Summary report of COMPRES Facilities Committee meeting, 15-16 December 2014

Related to Executive Committee by A. Campbell, 18 December 2014.
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The Facilities Committee met to review the annual reports submitted by the PIs of each COMPRES facility. Present were A. Campbell (chair), K. Leinenweber, J.-F. Lin, M. Rivers, J. Bass (president), and P. Burnley (Exec. Comm. chair). The discussion continued among the committee members over two mornings. Summarized below are the issues that were discussed by the committee.

U2A:

This beamline was the leading facility of its type in the world when it was closed on Sept 30, 2014. Its successor beamline, FIS, will get 50% time of the FIS/MET IR beamline at NSLS-II. The expected date of opening is late 2017 at best. This puts COMPRES in the awkward position of supporting Zhenxian Liu for more than two years with no IR synchrotron source.

The opening date for FIS has been pushed back further than previously expected because of DOE/NSLS-II budget delays, so Zhenxian Liu is making other plans. A hutch is coming up at NSLS-II to allow COMPRES users to perform offline experiments using a conventional IR source, and Liu is submitting an AP to ALS for the U2A users to go there during the dark period. This will complement the existing (Lisa Miller-led) NSLS AP at ALS. Liu's plan is to accompany users at ALS each cycle.

Recommendation:

Keep the project funded, to keep Liu available for FIS. The requested spectrometer repair is lower priority. Travel support is needed; diamonds are not.

A better plan for Liu's time during the dark period would be welcome. The committee might ask for more details on his activities at ALS, and for renewed commitment on efforts to support DAC activity at NSLS2. Perhaps Liu could act as a COMPTECH-like person around IR beamlines (ALS, NSLS2, ESRF?). It might be advisable to talk to Carnegie about their plans for this facility. Maybe Carnegie can support Liu for 1-2 years to do something else during the IR dark period?

12.2.2:

Progress continues at this facility, and management has ably faced some transitions thrust upon it. Budget cuts led to two layoffs, replaced by one ALS staff member. Otherwise, ALS continue to be good partners for COMPRES at this facility.

The Tschauner single-crystal AP has expired, and an AP from HPStar has been approved, receiving 10% of the 12.2.2 beam time. Development work on both laser heating and single-crystal applications continue. Beamline management are lobbying ALS for a better diffractometer. The budget request includes minor promotions for beamline staff.

More Earth science publications from this facility would be welcome; 2/3 listed in this report are materials science.

Recommendation:

The facility should be supported near the requested level. The Committee recommends that 12.2.2 staff keep better records of gas loading and laser mill users, and also urge users more effectively to acknowledge COMPRES support in their publications. Beavers' work on data processing tools would benefit from software being developed at other beamlines (e.g. Dera). The budget request is reasonable. The salary bumps are pretty high, but Yan's salary would still be pretty low for someone with his experience.

PX^2:

This project has developed rapidly, even without a beamline scientist. Contributed effort from Dera, GSECARS, and a temporary hire have made great strides. Beamline scientist Dongzhou Zhang begins in January.

It is important for COMPRES and PX^2 management to split this project from COMPTECH more explicitly in all reporting. Their budgets and goals have been confusingly intertwined. The Committee also noted that the salaries are high for fresh PhDs.

PX^2 has been well supported for equipment purchases already -- more than was recommended in the past by this committee. The priority now should be to have users for the facility for room temperature studies, both single crystal and powder. The laser heating development is not viewed by the Committee as a high priority for the coming year.

Recommendation:

The project is a very promising new facility for COMPRES and is a high priority for support, but at a level sufficient to maintain operations. Further equipment investment for future development (for example, the requested NIR spectrometer) is viewed as a lower priority. The travel and software budgets might also be trimmed. Some of the 2014-2015 salary funds that were not spent because of the delay hiring PX^2 staff could be held for 2015-2016 salary.

COMPTECH:

This project was stalled since Bin Chen left for Hawaii in January 2014, until Jin Zhang took over as the new COMPTECH officer in November 2014. As mentioned above, it would be best to more clearly separate COMPTECH from PX^2 in future reports and budgets.

The Committee raised concerns about the management strategy for COMPTECH. The COMPTECH Advisory Board that had existed previously has not been convened or consulted since the change in personnel. As the primary COMPTECH goal is to develop and promote technologies and (especially) PUP proposals to benefit the broader COMPRES community, it is important that the COMPTECH officer's activities be guided by input from the COMPTECH Advisory Board. It was even suggested that perhaps the COMPTECH program would benefit from changing from a single-PI model to a committee-run facility.

A concern was also raised that the nature of the COMPTECH officer position will lead to regular staff turnover, likely with interruptions in the project as seen this past year.

Recommendation:

Continued support for this project is recommended, including salary and materials necessary for the project (e.g. diamond anvil cells). It is imperative that the COMPTECH Advisory Board play a strong role in guiding the COMPTECH officer's activities, with regularly scheduled meetings to discuss progress and plans.

3-ID:

This is a new facility this year, transitioned from the EOID program. COMPRES contributes 70% of a postdoc salary to support a high pressure PUP at Sector 3 of APS. This facility also hosts workshops regularly to promote the technique. A new development is the PUP for low T, high P NRIXS studies.

The beamline is very oversubscribed, an outcome of the success of this project.

The COMPRES staff person, Wenli Bi, has had a change of title and salary bump because of APS rules regarding the duration of postdoctoral research appointments. This new salary is not reflected in the requested budget.

Recommendation:

The Committee recommends supporting the salary increase, with a budget increase to accommodate it. The Committee also recommends that the PI be encouraged to continue offering workshops regularly, to further broaden the user base and inform users of developments at the beamline.

XPD + 6-BM: [Burnley recused]

Operations at X17 closed Sept 30, 2014. As their report details, both the MAP and DAC programs at X17 remained productive to the end of their operations, including high quality development work at X17B2. Currently the Stony Brook group is staging the 250 ton DDIA press for its move to 6-BM. After that begins work on installing the big (1000 ton) press at XPD. Beamline 6-BM is expected to be available for Users' use in March 2015.

The X17-LVP program has maintained a strong publication record, and mainly an Earth science user base. XPD will offer a choice of presses, DT25 or DDIA. It is still not clear how the LVP user base will react to the mono-only beam offered at XPD, after many years of white beam experiments at X17.

The X17/XPD report did not provide a strong case for the DAC program at XPD. Last year the Facilities Committee was divided, but eventually recommended supporting the XPD DAC program under the expectation that the LVP and DAC programs would share 40% of the XPD beamtime, as requested in the PUP proposal submitted by PI Weidner to NSLS-II. However, only 20% beam time was assigned to the PUP, which is a less attractive deal for COMPRES. The Facilities Committee gives the XPD DAC program low priority. The low beam share for high pressure work (20%) makes it difficult to envision good use of DAC time, and moreover, it still appears that the expected spot size

will not make laser heating applications attractive to the COMPRES user base. COMPRES desires activity at NSLS-II, however, and X17-MAC was a leading COMPRES program for Earth science work, so the committee sees an important need to support the LVP program at XPD.

Some committee discussion also centered on untrue or unsubstantiated statements in the X17/XPD report -- specifically regarding statements on beam quality, and about outages upcoming at APS and ALS. The question of an eventual management transition plan for this facility was also raised.

Recommendation:

The LVP operations are critical to COMPRES activities at XPD and at 6-BM-B, and are a high priority for support. The committee recommends funding near the requested level for 6-BM-B. The budget for XPD-LVP is high for only 20% beam time, but still recommended for funding at a high level because of the importance of this program to COMPRES at NSLS-II. The DAC program at XPD is a low priority for funding, because it is unlikely to be a high impact facility based on the plan provided, and especially as it will share the 20% total high pressure beam time with LVP operations. It would be reasonable to halt XPD-DAC operations if COMPRES is unable to support all its facilities at an adequate level.
[Note: Subsequent to the Facilities Committee deliberations in December, it was learned that Stony Brook has an MRI proposal pending at NSF that could augment support for DAC operations at NSLS-II. Some committee members suggested that this should be an additional consideration in COMPRES' decision on XPD-DAC operations.]

MAP Assembly project: [Leinenweber recused]

Recent development activity for this project is mainly DIA assemblies, which became important when the SBU machine shop closed. Also, they are developing a pressure standard useful for calibrating MAP assemblies in absence of XRD, based on SiO2 solubility in GeO2.

Proposed new development for 2015-2016 would be production of calibrant materials that could be disseminated to multiple laboratories, to improve interlaboratory comparisons. Also, they would like to offer more sample capsules -- a component that has largely been left to individual laboratories, aside from simple capsules that are inadequate for many leading experiments. Single crystal MgO and precious metal capsules are mentioned as examples.

The budget requests $15k for Labview-based automation of their MAP. This will be used for doing calibration runs and other testing.

Recommendation:

Continue support for this project, which is seen as a good deal for the COMPRES community. Perhaps the Labview costs should be split with ASU, because COMPRES activity is unlikely to be the sole use of those presses.

Gas loading project: [Rivers recused]

This project has been a good deal for COMPRES and for the entire high pressure DAC community in

the US. The mail-in service is a success, and the user-present service is even greater. Other organizations worldwide have replicated the gas-loading system. There is no budgeted request for COMPRES to support regular maintenance/repair costs for the system on a regular basis, even though the need for such repairs was described in the facility report. The staff salary was viewed as relatively low.

Recommendation:

The Committee supports the requested increase from 40% to 50% of the staff salary, based on the high proportion of gas-loaded cells that are fore non-GSECARS experiments. A system for tracking publications supported by this project should be encouraged. At a minimum, it would be good to request a standard acknowledgment in publications that used this Project Facility.