

**ARM Nauru Research Station
RESET Visit 14N Report**

Visit Duration: 29 October to 09 November 2001

Denig District, Republic of Nauru

CONTENTS

A. Introduction

B. TWP Operations Management and Reset Visits

C. Tasks Performed

1. Train new BOM technicians on Calibration
2. Install IRT new gold mirror cover
3. I-Van UPS diagnostics, repair
4. Replace I-Van I/O block
5. Install I-Van Ups signal conditioning for ACCESS inputs.
6. Modify Rad Logger Real Time Display
7. General Instrument Calibration
8. Radiometer Comparison Testing
9. Radiometer Change Out
10. MFRSR Head Comparison and Shading Check
11. Replace Net Rad Assembly and Send Oldest One Back
12. Replace Anemometers
13. Replace T/RH probe
14. Calibrate Rad Logger and Spare Rad Loggers
15. Calibrate SMET Logger and Spare SMET Loggers
16. Calibrate Barometer in SMET Logger and Replace Desiccant Tube
17. Install AC Power for TSI
18. Install New Stand for TSI Near GRNRAD Stand
19. Install Data Line for TSI
20. Install TSI
21. Modify ADaM for TSI Install data collection PC for TSI (Widener)
22. Install Observer Laptop w/ new software
23. Set new diesel fuel tank and recon for hook up
24. NIES installation (Long, Widener, and Pearson)
25. Install CIMEL rain sensor, replace belt
26. WSI filter/shutter change out
27. Red mark ARCS-2 drawing book
28. Radiometer ventilator (Kornke)
29. Install Zeno logger tin roofs
30. Install 4 new AC units on vans (local electrician)
31. Clean out obsolete parts from storage Vans, old AC units leaving 2 spares
32. Baby-sit site for 2 days
33. Other
34. Audit-Out
35. Routine Maintenance Tasks (BOM)
36. Ship Back Equipment (Observers)

D. Future RESET Visits

A. Introduction

The main goals of the TWP Operations RESET14-N Visit (routine) to ARCS-2 at Nauru were the following:

This Report is organized according to the planned tasks or work units performed during the RESET Visit. Within these work units the activities accomplished are arranged chronologically. Most of the information was out together by the RESET-14N members based on the actual visit, daily reports.

B. TWP Operations Management and RESET Visits

Once an ARCS Site is established, TWP Operations maintains the site and performs data reporting. TWP Operations also coordinated equipment retrofits at the established sites; accomplished by local NWS site personnel, routine RESET visits, and non-routine RESET visits.

Routine RESET Visits

Routine visits are scheduled on approximately six-month intervals and are focused mainly on routine maintenance, instrument calibration, instrument replacement, and training. A formal audit-in is performed upon arrival and audit-out before departure.

Non-Routine RESET Visits

Non-routine visits are intended for technical non-routine tasks such as emergency repairs, retrofits, and/or the addition of new instruments.

The work on the RESET visit is performed by the RESET team, but often in close coordination with the local on-site Observers. The team holds a daily, morning tasking meeting at the site using the proposed RESET visit, tasking schedule. After each day's work, the team meets to summarize work activities and an assigned team member writes a "Daily Report" and e-mails the report to TWP personnel in the U.S. Because of time-zone differences, necessary calls to instrument mentors in the U.S. are done in the morning.

Reset Members

- John Glowacki (BOM)
- Rex Pearson (BOM)
- Troy Culgan (BOM)

C. Tasks Performed

1) Train new BOM technicians on Calibration

06Nov

- BOM techs did OJT by doing calibration themselves.

2) Install IRT new gold mirror cover

29Oct

- Glowacki installed the new SKYRAD IRT mirror system.
- Task completed.

3) I-Van UPS diagnostics, repair

09Nov

- Pearson worked out a procedure to adjust D & I van UPS voltages
- Glowacki tidied up the UPS wiring run between D & I vans.
- Task Completed

4) Replace I-Van ACCESS I/O block

29Oct

- Pearson set up gear to read PLC Blocks.

05Nov

- Pearson started fault finding on the SAM error messages for I and E vans. Task completed.

5) Install I-Van UPS signal conditioning for ACCESS inputs

08Nov

- Pearson found the necessary hardware on site.
- Task not completed

6) Modify Rad Logger Real-time display

09Nov

- Culgan made software, real time data display changes to the SKYRAD and spare RAD loggers and went through the system documentation.
- Task completed

7) General Instrument Calibration

29Oct

- Could not find standard resistors.
- Culgan collected the site configuration files and FTPed them to the TWP FTP site.

30Oct

- Culgan worked on the calibration equipment and searched for an old “break out” box. Found the Voltage Standard being used as a stand for the MPL. Started a cal procedure on the spare skyrad logger.
- Glowacki and the Observers installed the small “calibration stand” obtained from Manus – otherwise know as “Porch’s porch” at the end of the Skyrad stand.

01Nov

- Culgan and Pearson calibrated the SMET instruments.
- NOTE: The following files for Chris Cornwall have been transferred to the FTP site (TWPPPO) sky011101.dat, grnd011101.dat, cal011101.dat and cal011101.cfg.

02Nov

- Culgan completed the Ceilometer calibration check and vertical re-alignment.
- Culgan, Pearson completed the IRT calibration checks, collected calibration and configuration files.
- Pearson FTPed Ceilometer configuration file after calibration.

03Nov

- Pearson FTPed calibration records the TWPPPO site and helped with the change out of the WSI filters and checks.
- Culgan transcribed and prepared the cal records for transmission.

06Nov

- Culgan completed instrument change out forms and calibration documentation.

07Nov

- FTP'ed data and reports to TWPPPO.

08Nov

- Glowacki went through the AERI procedures for calibration.

09Nov

- Glowacki worked through the AERI calibration procedure and collected the AERI config file and put it on the FTP site.
- The two AERI calibration runs were made with the Everest Interscience Portable Blackbody calibration source. The first run was straight after the tape change at 00:54 9Nov and finished at 01:33. The second one was started at 03:00 and finished at 03:53. I'll e-mail Bill Porch and the mentors about the procedure and the file to collect. Reviewed the surface Temperature graphical display showed that once the temperature of our black body settled the three plots traced together with a delta of less then 0.5 degrees.
- Culgan changed out hand held TRH probe due to unreliability of humidity reading.
- Task Completed

8) Radiometer Comparison testing**31Oct**

- At 04:25GMT PIR 30167F3 removed from the Kipp-Zonen and now un-shaded and unventilated. Calibration logging commenced. Configuration PSPG 31289F3, PSPD 31286F3, PIRG 33059F3, PIRD 33060F3 and NIP 31351E6 placed on the Kipp-Zonen tracker.
- GrdRAD PIR and PSP invert to global position for cal check.

01Nov

- As of 0600 (1 Nov) cal logger configuration PSPG 31291F3, PIRD 33061F3, NIP 31352E6 and other instruments the same. Grndrad PIR and PSP remain inverted and un-ventilated.

05Nov

- Culgan worked with Long to move the calibration instruments onto the SKYRAD stand so Porch's porch could be used for the TSI.

- Task completed

9) Radiometer change out

06Nov

- Changed SKYRAD instruments over into their final configuration as per Chris Cornwall instructions.
- FTPed instrument replacement forms, configuration files.

12Nov

- Nauru has two spare UVBs at this time. UV-B ser #3873 and ser # 2867. Of the two, ser #2867 is the most recently calibrated. Do you want both kept here or do you want one sent back? Please advise the observers what you would like done.
- Task completed.

10) MFRSR head comparison and shading check.

02Nov

- Glowacki carried out checks on the MFRSR leveling. Shading check will be done tomorrow.

04Nov

- Checked the MFRSR shadowing at solar noon.

08Nov

- Found the spare MFRSR head, logger board, and shading band.
- The ARCS-2 spare MFRSR stand was deployed at the NIES site.
- Task completed

11) Replace Net Rad assembly and send oldest one back.

04Nov

- Culgan worked with Pearson to change the NETRAD. Commenced at 03Nov, 20:30UTC completed 21:15UTC. Old NETRAD serial number Q95063 replaced with NETRAD Q94207. New configuration file GRDRAD011104.cfg FTPed to TWPPPO, along with the equipment replacement form.
- Task completed

12) Replace Anemometers

01Nov

- Culgan and Pearson calibrated the SMET instruments.
- Decided not to replace the Anemometers as the spares looked “un-new. After reviewing the inventory records, we realized one of the anemometers was replaced during a previous RESET Visit and the broken anemometer on the shelf had not been returned to the US for repair. Will return spares to US for repair/calibration and verify calibration of the anemometers on the stand and leave them in place.

13) Replace T/RH probe

01Nov

- Replaced TRH probe on SMET mast.
- Culgan and Pearson calibrated the SMET instruments.

- Task completed

14) Calibrate Rad Logger and Spare Rad Loggers

30Oct

- Pearson worked with Culgan on the Cal equipment and the calibration of the spare skyrad data logger.

31Oct

- Culgan and Pearson calibrated the calibration logger (SPARE SKYRAD LOGGER) and making leads.

05Nov

- Culgan tested and calibrated SKYRAD and GRNRAD data loggers.
- Task completed

15) Calibrate SMET Logger and Spare SMET Loggers

01Nov

- Culgan and Pearson finished the SMET calibration on the SMET Logger and the spare SMET logger.
- Task completed

16) Calibrate Barometer in SMET Logger and replace desiccant tube

01Nov

- Culgan and Pearson calibrated the SMET instruments.
- Existing desiccant tube is ok. Pearson instructed Duburiya how to replace it if it becomes a problem.
- There is no spare barometer outside of the one in the spare SMET logger.
- Task completed.

17) Install AC power for TSI.

01Nov

- Glowacki layed the conduits for the TSI stand power and data cables. With Pearson and Culgan help, installed the power and data cables in the conduit.

03Nov

- Glowacki started fabrication conduit ends for TSI power installation.

04Nov

- Glowacki terminated the TSI power cable into the power box on the side of I van.

05Nov

- Glowacki mounted temporary power/ data box at the TSI end.
- Task completed.

18) Install new stand for TSI near Grnrad stand.

05Nov

- Culgan worked with Long to move the calibration instruments onto the SKYRAD stand so Porch's porch could be used for the TSI.

08Nov

- Coordinated with Andrew to get pads made for the TSI stands.

10Nov

- Andrew Kaierua arranged for concrete pads for the TSI stands to be made and these are now setting now. We are still awaiting delivery of the TSI stand steel and hardware kits from the “Capt Fearn”.

12Nov

- Concrete pads for the TSI stands have been made and will be stored at the ARC-2 site.
- Stand did not arrive in time.

19) Install data line for TSI.**01Nov**

- Glowacki layed the conduits for the TSI stand power and data cables. With Pearson and Culgan help, installed the power and data cables in the conduit.

04Nov

- Started to fit out power/ Data converter box for instrument end of TSI runs.

05Nov

- Widener tested all four fibers to the TSI stand and worked on networking issues with Pearson. Pearson worked with Widener to test the TSI and sort out network issues.
- Task completed

20) Install TSI.**04Nov**

- Culgan installed virus protection on the Observers laptop.
- Chuck Long set up the ARC2 site TSI and tested it.

05Nov

- Long worked on the TSI setup on Porch’s porch.
- Task completed

21) Modify ADaM for TSI Install data collection PC for TSI. (Widener)**06Nov**

- Widener and Long installed the ARC2 TSI software on the new TSI laptop in the I-Van.
- The Observers were trained on how to do weekly CD burns from the TSI laptop for weekly mailings.
- Task completed

22) Install Observer Laptop w/new software.**05Nov**

- Glowacki worked on the Observers laptops cleaning up the hard disks.

07Nov

- Adobe Acrobat was installed on the new Observer PC.
- The Observers have expressed an opinion that they would prefer to use the old laptop instead of the external floppy drive cluttering up their desk space. They were reminded that they could restart the machine w/o the external floppy connected.

09Nov

- Culgan installed virus protection (Macaffee) on the Observers laptop.

10Nov

- Culgan installed virus protection software on the Observers Laptop and removed the “snow white” virus that had infected the Laptop.
- Task completed

23) Set new diesel fuel tank and recon for hook up.

- No action taken

24) NIES Installation (Long, Widener, Pearson)

- See NIES Report

25) Install CIMEL rain sensor, replace belt

29Oct

- Pearson replaced the belts on the CIMEL and carried out the CIMEL checks.
- Task completed.

26) WSI filter/shutter change out

02Nov

- Downloaded WSI image files.

03Nov

- Culgan changed out the WSI filter.
- WSI optic filter took longer than expected due to difficulty in getting the filters out. It was very hard to break the epoxy bead holding the filters in. The old shutter assembly serial number is 64826 and the new assembly number is 83744.
- Task completed.

27) Red mark ARCS-2 drawing book

07Nov

- Glowacki started red marking the ARCS-2 drawing book.

09Nov

- Pearson worked on site documentation.

12Nov

- Finished red marking the drawing book.
- Task completed.

28) Radiometer ventilator work (Kornke)

- a) Check to verify if ventilator internal fuses have been removed - power distribution box provides circuit protection. (Kornke)
- b) Complete ventilator hardware upgrade to silicon bronze because (adjusting screws are corroded and seized)

31Oct

- John spent today reconditioning ventilators and drilling out stainless steel screws.

08Nov

- Culgan finished the last of the ventilator modifications.
- Task completed.

29) Install Zeno logger tin roofs (Observers)

29Oct

- Glowacki showed the Observers how to install the Data logger hats and then they completed the task.

30) Install 4 new AC Units on Vans (Local Electrician)

29Oct

- Both of the D-Van AC units were not operating and therefore the D-Van doors were opened to try to cool the Van while an AC repairman was summoned. The new AC units are on the Captain Fern that has not arrived. No word on when it will arrive.

30Oct

- When we arrived at the site the D-Van was very hot and ADaM was down. The Capelli A/C repair man got the unit going by replacing the pressure switch, but was unable to repair the left hand unit, it will need to be replaced when the "ship comes in". I am waiting for him to advise the other part he replaced so that we can get Monty Apple to order these also (apparently it is some sort of relay or switch - but cant provide more details at this stage)

31Oct

- As of today, the left hand unit (looking from the door) is faulty and hardly providing any cool air, therefore the right hand unit is doing all the work (the one repaired by replacing the pressure switch.)
- Nic advises there are no spare A/C units on site.

08Nov

- Captain Fern in port, but AC units not yet unloaded. If the new units do not arrive soon one from the E-Van will be moved to replace the malfunctioning unit on the D-Van.

10Nov

- The "Captain Fearn" is still along side but the AC units have not been unloaded yet. The AC unit on D-Van was re-gassed by the AC mechanic from Capellies and is working well. All AC units on the vans are working. The two AC units held in the store are split units for the storage van and are not suitable for the main vans.
- Task not completed.

31) Clean out obsolete parts from storage Vans, old AC Units leaving 2 spares

04Nov

- Glowacki started cleaning out stores van while looking conduit adapters and plugs.

08Nov

- General site tidying up of cabling and stores areas.

09Nov

- Pearson continued to clean up in I-Van.
- Pearson investigated wiring in the D-Van to remove the old inverter.

10Nov

- Pearson and Glowacki helped the observers clean up the site storage vans and then stowed the AERI boxes in the air-conditioned vans. Note that the spare TSI camera is stored in the NOAA (ISS) Van.
- Task completed.

32) Baby-sit site for 2 days**11Nov**

- We (Pearson, Culgan, and Glowacki) had a short day. Spent this morning at the site, check systems tidying documentation and collected configuration files.

12Nov

- Collected data and familiarized ourselves with the site systems.
- Task completed.

33) Other**29Oct**

- Glowacki performed the Audit In.

30Oct

- Glowacki removed the Voltage Standard from beneath the MPL and lashed up a replacement height adjustment stand for the MPL and leveled it.

31Oct

- Manus Troubleshooting on Observer Laptop internet/email access. Contacted Hymson and then later Francis to work through the problem with the Manus observers getting on line. They are going to contact Daltron re their overloaded e-mail account. The problem with looking up the H&S page also lies with Daltron. The observers can dial into Daltron but call an overseas web page takes that long the system times out.

01Nov

- Contacted Manus ARCS1, e-mail and browser problem has been resolved and the observers can use the web and email after the problem was fixed at the ISP.

04Nov

- Replaced current potentiometer on the Electrolyzer, this was a problem picked up by Collin Maxfield during the last service call.
- Pearson found a fault on the air compressor. Faulty starting capacitor. We'll send a replacement from Darwin.
- Stopped and restarted the ingest for the MPL to clear a red flag problem on the H & S.

06Nov

- Pearson investigated GRDRAD flagged red on the H & S page. At this stage we are able to talk to the logger from a laptop over the network. Stopped and re-activated the ingest software on Adam.

07Nov

- Pearson worked with Culgan to find the red flag problems with the GRDRAD. Problem was eventually traced to a difference in the configuration file version numbers where Troy had put in VXXXX.X instead of VXXXX.XX on the data logger. This was found after working through the other hardware possibilities and then comparing the old and new configuration files.

34) **Audit out**

- a) Spares inventory (Observers)
- b) Config files from Rad Loggers, MFRSR, Ceil, MWR, etc.
- c) Replacement records
- d) Re-label faded labels

30Oct

- Glowacki recorded the MMCR serial numbers for the MMCR

08Nov

- Pearson completed the equipment data base QC sheets.
- Task completed.

35) **Routine Maintenance tasks (BOM)**

a) ADaM backup

- Task not done, will be done remotely via dial-in in future.

b) AERI

- i) Actuate Hatch Sensor with Moisture/Check Hatch Operation Visually
- ii) Clean Out Air Intake and Filter
- iii) Inspect Blower Belt
- iv) Clean Mirror Air Conditioners – change filters on Bard Units, AERI Van unit.

06Nov

- Glowacki worked on the AERI tasks from the maintenance list.

07Nov

- Glowacki completed the AERI tasks. The rain sensors are working correctly.
- Task completed.

06Nov

- Glowacki found that the outside moisture sensor is not working and will fault find that tomorrow. The moisture sensor in the chimney is working.

c) BBSS – check antenna mount, change out UPS batteries.

02Nov

- Completed MPL, BBSS antenna, and sat phone antenna checks. No batteries available on site.

d) Ceilometer – check glass.

02Nov

- Task Completed.

e) Cimel – check battery voltage, belt.

29Oct

- Pearson replaced the belts on the CIMEL and carried out the CIMEL checks.
- Task completed.

f) Logger (Zeno) pressure check.

05Nov

- Culgan completed pressure checks on the data loggers.

- Task completed.

g) IRT – check for corrosion, shutter, and lens.

29Oct

- Task completed during mirror installation.

h) MFRSR – level and align.

02Nov

- Glowacki carried out checks on the MFRSR leveling.
- Task completed.

i) MMCR –

i) Check Operation of 12VDC Fan for Lotech MUX 488/64

ii) Check Operation of Antenna Heater Element

iii) Check Operation of Antenna Heater Blower

iv) Check Radome Fabric

v) Clean Receiver/Modulator Interface filters

vi) Clean Computer filters (foam)

vii) Change-Out Antenna Heater Filters

viii) Change-out Fan for Radian Receiver, 12VDC

30Oct

- Glowacki shut down the MMCR and completed the MMCR maintenance tasks.

j) MPL – check top glass and shade mechanism.

02Nov

- Completed MPL, BBSS antenna, and sat phone antenna checks.

k) MWR – check Teflon window, fan, screen, heater, and moisture sensor.

01Nov

- Completed MWR checks.

l) Net Rad – change domes and gaskets.

04Nov

- Completed change out.

m) Phone Manager – check setup.

12Nov

- Pearson re-terminated the phone lines into E van and mounted the sockets on the wall. Presently the only Nauruan line working into the site is 444 3277.

n) PIR, PSP ventilators – check operation.

- Task completed.

o) SAT Phone – check antenna, connections.

02Nov

- Completed MPL, BBSS antenna, and sat phone antenna checks.

p) SMET – check anemometers, TRH fan.

01Nov

- Task completed

q) Tracker – check tracking.

06Nov

- Glowacki fitted Kipp-Zonen tracker leveling interface plate, leveled and re aligned the home position to the East.

07Nov

- Glowacki checked Zipp-Zonen tracking after changes made yesterday.

r) Vans – inspect for rust, check dehumidifiers.

03Nov

- Glowacki worked with Nicholas to change out some of the fire alarm batteries.
- Glowacki spent time on the walkway, roof-sealing holes that reduces the work area when it rains.

s) WSI

i) Check Coolant Flow

ii) Check for Cloudy Coolant in lines

iii) Check for Corrosion

iv) Check both Sealants to Verify Seal

v) Check to See If N2 Change Is Needed

vi) Check heater operation

vii) Oil Coolant Pump Bearings

viii) Service AC unit on White and Blue boxes

ix) Change-Out Corrosion Prevention in ARC Drive

x) Change-Out Replace Metal Screen Filters in Blue Box

xi) Change-Out Shutter Assembly

xii) Change-Out Desiccant in Camera Housing

03Nov

- WSI optic filter took longer than expected due to difficulty in getting the filters out. It was very hard to break the epoxy bead holding the filters in. The old shutter assembly serial number is 64826 and the new assembly number is 83744.

03Nov

- Culgan changed out the WSI filter.

04Nov

- Adjusted the WSI Monitor for a clear picture.

08Nov

- Worked on the WSI to correct a problem with the lens aperture. During the filter change the aperture setting had moved from f2.8 to f11. WSI raw data file collected and FTPed to the TWPPPO site. Also verified that the focus was set to infinity.

36) Observer Training

a) ADaM HD change w/Obs Man, Monthly Ops, PRO (ADAM)-033.002

02Nov

- Task complete

b) Laptop Virus Protection Installation.

08Nov

- Task complete.

37) Ship back equipment (Observers)

- a) ARCS-2 drawing book with red marks
- b) Used NET rad assembly.
- c) MFRSR head to PNNL
- d) Old T/RH probe.
- e) Old Anemometers.
- f) Brusag remains.

D. Re-supply items needed:

1. Bard AC unit “pressure sensors”.
2. 1 Spare Ventilator
3. Air compressor starting capacitor.
4. Spare MFRSR stand since ARCS-2 spare deployed at NIES.
5. Spare barometer.
6. BBSS spare UPS batteries.
7. MMCR spare UPS batteries.
8. EMWIN spare UPS batteries.
9. Licensed virus protection software for Observers Laptop.
10. Ventilator screen, silicon

E. Task for future reset

- Replace BBSS antenna cable plug and earth strap clamp.
- Remove Netrad.
- Upgrade WSI software.
- AERI front end interferometer replacement (Dedecker)
- AERI hatch mechanism & controller replacement (Dedecker)
- AERI training (Dedecker)
- I-Van UPS diagnostics, repair
- Change out “finger cutting” aluminum labels.
- Observe laptop MaCaffe virus protection
- Install I-Van UPS signal conditioning for ACCESS input
- Install TSI Stand.
- Install hookup for new diesel tank.
- Remove old rental van.
- MMCR Calibration (Widener)