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08-07-2010

August 07, 2010

ISS On-Orbit Status 08/07/10

All ISS systems continue to function nominally, except those noted previously or below. *Saturday – EVA-15 day.*

US EVA-15 by EV1 Doug Wheelock & EV2 Tracy Caldwell-Dyson **was terminated without Loop A PM (Pump Module) removal** because of a leak at one (M3) of the four QDs (Quick Disconnects) connecting the ammonia lines to the failed PM of the starboard EATCS (External Active Thermal Control System) during demate activities. Torque on the 4 PM bolts remains unbroken. *[After Wheelock reconnected the M3 QD on the PM to stop the leak, not enough suit time remained to allow further PM work, due to the time necessary for the crew's cleanup procedures for assuring than no ammonia was introduced into the pressurized volume of the ISS. EV1 & EV2 began their "campout" last night in the U.S. Airlock (A/L) with hatch closure and depressurization of the Crewlock (CL) from 14.7 to 10.2 psi, followed by mask prebreathe. Following the usual hygiene break/with mask prebreathe for Caldwell-Dyson & Wheelock at 2:35am-3:45am, the A/L hatch was closed again by Shannon Walker & Fyodor Yurchikhin for EVA preps in 10.2 psi, followed by EMU purge (~5:15am-5:30am) and prebreathe in the EMUs (~5:30am-6:20am). Afterwards, with CL depressurization and EV1/EV2 switching to suit power, EVA-15 began at 7:19am EDT. It ended at 3:22pm, lasting 8h 3 min – the longest ISS-EVA and the sixth-longest EVA in history. It was the 148th spacewalk for ISS assembly & maintenance, and the 240th for US astronauts, with a total time of 929 hrs 38 min.]*

Before the EVA, FE-6 Walker –

- Printed out instructions for actions to be taken in case of occurrence of a "next worst failure", e.g. MBSU 2 (Main Bus Switching Unit 2) failure, ETCS Loop B failure, File Server crash, etc.,
- Completed the IV (Intravehicular) portion of the EVA "inhibit pad", i.e., the list of temporary external deactivations in support of the EVA,
- Set up the RWS (Robotic Workstation) and DOUG (Dynamic Onboard Ubiquitous Graphics) peripherals with the IPV (International Procedures Viewer) laptop to support SSRMS (Space Station Remote

Manipulator System) ops, and

- Operated the SSRMS, “flying” Douglas Wheelock during the EVA.

During the spacewalk, CDR Skvortsov assisted Walker on the SSRMS, and FE-5 Yurchikhin worked with her supporting the Campout, prebreathe, EVA prep & post-EVA activities.

At wake-up, Fyodor Yurchikhin performed the regular daily early-morning check of the aerosol filters at the Russian Elektron O₂ generator which Maxim Suraev had installed on 10/19 in gaps between the BZh Liquid Unit and the oxygen outlet pipe (filter FA-K) plus hydrogen outlet pipe (filter FA-V). *[FE-5 again inspected the filters before bedtime this morning, currently a daily requirement per plan, with photographs to be taken if the filter packing is discolored.]*

Alex Skvortsov completed the routine daily servicing of the SOZh system (Environment Control & Life Support System, ECLSS) in the SM. *[Regular daily SOZh maintenance consists, among else, of checking the ASU toilet facilities, replacement of the KTO & KBO solid waste containers and replacement of EDV-SV waste water and EDV-U urine containers.]*

FE-2 & FE-4 had their standard post-EVA PMCs (Private Medical Conferences), via S- & Ku-band audio/video, Wheels at ~3:50pm, Tracy at ~3:25pm EDT.

Before their sleeptime, Caldwell-Dyson, Wheelock & Walker were to complete another run of the Reaction Self Test (Psychomotor Vigilance Self Test on the ISS) protocol, today only once. *[The experiment consists of a 5-minute reaction time task that allows crewmembers to monitor the daily effects of fatigue on performance while on ISS. The experiment provides objective feedback on neurobehavioral changes in attention, psychomotor speed, state stability, and impulsivity while on ISS missions, particularly as they relate to changes in circadian rhythms, sleep restrictions, and extended work shifts.]*

The Russian crewmembers worked out on today’s 2-hr physical exercise protocol on the TVIS treadmill with vibration isolation & stabilization (CDR, FE-3, FE-5), ARED advanced resistive exercise device (FE-3, FE-5), and VELO bike ergometer with bungee cord load trainer (CDR).

Weekly Science Update (Expedition Twenty-Four -- Week 9)

2-D NANO Template (JAXA): The experiment was started on 7/9.

3-D SPACE: No report.

AgCam (Agricultural Camera): No report.

ALTCRISS (Alteino Long Term monitoring of Cosmic Rays on the ISS): Complete.

ALTEA DOSI (NASA/ASI): This ISS backup radiation monitoring system remains non-operational.

APEX (Advanced Plant Experiments on Orbit) -Cambium: No report.

APEX-TAGES (Transgenic Arabidopsis Gene Expression System): No report.

BCAT-4/5 (Binary Colloidal Alloy Test 4/5): No report.

BIOLAB (ESA): No report.

BIORHYTHMS (JAXA, Biological Rhythms): 1st sampling session for Wheelock was performed on 7/14-15.

BISE (CSA, Bodies in the Space Environment): No report.

BISPHOSPHONATES: No report.

CARD (Long Term Microgravity: Model for Investigating Mechanisms of Heart Disease, ESA): No report.

CARDIOCOG-2: Complete.

CB (JAXA Clean Bench): No report.

CBEF (JAXA Cell Biology Experiment Facility)/SPACE SEED: CBEF Rotor replacement was performed on 7/27-28.

CCISS (Cardiovascular & Cerebrovascular Control on Return from ISS): No report.

CERISE (JAXA): No report.

CFE (Capillary Flow Experiment): Reserve.

CSI-3/CGBA-5 (CGBA Science Insert #2/Commercial Generic Bioprocessing Apparatus 5): Ongoing.

CGBA-2 (Commercial Generic Bioprocessing Apparatus 2): Complete.

CIR (Combustion Integrated Rack), MDCA/Flex: No report.

Commercial Photo (JAXA): No report.

CSLM-2 (Coarsening in Solid-Liquid Mixtures 2): No report.

CubeLab: Hardware installed.

CW/CR (Cell Wall/Resist Wall) in EMCS (European Modular Cultivation System): Complete.

DECLIC (Device for the Study of Critical Liquids & Crystallization, CNES/NASA): Currently DECLIC is OFF. The next run will start on 8/27 and run for 15 days.

DomeGene (JAXA): Complete.

DOSIS (Active Measure, ESA): Impacted by ETCS cooling loop shut down; science data acquisition is currently not possible.

EarthKAM (Earth Knowledge Acquired by Middle School Students): No report.

EDR (European Drawer Rack, ESA): No report.

ELITE-S2 (Elaboratore Immagini Televisive - Space 2): Planned.

EMCS (European Modular Cultivation System): No report.

ENose (Electronic Nose): No report.

EPM (European Physiology Module): Activated in support of CARD.

EPO (Educational Payload Operations, NASA): (*Kids in Space*): No report.

EPO LES-2 (ESA): No report.

EPO COMMERCIAL (JAXA): Photo session was performed on 7/22.

EPO 3-min Video (JAXA): No report.

EPO J-Astro Report (JAXA): No report.

EPO Dewey's Forest (JAXA): Closed out on 3/15.

EPO Space Clothes (JAXA): Complete.

EPO Hiten (Dance, JAXA): No report.

EPO Moon Score (JAXA): No report.

EPO Try Zero-G (JAXA): No report.

EPO Kibo Kids Tour (JAXA): Complete.

EPO Paper Craft (Origami, JAXA): No report.

EPO Poem (JAXA): No report.

EPO Spiral Top (JAXA): No report.

ERB-2 (Erasmus Recording Binocular, ESA): [ERB-2 aims are to develop narrated video material for various PR & educational products & events, including a 3D interior station view.] "Tracy: The ERB-2 team would like to thank you for your excellent work on ERB-2 operations. You exceeded expectations by being very pro-active in the troubleshooting and commissioning of ERB-2."

ETD (Eye Tracking Device): Completed.

FACET (JAXA): No report.

Ferulate: No report.

FIR/LMM/CVB (Fluids Integrated Rack / Light Microscopy Module / Constrained Vapor Bubble): No report.

Fish Scales (JAXA): Completed on FD7/ULF-4 and returned on STS-132.

FOAM STABILITY (ESA): No report.

FOCUS: No report.

FSL (Fluid Science Laboratory, ESA): No report.

FWED (Flywheel Exercise Device, ESA): No report.

GENARA-A (Gravity Regulated Genes in Arabidopsis A/ESA): No report.

GEOFLOW: No report.

HAIR (JAXA): 1st sampling session for Wheelock and Walker was performed on 7/15.

HDTV System (JAXA): Was delivered by HTV1.

Holter ECG (JAXA): No report.

HQPC (JAXA): Was delivered by 34P.

HREP (HICO/Hyperspectral Imager for the Coastal Ocean & RAIDS/Remote Atmospheric & Ionospheric Detection System/JAXA): HREP is operating but images cannot be downlinked since the Ethernet link is turned off to conserve power. Images are stored onboard and once the Ethernet link is turned on any stored images can be downlinked. Currently 1495 images have been taken to date.

ICE CRYSTAL (JAXA): Complete.

ICV (Integrated Cardiovascular): No report.

IMMUNO (Neuroendocrine & Immune Responses in Humans During & After Long Term Stay at ISS): Complete.

INTEGRATED IMMUNE: No report.

InSPACE-2 (Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions 2): No report.

IRIS (Image Reversal in Space, CSA): No report.

IV Gen (Intravenous Fluids Generation): No report.

KID/KUBIK6: No report.

Kids in Micro-G: No report.

KUBIK 3 (ESA): No report.

LOCAD-PTS (Lab-on-a-Chip Application Development-Portable Test System): No report.

Matryoshka-2 (RSA): Acquiring science data.

Marangoni UVP (JAXA): 8th run was performed on 7/15-716.

MAXI (Monitor of All-sky X-ray Image, JAXA): Acquiring science data.

MDCA/Flex: See under CIR.

MEIS (Marangoni Experiment for ISS) in JAXA FPEF (Fluid Physics Experiment Facility): No report.

Microbe-1 (JAXA): No report.

Micro-G Clay (JAXA EPO): Complete.

MMA (JAXA/Microgravity Measurement Apparatus): No report.

MISSE7 (Materials ISS Experiment): MISSE-7 Low Rate Telemetry has been re-enabled at a reduced polling rate which temporarily enables 80% Science return. The long-term solution has been approved for a software patch to the payload MDM software. Estimated on-orbit date of patch is early September.

MPAC/SEED (JAXA): Completed on 19A FD4.

MSG-SAME (Microgravity Science Glovebox): First carousel (6 samples) was successfully completed ahead of schedule. The carousel change-out is planned in the coming days.

MSL (Materials Science Laboratory, ESA): No report.

MTR-2 (Russian radiation measurements): Passive dosimeters measurements in DC-1 "Pirs".

MULTIGEN-1: Completed.

MYCO 2 (JAXA): No report.

MyoLab (JAXA): Completed on 4/20.

NANOSKELETON (Production of High Performance Nanomaterials in Microgravity, JAXA): Returned on 19A.

NEURORAD (JAXA): No report.

NEUROSPAT (ESA/Study of Spatial Cognition, Novelty Processing and Sensorimotor Integration): No report.

NOA-1/-2 (Nitric Oxide Analyzer, ESA): Complete.

NUTRITION w/REPOSITORY/ProK: No report.

PADIAK: No report.

PADLES (JAXA, Area PADLES 3/4; Passive Area Dosimeter for Lifescience Experiment in Space): Photos were taken on 7/23.

PASSAGES (JAXA): No report.

PCDF-PU (Protein Crystallization Diagnostic Facility - Process Unit): No report.

PCG (JAXA, Protein Crystal Growth): No report.

PCRF (Protein Crystallization Research Facility) Reconfiguration (JAXA): PCRF maintenance will be performed on 7/29-30.

PMDIS (Perceptual Motor Deficits in Space): Complete.

POLCA/GRAVIGEN (ESA): Complete.

Pro K: No report.

RadGene & LOH (JAXA): Complete.

RadSilk (JAXA): Samples were returned to ground on ULF3.

RST/Reaction Self Test (Psychomotor Vigilance Self Test on the ISS): "Tracy, Wheels and Shannon: We appreciate your continued participation in Reaction Self Test! Shannon: Thank you for remembering the Reaction Self Test constraint of two sessions the same day and going out of your way to complete those."

RYUTAI Rack (JAXA): PCRF checkout was performed on 7/29-30 (see PCRF).

SAIBO Rack (JAXA): CBEF Rotor replacement was performed on 7/27-28.

SAMS/MAMS (Space & Microgravity Acceleration Measurement Systems): No report.

SAMPLE: Complete.

SCOF (Solution Crystallization Observation Facility, JAXA): No report.

SEDA-AP (Space Environment Data Acquisition Equipment-Attached Payload, JAXA): Survival Mode.

SHERE (Shear History Extensional Rheology Experiment): Complete.

SLAMMD (Space Linear Acceleration Mass Measurement Device): No report.

SLEEP (Sleep-Wake Actigraphy & Light Exposure during Spaceflight): “Shannon: Next week we will be downlinking the Actiwatch data that you downloaded and send it to the PI.”

SMILES (JAXA): Survival Mode.

SODI/IVIDIL (Selectable Optical Diagnostics Instrument/Influence of Vibration on Diffusion in Liquids, ESA): No report.

SODI/DSC (Selectable Optical Diagnostics Instrument/Diffusion Soret Coefficient): No report.

SOLAR (Solar Monitoring Observatory): Impacted by ETCS cooling loop shut down; science data acquisition is currently not possible.

SOLO (Sodium Loading in Microgravity): No report.

Space-DRUMS: No report.

SPHERES (Synchronized Position Hold, Engage, Reorient, Experimental Satellite): No report.

SPICE (Smoke Point In Co-flow Experiment): No report.

SPINAL (Spinal Elongation): No report.

SWAB (Characterization of Microorganisms & Allergens in Spacecraft): No report.

TASTE IN SPACE (ESA): No report.

THERMOLAB (ESA): No report.

TRAC (Test of Reaction & Adaptation Capabilities): Planned.

ULTRASOUND: Planned.

VASCULAR (CSA): No report.

VCAM (Vehicle Cabin Atmosphere Module, NASA): No report.

VESSEL ID System (ESA): “Wheels: Thank you for re-routing the power connections after the ETCS cooling loop

shutdown. This restored data acquisition."

VESSEL IMAGING (ESA): Acquiring data. Commissioning part II was nominally completed on 7/16.

VO₂max (NASA): No report.

VLE (Video Lessons ESA): No report.

WAICO #1/#2 (Waving and Coiling of Arabidopsis Roots at Different g-levels; ESA): No report.

YEAST B (ESA): No report.

CEO (Crew Earth Observations): "Through 8/4 the ground has received a total of 2,254 frames of E-24 CEO imagery for review and cataloging. "We are pleased to report your acquisition of the following targets with times corresponding to those of our daily CEO Target Request lists: Mississippi Delta Region – excellent views of this target area with sun glint enhancement of oil sheen in the water – publication is planned for this imagery; Aral Sea – good views acquired – under evaluation; Ashgabat, Turkmenistan – good views acquired – all requirements for this target have been met; Ankara, Turkey – good views – all requirements for this target have been met; Valletta, Malta – excellent views – target requirements met; Rabat, Morocco – good imagery – requirements met; Coast Mountains, BC, Canada – imagery of target acquired – still seeking detailed views of the Silverthrone Glacier; Edwards Plateau Land-use, TX – context views acquired, but unanticipated popcorn cumulus were present – we will continue to request this target. Your recent 1000mm view of the Dominic Point Fire, Montana was published in the Natural Hazards section NASA/GSFC Earth Observatory website this past weekend. This fire is believed to have been started by a lightning strike in a remote area of the Bitterroot National Forest of western Montana and was first reported to the US Forest Service less than an hour before you spotted it from the ISS and acquired this high-detail photo. Thanks for your vigilance, prompt notification, and downlink of your imagery of this dynamic event."

CEO (Crew Earth Observation) photo targets uplinked for today were **Muscat, Oman** (*looking left on the coast where a series of small bays and headlands protects this port city*), **Monaco, Monaco** (*looking right of track on Portugal's largest estuary*), **Nyiragongo Volcano, Rep. Congo** (*overlapping images left and right of track are requested. The volcano is forested compared with the surrounding farmland which is a lighter-toned green*), **Kigali, Rwanda** (*looking left for the urban zone which contrasts with the surrounding farmlands*), **Maseru, Lesotho** (*this small capital city lies on the border between Lesotho and South Africa. Visual cues are (i) this prominent border [between relatively devegetated Lesotho and the greener farmlands of South Africa], and (ii) a major angle in the border beyond Maseru [as seen from orbit]*), **Gulf of Mexico oil slick** (*Dynamic event. ISS passed over the center of the area most affected by the slick. Best images were in the region near the glint point, a fraction left of track, and forward of the nadir point*), **Havana, Cuba** (*nadir view of Havana. Havana on the north coast of Cuba, well centered in this handheld view*), **Kingston, Jamaica** (*Kingston lies left of track: look on the furthest large bay from track*), and **South Amazonian Fan, Brazil** (*one of the least visible river fans on the planet [due to cloud] is the Roosevelt River fan in central Brazil. A series of overlapping images, looking nadir and right of track, was requested during this cloud-free period. The fan appears as a series of curved, light-toned lines, which are the relict courses of ancient rivers. From track, the fan appears sandwiched between two good visual cues — the very large Madeira River uptrack, and a major trans-Amazon highway downtrack. Only one image of this large feature exists in the handheld database. Very large alluvial fans [up to hundreds of km in length] were recognized as a new class of landform, mainly on the basis of handheld imagery*).

ISS Orbit (*as of this morning, 8:07am EDT [= epoch]*)

Mean altitude – 354.3 km

Apogee height – 358.9 km

Perigee height – 349.6 km

Period -- 91.63 min.

Inclination (to Equator) -- 51.65 deg

Eccentricity -- 0.0006875
 Solar Beta Angle -- 2.0 deg (magnitude increasing)
 Orbits per 24-hr. day -- 15.71
 Mean altitude loss in the last 24 hours – 130 m
 Revolutions since FGB/Zarya launch (Nov. 98) – 67,154.

Significant Events Ahead (*all dates Eastern Time and subject to change*):

-----Six-crew operations-----
 08/11/10 -- US EVA-16 (*Caldwell/Wheelock*)
 09/07/10 -- Progress M-06M/38P undock
 09/08/10 -- Progress M-07M/39P launch
 09/10/10 -- Progress M-07M/39P docking
 09/24/10 -- Soyuz TMA-18/22S undock/landing (***End of Increment 24***)
 -----Three-crew operations-----
 10/08/10 -- Soyuz TMA-20/24S launch – *Kelly (CDR-26)/Kaleri/Skripochka*
 10/10/10 -- Soyuz TMA-20/24S docking
 -----Six-crew operations-----
 10/26/10 -- Progress M-05M/37P undock
 10/27/10 -- Progress M-08M/40P launch
 10/29/10 -- Progress M-08M/40P docking
 11/01/10 -- STS-133/Discovery launch (ULF5 – ELC4, PMM) ~4:33pm EDT – “target”
 11/10/10 -- Russian EVA-26
 11/17/10 -- Russian EVA-27
 11/26/10 -- Soyuz TMA-19/23S undock/landing (***End of Increment 25***)
 -----Three-crew operations-----
 12/10/10 -- Soyuz TMA-21/25S launch – *Kondratyev (CDR-27)/Coleman/Nespoli*
 12/12/10 -- Soyuz TMA-21/25S docking
 -----Six-crew operations-----
 12/15/10 -- Progress M-07M/39P undock
 12/xx/10 -- Russian EVA-28
 12/26/10 -- Progress M-08M/40P undock
 12/27/10 -- Progress M-09M/41P launch
 12/29/10 -- Progress M-09M/41P docking
 02/26/11 -- STS-134/Endeavour (ULF6 – ELC3, AMS-02) ~4:19pm EDT – “target”
 03/16/11 -- Soyuz TMA-20/24S undock/landing (***End of Increment 26***)
 -----Three-crew operations-----
 03/30/11 -- Soyuz TMA-22/26S launch – *A. Borisienko (CDR-28)/R. Garan/A.Samokutayev*
 04/01/11 -- Soyuz TMA-22/26S docking
 -----Six-crew operations-----
 04/26/11 -- Progress M-09M/41P undock
 04/27/11 -- Progress M-10M/42P launch
 04/29/11 -- Progress M-10M/42P docking
 05/16/11 -- Soyuz TMA-21/25S undock/landing (***End of Increment 27***)
 -----Three-crew operations-----
 05/31/11 -- Soyuz TMA-23/27S launch – *M. Fossum (CDR-29)/S. Furukawa/S. Volkov*
 06/01/11 -- Soyuz TMA-23/27S docking
 -----Six-crew operations-----
 06/21/11 -- Progress M-11M/43P launch
 06/23/11 -- Progress M-11M/43P docking
 08/30/11 -- Progress M-12M/44P launch
 09/01/11 -- Progress M-12M/44P docking
 09/16/11 -- Soyuz TMA-22/26S undock/landing (***End of Increment 28***)
 -----Three-crew operations-----
 09/30/11 -- Soyuz TMA-24/28S launch

10/02/11 – Soyuz TMA-24/28S docking

-----*Six-crew operations*-----

10/20/11 -- Progress M-10M/42P undocking

10/21/11 -- Progress M-13M/45P launch

10/23/11 -- Progress M-13M/45P docking

11/16/11 -- Soyuz TMA-23/27S undock/landing (***End of Increment 29***)

-----*Three-crew operations*-----

11/30/11 -- Soyuz TMA-25/29S launch

12/02/11 -- Soyuz TMA-25/29S docking

-----*Six-crew operations*-----

12/??/11 -- 3R Multipurpose Laboratory Module (MLM) w/ERA – on Proton.

12/26/11 -- Progress M-13M/45P undock.

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