



# TRISMAC 2008

Joint ESA-JAXA-NASA

Safety & Mission Assurance Conference

LESSONS LEARN FOR THE FUTURE

14 to 16 April 2008

ESA-ESTEC Noordwijk-Netherlands

<http://www.congrex.nl/08a04>





# Highlights & suggestions

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# Features

- First trilateral (actually multi-lateral) conference dedicated to Safety and Mission Assurance (S&MA) disciplines including safety, reliability, and quality assurance (SR&QA) for aerospace applications
- Diversified, yet balanced, coverage of SR&QA topics
- Presentations from many countries including USA, Japan, China, India, UK, Germany, The Netherlands, France, Italy, Canada
- Aerospace topics covered: standards, policies, requirements, methods, technologies, applications
- Single track sessions (i.e., no parallel sessions)

# Highlights

- Keynote addresses from ESA, JAXA, and NASA
- Lessons learned (NASA, ESA, JAXA)
- Overview of Space S & MA Programs
  - China, by CASI
  - India, by ISRO
- Quality Management systems
- Standardization
  - European Cooperation for Space Standardization
  - Space within the International Aerospace Quality Group
  - European Space Nuclear Safety Framework
  - Proposal for international cooperation for Space Safety Standards
- Project experience
  - Independent engineering review at JAXA
  - Relationship between quality and complexity (Galileo)

# Highlights (cont'd)

- Evolved risk management approaches and concepts
  - NASA Integrated Risk Management program,
  - NASA System Safety in the context of Risk Informed Decision Making (RIDM)
- Successful risk management experiences
  - PRA for the Space Shuttle Program
  - Safety and Mission Assurance Risk Identification for NASA's Expandable Launch Vehicles (ELV)
  - Risk Management application in the EarthCARE/CPR program (Japan)
  - Risk Management in Hubble Telescope servicing strategies
- Process improvement
  - Evaluation of Shuttle Solid Rocket Motor recovery data
- Knowledge management
  - Integration of Risk and Knowledge Management
  - Knowledge Management development at JAXA

# Highlights (cont'd)

- Prevention of human error
  - Human factors and error management in commercial aviation (Lufthansa)
  - JAXA engineering effort for human error prevention
- RAMS experiences
  - Maintainability and its importance for long duration missions
  - High reliability and survivability for Greenhouse Gases Observing Satellite
  - Galileo safety and dependability program for safety of life applications
  - Dependability impact of FPGA utilization in space projects
- Parts, material and process issues
  - Product Assurance for EEE space parts and components
  - Workmanship standards at ESA and NASA
  - Counterfeit electronic parts
  - Tin whisker studies and lead-free policy (Japan and USA)

# Lessons learned about lessons learned

- Just to have a database is not the solution → lessons learned must be put in practice (Bryan O'Connor)
- Suggestions from presenters
  - Incorporate in policies, requirements, procedures and processes( Bryan O'Connor)
  - Capture in a living handbook of best practices (Lengyel, D)
  - It does not matter the way you do it, but do it! (M. Warhaut)
  - Quarterly accidents and incidents worldwide, read by pilots with great attention (Lufthansa safety department)
  - ‘ Gray beards’ useful to generate lessons learned, but to be used wisely (H. Imamura)
- Rules to be documented together with their rationale (Bryan O'Connor)

# Suggestions for the Future

- Continue SMA conference on a periodic basis (about 2 years) in a multi-lateral format and with main focus on space agencies' participation
- Rotate the venue of conference to enhance attendance
- Retain the single track format for the sessions
- Add panel and discussion sessions to enhance exchange of information among participants
- Select a leading topic for each conference and try to limit the event to two days
- Make recommendations for the lead topic for the next conference