

TA4 – DESCRIPTION OF NORSAR'S INFRASTRUCTURE

The NORSAR office facilities are located in the municipality of Kjeller, 25 km northeast of Oslo, and the infrastructure to which access is offered comprise databases and research facilities for research in seismology and related sciences at the NORSAR main office and data center (Figure 1). In addition NORSAR has a maintenance center at Hamar, about 100 km north of Kjeller, and an office in Bergen on the west coast of Norway. More information about NORSAR can be found on NORSAR's web pages (www.norsar.no).



Figure 1 – Photography of NORSAR's main office in Kjeller, Norway.

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The infrastructure of the NORSAR institute consists primarily of a data center and field installations, consisting of several seismic arrays and broadband 3C seismic stations, which had been constructed for the recording of seismic signals from earthquakes and underground explosions (Figure 2).

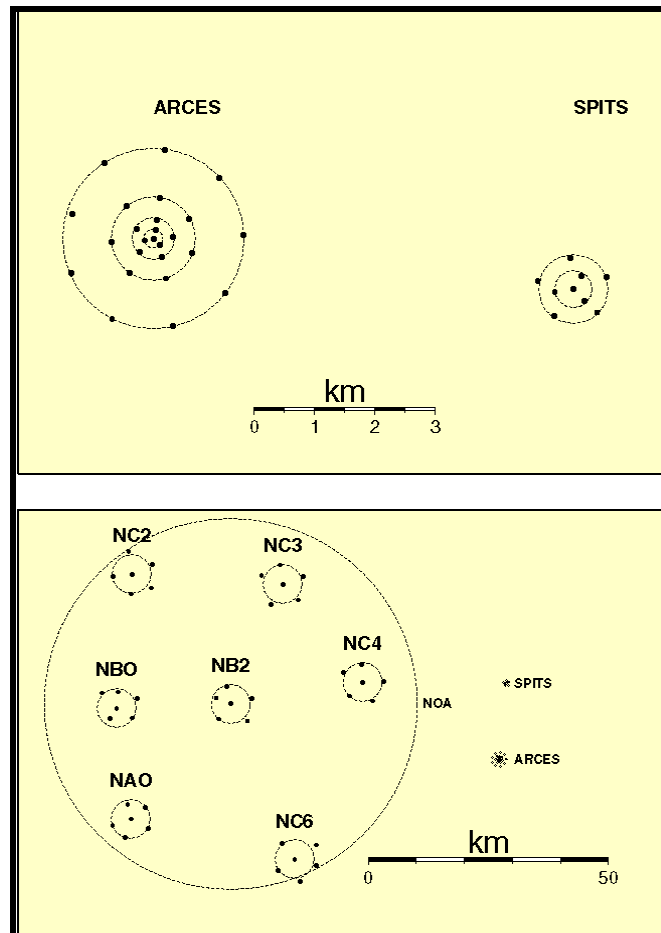


Figure 1 - Geometry and size of the three NORSAR arrays currently in operation. The NORES array has a geometry identical to that of ARCES and is co-located with site NC602 of the large NORSAR array.

NORSAR is a seismological research institute specializing in seismic arrays. Continuous real-time data are obtained from the arrays operated by NORSAR and from additional stations in neighbouring countries obtained through mutual agreements. Scientists at NORSAR have over several decades been at the forefront of international research in the design, installation, and operation of seismic arrays and in the analysis and interpretation of array data. NORSAR has been a significant contributor to the technologies currently implemented at the International Data Center (IDC) of the Provisional Technical Secretariat of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) in Vienna.

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Seismic array research at NORSAR dates from the beginning of the 1970s when signals detected by the large-aperture NORSAR array were measured to locate events at teleseismic distances. In the 1980s, NORSAR was central in the design and development of small-aperture arrays for the detection and location of lower magnitude events at local and regional distances. In the 1990s, researchers at NORSAR developed methods of associating seismic phases detected by a sparse network of several small aperture arrays to provide robust, exhaustive and fully-automatic seismic event bulletins.

Seismic hazard has been a key research and application topic at NORSAR over nearly 40 years. What first started as probabilistically and deterministically based assessment of shaking loads, later advanced into Bayesian computation procedures adapted, developed and applied to earthquake sensitive structures throughout the world.

When the HAZUS was developed in the United States in the late 1990's it was soon realized that it was technologically in the forefront, but it could not be applied outside USA. NORSAR has improved, expanded and further developed the basic technologies of HAZUS into the computer software SELENA which is now applied in many parts of the world. It is engineering based and applies the Logic Tree scheme so that damage and loss results are provided in probabilistic terms. The visualization package RISE goes along with SELENA using GoogleEarth as the GIS tool. NORSAR is today one of very few institutions where civil engineers work intimately with earth scientists towards earthquake risk reduction.

ACCESS PROVIDED

NORSAR provides access to its unique digital database of seismic recordings reaching back to April 1971. This database and the real-time data stream can be used to develop and to test all types of methods for real-time data analysis. Of special interest are detection algorithms, the automatic parameter extraction of declared detections, classification and association of single-phase observations to seismic events and finally the automatic event location. NORSAR's installations offer unique opportunities to combine the single instruments to virtual arrays, seismic networks or combinations of single sites and seismic arrays.

NORSAR also provides also acces to its group working on seismic hazard and earthquake engineering (<http://www.norsar-engineering.no/>). Within this group, we will particularly point to the ongoing research and software development within earthquake hazard and risk where NORSAR has built a unique collaborative environment comprising hazard (seismology) and risk (engineering). The SELENA software is among the most advanced risk tools presently, and free access to this software will be provided for visitors. The plan is to have one visitor per year with an earthquake risk, seismic hazard or earthquake engineering related reseach topic.

A typical TA user will be provided with all of the internal services that a NORSAR scientist normally enjoys, including an office equipped with Unix, Linux and PCs that are tied to 100 Mbps Internet lines, a variety of advanced peripheral equipment (plotters, printers, scanners, etc.), and a friendly human environment

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where there always will be somebody to answer questions, and to cooperate at all levels.

A visiting scientist to NORSAR will moreover be primarily assigned to one particular NORSAR scientist as his or her main scientific contact point, dependent on the research subject and the problems to be addressed. The degree of independence given to a user will depend on the user's needs and preferences, since this program allows for users at a variety of scientific levels in terms of qualifications and experience. The main point here is that there always will be one or more scientists within the regular NORSAR staff who will be interested in the study subject and who will allocate time for the visitor.

HOW TO APPLY FOR ACCESS GRANTS?

Applicants must be affiliated with an Institution located within the EC Member States or Associated States but not in Norway. Proposals for visits of 1 month, including a description of the proposed research (max 3 pages), the filled application form and a short CV, can be submitted at any time to NORSAR or the NERA management and will be considered every three month by the user selection panel. The first deadline for the submission of a proposal is set to 1st of March 2011.

SELECTION PROCEDURE OF VISITORS

The selection of the successful research applicants will be governed by a user selection panel consisting of the four NERA TA leaders, the NERA Project Manager and as external reviewers Prof. E. Faccioli and Prof. J. Virieux. The panel will select the users according to the following guidelines:

- 1 The research proposal should be consistent with the presented TA proposals
- 2 The research proposal should be anticipated (by the panel) to have a certain innovation potential
- 3 Judgement of the applicants' scientific qualifications as based on previous work
- 4 Opinions from personal references
- 5 Preference will be given to applicants who have not visited the TA facility before
- 6 The proposed projects should be in agreement with the overall goals of NERA
- 7 The applicant and the application must be in agreement with the rules of project eligibility of FP7

FINANCIAL ASPECTS

Each TA guest will be hosted for free in one of NORSAR's guest apartments and will receive a monthly support for 1500 € to cover the living costs in Norway and in addition, the two-way travel costs (cheapest fare, maximum 1120 €) will be covered.

REPORTING REQUIREMENTS

Before the end of the visit, all visitors

- have to write a report about their work done at NORSAR,
- have to answer the User Group questionnaire on the CORDIS web-page (http://cordis.europa.eu/fp7/capacities/questionnaire_en.html) about their visits, and
- must acknowledge in all future publications, when using results of their visits at NORSAR, the received support by the NERA Project, EC Contract Number 0262330.