

EAAE-ESC Task Group 3

ENSeRVES

European Network on Seismic Risk, Vulnerability and Earthquake Scenarios

A major problem to promote the activities of the Task and Working Groups of the European Association for Earthquake Engineering is funding their activities. Everybody agrees about the need of exchanging information among the scientific communities of the various European states and this is the reason why EAAE enforced many TG's and WG's during the last years. The main scope of TG's and WG's is to find common viewpoints, harmonize procedures, improve data bases, establish states of the art and so on. Although no specific research activity is envisaged, however travels and exchanges require funds that the Association cannot provide. The past experience of WG's was not satisfactory. Few or no meetings were organized during the four year periods between the conferences, and the few exchanges occurred mainly by mail. The final report were essentially obtained thanks to few cooperating researchers. This scheme required a lot of work by the coordinator with few advantages for the scientific and professional community.

For the above reasons, it appeared indispensable to the members of TG3 to look for funds necessary to make 1 or 2 meetings per year, involving as many people as possible, in order to coordinate the research activities of the institutes working on earthquake engineering and seismological problems especially related to seismic risk. Professor M. Dolce, the coordinator of TG3 of EAAE and Dr. Schenk as the Executive Committee member of EAAE representing ESC, took the initiative of making a proposal to the European Commission within the INCO-COPERNICUS program. This program is particularly well suited since it implies financing of European Union as well as Central Europe countries in joint research actions. Moreover within the same program it is possible to finance not only original research, which is not actually the scope of TG's, but also "concerted actions", that are aimed to promoting exchanges, harmonizing research activities funded elsewhere. In this initiative Professor Dolce was encouraged by the President and the Secretary General of EAAE.

The proposal is named ENSeRVES and involves 11 prominent Institutions working on Earthquake Engineering and Engineering Seismology from 10 EU and CCE countries. The proposal got an overall "very good" rate by the European Commission and will be funded with 230000 ECU by the end of 1996. The duration of the project will be 3 years, probably starting at the beginning of 1997 and finishing at the start of 2000. There will be the possibility of organizing 2 general meetings per year, involving 20-30 people each meeting. In the following paragraphs, the summary of the proposal and some other information drawn from the proposal are presented to give a general idea about the activities that shall be performed.

SUMMARY DESCRIPTION OF ENSeRVES

The awful impact on public health from major earthquakes has been emphasized by some recent earthquakes that occurred in highly populated and technologically advanced areas (Northridge, USA 1994, Kobe, Japan 1995). The mitigation of effects is the primary objective of the research activities in the seismological and engineering fields concerning seismic problems. The components that contribute in the

determination of the seismic risk of a given site are essentially the Seismic Hazard, i.e. the probability of occurrence of earthquakes, the Vulnerability of Constructions, i.e. the damageability of a constructions when struck by earthquakes, the Exposure, in terms of human lives, goods, social and economical activities. The goal of risk mitigation can be achieved only if research results on a wide range of topics and disciplines (Seismology, Geology, Urban Planning, Structural and Geotechnical Engineering, Transport Engineering, Social and Economical Sciences, etc.) are combined together. However it often happens that each specialist works on his/her problems with few or no exchanges with the other specialists. Another aspect which increases the difficulties in finding a common solution for a seismic mitigation program, is that each country has its own peculiarities for the numerous aspects involved by seismic problems, such as: characteristics of constructions, seismological features of territories, socio-economical conditions, etc.

A big effort of harmonisation has been made by the EU to implement the Eurocode N.8, to improve the safety of new and existing constructions in seismic areas. This effort has been looked at with great interest by Central Europe Countries. Most of them are harmonising their seismic codes with the Eurocode 8 principles and rules. However some difficulties arise due to the different seismological, socio-economic conditions, types of structures, etc.

The objective of this proposal is the creation of a Network of teams of scientists working on seismic risk with different competences (Engineers, Seismologists, Geologists, Architects, etc.) from the Eastern and Western Europe, to encourage the interactions between various disciplines, to exchange information, data bases and technologies, to disseminate the results. The network will comprise 11 partners selected among the most representative institutes in the field of Earthquake Engineering and Seismology from EU and CCE countries. In particular there are 6 Institutes from the most seismic areas and the most active in seismic studies from CCE (Bulgaria, Romania, Albania, Czech Republic, Slovak Republic, Hungaria) and 5 Institutes from the most seismic areas and the most active in seismic studies from EU (Italy, Greece, United Kingdom, France). Due to this composite partnership, an optimal exchange of data and technologies can be envisaged during the activities of this network.

The Network is basically referred to the activities of the EAEE Task Group 3 (TG3: Seismic Risk, Vulnerability and Earthquake Scenarios) of the European Association for Earthquake Engineering (EAEE). The aim of TG3 is mainly to coordinate the activities in the different countries and the different disciplines, in order to harmonize and better finalize the research activities in Europe. TG3 has started in 1994 and will last at least four years, up to the 11th European Conference on Earthquake Engineering (appr. September 1998). The continuation of TG3 is however foreseen for the subsequent four years, conditioned upon the success of its activities. Since no funds are available from EAEE and the aims of the TG3 are perfectly consistent with a network to be funded as a concerted action of the INCO-COPERNICUS program, this application is being proposed. In particular funds are requested to cover expenses of meetings, workshops, distribution of information, exchanges and visits, preparation and distribution of guidelines, preparation and distribution of data bases. Since the main aim of this network is to bring together different scientists from different countries to find a common language and harmonize their research activities towards the common objective of seismic risk mitigation, some deliverables related to such activities are expected, such as reports on workshops, including description of the various research activities and of the efforts of harmonization. Moreover the common experience will be collected into guidelines with recommended procedure for seismic risk and earthquake scenario evaluations.

Technical Description

The research activities that will be carried out in the various Institutes involved in the proposed network,

cover all the problems to be dealt with when performing seismic risk studies. The coordination of this activities will be made by:

- **a. comparing the approaches** used in the different Institutes to treat the same problems;
- **b. transferring methodologies** from one Institute to another Institute;
- **c. comparing the results** obtained on different case studies with the same methodology;
- **d. comparing the results** obtained on the same case studies with different methodologies;
- **e. comparing the databases** available in different countries;
- **f. integrating the results** at the various steps of a risk assessment procedure;
- **g. evaluating the feasibility of a common database** (data types and formats must harmonised);
- **h. evaluating the compatibility and the exploitation of the results with respect to Eurocode n. 8**;
- **j. drafting guidelines** with state of art and recommended procedures for seismic risk assessment and earthquake scenario preparation.

These activities will be carried out during joint general meeting, joint research subgroups, exchanges, etc.

The above activities will be scheduled according to the following bar-chart diagram.

	3rd	6th	9th	12th	15th	18th	21st	24th	27th	30th	33rd	36th
activity	month	month	month	month	month	month	month	month	month	month	month	month
a	+	+	+	+								
b			+	+	+	+						
c			+	+	+	+	+	+				
d					+	+	+	+	+	+		
e			+	+	+	+	+	+				
f					+	+	+	+	+	+		
g			+	+	+	+	+	+	+	+	+	
h					+	+	+	+	+	+	+	+
i					+	+	+	+	+	+	+	+

Organisation and Management

Overall management and coordination of the project will be the responsibility of Professor Dolce, who is the coordinator of EAEE - TG3 and Dr. Schenk who will cooperate in assuring links among seismologists and engineers.

Professor Dolce has wide experience of research activities, both as a researcher and as a research manager in the specific field of Earthquake Engineering. Besides being at present the Director of the Department of Structure, Soil Mechanics and Geology (DiSGG) of the University of Basilicata, he has been convenor of EAEE-WG3 since 1990 and Scientific coordinator of a research line of the CNR-GNDT (National Group for the defense against earthquakes) since 1989, dealing with problems of seismic vulnerability and risk analyses. He has been serving as a permanent consultant of the Italian National Seismic Agency (SSN) since 1991 and as an external consultant of some state company (FS, AUTOSTRADE) for problems concerning seismic protection of structures. He can therefore guarantee a high level expertise in seismic

risk problems and managing capacity for the project activities.

The teams participating at the network are listed below:

1 - University of Basilicata, Dipartimento di Strutture, Geotecnica, Geologia applicata all'ingegneria (USB-DiSGG), Potenza, Italy - Scientific coordinator: Professor M.Dolce (Coordinator of TG3)

2 - Academy of Sciences of the Czech Republic, Institute of Rock Structure and Mechanics (IRSM), Praha, Czech Republic (CZ) - Scientific coordinator: RNDr. V. Schenk

3 - Building Research Institute - INCERC, Earthquake Engineering Division, Bucharest, Romania (RO) - Scientific coordinator: Dr. H.Sandi (EAEE member)

4 - University of East Anglia - School of Environmental Science, United Kingdom (GB) - Scientific coordinator: Professor P.Burton

5 - National and Kapodistrian University of Athens, Department of Geophysics (NKUA.DGG), Greece (GR) - Scientific coordinator: Prof. Makropoulos

6 - Laboratoire de Geophysique Interne et Tectonophysique, Observatoire de Grenoble, I.R.I.G.M., France (FR) - Scientific coordinator: Dr. P.Y. Bard

7 - Dept. of Civil Engineering, Engineering Seismology and Earthquake Engineering Section (ESEE), Imperial College, United Kingdom(GB) - Scientific coordinator: Dr. A.Kappos

8 - Slovak Academy of Science, Geophysical Institute, Slovakia (SK) - Scientific coordinator: Dr. P. Labák

9 - Bulgarian Academy of Science, Central Laboratory for Seismic Mechanics and Earthquake Engineering, Bulgaria (BG) - Scientific coordinator: Dr. E.Vasseva

10 - Seismological Institute Tirana, Albania (AL) - Scientific coordinator: Dr. B. Muço

11 - Seismological Observatory - Budapest (HU) - Scientific coordinator: Dr. G. Szeidowitz

Joint meetings, specialty meetings and workshops will be the basic coordination activities of the network. They are finalised at comparing experiences, harmonising procedures, exchanging data, organising subgroup cooperations. They shall be organized by the proposers, in their Institute or during or after the conferences relevant to the topics dealt with by the network partners. These meetings shall be normally restricted to a participation of 20 to 25 people, so that a large room to discussion can be left. Experts external to the network, that can give valuable contribution to the improvement of knowledge on new technologies, are envisaged to be invited and travel expenses will be covered with the funds of the network. Especially European researchers involved in the EAEE TG3, who could not enter into the network because of their nationality (e.g. Turkey and Switzerland) or of the need to keep reasonable the total number of partners, will be invited, so that the discussion on the experiences in European countries will be as broad as possible.

The joint meeting will be organized in such a way that a half or one day of the meeting will be opened to local scientists and professionals, and devoted to the general description of the

experiences and advancements carried out in the various Institutes between two successive meetings. In this way the scientific aspects will be explained to possible users in the various countries. The second part of the joint meetings will be restricted

to the network partners and the invited TG3 members. It will be devoted to specific organization and coordination problems and to the development of the specific deliverables (guidelines, data bank) that are among the aims of the network. Intermediate meeting among subgroups as well as specific exchanges and common activities will be decided during this second operative part of the joint meetings.

The activities carried out at each joint meeting will be described in summary reports which will be published in the Bulletin of the European Association for Earthquake Engineering. Two extensive reports will be prepared, in which the network activities and the results obtained will be presented. The first report will be published in the proceedings of the 11th European Conference on Earthquake Engineering. The final report will contain the results obtained within the network and recommendations for seismic risk assessment procedures.

Prof. Mauro DOLCE