SEPT REPORT FOR LAB SCIENCE

Dear Marian and Bob,

The following is the September 1995 report for Laboratory Science, submitted to Chris Shepherd. All of the credit for the hard work represented in the report is due to the employees who contributed to the report. Thanks for your efforts.

Regards,
Steve Kottmeier

LABORATORY SCIENCE BRANCH

A. MANAGEMENT

þ Director's Summary of Significant Activities

þ Planned Activity Progress

- The Crary Science and Engineering Center (CSEC) staff completed all pre-deployment activities and began travel to Christchurch, New Zealand, in preparation for deployment to McMurdo Station in early October. With the exception of the new Supervisor, Laboratory Operations, the complete staff will have deployed by the sixth flight of Main Body. This is one of the earliest deployments ever and should result in a well-oriented staff, capable of providing enhanced laboratory support to science projects for the 1995-96 season.

- The CSEC staff completed 90-95% of winter/Winfly tasking by month's end resulting in excellent readiness of the laboratory for support of Main Body science projects.

- The Beckman Representative (T-519) arrived at Palmer Station on cruise PD95-6 and completed preventative maintenance, repair, recalibration, and training of the laboratory science staff on the station instruments (Beckman centrifuges and spectrophotometers, and some Perkin-Elmer instruments). This is the first visit of a technical representative to service the scientific equipment and should result in excellent operating condition of the equipment for the austral summer and years to come. Several recommendations were made regarding the instruments and their spare parts, which will improve the overall quality of analytical support at Palmer Station in the short and long

term.

- Laboratory Science conducted regular drills of the recompression chamber crew at McMurdo Station, ensuring that the chamber and crew were prepared for any pressure related dive accident with the advent of scientific diving operations in early October.

- Laboratory Science performed preventative maintenance on all scuba equipment and prepared for the immediate commencement of scientific diving at the onset of Main Body. This will ensure that S-006 will be able to dive shortly after their arrival the first week of October and collect fertile sea urchins before they spawn. These specimens will be used in larval physiology and development experiments (S-006) and for teaching molecular biology techniques in the biology training course (S-301).

- Laboratory Science completed approximately 95% of Research Support Plans (RSPs) for projects in which the staff are POCs. The RSP ensures a higher level of support for science projects than was present under the previous "Dear Grantee Letters". Copies of the RSPs were distributed by handcarry to Palmer and McMurdo Stations, and the research vessels.

- Laboratory Science prepared a summary of science support requirements, Cryogens Management Summary, and listing of science projects working at South Pole Station, for inclusion in the South Pole Operations Planning Summary.

- Laboratory Science prepared field season overviews for South Pole science projects for inclusion in the USAP Science Program Plan.

- Laboratory Science completed a schedule for development of Planned Maintenance and Operations and Maintenance Plans.

- Laboratory Science personnel arrived at month's end to sail on PD95-8 cruise, which will ensure a professional level of support laboratory safety issues (i.e. safe use of radioisotopes, laboratory safety overall, etc.).

þ Changed Conditions Affecting Functional Operations

- The resignation of the Supervisor, Laboratory Operations, McMurdo, necessitates an earlier deployment of the Manager, Laboratory Science, to McMurdo Station during the first week of October to provide for adequate management coverage of the CSEC until the replacement deploys in late October. No significant loss in quality of operation of the CSEC or provision of science support is anticipated.

- FMC started successfully the replacement seawater pump for the CSEC Phase III Aquarium early in the month. Due to severe icing in the intake well, the pump was only operated intermittently throughout the month, when the well had been deiced. Approximately 160 gallons of seawater 0.3 degrees Celsius warmer than seawater found in the intake well were delivered during its operation.

- The laboratory staff at Palmer Station, delayed in arriving at the station on the PD95-6 cruise in August 1995, arrived at the station on the PD95-6 cruise at mid-month and began an abbreviated three-day turnover (vs. 4 1/2 week turnover planned) with the winter laboratory staff. Significantly more hours will be required to be worked to make up for this lack of adequate turnover and additional labor on-site. Priority at month's end was given to preparing the laboratory facilities for 100% occupation expected on PD95-8 cruise.

- The Palmer laboratory staff monitored newly installed electrical switchboxes on the Palmer grid and confirmed proper functioning and resetting of power failure alarms on installed laboratory equipment (environmental rooms, refrigerators, and freezers).

- During offload of the R/V POLAR DUKE on the PD95-7 cruise, the cable to the S-201 tide gauge was severed. The PI was notified of the incident and provided directions to seal the cable until repairs could be effected by ASA Information Systems.

- Laboratory Science personnel deployed to Punta Arenas, Chile, in support of cruises NBP95-6 K. Smith, NBP95-8 Garrison, and PD95-8 Jeffry, and to assist in reorganization of the warehouse. Prestaging of cargo for onload on these cruises was accomplished and

direct
science support provided to arriving scientists, enabling cruise
preparations to run smoothly before departure.

þ Substance of Meetings/Interfaces with Customers and Providers

- FMC discussed with Bryan Boiler in Denver, provision of higher pressure
(20 PSIG vs. 15 PSIG) set steam safety valves. This innovation will
enable the boiler operating capacity to increase in extremely cold
weather.

- Laboratory Science received training on the Lachat Quikchem AE
autoanalyzer, which will result in excellent operation of the instrument in support of basic science and ASA SEH wastewater monitoring program.

- Laboratory Science agreed to provide PCB testing for 15 water and
sediment samples for ASA SEH. This will provide ASA SEH with timely
data and avoid the difficulties associated with shipping samples to the
contract laboratory in Maryland within the 7 day holding time constraint for this assay.

- Palmer Laboratory Science held the general laboratory orientation for
S-024 on the R/V POLAR DUKE enroute to Palmer Station in order to save
research time at the station. Immediately upon arrival at the station,
S-024 was given a tour of the facilities and received a radiation
user's inbrief. Within 24 hours almost all of the S-024 cargo had been
received and delivered to the project, enabling the project to get
started quickly with their research.

- Laboratory Science staff met with the Peninsula Logistics staff to
determine and remove items within the Punta Arenas, Chile, AGUNSA
warehouse could be cleared to make the facility more efficient and
organized.

- Laboratory Science staff attended radiation handling, packaging, and
safety training courses in Englewood, CO, to ensure that trained staff
were deploying to handle these materials safely and accurately in
Antarctica.

- Laboratory Science and Logistics completed the final draft of the
Liquid Helium Support at South Pole for 1995-96, and

submitted it to NSF/OPP. Purchases for provision of this support were nearing completion at month's end using FY 95 and holding for FY 96 funds.

- Laboratory Science submitted to NSF/OPP a final version of the USAP-wide Science Shops policy statement, and a South Pole Science Shop Qualification and Safety Policy.

- Laboratory Science prepared and submitted to NSF/OPP a second draft of the South Pole science population plan for review and comment. A cap of 45 was not attainable without severely impacting science projects' ability to complete work in the time alloted. A final science population plan will be prepared with the input from NSF/OPP.

- Laboratory Science prepared a second draft of the South Pole Facility Occupancy Agreement, incorporating comments from NSF/OPP and ASA, for ASA internal review. The agreement is expected to be completed before the austral summer season begins.

- Laboratory Science planned with S-132B, S-137, and S-148 to remove the S-137 experiment from the AST/RO Observatory until mid-December 1995 and installation of the S-148 experiment after break-in and concurrent operation with the S-137 experiment for one month.

- Laboratory Science interacted with the NSF South Pole Operations and Construction Manager on several issues including: Occupancy Agreement, relocation and housing of the GASP Telescope in the Dark Sector, and a penetration for the S-148 experiment in the Cryogens Annex of the AST/RO Observatory, and reached resolution on most issues, which will ensure a higher quality of science being conducted at the station this summer and winter seasons.

þ Quality Assurance Oversight of Operational Responsibilities

- The CSEC received a score of 96% on a capital equipment audit performed by the ASA Quality Control Inspector. Only two minor error were detected and will be corrected.

- The alarm system for the old McMurdo Aquarium was tested and found to be fully functional (for heat and water pressure). At

month's end the Aquarium was deemed ready for use by S-005 and S-006 starting at the beginning of Main Body.

- The third draft of the Analytical Services Quality Assurance Plan was completed and submitted for ASA review in Laboratory Science, SEH, and QA management. Once finalized in October this document will guide the activities of Analytical Services.

- Laboratory Science staff assisted Peninsula Logistics in organizing the Punta Arenas, Chile, AGUNSA warehouse and identifying materials left behind by projects no longer funded. These materials will be returned to the PI's home institutions for further deposition.

B. COST CONTROL AND FINANCIAL MANAGEMENT

þ Cost Performance

- Laboratory Science purchased a new Buck Scientific Model 210VGP Atomic Absorption Spectrophotometer to replace a 15 year old instrument for the CSEC Analytical Labs. The new instrument and accessories cost $9K less than the $35K budgeted for the instrument.

C. PERSONNEL

þ Status of Planned Staffing

- The Supervisor, Laboratory Operations, McMurdo, resigned at mid-month.

- The Supervisor, Laboratory Operations, Palmer, position became vacant at the end of the month and is expected to be filled by mid-October 1995.

- With the concurrent arrival at Palmer Station of personnel from the PD95-6 and PD95-7 cruises, the winter laboratory personnel turned over in an abbreviated period of time successfully with summer laboratory personnel.

- Laboratory Science made offers for several new positions, contingent upon NSF/OPP approval of the FY 96 Program Plan.

þ Personnel Acquired During the Period

- The previous Supervisor, Laboratory Operations, Palmer, will assume the vacant position of Supervisor, Laboratory Operations,

McMurdo, beginning FY 96. Deployment to the CSEC, McMurdo Station, is planned for late October 1995. Supervision of the CSEC in the interim will be accomplished by an earlier deployment of the Manager, Laboratory Science.

- Laboratory Science hired a contract Analytical Technician and Electronics Technician to complete the recruiting of positions approved in the FY 95 Program Plan.

- FMC hired and trained CSEC support staff for Barber-Colman hardware repair, and Xetron card key locks. Laboratory Science paid for the travel and training tuition of FMC personnel in the repair of ultra low freezers and freeze dryers.

D. IMPROVEMENT AND INNOVATION

þ Development and Implementation of Operational Improvements

- Laboratory Science and Science Construction designed and fabricated two new manifold for the Lachat Autoanalyzer, to be used for silica and nitrate assays in support of basic research. Fabrication of these manifolds on-site will save the USAP approximately $1.2K over purchasing the manifolds from the vendor.

- FMC rekeyed the outside vestibule doors of the CSEC during the month, which should improve the security for the facility.

- FMC designed, fabricated, and installed fifty time "delay on make of power" relays on portable lab incubators. These relays detect loss of power and on resumption of power delay delivery of power to refrigeration compressors for 10 minutes, thereby preventing damage to short operation cycles of the compressors. This innovation is expected to dramatically lengthen the lifetime of the compressors in the CSEC equipment.

- FMC installed an enclosure around the roll up drum and weather stripping on the roll up garage door in the Core Pod of Phase I, CSEC. This should stop the intrusion of outside air into the Boiler Room, which on cold, windy days can freeze water in external piping.

- FMC designed, fabricated, and installed a copy of a $1000 metal canopy

fume hood over the muffle furnace in the Earth Sciences Pod. The hood, equipped with an electrically-operated, damper control system, is the first hood installed over the muffle furnace, resulting in an extremely cost-effective safety innovation to this widely used furnace.

- FMC and Laboratory Science designed and presented to NSF/OPP the design for a small, reverse osmosis (RO) water purification unit to supply high quality water to the water purification system in the Biology Pod of the CSEC. ASA FMC began purchase of the RO components at month's end following approval by NSF/OPP.

- The Palmer Station winter laboratory staff coordinated with FMC to accomplish several improvements to the laboratories including: installation of a flexible electrical outlet over the island bench in Lab 10, rust removal and repainting of cabinets in Lab 1, installation of a Steril-matic autoclave steam condenser unit, relocation of electrical outlets in the Science Library to allow better use of full floor space, and test and repair of all seawater lines in each of the labs.

þ Development and Implementation New Procedures

- FMC and Laboratory Science developed a proposal for a stand alone sediment core storage facility for the Cape Roberts Project for the 1996-98 seasons. The proposal was discussed informally with NSF/OPP and will be presented formally next month to NSF/OPP for review and approval of purchase of building materials to be delivered on the 1996 resupply vessel.

- FMC continued to develop a 2-year supply of consumable materials and spare parts for the CSEC for purchase and inventory maintenance.

- Laboratory Science and Field Services developed new "closer", outbrief, and check-out procedures for NSF/OPP review and approval for implementation for McMurdo-based, science projects during the 1995-96 season. The procedures are designed to improve the efficiency of evaluation of the project's success and departure.

E. LABORATORY SERVICES

- Laboratory Resources Management and Operation
  - McMurdo Station
    - The CSEC supported successfully 27 scientists and writers/artists during the month, a number significantly larger than past Winflys.
    - The CSEC organized McMurdo winter-over "space-A" personnel to complete a flagged route on annual sea ice from the Tongue to Cape Evans. The route is deemed safe now for travel by W-004, W-006, S-006, and S-009, starting early Main Body 1995.
    - The laboratory staff staged material, equipment, and instruments in laboratories and cleaned lab spaces in preparation for support of science projects in early October with the onset of Main Body.
    - Laboratory Science and FMC received authorization from NSF/OPP to submit a proposal for design and purchase of a sediment core storage facility for delivery on the 1996 Vessel for the Cape Roberts Project.
  - Palmer Station
    - Summer Laboratory Science staff arrived at the station and turned over with the winter staff in three days. Significant time was spent in preparation of the station work spaces with material, equipment, and instruments in anticipation of the arrival of science projects.
    - The Beckman Technician (T-519) arrived on cruise PD95-7 and serviced all of the Beckman equipment, and some Perkin-Elmer instruments, on the R/V POLAR DUKE enroute and at the station over three days.
    - Laboratory Science coordinated the visit of a Wallac Technician to Punta Arenas, Chile, at the end of the month. Two Wallac liquid scintillation counters were serviced, one after being removed from the radiation van of the R/V NATHANIEL B. PALMER. This will ensure that all of the Wallac scintillation counters will be in

excellent working condition to support science cruises and Palmer Station during the 1995-96 season. A new Beckman liquid scintillation counter will replace the counter removed from the R/V NATHANIEL B. PALMER radiation van in time for the NBP95-8 cruise.

- þ The winter laboratory staff cleaned up MAPCON inventories in various stockrooms, removing many duplicate item numbers and PDO'ed equipment records from the active MAPCON inventory.
- þ The summer laboratory staff initiated the documentation of instrument repair and service in the MAPCON Work Order, Equipment, and PM modules, beginning with the replacement of the high pressure, mercury bulb for an epifluorescence microscope.
- þ Laboratory Science began repair of an analog Turner fluorometer left with seawater bathing external components, based upon training received recently. If all repairs are successful using spare parts on the station, then the instrument will be available to science projects this austral summer and not required to be returned to the U.S. for repairs.
- þ At month's end, Laboratory Science drafted a second draft Palmer Station Shop Use Policy for internal review and comment. A final draft will be completed and submitted to NSF/OPP for review and approval for implementation for the 1995-96 season.

- South Pole Station

- þ Laboratory Science developed with ASA Engineering and SEH locations of machines and storage areas in the South Pole Science Shop.
- þ Laboratory Science completed purchases of electrical components needed to construct the electrical generator building and distribution system for PICO's drilling for AMANDA.
- þ Logistics personnel deployed on SAAM-2 to serve as the technical escort for the first 1000 gallon liquid helium dewar, which was scheduled to arrive at McMurdo Station during the first week of

October. This will ensure that liquid helium can be transported to South Pole Station on the first flight to allow for continuation of experiments using the material to chill astronomical detectors to low temperatures.

- R/V NATHANIEL B. PALMER

  þ Laboratory Science personnel assisted during the port call in Punta Arenas, Chile, in preparing the laboratories for NBP95-6 cruise. While no laboratory personnel are sailing on this cruise materials, equipment, and instruments were prepared for operation during the cruise.

  þ Laboratory Science personnel prepared cargo in the Punta Arenas, Chile, AGUNSA Warehouse, for loading for the December NBP95-8 cruise, including incubators left unshipped on the NBP94-6 cruise.

- R/V POLAR DUKE

  þ Laboratory Science personnel prepared cargo in the Punta Arenas, Chile, AGUNSA Warehouse, for loading for the PD95-8 cruise. At month's end staff were preparing to sail in the Laboratory Supervisor position to monitor safe laboratory practices and use of radioisotopes on the cruise.

þ Science Project Material and Equipment Support

  þ Laboratory Science submitted and received from NSF/OPP approval to purchase a SGI computer workstation to support the digital cartography, GIS, and spatial analysis/modeling requirements of S-052, sponsored by the Program Manager, Polar Earth Sciences.