DC-8 Working Group

PI presentations for all instrument teams were reviewed. These have all been given to Kathy for posting on the ARCTAS web site.

Charge Topic 1; conflicts between different instruments

No definite conflicts were identified, though longstanding issue of airspeed remains (LARGE/UNHMERC/SAGA prefer higher TAS for inlet/pump performance, DFGAS requests 440 knot max speed above 35 kft). Uncertainty about NCAR HO_x CIMS inlet performance may make this a bigger problem (to be tested during test flights).

Charge 1 cont.

Some discussion about how/whether decisions made by PIs about operation of their own instrument should be informed/vetted by larger group.

e.g., CT CIMS could focus on high frequency HCN in fire plumes, but would back off on other molecules, DFGAS raised concern about maintaining MeOOH data

PTRMS has a list of possible target compounds, can not do all fast. Current plans are to make unique compounds priority, rather than duplicate for comparisons.

UNHMERC particulate sampling around tropopause will preclude collection of SAGA filters. Which SAGA filter? How often? Who decides?

Charge 1 cont.

Discussion of the new DC-8 on-board network and data system. Rick needs to know asap about PI data streams that will be provided for display and distribution. Also, what we want to see in time series plots and/or in the data feed. More details are available in handbook.

Related topic, how much data needs to be passed down to ground (general feeling in our group was “not much, better to save the bandwidth to upload met and satellite products for onboard info in flight”)?

Gao Chen stressed that fast data (≥ 1 Hz) needs to be very well time synched. DC-8 provides IRIG B (PIs need hardware to capture directly) but it is also on the feed at better than millisecond accuracy. INSTRUMENT LAGS IMPORTANT AT THESE SCALES.

Charge 1 conc.

Had brief, not very well informed, discussion about what "sampling pyro CBs" would really entail. Impression was that we might be able to overfly turrets, but would not penetrate them. Focus would be on the detraining smoke plume at increasing distance (age) from the updraft core. (Input from Mike and Brian would be good.)

Charge 2, currently unmet ground requirements.

Nearly no PI support for ESPO plan to ship everything to Fairbanks on truck leaving day after first, and before second, test flight.

2 possible modified plans, both still include truck shipment of all expendables (cylinders/water) and heavy AC equipment on or before 26 March. Also, calibration systems and critical spares for PI instruments stay in Palmdale through all test flights under both plans.

Charge 2 cont.

ESPO will explore options for air freight shipping all cal systems and spares to Fairbanks. PI groups need to provide accurate estimates of weight/cube to Kent (he will specifically request this info soon). Plan 1) all of this would be shipped to Fairbanks to arrive ~ same time as DC-8. Plan 2) cal systems would be shipped by air freight to Fairbanks, all spares would stay at Palmdale (or possibly at PI lab). If parts are needed for repair, DFRC would Fed Ex to Fairbanks (or someone from home base would ship). This will require PIs to leave detailed inventory at Palmdale to allow proper parts to be found and shipped.

Broken instruments may miss a flight waiting for parts under plan 2.

Cold Lake deployment presents similar issue, not addressed yet (truck less risky and maybe faster??)

Charge 2 conc.

Also revisited the integration/test flight schedule to see if both test flights could be done before 3/26. Not out of the question, but some PI teams do not want to put delicate equipment on the truck even if time allows (thanks Glen!). Regardless, compressing integration could save travel $.

Shipping to Thule for local flight presented as very difficult and expensive. This contributed to decision to forgo Thule local (see Charge 3)

Charge 3 Review Flight plans

Decided risk and headache of Thule local in spring had too small a payback. Makes intercomparison with Falcon and ATR 42 essential on summer Thule suitcase.

Charge 3 cont.

Suggest that ARCTAS should be proactive and present CARB with pretty detailed suggestion about how our airborne platforms could best help CARB. Ron Cohen to prepare strawman flight plans for discussion with Singh/Dibb (and any other interested ARCTAS PIs). Singh to discuss these with CARB, and modify if needed.

Note, not clear if Ron planning to also include P3 in his strawmen. If yes, Phil should be involved in ARCTAS discussion before anything goes to CARB. If not, we think Phil might want to do something similar.

DC folks like this idea of having flight plans ready early for discussion with ATC. May greatly improve chances of being allowed to do much of what we want.

Charge 3 cont.

Regarding ATC issues in congested CA airspace, Wennberg suggested that second test flight include components that could be “pre-CARB”. Examples, low-level work over central valley, LA, Long Beach.

OMI requested that we consider spiral over plume from big power plants near Four Corners on test flight 2 (cost 3-4 flight hours). Might conflict with idea of testing relations with ATC.

Wennberg (supported by Jimenez/Weber/Cohen/others) proposed a night flight in July to examine SOA processing in fire plumes. Work would be fairly close to fire, better if plume at high lat, so night shorter.

Dibb/Hair/others? suggest flight plans include walls, to take better advantage of DIAL to find Haze and smoke layers.

Charge 4. Aircraft co-ordination

Pilots comfortable with wingtip-wingtip formation for intercomparisons if VFR. Plan to do such legs with both P3s, DLR Falcon and CV 580. In-cloud comparison to CV 580 should be attempted, but approach needs more consideration.

NOAA P3 comparison should be early in Fairbanks deployment. Ideally in region where BrO (and other halogens?) expected. Does this argue for first science flight to be a local near Barrow? Could we knock off first comparisons with all other US planes same flight?

Some concern about P3-centric coordinated flight plans for aerosol/radiation studies. Also, experimenter group felt uncertain how DC-8 and/or multiple aircraft would interact with various satellite sensors to address aerosol/radiation issues.

Charge 5. Intercomparisons

To be presented separately by Bill Brune.

Charge 6. Other business

None identified/discussed.