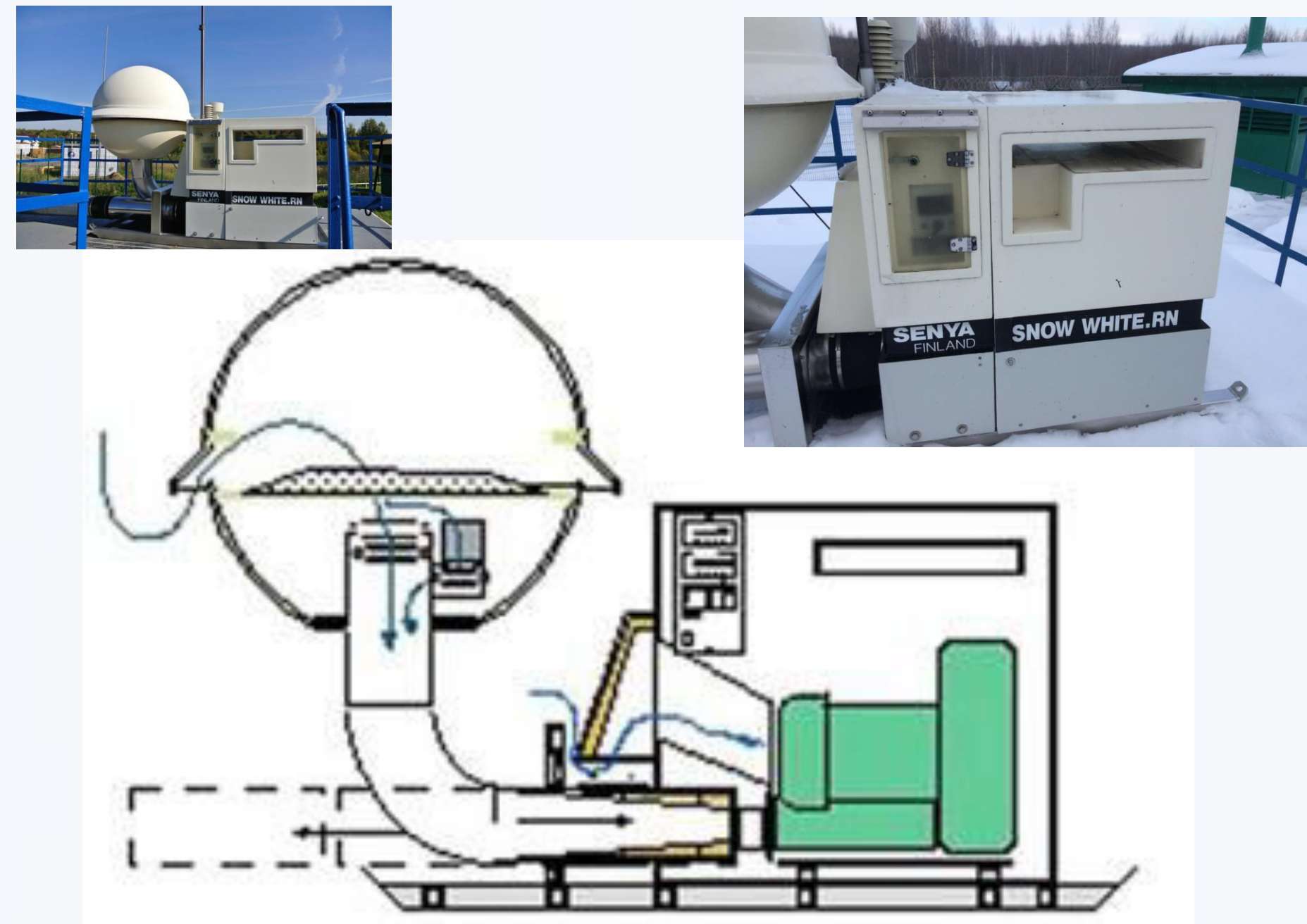


Thermal Insulation System and Automatic Heating of Air Sampler “SNOW WHITE” for IMS Radionuclide Station (for Example Station RN61 (Dubna))

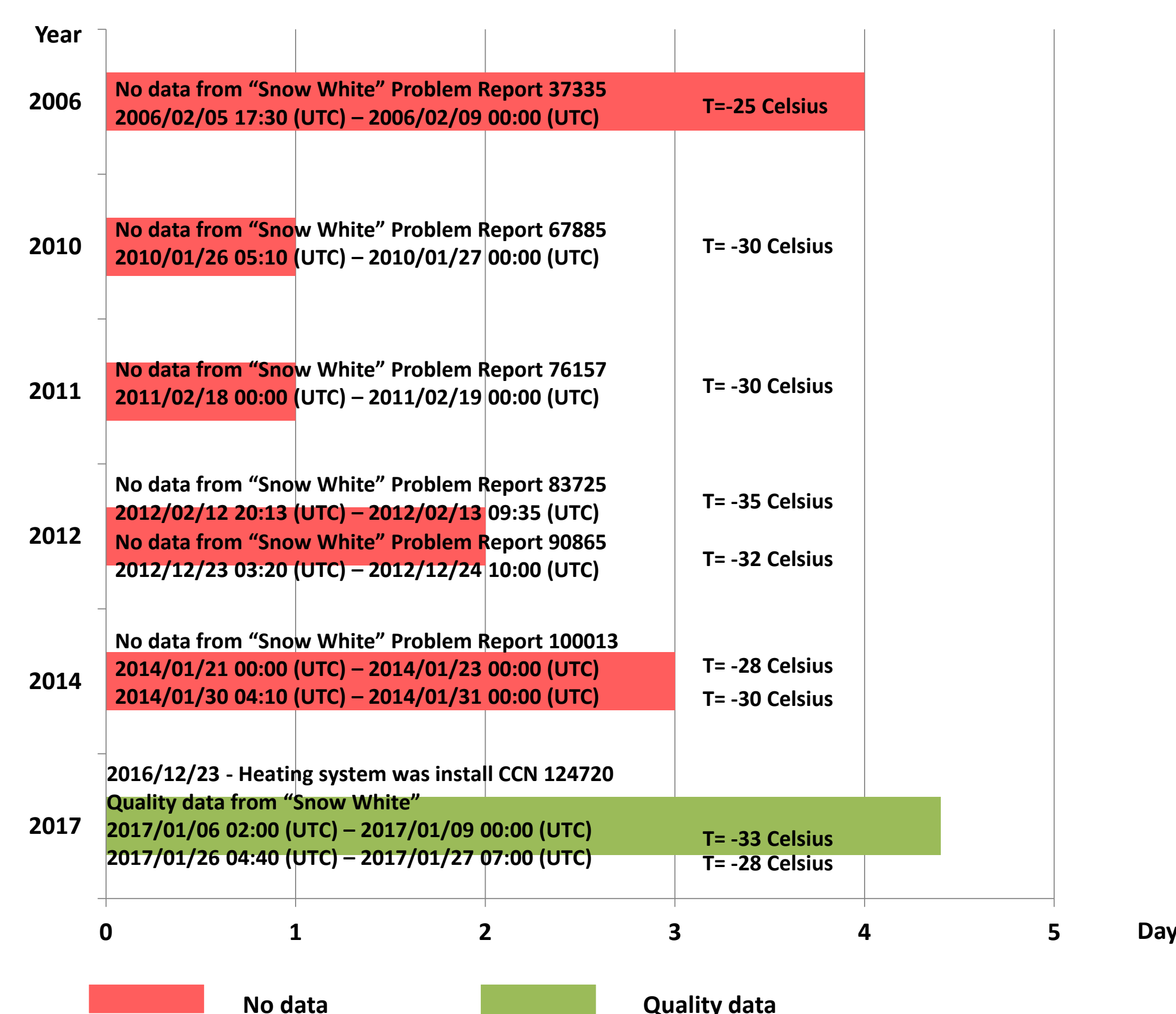
IGOR V. Rulev – Operator of radionuclide station RN61, Dubna, Russia (ivrulev@rambler.ru)



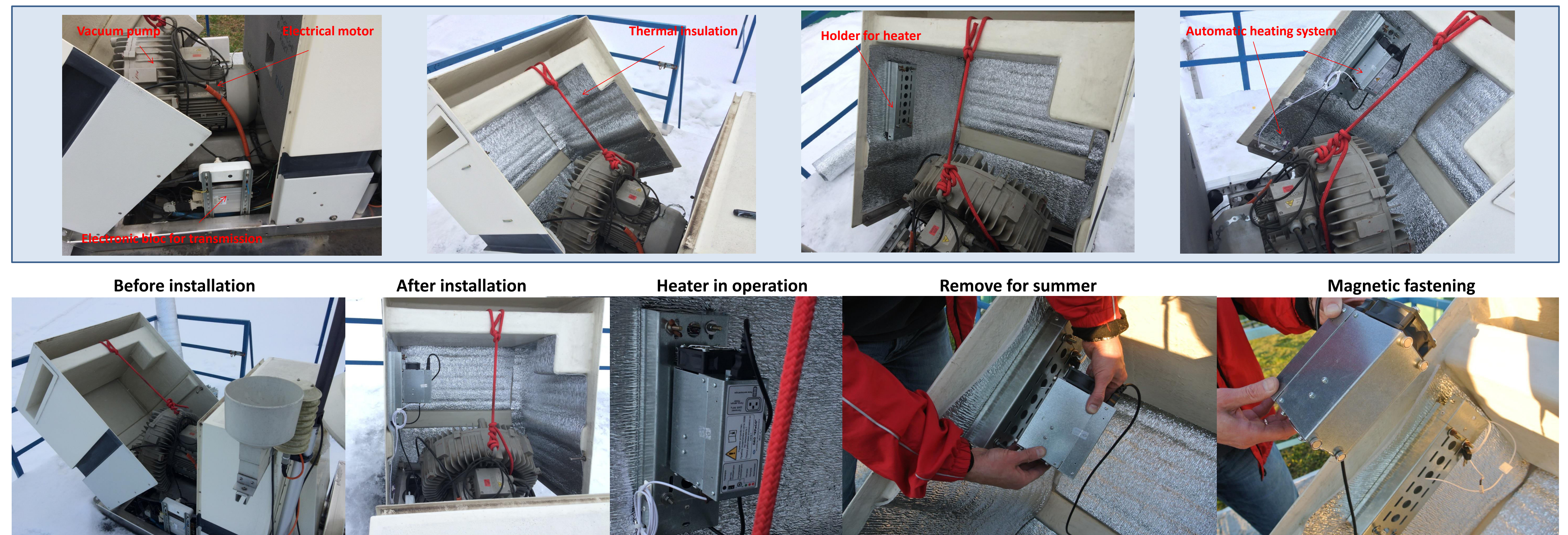
Abstract

This presentation introduces a thermal insulation and automatic heating system for air sampler «SNOW WHITE» used at IMS radionuclide stations (for example station RN61 (Dubna)). During sustained operation of IMS radionuclide stations in Russia, we have experienced problems with the air sampler «SNOW WHITE» when temperatures drop below -25 Degrees Celsius. Taking the example of RN61, when the temperatures dropped below -25 Degrees Celsius, data from «SNOW WHITE» stopped because the electronic bloc for transmission of data was frozen (for RN61 this is LANTRONIX CoBox -FI-01); - sampling stopped because bearings were destroyed and the vacuum pump and electrical motor were jammed. This is difficult situation which requires complicated repair of the air sampler at low outdoor temperatures. The system I have designed provides stability in the operation of «SNOW WHITE» for temperatures from -25 Degrees Celsius to -50 Degrees Celsius. The system was successfully tested between December 2016 and February 2017 on the radionuclide station RN61. Results of these tests are available under references PR100013 and CCN124720. The system is cheap but of good quality and ensures that «SNOW WHITE» does not stop when temperatures fall below -25 Degrees Celsius. I offer to install this system on all stations affected by these extreme temperature conditions.

Statistics of work “Snow White” with the system and without heating



Installation the thermal insulation and automatic heating system for air sampler «SNOW WHITE» used at IMS radionuclide station RN61 (Dubna)



ATM heating device

The heater fan is equipped with highly efficient heating element created using posistor ceramics. The heater fan is controlled by the built-in thermoregulator with possibility to regulate the temperature in the limits of +5...+25°C Compact dimensions of the heater fan make it possible to install it inside the narrow space of the "Snow White". The design of the heating element and using of the highly productive fan secure the high speed of the air flow, which is necessary for eliminating zones of stagnant cold air, quick smoothing of the temperature inside the closed space of the safe and powerful warmth stream for heating the devices placed near the face panel of the instrument module.

Height x Width x Length (mm)	115x62x180
The outlet speed of the air flow, m/s	5
Productivity	0.8 m³ per min
The outlet air temperature	45°C
Voltage / Power	220-250V/300 Wt
Mass	1,2 kg



Heater

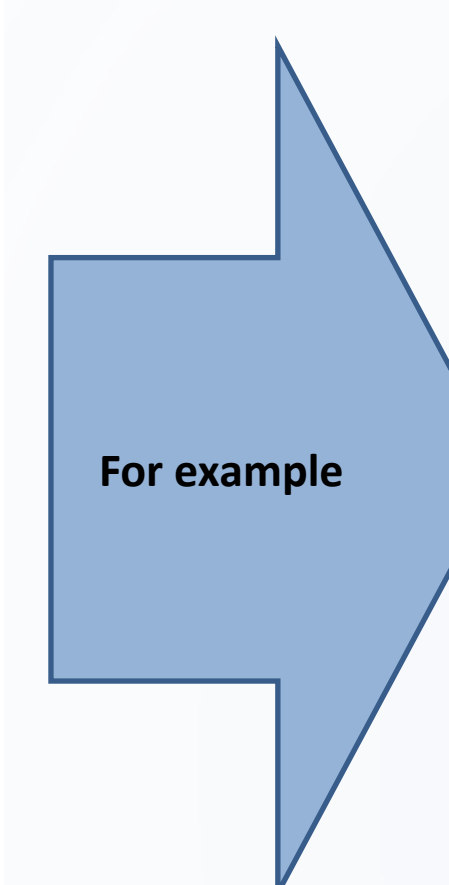


Set for system

Manufacturer
Open Joint Stock Company
"CR & SO"
Capital repairs and maintenance
www.criso.com (+7(81371) 7-64-22
Fax +7(81371) 3-90-93

Heating system test

The system was successfully tested between December 2016 and February 2017 on the radionuclide station RN61. The system does not stop when temperatures fall below -25 Degrees Celsius. Data from the device came continuously and without errors.
Conclusion: install this system on all stations affected by these extreme temperature conditions.



BEGIN IMS2.0
MSG_TYPE DATA
MSG_ID 10092438 RUP61
DATA_TYPE MET
RUP61
2017/01/08 04:50:00.0 2017/01/08 05:00:00.0 -35.3 58 0 1013.80 65 0
2017/01/08 05:00:00.0 2017/01/08 05:10:00.0 -35.5 58 0 1013.90 65 0
2017/01/08 05:10:00.0 2017/01/08 05:20:00.0 -35.7 57 0 1013.90 64 0
2017/01/08 05:20:00.0 2017/01/08 05:30:00.0 -35.7 54 0 1013.90 64 0
2017/01/08 05:30:00.0 2017/01/08 05:40:00.0 -35.4 54 0 1013.90 65 0
2017/01/08 05:40:00.0 2017/01/08 05:50:00.0 -35.2 54 0 1014.20 65 0
2017/01/08 05:50:00.0 2017/01/08 06:00:00.0 -35.7 54 0 1014.30 64 0
2017/01/08 06:00:00.0 2017/01/08 06:10:00.0 -35.6 56 0 1014.30 65 0
2017/01/08 06:10:00.0 2017/01/08 06:20:00.0 -35.8 90 0 1014.30 64 0
2017/01/08 06:20:00.0 2017/01/08 06:30:00.0 -35.4 93 0 1014.00 65 0
2017/01/08 06:30:00.0 2017/01/08 06:40:00.0 -35.1 89 0 1013.90 65 0
2017/01/08 06:40:00.0 2017/01/08 06:50:00.0 -34.8 91 0 1013.90 66 0
STOP

Outdoor temperature

For example