SOUTH POLE USERS' COMMITTEE (SPUC) MEETING

June 11, 2003
Denver, Colorado

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SOUTH POLE USERS' COMMITTEE
ANNUAL MEETING, 11 JUNE 2003
Raytheon Polar Services Company, Centennial, Colorado

7:00 - 7:30 CONTINENTAL BREAKFAST

7:30 – 8:20 Opening

- Welcome and introduction of attendees (10 min) — A. Stark, P. Sullivan
- Overview of meeting agenda (10 min) — A. Stark, P. Sullivan
- NSF welcome and remarks (15 min) — V. Papitashvili
- RPSC welcome and remarks (5 min) — S. Dunbar

8:20 - 9:15 Committee Business

- Review and assessment of last year's action items and recommendations (20 min) — A. Stark, P. Sullivan
- Review and approval of membership (20 min) — A. Stark
- Working Group Status Reports (15 min) — A. Stark

BREAK (15 min)

9:30 – 9:45 Health and Safety (15 min) — S. Frost

9:45 – 12:00 IT and Communications

- Time Frequency Standards (10 min) — D. Leger
- Status of existing Sat Systems (20 min) — N. Powell
- Iridium Narrowband Update (15 min) — M. Perry
- SPSM IT update (10 min) — D. Brooks
- PolarIce status (15 min) — S. Holbrook
- EMI Survey Overview (30 min) — N. Powell
- Internet Security Update (30 min) — T. Howard

12:00 – 12:30 Operations

- Power Plant operations for FY03 (15 min) — M. Lewis
- Season Overview (15 min) — R. Ofstedal, J. Marty

BREAK FOR LUNCH (1 hr)

1:30 – 2:00 SPSE/SM Project and Construction Update

- Construction schedules including DSL (15 min) — D. Scheuerman
- Science Transition Plan (15 min) — D. Scheuerman

BREAK (15 min)

2:15 – 2:45	**Special Topics**	
	➢ Meteorology support plan (10 min)	K. Hill
	➢ Cryogenic support plan (10 min)	A. Baker
	➢ IceCube Project update (10 min)	E. Jensen
2:45 – 3:00	**Question Session**	
3:00 – 4:00	**Executive Session**	**SPUC Members**

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Recommendations of the South Pole User's Committee 2003

This memorandum summarizes the recommendations of the South Pole User's Committee (SPUC) for 2003. The topics on which these recommendations are based were discussed at the tenth annual meeting on 11 June 2003; the minutes for that meeting are available as a separate document from Raytheon Polar Services (RPSC). The present memorandum was begun in executive session at that meeting and refined by committee members through email correspondence; it will be distributed in both email and paper form.

(1) Internet Security at South Pole--- *The committee recommends use of a Virtual Private Network.* Reliable, continuous access by grantee scientists to South Pole computers is essential to successful science at the Pole. While satisfying this need, the network security requirements for South Pole Station can be met by any of several commercially available Virtual Private Network (VPN) systems. This will provide computer communication which is both encrypted and authenticated from the individual scientist's home computer through to the inside of the firewall protecting the South Pole network. Special client software running on the scientist's home machine will be required. In order to support the full range of computers used by South Pole scientists, the client software must be available for Microsoft Windows, Macintosh OS X, Sun Solaris, and Linux. One attractive possibility is Java-based client software that is automatically and securely delivered by a web browser such as Microsoft Internet Explorer or Netscape. Further discussion of this recommendation can be found in a memo by the SPUC Information Technology Working Group.

(2) Science network Security Needs--- *Science computers at South Pole have different security needs from other parts of the network.* The science computers at South Pole contain no sensitive or proprietary information; science computers need only be protected from unauthorized use and denial-of-services attacks, a situation which is different from RPSC computers. The committee suggests that the science computers be isolated on their own separately-managed and firewalled subnet, so that RPSC can implement security requirements as needed on RPSC computers, without interfering with science computers.

(3) Network modifications in summer only--- *Changes to the computer network should not be made during the winterover period.* Modifications to the arrangement or naming of network components often result in unforseen difficulties and loss of essential computer services. When these changes are made in the winter, network services have been lost for extended periods. Dealing with these problems has been a burden for winterover scientific staff, and data has been lost from scientific experiments. Changes to the computer network should be scheduled for the summer season only.

(4) Full-time, low-bandwidth Internet--- *The committee recommends immediate installation of low-bandwidth Internet over Iridium.* For several years now, it has been technically possible to provide full-time email capability to the South Pole using the "Iridium" satellite network, and the committee has repeatedly urged that this should be done. Many science projects would benefit from a low-bandwidth, continuous Internet capability. We again urge that this be done immediately. We point out that such a system has been working well at an unmanned base at the North Pole for two years, even though the North Pole has satellite communications problems, which are identical to the South Pole.

We strongly encourage the expansion of Iridium groundstation infrastructure at the Pole in order to increase communications bandwidth through the Iridium system. We consider this to be the most cost-effective solution to broadband, continuous Internet service at the Pole.

(5) Wireless Communication Devices at Pole--- *Use of wireless devices must be kept to a minimum.* The South Pole is one of the world's preeminent radio observatories for astronomy and ionospheric research. All radio transmissions are a potential threat to science, which is not easy to assess or ameliorate. Unlike interference in radio communications systems, the only power level for radio transmissions which is definitely "safe" at a radio observatory is zero power, no transmission at all. This is because radio telescopes can, in principle, detect arbitrarily low signal levels by averaging many observations over time, and sequestration of transmissions by frequency is never perfect. The usual engineering paradigm of assuring electromagnetic compatibility between communication channels does not apply. Radio transmissions should be forbidden at the Pole unless a strong case can be made that they are necessary.

This should be kept in mind as wireless devices proliferate and are inevitably brought to the Pole. Many new computers now have built-in wireless devices, which are "on" by default. Wireless Internet, Bluetooth devices such as wireless keyboards and mice, pagers, and cell-phone devices have become ubiquitous; they are inexpensive and convenient. Any use of these items at the Pole should be carefully considered in the context of the insidious harm they may do to South Pole science, through the ever-increasing background of man-made radio noise.
It is especially important that the use of wireless devices be restricted to summer-only scientific use. During the winter, radio silence should be enforced, consistent with health and safety, and all wireless devices should be shut down. The need for radio quiet should be mentioned to each new arrival at Pole at the in-brief.

(6) Network services--- *Provide Network Time Protocol, "scratch" disks, and anonymous FTP.* There are three network services that we encourage RPSC to provide for grantees at the Pole. The most important is Network Time Protocol (NTP), a UDP port service providing time signals to network computers. This need can be met by purchasing and installing an inexpensive commercial NTP server that works using Global Positioning System signals.

Temporary data storage should be made available to grantees in the form of a large (Terabyte) file system. In order to prevent this file system from filling up and becoming useless, it would be managed by RPSC personnel. It would be understood that data stored there is subject to erasure after a short period of time, at the descretion of the network manager.

One way of enhancing the usefulness of the South Pole computer network without compromising security is by installing an anonymous FTP server. This would be a secure computer owned and managed by RPSC, having two externally available file systems. One, the "incoming" file system, can be written to but not read by anyone on the Internet. The second, the "outgoing" file system, can be read by anyone on the Internet, but not written to. Both the "incoming" and "outgoing" file systems would be available for reading and writing only by computers, which are safely behind the South Pole firewall.

(7) Supply of Cryogenic Liquids--- *The liquid Helium supply in winter continues to be a problem.* The failure of the liquid Helium supply at the South Pole in September of this year caused a significant loss of data for some experiments. It is disappointing that the new liquid Helium transport and storage container did not perform to specifications. The reason for this failure should be determined before any additional cryogenic equipment is purchased. It is hoped that the liquid Helium needs for the winter 2004 season can be met using the equipment successfully used in 2002.

(8) South Pole Science Support--- *Science support this year was excellent overall.* The scientists at South Pole station gratefully acknowledge the contributions of RPSC staff to all aspects of the science projects. This high level of support has been beneficial to scientific work at South Pole Station. Science cargo has done an excellent job in both speed and reliability. Science construction support has been especially responsive and effective. The summer population limits continue to be tight during SPSM and this has resulted in the cancellation or postponement of some science activities.

Respectfully submitted for the committee,

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South Pole Users' Committee Meeting Minutes

Opening

Welcome and Introduction of Attendees
Dr. Stark, Chairperson, emphasized that these meetings serve a valuable purpose because they make a difference by continuing to improve the processes utilized between the NSF, RPSC and science. He remarked that he was pleased with the progress made within the committee, the housing facilities and construction. The science and support of science has a bright future thanks to the efforts of the people at RPSC and the NSF.

Overview of Meeting Agenda
Dr. Stark provided an overview of the meeting agenda. His emphasis was on communications, the IT support and the responses to all items recommended from last year. He emphasized the purpose of communications is to improve quality of science at the South Pole. Committee members will accentuate discussions on these topics, including the progression of IceCube, Internet security, cryogen concerns, Iridium issues and the transition plan. In addition, they expressed continued concern about the South Pole Station Modernization (SPSM) construction project and its impact on science. They felt the items on the agenda that they were satisfied with and did not warrant further discussion were the time frequency standards issues, power plant operations, POLARICE, and meteorology issues.

NSF Welcome and Introductory Remarks
Vladimir Papitashvili, NSF Aeronomy and Astrophysics Program Manager, welcomed everyone and spoke of his appreciation to the committee members for their active participation and encouraged their comments. The NFS/OPP budget has increased by $9.6 million, $4 million since CARA has ended, $7.9 of which is being used for astrophysics resources.

RPSC Welcome and Informational Remarks
Steve Dunbar, Director, Science Support, welcomed the group to the tenth annual meeting of the South Pole Users' Committee. He spoke of the overall progress and appreciation for the collaborative efforts by all the members of the committee, RPSC and the NSF. Mr. Dunbar thanked everyone for coming and expressed his gratitude for the valuable input gathered from this meeting. The use of a video-teleconference connection between the Denver group and NSF headquarters in Arlington made it possible for several guests and presenters to attend the meeting.

The group discussed the purpose of the SPUC meeting and agreed that it is a chance to review and consider the Committee's activities, as well as an opportunity for the Science Community to respond to and critique the Contractor.

Committee Business

Progress Since Last Meeting and Committee Business

Review and Assessment of Last Year's Action Items and Recommendations

Dr. Stark summarized the issues from last year:

Aircraft Flying in the Clean Air Sector
Paul Sullivan, Manager, Science Support, South Pole, stated that he has consulted with the SPAWARS representatives and considered the action closed. However, Dr. Clarke commented that there is still a problem with the Twin Otters and suggested that their flights be within the boundary layer.

> **ACTION: Dr. Clarke will outline the boundary layer. Mr. Sullivan will consult with Kirk Salveson, Manager, Field Support, to incorporate the flight pattern and boundary layers into the Twin Otter Statement of Work.**

Clothing
Mr. Dunbar said that the clothing budget was cut significantly last year, but negotiations between RPSC and the NSF have been restored. Melissa Rider, Manager, Planning Support, has been working on an extensive test and evaluation inventory survey that will be distributed for suggestions. He said that he just signed the paperwork for implementation.

Review and Approval of Membership
Dr. Stark pointed out that the Charter needs to be rotated by one-third, but that the present representation seems to be working out well. This will be addressed at the executive session.

Members attending the June 11, 2003 meeting included the following people:

Dr. Antony Stark, A-371-S
Dr. Robert Morse, A-130-S
Dr. Joe McConnell, O-324-S
Dr. Robert Pernic, A-370-S
Dr. Jeffrey Peterson, A-375-S
Dr. Darren Schneider, A-130-S
Dr. Dan Simon, O-257-S
Mr. Andy Clark, NOAA
Dr. Robert Loewenstein, A-376-S
Dr. Fred Eisele, I-176-S
Dr. Gonzalo Hernandez, A-110-S

Absent members included the following people:

Dr. Giles Novak, A-376-S
Dr. Al Weatherwax, A-128-S
Dr. John Ruhl, A-376-S

Dr. Chris Martin

Dr. Stark said that he has sent out e-mails soliciting new members for the committee, but has not received any responses. Since there have been no complaints about the work the committee has been doing, it is assumed that the community is confident with the work they have done. He suggested, however, that an effort should be made to recruit new members.

Working Groups Status Report

Equipment

Brian Stone, Science Projects Manager, Polar Operations, said that they still have $1 million left from the SPSM to purchase equipment. Since this excess is tied up into the Transition Plan, he and Dr. Papitashvili have not made a commitment yet. He has been working with Dave Scheuerman, RPSC Project Engineer, on a list for communications. The input has been good, but they still do not have approval. He wants RPSC to put together a realistic forecast for a capital equipment plan so they can better allocate monies based on recommendations from an annual plan. They no longer want to "raid" other areas of the capital equipment budget for other materials. Instead they want to be able to increase the budget based on a more realistic plan.

Mr. Dunbar commented that equipment negotiations is the Planners' main focus right now because SIP requests are higher that what we can give. Paul will be working closely with the science groups identifying project areas and their priorities in order to augment the 5-year plan to a 10-year plan. Brian would like to tie into the budget considerations a compiled, on-station, general resource list of equipment that has not been included in the SIPs. Dr. Stark pointed out that there are certain items that will require spares that will always need to be available. These spares will need to be included on the equipment lists.

ACTION: RPSC will compile a current, on-line list, including detailed information and suggestions for equipment requirements. Dr. Stark will keep this list on the Web and Dr. Papitashvili will be the facilitator for this list. He will need to know which and/or how many projects will be using what equipment and the costs so he can better justify the purchases when the money becomes available.

Subscriptions for Library

Dr. Stark stated that he could help other science groups send their information for their journals if he could get the right kind of access to the universities. The NSF wants to use electronic licenses for journals and he will add subscriptions to the library the NSF already has.

ACTION: Mr. Stone will cancel some subscriptions since the NSF wants consistency throughout all stations.

ACTION: Steve Dunbar will investigate this requirement for the South Pole.

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2003 Agenda Topics for South Pole Users' Committee

Health and Safety

Stephen Frost, Health and Safety Officer, said that he had a chance to visit the stations has made significant changes in safety. The main focus of his team of three coordinators is to make sure everyone is safe while in Antarctica. Mr. Frost said they work with the physicians in the care of injures and getting employees back to work as quickly as possible to reduce the impact of having them away from their work stations.

Mr. Frost pointed out that safety is a state of mind. We will continue to see improvements in TRIR, which is at 6.3 because of our improvements and conscienous efforts. They are continuing to educate the RPSC employees and implementing safety standards. Mr. Dunbar noted that we would need the help of the science community in this effort to drive down the rate of injuries. It will be a cultural change throughout the USAP. Mr. Frost stated that there is a safety person on station available to the scientists at all times. He pointed out that 60% of injuries are sprains and strains. Mr. Dunbar pointed out that we track which work areas record the most injuries based on work hours; if the injury happened before or after work hours; and if the injury required more than just first aid. Dr. Schneider said that he would like to have a brief statement of privacy ensuring that physicians would keep recorded injuries and medical records confidential. The NSF reassured the committee that anytime one goes into clinic they are subject to the "Privacy Act" and any material in a medical file is considered sensitive and confidential.

> **ACTION: Mr. Frost will ensure that in case an injury needs to be reported, there will be a Statement of Privacy included in each arrival packet.**

Mr. Frost presented his Power Point safety information.

"Safety" is a state of mind

Focusing on work activities and lifestyle that keeps you safe requires the individual to take care of himself or herself.

- Reduce unnecessary risks
- Keep safe attitudes
- Choose safe behaviors
- Create safe conditions
- Real benefits: Saves time, pain, money…maybe a life

Noteworthy Achievements

- No injuries so far this Winter season at the South Pole
- 100% participation in safety program

Dark sector construction

- DSL
- Power Distribution Center work
- Follow established procedures, avoid construction zones, use hard hats when required, notify on site coordinator if entry required

Key Points for Safety

- Slips, trips and falls
- Sprains and Strains
- Safe workplace practices: General Housekeeping and Fire safety awareness
- Electrical safety
- Chemical safety: Chemical receiving and chemical storage

Safety resources

- EH&S Coordinator/Safety Officer/Physician
- Science Support Coordinator
- OSHA Regulations
- Material Safety Data Sheets (MSDS)
- RPSC Health & Safety Manual
- RPSC Supervisor's Handbook
- USAP/RPSC Standard Operating Procedures (SOPs)
- USAP Observatory/Laboratory Code of Conduct
- Internet

Safety awareness is improving

- Incident statistics: Total Recordable Incident Rate (TRIR)
- (# Injuries x 200,000)/(# of Hours Worked)
- RPSC 2001 YTD 17.9
- RPSC 2002 YTD 11.2
- RPSC 2003 YTD 6.3
- South Pole 2003 YTD 12.6
- Construction Industry: 7.8
- Service Industry: 4.8
- Raytheon Corporate: 0.8
- Raytheon Technical Services: 1.26

Who is responsible - we all are

- Every manager, supervisor, team member, and/or employee is responsible for his/her safety and the safety of anyone else in the area
- Dangerous behavior puts everyone at risk
- Activities that are perceived as low risk may have severe consequences
- Remember HEALTH is 50% of the Health and Safety Program

Break

IT and Communications

Bandwidth Requirements

Mr. Dunbar stated that there needs to be a plan for required bandwidth use for each groups' needs. Pat Smith, NSF Electronics Engineer, Polar Operations, agreed that it would be beneficial to the NSF to have an inventory of operational tools and long range plans to see what the forecast would be. There could be spreadsheets done on an annual basis and role up SIP requirements.

ACTION: Update spreadsheets for bandwidth requirements for long range planning and submit to Bill McAfee, Project Manager, IT, South Pole.

Iridium Narrowband Update

Mitch Perry, Project Engineer, IT, presented an Iridium applications update. The South Pole projects include a 24 X 7 single channel dialup for South Pole and McMurdo, 24 X 7 mulit-channel WAN link and South Pole PBX integration. It is Windows-based and uses Iridium as a transmission channel. It will be a 24 X 7 operation with PPP protocol. It will be used for critical message and upper air traffic. It has been deployed and is being tested at the South Pole and will continue through the winter. It is point-to-point from coms into a dedicated desktop server.

The initial goal for the WAN link was to implement four channels, 24 X 7. One advantage is the scripting capabilities of the Sysco routers. We are currently building a test configuration in the Denver lab that will be moved to the South Pole using existing material there. They have rolled-out the integrated transceiver with PBX configuration. One can dial an access code and it is routed to a dedicated receiver. Although, this system does not support text messaging, Iridium does.

The committee discussed some of their communication priorities such as being able to receive calls to and from anywhere in the world at any time and needing fast response e-mails. Steve Toth, Director, IT, suggested that the committee submit their needs to IT so they can work on long range planning. RPSC will work on solutions and technical design. First, they need to see what the scientist's requirements are and configure their designs to meet those requirements.

ACTION: Scientists will updates requirements and give to IT.

SPSM IT Update

Dan Brooks, IT Project Engineer Manager, presented the South Pole Station Moderation IT update. The elevated installation will be finalized in FY04. The Dark Sector cable to all Dark Sector facilities from Building 61 and from the NPP to Building 61 is fully connected. They are trying to integrate their projects with construction projects. New meteorological system will go in during FY04. Full implementation for FY05 is planned for the high frequency radio system and antennas, the telephone services and network backbone, the network support services/time and frequency, the land mobile radio and the Radome for SPMGT. But, implementation is based on the construction schedule. The TDRSS will be fully implemented in FY06 supporting 45 gigabytes per day. The process will be to solicit requirements from scientists as they relate to

subprojects so RPSC can design, test and implement and accept the process. The NSF will select an individual to will act as a representative in their design requirements.

Dr. Loewenstein brought up the subject of wireless access and wanted to know what kind of impact it would have on science. The discussion by the committee indicated that wireless should not be allowed at the South Pole unless there was a serious need. It should not be used as a matter of convenience. The transmissions interfere with science work. Dr. Papitashvili suggested that if anyone wants to take a wireless devise to the South Pole, it should be stated in the SIP. It was pointed out that RPSC construction people need the wireless pagers in order to do their work. Dr. Smith said that they would look into a wireless phone and paging system policy.

EMI Survey Overview

Nick Powell, Project Engineer, IT, presented overheads while Dr. Peter Hansen from SPAWARS was connected to the meeting via telecom. The cost of the Iridium earth station was discussed. Mr. Smith said that there will be an $8 million up-front cost with $3 million for recurring costs. Funding is an issue so we must demonstrate technical feasibilities and risks. The TDRSS platform is deliverable this year, but we need to know how it would need feedback from the scientists on how it would affect their studies. He went on to say that the engineering feasibility will be known by the end of July of this year. We would need commitments from the Iridium owner and we would need to know how to fund this project. Putting the funding issue aside, producing a good quality broadband link would be a good thing to pursue.

If RPSC IT is successful in establishing a T1 link, then MARISAT and GOES will be phased out will and keep working TDRSS. We would need a big broad satellite along with broadband Iridium. This is worth making the investment giving an 8 - 9 year return as long as Iridium stays in business. Mr. Pernic inquired about running fiberoptics to Dome C. Mr. Toth said that they have done a survey and had 11 responses. The final report was sent to the NSF with a project plan. However, Mr. Smith said that the report was not very encouraging. Most of the solutions were of fiberoptic studies and what happens in terms of the deployment of the fiber. Glaciology research needs to be done to see if a cable can even be deployed successfully. Two more years of study, including the necessary support required, is needed to see if it is feasible. Conventional thinking is that Iridium is more probable than trying to lay a transantarctic fiberoptic cable. The fiberoptic issue will be tabled for a future top-level NSF decision from Dr. Erb.

> **ACTION: Pat Smith will work with SPAWAR once the report is out. He wants to have it available to the Committee. When it is released RPSC will distribute the report as required and put it on the website if necessary.**

Network Security

Bill McAfee, Project Manager, IT, South Pole, presented information on Information Security and how it affects science. Tim Howard, Information Security Manager, attended the meeting via telecom. The purpose of network security is to implement new standards of improvement and proactive feedback from scientists regarding the IT needs. Mr. Howard opened his remarks by emphasizing that this information contains some material which is considered operationally sensitive in nature, and which should not be released to anyone without NSF permission. Participants are reminded to protect the information from unauthorized

disclosure, which includes discussion of the material with others not directly affected by the issues.

Mr. Howard told the committee that there have been some recent security incidents that occurred in 2003. These were South Pole Slammer infection in January, the South Pole science server hack & web defacement in March, the McMurdo DDoS drone on personal laptop in March, and the South Pole intrusion in May. Several things have been implemented as a result:

- Established a firewall management process, which includes stations.
- Managed system vulnerabilities using patches and other methods.
- Improved station-to-headquarters communications and communication paths.
- Published Information Security policies.
- Developed an upgrade plan to replace unsupportable legacy systems that present any vulnerability for the network.

Some changes that will need to be implemented are:

Vulnerability Patch Tasking

1. Two recent tasks highlight issue
   - Sendmail Vulnerability – Feb 2003
   - Win2000 Web Vulnerability – Mar 2003
2. NSF CIO tasked all NSF elements to report status of affected systems, apply patch from CIO Council
3. Tasks included all USAP servers, including grantee science servers & other USAP systems using station infrastructure
4. NSF directed short turn around on reporting and patching
5. We expect to see more of these and will need science help to ensure all systems are patched

Changes for USAP Science Systems

1. New OPP approach for Information Security
   - Non-USAP systems can not be allowed to jeopardize the network; same security rules as NSF systems (C&A)
   - New firewall approach – Deny all; allow by exception
     - Firewalls need to be under configuration management, with input from USAP users and NSF approval of rules
     - Info from grantees in SIP/RSP process (POLAR ICE); other users report needs to RPSC Help Desk, info NSF
2. We can expect more of the "patch taskings"
   - Need to proactively identify all systems and their configuration, and keep it current
   - Patch taskings apply to science systems on station
   - NSF looking at patch management system
3. We will need support of science community to implement

Certification of Science Systems

New Systems

- Develop applications that can support operating system upgrades
- Ensure systems are patched prior to deployment

- Maintain patches while system is in production mode
- Install anti-virus protection
- Identify system vulnerabilities that can not be managed through patching
- Identify firewall rule requirements in SIP/RSP process (POLAR ICE)

Existing Systems

- Inventory all systems on station network and identify vulnerabilities (patches, etc)
- Patch systems to highest supportable level
- Establish other means to manage vulnerabilities for systems that can not be patched
- Update firewall rule requirements annually in SIP/RSP process
- Develop plan to update mission applications to run on newer platforms

Contingency & Incident Response Management

1. NSF Manual 7 requires Contingency Plan for "mission critical" systems; each USAP station is a system
2. Approach is to establish station contingency plan first, followed by individual system contingency plans
   - Station plan being developed based on Nov 02 assessment visit with station support
3. Need to prioritize station systems – which systems get attention in which order
   - Life Safety – telemedical systems
   - Essential Operations – Power plant, email, VoIP
   - Science – Need order of restoration for grants – inputs from station science community
   - Quality of Life – personal use of network
4. Incident Response a subset of Contingency Planning

Awareness Training Concept

1. Information Security Awareness training required
   - Each user must complete federal training
   - Annual is good approach
2. Federal government has a CD available at no cost
   - Takes about 1 hour to complete
   - Can be done independently
   - NSF needs to track & report training accomplishment to OMB – working on this
3. Concept is to use existing venues to complete training before users reach the Ice
   - Web-based training at home organization
   - Computer-based training in Christchurch
   - Training on station – not the preferred solution

Looking Forward

- Firewalls will be tighter; rule requirements must be in SIP/RSP
- Vulnerability management approach will include options besides patching; all systems will be addressed
- Science systems will undergo a certification process; will need science help to define the process
- Contingency planning is underway and will require science support

- Awareness training is recurring requirement for all users; will begin implementing for 2003-2004 season
- Need to address replacement of legacy technologies within existing science systems

Dr. Papitashvili reminded the committee that if they have questions or problems regarding network security, to sent an e-mail to him or Pat Smith for resolution. Dr. Papitashvili will keep Paul Sullivan informed.

Mr. Howard mentioned that there are two issues they will need to work on: 1) How to expedite measures and improve doing business; and, 2) Building toward a cleaner way to provide security needs and have the customer working well. This involves the architecture and network design. We don't want security issues to get in the way of doing science. Mr. Smith reminded the committee that the NSF has made assessments as to how network security impacts science dollars, time involved and security threats. We need to learn how to manage these issues and evaluate risks and come up with solutions that will have the least amount of fallout to science. He also said that he would like to see the science community involved in the process. Dr. Loenenstein asked if this plan was still in the proposal stage and yet to be deployed. Mr. Howard stated that RPSC is required by law to initiate certain policies in order to maintain network security. Their proposal will be submitted to the NSF for approval. The NSF will consider the impact of science in their decision. Mr. Dunbar reminded the committee that Mr. Hansen has done extensive research backing up this proposal. He has communicated with various universities and institutions to understand what securities systems work for them. He has considered the mid-range of these studies to best apply what will work for the USAP.

ACTION: Bob Lowenstein will be responsible for gathering network security concerns from the science community and present them to Pat Smith.

Operations

Power Plant Operations Status

Martin Lewis, Station Ops Support Supervisor, presented the Power Plant Operations status. He stated that he does not expect any problems this coming season. There will be four outages in the Dark Sector and one station-wide for maintenance and the installation of a backup generator. Operations will be following procedures to notify people when outages will occur. He does not have a schedule yet, but will be working with Mr. Sullivan on activities this will affect and will notify everyone as soon as it is set. Dr. Stark suggested having the outages as close together as possible so they could leave all their equipment turned off and shut down for only that period. Dr. Peterson inquired about the transformer building upgrade, but Dr. Stark informed the committee that it had been cancelled. Dr. Schneider inquired of the power monitor usage. Dr. Stark suggested that power-monitoring equipment should be available to measure usage estimates. Mr. Sullivan stated that RPSC has a good handle on the power budget, but the science community needs to continue to let him know of their anticipated needs.

Station Support Planned for FY03

- The population cap will remain at 220.
- There are 496,488 gallons of fuel estimated. This will depend on finalized science requirements, winter usage and other taskings.
- There are 8,284,341 pounds of ACL estimated for cargo, fuel, pax and TDE.

It is planned to have two Pisten Bully's replace three 1200 LMC's and to have a roll over protection/cab for the trencher.

There will be continued operational support of remote science including the SPRESO, Polar Solar Observatory, and the VLF antenna. There has been 650 PAX allocated, 50 additional over FY02.

SPSE/SM Project and Construction Update

FY03 Summer Tasking Planned for the SPSE/SM

The completion of the SPSE/SM punchlist includes the garage shops, fuel storage, new power plant and RF/MARISAT. Conditional acceptance of the pods A1, A2, Circulation Tower, Utility/Snow Tunnel Utilities, and the water well will continue.

Also included in the summer tasking will be:

- Steel and insulated shell of pod B3.
- Exterior landings and penthouse of DSL.
- Building 61 upgrade.
- Elevated station leveling.

Other FY03 Construction Tasking for the Summer Include

- Completion of SPRESO (Remote Seismic).
- Viper covered walkway.
- Construction of VLF antenna (INAN).
- Other minor projects.

Planned tasking for winter FY03 SPSE/SM includes interior finish of Pod A3 and interior finish of the DSL and Penthouse.

Science Transition Plan

Dave Scheuerman, Project Engineer, FEMC, presented the Science Transition Plan. The greatest impact of the completion of B2 and DSL will be to those working in the Skylab. Cabling will be done at the same time the transition will be done as soon as January 2005. Dr. Papitashvili wanted to be reassured that the quality of operations during this transition would be acceptable and making sure that when the cut-over is done, instrumentation is up and running before shutting down other experiments. Upgrades will be performed at this time. We need to allow three weeks for this transition. Mr. Scheuerman will develop plans for specific future needs such as fume hoods and water accessibility. Dr. Papitashvili said that the aurora instruments will be in place in 2005 and will run simultaneously with Skylab. The B2 will be transitioned in 2006 all

science will be out of Skylab by 2006. Contacts for the science construction layout are Dave Scheuerman, Paul Sullivan and Jerry Marty (NSF).

Special Topics

Cryogenic Support Facility
Al Baker, Coordinator, Science Support, South Pole, presented the Cryogenic Support Facility status. He said that there are plans to have two 3K-gallon LHe transports this summer. That is up about one-half from the previous year. The winter season will begin with 7.3K gallons as well as the 4.3K gallons that is presently on site, which is performing better than expected. They expect a 20-liter per day loss rate. The LN2 plant is operating as always, but it is the last year that it will be there because they have presented proposal to NSF for new plant. The proposal includes repair kits. RPSC is exploring options for the long-range plan. Dr. Peterson asked that the Cryogen Committee continue to be included in further discussions regarding the LN2 plant. Mr. Baker stated that the New LN2 plant would curtail the need to rely on McMurdo substantially. Mr. Stone said that it would produce 120 liters per day. He also said that they will need suggestions and recommendations from the committee.

> **ACTION: Dr. Peterson's Cryogenic Committee will investigate the factors involved and propose recommendations.**

IceCube Project Update
Mr. Eivind Jensen, Manager, IceCube, presented the IceCube Project update. This is a seven to eight year project and will encompass the use of other divisions throughout RPSC for support. It will also involve engineering and labor for the design, procurement, logistics, construction, installation, and operations support of a drill camp and associated IT infrastructure for the startup of the IceCube 80-hole drilling program. We will also need to provide ongoing annual on-site support to the drill camp and IT infrastructure.

This project includes 80 drill holes, 2,400 m deep, which will include 4,800 detectors in the ice. Funding for two years has been approved. The design for the array is well defined now. The Counting House will be placed in the middle of the array in FY05 and will be functional by FY06. FY04 will consist of a logistics campaign – cargo will be flown in from New Zealand, caterpillars and equipment will be flown in from McMurdo. More cargo will be brought in on the resupply vessel in February 2004. The plan is to have 16 holes drilled each year, each hole requiring 8,000 lbs of fuel. The drill structures will require reassembly every season. There has been $15 million allocated by the NSF for design of the drill and to prepare the facilities. CRREL is conducting radar surveys to detect the subsurface level of snow. Construction and drilling will start during 2005 and finish by 2009. Over the seven-year life of the project it is estimated that there will be 342 flights. The IceCube project will collect data over a 50-year period.

South Pole Traverse Status Report
Mr. Dunbar gave a brief summary of the traverse progress. It is still a "Proof of Concept" at this point. Rick Campbell, Estimator/Scheduler, Operations, also further explained their progress in a separate document in support of Mr. Dunbar's comments. Mr. Campbell explained that they are

attempting to develop a route from McMurdo to South Pole. It is a planned 3-year project. If the route is developed, and full funding is realized, then, potentially, there would be three "Swings" (or, groups of six tractors) making three trips each to South Pole in any one season, for a total of nine annual traverses to the South Pole. If fully equipped, 86 LC-130 missions are estimated to be replaced by the nine traverses.

RPSC is funded annually for the needs of each season's planned activities. We only have equipment to support the Proof of Concept route development at this time. Year 1, the crossing of the Shear Zone region of crevasses outside of McMurdo, was a success. Year 2, progress up the Ross Ice Shelf with reconnaissance and route development up to and including the Leverett Glacier as far as possible (and hopefully reach the Plateau), is planned for in 2003-04 season. Year 3 (2004-2005) is hoped to reach the South Pole by February 2005.

Potentially, it could support IceCube's logistics once the route was developed, and funding realized for the procurement of traverse equipment. It is not anticipated that all three swing tractor and sled fleets would be procured, built and shipped in one fiscal year, rather, spread out over several years, such as one fleet per year. It could support other camps, but the South Pole is the objective at this time. There is potential that West Antarctica could be a traverse destination.

The amount of maintenance is yet to be determined, depending on mix and type of equipment. Most diesel tractors require at least basic maintenance (oil change, lubrication service) every 250 hours. The South Pole traverse, once fully operational, is forecasted to be 335 hours, McMurdo to Pole (222 hours) and return (113 hours).

Some initial CRREL surveys for strain rate calculations for the Leverett Glacier have been accomplished (1995-96), but that data is not available at this writing. Year 2 efforts will include establishment of "strain grids" to determine annual movement.

2002/2003 Science Population Summary

Ruth Ofstedal, Station Support Supervisor, presented the Population summary. South Pole. Her office will be tracking the population movement by 360º**.** They will be tracking each deploying person by arrival and departure dates and flights. They will also know what was originally planned, what was revised and the actual dates. They will also be monitoring bed capacity, housing assignments and overall deployments. Other responsibilities of the population group will be to oversee the retail store, post office, recreation and janitorial services at the South Pole.

Ms. Ofstedal asked that they inform her, in the office or on the ice, of any new or revised names and dates, and pre-deployment information. NSF approval must be obtained for double deployments or for extra people deploying.

Total station capacity will be limited to 223 beds pending final approval. These include 50 for Science, 3 for NSF/other, 5 for science construction support, 84 for SPSE/SM construction, 77 for RPSC station support (and FEMC maintenance), 2 for station support miscellaneous, and 2 for minor projects.

The tentative season dates are:
Opening day: October 23, 2003

Summer begins: October 30, 2003
Winter begins: February 15, 2004
These dates are pending final approval.

Some of the housing changes will be that four Jamesways will close and the new station berthing is now open along with the new station galley.

Flight Operations Support
There are 331 total flights scheduled for the South Pole: 12 for science, 5 for cryogens, 4 for liquid Helium, 1 for liquid Nitrogen, 7 for SIP requirements. These include science construction materials and general resupply of consumables.

State Of South Pole Users' Committee

Attendance

(For SPUC Members' complete addresses and terms –Appendix 14)

Committee Members Attending:

Dr. Antony Stark, Harvard-Smithsonian CFA	aas@cfa.harvard.edu
Dr. Joe McConnell, Desert Research Institute	jmcconn@dri.edu
Dr. Jeff Peterson, CMU	jbp@cmu.edu
Mr. Andy Clarke, NOAA/CMDL	andrew.clarke@noaa.gov
Mr. Russ Schnell, NOAA/CMDL	Russell.C.Schnell@noaa.gov
Mr. Bob Pernic, University of Chicago	pernic@yerkes.uchicago.edu
Dr. Gonzalo Hernandez, University of Washington	Hernandez@u.washington.edu
Dr. Fred Eisele, Georgia Institute of Technology	eisele@ucar.edu
Dr. Robert Loewenstein, Northwestern University	r-loewenstein@northwestern.edu

Committee Members Unable to Attend

Dr. John Ruhl, Case Western Reserve University	jer23@po.cwru.edu
Dr. Al Weatherwax, University of Maryland	allanw@polar.vad.edu
Dr. Chris Martin, Harvard-Smithsonian CFA	cmartin@cfa.harvard.edu
Dr. Giles Novak, Northwestern University	g-novak@northwestern.edu
Dr. Umran Inan, Stanford University	inan@nova.stanford.edu

McMurdo Area Users' Committee Representative:

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Mr. Brian Stone, Science Projects Manager, Polar Operations	bstone@nsf.gov
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Mr. R. Allan Baker, South Pole Science Coordinator	robert.baker@usap.gov
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Ms. Ruth Ofstedal, Station Support Supervisor	ruth.ofstedal@usap.gov
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Mr. Eivind Jensen, Project Manager, IceCube	eivind.jensen@usap.gov

Mr. Steve Toth, Director, Information Systems	steven.toth@usap.gov
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Mr. Tim Howard, Information Security Manager	tim.howard@usap.gov
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Dr. Peter Hansen from SPAWARS	
Ms. Barbara Wood, Administrative Coordinator, Science	barb.wood@usap.gov