

SOUTH POLE USERS'
COMMITTEE
(SPUC)
MEETING

July 15, 2002
Denver, Colorado

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Distribution List

Committee and Affiliated Members

R. Morse	R. Schnell	G. Hernandez
G. Novak	A. Stark (Chair)	A. Karle
R. Pernic	A. Weatherwax	R. Loewenstein
J. Peterson	A. Clark	J. McConnell
J. Ruhl	C. Martin	

National Science Foundation

S. Borg	G. Gutheridge	D. Peacock
D. Bresnahan	B. Lettau	P. Penhale
F. Brier	H. Mahar	J. Rand
E. Chiang	J. Marty	P. Smith
K. Erb	A. Metcalf	B. Stone
D. Fisher	J. Palais	A. Sutherland
R. Wharton		

Raytheon Polar Services Company

T. Aldridge	B. Grant	N. Powell
J. Corbin	E. Jensen	P. Sullivan
A. Brown	M. Lewis	C. Walker
S. Dunbar	B. McAfee	A. Baker

Executive Summary

The ninth meeting of the South Pole Users' Committee took place on 15 July 2002, at the Raytheon Polar Services Headquarters in Centennial, Colorado. NSF Representatives in Arlington VA joined the meeting via a video-teleconference (VTC) connection. During the meeting, the Committee, affiliated members, and guests reviewed past accomplishments and challenges, and discussed plans for the upcoming season. The Committee's primary concerns involved communications capabilities, cryogenics support, and population management during the continued SPSM construction.

Other primary topics of discussion included the USAP Private Computer Network, satellite communications capabilities, and a Science Transition Plan from current lab space to the new elevated station and the Dark Sector Laboratory. If the construction schedule becomes delayed by another season of weather-related logistical shortfalls, the schedule for the Science Transition Plan will change as well. As always, flexibility and continued communication will be the keys to our success.

The Committee's recommendations follow. Other observations, questions, and Action Items are included in the Meeting Minutes or the appended documentation.

Meeting Agenda

7:00 - 7:30 **CONTINENTAL BREAKFAST**

7:30 – 8:20 **Opening**

- Welcome and introduction of attendees (10 min) A. Stark, E. Jensen
- Overview of meeting agenda (10 min) A. Stark, E. Jensen
- NSF welcome and remarks (15 min) R. Wharton
- RPSC welcome and remarks (15 min) BK Grant, S. Dunbar

8:20 - 9:15 **Committee Business**

- Review and approval of membership (30 min) A. Stark
- Working Group Status Reports (25 min) A. Stark

BREAK (15 min)

9:30 – 9:45 **Health and Safety**

BK Grant

9:45 – 12:00 **IT and Communications**

- Internet Security (35 min) R. Mitalski
- Qualifications of new computers (15 min) B. McAfee
- Full-time email / Iridium data transfer (25 min) B. McAfee
- Wireless architecture / EMI/RFI Study (20 min) N. Powell, D. Brooks
- Satellite communications update (30 min) N. Powell
- PolarIce status (10 min) S. Holbrook

BREAK FOR LUNCH (1 hr)

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

- Construction schedules including DSL (30 min) C. Walker
- Science Transition Plan (15 min) D. Scheuerman
- Cryogenic Support Facility (15 min) D. Scheuerman

2:00 – 3:20 **Operations**

- South Pole Traverse status report (15 min) J. Wright
- Power Plant operations for FY03 (15 min) BK Grant
- Population (20 min) A. Brown, J. Marty
- New mobile equipment (15 min) M. Lewis
- LC-130 Flight Operations (15 min) BK Grant

BREAK (15 min)

3:35 – 4:00 **Special Topics**

- Cryogenic support plan (15 min) J. Alcorta
- IceCube Project update (10 min) E. Jensen

4:00 – 5:00 **Executive Session**

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South Pole Users' Committee Members

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Recommendations of the South Pole User's Committee 2002

This memorandum summarizes the recommendations of the South Pole User's Committee (SPUC) for 2002. The topics on which these recommendations are based were discussed at the ninth annual meeting on 15 July 2002; 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

Internet reorganization should accommodate the needs of all science users. The RPSC plan for reorganization of internet communications is for the most part a benefit to South Pole science, and the committee encourages its speedy implementation. As mentioned in previous committee reports, it is important that this plan: (1) provide some support for "telnet" and "ftp" service to legacy machines; (2) support Appletalk; (3) involve consultation with science groups to determine policies for packet filtering and port blocking on their own machines; (4) support DHCP connections; (5) support permanent IP address assignments for science machines that need them; (6) include secure public-key and certificate server machines; (7) include "scratch" public disk storage space for temporary storage of large files.

(2) Rationing of communication resources

Communications should be prioritized by source, not by content. Communications bandwidth to and from the Pole is finite and often outstripped by demand. Some communications to and from the Pole require higher priority than others: real-time medical data should have priority over recreational use of the internet. Rationing and prioritization of communications channels should be built-in to the network, as RPSC is preparing to do. The committee was alarmed, however, at the suggestion that this rationing be content-based, i.e. that someone at RPSC monitor the content of communications and adjust network use accordingly, or that recreational use of the internet be restricted to certain hours. The committee feels strongly that this rationing should be prioritized on the basis of the source of the communications, that RPSC should allow the communications from some sources priority over other sources. This would mean, for example, that communications from the medical facility would always have higher priority than communications from the general-use computers. Internet use of all kinds is essential to members of the South Pole community. Many South Pole researchers are neither RPSC employees nor Government employees, they are private citizens. When at South Pole station they are totally dependent on the network for all communications with the outside world. It is an invasion of privacy for RPSC to monitor the content of these communications, and RPSC should not waste resources doing so.

(3) 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 point out that such a system has been working well at an unmanned base at the North Pole for over a year. Again we urge that this be done immediately. At the same time, far more expensive plans have been proposed to connect the South Pole to other sites by optical fiber in order to provide continuous high-speed internet access. In our opinion, continuous high-speed internet is somewhat more beneficial than continuous low-speed internet, but the very high costs of this marginal improvement should be considered carefully before a commitment of funds is made.

(4) 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.

The committee suggests that 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.

(5) Wet chemistry in the new South Pole Station

Laboratory space suitable for wet chemistry will be needed in the new station. The committee suggests that a section of the planned laboratory space be made into a separate room with sink, laboratory water purification system, fume hood, and facilities for disposal of chemical waste. This room should be light-tight so it can also serve as a darkroom and should be equipped with basic laboratory equipment (e.g., glassware, electronic balance) and full LAN connections.

(6) Liquid Helium transport to experiments

Transportation of liquid He in winter is a problem. Winter delivery of Liquid Helium from the new cryogenics facility to its point of use in the Dark Sector continues to be a problem which needs an effective solution. Possible solutions include a new transport vehicle which is operable at almost all times, or a warm "garage" space in the dark sector.

(7) 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. Cryogenic support has been fully successful. Science construction support has been 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

Eivind Jensen, RPSC South Pole Science Support Manager, welcomed the group to the ninth annual meeting of the South Pole Users' Committee. 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.

Overview of Meeting Agenda

Mr. Jensen opened the meeting by providing an overview of the meeting agenda. His emphasis was on communications and the attempts made in response to all items recommended from last year. Antony Stark emphasized the purpose of communications is to improve quality of science at the South Pole. Committee members will discuss the reports presented on these issues and others, including IceCube and the 8-m telescope, and make recommendations. In addition, they expressed continued concern about the South Pole Station Modernization (SPSM) construction project and its impact on science.

NSF Welcome and Introductory Remarks

Dr. Wharton, Executive Officer, welcomed everyone and spoke of his appreciation to the committee members for their active participation. Dr. Erb, Director, OPP, sends regards. The appropriation budget for this fiscal year is still in Congress and will not be signed until November 2002. There has been \$300 million designated for the OPP representing a \$6 million or 2% increase from last year. The grant program is over \$68 million and \$130 million has been earmarked for polar programs operations. It is their goal to use this increased funding to add to the size and duration of grants. The target is to have a five-year grant cycle. The NSF is in the final stages of hiring a new program officer who will function as NSF South Pole Science Manager.

RPSC Welcome and Informational Remarks

Steve Dunbar, Director, Science Support, spoke of placing more emphasis this year on proactive support of South Pole science. Mr. Dunbar gave background of the science work that has been done at the South Pole Station. RPSC is diligent to establish more of a partnering relationship with the NSF and introduced the new RPSC changes. Eivind Jensen will be supervising the Ice Cube project. Paul Sullivan is currently acting as the South Pole Manager and the interviewing process is underway. RPSC is introducing a new planning group to make the planning effort a year-round process reducing the work load with the present POCs and workcenter groups and to assist with the PQing processes. He made emphasis to supporting project managers and management liaisons by having the outbrief process feed into the planning development more efficiently.

BK Grant, South Pole Area Director, opened with the RPSC structural changes in staff. The Director of the Operations Division no longer exists and each area director now reports to Tom Yelvington, TITLE?. This would ensure better communications with the Science Support Director and other divisions within

RPSC. This new structuring will allow the South Pole and the McMurdo Area Directors to all have the same leverage and raise the importance of science and logistics on station. A full time meteorologist and a logistics supervisor were also hired.

Committee Business

Review and Approval of Membership

Members attending the July 15 meeting included the following people:

Dr. Antony Stark, AA-371-O
Dr. Albrecht Karle, AA-130-O
Dr. Joe McConnell, OO-324-O
Mr. Robert Pernic, AC-370-O
Dr. Jeffrey Peterson, AC-375-O
Mr. Russ Schnell, OO-257-O
Dr. Alan Weatherwax, AO-111-S
Mr. Andy Clark, NOAA
Dr. Chris Martin (replacing Dr. Robert Loewenstein)

Absent members included the following people:

Dr. Gonzalo Hernandez, (AO-110-S)
Dr. John Ruhl (AC-378-O)
Dr. Giles Novak (AC-376-O)

Dr. Stark suggested that an effort should be made to recruit new members for the committee.

ACTION:- Stark suggested sending out e-mail to South Pole scientists to see who would be interested in becoming involved with the committee. Paul Sullivan will provide this list and draft an e-mail and advise Dr. Stark.

Working Groups Status Report

Mr. Jensen commented that SPSM plans are finalized and the schedule is dynamic.

IT equipment and the work involved needs to be defined so that the Committee can make recommendations. Dr. Stark solicited IT to help with lists of items from the web page.

Brian Stone, NSF Research Support Manager, has had discussions with RPSC representatives to replace equipment and outfit new station. Frank Brier, Facilities Engineering Project Manager, and Dennis Peacock, Section Head, Antarctic Sciences, have had discussions about trying to get more solicitations from scientists regarding items that would be needed for future use on station by all scientists. Antony Stark inquired about who would decide what needs to be bought.

ACTION: Brian Stone and Antony Stark will address the committee of the general needs of the scientists and will invent a list of equipment, including capital equipment that the committee and the NSF can choose from to purchase.

RPSC maintains this itemized list. Dave Scheuerman, RPSC Project Engineer, has not had responses from the scientists regarding a detailed list, but Dr. Stark has independently provided the NSF with information. The NSF reported that potentially one million dollars has been set aside for these items.

The largest purchase for multipurpose uses by all scientists would be limited to \$10,000 to \$15,000. This would include such items as fume hoods and biology related items.

One controversial item mentioned was the ability to access and send electronic journals and publications.

ACTION: Guy Guthridge, Antarctic Information Program Manager, will continue to investigate the use of electronic journals.

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:

Future of CARA

CARA came to a consensus and supply recommendations have been submitted to Dr. John Carlstrom, CARA Project Director. Dr. Carlstrom working in conjunction with Dr. Peacock has submitted a budget regarding these issues. Currently, discussions are ongoing within the NSF, Drs. Chiang and Peacock, and the committee is waiting for a decision to be made.

Review and Approval of Membership

Will be addressed at a later date.

EMI Working Group Status Report

EMI (Electro-magnetic Interference) working group will go forward and issues will be addressed. Stanford engineers will work with RPSC for construction and logistical coordination. The Stanford VLF (Very Low Frequency) antenna is still scheduled for installation in FY03 will involve the whole station. The antenna will be turned on in January 2003.

ACTION: The NSF would like to see the plan and testing from the PI Umran Inan.

Dr. Peterson suggested changing the format of the SIPs and ORWs.

ACTION: RPSC will modify ESP.

Science Occupancy Plan

The Science Occupancy Plan will be reviewed on an annual basis as projects and requirements change. NSF will try to anticipate future projects for long-term planning, but allocation must be based on actual funding. Dave Scheuerman, RPSC Project Engineer, has purchased the cabling and will update committee on the transition and how it will occur.

Dark Sector Laboratory

COMEBACK: Mr. Scheuerman will report for John Rand on current issue(s) with the Dark Sector Laboratory. Jerry Marty suggested leaving this with Dave Scheuerman and Carlton Walker.

South Pole Power Planning

BK Grant stated that the power projections and the initial work has been completed for SPRESO and other new additions. The Power Projection Plan is being addressed as a 10-year approach, bringing in information on what facilities will be affected.

Jerry Marty will be consulted on what the goals are and what is on-line and off-line. This projection will be done by next year.

Aircraft Flying in Clean Air Sector

The Air National Guard should consider a different flight path to avoid polluting the Clean Air Sector. It was suggested that they turn left when taking off the runway. Other flight paths were discussed. Mr. Dunbar suggested that the Twin Otters should have the same flight path. This subject will be addressed at a later time considering fuel and safety as the critical criteria.

ACTION: Steve Dunbar will ensure that this information gets to SPAWARS hands and a written request be published for pilots to adhere to the turn-left rule.

2002 Agenda Topics for South Pole Users' Committee

Health and Safety

BK Grant reminded all that safety is for everyone. During the construction phase everyone has to adhere to safety procedures and be aware of hazards. She reported that RPSC has improved the safety record significantly and benefits have already been experienced because of these efforts. She emphasized that everyone is responsible for maintaining a safe working area including the scientists.

Chris Martin addressed the clothing improvements for the South Pole. Mr. Dunbar mentioned that Melissa Rider is working to improve footwear and goggles. Hardware has not yet been addressed. Dr. Martin suggested bringing new samples of hardware from CONUS that they could test on station and report improvements to RPSC.

Mr. Dunbar stated that work specific clothing that is not general issue needs to be funded out of the scientist's grant. Brian Stone emphasized that the purpose of ECW issue is to provide good basic protection including specialized equipment that may need to be supplied. But what works for one doesn't work for another. Suggestions from scientists will be sent to Ms. Rider for review and evaluation. Dr. Pernic suggested Ms. Rider be very proactive in finding clothing that performs better. Mr. Smith suggested advertising the fact that we want to hear from people on station regarding clothing performance and design.

ACTION: Mr. Dunbar will ask Ms. Rider to send out a solicitation to grantees for clothing suggestions. He will also set up a web site presence for clothing issues, suggestions and improvements. Mr. Marty suggested a target date of 2004 as the test year and to be ready for full ordering and purchasing in year 2005.

Dr. Martin felt that the mental health and safety issues need to be addressed in order to improve station morale. He suggested that station activities such as exercising should be implemented. Mr. Pernic agreed that it is very important that the little things involving safety and health be addressed.

Ms. Grant presented overheads and called attention to the fact that “safeness is a state of mind”. It is workstyle and lifestyle that keeps people safe. She pointed out that to reduce unnecessary risks one must keep safe attitudes, choose safe behaviors and create safe conditions. Saving time, pain and money – or maybe a life – are the real benefits. Special safety precautions need to be taken during remote site activity. Follow established procedures, avoid constructions zones, use hard hats when required, notify on site coordinator if entry is required, check radios and survival bags, stay on established routes. Avoid slips, trips and falls.

Be aware of safe workplace practices:

- General Housekeeping
- Fire safety awareness
- Electrical Safety
- Chemical Safety
- Chemical receiving
- Chemical storage

There are many 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

Ms. Grant pointed out that RPSC’s safety awareness has been improving. The Total Recordable Incident Rate (TRIR) - $(\# \text{ Injuries} \times 200,000) / (\# \text{ of Hours Worked})$ has dropped dramatically since 2001:

RPSC 2001 YTD	17.9
RPSC 2002 YTD	11.2
Construction Industry:	8.6
Service Industry:	4.9
Raytheon Corporate:	1.7
Raytheon Technical Services:	1.5

Ms. Grant concluded her presentation by stressing that 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 high risk may have severe consequences. Remember HEALTH is 50% of the Health and Safety Program

IT and Communications

Network Security

Rob Mitalski, Security Analyst, presented information on Information Security and how it affects science. The purpose of network security is to implement new standards of improvement and proactive feedback from scientists regarding the IT needs.

Information Security is Mandatory for Federal Information Systems.

- GISRA- Government Information Security Reform Act (2001).
- OMB A-130 Policy for management of federal systems.
- 40 U.S.C 1441 Information Technology Reform Act.

Why are we here?

- Information Security is an existing federal government requirement with renewed emphasis.
- Federal government requires mandatory periodic training for all users of federal IT systems, including contractor personnel and science grantees.
- Annual training supplemented by periodic reminders keeps us aware of the major security issues and this briefing satisfies your training requirement.
- We need science grantee input to write effective policies and procedures.

Basic Elements of Information Security

Information Security is:

- Confidentiality – Protect our personal information from unauthorized access or disclosure.
- Integrity – Protect information from being changed inadvertently or by unauthorized people.
- Availability – Protect information resources so we can use them when we need them.

What do we protect against?

- External Threats – Natural disasters (flood, storm damage, fire); Criminal events (robbery, arson); Information-focused attacks (hackers).
- Internal Threats – Accidental loss or change of data; Fraud, Waste and Abuse; Disgruntled users; Unethical behavior.

USAP Information Security Considerations

USAP network is:

- A federal government network- target for hostile activities.
- An open network to support science mission – vulnerable to attack.
- Integral to station safety, morale and quality of life.

Network intrusions can:

- Place safety of station residents at risk.
- Create havoc with science data.
- Could allow intruders to move to other government networks.
- Could undermine public confidence in NSF.

Areas we are trying to protect:

- Bandwidth - our scarcest resource.
- Privacy Act information
- HIPAA information such as medical records and reports
- Science and Proprietary information
- Military airlift schedules; DV/VIP activities - OPSEC

USAP Information Security Policies

- 5000.1 USAP Information Security Program
- 5000.2 InfoSec Organization & Admin
- 5000.3 Program Information Categorization
- 5000.4 Security Risk Management

- 5000.5 Information Security Architecture
- 5000.6 Acceptable Use
- 5000.7 User Access
- 5000.8 Security Auditing
- 5000.9 Security Training & Awareness
- 5000.10 Personnel Security
- 5000.11 Physical Security
- 5000.12 Security Incident Management
- 5000.13 Contingency & Disaster Planning
- 5000.14 Virus Protection & Detection
- 5000.15 Security Configuration Management
- 5000.16 Certification & Accreditation
- 5000.17 Non-USAP Systems

Information Security Program

- Policies and Procedures – the policy process includes comments from science community.
- Information Architecture – Establishes standards for IT; phase-out legacy equipment and applications that present unacceptable security risks.
- Certification and Accreditation – Assess sites, systems and applications to identify and mitigate risks.
- Awareness and Training – Help users understand their role in protecting the infrastructure.

User Responsibilities

Protect Confidentiality of our information:

- Protect sensitive information.
- Use passwords properly.
- Log off/password screen savers when leaving your system.

Protect Integrity of our information

- Use passwords properly.
- Ensure your information is backed up.
- Use anti-virus software to check items before installing.
- Use only authorized software.

Protect Availability of our information resources

- Use the infrastructure for acceptable purposes only.
- Take proper care of equipment.
- Use only authorized software.
- Use anti-virus software to check items before installing.
- Know what to do in an emergency or disaster situation.

Password Tips

Examples:

D@rkg066Le\$
 2#gluvsHelp
 R3dc0@t th1Kpant\$

- Change your password regularly
- Use strong passwords (8 characters, mixed characters)
- Protect your password – NO sharing

Proposed Acceptable Uses of USAP IT Resources

Users of IT resources are not to interfere with mission, they are subject to risk assessment and the NSF may supersede at any time. Acceptable uses are:

- Personal telephone/fax use ok – user may pay charges.
- Personal email use ok – not to interfere with mission.
- Personal internet use ok – not to interfere with mission.
- Recreational web browsing ok – not to interfere with mission; no downloads of prohibited material.
- Instant messaging ok – reasonable use.
- Personal encryption ok – user may be asked to share key to support investigations.
- Third party software ok – user to run antivirus checks and must have license.
- E-mail lists ok – provide unsubscribe info to station IT.
- Personal business – limited to activities ok.
- User has the responsibility to read the entire policy – will have to sign an agreement for account access.

Proposed Prohibited Uses of USAP IT Resources

Prohibited Uses – users may not engage in prohibited activities which are:

- No illegal activities
- No adverse activities
- No classified information
- No downloading pornographic, sexist, racist or threatening material
- No email chains, or email broadcasts
- No personal servers for email, web, ftp, telnet, or similar applications – all project servers must be in SIP and NSF approved
- No chat room or newsgroup participation from usap.gov
- No political campaigning
- No network gaming activities
- No personal e-commerce or non-program business activities
- No network monitoring tools
- User has the responsibility to read the entire policy – will have to sign an agreement for account access

The USAP Banner:

“This is a National Science Foundation federal government computer system. Users should be aware that they have no expectation of privacy when using NSF-provided computers, access to the Internet, or electronic mail systems. Files maintained in NSF computers, including electronic mail files, may be reviewed by NSF officials who have a legitimate reason to do so when authorized by the Director or Deputy Director, or by the Inspector General.”

- NSF standard banner – deployed on all information systems attached to USAP infrastructure.
- Deployment brings USAP into compliance with NSF and federal directives.
- No expectation of privacy – government may access what users might consider personal communications.
- USAP approach – not normally monitoring people, but do monitor network activity.

Information Security Contacts

The USAP Help Desk: helpdesk@usap.gov

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RPSC IT Director, Steve Toth, 720.568.2006, steve.toth@usap.gov

NSF/OPP Technology Director, Pat Smith, 703.292.7455, pdsmith@nsf.gov
NSF/IG

Station IT Managers:

McMurdo

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South Pole

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How Will This Affect the Science User?

- On a government network, rules of use are more restrictive than your home institution
- Some activities, such as servers, will be more closely managed than in the past
- SIPS take on a greater importance in defining requirements; if it isn't in the SIP, you may encounter a delay at the station
- Policies bring a standardized process for change, which should eliminate surprises
- Firewalls protect the infrastructure; rules can be set to allow science activities to occur across the Internet
- Standards and architecture will help you connect to the network with minimal delay
- Cautiously Implementing secure services, such as SSH instead of telnet, and Secure
- FTP protect science and network resources from intrusion

Summary

- Information security protects the confidentiality, integrity and availability of our information and information resources.
- Information security strengthens our infrastructure to ensure bandwidth is available to support science and operations mission.

- Information security ensures that the free flow of information continues among authorized users in the program.
- Poor security puts lives and science mission at risk.
- Strong passwords strengthen security.
- Know the USAP Acceptable Use policy and follow it.
- Know who you go to for help, advice or problem reporting.

Information Security affects all users, not just IT; we are ALL responsible

Discussion:

The NSF felt that news groups should not be sent information from scientists on station. Pat Smith was concerned with using the “.gov” e-mail addresses. Although he is not condoning information sent to news publications, but it should be limited. The NSF will have to seek legal review on some of these issues and ask for clarification of policy. The NSF feels that they do not want to monitor, but should determine what is appropriate and what is not allowed. Dr. Stark stated that the network is their only means of communication to the outside world and would feel limitations to be a constricted and unwarranted intrusion. He feels that what is legal in the states should be allowed at the South Pole. Mr. Smith will review the draft of the Successful Use Policy where the preamble of the Guidelines specifically addresses this matter, including morale issues. There should be a balance between the government network, what the taxpayers feel is appropriate and government committees who establish these guidelines. Dr. Peterson does not see why there should be a need for such severe restrictions. Mr. Smith stated that these regulations will be posted for comments and suggestions. Policies should be balanced between the committee, Dr. Erb after legal reviews, and what the NSF wants to put in place. Issues should be formulated, discussed and a mechanism provided for feedback from scientists.

ACTION: Mr. Dunbar will alert the RPSC science community once the information regarding e-mail communication restrictions and policies are posted for comment. Mr. Smith confirmed this action and will set up e-mail list of scientists for comments to policies.

Dr. Stark asked if the network software will support the blocking of certain words as a security measure. Steve Toth commented that 70% of the bandwidth at McMurdo is used for personal use. This impacts work and operations of stations. The reality is that the bandwidth we use is a limited resource. We must be able to balance personal and work requirements. Dr. Stark suggested just setting aside a certain amount of bandwidth to be used for personal transmission. Mr. Smith stated that we still have to stand by policy and be able to support science. This is not out of line from other federal work centers such as NASA. Scientists will have the opportunity to submit comments and suggestions. Dr. Stark suggested making comments to congressmen. Dr. McConnell reminded everyone that this monitoring system is universal and is used throughout other companies.

The committee continued to discuss privacy issues. Mr. Smith stated that the “no expectation of privacy” gives the user a warning of the potential that private conversations would be compromised. Dr. Stark commented that Internet use can be encrypted to guard privacy. Dr. Smith said that there may be an occasion where NSF would have to ask for the key because of legal policies. We should use our own encryption. Dr. Stark asked if this is prohibited. Mr. Smith said that it is not, but we must be prepared to have them overwritten. Dr. Stark also wanted to know if the FTP/telnet is being eliminated because there are a still few machines that need to use this. Jeff Thompson said that RPSC is implementing the phase out of the FTP. Dr. Karle wanted to know how this would affect operations. Mr. Thompson said that we would be forced to relay mail to the server to go out. The proposed policy scope represents items that are standard to our network. Mr. Smith suggested that the responsibility lies with researchers to help determine all that needs to be processed through our server. Mr. Thompson commented that IT is trying

to provide centralized security. Mr. Smith stated that security is based on risk assessment. What is acceptable and what is not would have to be signed off by Dr. Erb. If it is critical to the success of your mission then consideration would be evaluated. Dr. Martin wanted to know about firewall changes. Dr. Stark said that these changes should be done in the summer – not winter. Dr. Stark is concerned that reconfigurations and the network being down would cause loss of work on station. Mr. Thompson assured him that there will always be checks and rules set for security. RPSC will adhere to rules to work for scientists.

Qualifications of New Computers

Bill McAfee, Project Manager, IT, South Pole, started his presentation by stating that the qualification of new computers at the South Pole is a subset of the USAP Information Security Policy that is currently under development by NSF and RPSC. Minimum hardware and software (operating system, security patches, antivirus) requirements will be published on the www.usap.gov website when they become available. These requirements will be applied to ALL incoming computers (RPSC, NSF, Grantees, etc). The primary objectives for the 2002/03 season will be antivirus software and security patches.

The goals for the season are to protect the network and to have minimal impact on the Grantees. Also, RPSC will be making an announcement during orientation offering to scan PCs for viruses and will spot check computers as time allows.

The South Pole IT O&M will provide as much assistance as possible, but would prefer to not touch a Grantee computer unless it is absolutely necessary. They cannot install commercial antivirus software on non-NSF machines due to licensing. Perhaps a good freeware package is available (e.g., AVG (www.grisoft.com)). We must trust that a computer's owner has taken adequate precautions.

Dr. Stark wanted to know why certain software and operating systems are not allowed. Dr. Peterson stated that he could hook up into McMurdo and South Pole servers with no problems. Mr. Smith suggested that RPSC should work up some kind of process in regard to software and operating systems. Steve Toth, IT Director, stressed that we are only introducing guidelines and do not want to limit uses, but we do have to insure that viruses do not contaminate the network. Dr. Peterson suggested that Christchurch be included in the software compliance program. Dr. Stark said that everyone agrees we need security, but currently there is no type of inspection to insure that what is on ones' computer is allowed. It was suggested that it would be valuable to have the software on station when they get there. But, Jeff Thompson, IT Network Engineer, said that we don't have adequate licenses to provide each computer with the software they need. Dr. Peterson suggested that that we get enough licenses. Dave Leger commented that the ships have licensed antiviruses on non-NSF machines, but the software is removed from machine when they leave ship.

ACTION: Mr. Smith will provide RPSC enough money to purchase enough licenses. Mr. Toth will present the NSF with a cost estimate and further information.

Full-time E-mail / Iridium Data Transfer

Bill McAfee also made a presentation regarding Iridium data transfer and full-time e-mail. He stated that the Marisat/TDRS/GOES satellites are visible for approximately 11 hours a day. The station would need priority e-mail access for the remaining 13 hours. High bandwidth solutions are many years away. Low bandwidth solution is focused on Iridium.

Iridium Data Services

The first year rollout during the 2002/03 Austral Summer will be connecting South Pole Comms to Mac Relay. This will involve operational traffic only which includes flight info (Offdeck, PAX, Cargo, Fuel) and weather (Replacing HF RTTY). Instant Messaging is a possibility.

Also during the 2002/03 Austral Summer science projects can implement their own Iridium data systems for high priority e-mail. NSF will subsidize the airtime. They may subsidize hardware/software as well if funding is available. It will be mobile-to-mobile connection only to avoid long distance charges.

During the 2003/04 Austral Summer Inverse Multiplexed Iridium Data will be accessible approximately 13 hours/day when Marisat/TDRS/GOES are unavailable. It will have a modest bandwidth (< 56kbps) and tied into the station network. It will be for small, text only, e-mail messages.

There will be point-to-point (Circuit mode) for proprietary Windows 95/98/2000 modem drivers. Satellite link will perform as com port extender/line driver. There will be mobile-to-mobile connection for PPP connection to the McMurdo LAN. Access to the McMurdo mail server will use a POP client.

Some performance issues may be that the call dropout is approximately 6% at polar latitudes. Data service availability has limited data capabilities (2400 bps). Iridium Data will be used only when Marisat/TDRS/GOES are not visible to minimize expense. It will be used mobile-to-mobile only to avoid long distance charges.

It was stated that Iridium, LLC is financially stable and the outlook for the company looks good. The federal user package provides 71 mobile units throughout the USAP, resulting in an economical mobile-to-mobile use protocol. Mr. Smith proposed that the USAP have use of the DOD outbound gateway. Jeff Thompson noted that if there should be an emergency alert message sent, there would be a minimum of a 5-second delivery time.

ACTION: Dr. Martin will take the lead on the high priority Iridium phone capabilities and provide information to the NSF regarding cost, technical support, administrative details and interfacing. Mr. Smith said that the NSF would then allocate funding for the phone support contingent on Dr. Martins' findings.

Dr. Peterson asked if the station is converting to IP phones. Bill McAfee said that we are setting those up with or without a satellite connection. The transition from the analog to IP should be seamless.

Mr. Smith commented that there is a Maritime Iridium channel that has a subscriber line tied into it where it could be stand-alone. It costs \$15,000 to get four channels plus \$150 per month to put in place. We will have to see where the money for the phones is allocated when we get to this point.

Wireless Architecture / EMI/RFI

The wireless architecture information was presented by Dan Brooks, IT Project Engineer Manager. The objective end would be that life and safety requirements are fulfilled. It would fully integrated in USAP Information Architecture such that current and future science requirements would be fully supported. It is cost effective for temporary and permanent connectivity. The RF Sector would be designated and maintained as well as the Dark Sector and Quiet Sector. It would also support efficient inter-personal electronic communications.

The method would be to establish an Electronic Environment Baseline. The EMI/RFI Study would be conducted by SPAWAR. Functional requirements would be developed based on current known needs.

Technical requirements would be developed based on functional requirements. These requirements would be reviewed by the NSF, SPUC, and RPSC (frequency coordination). Procurement would be conducted using a Request for Information (RFI) and Request for Proposal (RFP). The wireless architecture would then be implemented.

The current estimate for the time line is:

FY 03	Summer	Establish a Baseline
FY 03	Off Season	Functional Requirements
FY 04	Summer	Technical Requirements
FY 04	Off Season	Conduct procurement
FY 05	Summer	Implementation

Potential Technologies that would be required at the South Pole are:

Iridium
Low Power Cellular Communications (PCS)
Micro Cell
IEEE 802.3 CSMA/CD (Ethernet)
IEEE 802.11 (a-5 GHz, b-2.4 GHz) Wireless
IEEE 802.15 Wireless Personal Area Networks
IEEE 802.16 Wireless Metropolitan Area Network

2001/02 Wireless LAN Results

Nick Powell also presented the 2001-02 Wireless LAN Results. There were three test locations: SPRESO, Under Dome, and Summer Camp. There was limited funding for purchasing equipment.

The Effects Evaluation on RF Environment

- IEEE 802.11b spread spectrum signal in 2.4 GHz Part 15 portion of radio spectrum.
- Very low signal levels were observed -65 dBm 500 ft from Omni, -80 to -85 dBm at SPRESO supported 11 Mbps.
- It was found that low power still supports good throughput.

2001/02 Results at SPRESO

- Point to Point RF Bldg to SPRESO (~ 6 km)
- Equipment configuration was:
 - Parabola antenna on RF Bldg (21 dBi gain).
 - Yagi antenna at SPRESO (13.5 dBi gain).
 - Cisco 340 series bridges at each end.
- Provided site voice over IP phone & e-mail services.
- Near 100% connectivity - very reliable
- Data rate - 11 Mbps

2001/02 Results Under the Dome:

- Spotty coverage with number of fade zones.
- One flat panel, semi-directional antenna and Cisco 350 series. Access point was inside the Comms Building.
- Metal structure of buildings limited performance, particularly with one antenna located inside.

2001/02 Results at Summer Camp:

- Omni Antenna (12 dBi) on top of El Dorm.

- Cisco 350 series Access point in El Dorm.
- Users report relatively poor performance in Summer Camp and no signal in Hypertats.

The future plans for wireless LAN in 2002/03 include four WLAN nodes which will be at SPRESO, the Dark Sector, Under the Dome, and at Summer Camp. It supports remote sites with no wireline connectivity during the summer. The SPRESO support ends with wireline installation that will be completed this summer

Satellite Communications Update

South Pole SATCOM LES-9

Nick Powell gave overview of SATCOM and Marisat. Currently a feed problem exists resulting in shortened service hours of 38 kbps inter- and intra-continental e-mail service (mainly austral summer). It ends limited Internet access possible during the pass. It increases dependence on HF radio teletype and data over Iridium (to be deployed this season) for operational message exchange with McMurdo. There will be no affect on science data transmission since LES-9 is not used for this purpose.

GOES Status

There was a lightning strike on 5 July at the Florida teleport causing significant damage. The 20-m antenna is not operating and damage to the electronics is still to be determined. The station is currently using a small back-up system (128kbps out and 176 kbps in). The restoration to the FOC is unknown. Currently the 3 m GOES-BA is being used which was installed last season on the SPMGT platform. Damaged feed and poor design precludes the use of SPMGT. It uses a different modem, and SSPA than MARISAT. The original SPMGT modems are to be replaced and are incompatible with CONUS modems. SPMGT SSPA can't provide the power required to close the link using GOES-BA. It may work with a SPMGT antenna (TBD). RPSC is working with the supplier. (FOC GOES-BA data rate 256 kbps out, 512 kbps in)

The future plans for the 2002/03 GOES includes integrating into SPMGT, correcting the SSPA problem, replacing modems at South Pole and the Florida Teleport, and installing the replacement SPMGT feed. There are plans to install the remote SPMGT antenna/GOES-BA switches and controller which would integrate into M&C system. The M&C macros will be modified. This will establish best throughput data rates.

The SPMGT supports MARISAT mission at 768 kbps In/1.544 Mbps out. There would be possible periodic terrestrial interference at the CONUS ground station. Design to the SPMGT antenna feed required field modification last summer to eliminate Tx signal coupling/noise into Rx side of feed. This eliminated redundancy. There is one MARISAT & one GOES LNA string

Using the "horizontal" feed horn connection only - "vertical" connection damaged and not field repairable precludes the use of SPMGT for GOES operations. RPSC recognizes the problems with modem firmware and performance. It will not operate at T-1 rate on MARISAT. It periodically experiences uncommanded state change.

The Solid State Power Amplifiers (SSPAs) are incapable of full power out (250W) at GOES Tx frequency. It can only provide 125W. They work fine at MARISAT Tx frequency. The monitoring and control system is fairly stable. The device serial interfaces are poorly implemented which leads to software conflicts in the M&C processor and there are occasional system crashes or freezes.

The Antenna Heater Control appears to be in good health. It is a fragmented design and is not integrated into M&C system.

The South Pole SATCOM SPMGT 2002/03 future plans are to:

- Integrate GOES into SPMGT
- Replace feed
- Replace modems
- Correct SSPA problems
- Upgrade & modify M&C software
- Install M&C Serial Communication Hardware & Software in Antenna Shelter & RF Bldg -
Offloads communication processing from M&C processor
- Establish best throughput data rates

The TDRSS System is nominal and stable with few problems. There is an outage planned on July 18-25 for scheduled Ku-band link antenna maintenance. The S-band link will be unaffected. The latest satellite status report indicates that the TDRSS F1 is still capable of supporting the SPTR mission. White Sands to RPSC HQ Denver private T-1 link is to be installed on 28 July and should alleviate CONUS terrestrial circuit congestion.

Brian Stone wanted to know if anyone is using the wireless LAN near the dome and if it can work inside. Dr. Stark stated that it does work in the galley. Mr. Smith said that the NSF is trying to get a 24/7 iridium usage in place.

Dr. Stark stated that for one week every year the outage for the KU band link antenna maintenance should be rescheduled for a more convenient time when it doesn't impact science. When Dr. Peterson asked if there would be a bandwidth problem from HQ, Jeff Thompson answered that we are able to stay within protocol with a 10 k increase in capability and should not be a problem.

PolarIce Status

Scott Holbrook, RPSC Senior Software Architect, reported on the Participant On-Line Antarctic Research Information Coordination Environment (POLAR ICE) web-based, data collection and dissemination system being developed to replace the Electronic Support Planner (ESP). The NSF and RPSC recognize the limitations of ESP and the need for a more effective system that will better support Antarctic research. Users will see immediate changes when it is implemented. Because it is web-based it will be accessible from any computer and operable with all browsers. The POLAR ICE team began collecting requirements information in February 2002, hiring and planning began in May 2002. Version 1 will be implemented March 1, 2003. RPSC will be testing a pilot in January 2003.

POLARICE is the "Next-Generation Software for the 7th Continent". It is a web-based data collection and dissemination system designed to capture and administer all relevant support requirements for scientific research in Antarctica. It captures all data currently captured in ESP – and more. System administration and data maintenance will be accelerated. We will have more robust reports to fit business needs. There will be flexible data manipulation to support on-ice usage. Our target audiences will be the grantees, RPSC and the NSF.

POLARICE represents a paradigm shift. It is a client-server replicated application to a web-based architecture. No longer will users download packaged software applications. It will be accessible from any Internet-connected computer and interoperable with all browsers. POLARICE will provide administrative functionality to bypass the problems of latency of report data and the inability for work center personnel to update records. It has created support issues to keep inventories current. No system rebuild/redeploy will be required when changes occur.

POLARICE vision addresses the user experience. The user views the software as a web service. This is a primary design goal for both interface and flow. RPSC is currently migrating ESP users to a web interface. POLARICE is based on the entire planning process lifecycle. All phases are supported and extensible for process modification.

Grantees will require a stable system with reliable access to input, update, and review all ORW and SIP information electronically. It needs to be available to multiple collaborative Grantees. They will require that proprietary information to be protected with improved interface and connectivity.

RPSC will require the ability to view, add, modify, and delete inventory items. We will need the ability to view real-time data on ORWs and SIPs. It will be the primary support for creating the final RSP.

The NSF will derive electronic reports including PI contact information. They will be able to monitor the progress of ORWs and SIPs and have the ability to view and compare projected with actual seasonal support. It will also support annual budgeting and funding decisions.

POLARICE will be a simpler user interface driven by Grantees. Each ORW/SIP will have tabbed sections simplifying data input and reducing errors in finding requirement locations.

POLARICE Summary

- Web-based environment provides advantages over the current client-server architecture.
- Single point of interaction for grantees, the NSF and RPSC.
- Integrate with existing RPSC data streams.
- System architecture is scalable and extensible.
- First step to integrated support environment.
- Future goals include automated services and wireless data access.

Mr. Pernic wanted to know if RPSC is considering laying fiberoptics from the dome. Mr. Toth said that RPSC is looking into the feasibility of doing this. He is laying the ground work and expects to have conclusions and evaluations by the end of the year for implementation in 2008/10.

SPSE/SM Project and Construction Update

Construction Schedules Including DSL

Carlton Walker reported on that the 3,000 ft of tunnel was completed January 25, 2002. The immediate focus for construction will be on A1 and A2. We should be using the facilities by December.

FY02 Station Support Included:

The station received 467,835 gallons fuel. A second fuel pit was operational on November 14, 2002 and the Boost Pump was operational on January 1, 2002. There was 6,659,175 pounds of ACL received which included cargo, fuel, pax and TDE. The ARFF was in service on 10/30. Skiway survey and reflagging was completed on 12/01. There was 596 PAX received and 61,189 meals provided.

FY02 SPSE/SM Summer Tasking Included:

- POD A1 and A2 interior finish.
- POD A3 and B2 steel frame and insulated shell.
- A new Rodwell.
- A utility/snow tunnel.

Other Construction Scheduled for FY02 Include:

- SPRESO (remote seismic)
- ARFF (Aircraft Response Firefighting) shelter

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.

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 include interior finish of Pod A3 and interior finish of the DSL and Penhouse

Science Transition Plan

Dave Scheuerman 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. Mr. Stone wanted to be sure that there will be concurrent operations during this transition. Making sure that when the cut-over is done, instrumentation is up and running before shutting down the old experiment. Upgrades will be performed at this time. We need to allow three weeks for this transition. Mr. Scheuerman will stay in touch with Dr. Weatherwax on the scheduling of this project. He will also develop plans for specific future needs such as fume hoods and water accessibility. Mr. Stone wanted to be reassured that the telescope will not be higher than the roof top. Mr. Scheuerman verified that this is the case. Dr. Carlstrom will work with the other grantees to make sure the 8-m telescope will not impede on other experiments.

Contacts for the science construction layout will be Dave Scheuerman, Paul Sullivan and Jerry Marty (NSF).

Cryogenic Support Facility

There will be minimal transitional impact since the Cryogenic Support facility is not a working lab. When it is time to move the equipment during the austral summer this should not interfere with cryogenic operations.

Operations

South Pole Traverse Status Report

John Wright, Project Manager, provided SPUC with the *South Pole Proof of Concept Traverse* presentation as given at the APC meeting earlier this year. Three positive objectives John and his staff will attempt to achieve are: no loss of life, no equipment loss, and no injury.

Introduction

RPSC is to execute a Proof of Concept Traverse. The purpose of this traverse is to establish a route from McMurdo to South Pole identified in the George Blaisdell (CRREL) and Dave Bresnahan (NSF) Traverse Analysis paper. It will be supported entirely from McMurdo. RPSC will evaluate the feasibility of creating a regular McMurdo to South Pole route. Also being evaluated will be the equipment future traverse work. The USAP traverse capability will be expanded as well as the USAP intra-continental cargo delivery capability.

The Schedule for this Project is as Follows:

Denver Headquarters Summer 2002

- Plan for FY03 on-ice activities and support requirements
- Develop FY03 Annual Program Plan
- Recruit field season staff and provide training
- Procure support equipment: LGP D-8, 6 snowmobiles, ground penetrating radar equipment, crevasse hazard mitigation equipment
- Identify future equipment requirements and design
- Interact with CRREL and Science Community

On-Ice McMurdo 2002/2003

- Examine the recommended Shear Zone route (March 1996)
- Establish field camp
- Develop passage for heavy equipment through the Shear Zone
- Return to McMurdo

Denver Headquarters Summer 2003

- Plan for FY04 on-ice activities and support requirements
- Develop FY04 Annual Program Plan
- Recruit field season staff
- Procure support equipment: tractors, trailers, living and workshop modules

On-Ice McMurdo 2003/2004

- Establish route beyond Shear Zone across Ross Ice Shelf
- Mobile Camp
- Progress to Leverett Glacier

- Initiate route development and crevasse hazard mitigation in the Leverett Glacier region as far as possible
- Return to McMurdo

Denver Headquarters Summer 2004

- Plan for FY05 on-ice activities and support requirements
- Develop FY05 Annual Program Plan
- Recruit field season staff
- Procure resupply materials, ancillary support items

On-Ice McMurdo 2004/2005

- Traverse established route beyond Shear Zone, across Ross Ice Shelf, up Leverett
- Continue route development and crevasse mitigation in the Leverett Glacier region
- Execute heavy equipment traverse from the base of the Leverett Glacier to South Pole Station, deliver cargo, return to McMurdo

Current Status

FY02 funding has been approved, the Project Manager has been hired and recruitment of field season staff is in-progress. Procurement activity for support equipment is in-progress, including: LGP D-8, snowmobiles, Ground Penetrating Radar (GPR) equipment and ancillary support items. RPSC is commissioning the design work. Scoping appropriate environmental coverage is in progress.

Power Plant Operations for FY03

BK Grant indicated that Operations has developed a notification procedure that should prevent outages. This procedure will be continually updated according to developing needs and requirements.

Terry Aldridge discussed power outage schedule. Outages will be scheduled so the impact on science will be minimal. Expected Power outages for 2002/03 would include a station outage for the main breaker (Pod B) that would be removed for repair early in November. Late in November there would be a station outage for replacement of main breaker after repair. Early in December there will be two outages associated with transformer installation.

Additional outages will include one for maintenance and repair of DDC. There are two partial outages expected for summer camp feeder 7 only during removal of old emergency gensets. This will affect TDRS connectivity. There will be four possible outages for the Dark Sector feeder - nine during the re-positioning of Building 61, Dark Sector power substation and communications hub. Dark Sector feeder 9 will operate on a remote generator for three to five days while Building 61 work is being done. Remote power will be provided for additional science groups working away from the main station by use of portable generator sets. Current projections do not indicate problems for power availability.

New Power Plant Status

The engine problems experienced 2001-2002 have been identified and repaired. Monitoring of engine condition is on going to prevent repeat failure. A notification procedure has been developed which would include:

- Identifying and implementing for start up of power system after an outage.
- Dark Sector and ARO would be powered up after confirmation from grantees.
- Notification list would require updates from Science Community on yearly basis.

2001/2002 Science Population Summary

	<u>Planned</u>	<u>Actual</u>
Maximum	47	48
Minimum	9	10
Total Bed Nights	4181	3416
Total PAX	142	163

2002/03 Updates

There have been no changes to the past policies and procedures. There are 50 beds allocated for science. Participants must be identified for medical packet to be sent. Double deployments require NSF approval. Increased deployments over the Funding Memo/ORW require NSF approval. McMurdo is implementing a new population management program.

New Mobile Equipment

Sixteen new Pisten Bully 100s arrived in McMurdo on the 2002 resupply vessel. Two vehicles are scheduled to arrive South Pole early in the season to replace the existing LMC 1200 fleet. The two new Pisten Bully's are to be science support vehicles.

The current Spryte (LMC) fleet will remain at the Pole until January to support remote science projects already scheduled. Better reliability and availability for science support vehicles are expected with the new fleet.

PB100 Fleet Support

Operator training will be provided for all persons operating the PB100s. On-ice instructors are being trained in US prior to deployment. Additional mechanic training is being provided to RPSC personnel prior to their deployment. There will be 14 machines remaining in McMurdo making parts availability more consistent.

Snowmobile Replacement

Two new snowmobiles are being procured for vessel delivery for FY03 (replacement of existing science support snowmobiles). The Super Wide Track machines have a proven track record with McMurdo deep field support. These machines are consistent with the existing McMurdo Fleet. Therefore, there will be better parts and technical support utilizing the assistance from McMurdo. Existing science snowmobiles are currently being prepared for summer.

Additional Pole Equipment

In mid-December a 950 G loader with wide tires for testing and evaluation will arrive at the South Pole. Additional support for snowmobiles and small generators will be provided by McMurdo MEC for some science events this season. Currently pickups and Mattracks are being evaluated in McMurdo which may offer use at Pole in future seasons. Current options for improvement in winter equipment operations and reliability are being explored. Areas being considered are equipment type and modifications, operational improvements and scheduling improvements.

Mr. Lewis went on to describe the benefits of the new Piston Bully's and snowmobiles which will be consistent with McMurdo inventories. The same spare parts and related equipment would be interchangeable. Space is limited in the summer time for indoor storage for snowmobiles, but during the winter they will be moved inside.

McMurdo Operations will continue to improve on scheduling and equipment modifications. Dr. McConnell asked if having a Nansen sled would be feasible at the South Pole. Mr. Dunbar is investigating new more workable sleds and went on to describe other sleds currently being used at

McMurdo such as the Komitak. He described the differences and will look into using other sleds that could be used at the South Pole. Pricing for the Nansen is \$2,500, the Komitak is \$1,500 and the Siglen is \$300.

LC 130 Flight Operations

Flight Operations Support

There are 318 missions planned to the South Pole this year. Last year 460 total missions were planned, but was dropped to 433. The total number of continental flights not scheduled for South Pole is 72 which are to be used in support of field science. The NSF has lowered planning to 80% of capacity. There are plans for a wheeled runway in the future, but not this year. They will stretch out the 141 missions to fill in the gap between the January and February timeframe. Issues regarding the retrograde of materials left in the field at Siple Dome and Byrd infrastructures was discussed. RPSC wants to only take 20 missions to do this and will be combined with other retro missions already planned.

FY03 Planned Flights by Week

South Pole Station FY03	ZCM - South Pole Flights (Planned)	Science	Station Operations & Facilities Maintenance	Fuel	Personnel / PAX	SPSE/SM Construction	Total
Planned Capacity		12	31	115	9	151	318
week-ending:							
26-Oct	4	0.00	0.64	0.30	0.76	2.29	4
2-Nov	17	0.34	1.48	7.80	1.40	5.65	17
9-Nov	16	1.20	4.31	9.44	0.51	0.78	16
16-Nov	16	2.36	0.44	8.79	0.25	4.01	16
23-Nov	14	0.15	0.09	9.20	0.51	4.19	14
30-Nov	13	0.11	0.15	9.22	0.44	3.19	13
7-Dec	20	0.09	0.39	9.34	0.44	9.62	20
14-Dec	24	0.85	0.04	8.91	0.25	14.10	24
21-Dec	24	1.16	0.04	9.19	0.33	13.24	24
28-Dec	18	0.00	2.76	9.34	0.32	5.76	18
4-Jan	19	0.02	0.39	9.38	0.57	8.72	19
11-Jan	22	0.37	0.04	8.92	0.76	11.96	22
18-Jan	20	0.05	0.04	9.34	0.44	10.13	20
25-Jan	20	0.00	0.39	5.98	0.66	12.96	20
1-Feb	21	0.62	0.04	0.00	0.70	19.64	21
8-Feb	25	4.15	7.03	0.00	0.25	13.13	25
15-Feb	25	0.62	12.75	0.00	0.13	11.61	25
22-Feb	0	0.00	0.00	0.00	0.00	0.00	0
Total:	318	12	31	115	9	151	318

Special Topics

Cryogen Support Plan

Allan Baker, South Pole Science Technician, presented the cryogen support plan update. There will be 12,00 liters of liquid helium shipped through Pt. Hueneme to Christchurch by October 21, 2002. There are 250-liter Dewars available if early season needs are not met. At present, projections show a continuous supply of liquid helium through the second week of November, which will be the first year South Pole will not run out. There is 24,000 liters earmarked for the South Pole off the Greenwave. Dr. Stark inquired about the Liquifier. Jesse Alcorta said that he spoke with the Brian Stone regarding bringing this down piece by piece and having it ready when construction is complete. Mr. Stone stated that the NSF would like to finish the cryogenic support plan since space has been allocated and they would like to acquire the budgeting to fix the problem. The benefit of liquifier is that it would allow one to make liquid helium while on station. Mr. Pernic noted that all we would need is a liquid regenerator, but we need to be cautious about purchasing a liquifier. His argument against the liquifier is that gas for the balloons has to be brought in to the station. Mr. Stone requested recommendations on the purchase of a reliquifier/recondenser or get another transport to sort out funding. Mr. Pernic requested Dr. Stark to formulate a plan. The topic of the new tops for the Wessington dewars was brought up. Paul Sullivan questioned if we could improve the capability by redistributing heat or by fabricating a new cold head. All of the equipment didn't arrived on station. Cold heads were never manufactured and never sent to the South Pole. The design of the cryosystem for the 8-meter is still in question. Dr. Stark noted that we are still on track with the cryogenic plan.

IceCube Project Update

Mr. Eivind Jensen 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. A project management office will have to be established. 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 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 will leave a huge footprint at the South Pole Station. This project includes 80 drill holes, 2,400 m deep. It will require 40 flights to bring in one million pounds of cargo. The plan is to have 16 holes drilled each year. Funding has been approved and \$15 million has been allocated by the NSF for design of the drill and to prepare the facilities. Construction is already in progress. Plans are for transportation of EHWD to occur during 2004; construction and drilling starts during 2005; finishing by 2009. The total cost would be \$250 million which still has not been funded by Congress. The NSF is still waiting for approval. The University of Wisconsin is submitting a contract to ICBS to design the drill and provide major field support.

There are 19 collaborative institutions involved with IceCube: Ten from the United States, eight European and one Japanese. They are:

- Bartol Research Institute, University of Delaware (*)
- BUGH Wuppertal, Germany (*)
- Universite Libre de Bruxelles, Brussels, Belgium (*)
- CTSPS, Clark-Atlanta University, Atlanta USA
- DESY-Zeuthen, Zeuthen, Germany (*)
- Institute for Advanced Study, Princeton, USA
- Lawrence Berkeley National Laboratory, Berkeley, USA (*)
- Department of Physics, Southern University and A&M College, Baton Rouge, LA, USA
- Dept. of Physics, UC Berkeley, USA (*)

Institute of Physics, University of Mainz, Mainz, Germany (*)
 University of Mons-Hainaut, Mons, Belgium (*)
 Dept. of Physics and Astronomy, University of Pennsylvania, Philadelphia, USA (*)
 Dept. of Astronomy, Dept. of Physics, SSEC, University of Wisconsin, Madison, USA (*)
 Physics Department, University of Wisconsin, River Falls, USA (*)
 Division of High Energy Physics, Uppsala University, Uppsala, Sweden (*)
 Dept. of Physics, Stockholm University, Stockholm, Sweden (*)
 University of Alabama, USA
 Vrije Universiteit Brussel, Brussel, Belgium(*)
 Chiba University, Japan (*) also in AMANDA

The tentative schedule for the IceCube project drilling and detector deployment (16-hole season) is as follows:

South Pole Station Opens	Nov 1
Start Drill Set-up (18-25 days)	Nov 4-5
Complete Set-up	Nov 23-30
Start Drilling (rate of 2 holes per week)	Nov 36-31
Finish Drilling and Deployment	Jan 26-30
Start Drill Build-down (7-10 days)	Jan 27-31
Complete Drill Build-down	Feb 2-10
South Pole Station Close	Feb 15

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
Dr. Joe McConnell, Desert Research Institute
Dr. Al Weatherwax, University of Maryland
Dr. Jeff Peterson, CMU
Mr. Andy Clarke, NOAA/CMDL
Mr. Russ Schnell, NOAA/CMDL
Mr. Bob Pernic, University of Chicago
Dr. Chris Martin, Harvard-Smithsonian CFA
Dr. Albrecht Karle, University of Wisconsin, Madison

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Committee Members Unable to Attend

Dr. Gonzalo Hernandez, University of Washington
Dr. Umran Inan, Stanford University
Dr. John Ruhl, Case Western Reserve University

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McMurdo Area Users' Committee Representative:

Dr. Deneb Karentz (University of San Francisco)

karentzd@usfla.edu

National Science Foundation

Dr. Scott Borg (Polar Earth Sciences, Polar Science)
Mr. Dave Bresnahan (Systems Manager OPS and Logistics)
Mr. Frank Brier (Facilities Eng., Project Mgr. Polar Operations)
Dr. Karl Erb (Director, OPP)
Dr. Robert Wharton (Executive Officer)
Mr. Dwight Fisher (Deputy Manager, Polar Operations)
Dr. Harry Mahar (Safety and Health Officer)
Dr. Dennis Peacock (Science Section Head, Polar Science)
Dr. Polly Penhale (Program Manager, Polar Science)
Mr. Patrick Smith (Electronics Engineer, Polar Operations)
Mr. Brian Stone (Science Projects Manager, Polar Operations)
Mr. Al Sutherland (Ocean Projects Manager, Polar Operations)

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Mr. Steve Dunbar, Director, Science Support
Ms. BK Grant, South Pole Communications Supervisor
Mr. Paul Sullivan, South Pole Science Coordinator
Mr. Rob Mitalski, Security Analyst
Mr. Martin Lewis, Station Ops Support Supervisor
Mr. Jeff Thompson, Network Administrator, IT
Mr. R. Allan Baker, South Pole Science Technician
Mr. Nick Powell, Project Engineer, IT
Mr. Richard de Lore, SATCOM Engineer, IT
Ms. Pat Douglas, Supervisor, South Pole Logistics
Mr. Terry D. Aldridge, Manager, Station Ops, South Pole
Mr. Jack Corbin, South Pole Science Construction Coordinator

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Ms. Alexandra Brown, Assistant Manager, South Pole
Mr. Eivind Jensen, Project Manager, IceCube
Mr. Dan Anderson, Project Manager, IT
Mr. Felix Mendoza, Supervisor, SAS, IT
Mr. Scott Kulinski, Sr. Systems Architect, IT
Mr. Steve Meredith, Project Architect
Mr. Steve Toth, Director, Information Systems
Ms. Barbara Wood (Administrative Coordinator, Science)
Ms. Dawn Scarboro (Administrative Coordinator, Marine Science)

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