



GRIP LESSONS LEARNED Operations



WB-57 (LL regarding communications only)
Operations

Communications Discussion (w/Platform Leads)

- 104 Lessons Learned submitted to ESPO



GRIP LESSONS LEARNED

Operations



- **Telecons:** Time consuming and often hard to keep up with but worth it.
 - Daily Science (14-16Z)
 - Dry Run
 - FBO/STX Prep
 - Pilot prep were all very useful. Time consuming but worth it.
- **Documents:** Very useful
 - Tri Agency Communications plan
 - MS A/C Fact sheet
 - Country clearance book
 - Aeronautics charts
 - Daily aircraft summary were all very useful.



GRIP LESSONS LEARNED

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- **Tools:**

-List Serve was useful - Need to get ALL members on list serve. Students knew little of what was going on.

-Database registration useful but needs improvement but "are you in the database" helped reach team members.

-Website was useful but busy. Simple table of flights completed would be useful.

-Webinar was very useful.

-Plan of the Day was useful except FLL needed info before DFRC had made decisions. Ended up with POD for GRIP and then local DFRC modified schedule. Also POD statement at the end of the 16Z telecon would have been helpful to PI teams.



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- **Preparation:**

- Although ESPO sent out info, posted info and discussed info at the telecons, personnel arrived at FLL without an understanding of the location, ops, or safety.
- Some confusion regarding what gases and specialized support ESPO will provide. Needs to make costs clear during proposal process.

- **Planning:**

- Although a full Mission Scientist and Forecast deployment schedule was worked in advance (good practice), Mission Scientists needed longer overlapping time in the field so that the new MS was fully briefed before the leaving MS departed.
- Country clearances were a major effort but having ESPO submit one for all 3 aircraft was effective.

- **Facilities:**

- FLL lab/office space, hotels etc were great. Would appreciate better chairs.
- Site visits were valuable. Were able to work TSA badging waiver.



GRIP LESSONS LEARNED

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DC-8

- Medical approval process for flight was easy. MM were flexible during deployment for setting up safety briefs.
- NSERC worked well with ESPO on manifests and aircraft status.
- Integration was a problem. Support and communications were lacking. Changes in personnel created delays and left people feeling unsafe.
- Suitcase deployments worked well. Suitcase flights should always have ground crew on board.
- “Students” should not be sent to the field for the sole purpose of flying on the DC-8.



GRIP LESSONS LEARNED

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DC-8

- The debrief included an impromptu summary by one of the scientists aboard the plane. That was very instructive but it would have been interesting if there had been science instrument debriefs on some of the no fly days (not that we needed more meetings).
- During planning, MM was slow to respond to requests for information.



GRIP LESSONS LEARNED

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Global Hawk

- Integration process needs improvement. Need to establish a more defined process with associated schedule and milestones.
- GH was short in manpower and integration was not complete on time. Schedules are way too success driven.
- The payload scientists were often given too little “hands-on” time to work-on, prep and post-flight their instruments on the GH.
- Global Hawk project really needs to come up with an updated, accurate and useful "Investigator's Handbook".



GRIP LESSONS LEARNED

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Global Hawk

- Impressed by the flexibility that the pilots had in flying the Global Hawk.
- All the GRIP lead scientists were extremely helpful in working out the flight plans, however, the decision making chain of command was sometimes not clear. Operationally it is critical that there is one person for the mission coordinator and the PIC to go to for mission decisions.
- It was great having Ku-Band satellite communications available during this mission. Its loss, however, can diminish the science return, and might even result in the total loss of some key measurement. Improvements needed.



GRIP LESSONS LEARNED

Communications Discussion



General

- Having 3 aircraft at 3 locations and coordination with NOAA, NSF and Air Force was a challenge but communication was the key.
- No fly day is not a down day. Science and A/C teams should be available. Down days are for A/C crew rest, it is not a vacation day for science teams.
- The RTMM waypoint tool was NOT ready for real time use. There were too many things in it that needed to be fixed and the mission coordinators spent too much time trying to figure out how to make it work, running into problems with it, and figuring out workarounds although Matt and Michelle did a great job bailing us out repeatedly but development of the tool should not take place during the deployment.



GRIP LESSONS LEARNED

Communications Discussion



WB-57 Communications

- Having one aircraft and one PI in a separate location and on a different start schedule made communications sometimes difficult.
- WB was originally told that representatives needed to be on the 15z. It would have been useful to be included in all 3 from the start.



GRIP LESSONS LEARNED

Communications Discussion



DC-8 Communications

- Between RTMM and x-chat we had unprecedented information however for flight safety and cockpit management purposes we found that the aviation communication sources were the ones to rely on. Establishing radio contact with the air traffic controller in the control tower at STX and Iridium phone contact with the FBO operator were the factors that permitted sound flight-safety decisions.
- Landing in STX. DC-8 communicated with STX tower but didn't pass that info to FLL. It would be useful to the science and management teams on the ground to know that the DC-8 was receiving info from other sources and how that was impacting the decisions made.
- Difficult to coordinate with DC-8 MM during GRIP Prep. Many misunderstandings due to lack of communication. DC-8 MM needs to make upcoming mission a priority.



GRIP LESSONS LEARNED

Communications Discussion



GH Communications

- Communication channels were also open between the science team and the pilot and aircraft crew.
- Communicating PI aircraft access in advance, can be improved.
- Comm link: When flying Earl flight #4 DC-8 could hear GH radios but JAX Center could not. The DC-8 copilot started relaying comms for GH. Why couldn't JAX Center call GH on the phone?