

# TIMODAZ Second Training Course: Impact of THMC processes on Performance Assessment

Last Updated Wednesday, 24 February 2010

UPC, Barcelona, Spain, 13th - 15th January 2010

Online course registration is available [here](#).

## Training Course Objective and Structure

The TIMODAZ project within the EU FP6 programme is a four-year Specific Targeted Project (2006 &ndash; 2010) that investigates the thermal impact on the damaged zone (DZ) which evolves around a radioactive waste repository in clay host rocks. The DZ is defined here as the zone of the host rock with Thermo Hydro Mechanical and Chemical (THMC) modifications induced by the repository, with major changes in the transport properties of radionuclides. These transport properties are the low permeability of clays, a slow diffusive transport combined with the absence of preferential migration pathways for solutes and some sealing capacity. The priorities of the TIMODAZ project have been set on the study of the combined effect of the Excavation Disturbed Zone (EdZ) and the thermal impact on the host rocks around a radioactive waste repository and how to apply this in performance assessment. More information is given on the TIMODAZ website ([www.timodaz.eu](http://www.timodaz.eu)).

The second training course of the TIMODAZ project focuses on the impact of THMC processes on deep clay geological formations (soils and rocks) on performance assessment for heat-emitting high level radioactive wastes. The course lasts in total two days. There will be lectures given by tutors from the Swiss Federal Nuclear Safety Inspectorate ENSI (the regulatory authority in Switzerland) and the Belgian Agency for Radioactive Waste and Enriched Fissile Materials ONDRAF/NIRAS (the agency concerned with radioactive waste and its management in Belgium) providing the regulatory framework. Furthermore, the current results of the laboratory experiments (including a lab visit), in-situ tests and modelling conducted during the TIMODAZ project are presented by tutors from Ecole Polytechnique Fédéral de Lausanne (EPFL), the Swiss National Cooperative for the Disposal of Radioactive Waste (Nagra) and Universitat Politècnica de Catalunya (UPC) in Barcelona. A group exercise will be carried out to identify TIMODAZ results that can be used in the context of a safety case. Finally, a worked example of a waste management agency will be presented by Nagra

## Course Location

The training course will take place in the 'Departamento de Ingeniería del Terreno, Edifici (building) D2 of the Campus Nord of the Universitat Politècnica de Catalunya (UPC)' in Barcelona, Spain, Room 212, 2nd floor (see [www.upc.es](http://www.upc.es) and for a map).

Location of Building D2 - [click here](#) for full size PDF of the above map 543 Kb

The Department is easily accessible by public transport. The nearest Metro stations are "Zona Universitaria" and "Palau Reial" on Line 3 (green). They are also shown on the map.

Who should attend ?

Young professionals as well as scientists working for universities, implementers and regulators entering the research areas of TIMODAZ with a geomechanics or performance assessment background. Scientists and students from outside the project are most welcome.

## Course Programme

Wednesday, 13th January 2010

Morning

Travel / Arrival

1215 &ndash; 1345

LUNCH

1345 &ndash; 1415

Orientation

Participants introduce themselves

P. Blaser, ITC,

A. Gens, UPC / CIMNE, All

1415 &ndash; 1545

General context &ndash; Radioactive wastes &ndash; Geological disposal &ndash; Regulatory framework for the safety case

F. Altorfer, ENSI

1545 &ndash; 1615

Short introduction to group exercise of day 2 & announce constitution of working groups

All tutors

1615 &ndash; 1630

COFFEE

1630 &ndash; 1800

What is (in a) safety case?

M. Capouet, ONDRAF / NIRAS

2000 &ndash; &hellip;

COURSE DINNER in Barcelona

Thursday, 14th January 2010

0845 &ndash; 0945

Lab test results from TIMODAZ project

S. Salager, EPFL

0945 &ndash; 1045

Lab visit of UPC/CIMNE laboratories

E. Romero, UPC / CIMNE

1045 &ndash; 1100

COFFEE

1100 &ndash; 1200

In situ test results from TIMODAZ project

T. Vietor, Nagra

1200 &ndash; 1300

Modelling results from TIMODAZ project

B. Garitte, UPC/CIMNE

1300 &ndash; 1430

LUNCH

1430 &ndash; 1630

Group exercise:

Two reference designs for radioactive waste repositories in deep geological clay formations (OPA/Bentonite & BC/Concrete) are provided and briefly explained (how the systems are supposed to fulfil their safety functions)

Participants with a PA and geomechanics background will work together to:

1. identify TIMODAZ results (from morning presentations) that can be used in the context of a safety case and propose how to treat these:

- concepts (anisotropy, thermo-plasticity,...)
- supporting pheno evidence (self-sealing, upscaling,...)
- predictive capability of models
- ...

2. build a storyboard of the expected evolution of the disturbed zone up to (at least) the end of the thermal period

All tutors and participants

1630 &ndash; 1645

COFFEE

1645 &ndash; 1800

Group exercise continued

All tutors and participants

Friday, 15th January 2010

0845 &ndash; 1015

Presentations of exercise results by trainee groups

Presenters from Groups

Tutors

1015 &ndash; 1030

COFFEE

1030 &ndash; 1145

How a waste management agency (implementer) does it

P. Marschall, Nagra

1145 &ndash; 1215

Summary & Feedback Discussion

How participants plan to use what they have learned and maintain contacts and build upon the course

All

1215

End of course

All

1215 &ndash; 1345

LUNCH

## Course Registration

Online course registration is available here.

Please note that the number of participants of this course is limited to 25.

### Course Fee

(inclusive of 3 lunches with non-alcoholic beverages and coffee breaks): 100.- Euro / person

Option of a Course Dinner (including beverages & wine) is available for : 60.- Euro extra / person

Accommodation, Arrival and Departure

You should plan on arriving on Wednesday morning before lunch time (lunch can be organised). The course will finish on Friday, 15th January at 12:15 h with the possibility to have lunch in order to allow you to get home the same day.

Information on the airport is provided by the official website:

[Barcelona Airport Website](#)

Information about the city is available at the following website:

<http://www.bcn.es/turisme/english/turisme/welcome.htm>

Metro-bus information is provided by the Barcelona metropolitan public transportation website:

[http://www.tmb.net/en\\_US/home.jsp](http://www.tmb.net/en_US/home.jsp)

Although the meeting place is easily accessible by public transport from the centre of town, there are some hotels within walking distance (20 &ndash; 25 minutes) to the course venue. The organisation of the course does not arrange accommodation. Following are a few suggested hotels:

Hotel Husa Arenas (\*\*\*\*)

Capitan Arenas, 20, 08034 Barcelona. Tel. +34.93.280.03.03 &ndash; Fax. +34.93.280.33.92

<http://www.hotelhusaarenas.com/en/>

Hotel Bonanova Park (\*\*)

Capitá Arenas, 51, 0834 Barcelona. Tel. + 34 93 204 09 00 &ndash; Fax. + 34 93 204 50 14

<http://www.hotelbonanovapark.com/>

Hotel Pedralbes (\*\*\*)

<http://www.itc-school.org>

Fontcuberta, 4, 08034 Barcelona. Tel. +34.93.203.71.12 &ndash; Fax. +34.93.205.70.65

<http://www.hotelhusapedralbes.com/en/>

Information on other Barcelona hotels is available at <http://www.barcelonahotels.es/> and in the usual booking websites.  
Early booking is advisable.

Contact

If you need any assistance please contact:

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