ISO/TC 20
Aircraft and space vehicles

Business plan
2015
Our vision

To be the world’s leading provider of high quality, globally relevant International Standards through its members and stakeholders.

Our mission

ISO develops high quality voluntary International Standards that facilitate international exchange of goods and services, support sustainable and equitable economic growth, promote innovation and protect health, safety and the environment.

Our process

Our standards are developed by experts all over the world who work on a volunteer or part-time basis. We sell International Standards to recover the costs of organizing this process and making standards widely available.

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ISO/TC 20, Aircraft and space vehicles

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Executive summary

- The principal markets utilizing ISO/TC 20 standards are aircraft and space systems manufacturers and operators. With expanding international participation and cooperation in aerospace design and manufacturing, it is important for the industry sector, governments, users, public interest groups, suppliers, etc., to adopt international standards to facilitate this global market.

- The international demand for cooperation in outer space exploration and research with the development of telecommunication capacity, weather prediction, navigations, etc., is fostering an expanding commercial space market place resulting in an international customer base for aerospace products. The customer base for aerospace products is international. Products must be capable of being certified, operated and maintained in all nations that a buyer (commercial airline, space launch provider, etc.) intends to operate.

- To serve this market manufacturers of aerospace products from across the globe have found it necessary to work together under partnerships, consortia and buyer/supplier relationships for design, development, manufacture, operation and maintenance. Safety, reliability and interoperability are fundamental to all aspects of this market. This requires that a systematic approach be taken with respect to all aspects of aerospace products. This also means that all aerospace products are the subject of rigorous requirements established by national and international regulatory agencies.

- Some of the qualitative benefits are: improvement of product quality, reduction in the variety of standards called for a specific product, reduction in the number of different standards to be managed in aeronautics by operating customers such as airlines, maintenance and support facilities, common terminology to allow for communication of complicated design requirements, common test methods, and systems definitions, facilitation of product and system certification, and coordination of aerospace standards activities.

- The main objectives of ISO/TC 20 are:
  1. To set a clear target for the standardization work of TC 20.
  2. To make a specific priority list of standardization work of TC 20 for public review and comment.
  3. To address the impact of emerging technology that may lead to potential standardization work in the aerospace arena. To attract more participation from interested parties in these subjects.
  4. 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. And as required, produce, maintain and assure these standards are produced cost effectively and correspond to users’ and market needs and to support the technical projects of the sector.
# ISO/TC 20

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INTRODUCTION

0.1 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 regular reviews. The aim is:

- To align the ISO work programme with expressed business environment needs and trends
- To allow ISO/TCs to prioritize among different projects
- To identify the benefits expected from the availability of International Standards
- To ensure adequate resources for projects throughout their development.

0.2 International standardization and the role of ISO

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

b) 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).

c) 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.

d) The principal deliverable of ISO is the International Standard.

e) 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.

f) 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.
1 BUSINESS ENVIRONMENT OF THE ISO/TC

1.1 Description of the Business Environment

a) 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:

b) The market covered by the scope of this committee includes the entire spectrum of aerospace industry for the design, manufacture, test and evaluation, operation and maintenance of components, equipment and subsystems for general aviation, commercial aircraft and space systems. It also serves the military aerospace market to the extent that military aerospace products can utilize commercial aerospace standards.

1.2 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 the ISO/TC:

The global aerospace and defence (A&D) sector, valued at US$920.6 billion (2009), grew at 8.7 percent CAGR for the period spanning 2005 to 2009. Defence is the largest segment accounting for around 71.8 percent (US$660.8 billion) of the sector's total value, with the rest (US$259.8 billion) comprising the civil aviation sector. The United States is the largest market, accounting for 59 percent of the global aerospace and defence sector value, followed by Europe with 22 percent share and Asia-Pacific with 19 percent share. Boeing (USA) is the leading market player with 7.4 percent share of the sector's value followed by EADS (Netherlands) with 6.5 percent share, Lockheed Martin Corporation (USA) with 4.9 percent share and BAE Systems Plc (UK) with 3.8 percent share.

The aerospace industry is hopeful about the future as the sector is expected to grow at a 5-year CAGR of 5.3 percent between 2009 and 2014. The market is predicted to be valued at US$1,190.5 billion by end of 2014. This positive outlook can be attributed to a positive GDP growth outlook, rising incomes, improving health of airlines, and the large order backlogs with airframers (Boeing, EADS). Demand for air travel is pegged to economic growth. In the second half of 2009 the world's economy began to recover from the sharp economic downturn. On a geographical basis, GDP is expected to grow at an average 2.7 percent in North America and 1.9 percent in Europe but as fast as 7.4 percent in China for the next 20 years. With the growth of North American and European economies expected below the global 20-year average of 3.2 percent, airline passenger and fleet growth rates in Europe are anticipated to be proportionately slower in comparison to emerging.

1.2.1 Description of the market structure and the major market players

a) Maturity of domestic markets has driven companies to pursue international expansion more aggressively. The information technology revolution, the rise of newly industrializing countries, and the growing confluence of cultural tastes have all contributed to unprecedented global business opportunities. Aircraft and space vehicle manufacturers and operators with global presence maintain headquarters in the USA, Europe, and Asia. The USA and Europe hold most of the market share in the aerospace industry, but demands for aerospace standardization work will grow to meet the expanding world-wide market for aerospace applications, especially in maturing technologies and new designs. The increasingly global nature of the aerospace industry has also increased the demand for International Standards, which can be used to facilitate co-production efforts, reduce costs, and eliminate differing regulatory standards that have become a major trade barrier.

b) The balance between the key elements in national industries will vary in accordance with domestic strengths and priorities such as technological capability, the relative importance of civil and military applications and the imperatives of import and export.

1.2.2 Particularities of the Industry

To understand the competitiveness of the aerospace industry one needs to know the particularities of this unique industry. The following eight points depict the peculiarities of the aerospace industry. These strongly influence the structure and evolution of the production organisation, the localisation of activities and – last but not least – the relationship between the stakeholders:

a) High technological level;

b) Technological complexity;

c) High and increasing development costs;

d) Long break even periods and small markets;

e) Heavy upfront investments and exceptionally long cycle time;

f) Programme lives;

g) High interdependencies between civil and defence markets;

h) Strategic industry.
1.2.3 Structure of the market: Suppliers/Manufacturers

1.2.3.1 Major product categories and their relative market shares

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft and Aircraft Parts</td>
<td>51.7 %</td>
</tr>
<tr>
<td>Engines and Engine Parts</td>
<td>15.6 %</td>
</tr>
<tr>
<td>MRO</td>
<td>19.6 %</td>
</tr>
<tr>
<td>Space Launches and MFG</td>
<td>12.4 %</td>
</tr>
<tr>
<td>Training</td>
<td>0.7 %</td>
</tr>
</tbody>
</table>

1.2.3.2 Growth sectors in the market

The growth sectors in the market are mainly:

- Aircraft structural parts and engine components
- Missile systems
- Launch vehicles
- Spacecraft
- Ground Infrastructure

1.2.3.3 Major technologies used in the production and use of major products

The major technologies used in the production and use of major products are:

- Metallic and non-metallic materials (composites)
- Computer and communication technologies
- Gas turbine technology
- Rocket propulsion technology

1.2.3.4 Resources for aerospace work

Resources for aerospace work will be increasing to meet the growing global markets for aerospace applications, especially for maturing technologies and new designs, which will affect standardization activities.

1.2.3.4.1 Civil aircraft sales

Civil aircraft sales increased slightly from 2009 through 2010, $98.5Bn, about 10% improvement noted in 2011 and continued on an upward trend in 2012. Sales in 2013 are estimated to rise approximately 11%.
1.2.3.4.2 Space sales

<table>
<thead>
<tr>
<th>Space Systems Products and Services</th>
<th>2010</th>
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<tr>
<td>Commercial Infrastructure (Satellite Manufacturing, Launch)</td>
<td>$87.39B</td>
</tr>
<tr>
<td>Commercial Space Products and Services</td>
<td>$102B</td>
</tr>
<tr>
<td>Commercial Transportation Services (Tourism)</td>
<td>$0.01B</td>
</tr>
<tr>
<td>U.S. Government Space Budgets</td>
<td>$64.63B</td>
</tr>
<tr>
<td>Other Government Space Budgets</td>
<td>$22.49B</td>
</tr>
<tr>
<td>Totals</td>
<td>$276.52B</td>
</tr>
</tbody>
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The following are dependent on National Defence Policies:

1.2.3.4.3 Military aircraft sales

Sales of military aircraft, engines, and parts have decreased. Reduced exports were largely responsible for the military aircraft sector's sales decline during the year. Fewer foreign deliveries of fighters and military transports pulled military aircraft exports down. The military aircraft sector is fundamentally driven by the US and EU Defence funding for aircraft procurement.

1.2.3.4.4 Missile sales

US DoD's funding of missile research and development, with its emphasis on missile defense, has aided industry in maintaining its technological prowess during this period of declining production.

1.2.4 Structure of the market: Customers/Buyers (descriptive and quantitative)

The near-future market outlook for the global demand for aircraft and space vehicles is uncertain. From 2003 through 2012, the market experienced spectacular growth. However, the growth cycle appears to be maturing and trending toward more modest increases.

1.2.4.1 North America

a) United States

In the United States (U.S.), aerospace industry sales are expected to reach $218 billion in 2012, up 4.9 percent from 2011. This year marked the third consecutive year of growth for the U.S. aerospace industry. U.S. aerospace orders were stable since 2010, at around $242B. Aerospace backlog, has been increasing since 2009 after a sharp decrease in 2008. The U.S. aerospace industry is vitally important to the domestic economy. It is the leading net exporter in the country and provides employment for more than 630,000 workers. Its products and services are the backbone of many other industries that are dependent on air transportation and worldwide communications. Despite the challenging current market conditions, the aerospace industry is an integral component
of modern society and business. Consequently, when the overall economy improves, the aerospace industry will rebound accordingly.

Although Japan is the largest single country export market for the United States aerospace industry, combined U.S. aerospace exports to France, the United Kingdom, and Germany, the EU’s three largest aerospace markets, illustrate the importance of the region for both the U.S. and EU aerospace markets. European aerospace companies supply the full range of aerospace products and services, from large civil aircraft, to satellites, to subassemblies and components. Consequently, European firms are both important partners and competitors for U.S. firms.

b) Canada

According to the Aerospace Industries Association Canada, Canada’s aerospace sector generates more than $22 billion and exports 80% of its output. Aircraft and Engine sales make up over 68 percent of this revenue. Investments of over $2 Billion make the aerospace industry the second largest R&D investor in Canada. Aerospace is responsible for the employment of 160,000 Canadians.

c) Mexico

The Mexican Federation of Aerospace Industries, A.C. (FEMIA®), a nonprofit association which integrates the majority of the of the aerospace companies in Mexico reports that the country’s Aerospace industrial sector has more than 31,000 workers in 260 companies, in the manufacturing, services, and design engineering areas, and MRO. The industry has expanded rapidly in recent years, with aerospace exports increasing 279 percent since 2005 to more than $4.5 billion in 2011. Aerospace parts manufactured in Mexico include turbine fuselage and landing gear components, harnesses and cables, audio and video systems, and heat exchangers.

1.2.4.2 Europe

Europe is one of the most important markets for commercial aerospace products and space co-operation, and is also an important source for components of worldwide aerospace products. Aerospace industry sales Turnover: 171.5 Billion € .Aerospace R&D expenditure: 16.3 billion €. Aerospace Employment: 479,600, in accordance with “Facts and Figures 2011” published by ASD, (http://www.asd-europe.org/fileadmin/user_upload/Client_documents/Attachments/Facts Figures/ASD_Facts_and_Figures_2011.pdf)

Europe’s civil aviation sector has performed relatively well recently, despite the challenging and uncertain economic environment. Growth continues in the large civil aircraft, regional aviation, and helicopter sectors. However, the general and business aviation sector has been hurt by the worldwide downturn. Aerospace industry sales improved by nearly 23.4 percent from 2008 to 2011, reaching 171.5 billion €. From 2008 to 2011, European aerospace employment averaged 47,000.

The German air and space industry experienced growth of the overall industry 4.1% of total revenue reached 25.7 billion Euros (Previous year: EUR 24.7 billion). The number of employees increased 2.1%, from 95,400 to 97,400. Expenditures on research and development in 2011, was around 16.8% of industry sales at a similar level as in previous years.
According to ADS, the UK aerospace industry turnover for 2011 was £24.2 Bn; of which 92% was Aircraft and Rotary Wing sales.

### 1.2.4.3 Asia

China, India, Indonesia, Japan, Kazakhstan, Korea, Russian and the Ukraine account for the bulk of aerospace manufacturing activity in the Asia-Pacific region. As measured by sales, Japan has the sixth-largest aerospace industry worldwide.

Japan's aerospace production sales mostly come from the production of primary components and parts for foreign commercial and domestic military aircraft for defense and rescue.

In addition to supplying manufactured aerospace products to many airframers including Boeing and Airbus, Japan also manufactures aircraft engines. In 2010, total aerospace sales slipped 11 percent from a recent high of $11.5 billion, in part due to delays in the Boeing 787 program. Exports increased nearly 20 percent, reaching $6.4 billion in 2012, while imports rose more than 55 percent to $11.2 billion. Exports rose primarily because of several international joint projects, including the Boeing 777 and 787 aircrafts, and the V2500 and CF34 engines.

The future for China's general aviation and helicopter sector appears promising, as China is investing heavily in its civil aircraft industry and because of the tremendous growth potential of the country's domestic air travel industry. The Commercial Aircraft Corporation of China (COMAC) oversees the development of China's $7.1 billion indigenous 150-seat jet airliner program that will compete directly with Boeing and Airbus. China hopes to have its new 150-seater airliner in service by 2020 and is aiming at a potential domestic market of 2,200 narrow-bodied airliners. China's main weaknesses lie in engine and systems technology, although international collaboration on the 150-seat airliner will go some way to raising capabilities.

### 1.2.4.4 South America

The Brazilian Aerospace Industry is the largest in South America. The companies of this industrial conglomerate are involved in every stage of aeronautic, space and defense activities, including design, manufacturing, sales, customer support, and aerospace services.

The aeronautical segment offers a variety of products such as airplanes, helicopters, structural segments, engines, aircraft/engines parts, on board systems and equipment, and air traffic control systems.

Embraer, based in Brazil, is the world's third largest manufacturer of commercial aircraft. The defense segment presents aircraft designed to meet specific mission's requirements as well as weapon systems, equipment, non-guided and guided weapons, and systems integration. The AIAB (Aerospace Industries Association of Brazil) reports that the industry had sales of $ 6.8 Billion in 2011, 7.5 billion in 2012 and 7.5 billion in 2013. Aerospace employment reached 26,239 people in 2013. To consolidate the Brazilian space industry, the Brazilian Space Agency (AEB), according the National Program of Space Activities (PNAE) 2012-2021, developed an intensive program to foster the capacity building in the Brazilian space sector. The construction of the
Geostationary Defense and Strategic Communications Satellite (SGDC), to be built by a joint-venture company created by the state owned Telebras and a branch of the Embraer, is an example of this program. In order to implement this program, started in 2012, the Brazilian Space Agency (AEB) will invest $4 billion, with 47% allocated to satellite mission project, 17% to space access projects, 26% to space infrastructure and 10% to other spacial and complementary projects.

Brazil has relevant space cooperation agreements with other countries. With China, Brazil has a “global strategic partnership” to develop and produce the CBERS project – China-Brazil Earth Resources Satellite. Brazil and Ukraine formed a bi-national company “Alcântara Cyclone Space (ACS), for commercial launches using the Ukrainian vehicle from the Alcântara Launch Center (CLA). Brazil, also, has partnership with Germany and Argentina (SABIA – Mar end Multi- Mission Platform- PMM) and others.

In the National Program of Space Activities (PNAE) 2012-2021, the Brazilian Space Agency (AEB), also, stated that the standardization and certification of the Brazilians space activities are vital and a high priority, to this end, the Brazilians are adopting regulations that meets international standards in terms of space safety, quality of products and services, as well as universally accepted agreements and contracts.

The most representative Aerospace Industry in Argentina is FAdA, "Fábrica Argentina de Aviones “Brigadier San Martín”, a new state-owned company created at the end of 2009. The FAdA employs approximately 1,000 people and had annual sales about $100 million, largely from maintenance contracts with the Argentina Air Force. Some of most relevant programs are: manufacturing of the advanced trainer and light attack IA-63 Pampa aircraft; modernization of the Argentine aircraft IA-58 Pucara, maintenance and modernization of C-130 Hércules, and Fokker F-27 and F-28.

The National Commission on Space Activities (Comisión Nacional de Actividades Espaciales - CONAE) is the Argentine space agency, which coordinates all activities connected with the peaceful uses of outer space. CONAE is currently executing the National Space Plan “Argentina in Space” for 2004-2015.

1.2.4.5 Australia

Australia has a long history of aerospace manufacturing, and continues to provide world-class innovative products and services to the domestic and global aerospace sector. With capabilities ranging from the production of specialized components, to full maintenance, repair and overhaul services, the Australian aerospace industry is particularly well positioned to supply the Asia-Pacific region, a forecasted major aviation growth region.

Australia also possesses a significant and growing Unmanned Aerial Systems (UAS) manufacturing sector. There is currently a lot of activity directed toward the progression of aviation safety regulations for UAS in Australia, with regulations developed by the Civil Aviation Safety Authority (CASA) enabling the Australian UAS industry to grow to what it is today. The Australian Aerospace Industry UAS Sub-Committee has recently submitted a review of regulations and guidance material to CASA to assist in shaping the future of the Australian UAV industry.
The Australian aerospace industry has approximately 830 firms that employ 14,000 people; the industry has an annual turnover of more than $4 billion. Of this sum, 25% is exported.


1.2.5 Major factors related to suppliers, manufacturers, and customers

a) The major factors related to suppliers, manufacturers, and customers have an impact on the development of the markets (i.e. materials, environment, disposal requirements). Examples: REACh, US regulations and other similar environmental regulations restricting the use and/or disposal of materials and substances.

b) The major emerging factor is the increasing pressure on suppliers, manufacturers, and customers to compete in the global market place while addressing the growing requirements for protecting the environment and the rapid development of IT. These two drivers will often result in requirements for standards directly involved in fostering the use of materials, products, systems, services, and practices that are environmentally sound and energy efficient with demands for higher performance at lower cost, for competition and for innovation. All these have therefore become the top priority for all regions in the world. The understanding of aircraft and space vehicles performance and providing relevant requirements in the International Standards is therefore a vital issue.

c) Market requirements for new technology and product innovation, higher performance, reduction of costs as well as environmental and social aspects will also be the major factors impacting suppliers and manufacturers.

d) International air commerce is increasing both in volume and number of carriers. This requires increased attention to sufficient ground handling of aircraft, passengers, luggage and cargo. Common communication tools, such as symbols and labels will also be required.

e) The sharing of aircraft fleets is becoming a common practice. Leasing companies own and maintain an increasing share of aircraft. Increasingly independent companies provide maintenance and this trend of flexible sustainment is transitioning to the support of military aircraft. This places added importance on support commonality and increases the need for international standardization.

f) International participation and cooperation in aerospace design and manufacture is expanding. The number of prime manufacturers is decreasing through acquisitions and mergers causing the consolidation of multiple design systems. At the same time, there is a growing reliance on global suppliers who have increased responsibility for product design, fabrication, system integration and field support. These suppliers provide their products to multiple customers and in many instances multiple industries. International standards are needed to facilitate this process. Major new aircraft design programs are fostering international cooperation: It is recognized that manufacturers and operators of aerospace systems would benefit from better consolidation and standardization of fasteners, hydraulic components and other
types of utility hardware. Accomplishing this improvement world-wide will require a body of internationally accepted product standards which have been selected to avoid duplicate standards. Currently there is a large body of functionally acceptable regional, national and company standards available from which these could be selected.

g) The international demand for telecommunication capability, weather prediction, navigation etc. in both the developed and developing nations has fostered an expanding commercial space marketplace. Further, as the industrial space capability (both for spacecraft manufacturing and launch vehicle development) expands in the various nations, this market place becomes increasingly competitive at both the system and component levels. International standards for expressing both requirements as well as capabilities (or performance) and the means of verifying performance are therefore essential to facilitate fair and equitable trade that will result in reliable commercial space systems.

h) Collaboration on major international space programs (International Space Station, lunar and interplanetary exploratory missions, earth observation missions, etc.) has become essential due to ever increasing costs of such programs. The pooling of the various national aerospace resources as well as the program costs will continue to be a way of life in mankind’s continuing endeavour to explore the space horizons as well as preserve the natural resources of planet Earth. International standards are essential to ensure such programs can be reliably integrated in a cost-effective manner. Failure to respond to these trends will encourage the growth of national and regional standards that may not be compatible with each other.

i) Protecting the earth's environment has become a priority issue for all regions. Standards are directly involved in fostering the use of materials, products, systems, applications, and practices that are environmentally sound and energy efficient.

j) New more efficient air traffic control systems such as SESAR and NextGen will be deployed in the near future. Aircraft and ground support systems will be required to communicate and be interoperable with these new technologies.

k) Demand is expected to increase for communication bandwidth for use in unmanned aircraft systems.

l) Security and Cybersecurity.

1.2.6 Outside Environment Issues

a) Language barriers still exist among experts from non-English speaking countries. They need more time to review and study documents, and fail sometimes to efficiently express their technical views.

b) Different regions of the world use different processes for approving suppliers and qualifying standards parts. International acceptance of product standards requires an internationally accepted process for approving suppliers and for qualifying parts.

c) Technology growth is often faster than the current standard development cycle.
d) Legal/regulatory issues may necessitate modifications of the content and target dates for specific projects in the work program.

1.2.7 Other relevant international, regional or national standards or voluntary initiatives

a) There is increased emphasis on commercial and industrial standards in lieu of government-developed standards. As government-developed standards are replaced with commercial and industrial standards it is important that full consideration be given to making the replacement standards suitable for the global marketplace.

b) 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 the following organizations:

   **ADS** - ADS is the premier trade organisation advancing the UK Aerospace, Defence, Security and Space industries.

   **AIA** - Aerospace Industries Association - The Aerospace Industries Association represents the United States leading manufacturers and suppliers of civil, military, and business aircraft, helicopters, unmanned aircraft systems, space systems, aircraft engines, missiles, materiel, and related components, equipment, services, and information technology.

   **AIAA** - American Institution of Aeronautics and Astronautics - AIAA’s mission is to address the professional needs and interests of the past, current, and future aerospace workforce and to advance the state of aerospace science, engineering, technology, operations, and policy to benefit our global society.

   **ASD-STAN** - The legal successor of AECMA-STAN, this Standardization Committee is the recognized body in Europe for the preparation and promotion of European Standards (EN) for aerospace applications and is an Associated Body (ASB) to CEN, the European Body for Standardization.

   **ASTM International** - ASTM International is one of the largest voluntary standards development organizations in the world—a trusted source for technical standards for materials, products, systems, and services.

   **CEN** - The European Committee for Standardization (CEN) is a business facilitator in Europe, removing trade barriers for European industry and consumers. Its mission is to foster the European economy in global trading, the welfare of European citizens and the environment. Through its services it provides a platform for the development of European Standards and other technical specifications. CEN is a major provider of European Standards and technical specifications with the exception of electrotechnology (CENELEC) and telecommunication (ETSI). CEN’s 31 National Members work together to develop voluntary European Standards (ENs).

   **CCSDS** - Development of well integrated space data and information transfer systems recommendations for standardization, with the primary objective of enabling cross-support at national and international levels, with the use of resources which can observe interoperable profiles, associated to management and operational guidelines.
that can solidly and effectively contribute to the reduction of: Risk, Cost and of Project development timelines, in a very wide scope of space missions.

**DIN** - The German Institute for Standardization is a private organization providing standardization services in Germany. Because standardization is a form of industry self-regulation, DIN sees itself as a business partner in all sectors of the economy. In an agreement with the German Federal Government DIN is recognized as the sole national standards body representing German interests in international standardization. In return, DIN sees that the interests of society as a whole are taken into consideration in the standardization process.

**EUROCAE** - EUROCAE, the European Organisation for Civil Aviation Equipment was formed in Lucerne on 24 April 1963. EUROCAE has now been operating for more than 40 years as a non-profit organisation whose membership exclusively comprises aviation stakeholders made up of Manufacturers (aircraft, airborne equipment, ATM systems and ground equipment), Services Providers, National and International Aviation Authorities and Users (Airlines, Airports, operators) from Europe and elsewhere. From the outset, EUROCAE has developed performance specifications and other documents exclusively dedicated to the Aviation community. EUROCAE documents are widely referenced as a means of compliance to European Technical Standard Orders (ETSOs) and other regulatory documents.

**EUROCONTROL** - European Organization for the Safety of Air Navigation, is an intergovernmental organization bringing together 39 Member States and the European Community. Founded in 1960, it is a civil-military organization that has developed into a vital European repository of air traffic management (ATM) excellence, both leading and supporting ATM improvements across Europe. Today, EUROCONTROL is committed to building a Single European Sky that will deliver the ATM performance required for the 21st century and beyond.

**IAQG** - The International Aerospace for Quality Group is a cooperative global organization of companies providing aviation or space products (including platforms and systems) or services, and aviation, land or sea based systems for defense applications. The purpose of the IAQG is to implement initiatives that make significant improvements in quality and reductions in cost throughout the value stream by establishing and maintaining dynamic co-operation based on trust between international aerospace companies. The focus is to continually improve the processes used by the supply chain to deliver consistently high quality products, thereby reducing non-value added activities and cost. The Supply Chain Management Handbook (SCMH) is provided by the IAQG to assist with the advancement of quality practices.

**ECSS** – European Cooperation for Space Standardization – ECSS has the goal of the development of a single coherent set of space standards for use by the European space community. ECSS has an agreement with ISO/TC 20/SC 14 Subcommittee to harmonize work plans and coordinate activities. ECSS holds a liaison with ISO TC20/SC13 Subcommittee and with CCSDS.

**IEC** International Electrotechnical Commission - The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes international standards for all electrical, electronic and related technologies. These serve
as a basis for national standardization and as references when drafting international tenders and contracts.

**IEEE** - Institute of Electrical and Electronics Engineers (IEEE). IEEE is the world’s largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. The IEEE Standards Association (IEEE-SA) is a leading consensus building organization within IEEE that brings together a broad range of individuals and organizations from a wide range of technical and geographic points of origin to facilitate standards development and standards related collaboration. With collaborative thought leaders in more than 160 countries, the IEEE-SA promotes innovation, enables the creation and expansion of international markets and helps protect health and public safety.

**ITU** - International Telecommunication Union

**NSBs** (national standardisation bodies) - The standardization requirements for individual countries may be addressed by their national standards bodies. These bodies determine if the standardization needs are satisfied through international standards or independently developed.

**RTCA** - RTCA, Inc. is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues.

**SAE International** – SAE International supports the technical and professional needs of the mobility industries. SAE International is the single largest developer of globally recognized, accepted and used aerospace standards. SAE works closely with industry, government agencies and regulatory bodies to develop standards which meet the needs of the aerospace industry.

**US Department of Defense** – The United States Department of Defense has historically been one of the largest producers of standards used by the aerospace industry. Many US DoD standards have become de facto international standards used by the global aerospace industry.

**SSFA** – The Strategic Standardization Forum for Aerospace is a standards forum consisting of US Aerospace Companies, global and regional aerospace standards developers, US government agencies and regulatory bodies, and airline representatives who work together to address standardization issues which cross multiple stakeholder groups.

### 1.2.8 Recognition and Utilisation of ISO/TC 20 Standards

a) It is very important to recognize and utilize ISO/TC 20 standards, in order to increase existing or create new trade opportunities, to challenge national standards as being restrictive trade barriers, to unify technical requirements in the purpose of unifying markets, to strongly link between global trade and global production, and finally to rapidly open new markets around the world. In addition to the member bodies of the committee, users of TC 20 standards (suppliers, manufacturers, regulatory agency, liaison organizations and stakeholders) may be invited to participate in meetings and its sub-committees’ meetings to assist in the standards development process. If more people understand that the value of a standard is
not only determined primarily by its usefulness in gaining market acceptance of the product and the success of the standard in improving safety and quality of the product, but also is widely recognized and used, then more TC 20 standards will be utilized by them. Many of these standards are based on or form the basis of many basic product standards developed by national and regional aerospace standards developing organizations worldwide. An International Standard which states the consensus rules for designing, manufacturing, testing, inspecting, or installing a product or service on the commercial market holds significant value, and strengthens a company’s position in national and foreign markets, ensures product quality and safety, and sets them ahead of their competition.

b) 560 ISO standards have been developed and issued by ISO/TC 20 making it one of ISO’s most active technical committees. ISO/TC 20 standards also provide international definitions for the space environment and for space systems interchangeability and interoperability.

The SI system will be 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, English system standard will continue to be issued and adopted whenever required by industry.

2 Benefits Expected from the Work of the ISO/TC

a) An assessment of the specific benefits already realized or expected from the work of the ISO/TC 20 is based on general trends in Manufacturers policy and demands made by end-customers.

b) These benefits shall be dealt with through the following steps:
   - identification of the present context relating to Standardization in Aeronautics, Space and Defense
   - identification of qualitative benefits
   - tentative identification of quantitative benefits

2.1 Present context relating to Standardization in Aeronautics, Space and Defence

Since 2000, a new context has developed for the aeronautics, space and defence industry which is evolving more as a global Industry:

2.1.1 Aeronautics

a) It had been practice in the past, when customers were still largely under national or governmental influence, that prime manufacturers in aeronautics develop their own individual standards for their own products with very little use of internationally recognized standards. That old practice has had a significant and long lasting impact
on the variety of existing domestic standards used on existing aircraft fleets (at least in Europe), since any change in standard usage for a given product is considered as a modification of the approved design and requires that an approval process of that modification be implemented.

b) It has now become quite clear that common interests within the aeronautics industry are channelled through the usage of a limited number of common international technical standards. Key factors in that new context are:

c) Airlines in civilian aeronautics operating in a very competitive environment: most of them have become large organizations, driven by the market, and they are frequently complaining about the large variety of standards used on existing aircraft, which is for them a significant costly burden for support and maintenance.

d) While conformity assessment and standards are two separate activities, they are closely related. Certification of aerospace products by regulatory agencies (FAA, EASA) is based on the use of and conformance to standards. To the extent that the Aeronautics sector has started to harmonize standards and standards related data, the certification process is greatly facilitated and the associated costs are reduced (see International Aerospace Quality Group which represents one of the new strategies for global standardization, and has been established to help the aerospace industry implement the ISO 9000 Quality Management System).

e) The International Civil Aviation Organization (ICAO) has been functioning as an international standards developer for the aerospace industry in the areas of aircraft operations, noise, emissions, etc. These standards function as general regulations and need to be supported by specific standards.

f) The aeronautics industry needs to better articulate and understand the relationship between standards and conformity assessment. The industry needs to harmonize standards which form the basis for regulations. Qualification and certification are major cost drivers helping conformity assessment schemes which are mutually recognized and cost effective.

g) Military customers have introduced a new philosophy for their procurement: Having a large number of specific Military Standards created and monitored by Governmental Agencies has been found costly and inappropriate in the recent past. Consequently, new and existing military programs are now calling for civilian standards, or, appropriate industry standards (see section 3.1.4).

2.1.2 Space

a) The recent history of standardization shows that the major launch provider establishes the framework of standards for space systems. Space systems are defined as Space segments, Ground Segments and services (or applications). In general, requirements are set for each project individually. Agencies provide system requirements as standards for project application in general. Europe started in the mid 90s to provide a coherent, single set of user-friendly standards for use in all European as well as national (within Europe) space activities. Use of these standards has proliferated beyond Europe, esp. into the Asian-pacific sector.
b) In respect to the development of standards for Space Data Systems, a pioneering NASA-ESA effort in the late 70s and early 80s resulted in an effort of international scale, with the creation of the Consultative Committee for Space Data Systems - CCSDS, in 1982. Since then, an increasing number of CCSDS recommendations for standards and for Best practices resulted, with almost immediate application to space missions. In the early 90s CCSDS products started their migration to the ISO domain, to become ISO Standards and to involve countries with non-existent or a still-growing space program. Currently, well above 600 space missions, worldwide, have already adopted those Space Data Systems standards, for the benefit of their capabilities, which continue to involve the use of interoperable and of cross-supportable systems, configured in different combinations of ground, space link and on-board systems which, in many cases, operate under a true international scenario.

c) Private and public actors involved in space operations are increasingly aware of the threat of space debris. Some of these organizations have been applying measures to mitigate debris generation for many years. However, the population of debris continues to grow, and the probability of potentially-damaging collisions is increasing correspondingly. Because remediating the space environment is challenging with existing technologies, the most effective way to ensure the long-term sustainability of space activities at present is to standardize the implementation of debris mitigation measures, including collision avoidance. Standardization will have a major role in the coming years to help regulatory bodies and operators create and apply, in an efficient manner, appropriate space debris regulations and best practices.

d) As the Commercial Space industry re-energizes, the benefits of industry standardization will be critical to cost, quality and the transfer of the space development and manufacturing processes to serial production. ISO/TC 20 needs to ensure that globally relevant standards exist to meet our technical needs in space. We may consider now Space sector has a growing role for standards and that International cooperation in space industry is going to expand drastically, which imposes that involved countries and companies have to agree on a unified set of general requirements and procedures if they want to succeed together and reduce costs. There is a potential for new standards given the increase in commercial space activity, and space tourism markets.

2.1.3 Aeronautics and Space

a) The U.S. Aerospace Industry has been, at the end of 90’s and for European aerospace Industry at beginning of 2000’s, merging into a small number of large companies (or groups of companies), and they are facing a common pressure from both sides: Their common customers are now asking for a reduced variety of standards, as already mentioned ahead, and, at the other end of the chain, their common suppliers are requesting more harmonized technical standards and practices.

b) In commercial aerospace market, international standards addressing requirements, capabilities, performances and means of verifying performances are essential to facilitate fair and equitable trade and to remove technical barriers to trade and open markets in various regions of the world.

c) Within international cooperation, harmonized standards appear necessary to ensure that products can be integrated in a reliable and cost-effective manner.
d) Open competition and cost reduction have led to further globalization of aerospace industry structure and supply chain, which is made easier by the development of E-techniques in all areas of activity. Such a global structure requires International Standards as well.

e) Developing standards that facilitate interoperability to reduce costs leads to increased collaboration between countries and companies.

2.1.4 Defence

a) Military specifications and standards have been fundamental to the aerospace industry for the past 50 years. These documents not only support all the military platforms, but because of the close relationship between civil and military designs they form a large part of the standards used by commercial aviation.

b) However, Ministries of Defence involved in the procurement of aerospace products have adopted policies which recognize the value and need for using global standards developed by the private sector. Organizations such as NATO encourage the use of ISO and other internationally recognized and used standards for the design, manufacture and operation of military platforms. Additionally, government policies promote working with the private sector through organizations such as ISO to create standards necessary for military aerospace products to the greatest extent possible, especially when those standards address dual use applications with civil products. ISO/TC 20 will continue to reach out to the defence industry to promote TC 20 and its sub-committees as a preferred venue to develop globally relevant standards.

2.2 Qualitative benefits

a) Improvement of quality of products which can be expected from optimization in the supply chain resulting from international harmonization of technical and process standards, where the best expertise in the world has been taken into account.

b) Reduction in the variety of standards called for a specific product, which means some reduction of product complexity, coherency between design, production and test methods to promote performance requirements as a primary objective, larger quantities to be procured for the same component or service, some reduction in cost at delivery of individual products.

c) Reduction in the number of different standards to be managed in aeronautics by operating customers such as airlines, maintenance and support, for a given fleet of aircraft or engines bought on the market, from different manufacturers, which means some cost reduction for the operators.

d) Common terminology to allow for communication of complicated design requirements, common test methods, and systems definitions.

e) Support the facilitation of product and system certification – Aerospace products must be certified by national, regional and international bodies to ensure safety and performance. To the extent that these products utilize accepted international standards, certification is easier and more readily accepted from one certifying body to another.
f) Provision of a response to relevant social, safety, health, environmental concerns, or regulations.

g) Coordination of Aerospace Standards Activities -- In addition to TC 20, there are many other ISO and IEC technical committees working on standards in a variety of areas of concern to the aerospace industry, for example, software and configuration management. Liaisons established by ISO/TC 20 can provide a resource-effective way of monitoring or participating in these activities and ISO/TC 20 can also provide a basis for other international standards, through their use as normative references.

2.3 Quantitative benefits

a) Significant decrease of the number of different standards used for a given aircraft or space program, either military or civilian, has been observed in the last twenty years, as a result of national industry achievements in standardization. There exist example cases where manufacturers have been able to reduce the number of different part standards used to build a specific aerospace product from close to 3000 standards down to less than 2000 standards over a period of 20 years. It shall be mentioned that such a harmonization effort remains limited by the reverse trend for specific standards preference, where innovation and market positioning are high incentives for the establishment of innovative domestic standards. Nevertheless, international harmonization through ISO may remain a final target when innovative standards have become mature and largely used.

b) Suppliers generally declare that progress in standards harmonization always means easier and more reliable supplier processes.

c) Potential impact on costs has been evaluated through various ISO studies (such information is available on the ISO/IEC INVENTORY OF STUDIES ON THE ECONOMIC AND SOCIAL BENEFITS OF STANDARDIZATION): Some industries find that the economic benefits of using Standards for Engineering, Manufacturing and procurement yielded an economic benefit ranging from 0.5% to 2.5% of total sales. While it was not specific to the aerospace industry a correlation can be made that benefits would be realized as well in the use of aerospace industry standards. Further study would be required to validate this hypothesis.

2.4 Main priorities in the work of the TC 20 committee

a) The main priorities in the work of the committee and how the priorities are related to trends in the business, technological, environmental and social environment of the field addressed by the work of the ISO committee are the following:

- To lead to cost savings through implementation of TC 20 standards;
- To remove technical barriers to trade and open markets in various regions of the world;
- To address relevant social, safety, health or environmental concerns;
- To facilitate the harmonization of national and regional standards;
- To support the implementation of other International Standards;
- To be cited as normative references in other International Standards.
- To enable interoperability and collaborative, world-wide cross-support among space data systems, as has already been substantiated by an ever increasing number of spaceflight missions.

b) For the next 5-10 years, ISO/TC 20 will work to achieve the above benefits through the development of relevant aerospace standards. ISO/TC 20 will be giving special attention to meeting emerging standardization needs in the following areas:

- Environmental issues including emissions, resource use and waste, sustainability, and end-of-life reclamation
- UAVs/UAS
- Air Traffic Control and Air Traffic Management
- Environment and multi-domain applications
- Implementation of national, regional and international regulations related to the reduction and elimination of hazardous chemicals and materials
- Interoperability
- Inspection, testing, and repair and replacement of parts, materials, components, subassemblies and systems related to ageing aircraft.
- Airport infrastructure and data exchange standards

c) The above list could have an impact on the current TC 20 structure and may require the establishment of new subcommittees or working groups.

3 REPRESENTATION AND PARTICIPATION IN THE ISO/TC

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

- Participating countries: 11
- Observing countries: 26

Secretariat: [USA (ANSI)](http://www.ansi.org)
As of July 2014

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<tr>
<th>Participating Countries</th>
<th>Observing Countries</th>
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<tr>
<td>Brazil (ABNT)</td>
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<td>France (AFNOR)</td>
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<td>Hong Kong, China (ITCHKSAR)</td>
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<td>USA (ANSI)</td>
<td>(Correspondent member)</td>
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Please click on the following link for an updated list: ISO/TC 20 Participating and observing countries.

3.2 Analysis of the participation

a) Section 4.1 shows the current participation of ISO members in the work of ISO/TC20. It will be noted that all the nations with a significant aerospace industry are either P or O members of TC 20 and/or its subcommittees. There are 12 P-members and 24 O-members as of October 2013. Among the P-members, 70% come from developed countries, and 30% from developing countries and countries with economies in transition. Most of the participants are from North America, Europe and Asia. There is little participation from Africa or the Middle East. Those member nations with the most active aerospace industries are the most active in TC 20 work. Most major
manufacturers of aerospace systems, propulsion systems, components, and parts have some representation through their national member bodies. Participation by aerospace system operators, i.e., airlines, space launch providers, etc., however, is weak.

b) An analysis of the trends for participation in TC 20 and its subcommittees shows a slow decline in the number of subject matter experts participating in the development of the standards and fewer aerospace companies supporting the work of TC 20. The challenge for TC 20 is to re-engage industry and to identify those projects which will benefit industry and therefore will be supported by aerospace companies and national bodies.

c) 4.2.3.1 shows the organizations with which TC 20 maintains an interest. The relationship with ASD-STAN, AIA, AIAA, CCSDS, ECSS and SAE is strong while the relationship with many of the others is weak. An important part of TC 20's business plan is to improve participation of all interested stakeholders and to strengthen liaison relationships with all organizations listed in 4.2.1.

d) TC 20, in order to support the global aerospace industry, will continue to try to minimize the barriers posed by geography and travel constraints. Countries which are not able to participate physically in TC 20 meetings should be encouraged to contribute via electronic on-line tools and processes.

e) With the growing importance of IT systems, communications protocols, and information technologies to the aerospace industry, ISO/TC 20 will continue to evaluate the need to form new liaisons with those organizations and technical committees which develop these types of standards. This will be increasingly important due to international efforts to modernize the global Air Traffic Management systems, the push to migrate unmanned air systems into commercial airspace, and the rapid and continual update of on-board entertainment and passenger connectivity systems.

### 3.2.1 Organizations in liaison with ISO/TC 20

#### 3.2.1.1 ISO committees in liaison

| ISO/TC 1/SC 31 |
| ISO/TC 4 - Rolling bearings |
| ISO/TC 14 - Shafts for machinery and accessories |
| ISO/TC 31 - Tyres, rims and valves |
| ISO/TC 37 - Terminology and other language and content resources |
| ISO/TC 79 - Light metals and their alloys |
| ISO/TC 104 - Freight containers |
| ISO/TC 131 - Fluid power systems |
| ISO/TC 135 - Non-destructive testing |
ISO/TC 142 - Cleaning equipment for air and other gases
ISO/TC 176 - Quality management and quality assurance
ISO/TC 197 - Hydrogen technologies
ISO TC 20 Business Plan 2014

3.2.1.2 IEC committees in liaison:

IEC/TC 107

ISO TC 20 Business Plan 2014

A complete list of ISO Technical Committees is available on the ISO web-site.

3.2.1.3 ISO/TC 20 and its SCs also maintain a close interest with the following organizations:

- ACI Airport Council International
- AIA/NASC Aerospace Industries Association/National Aerospace Standards Committee
- ASD-STAN European Association of Aerospace Industries - Standards Program
- ASTM International
- A4A Airlines for America
- CCSDS Consultative Committee for Space Data Systems
- COSPAR Committee on Space Research
- EASA European Aviation Safety Agency
- ECSS European Cooperation on Space Standardization
- EUROCAE The European Organization for Civil Aviation Equipment
- EUROCONTROL
- FAA Federal Aviation Administration
- IAOPA International Council of Aircraft Owner and Pilot Associations
- IAQG International Aerospace Quality Group
- IATA International Air Transportation Association
- ICAO International Civil Aviation Organization
- IEC International Electrotechnical Commission
- IMO International Maritime Organisation (http://www.imo.org)
- NASA National Aeronautics and Space Administration
4 OBJECTIVES OF ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1 Defined objectives of ISO/TC 20

a) 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.

b) 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.

c) 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.

4.2 Identified strategies to achieve the ISO/TC’s defined objectives

a) Encourage active participation in TC 20 activities by regulatory agencies.

b) 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 9130).

c) 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 and ASD-CERT.

d) Reinforce communication between ISO/TC 20 and its mirror committees to facilitate the use and adoption of TC 20 standards.

e) Encourage development of standards offering dual use potential (civil and military).

f) Protection of the environment, by more involvement in the development of standards which 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.)

g) Improve the visibility on all SCs work programmes and promote more transversal work modes. Cross checking involving each SC has to be implemented within TC 20 to increase cross fertilization.

h) Define a process to pick out common topics to escalate them at the right level within ISO Organisation (interface with others TCs).

i) Encourage active participation in TC 20 activities by Research and Development or, innovation organisations.

4.3 Standard Operating Procedures

a) 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.

b) Identify what standards exist elsewhere and those needs that are not adequately served by existing standards developing organizations (SDOs). Establish programs of work as required to address these standardization gaps.

c) 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.

d) Maintain and encourage consistent links with national, regional or international organizations (i.e. IEC) publishing standards, to coordinate preparation and maintenance standards procedures.

e) Encourage active mutual participation in TC 20 activities by standards developing organizations listed in 2.2.7.

f) 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.

g) Focus on achieving international commonality on the basic subjects of:

- terminology, coding, definitions
- testing methods
- widely used technical specifications
- dimensional and functional interfaces
- 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

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

The degree to which this business plan will be successfully implemented depends on how well TC 20 can deal with industry, ISO process, and outside environment issues:

5.1 Industry Issues

a) There is a perception throughout the aerospace industry that the ISO process is not responsive to industries’ needs. ISO/TC 20 has to ensure that all secretariats (TC, SC and WG) are supported by a professional National Standardisation Organisation to ensure that all ISO processes are well known and well applied. This has to ensure a minimum development time as well as the further development of the ISO Standardisation Processes according to the Standardisation needs.

b) For the foreseeable future, resources for aerospace standardization work could be lower than has been historically the case (see 6.2 Process Issues). 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.

c) Industry and regional standards developing organizations each have their own business interests in promoting/protecting the standards that they develop.

d) Support of ISO by national working-groups and not duplicating ISO standards with national standards.

e) Due to lack of engagement in the international standards development process, some manufacturers tend to be more comfortable with company generated and controlled standards and to a lesser extent industry and national/regional standards.

f) Low priority given by top management due to short term objectives and return on investment, i.e. standardization has a medium/long term R.O.I.

g) Availability of project leaders and experts are in question.

h) Validation of a test method is dependent upon funding being available to undertake the necessary pre/co-normative research.
i) Expertise with sufficient resources from industries is not always made available as expected.

j) Reviews by companies, answers to the votes, added value comments are based on voluntary contribution and could be insufficiently elaborated.

k) Many of the existing widely used standards utilize the inch system of measurement.

l) 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. A way is needed to adopt such standards into the ISO system without changing the prime identifier of the standard.

5.2 ISO Process Issues

a) Most secretariats support ISO TC 20 sub-committee activities on a part time basis, so at times it is difficult for them to complete or progress the programme or work, 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.

b) There is a continuing difficulty in having adequate member attendance at TC 20 and its SC meetings to do contributions. The cost for attending meetings continues to be a concern as well.

5.3 Use of Livelink for ISO/TC 20 and all of the TC 20 Sub Committees

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

6 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.

6.1 Structure of the ISO committee

6.2 Current projects of the ISO technical committee and its subcommittees
6.3  **Publications of the ISO technical committee and its subcommittees**

Reference information

- General information on the principles of ISO's technical work
- Glossary of terms and abbreviations used in ISO/TC Business Plans