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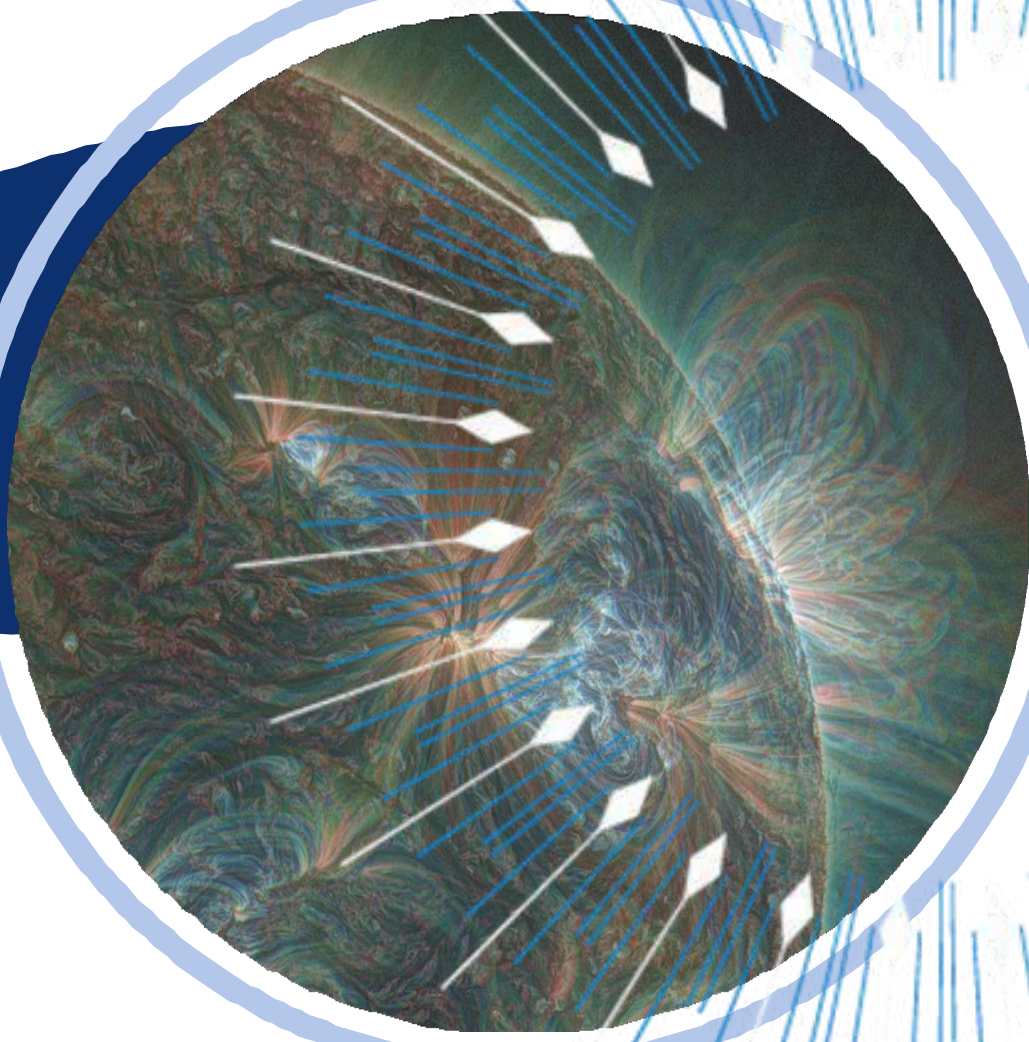

February 2024

Meeting Agenda

SANAE IV: CTBTO Station

PREPARED BY

Mr. D. van Wyk (SANSA Electronics Engineer, Group Leader)

SANSA is an entity of the Department of Science and Innovation

SANAE IV: CTBTO Station Meeting Attendance

Persons in attendance of the collaboration meeting and training session with regard to the CTBTO Station at SANAE IV, Antarctica Research Base are listed below:

Held at 09:00 UTC; 01 February 2024

NAME	POSITION	AFFILIATION	DATE	SIGNATURE
MATHIAS HOFFMANN	SO	BGR	01/02/24	
Torsten Grasse	SO	BGR	01/02/24	
Heinrich Benz	AEE	SANSA	01/02/24	
TANKISO MOSO	AEE	SANSA	01/02/2024	
Nivesh Ghazi	AEE	SANSA	01/02/2024	
DJ van Wyk	AEE(GL)	SANSA	01-02-2024	

Background

The Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) hosts a seismic station at the SANAE IV research base, Antarctica. The Comprehensive Nuclear-Test-Ban Treaty bans nuclear explosions by everyone, everywhere.

The purpose of the meeting is to introduce the seismic station operations and respective responsibilities to the SANSA engineers stationed at SANAE IV. The SANSA engineers will be responsible for the upkeep and maintenance of the seismic station.

Station Overview

The seismic station at SANAE IV research base located at Vesleskarvet, Dronning Maud Land. 71° 40 S 2° 51 W.

The station consist of a seismometer which is located a few meters South of the research base, buried in the rock with access through a man-hole. The seismometer is connected to the monitoring station found in the bottom physics lab of the research base.

The monitoring systems consists of 1 active data acquisition computer, a data logger, a SeisComP PC, an interface console with a monitor and keyboard. All connected through a CISCO switch and the BGR communication server, supplied with main power from base and an internal backup UPS.

Spare parts are readily available for replacement of all the various components within the monitoring system and/or seismometer instrument.

Discussion

Brief overview of the monitoring system with Mathias Hoffmann and Torsten Grasse, introducing the new SANSA engineers to the seismometer and the operation of their server.

- Remotely monitored from Germany.
- Hardware overview.
- Software overview managed by BGR, data accumulation and duration interval. Continuous data retrieval for 2 weeks and repeated.
- Continuous data transfer daily, done automatically. Less than 1MB.
- Note the special authentication cards required by the CTBTO.
- Seismic sensor in the man-hole to not be tampered with unless instructed otherwise by BGR representatives.
- Very sensitive to any interference due to the nature of the sensor and age of the cables being roughly 20 years.
- 3-component seismic sensor, spare module available on shelf for replacement when required. Components/Masses are locked on the spare module.
- Installation process will be instructed through BGR to the SANSA engineers. Crucial point of contact and communication is mandatory.
- Overview of how to unlock the masses on the spare sensor when required.
- Movement outside around the sensor is freely allowed, no restrictions.
- Sensor is most likely buried in blue-ice, therefore it will not be opened to mitigate any damage that may occur.
- Component alignment can be done manually through a switch on the connector housing or preferably through the operating software, and is done when temperature variates in high ranges or when newly installed.
- Brief overview of the Grafana dashboards for the whole system reflecting the data ingress, system status and network activities.
- Overview of rack temperatures.
- Briefing on the seismic plots and waveforms generated in real-time.
- How to read the plots, identifying seismic activity between local activity such as a CAT bulldozer moving ice or movements picked up from the ocean and actual earth quack data.

Updated documentation is available on soft copy on the main SANSA data server as well as a hard copy has been provided. Revised version from 2020.

Responsibilities

The SANSA engineers will primarily be responsible for the monitoring of the systems within the server rack making sure it is operational and that no power outages occur. The internal UPS will last about 40-minutes. The whole system is also backed up by the UPS in the lower physics lab for additional backup should the internal UPS fail.

The system can be monitored through the Grafana dashboards for ease of use and to avoid any interference with the data acquisition computer. Spectograms and waveforms of the incoming data can be viewed utilizing the Sworm software package, to be installed on both SANSA engineers' computers.

The overwintering SANSA engineers must report any defects and/or network problems to BGR for record keeping and assistance to rectify defects where applicable.

Spares Inventory

The spares currently available on shelf for the seismic station:

Description	Status	Brand	Designation	Serial Number	Checked
Seismometer	Active	STS-2	AS035-01	110044	
Seismometer	Spare	STS-2	AS035-02	110045	YES
Datalogger	Active	Q330HR	AS035-01	3564	ACTIVE
Datalogger	Spare	Q330HR	AS035-01	3566	YES
GPS Antenna	Active	Trimble		16N90421	ACTIVE
GPS Antenna	Spare	Trimble		125100508	YES
Data Acquisition PC	Disposed	PrioSys	WS02-SNAA	AW77821209123	N/A
Data Acquisition PC	Active	PrioSys	PC01	AECI070162	ACTIVE
Data Acquisition PC	Spare	PrioSys	PC02	AW98131216108	YES
Authentication Card	Disposed	Luna PCM	WS02-SNAA	305333	N/A
Authentication Card	Spare	Spyrus 3003	PC02	f0001ee4	YES
Authentication Card	Active	Spyrus 3003	PC01	f0001e80	ACTIVE
LCD Monitor + Keyboard + Touchpad	Active	Avocent		320020958	ACTIVE
Smart-UPS X 1500	Active	AP9631		5A1315T09045	ACTIVE
Seiscomp PC	Active	Alpha2000	SNAA	001BEB6634F2	ACTIVE
Seiscomp PC	Spare	Alpha2000	SNAA	AW5682110706	YES
Power Distribution Unit	Active	Avocent PM3009H	SNAA	510137027	ACTIVE
Power Distribution Unit	Spare	Avocent PM3009H	SNAA	510140753	YES
SWITCH_2	Active	WS-C2960-48TT-L	SNAA	FCQ1720Y20D	ACTIVE
SWITCH_1	Spare	WS-C2960-48TT-L	SNAA	FCQ1720Y20X	YES

Point of contact

Federal Institute for Geoscience and Natural Resources (BGR)

www.bgr.de

Mathias Hoffmann: mathias.hoffmann@bgr.de
Torsten Grasse: torsten.grasse@bgr.de

South African National Space Agency
Space Science Division

www.sansa.org.za

Jon Ward: jward@sansa.org.za
DJ van Wyk: djvanwyk@sansa.org.za

SANAE IV Overwintering Engineers (2024)

Tankiso Moso: tmoso@sansa.org.za
Heinrich Benz: hbenz@sansa.org.za

Closure

In closure an overview of the seismic spectograms and waveforms were discussed using the Sworm software package. This software will be shared with the SANSA engineers to utilize during the year for data monitoring purposes.

All matters related to the upkeep and maintenance will be through the direct contact with the BGR group.