



Maintenance Unit, Monitoring Facilities Support Section, International Monitoring System Division, CTBTO

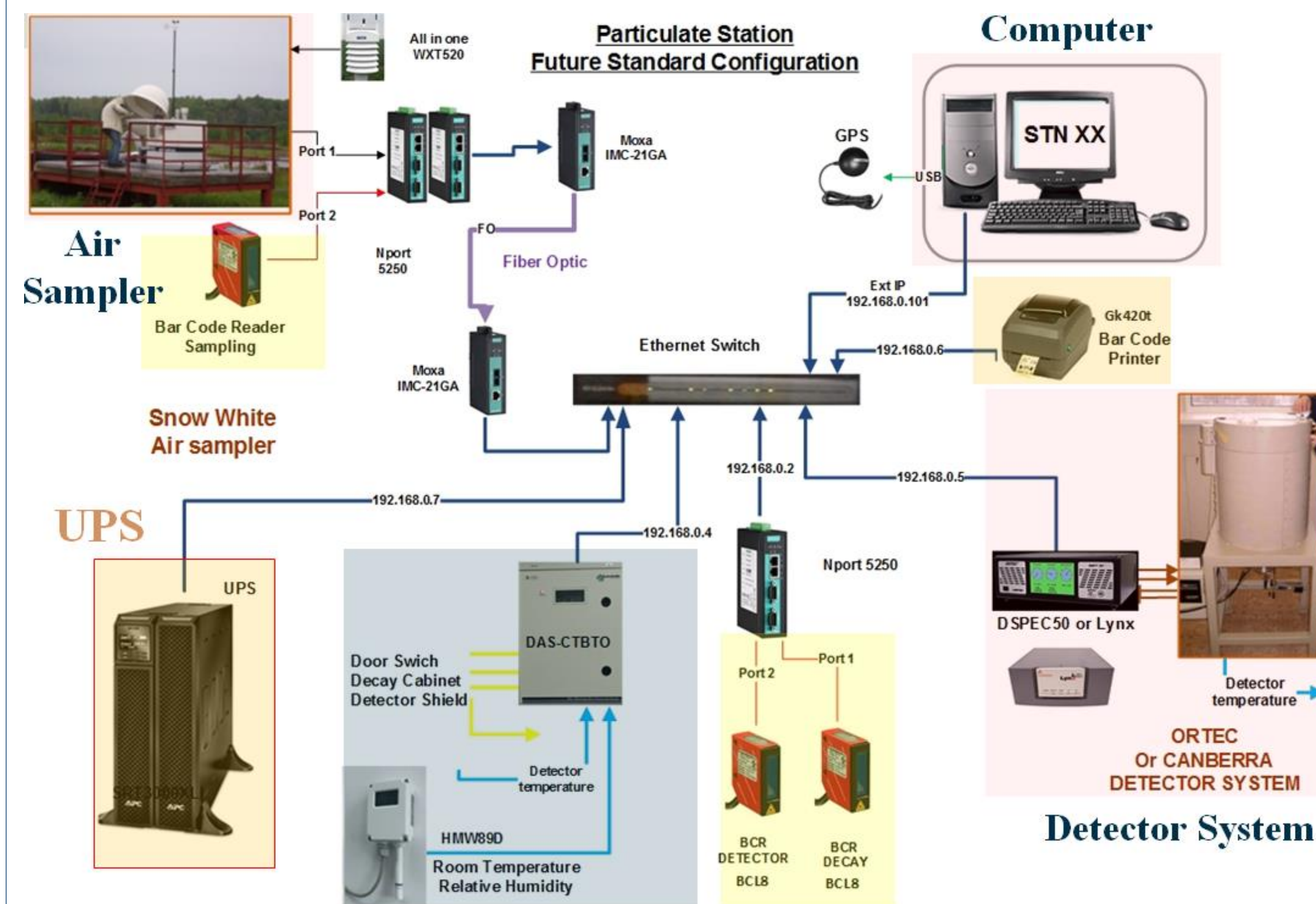
## Abstract

This poster describes key factors that led to improved Data Availability at IMS stations. Work was implemented to move away from corrective Maintenance to preventative Maintenance.

- The focus was to improve station infrastructure; power, grounding, lightning protection and climate control.
- Strengthened Station Operator technical training's by targeting stations in need, improve training content and delivery.
- A targeted sparing program was implemented at stations to provide critical spares when needed and to mitigate long lead times from shipping and procurement.
- Further optimization of the overall sustainment was achieved by equipment standardization and improved documentation.
- Gamma detectors are the key element of a RN Station, secure Shipping and handling procedures were implemented to reduce damage to sensitive instruments. For RN detectors we introduced vacuum evacuation when deemed necessary to extend detector life in the field without resorting to field replacement.

## Equipment standardization at manual particulate stations

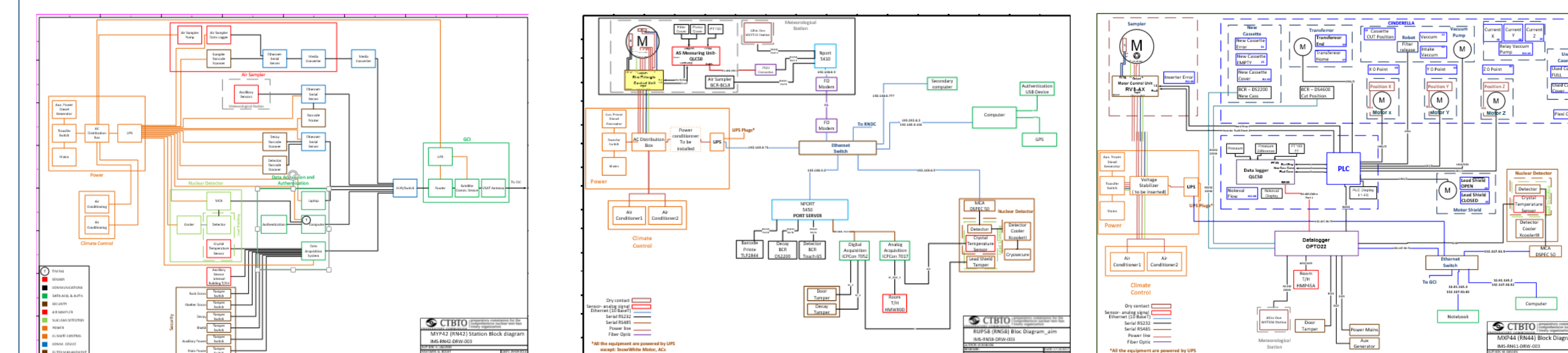
Optimization of the overall sustainment was achieved by equipment standardization and improved documentation



As a standardisation effort, the PTS has implemented an upgrade of the Data Acquisition System (DAS) for RN stations. Reliable equipment were chosen to be implemented for this standardised configuration. Stations with this configuration have improved maintainability and data availability. The new configuration has been implemented in most RN manual stations.

## Improving documentation for station support

Station specific documentation project is ongoing to provide validated, maintainable documentation (as required by IMS Operational Manuals) for stations. These documents are being made available to Station Operators and PTS staff. This project will enable PTS to implement knowledge management and to allow for better sustainment of IMS stations.



Manual particulate station: Old and new schematic

Cinderella layout

## Training: improving effectiveness

We strengthened Station Operator technical training's (TTPs) by targeting stations in need, improving training content and delivery. Former TTPs was held in Seibersdorf since 2003 and was outdated using non standard equipmen. External contractor was providing the training..



New course for Manual particulate station was designed and developed by MFS for hands on training in.

- Station Infrastructure, Power UPS, Air sampler.
- Detector System and Electronics ( ORTEC and Canberra)
- Data Acquisition System DA
- Weather Station , Temperature and Humidity probe



5 Kits especially designed and wired by MFS staff for the TTP. Covering: DAS, BCR, Serial converter and T/H Probe.. Detector temperature emulator Voltage/RTD deployed

## Improved station infrastructure; power, grounding, lightning protection and climate control.

The focus was to improve station infrastructure; power, grounding, lightning protection and climate control.

Power issues are a frequent cause of station downtime. Spikes, transients and/or poor supply regulation have resulted in damage to sensors, station electronics and infrastructure.

To prevent this, power conditioners are being installed at stations with frequent power problems.

Temperature and Humidity at the station (out of specifications) in many cases can degrade performance and damage components. Improved Air conditioners and dehumidifiers were deployed.



## HPGe detectors handling and vacuum restoration

Detectors are the key element of a station, secure shipping and handling procedures were implemented to reduce damage to sensitive instruments.

Several incidents have been recorded where detector damage occurred during shipment to or from a station. These failures led to lower data availability.

The PTS worked together with the vendor, and equipment support contractors to redesign the detector shipping cases and to ensure that the approved cases are used for shipping detectors to and from the station .



HPGe detectors can lose vacuum over time. An HPGe detector with degraded vacuum will exhibit problems with detector cooling and cause failures at radionuclide stations. For RN detectors we introduced vacuum restoration to extend detector life in the field.



## Conclusion

While sustaining the IMS, key areas have been identified where preventative maintenance is being effectively applied. These include improving power quality, lightning protection and grounding, robust detector shipping cases and critical sparing. Equipment standardization and station recapitalization play a key role in sustaining station equipment and infrastructure. **These in conjunction with effective training can contribute to long term benefits and ensure the CTBT network remains operational, reliable and credible.**

In the future, the PTS, together with relevant stakeholders, will continue to identify such areas based on historical data from the field and lessons learnt.

**A Maintenance Strategy, including an effective Maintenance Programme** needs to continuously evolve. This together with efficient inventory management, documentation and pre-certification of equipment should help sustain a reliable IMS network.



## Critical sparing program

A targeted sparing program was implemented at the stations to provide critical spares when needed and to mitigate long lead times from shipping and procurement.

A critical sparing programme was initiated for RN stations. Experience gained over the years helped to develop a list of critical parts such as digitizers, X-coolers, pre-amplifiers, HV filters and computers.

These parts are sourced in advance and kept spare and readily available at each RN station. Higher cost gamma detectors are kept at depots strategically located around the world:

