

APRSAF-17 SEU WG

the 17th Session of the Asia Pacific Regional Space Agency Forum  
22-26 Nov. 2010 @Melbourne, Australia

# Summary of Space Environment Utilization Working Group (SEU WG)

Mr. Shigeki Kamigaichi,

Director of Kibo Utilization Office for Asia, Space  
Environment Utilization Center, JAXA

Dr. Kimberley Clayfield,

Executive Manager, Commonwealth Scientific and Industrial  
Research Organisation (CSIRO) Space Sciences &  
Technology

# SEU WG Presentations (1/7)

---

- SEU WG
  - Attended by 30 participants from 16 Organizations of 7 countries
  - 13 presentations on activities and achievements
- Japan (JAXA) reported the Review of the SEU WG summary of the 16<sup>th</sup> APRSAF
  - The results of the WG
  - Action items and its current status.
- Australia (co-chair) reported on the space utilization activity of Australia
  - CDSCC activity as a part of NASA Deep Space Network
  - Australian activity in the areas of human health, material processing and damage repair of spacecraft.

# SEU WG Presentations (2/7)

---

- JAXA gave update on the KIBO utilization status
  - JEM utilization activity in CY 2010
    - Resource balance among disciplines
    - Science experiments in various areas including industrial applications and education.
  - Future plan, schedule of new payloads and research
    - Potential for use of Multi-purpose rack etc. by Asian participants.
  - Collaborative activities with SEUWG members
    - Parabolic flights, Asian Seeds, etc.
  
- Indonesia (LAPAN) reported;
  - JEM feasibility study on “The effect of space environment on gene expression of banana ripening”
    - Developing a clinostate to support the experiment as well as other proposed simple space experiment.
  - Possible future research using data from JEM Exposed Facility for meteoroid detection
  - Status of Asian Seed project

# SEU WG Presentations (3/7)

---

- Korea (KARI) reported;
  - Introduction of Korean Manned Space Program
  - Progress Status of Feasibility Study on “KIBO” utilization
    - Selection of 4 candidates out of 17 proposals as a result of Feasibility Study.
    - Step by step approach to development of the flight experiment through ground-based experiments using drop tower and/or parabolic flight.
  
- Thailand (NSTDA) reported
  - Students parabolic flight
    - One experiment selected and successfully flown in March 2010
    - Another experiment selected and prepared for flight scheduled in coming December 2010.
  - Status of Asian Seed project
    - Seeds for flight have been selected and submitted.
    - Post-flight, returned seed will be used for both educational purposes and scientific analysis.

# SEU WG Presentations (4/7)

---

- Vietnam
  - A space experiment idea was read by JAXA for the Vietnamese researcher who unfortunately was absent.
  
- Malaysia (ANGKASA) reported
  - Activity in 2010
    - Student parabolic flights in March and December.
    - Promotion of next ANGKASAWAN (Astronaut program)
    - Participation in the Asian Seed program (100g seed of red pepper)
      - Post-flight, returned seed will be used for both educational purposes and scientific analysis.
    - Continued participation in the protein crystallization experiment in JEM
      - Five scientific reports were submitted and one report have been already approved.
    - Microgravity science workshop to Parliament as well as outreach program.
  - Proposed discussion area
    - Give high priority to education, research activities and outreach

# SEU WG Presentations (5/7)

---

- Japan Space Forum reported
  - Status update of the KIBO Hi-vision EarthView system
    - Onboard system will be available in 2012
    - Real time image from KIBO will be distributed through internet
    - All member countries are invited to join KIBO Hi-vision EarthView program.
- Dr. Wilkinson from the Australian Bureau of Meteorology presented on space weather
  - Australian activity on space weather monitoring and forecasting.

# SEU WG Presentations (6/7)

---

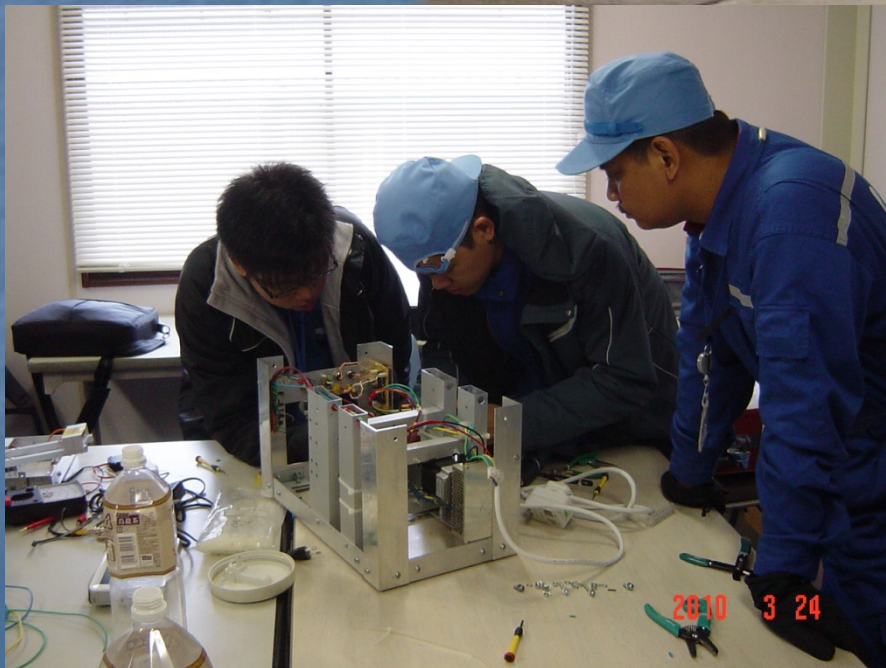
- Dr. Gorman from Flinders University presented on space heritage
  - Orbital debris needs to be mitigated to secure sustainable access to the space.
  - Some orbital debris may be considered to have heritage value
  - Space heritage is a low-risk avenue to explore issues in developing an international cooperative effort in space situational awareness.

# SEU WG Presentations (7/7)

---

- JAMSS presented
  - Introduction about JAMSS
  - Introduction of activities on commercial base utilization of Space Station
  - Achievements on KIBO/ISS operation
  - Space Environment Utilization support in Asia
    - Agent of Bigelow Aerospace, Excalibur Almaz, etc
    - Support capabilities in Astronaut training, safety and mission assurance by contract base.
- JAXA reported
  - Activity of the new task force
    - Managing student parabolic flight
    - Establishing and driving Asian Seed project
  - Educating students in microgravity applications.

# Student Parabolic flight



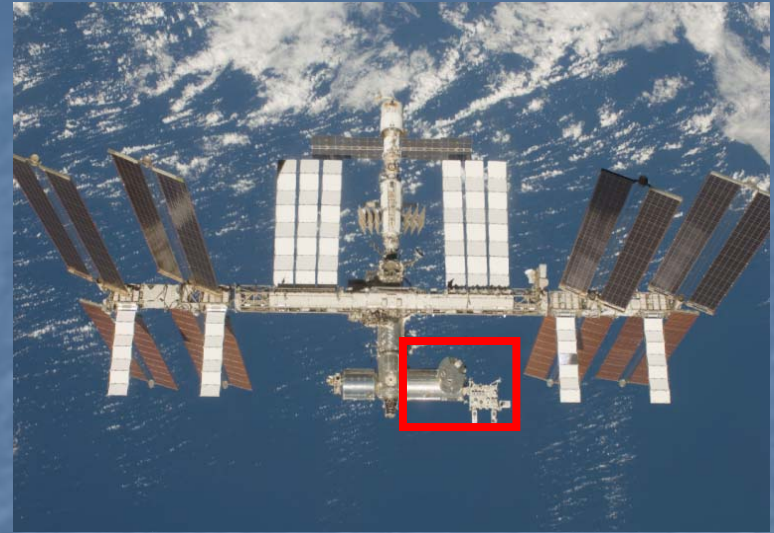
# Asian Seed project



# Space journey of seeds



HTV-II



# Joint Sessions

---

- Joint Session with SEAWG (Day 1)
  - Astronaut Naoko Yamazaki presented her experience on STS-131, which flew in April 2010
  - More than 50 audience members participated and had a active Question and Answer session.
- Joint Session with EOWG (Day 2)
  - More than 70 participants attended the joint session
  - Introduction of ISS contribution and potential to the Earth observation area. Prof. Fukuda presented on wildfire monitoring.
  - The utilization of ISS capability including high definition video camera for earth observation activity was discussed.
  - New ideas such as ISS contribution to international disaster charter and new sensor development are also discussed.
  - The importance of the ISS utilization for Earth observation such as wildfire detection, education and outreach is recognized.

# Common Understandings

---

- SEU-WG participants appreciated enhanced opportunity of “KIBO” utilization beyond 2015.
- Scientific outputs (Protein Crystallization Experiment) of collaboration activities are materializing.
- Feasibility Study (such as JAXA-KARI joint study) is progressing.
- New project “Asian Seed” is almost ready for launch.
- Any new proposals including small payloads can be discussed at the task force regular meeting.
- Education and outreach opportunities enhanced
  - Announcement of Try Zero G is now open
  - KIBO hi-vision EarthView expected to be available in 2012.
  - Enhancement of task force activity achieved new challenges such as Asian Seed mission.
- The Japanese Non-Profit Organization and private sectors are also encouraged to support cooperative activities in the Asia-Pacific region.

# Action Items

---

- Action Item
  - (ALL members)
    - To propose any new collaborative activities to succeed the Asian Seed mission.
  - (JAXA, KARI, Malaysia)
    - To make available Asian astronaut (Japan, Korea, Malaysia) activity through an online portal, such as a wiki site or the APRSAF site.
  - (JAXA)
    - To announce web address from which to download JEM Utilization Guide.
    - To provide “information on small satellite launch capability from JEM” when it is available.
    - To provide MPAC & SEED published results as a example of experiment on Exposed Facility.

# Recommendations from SEU Working Group

---

- Welcome the continued operation of Kibo/ISS beyond 2015 for full utilization of this unique facility with infinite potential.
- Recommend enhancing Kibo/ISS utilization opportunities through the SEU WG task force, in science, education and outreach of space environment utilization, such as Asian Seed project, small payload, and “Try Zero G” activities in recognition of successful cooperation on activities including protein crystallization experiment and progress of bilateral feasibility study, which demonstrate the significance and potential of further Kibo/ISS cooperation.
- Recommend enhancing ground-based microgravity activities such as drop tower experiments and parabolic flight, as these have relatively low thresholds to participation, in order to build capacity and prepare to develop on-orbit experiments.
- Recommend implementing joint activities with SEAWG and EOWG to increase space environment utilization based on the success of the joint sessions with those two working groups.