



## SPECIAL THEME SESSION

### "SEISMIC HAZARD IN THE IBERO-AMERICAN COUNTRIES. CODE HARMONIZATION"

**Chairman:** Rafael Blázquez, Asociación Iberoamericana de Ingeniería Sísmica

**Co-Chairman:** David Murià-Vila, Instituto de Ingeniería, Universidad Nacional Autónoma de México

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Session language: Spanish

### SUMMARY

In this session the state of the art of the codes and data sources for seismic hazard analysis of each one of the countries of the Ibero-American Association of Seismic Engineering (AIBIS for its spanish initials), will be reviewed. With the aim at determining the compatibility among the seismic hazard regulations of different countries, a comparative analysis of their fundamentals and evaluation methods will be carried out.

In the first part of the session, an overview of the troubles about computation of hazard and the harmonization process of the regulations for the Ibero-American environment will be presented.

After the later, experiences on several work lines, going from geophysical and seismological studies, to formats and acceptable risk levels in participant countries will be presented and discussed.

Conclusions of Commission of Experts about suitable criteria to develop changes in the harmonization trends, will be presented. So, troubles in the elaboration of a multinational seismic hazard map, able to contain all the risk scenarios of the different countries will be detected.

In this way the experiences obtained from the comparison of spanish and portuguese national regulations, and the Eurocode 8 - to be set in the future in the European Union - can be very useful and clarify the work in this point.

### EXPERTS COMMISSION:

Luis Esteva (Mexico)  
José Grases (Venezuela)  
Antonio Martín (Spain)  
Rodolfo Saragoni (Chile)

## **PROGRAM**

### Morning (9:30-11:30)

#### **PART I.- Invited conferences**

Chairman: Rafael Blázquez

Co-Chairman: David Murià-Vila

- Opening of the session (Rafael Blázquez/David Murià-Vila) (9:30)
- Overview of the current harmonization of the European Seismic Regulations. The Eurocode 8. (Rafael Blázquez) (9:40)
- Troublesome in the development of regional and continental hazard maps in Ibero-America. Previous experiences. (Juan Carlos Castano) (10:00)
- Presentation of the AIBIS Guide to evaluate the hazard. Elaboration criteria. (José Grases) (10:20)  
→ ANNEX I

Break (10:35-10:45)

#### **PART II.- Experts Commission of AIBIS**

Chairman: José Grases

Co-Chairman: Carlos Oliveira

- Experiences in Ibero-American seismic hazard (10:45-11:30)

Antonio Martín (Spain)

Carlos Oliveira (Portugal)

Mario Ordaz (Mexico)

### Afternoon (14:30-17:00)

- Experiences in Ibero-American seismic hazard (14:30-15:45)

Rodolfo Saragoni (Chile)

Juan Bariola (Perú)

Franz Sauter (Costa Rica)

Héctor O'Reilly (Dominican Republic)

Luis Enrique García (Colombia)

Break (15:45-15:55)

## **PART III**

**Chairman:** Carlos Genatios

**Co-Chairman:** David Murià-Vila (15:55-17:00)

- Open discussion of the presented lectures  
(Moderator: Carlos Oliveira)
- Presentation of the previous conclusions of the Experts Commission, and establishment of the AIBIS Working Group about seismic hazard.  
(José Grases)
- Presentation of AIBIS → ANNEX II (Rafael Blázquez/Carlos Genatios)

## **ANNEX I**

### **Proposal of AIBIS Technical Guide for Seismic Hazard Evaluation**

Author(s): .....

Country or region described: .....

\* Brief historical note on local hazard evaluation and incorporation into seismic codes

- Previous maps.
- Previous codes.
- Actual situation.

\* Available information on active tectonics. Data quality (reliability)

- Geometry of seismogenic zones
- Type of tectonic processes.
- Source displacements. Inference methods.
- Correlations used for seismic moment and stress drop.
- Method used for seismicity evaluation.
- Creep evidences.

\* Characterization of the seismicity. Quality and extension of the information

- Method used to account for non-recorded earthquakes. Range of error.
- Homogeneization of the seismic catalog. Criteria followed with respect to magnitudes, focal depths, etc.
- Criteria used for determination of seismic zones and seismic sources. Selection of completeness gaps.
- Regional values of b in Guttenberg's law.
- Regional values of a in Guttenberg's law in terms of annual number of events per  $10^5$  km<sup>2</sup>.

\* Seismotectonic model

- Uncertain variables. Probability distributions. Variances.
- Attenuation laws. Variances. Soil conditions.

\* Computational algorithm

\* Criteria used in the definition of seismic actions

- Vibratory effects (for response spectra or accelerograms).
- Maximum fault displacements (bridges, pipelines).
- Tsunami wave heights.

\* Criteria adopted for hazard mapping

- Zonation and microzonation for engineering purposes (scales).
- Lifeline studies.
- Loss of human lives and material resources.

\* Definition of design response spectra

- Shape of normalized spectral curves, Governing parameters: soil type, distance and damping.
- Reduction factors for inelastic response.

\* Criticism and further suggestions

## ANNEX II

### SCOPE AND AIMS OF AIBIS (Asociación Iberoamericana de Ingeniería Sísmica)

The Ibero-American Association for Earthquake Engineering (AIBIS) has been founded in Mérida, Venezuela on July 7th, 1993, along the lines established in the Memorandum of Understanding signed on July 24th 1992 during the Tenth World Conference on Earthquake Engineering Madrid, Spain (see Vol. 11, page 6358 of the Proceedings of the X WCEE). AIBIS is the result of a group that includes several professionals and reserchers of this part of the world. It has been created with a main objective of promoting the cooperation within scientific and technical institutions and individuals working on seismic engineering, through the exchange of knowledge and techniques for the adequate consideration of seismic phenomena and the reduction of seismic effects in the iberoamerican region.

This association is integrated by national seismic engineering associations together with institutions related to the seismic problems (such as research institutes, housing and construction institutes and chambers, etc). Individual members are also included. Its structure includes a General Assembly of Delegates an Executive Commitee.

Four meetings have already taken place: the first was in Mérida, Venezuela in 1993, on the occasion of the VIII Latin American Seminar on Earthquake Engineering (constitution meeting); the second was in Vienna, Austria, in August 1994, during the X European Conference of Earthquake Engineering. The third meeting was in San José de Costa Rica, in September 1994, during the 9th International Seminar on Earthquake Prognostics, and the fourth took place in Caracas, July 1995. These reunions have allowed the preparation of the statutes and legal requirements, the exchange of ideas and certain diffusion activities. A Regional Seminar will be held in Dominican Republic by the end of 1996, and the first Iberoamerican Congress on Earthquake Engineering will take place in Chile, in 1997.

The acting Executive Committee of AIBIS is composed by: Vitelmo Bertero, Honorary President; Rafael Blázquez (Spain), President; Rodolfo Saragoni (Chile), Executive Vice-president; Ottón Lara (Ecuador), Vice-president; Carlos Genatios (Venezuela), Executive Secretary and eight members: José Grases, Rafael Riddell, William Lobo Quintero, Franz Sauter, Oscar López, Omar Cardona, Héctor Gallegos and Iria de Uzcátequi.

AIBIS plans the publication of the Spanish and/or Portuguese version of the papers to be presented at the XI WCEE by scientists of the iberoamerican countries. In order to achieve this goal, we ask the concerning participants to hand their "camera ready" versions, following the same format of the conference, to the AIBIS delegation during the conference or to the Executive Secretary:

Secretaría Ejecutiva AIBIS

Att. Prof. Carlos Genatios

Tel. y Fax: (58-2)-6053136/6053134

IMME- Universidad Central de Venezuela

Apartado 50361

Caracas 1050A - Venezuela

Firmado en Mérida, Venezuela, el día siete de Julio de 1993

The image shows several handwritten signatures and names of participants from various countries. The names and countries are as follows:

- OTTON LARA** (ECUADOR)
- Rafael Blazquez** (ESPAÑA)
- Carlos GENATIOS** (Venezuela)
- WILHELMO BERTERO** (Argentina USA)
- FRANCISCA SAUTEC** (COSTA RICA)
- Hector GALLEGOS** (PERU)
- William Roberto Quintero** (CHILE)
- Rodolfo Saragoni** (CHILE)
- Omar D. Cardona** (Colombia)
- Rafael Ribbeck** (CHILE)
- Francisco Garcia** (MEXICO)
- José A. López** (Venezuela)
- Francisco** (MEXICO)

The original signatures from the Minutes of the Foundation of AIBIS