BUSINESS PLAN
ISO/TC 20

EXECUTIVE SUMMARY

ISO Technical Committee (TC) 20, Aircraft and Space Vehicles, develops international standards for the global aerospace industry. This complex, high technology, competitive industry has changed the way humans travel, transport goods, communicate, and live on a daily basis.

The industry is characterized by long life cycles, heavy upfront investments, and increasing development costs. International standards are vital to ensure the quality, interoperability, connectivity, and safety of aerospace products. TC 20 has broad representation from all regions of the globe involved in the aerospace industry.

TC 20 seeks a collaborative approach to meet the standardization needs of the aerospace industry, maximizing the time and resources of industry experts while seeking to reduce duplication of effort.

In addition to the existing 600+ standards developed through 11 subcommittees, TC 20 will focus on standards to support emerging technology areas including, but not limited to Autonomous systems, Internet of Things (IoT), Unmanned Aircraft Systems, Distributed Ledger (Blockchain), Digital Transformation, Cyber Security, Electric Aircraft, and Hybrid Electric Propulsion. TC 20 endeavors to support the UN Sustainable Development Goals.
1 INTRODUCTION

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of ITU (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 140 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the International Standard.

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2 BUSINESS ENVIRONMENT OF ISO/TC 20

2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:
2.1.1 **Context**

To understand the competitiveness of the aerospace industry one needs to know the particularities of this unique industry: the high technological level, the technological complexity which this sector has developed since the beginning of aviation, the high increasing development costs, long life cycles, heavy upfront investments, and high interdependencies between civil and defense markets.

2.1.2 **Technical changes and innovations**

The aerospace industry has benefitted from many different innovations and technical changes; significant innovations include the use of electrical flight control, engines with lower emissions, composite materials, and the use of additive manufacturing. The challenges for the coming decades will be the transition to electric-powered aircraft, autonomous vehicles, digitalization, more environmentally friendly materials and cybersecurity.

2.1.3 **Relevant stakeholders**

Maturity of domestic markets has driven companies to pursue international expansion more aggressively. Aircraft and space vehicle manufacturers and operators with global presence maintain headquarters in North and South America, Europe, Russia, and Asia-Pacific. The US and Europe hold most of the market share in the aerospace industry, but demands for aerospace standardization work will grow to meet the expanding worldwide market for aerospace applications, especially in new technologies and new designs as there is more active participation from the eastern part of the globe.

2.1.4 **Major factors related to suppliers, manufacturers, and customers**

There are several factors that impact the industry. One industry objective is to stay environmentally sound and energy efficient while meeting demands for higher performance at lower cost and complying with environmental regulations that restrict the use and/or disposal of materials. Another factor is the increasing the development of IT, flight entertainment, data management, and communication between in-flight systems or UAVs. In these areas, physical security and cyber security are critical, but even more so as more efficient air traffic control systems such as SESAR and NextGen are deployed. The space marketplace is increasingly competitive with low-cost launch programs and small-satellites. Other factors will influence strongly the aerospace industry in the coming years: safety and performance of batteries, digitalization, additive manufacturing or artificial intelligence reliability for autonomous vehicles. These factors explicitly demonstrate the need for aerospace international standards.

2.1.5 **Other relevant international, regional or national standards or voluntary initiatives**

There are many organizations that issue internationally used standards and are involved in Standardization activities. ISO/TC 20 will pay specific attention to standardization efforts by liaisons to the committee (see the TC 20 webpage for a list of liaisons, [https://www.iso.org/committee/46484.html](https://www.iso.org/committee/46484.html)).

2.2 **Quantitative Indicators of the Business Environment**

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of ISO/TC 20:
The global aerospace and defense (A&D) sector, valued at US$838 billion (2017), the global aerospace and defense sector revenues grew at a CAGR of 3.4%.

Over the next 2 decades, passenger traffic is expected to grow at an average annual growth rate of 4.7%, forcing Industry to increase aircraft production (the aircraft deliveries could increase to over 2000 aircraft delivered per year i.e. 25% more than in 2017).

The top 10 countries represent 87% of the global A&D revenues. All of them are represented in ISO TC 20.

Aircraft & Engine OEMs represent 28% of the aerospace economic activity (Aircraft systems & Component manufacturing 26%, Civil & Military MRO 27%, Satellites & Space, 7% and Missiles & UAV 5%).

For space activities, new markets emerge like lower cost space launcher companies, small-satellites (2400 will be launched through 2023 - mass production - mega-constellation) and new business models and partnerships (Airbus aerial fuses satellite and drone imagery – Intel and Intelsat for 5G spectrum share).

ISO TC 20 and its subcommittees have published 679 ISO standards making it one of ISO’s most active technical committees.

The SI system is the basic measurement system for TC 20 standards. However, the aerospace industry has a huge legacy of technical standards based on the English (inch-based) system which needs to be continuously supported for reasons of safety and quality. Therefore, the English measurement system will continue to be issued and adopted whenever required by industry.

3 BENEFITS EXPECTED FROM THE WORK OF ISO/TC 20

The aerospace industry is a global industry, with products that are manufactured, assembled, operated and maintained worldwide. Its supply chain extends to every corner of the Earth. International standards are vital to ensure the quality, interoperability, connectivity, and safety of aerospace products.

The aerospace industry uses a large number of standards developed by many different enterprises and organizations. Having to comply with duplicative, overlapping, or inconsistent requirements in standards places a costly burden on the industry. The use of ISO/TC20 as the prime platform for developing international standards will significantly reduce cost to industry, save the very valuable and limited resources of industry experts from participating in redundant standardization activities at different levels, and eventually reduce the overall quantity of aerospace standards.

ISO/TC 20 and its subcommittees provide airworthiness authorities (FAA in USA, EASA in European Union, CAAC in China, etc.) with globally relevant standards as a basis for certification. More close cooperation with regulatory agencies is further explored by ISO/TC20 to provide the industry confidence in using ISO standards.

ISO/TC 20 and its subcommittees provide a range of international standards that are used in civil and defense applications and support global collaboration.

Social, safety, health and environmental concerns including emissions, resource use and waste, sustainability, end-of-life reclamation, reduction and elimination of hazardous chemicals and materials will be addressed by ISO/TC20 and its subcommittees.

Emerging technologies such as Autonomous systems, IoT, Blockchain, Digital transformation, Cyber Security, Electric Aircraft & Hybrid Electric Propulsion will be priorities of ISO/TC 20 and its subcommittees in future development.
Stakeholders will find ISO/TC20 to be the best place to develop internationally recognized standards, addressing emerging standardization issues, sharing experience and knowledge, and leveraging different levels (Regional, national, industrial) of standardization activities.

4 REPRESENTATION AND PARTICIPATION IN ISO/TC 20

Countries/ISO members bodies that are P and O members of the ISO committee

4.1 Analysis of participation

ISO/TC 20 has Participating Member participation from countries with significant aerospace manufacturing and Observing Member participation from most countries with aerospace business activities. North and South America, Europe, and Asia are well represented at the TC 20 level. Several subcommittees lack participation from various countries and TC 20 works to encourage participation from these missing countries.

ISO/TC 20 has liaisons with many related ISO committees and coordinates on areas of mutual interest when appropriate. TC 20 currently has one category A liaison with ASD-STAN (AeroSpace and Defence Industries Association of Europe – Standardization). The full list of liaisons to ISO/TC 20 is available on the ISO website.

5 OBJECTIVES OF ISO/TC 20 AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of ISO/TC 20

- To ensure that internationally accepted standards exist for the design, construction, test and evaluation, operation, air traffic management, maintenance and disposal of components, equipment and systems of aircraft and space vehicles, including issues related to safety, reliability and the environment.
- As required, produce, maintain and assure these standards are cost effective and correspond to users’ and market needs and that they support the technical projects of the sector.
- Reduce the time to deliver aerospace business driven standards to the end user. ISO/TC 20 will continue to look for process improvements, which will reduce the standards delivery cycle to be competitive with those of other major aerospace standards developing organizations.

5.2 Identified strategies to achieve ISO/TC 20’s defined objectives

- Encourage active participation in TC 20 activities by regulatory agencies.
- Further standardization for credential and educational demands (international standards for certification) recognizing the work done by the IAQG (e.g. EN/AS/JS 9100 and EN/AS/JS 9133).
- Support the reduction of efforts for control and certifications for multiple national and international audit processes and certifications through recognition of and cooperation with certification organizations such as PRI, SAE-ITC and ASD-CERT.
- Reinforce communication between ISO/TC 20 and its mirror committees to facilitate the use and adoption of TC 20 standards.
- Encourage development of standards offering dual use potential (civil and military).
• Protect the environment, by more involvement in the development of standards that address environmental issues and their effects on the manufacture, operation, and end-of-life of aerospace products (e.g., noise, emissions, fuel consumption, recycling, SSA etc.).
• Improve the visibility on all subcommittee work programmes and promote more cross cutting work modes.
• Define a process to pick out common topics to escalate them at the right level within ISO Organisation (interface with others TCs).
• Encourage active participation in TC 20 activities by Research and Development or innovation organisations.

5.3 Standard operating procedures

• Take into account aircraft, defence and space vehicle international standardization needs and understand where those needs are already being met by other standardization bodies.
• Organize TC 20 subcommittees and working groups as necessary to provide standards in those areas not adequately served by existing activities.
• Support the reduction in the number of national standards and promote global standardization by encouraging the migration of national and European standards to the ISO-level or through recognition of already globally used standards developed by other organizations.
• Maintain and encourage consistent links with national, regional or international organizations (i.e. IEC) publishing standards, to coordinate preparation and maintenance standards procedures.
• Encourage active mutual participation in TC 20 activities by aerospace-related standards developing organizations.
• Recognize standardization issues raised by other bodies concerned with development and maintenance of international standards for aircraft and space vehicles. When required, provide a forum to discuss and resolve these issues.
• Focus on achieving international commonality on the basic subjects of:
  o terminology, coding, definitions
  o testing methods
  o widely used technical specifications
  o dimensional and functional interfaces
  o procedures and methods for qualification
• Prioritize activities by taking the following into account:
  o Elimination of trade barriers
  o Safety, health and protection of life and environment
  o Interface, interchangeability and interoperability
  o Fitness for purpose (performance requirements)
  o Coherency between design, production and test methods.

6 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

This section is a guide on how the business plan can be more successfully implemented, considering current industry, ISO process, and outside environment issues.
6.1 Industry Issues

- ISO/TC 20 has to ensure that all secretariats (TC, SC and WG) are supported by a professional National Member Body Organisation to ensure that all ISO processes are well known and well applied. A minimum development time period has to be provided, as well as the further development of the ISO Standardisation Processes according to the Standardisation needs. This will minimise the perception throughout the aerospace industry that the ISO process is not responsive to industries’ needs.
- While it is understood that for the foreseeable future, resources for aerospace standardization work could be lower than has been historically the case (see 6.2 Process Issues), attention still needs to be paid to the need to apply resources to international standardisation. Of course, there will be competition for these resources from the business needs of individual companies as well as from industry, national, regional and international standardization efforts. Commitment of resources at a company level to support international standardization efforts will be driven primarily by specific business requirements and priorities as well as the inherent fluctuations of the global economy, so it is important to argue the case that applying resources to standardisation does also benefit our industry programmes.
- Industry and regional standards developing organizations each have their own business interests in promoting/protecting the standards that they develop, but this can be achieved with due consideration for international standardisation.
- National working-groups can support ISO and not duplicate ISO standards with national standards.
- By being better engaged in the international standards development process, some manufacturers will become more comfortable with industry and national/regional standards, and use these where appropriate with their company generated and controlled standards.
- Challenge that low priority is given by senior management due to short term objectives and return on investment, i.e. standardization has a medium/long term R.O.I.
- Make relevant persons available as project leaders and experts.
- Make funding available to undertake the necessary pre/co-normative research to validate new test methods.
- Make available expertise with sufficient resources from industries, so that reviews by companies, answers to the votes, added value comments are not solely based on voluntary contribution and so avoids them being insufficiently elaborated.
- Write new international standards and revise existing widely used standards utilizing the inch system of measurement favoured by much of our industry.

6.2 ISO Process Issues

- Most secretariats support ISO/TC 20 subcommittee activities on a part time basis, so at times it is difficult for them to complete or progress the work programme, in addition to the fulfilment of regular secretariat duties including delivery of meeting agendas, organization of meetings, and formatting standards in the ISO template, etc.
- Sometimes it is difficult to find the required five P-members willing to participate in a project.
- There is a continuing difficulty in having adequate member attendance at TC 20 and its subcommittee meetings to do contributions. The cost for attending meetings continues to be a concern as well.
- It is costly to introduce new part numbers into an aerospace product because of the rigorous certification requirements. Also most new commercial aircraft are derivatives of existing aircraft. That means that to benefit from common parts inventories, it is often not cost effective to introduce new standards at the time of developing a new aircraft. Therefore ISO need to find a way to adopt such existing standards into the ISO system without changing the prime identifier of the standard.
6.3 Use of Livelink for ISO/TC 20 and all of the TC 20 Subcommittees

ISO/TC 20 and all of its SCs are afforded access to Livelink collaboration tool and should use Livelink to manage their work.

7 STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

This section gives an overview of the ISO/TC's structure, scopes of the ISO/TCs and any existing subcommittees and information on existing and planned standardization projects, publication of the ISO/TC and its subcommittees.

7.1 Structure of the ISO committee

7.2 Current projects of the ISO technical committee and its subcommittees

7.3 Publications of the ISO technical committee and its subcommittees

Reference information

Glossary of terms and abbreviations used in ISO/TC Business Plans

General information on the principles of ISO's technical work

Facts & Figures 2017, AeroSpace and Defence Industries Association of Europe (www.asd-europe.org)


2019 global aerospace and defense industry outlook. Deloitte.