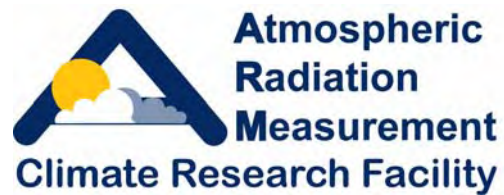


**Atmospheric Radiation Measurement Program
Climate Research Facility Operations
Cumulative Quarterly Report**

October 1, 2003 – September 30, 2004



Work supported by the U.S. Department of Energy,
Office of Science, Office of Biological and Environmental Research

Contents

1	Data Availability.....	1
2	Site Visit Requests, Archive Accounts, and Research Computer Accounts.....	2
3	Publications.....	4
4	Safety	4

Tables

1	Operational Statistics for the ACRF Sites for the Period October 1, 2003 – September 30, 2004.	2
2	Summary of ACRF User Site Visits, Archive Accounts, and Research Computer Accounts for the Period October 1, 2003 – September 30, 2004.	3
3	Summary of Publications that Use ACRF Data.	4
4	Consecutive Days Since Last Recordable Lost Time Incident or Property Damage Incident, October 1998–September 2004	5

Atmospheric Radiation Measurement Program Climate Research Facility Operations Quarterly Report October 1, 2003 – September 30, 2004

1. Data Availability

Description. Individual raw data streams from instrumentation at the Atmospheric Radiation Measurement (ARM) Program Climate Research Facility (ACRF) fixed and mobile sites are collected and sent to the Data Management Facility (DMF) at Pacific Northwest National Laboratory for processing in near real time. Raw and processed data are then sent daily to the ACRF Archive, where they are made available to users. For each instrument, we calculate the ratio of the actual number of data records received daily at the Archive to the expected number of data records. The results are tabulated by (1) individual data stream, site, and month for the current year and (2) site and fiscal year (FY) dating back to 1998.

The United States Department of Energy requires national user facilities to report time-based operating data. The requirements concern the actual hours of operation (ACTUAL); the estimated maximum operation or uptime goal (OPSMAX), which accounts for planned downtime; and the VARIANCE [$1 - (\text{ACTUAL}/\text{OPSMAX})$], which accounts for unplanned downtime. The annual OPSMAX time for the Southern Great Plains (SGP) site is 8,322 hours per year ($0.95 \times 8,760$, the number hours in a year, not including leap year). The annual OPSMAX for the North Slope Alaska (NSA) site is 7,884 hours per year ($0.90 \times 8,760$), and that for the Tropical Western Pacific (TWP) site is 7,446 hours per year ($0.85 \times 8,760$). The differences in OPSMAX performance reflect the complexity of local logistics and the frequency of extreme weather events. It is impractical to measure OPSMAX for each instrument or data stream. Data availability reported here refers to the average of the individual, continuous data streams that have been received by the ACRF Archive. Data not at the Archive are caused by downtime (scheduled or unplanned) of the individual instruments. Therefore, data availability is directly related to individual instrument uptime. Thus, the average percent of data in the Archive represents the average percent of the time (24 hours per day, 365 days per year) the instruments were operating.

Summary. Table 1 shows the accumulated maximum operation time (planned uptime), the actual hours of operation, and the variance (unplanned downtime) since the beginning of FY 2004 on October 1, 2003. The fourth quarter (July 1–September 30) represents a total of 2,208 hours, and the leap year to date total of possible hours is 8,784 (October 1, 2003–September 30, 2004). At all three sites, the actual data availability (and therefore actual hours of operation) exceeded the operational goal for the fourth quarter (0.93 for NSA, 0.97 for SGP, and 0.91 for TWP). This performance is attributed to fewer adverse weather events than expected

(particularly during the third and fourth quarters) at the SGP and NSA sites and fewer transportation logistics issues than normal at the TWP site.

The performance can also be attributed to the significant resources that have been allocated during the past year to improve the early detection of problems with data systems and instrumentation. Improved network communications allow data to be transferred by the internet rather than by disks at the TWP site, which has allowed significantly earlier detection and correction of problems. The increased bandwidth at both the NSA and TWP sites has allowed problems to be corrected remotely, decreasing the amount of time that instrument, data logger, and computer problems might result in data loss. In addition, the Data Quality Office has implemented the Data Quality Problem Report system, which very quickly identifies and diagnoses problems associated with unexpected missing data and data not meeting data quality goals.

Finally, the operational stability of some of the more problematic instruments (the millimeter cloud radars, the micro-pulsed lidars, and total sky imagers) has been improved by installation of upgraded instruments, which began during the first quarter at the SGP site and during the second quarter at the NSA and TWP sites. Because there are fewer instruments at the NSA and TWP sites, monthly data availability statistics show a noticeable steady improvement in the third and fourth quarters. In fact, the annual hours of actual operation for all three sites slightly exceeded operational goals for FY 2004.

Table 1. Operational Statistics for the ACRF Sites for the Period October 1, 2003 – September 30, 2004.

Site	Hours of Operation			Data Availability	
	Opsmax	Actual	Variance	Goal	Actual
NSA	7,905.60	7,993.44	-0.011	0.90	0.91
SGP	8,344.80	8,432.64	-0.010	0.95	0.96
TWP	7,466.40	7,642.08	-0.024	0.85	0.87
Site Average	7,905.60	8,022.72	-0.015	0.90	0.91

2. Site Visit Requests, Archive Accounts, and Research Computer Accounts

Description. The Site Access Request System is a web-based database used to track visitors to the fixed sites, all of which have facilities that can be visited. The NSA site has the Barrow and Atqasuk facilities. The SGP site has 1 central facility, 23 extended facilities, 4 boundary facilities, and 3 intermediate facilities. The TWP site has the Manus, Nauru, and Darwin facilities. In addition, a user who requires data more timely than that provided by the ACRF Archive can request an account on the local site data system. The 7 research computers are located at the Barrow and Atqasuk facilities; the SGP central facility; the TWP Manus, Nauru,

and Darwin facilities; and the DMF at Pacific Northwest National Laboratory. This report provides the cumulative numbers of visitors and user accounts by site since the beginning of the 2004 fiscal year on October 1, 2003.

The United States Department of Energy requires national user facilities to report facility use by total visitor days—broken down by institution type, gender, race, citizenship, visitor role, visit purpose, and facility—for actual visitors and for active user research computer accounts. During this reporting period, the ACRF Archive did not collect data on user characteristics in this way. Work is under way to collect and report these data.

Research computer accounts are counted in the same manner as for the ACRF Archive accounts: an individual is counted as only one unique user per site, even though he or she opens and closes an account several times to obtain different data at one or more sites. However, site visitors are counted each time they visit, because many visitors participate in multiple unrelated experiments or events.

Summary. Table 2 shows the summary of cumulative users through the third quarter of FY 2004. For the period July 1–September 30, 2004, the NSA site had a large number of visitors before and during the Mixed-Phase Arctic Cloud Experiment intensive operational period (IOP). This was expected, since the ARM Program has put a high priority on NSA activities. In the same period, the SGP site had a large number of visitors in association with the significant upgrades of instruments (most notably the Raman Lidar) and the usual preparation of future IOPs to be conducted in the early fall of FY 2005. For this same 3-month period, the number of ACRF Archive accounts increased evenly across all sites by about 40%. Three categories of Archive users can be defined: those requesting routine data, those with standing orders for routine data, and those requesting IOP data. The largest increase in users for the fourth quarter was associated with IOP data requests. Since IOP data sets are acquired about 6 months after the conclusion of an IOP, the fourth-quarter increase in IOP data requests is due to past IOP data sets becoming available. Especially noteworthy is that the ACRF reached and exceeded by far its goal of 800 users for FY 2004.

Table 2. Summary of ACRF User Site Visits, Archive Accounts, and Research Computer Accounts for the Period October 1, 2003 – September 30, 2004.

Site	Visitors	Visitor Days	Archive Accounts	Research Accounts	Total Users
NSA	133	1,333	154	37	324
SGP	141	909	503	32	676
TWP	63	346	143	22	228
DMF				19	19
Total	337	2,588	800	110	1,247

3. Publications

Description. As an additional measure of performance, this quarterly report will now include the number of publications that are based on ACRF data, with emphasis on this year's contribution but also summarizing historical data, collection of which began in 1990. The publication categories are (1) abstracts or presentations at conferences, (2) technical reports, (3) books, (4) book chapters, (5) journal articles, and (6) papers in conference proceedings. The first category mainly reflects the ARM Science Team meeting poster abstracts since 1990. Counting of abstracts and presentations for the American Meteorological Society began in 2002. The conference papers category mainly reflects the ARM Science Team Meeting extended abstracts published since 1990. Counting of papers for the American Meteorological Society and the American Geophysical Union began in 2002.

Summary. Table 3 shows the number of publications by category for 1990 through September 2003, the number of publications for FY 2004, and the total of publications for 1990 through September 2004.

Table3. Summary of Publications that Use ACRF Data.

Category	Publications 1990-September 2003	Publications, FY 2004	Publications, 1990-September 2004
Abstracts or Presentations	1,088	349	1,437
Technical Reports	70	3	73
Books	3	0	3
Book Chapters	47	0	47
Journal Articles	1,443	59	1,502
Conference Papers	1,587	136	1,723

4. Safety

This quarterly report also now includes safety performance data. For reporting purposes, the three ACRF Sites and ARM Mobile Facility operate 24 hours per day, 7 days per week, 52 weeks per year. Time is reported in days instead of hours. If any lost work time is incurred by any employee, it is counted as a workday loss. Consecutive days since the last recordable or reportable injury or by damage to property, equipment, or vehicle are provided in Table 4 for the period October 1, 1998–September 30, 2004.

Table 4. Consecutive Days Since Last Recordable Lost Time Incident or Property Damage Incident, October 1998–September 2004.

ES&H Category	NSA (Days)	SGP (Days)	TWP (Days)	ARM Mobile Facility (Days)
Days Worked without Lost Time Incident	2,190	1,028*	2,190	274
Days Worked without a Recordable Accident (Doctor Case)	2,190	1,028*	2,190	274
Days Worked without a Recordable Incident (Property-Equipment Damage/Loss)	2,190	2,190	2,190	274
Days Worked without a Recordable Incident (Property-Equipment Damage/Loss)				
Days Worked without a Reportable Loss to Vehicles	2,190	2,190	2,190	274

*SGP has had three lost work day cases:

FY 1998: 2 lost days restricted work for lower back sprain;

FY 1999: 14 lost days for fracture of wrist (slipped and fell on ice after hail storm); and

FY 2000: 162 lost days and 130 restricted days to alleged injury of congenital defect to back.