

EARTHQUAKE HAZARD ASSESSMENTS FOR BUILDING CODES

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SECTION 0: PREFACE

This report comprises two semi-annual reports that cover the period November 2002-November 2003. The ongoing hostility in the area did not enable much progress and therefore we had nothing to report for the period Nov. 2003-April 2003. However, despite political difficulties and due to the well-recognized importance of our work, and owing to the political umbrella of the RELEMR initiative which enabled meetings of the participants, we managed to make useful progress which is reported in the following.

During 2003 the US-AID-MERC initiated an evaluation of the project by Prof. S. Aggour and Dr. M. Metz. The evaluation report provides a reliable picture of the status of the project and its performed activities.

This report is a short summary of the activities mainly during 2003. The detailed information, elaborated reports, lists of publications and products are presented in the projects home-page on the internet in:

WWW.RELEMR-MERC.ORG

SECTION I: TECHNICAL PROGRESS

A) Research objectives

The overall aim and specific objective of the project is to produce maps and charts that will provide the necessary seismological data for the implementation of building codes and regulations in Jordan, Israel and the Palestinian National Authority (PNA). We met this objective to the level of preparing a regional seismic hazard map (last updated in Sept. 2002). In recent months we also performed engineering surveys in the west bank and conducted workshops for the Palestinian engineering community

B) Research accomplishments

During the period covered by this report, the main progress was made on two subjects:

1. Determination and zoning of site specific acceleration spectra across Israel (performed by GII teams).
2. Formulating the engineering requirements for building codes in the Palestinian territories (Performed by ESSE, the Royal Engineering Society of Jordan and private engineers).
3. So far, no strong enough earthquake has occurred to trigger the accelerometers deployed by the project.

[Results and details are presented on the project's web site]

C) Scientific impact of cooperation.

The main scientific impact was made in 2000-2001 as reported in our previous reports. Due to the political situation in the region, there was no direct cooperation between the project participants except through the internet and mainly during the RELEMR meetings in 2002 and 2003 where we examined seismic hazards in the region by using different models for describing the regional seismicity and by applying different computational techniques. A close cooperation between ESSE, En Najah University and the Royal Engineering Society of Jordan led to several meetings devoted to the problem of characterizing typical building practice in Jordan and in the Palestinian territories and their implication on national building codes.

D) Description of project impact

During 2002 the Standards Institution of Israel has adopted the updated hazard map and is about to complete the juristic process to be included in the Israeli Building Standard 413. It also seems that Jordan is progressing towards formal implementation of its first mandatory building code.

The ESSE of En Najah University has organized workshops for the Palestinian engineering community and presented to them results from the work performed by the project investigators. The workshops had appreciated attendance, received headlines in the local press and triggered great interest by a number of municipal leaders and ministers of the PNA.

E) Strengthening of ME institutions

1. Technical assistance is needed to repair and upgrade the seismic systems provided by the project, however, it requires exchange of personnel and equipment, which is currently not possible.
2. Despite transportation difficulties, ESSE experts managed to meet with experts in Jordan for discussions and joint evaluation of the surveys performed in cities of the Palestinian national Authority (PNA).

F) Future work

The turmoil events in the Middle East disrupted our operations. However, we approach a breakthrough in the form of a regional meeting to be held in Aqaba, Jordan (see following chapters). Assuming that the meeting will take place as planned, we plan to proceed as follows:

1. GII technical staff will repair, re-integrate and upgrade the hardware and software of the seismic acquisition systems provided to NRA and ESSE by the project.
2. Train technicians from NRA and ESSE to operate and maintain the data acquisition systems.
3. Train and exercise field measurements for site response investigations and quantification of dynamic properties of existing buildings.
4. Conduct a workshop on the topic of empirical site response determinations, theory and practice (using data from field measurements in Aqaba).
5. Conduct a workshop on the topic of empirical determination of the dynamic characteristics of existing buildings (using data from measurements of 1-2 buildings in Aqaba).

6. provides means for continuous interaction and communication between the participants over the Internet.

SECTION II : Project Management and Cooperation

A) Managerial Issues

1. The project influences and is fairly well integrated into the RELEMR activities and provides a platform to conduct meetings between the project collaborators.
2. Meetings between Palestinian and Jordanian engineers (The Royal Society of Engineers) were lead by Dr. J. Dabbeek in Amman, Jordan.
- 3.

s web-site which is constantly updated.

4. The NRA has upgraded the telemetry of its seismic network. Consequently, we asked US-AID-MERC for the permission to redirect

support maintenance. This upgrading will commence at the occasion of a joint workshop planed for January 2004 in Aqaba, Jordan.

5. WORKSHOP IN JORDAN.

Owing to the ongoing cooperation with the RELEMR project, we are facing a unique opportunity to have a breakthrough that will put us back on tracks to successfully complete the project. In January 2004, we plan to conduct a sequential series of project workshops in Aqaba (Jordan):

- 5.1. Checking, fixing and upgrading the seismic data acquisition and data processing system purchased by the project.
- 5.2. Training technical staff from NRA and ESSE to operate and maintain the equipment.
- 5.3. Joint teams from GII, ESSE and NRA will conduct field measurements in Aqaba as part of the technical training process for evaluating seismic site response functions.
- 5.4. Joint teams from GII, ESSE and NRA will temporarily instrument 1-3 buildings in Aqaba as part of the technical training process for evaluating dynamic characteristics of buildings.
- 5.5. A workshop dedicated to the problem of empirical site response determinations- theory and practice.
- 5.6. A workshop dedicated to the problem of empirical determinations of the dynamic characteristics of buildings.

The meeting and field work will be organized by the Jordan Royal Society of Engineers who are members of the RELEMR and collaborators and consultants to the project. In addition to the participants from Israel, Jordan, PNA and the USA, we shall also invite researchers from the other Arab countries (as outlined in the original project proposal). UNESCO will assist financially by covering expenses of participants from Europe and from Syria, Libya and Iran.

B) Special Concerns

Everybody is very much concerned about the political situation in the region that limits dramatically the possibilities to complete the project. We are thankful for receiving the prolongation for another 18 months.

The collaborative aspect of the project is based on a series of meetings and workshops to be held at the premises of the collaborating institutions. The unfortunate political situation does not allow such meeting to occur. We made significant progress through working over the internet (see www.relemr-merc.org) and during RELEMR meetings. However, we reached the stage in the project where, without mutual visits and field operations, we can not make a significant progress. We have great hopes that the Aqaba meeting in January 2004, as out lined above, will materialized.

C) Cooperation, Travel, Training & publications:

1. Cooperating investigators traveled to the RELEMR meeting in Antakya, Turkey (December 2002) and Nicosia, Cyprus (Sept. 2003).
2. Dr. Dabbeek traveled to Amman to meet with Jordanian engineers.
3. Publications and Reports associated with the project are presented on the www.relemr-merc.org

D) Request for USAID actions

We did not receive yet a formal approval for our previous application to redirect allocated fund for purchases as follows:

1. Approve the redirection of funds to NRA for equipment.
It was originally planned to help upgrading the Jordanian Seismic Network by purchasing new radio systems for the seismic signal telemetry. NRA have moved from UHF radio transmission to micro-wave transmission and do not require this equipment. NRA however has an urgent need:
 - 1.1 Replacement of an old PC, which is used for seismic data processing.
 - 1.2 Replace connectors of L4C seismometers that are used in the project.
2. Owing to the long time since we purchased the equipment for NRA and ESSE, some of the equipment needs repair and upgrade (especially equipment associated with the data acquisition and data processing). We shall complete the purchasing of the required units from the available funds allocated for equipment. We shall be able to identify the exact needs only during the expected workshop in January 2004.