with the founding of CAST in 1957, launch of their first sounding rocket in mid-1960s, and successful operations of their first spacecraft in 1970 (Dong Fang Hong-1, DFH-1 spacecraft). By design, the PRC is building space capability in and for countries that the U.S. has not yet built strong relationships with. It is often the case where they work with countries the US has placed on a “watch list” for technology export. They are not "giving" technology away but rather are partnering with the "space agencies" of countries such as Pakistan, Nigeria, Bolivia, Brazil, India, France, etc. to build facilities.
4. In the case of Assembly, Integration and Test (AIT), the people at the Beijing Institute for Space Environment Engineering (BISSE) are partnering to modernize their facilities, build facilities for partners using their practices and building (international) standards to facilitate global market growth. BISSE is part of CAST (Chinese Academy of Space Technology). In SC14 we are also seeing (Chinese Academy of Launch Technology), along with CAST, making those international market links and contributions to future standards.
5. BISSE invites international technical experts to participate in workshops to further understanding of individual standards. Fred Slane, U.S. convener of ISO TC20/SC14/WG2, has participated in two of these, expenses paid by BISSE (Slane participated after full disclosure to

the US DOS.) As reported earlier, Slane's assessment is that BISEE possibly may have one of the world's most sophisticated AIT facilities.

6. Within the space community, China has grown its participation in the development of international standards. Today, China is a willing participant and contributor to standards development and the consensus-building process.
 - a. Specifically in ISO TC20/SC14, China has delegates participating in all seven working groups, including WG2: Interfaces, Integration and Test, WG3: Space Systems: Operations and Ground Equipment, WG 5: Space Systems - Programme Management and Quality, and WG7: Space Systems: Orbital Debris Mitigation.
 - b. In 1998 the US (with Aerospace Corporation as the project lead) abandoned work on ISO 15862 (Space systems — LV-SC flight environment requirements for telemetry data processing) due to ITAR concerns. In the ensuing vacuum, China assumed the Project Lead role. In 2007, the first Chinese-led international standard, ISO 15862, was published.
 - c. China has both project lead and co-project lead status on several SC14 standards and specifications, including ISO 23312:2021, "Space Systems – Detailed space debris mitigation requirements for spacecraft (which is now in FDIS stage), ISO 21886: 2019, "Space systems - Configuration management", and a long list of AIT standards related to work by BISEE.
7. In general, Chinese difficulties in obtaining visas for travel to western countries, coupled with cost and resource limitations, have hampered Chinese participation in standards development activities. This at times leads to an in-country person (who likely does not have the requisite subject matter expertise) coming to the ISO plenary or fall meetings to represent the actual author. This in turn leads to a lack of continuity from one meeting to the next, because the presenter on a given work item is frequently changing.
8. One of the central requirements for a standard to be developed and published is that it must have market relevance. This may be a difficult concept to grasp. Some standards and New Work Item Proposals (NWIPs) submitted by PRC SMEs may be of academic interest but may not have market relevance or reflect a global operational need.
9. Resource prioritization in standards development
 - a. It is fairly apparent that delegates from China participating in standards development are given substantial resources to develop a standard (i.e., not a Technical Report or Technical Specification). If a Project Lead fails to develop and publish a standard, it seems that they may be replaced by another SME who may perhaps have greater success in getting a standard published. This has appeared at times to lead to an insistence on a given work item generating a standard, even if a Technical Report (informational, non-normative) or Technical Specification might be a better choice at the present time.
 - b. The language barrier (Chinese/English) has made it very difficult for Chinese SMEs to author and/or contribute to standards development initiatives. Primarily for this reason, the English-speaking volunteer resources available to help Chinese colleagues to assemble a coherent, market-relevant, useful standard can be quite limited, with the result that standards can move slowly and not get the attention and advance/cancel decision they need. This also can make it more difficult to advance other standards

- being drafted by other P-Member countries. Recently, there has been greater support from English-speaking countries to assist Project Leads to use better technical language.
10. In our standards development activities, our Chinese colleagues often state that they have a standard which contains relevant content. Although we have requested copies, our ISO subcommittees have not succeeded in obtaining copies of the Chinese standards being referred to. Chinese standards do exist, but not in English. As recently as 2006 an internet link to the Chinese standards library was accessible, but that has not been explored in recent times.

Comments on U.S. standards policies and competitiveness

1. Regarding bolstering US government and industry participation, US policy requires US government organizations to participate in open standards development and to use those standards. Other countries have a similar policy. But in the US, many NASA and DoD space programs are given a waiver to this policy by respective agency Headquarters. There is an accompanying policy/law/regulation/directive that each of these programs have an architecture, which implicitly would bring existing standards, that is also waived by respective agency Headquarters. NASA explicitly confirmed this in 2014. DoD/SMC has remained silent on this topic.
2. Commercially, space standards are unlikely to be prioritized by many commercial companies unless and until those commercial companies see direct value and relevance in such participation. The US Standards Strategy (<https://ansi.org/news/standards-news/all-news/2021/01/1-6-21-new-edition-of-the-united-states-standards-strategy>, downloadable at <https://share.ansi.org/Shared%20Documents/Standards%20Activities/NSSC/USSS-2020/USSS-2020-Edition.pdf>) emphasizes as its foundation the diverse and flexible development of voluntary consensus standards without favoring any particular Standards Development Organization (SDO). This has the benefit of promoting new, innovative best practices. But as the strategy also notes, we need to work to eliminate redundancies and overlaps in standards, as well as to ensure that we don't diversify our standards development participation to the extent that industrial and government organizations are not able to effectively contribute to SDOs such as ISO and CCSDS at the level that others (EU countries, China, Russia) do.
3. Note that ISO has a "One country, one vote" construct. The United States, Russia, and China are therefore placed at a disadvantage as compared to unions of countries such as the EU in terms of supporting our interests. This places an emphasis on the need to achieve consensus with other P-Member entities where possible, without being forced to embrace the wills of other countries.
4. Leadership in standards work is an opportunity for the US to step up as leaders in space development and expanding markets. To enable those who would "boldly go..." Being strongly engaged in space standards development, now, assures that our country's values and practices will be represented in the space industry of the future. If we change nothing ("lead" from behind a protectionist regulatory wall), then others will move ahead without us.