Introduction: In 2010, the Swiss Federal Nuclear Safety Inspectorate ENSI launched the project RADUK to replace the current atmospheric dispersion calculation system ADPIC by 2015. The goal is to provide high-quality dispersion calculations on an Intel-based, high-performance computing platform. In collaboration with the developers of JRODOS and LASAT, ENSI is currently implementing a new atmospheric dispersion system for a range of up to 250 km from the site, based on the requirements of the Swiss concept for emergency preparedness in case of radiological accidents in nuclear power plants.

General requirements
- Area at least 500x500 km² around the Swiss NPPs
- Horizontal spatial resolution of NWP 2.2 km, (1 km after 2016), windfield resolution 250 m in the vicinity of release point
- Lagrange particle model
- 24 h forecast
- Modern software platform

Technical requirements
- Intel-based platform with Windows OS
- High availability (>99%)

Solution:
- IBM server X3850 X5
- 8 Intel Xeon E7-8870 processor units (10 dual-threaded processors each)
- 512 GB RAM and 4.8 TB SAS-hard disks
- OS Windows Server 2012
- Full redundancy at a 2nd location, National Emergency Operation Centre

JRODOS
- Java-based real-time online decision support system
- Client-server application
- 2 simultaneous sources with variable release rates
- Capability of a 5-fold nesting
- Includes dose calculation modules
- Fully parallelized wind field processors & graphical output

LASAT
- Generic Lagrange particle dispersion model
- Nested grids, turbulence parametrization, multiple sources
- Features OpenMP
- Complies with the German guideline VDI 3945 Part 3
- Widely used and accepted by national authorities in Germany

COSMO-2
- NWP produced by MeteoSwiss
- Boundary conditions from COSMO-7
- Mesh size 2.2 km
- 60 vertical levels
- 8 x 24 h forecast per day
- Time resolution 10 minutes!
- In 2016 → COSMO-1