

FOREIGN TRIP REPORT

A1. SUMMARY :

Report date : 25th June 2001
Traveler : Rex Pearson ¹
Destination : Nauru Island, Republic of Nauru
Dates : 17th June 001 to 23rd June 2001

A2. PURPOSE

This trip was part of the DOE¹ ARM² Program's continuing efforts to establish several ARCS³ sites in the Tropical Western Pacific (TWP) region. The first ARCS was installed on Manus Island in Papua New Guinea (PNG) in the summer of 1996 and the second ARCS was installed on the Island of Nauru in the Central Pacific in the fall of 1998.

This particular trip was for emergency maintenance on the Nauru site to repair the Brusag tracker assembly and the MMCR cloud radar.

A3. ABSTRACT

The Department of Energy's ARM program has begun phased operations of Cloud and Radiation Testbed facilities in the TWP. TWP science considerations require that several observation stations be sited across the Pacific Basin from Indonesia to east of the dateline. To meet these requirements the ARM program is developing ARCS, which will operate in a semi-autonomous mode for long periods in remote locations. We began operations of the first ARCS on the island of Manus in PNG in the fall of 1996 and installed the second ARCS for Nauru Island in the central area of the TWP in 1998. Regularly scheduled maintenance, improvement and calibration visits are required for both sites by ARM Operations. Teams made up of technical personnel from several national labs participate in those visits, known as RESETs.

This report outlines the emergency maintenance visit by Rex Pearson. The description for each item is based on the daily activity at the site.

¹ Technician, Australian Bureau of Meteorology

B. REPORT

Activities on Nauru site 18th June to 22nd June 2001

18th June (Monday)

- Assessed the condition of the existing Brusag tracker
Power and external cabling appear to be intact and within normal limits.
Secondary motor control connector had come out of the connector on the control printed circuit board (PCB), replaced but did not solve problem.
Tracker will send messages to console but the console cannot communicate back to the tracker. Suspect the serial driver integrated circuit (MAX232) is faulty. As there were no spares for this or the control PCB further repair analysis was terminated.
- Replaced faulty Brusag tracker with unit sent from US. (WD24217)
Completed alignment of the unit and set time, checked other settings and set to sun tracking mode.
The unit came to the correct position and tracked the sun for the remainder of the day within the nominal accuracy limits.
- Commenced work on the MMCR – fault finding as to why the TWT drive pulse was not present.
Replaced faulty coax cable and drive pulse now normal.

19th June (Tuesday)

- Returned MMCR to operational status and confirmed unit was functioning normally.
The monitor pulse from the TWT was the opposite polarity to the documents but was informed by K. Widener this was correct for this site (all other sites are the opposite polarity)
- Commenced calibration routine for MMCR.
Experienced problems with the routine not producing calibration constants.
Passed information to K. Widener for information and suggestions.
- Observers reported the shutter on the IRT was not closing properly.
Removed solenoid assembly, cleaned the shaft and lubricated shaft.
Replaced into service and tested ok.

20th June (Wednesday)

- Further testing on the MMCR did not initially produce calibration constants, K. Widener advised.
- K. Widener suggested a resolution to the problem which resulted in the constants being produced. The results were e-mailed to Kevin for analysis.
- Commenced power cabling run from D van to the I van to bypass the I van ups for all critical loads.
- Worked on the observers laptop to attempt to obtain an internet connection (observers had not accessed the internet for over a week)
Eventually set the laptop for “connect only at 4800Baud”. This has allowed a reliable connection to the ISP albeit extremely slow.
- Observers reported a leak in the primary filter assembly for the H₂ generator. The conduit assembly connecting the top of the filter to the brass elbow was cracked and leaking. The conduit was removed and a replacement assembly made. This has allowed the filter to function with a slow water leak as the conduit did not fit correctly. A replacement assembly has been requested via BoM in Australia.

21st June (Thursday)

- Cable work between D and I vans completed and the WSI, Lidar and the two laptops for the Ceil and MWR were connected to the D van UPS. All functioned normally and the load on the D van UPS is below 50% of capacity.
- K. Widener advised all calibration constants were ok for the MMCR and the MMCR was returned to service.
- Further attempts to repair the small leak in the H₂ primary filter were unsuccessful. Contacted BoM to confirm that action was underway for a replacement filter.
- Final check on Brusag tracker confirmed the operation was normal (during Tuesday and Wednesday the unit was checked on a regular basis to confirm correct tracking)
- Sprayed the silicon bronze screws on the skyrad stand to prevent further oxidation. Will monitor the sprayed to unsprayed screws to gauge the effectiveness of coating the screws.
- Worked with observers to replace the desiccant tube on the SMET data logger. This was replaced with the unit from the spare data logger. ARM are to source a replacement assembly.
- Check of all systems to confirm normal operation.

22nd June (Friday)

- General tidyup of completed wiring etc
- Final check of instruments to confirm normal operation
- Review of phone cabling within site to work on proposal to tidyup/replace during Reset14 in preparation for new street cables to the exchange.

C1. ITINERARY

Itinerary for Rex Pearson

<u>From/To</u>	<u>Date</u>	<u>Purpose</u>
Darwin/Brisbane	17 th June 2001	Air travel to Nauru
Brisbane/Nauru	17 th /18 th June 2001	Air travel to Nauru
Nauru	18 th /22 nd June 2001	Nauru maintenance
Nauru/Brisbane	22 nd June 2001	Air travel to Darwin
Brisbane/Darwin	23 rd June 2001	Air travel to Darwin

C2. KEY CONTACTS

Nauruan Government:

- Andrew Kaiurea – Nauru IDI (Administrative contact)
- Megan Aliklik, On-site observer
- Henry Harris, On-site observer
- Nicolas Duruburia, On-site observer
- Franklin Teimitsi – Nauru IDI (Observer)

Australian Bureau of Meteorology:

- Colin Maxwell
- Troy Culgan
- John Glowacki
- Tony Baldwin
- Mat Gould