

Presentation
to the UN COPUOS
STSC LTSSA Workshop

ISO Space Standards

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Purpose

- The purpose of this presentation is to inform the UN COPUOUS STSC LTSSA Workshop of ISO space standards background and activities, with emphasis on the two ISO subcommittees that develop space-related standards.
- Will also show standards that have been and are being developed that support the goals of the LTSSA Working Group

ISO History

- Founded in 1946
- The ISO Mission

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

- The ISO Name

Because “International Organization for Standardization” would have different acronyms in different languages (IOS in English, OIN in French for Organisation Internationale de Normalisation), founders decided to give it the short form ISO. ISO is derived from the Greek isos, meaning equal. Whatever the country, whatever the language, the short form of our name is always ISO.

- Many Collaborations with UN activities (e.g., WHO)

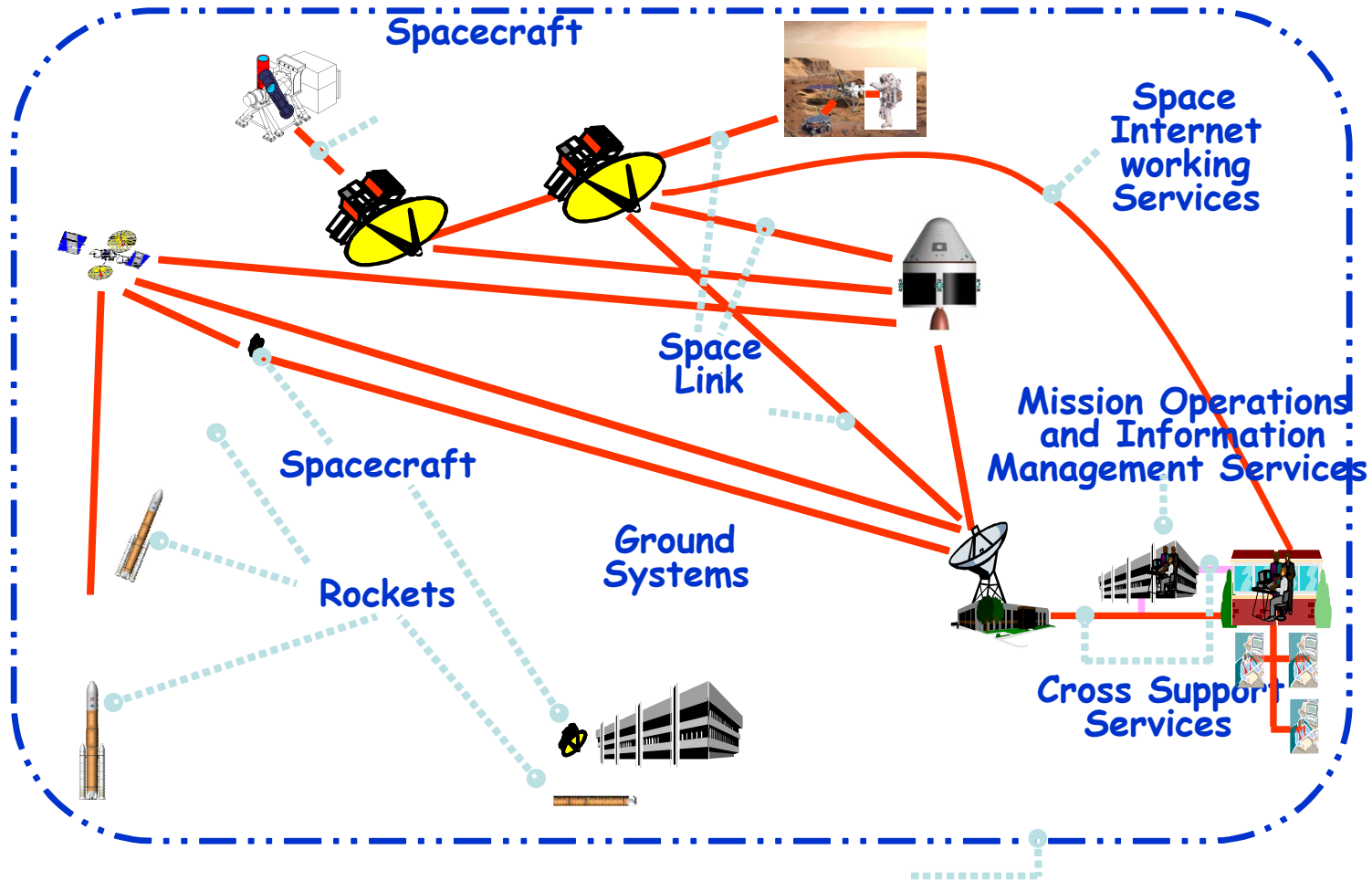
The Make Up of ISO

- ISO is a network of national standards bodies
 - These national standards bodies make up the ISO membership and they represent ISO in their country.
 - There are 164 member countries in full, corresponding and subscribing member categories
- ISO liaises with other Standard Development Organizations (SDOs) where appropriate.
- Within ISO there are 228 Technical Committees (TCs).
Examples are:
 - Screws (TC1 is the oldest TC)
 - Aircraft and Space Vehicles (TC20)
 - Health Informatics (TC215)

Space Subcommittees

- Within ISO there are two committees that deal specifically with space topics. They are both subcommittees within TC20
- SC13 deals with Space Data and Information Transfer
 - SC13 is closely related to the Consultative Committee for Space Data Systems (CCSDS), a formal grouping of space agencies of the world, started in the early 1980s
 - SC13 members are Brazil, China, France, Germany, India, Italy, Israel, Japan, Kazakhstan, Russia, Ukraine, UK and USA with five more observing countries
- SC14 deals with Space Systems and Operations
 - SC14 members are Brazil, China, France, Germany, India, Italy, Israel, Japan, Russia, Ukraine, UK and USA with seven more observing countries

Common Reference Framework



SC13/SC14 Focus

- SC13 emphasizes interoperability
- SC14 emphasizes terrestrial and non-terrestrial market application services including
 - Satellite communications
 - for education and health
 - for logistical support
 - Remote Sensing
 - Earth environmental surveillance and protection, including protection against infectious diseases
 - Earth management of natural resources (e.g., energy and water)
 - scientific investigation
 - space exploration
 - space surveillance (against orbital traffic, natural objects)
 - intelligent roads
 - sustainable development in mountainous areas
 - maritime surveillance (against piracy, border security, supply chain safety)
 - Disaster response and management
 - natural and man-made disaster response
 - orbital debris management and mitigation
 - Navigation
 - global (centimeter scale driven by agriculture)
 - space navigation
 - Manned Systems/Tourism
 - Others

Experiences and Practices

- ISO works on standards by consensus
- Developing a standard takes from three to five years (nominal schedule), often longer
- Consistent technical leadership through development is a challenge
- Building collective context between SDOs allows a stronger basis for consensus

ISO Space Activities Related to LTSSA

Expert Groups “B” and “C”

- Standards related to Space Operations include
 - ISO 13526:2010 (CCSDS 503.0-B-1) – CCSDS Tracking Data Message
 - ISO 24113: Space Systems – Space Debris Mitigation Requirements
 - ISO 26872: Space Systems – Disposal of Satellites Operating at Geosynchronous Altitude
 - ISO 26900:2012 (CCSDS 502.0-B-2) – CCSDS Orbit Data Messages
 - ISO 27852:2011 Space Systems – Estimation of Orbit Lifetime
 - ISO 27875:2010 Space Systems – Re-Entry Risk Management for Unmanned Spacecraft and Launch Vehicle Orbital Stages
 - ISO (#tbd) (CCSDS 508.0-R-1) – CCSDS Conjunction Data Message
 - ISO 16699 Space Systems – Disposal of Orbital Launch Stages
 - ISO 11233: Space Systems – Orbit Determination and Estimation -- Process for Describing Techniques
 - ISO 16158 Space Systems – Avoiding Collisions Among Orbiting Objects: Best Practices, Data Requirements, and Operational Concepts
 - ISO 16164: Space Systems – Disposal of Satellites Operating in or Crossing Low Earth Orbit
 - ISO (#tbd) (CCSDS 511.0-W-2) – CCSDS Spacecraft Maneuver Message
- Standards related to Space Weather includes (sample list)
 - ISO 14200: Space Environment (natural and artificial) – Guide to process-based implementation of meteoroid and debris environmental models (orbital altitudes below GEO + 2 000 km)
 - ISO/DIS 14222: Space Environment (natural and artificial) – Earth upper atmosphere
 - ISO/NP 18147: Space Environment (natural and artificial) – The method of the solar energetic protons fluences and peak fluxes determination

Summary

- ISO standards are developed by the international community
- ISO space-related subcommittee's standards contribute to the long term sustainability of outer space activities by capturing best practices for
 - Estimating and modeling the space environment
 - Improving and harmonizing space operations
 - Minimizing creation of space debris
 - Proper disposal of space systems
 - Sharing data on satellite maneuvers
 - Avoiding collisions
- ISO standards exist and can be immediately applied to LTSSA goals