

Case description

Swedish ARGOS implementation

January 2007

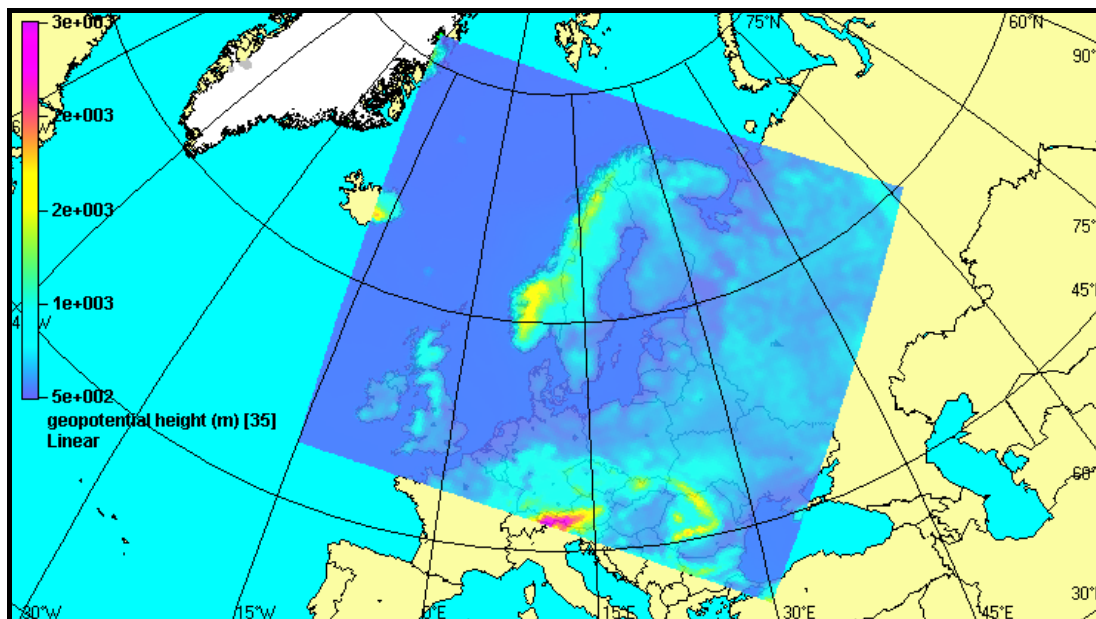
General

Following an initial test and evaluation period, the ARGOS system has been in production use within the Swedish Nuclear and Radiological Emergency Preparedness since 2005. The system is currently implemented at the Swedish Radiation Protection Authority (SSI) in Stockholm and at the Swedish Defence Research Establishment (FOI) in Umeå. A full installation at the Swedish Meteorological and Hydrological Institute (SMHI) in Norrköping is currently pending. Furthermore, there have been some manifestations of interest from the NPP operators to get access to the system.

Today, the core databases at SSI consist of two identical implementations, a primary system in Stockholm and a secondary, geographically separated from the primary, in Northern Sweden

Monitoring data

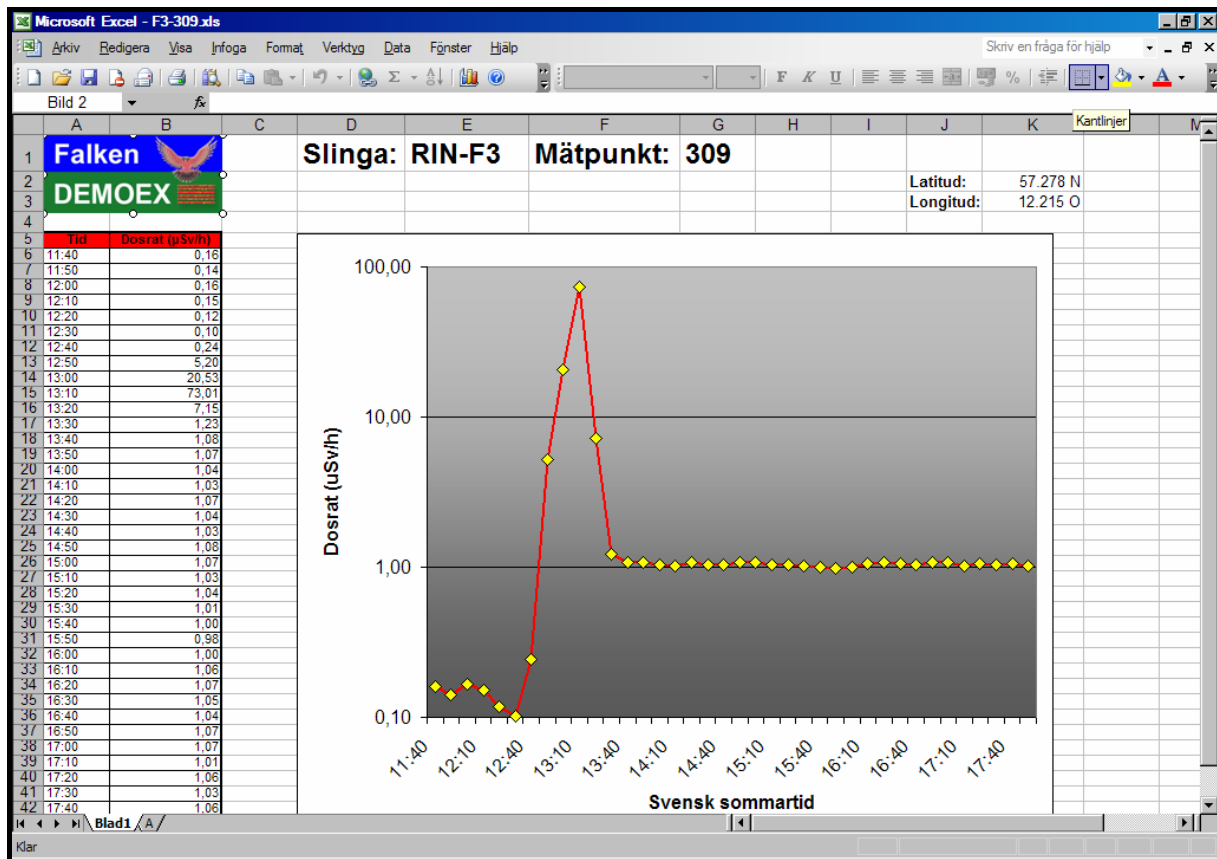
When ARGOS was first deployed in Sweden, it was primarily used to collect and visualize information from the Swedish and European gamma station network. Although the Swedish stations only deliver dose rate data, they are simultaneously uploaded into the accompanying PMS data base to enable a greater flexibility in visualisation and error reporting in a manner fully integrated into the ARGOS GUI.



The uninterrupted access to up-to-date NWP data constitutes a necessary requirement for the possibility of calculating dispersion prognoses using the built-in RIMPUFF dispersion model.

The Swedish ARGOS data bases are also provided with precipitation radar data originating within the NORDRAD network (theoretical coverage as shown). The information is updated every 15 mins, and constitutes an important data set for the assessment of the potential for wet deposition of radionuclides following a release. The observed precipitation data, normalised into precipitation rate (mm/h), can also be used as an additional constraint in *a posteriori* dispersion calculations.

During the bi-annual Swedish National Nuclear Power Plant Emergency Exercise in 2006 (Falken / Ringhals NPP), ARGOS was used to generate “observed” time series of dose rates at the pre-defined monitoring sites around Ringhals NPP using NWP data for the exercise day some 12 h before the exercise started. Using the “true” release characteristics as the source term for the RIMPUFF calculation, the resulting plume was sampled at all the monitoring sites. The individual dose rate time series were subsequently noise contaminated, background was added, and the resulting data were delivered to the measurement teams to be used as a basis for reporting.



Long Range Dispersion

SMHI in Sweden has a long history of serving the Nuclear Emergency Preparedness in Sweden. The MATCH model, implemented on an extremely powerful computer cluster in Norrköping, is delivering 6-hourly dispersion calculations based upon a standardised release scenario on a 24/7/365-basis for the NPP:s in Sweden and around the Baltic Sea. Those routine calculations are immediately downloadable from SMHI in ARGOS format and serve as a basis for initial assessment of the plume, should there be an indication of an emergency in an NPP.

If more specific information about the source term and release time is at hand, or if an NPP not covered by the routine calculations is affected, a request for calculation can be submitted through the ARGOS GUI (right). Once the request is submitted, a fully automatic process is initiated at SMHI, where a MATCH calculation is set up according to the request. The resulting prognosis will be available for download some 10 mins after the request is sent.

Nuclear Explosions

Extending the technique of remote prognoses-on-demand, a Swedish initiative in adding the possibility to trigger calculations of dispersion from nuclear explosions will be concluded in 2007. Rather than adding any built-in capacity into the code, ARGOS will be able to serve as a GUI for the triggering of nuclear calculations at processing centra in analogy with the long range dispersion technique described above.

Nuclear Explosion

Enter name of run request:

Model:

Define nuclear source

Yield: Fission Proportion: % Advanced model input

Explosion Type:

Surface Type:

Set run parameters

Time of explosion: Latitude:

End of simulation: Longitude:

Output timestep [h]:

The functionality of ARGOS, merely serving as a GUI to the remote application removes the need for introducing sensitive code elements and/or data bases into the installation.

Food and Dose Modelling

The ARGOS moduli for terrestrial food and dose modelling as well as the countermeasure routines have not yet been taken into production use in Sweden; however, a project is underway with the aim of performing the necessary regionalisation of the data bases in order for the routines to be applicable to Swedish conditions. The work will draw upon the experience gathered by other EU member states in performing the same work for the RODOS FDMT implementation.

Geographical Background Information

The vector-based geographical background information shipped with the ARGOS installation has proven not to be sufficient for domestic use. Rather than going through the lengthy – and expensive – process of getting access to, and adapt, high resolution Swedish geographical vector data, the Swedish approach has been the incorporation of raster-based maps of various scales through the GeoTIFF import facility. Swedish ARGOS clients can now run using scale-adaptive background information ranging from the scale 1:10,000 up to 1:1,000,000.

