



# *Session 3 – Current Coordination and Implementation: Summary*

*Jeff Foust  
2009 May 9*

- Session speakers:
  - Michael Taylor
  - Laura Montgomery
  - Carsten Wiedemann
  - K R Sridhara Murthi
  - Feng Jiehan
  - Michael Yakovlev
  - Hugues Gilbert
- Catherine Doldirina
- Prof. Ram Jakhu

### **Piece of second stage of Soyuz booster found in Altai village**

(ITAR-TASS, 2009 May 8)

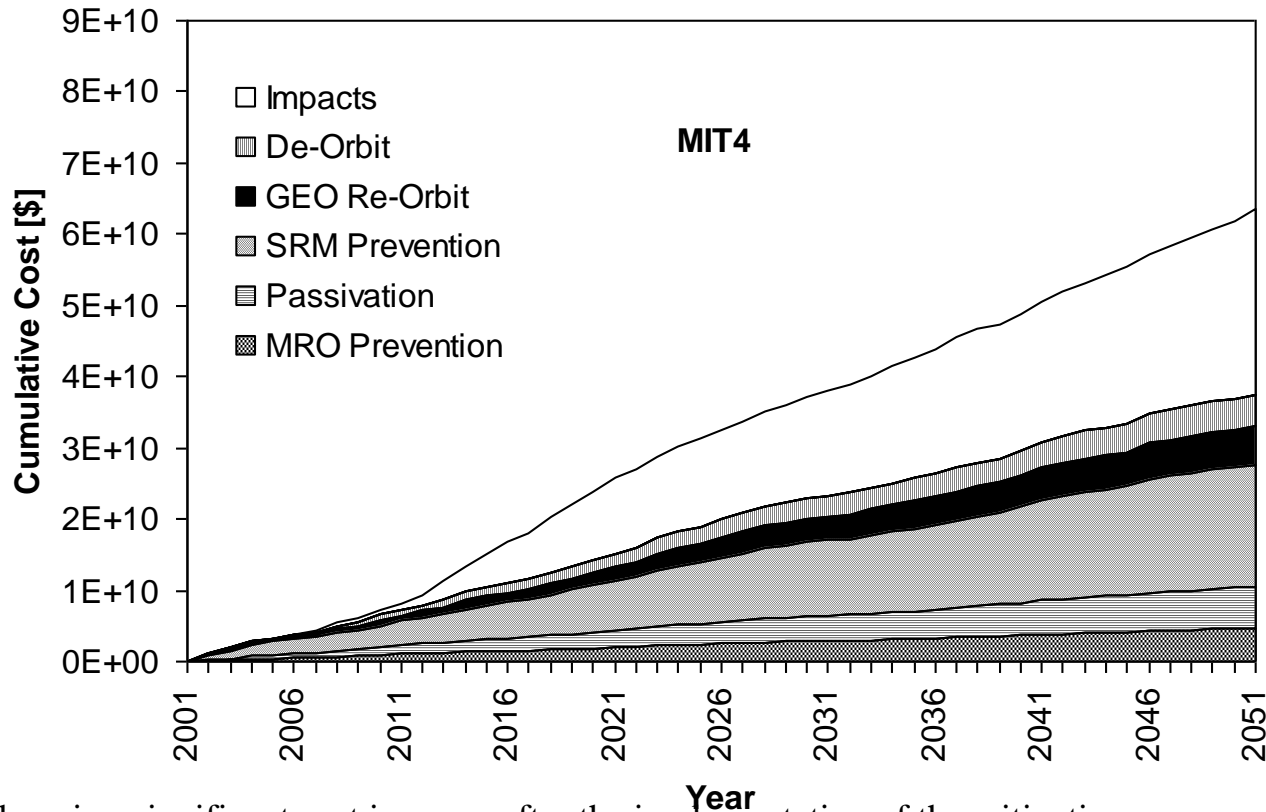
A metallic piece, which was found in the village of Baranovka, the Altai Territory, is a part of the second stage of the Soyuz booster, Deputy Director of the Institute of Water and Ecological Problems of the Siberian branch of the Russian Academy of Sciences Alexander Puzanov, who is also a member of the committee investigating the accident, told Itar-Tass on Friday.

“The fact that the found piece is a part of the second stage of the Soyuz booster is doubtless. Another question is during which launch and where exactly this piece fell down,” Puzanov said.

## *Converting Guidelines into Regulation*

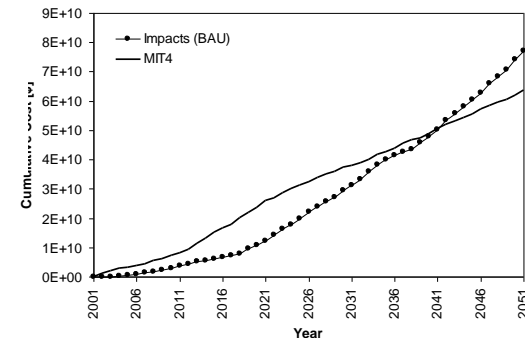
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- Space Debris Mitigation Guidelines endorsed by UN General Assembly
- However, their adoption by member states is voluntary
- Until we reach the “utopia” of a binding international treaty, we must rely on nations to adopt these guidelines (and enforce them) through laws and regulations if these guidelines are to be effective



From Wiedemann *et al.*

There is a significant cost increase after the implementation of the mitigation measures in the year 2001. The break-even point is reached in 2041. After this point there is a considerable cost saving due to the reduced number of generated slag particles in this scenario.



- National Space Policy of 2006 specifically states that the US “shall seek to minimize the creation of orbital debris by government and non-government operations in space”
  - Carried out through adherence to United States Government Orbital Debris Mitigation Standard Practices
  - These are largely aligned with UN guidelines
- Defense Department
  - Directives and Instructions for adherence to guidelines
- NASA (not discussed)
  - NASA Technical Standard 8719.44
- Other Agencies
  - FAA – commercial launch licensing
  - FCC – RF licensing
  - NOAA – remote sensing licensing

- Canadian Remote Sensing Space System Act
  - Administered by Department of Foreign Affairs and International Trade
  - Requires detailed plans for end-of-life disposal of remote sensing spacecraft
- RF licensing
  - Administered by Industry Canada
  - Requirements on minimizing debris and moving GEO satellites into graveyard orbits (minimum 300 km) at end of life

- Chinese debris mitigation efforts evolving through series of white papers and action plans
  - Focus on SSA, spacecraft protection/survivability, debris mitigation
- Registration and licensing regulations for civil space objects include debris mitigation requirements
- Requirements for Space Debris Mitigation (QJ3221-2005) issued in 2005 – industrial standards
- Future work includes drafting regulations on limitation and management of space debris



- Responsibility of ISRO/Department of Space
- Many guidelines implemented
  - Passivation of upper stages
  - Reorbiting spacecraft at end of life
  - Development of models for on-orbit fragmentation, collision avoidance measures

- Roscosmos in compliance with UN guidelines
  - Various work on passivation of upper stages, release of stored energy of spacecraft, reorbiting spacecraft, etc.
- National standards: “General Requirements to Spacecraft and Orbital Stages on Space Debris Mitigation”
  - Came into force 2009 January 1
  - Harmonized with UN guidelines

- Analysis of how all spacefaring countries are implementing UN standards
  - Where do they adhere, exceed, or fall short
  - Search for “best practices” that can be adopted by others?
  - Focus on mechanisms for adoption and enforcement
    - Are laws “better” than regulations?
- Analysis of how to extend adoption of guidelines to other countries
  - What are best technical and policy approaches to encourage other nations to put these guidelines into effect?
  - Is there a need for technical support for developing nations?
    - Could run afoul of export controls (esp. ITAR), MTCR
- Other issues?