

APF Meeting Notes 1-6-06

Present: Bob K., Jerry, Will, Barry, Ken, Jeff, Dave H., Matt, Lee, Nick, Dave C., Debra, Steve, Geoff, Tony, Myra

Purpose of meeting: to review next 6 mo activities, determine where groups are so no surprises.

Schedule, budget: mostly purchased big items, what is extant? Computers, Fiberoptics will be ordered soon.

Dome in week five of build. Superstructure, floors done. Elphick here. US crew on site starting Monday, plus Mark and 2 juniors from EOS, will start cladding and shutters. Last two containers steel and rest of fiberglass. Now sitting in customs [UPDATE: Customs has released one and will release the other one today. AB has been notified]. Will panels fit dome? Unknown. If fit issue, we have time to modify them in SC or SJ. Panstars is finding all the problems. We have advantage in that we have shop facilities to correct mistakes. Contractor has been great with doing mods as well. Weather will be main issue. Electrician took care of 3-phase power to site, now waiting for enclosure. UPS, flex power cable still to be ordered. Power to chiller done.

Two open issues: Lightning and fire suppression.

Lightning: Matt reviewed Panstars plan, which will be retrofitted to our dome. Large copper strap inside dome, spring loaded brush pickups. Copper straps outside on both sides, run inside, around bogey wheel and into the ground. Every piece of equipment should be grounded.

Fire suppression: Fire marshal willing to do inert gas suppression system on level one, CO2 is cheaper by \$10K so we are shooting for that since it's an unoccupied building (instead of FM200).

Lick tests open issues:

Fibreoptic cable

Lightning, fire

Metro station. How high on Astrograph? Not too, on building not dome. Will measure strong winds, for shake or particles? Wind load on shutter is what matters; Tony says particle detector for telescope can be provided. There are already 3 or 4 wind sensors on Mt – We will have access to this information. Data logged on computer as well. **Part of LIST TBD for telescope prep.** Wind limit per EOS is 50 MPH. Squat telescope, so wind shake shouldn't be a factor. Is APF dependent on other sites for wind information if power goes down? Yes, and also for other weather conditions.

Close circuit TV monitoring. Bought cheapo cameras, but not sensitive to dark. For a few hundred, could get decent ones and network. Nighttime surveillance has IR capabilities, but pretty cold so res would be bad. Not really necessary for nighttime surveillance (we simply turn on lights if there is a problem). However, audio would be better so we can listen to dome sounds. Discreet computer to run s/w? Will look into. Mike systems go into Galils. Multiple mikes, fixed cameras with one steerable. Think we can do at minimal cost. This can be modified according to need, but hooks should be in place from

outset. Mostly to monitor at night, sep audio w/discriminator and time stamp. Sophisticated systems, start new files at intervals. **Matt, Will to look into systems.** Safety modes are included in s/w – up to us to set protocol. Last stair to level 3, moving chain nearby w/guard. Access issue for back of telescope, articulated hatch. Issue: will be used a lot, awkward configuration, too many things to trip over. There is another access to level 3 through grate via ladder. Working on this, may be a dome feature that is just annoying. Once in operation not a big deal, but headache during commissioning. We may be able to modify ourselves. Fire marshal may not be happy, fire exit not good.

Telescope:

Major pieces are in-house at EOST. Hoped to have it up and running but holes were off, by end of January should be assembled minus primary. Secondary is here, we are certifying it (profilometer is being upgraded now). Need to know conic to high degree, may determine position of instrument. 21 January deadline to notify EOST, should be fine for that. Data on surface has been taken, all in Nan's hands for analysis. W/have two independent measurements as well, so will be very precise and double-checked. If trouble, will be able to determine which optic is faulty.

Primary: no interferogram seen yet. They are taking them, but issue about actually seeing them. Proprietary information? Raleigh being dogged? Yes, PM is doing this, but we are still not seeing. EOST management structure broken, they have not been effective in checking their subcontractors; have even suggested that we do it ourselves. Are we waiting in line behind anyone? No, not right now. We are rated as a defense contract – if they put nonrated project ahead of us, they are breaking the law. Question is if central purchasing didn't attach a contract copy to EOST, and they did not know we are rated, it is our mistake and we have little pull with Raleigh. Keep pushing with threats.

Servo testing. Have data for Panstars, Bob reviewed. Is testing proper, thorough, complete? Looks pretty good, summary results. Some cases failed, passed with no explanation – is it sufficient, will they re-do? No upper level required in contract. **We need to outline test requirements so they will not be surprised.** We asked for test suite with RFQ, we need to review what they agreed to. They have faltered on delivering documentation, we have to keep on them. Will has received most S/W he needs, dome simulator, weather simulator, telescope simulator. **Documentation is missing. They know we will not proceed to factory acceptance testing without documentation, one month ahead.** We will hold \$1M until received, a strong hand financially. All s/w from Australia, except guide camera. In their interest to meet requirements, but will we hold project? How far along is documentation? Nothing written down at this point. Who is in charge of filling in cracks? Will, but not in touch frequently (bi-weekly would be good). Next milestone payment for telescope: when system is together minus primary. Hoped to meet before 2006, but now under pressure. End of January. S/W integration March 3-30. Doc required at beginning of February. They don't get paid until we test everything. **Need their list too.**

Instrument:

Science grade CCD in dewar, it is running. Everything working, and it is imaging. Metal seals to be replaced, cool again. Going at Richard's pace, contamination issues resolved. Will try to get dewar on instrument at Lick for performance testing (Debra), but may not have time.

Test for radioactivity now that site is complete. Richard can do.

Three stages done, populate breadboard for S/W to test. Problems with servo motors, but resolved (resonance problem). What measurements on stability of stages? Check at every discreet step, check load encoders. Have looked at tuning, will check load encoders after all else correct. No reason to believe this system won't work as well as brushed motors. Push is to finish stages, Lee working on. Enclosure is partially built. Pfister working on, he's been doing design/build as he is CAD proficient. Camera construction underway. January to Feb all pieces together. Last optical elements done for camera, then put together. Last optic will be ordered. Still uncertain about shape, but will buy pre-made so lead time short. \$32-35K for AR coatings for instrument. Max Mirror coating? Have flat done with this, do they do 4"? We'll see. Go out to bid soon. Finish design for small optic mount, camera struts, camera gratings. Then build main structure. Mill will be hooked up and tested, ready to go next week. Invar purchases can be made. How about spares? Some purchased already, Galil, motor, couplings. **Make list of what we need.**

S/W source code in escrow for 7 years. Need contract person to investigate. Need self-extracting, executable: never have delivered. Will changes be reflected in escrow? Should be in contract. If we want source code, needs to be pursued. **Will to write down criteria of what s/w wants.** Will has but who will negotiate? Matt, w/Will present. Do in January. **Work out escrow agreement.** We'd love for them to be responsible in case of failure, but what is response time? I.e., if break happens, give them a few days and if no response, we open escrow account. Need local escrow agent. Template in agreement, need someone knowledgeable about such things to inspect. If open, can we even read? Set up agreement, self-sabotage so check their response and escrow agreement. Other Documentation: Electronic and hard for of mech, electrical schematics. Layouts, traces, custom chips, etc. all need to have logic equations available. **We need to see soon, not on delivery,** to see if all makes sense. TOC of ICDs? Kevin doesn't have, Matt told him he needs to see next visit. Pushing hard on Kevin for this. Preventive maintenance is deliverable as well.

Open issues: radiation shielding. Jerry worked on, fully shielded is 800#, 98% is 250#. That's what we'll do. Baffles, stops to protect optics.

Cooling: TBD. Glycol thru service loop for instrument.

Computer purchases. \$6600 for computers and hot spare. When? End of next week. Cisco might be willing to help. Sun computers might be best, very robust and stable. Linux making too many changes too fast. Might have to recompile in a couple of years. Device drivers trickier than originally thought. Most reliable vendor keeps changing. Sun still hasn't gone under despite reports, so perhaps we should go with. EOS committed to Linux-based – change to Solaris? Maybe. **Will to bounce list to Debra, she'll check on what's available through Cisco contact.**

Time line for finishing spectrometer? Matt will have answer next week. More engineering and s/w than thought. Must finish detailed drawings (Lee is it). In-shop commissioning time will only be a few weeks, as all contingencies are being accounted for in advance.

Budget discussion unrecorded.