InterCAT Technical Working Group Meeting
March 18, 1999

Agenda Review, TWG Activity Summary, and February Minutes: (Paul Zschack)
Zschack announced that the TWG WWW page, which can be found at http://www.aps.anl.gov/cats/twg/, was recently updated. He asked the group to forward any comments or suggestions for the page to him. The meeting agenda and action items from the previous meeting were reviewed. Zschack indicated that the diagnostics subgroup is still looking for a leader.

Facility Reports

APS Facility Update/News: (Steve Davey)
Davey reported that he and BioCARS are finalizing the protocol for using dry shippers. When the system is finalized, Davey will distribute a technical update outlining the procedure. Same-day transport will be available for dry shipper shipments by paging ANL Site Services at 4-1683 (details will be provided in the technical update).

Kits are available in the stock room for shipping hazardous materials using the Small Quantity Exception. The kits include all necessary containers, labels, absorbent material, seals, etc.

(Information from Tony Rauchas) Fill-on-fill operation with shutters open is still delayed pending completion of administrative internal approvals. Required documentation is expected to be completed by the third week in March. The original review had to be postponed; it will be rescheduled for around the first or second week in April.

A colloquium featuring Dr. Veronica James will be held at 10:30 a.m. April 5, 1999, in the Bldg. 402 Lecture Hall. The talk "What is a Hair?" is co-hosted by the APS and the Argonne Women in Science and Technology program.

Davey clarified the definition of "operational" as it was used in the new *CAT Guide and Beamline Directory*. If anyone needs to update information about their beamlines in the directory, contact Steve Davey.

Liquid Nitrogen Distribution Update: (Bob Ferry)
Ferry announced that the contract has been awarded to Quality Cryogenics (from Georgia). Measurements and preparation of the design report are scheduled for the end of March. The design report will then be reviewed, after which special design requests will be considered. The approval/award process schedule has slipped by one month. Any questions should be directed to Bob Ferry.

Two schools to be offered: (Dean Haeffner)
Haeffner briefly described the following schools, both of which will be held at ANL:

The U.S. Particle Accelerator School / June 14-25, 1999
Web site: http://www.indiana.edu/~uspas/programs/anl1.html

National School on Neutron and X-ray Scattering / August 16-27, 1999 (deadline for application is April 30, 1999)
Web site: http://www.dep.anl.gov/nx/index.html

CAT Reports

Double-undulator Heat Load Studies (Wah-Keat Lee)
Lee reported that in November 1998 a second undulator was installed on sector 1-ID and showed a beamline schematic showing the orientation of the two undulators and the double-crystal monochromator. A variety of rocking curve measurements were done to evaluate thermal effects on the monochromator. Tests on two (111) synthetic diamonds from Sumitomo were done using a Bragg geometry. Lee briefly discussed the parameters of the diamonds, indicating that they were mounted on a water-cooled copper block. Lee discussed the experiments and results obtained using white beam with both undulators set at an 11-mm gap, max. incid. power at 578 W, and max. incid. power density at 300 W/mm^2. Rocking curve data gathered using one and two undulators were compared. Additional tests are planned for the upcoming run.

Lee also briefly reviewed simple 1-D calculations used to determine thermal distortion of cryo-cooled silicon crystals. He described the difference in beam position for the "thin-crystal" and "thick-crystal" geometries, discussing a plot of average absorbed power density vs. actual incident power from the thick-crystal experiments in detail.

CMC-CAT Activity Update: (Thomas Gog)
Gog reviewed the current staff and member institutions for CMC-CAT. The research focus of CMC-CAT is geared towards the characterization of composition, structure, and dynamics of complex materials, complex fluids, polymers, membranes, liquid crystals, and thin films, etc. Methods employed include ultra-high-resolution time-dependent SAXS, grazing incidence diffraction and reflectivity, inelastic scattering, EXAFS, imaging, and others.

Gog reviewed the layout of the beamline and discussed its primary components. A double-crystal Si monochromator (cryo-cooled, planned to be KB configured) is available on the primary beamline (C hutch). Gog showed the inside configuration of the primary line's FOE (expected to be done at the end of April). CMC-CAT is currently running in windowless mode, and plans call for delivery of monochromatic beam at the end of the month. On the secondary beamline (B hutch), a KB-configured diamond monochromator is available (5-10 keV range). The goal is to have the two ID lines support two experiments simultaneously. Most of the available instrumentation will be usable on both lines. The third beamline will be a bending-magnet line and will be used primarily for research by CMC-CAT's only industrial partner, Exxon.

Gog also discussed a white beam slit with a tungsten-polished knife edge design for sensitive scattering experiments. The slits can be moved vertically and horizontally and with respect to pitch and yaw to detect scattering. The components and logistics of the four-sided slit design were reviewed, including the need for a device capable of moving all of the parts. The capacity for vertical lifting is the most critical element. Gog reviewed the modifications made to the translation slides and indicated that tests have shown that the device has good precision despite the high weight capacity requirements. Gog also discussed a fixed mask modification designed by Rich Hewitt to make a square aperture.

Accelerator Parameter Subgroup Report (Jon Tischler)
Tischler reviewed the March 11 subgroup meeting, indicating that the group discussed how timing parameters affect storage ring parameters (i.e., what buckets are filled and not filled). The critical harmonic is number 1296. The current normal operating mode consists of 25 triplets and one sextuplet, with the sextuplet requiring 300-400 ns advance time and 10% of the beam to trigger the rf buttons. The special operating mode has been changed to 25 singlets, and it is hoped that the sextuplet will also be changed to a singlet.

Tischler reviewed some current and upcoming applications that are timing-dependent (e.g., nuclear resonant scattering, laser melting, chopper/single-bunch experiments, photon correlation spectroscopy, time-of-flight work, etc.). Some of the issues related to timing that were discussed included bunch purity (will it degrade when the PAR is gone?), emittance and coupling (what are they in real time?), dead-time corrections (how are the new fast detectors performing), and special operating modes (can change from triplets to singlets).

The group's recommendations included noting that one special operating mode per run may not be enough. The group felt that singlets should be made the standard operating mode, allowing the special operating modes to be reserved for more unusual operating modes.

News and Other Business

DI Water / Tungsten Interaction Update (Tunch Kuzay)
Tunch refreshed the groups' memory about the original problem of corrosion/erosion found in internal passages (esp. at joints) of L5-90 slits where DI water contact occurs. The problem could *potentially* affect L5-20 and L5-80 category slits (other tungsten slits have not yet been examined). A variety of steps have been taken to fix the problem and redesign the affected parts. Existing L5-90 slits that have not yet been used will be nickel plated and thermally treated. Newly designed L5-90 slits do not have internal tungsten cooling passages. Silver-braised copper tubes are used to channel water. Three of these slits are being made for COM-CAT and CMC-CAT for testing.

The culprit, oxygen content in the DI water, had been measured at 2-5 ppm (a very high level). Nitrogen gas blanketed over the DI water tank has reduced the oxygen level to 20 ppb. The system has maintained a low-oxygen level after the purge. Tunch indicated that a complete de-oxygenating system would cost approximately $4K (cost could be reduced if monitoring systems are not purchased). Kuzay advised the CATs to seriously consider taking steps to reduce oxygen in their systems if these slits are in use. Users interested in more accurate cost estimates should contact either Tunch Kuzay or Jeff Collins. Kuzay indicated that he will report results from ongoing tests at future TWG meetings

Next Meeting

The meeting will be held Thursday, April 15, 1999, in conference room A1100.

Action Item

1. Send out technical update about the use of dry shippers to all CATs when completed (S. Davey)