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EUROPEAN AND MEDITERRANEAN MAJOR HAZARDS AGREEMENT (EUR-OPA)

AUDIT REPORT

by the Chair of the Audit Sub-Committee
Jean-Mathias Goerens, Doctor of Law

Meeting of the Permanent Correspondents of the Agreement
St Petersburg, 27 September 2010

In 2010, the Audit Sub-Committee set up under the EUR-OPA Medium-Term Plan carried out audits of the EUR-OPA centres in Madrid, Spain (**CEISE**, 8 and 9 March 2010), Bruyères le Châtel, France (**CESM**, 15 and 16 March 2010), San Marino, San Marino (**CEMEC**, 28 and 29 June 2010) and Valetta, Malta (**ICOD**, 19 and 20 July 2010).

The audits focused firstly on the legal and financial aspects of the organisation and management of the centres and the use made of the grants awarded under the Agreement, and secondly on the scientific standard of the centres' work and the degree of compliance with the priorities set in the Agreement's Medium-Term Plan.

The composition of the committee was adapted on a case-by-case basis to fit the needs of the appraisal, according to the scientific fields covered by each individual centre.

The centre audit reports looked firstly at the organisational and managerial aspects and then at the scientific aspects, rounding off with conclusions and suggestions. This report will follow the same pattern.

Organisation and management

Structures

As noted in the 2008 and 2009 reports, the legal structure of the centres varies in that some have been set up as private- or public-law entities while others have no legal status of their own but rather form part of administrative or scientific entities operating under the wing of the host state.

In the case of the centres audited in 2009, for example, the CSEM and the CEMEC are independent private-law entities, while the CEISE and the ICOD are incorporated into much larger public-law entities, the General Secretariat for Civil Protection and the Institute of Earth Systems (IES) respectively. The centres' constituent bodies normally vary depending on their legal status.

As regards the bodies prescribed by the Agreement, ie an administrative board and a scientific board, the committee observed, as it had in the past in relation to other centres, that this rule was only partially observed, if not disregarded altogether, as far as the actual existence of the bodies (CEISE and lack of independent administrative board at the ICOD) and their international make-up (CEMEC) were concerned.

Staff

It was observed that generally speaking, the centres operate with small groups of scientists who can either bring in externals, when needed, or enlist the help of the host institution's staff. The committee was pleased to note that the host countries cover all or a very substantial share of the staff costs, leaving the bulk of the OPA grant available for programme expenditure.

Premises and equipment

The above comment also applies to the costs pertaining to the premises and equipment of the centres audited, which are almost entirely borne by the host countries.

Bookkeeping and use of OPA funds

The committee carried out a detailed inspection of the accounts for the past three financial years. It was established that, apart from one element in respect of which additional explanations were requested and the use by one of the centres of OPA funds for activities whose purpose was not eligible, all four centres audited had made proper use of the OPA grants, as evidenced by supporting documents. The committee did, however, note some shortcomings relating not to the expenditure charged to the OPA grant or the supporting documents, but rather to the presentation of the accounts and in particular the way in which the model accounting tables provided by the Agreement were completed. For a more detailed analysis, the committee refers to the individual audit reports.

To conclude this point, the committee again wishes to draw the attention of the EUR-OPA Agreement officials to the need to provide the centres with more precise, standardised instructions on how to complete the accounting tables and to ensure that the centres' managers receive appropriate training, especially in how to carry over from one year to the next non-implemented activities and expenditure that has not been incurred. The simplified presentation rules adopted from the financial year 2010 should remedy these problems.

Ratio

Under the rules of the Agreement, the OPA grant must not exceed 60% of the contribution received from the host country. In this context, two of the centres audited are special cases, with the CEISE, as in the past and at its request, not having received OPA funding, while the OPA contribution to the CSEM should

be seen as payment for services rendered rather than a grant.

The services in kind (premises, office equipment, telecommunications), plus the staff costs met by the host countries, mean that, even though it is difficult to put a figure on these services, all four centres audited amply satisfied the 60% requirement. Such contributions are of major benefit to the centres and a testimony to the host countries' interest in what their centres are doing.

Scientific aspects

As in most of the previous audits, the committee's assessment of the standard of the centres' work was, to a very large extent, positive. The audits concerned the financial years 2006, 2007, 2008 and 2009 and the committee also had the centres brief them on projects in progress and those planned for 2011. The years under review thus straddle the 2002-2006 and 2007-2011 Medium-Term Plans.

It should be noted that the activities of the ICOD in Malta were not directly covered by the 2002-2006 MTP and that, in the case of the CEMEC, the international requirements of the Agreement are barely complied with as regards the composition of the constituent bodies and the target group of the activities.

As regards the scientific work of the various centres, the committee noted in particular:

I. CEISE Centre in Madrid

It should be noted that the visit made to the CEISE should not be regarded as an audit but, at the request of the Agreement authorities, a visit to (re-)establish contact.

Scientific aspects

1. Mission of the CEISE

The aim of the Centre is to:

- "- Promote and develop sociological, legal and economic investigations and research in the field of civil defence.
- Maintain the functions formerly assigned to the European Centre for Public Information in Emergency Situations, functions covering numerous aspects relating to the management of emergency situations but also risk assessment and risk prevention which, if they are to be properly understood and addressed, require a human sciences perspective (psychology, sociology, economics, legal science, educational science, etc.)."

The CEISE is thus responsible for sociological, social, economic and psychological investigations and research in the context of disasters and other catastrophic events. The research and investigations are focused on aspects of social destabilisation, public behaviour and reactions in the event of a disaster, and the behaviour of the relevant authorities involved in managing emergencies. The Centre encourages external research in its fields of competence, mainly at university level by offering prizes for theses on subjects that fall within its purview.

2. Activities

The Centre's activities are documented in the annual reports, copies of which were given to the undersigned and are attached hereto. Among other things, these reports contain references to a number of activities and projects that might be of interest to EUR-OPA member states. Two of these countries, Belgium and France, have taken part in various activities and projects, although these were a European Commission, rather than a EUR-OPA, initiative. Other activities had more of a Latin American focus.

In keeping with the Centre's mission, the subjects covered include work on the theoretical and practical aspects of social sciences in emergency situations and the socio-economic impact of disasters. Among the issues addressed are nuclear risk and the Seveso directive.

In the context of psychological aspects, a working party was set up in 2002 to develop an occupational profile for the job of disaster psychologist and rules of conduct for psychologists dealing with emergencies.

Another area where work has been carried out is in implementing public information and education programmes with a view to creating a culture of prevention.

In response to current situations, the CEISE has produced a number of studies: "From ecological disaster to political crisis" (Prestige oil spill), "Social acceptability and public awareness in the energy field", "Maritime safety and environmental protection", "Television news coverage of disasters", etc.

In 2007/2008, the Centre carried out and published a major study on "Public perception of risk in Spain". The basic information was gleaned from a survey carried out using methods developed by the Centre. The study provided information about public attitudes to risk, how people reacted in the event of a disaster, what their expectations were vis-à-vis the emergency services and the level of confidence encountered by these services. Particular emphasis was given to the print and broadcast media's coverage of disasters and how they were received by the public.

The Centre has focused on risk education in schools and has published a 5-part teaching pack consisting of a general document setting out the basic principles of self-protection and four booklets dealing specifically with forest fires, floods, earthquakes and volcanic eruptions, each with descriptions and guidance for teachers. This project merits close attention and should be linked up with the work of the "Be Safe Net" Centre, which could make use of it in its educational programmes.

As well as its in-house activities, CEISE also works with universities. Since 2001, it has presented numerous awards for PhD theses in an effort to encourage scientific research in the area covered by it. Masters degrees in subjects of relevance to the Centre have also been introduced.

3. International aspects

In the past the Centre's work tended to focus mainly on Spanish target groups, although some of the activities did have participants from other countries. In terms of both the subject-matter and the methods developed, however, the work is likely to be of interest to other EUR-OPA states. The Centre has said it is willing to give its activities a more international slant, so as to involve other EUR-OPA states in its work and enable them to benefit from it. One example of this in the near term is the study on "*volunteering in the emergency services*", which is expected to attract interest from other countries, enabling comparative research to be carried out. The Spanish authorities are planning to present the project, which appears in the activity programme submitted to the OPA for 2010, at the next meeting of Permanent Correspondents.

4. Appraisal

From the description of the activities and a close look at some of them, we are able to give a positive assessment of the CEISE's work. It is a pity, therefore, that these activities were conducted outside the OPA framework as, firstly, the research is apt to be of interest to all countries involved in the Agreement and, secondly, EUR-OPA Centres such as those in Cyprus, Armenia, Azerbaijan and Malta, for example, could have complemented the CEISE's work, by making contributions of their own.

It is worth noting, as a footnote, that the Centre's web page featured on the EURO-OPA site is, like many others, out-of-date and the link to the Centre's own web site does not work, with the result that the CEISE's activities are not as visible and accessible as they should be.

5. Conclusions

The CEISE's work has a distinctive thematic focus that brings added value to the Agreement, particularly as the subjects covered by, and the aims of, the Centre are of general interest to all EUR-OPA member states. That should be enough to earn those CEISE projects which are of general interest a place among the OPA's co-ordinated programmes. It is to be hoped, then, that the CEISE management will seek to give the Centre a higher international profile. This could be done by inviting EUR-OPA member states to take part in the Centre's projects and research and, at the same time, by disseminating its work, in particular by arranging for the studies to be translated into the official languages of the Agreement.

The Centre's work is in keeping with the Agreement's Medium Term Plan for the period 2002 to 2006 (point B1i: introduction of master's degrees, B1ii: information, teaching material; point B2: information/communication in the fields of seismic risk and flood risk). As regards the Medium Term Plan for 2007-2011, the Centre's educational programmes are fully in keeping with the aims of point III.2 aimed at creating a "culture of risk reduction".

Although, for organisational reasons and reasons connected with Spanish law, turning the Centre into an independent body does not appear to be an option, we would nevertheless suggest that, in order to raise its international profile and strengthen its international scientific standing, a scientific board with members drawn from other countries be set up, as stipulated, moreover, in the OPA rules.

The undersigned is satisfied that the Centre has the potential to make a specific contribution to the aims of the Agreement and that its OPA status should accordingly be maintained.

II. CSEM Centre (Bruyères-le Châtel, France)

Scientific aspects

EMSC provides rapid earthquake information (also mentioned as Real-Time Earthquake Information – RTEI) services as well as an earthquake notification service (ENS).

Data (source parameters and phase pickings) are currently collected from 65 seismological networks, counting about 1800 seismic stations, via email or permanent TCP connections. The volume of data as well as the number of contributing networks and stations has steadily and remarkably increased in the last five years. For example the number of stations has passed from 1100 in 2004 to 1782 in 2009 and the number of received arrival times has passed from $4.5 \cdot 10^5$ in 2004 to $20.6 \cdot 10^5$ in 2009, which marks a more than 5-time increment in such a short period of time. Even the moment tensor solutions have increased from about 1000 to about 1300 in the last years.

The data are merged and processed by EMSC in view of providing a more complete geographical coverage and a better earthquake determination, especially in case of event occurrences in border regions and off-shore.

The RTEI service provides real-time information on the EMSC web-site (www.emsc-csem.org). The information is reviewed manually within the following working day. The service was originally developed for scientific usage, but it is now used extensively by the general public. The daily traffic is estimated (through a special software called StatCounter) in about 17,000 visitors for 2009, but it was only about 2000 in 2004, which means that the website became very popular in the last few years. The RTEI is continuously updated every minute. It consists mainly of a searchable list of earthquakes, of clickable maps, of interactive regional maps. For each event the RTEI provides automatic pages with geographical maps, satellite images, regional seismicity maps, a list of past destructive earthquakes, rapid seismic moment solutions, past focal mechanisms of the region. Special pages are also available with field observations, damage reports, aftershocks and source studies.

In 2009 Italy was shaken on April, the 6th by an $M_w=6.3$ large earthquake that killed about 300 people. The earthquake raised a lot of interest and as an effect the EMSC traffic increased to the aforementioned level of about 17,000 unique visitors per day. This event contributed very much to the visibility of the EMSC web site on the internet and among the common search engines.

The quality of the preliminary information has improved significantly. The location accuracy (measured by comparing the EMSC location with the reference location, which is the published on manually revised bulletins) has improved, since the average error (or discrepancy) went down from about 40 km in 2006 to less than 20 km in 2009. Moreover, the delay time between the earthquake origin time and the time of the publication of the preliminary information on the web has decreased from about 15 min in 2006 to 10 min in 2009. The number of earthquakes published in 2009 by EMSC was 16,818 worldwide of which 11,252 occurred in the Euro-Mediterranean region. Of these as many as 8364 were relocated manually by the EMSC.

The EMSC promotes and collects macroseismic questionnaires on the shock damage from the EMSC website eyewitness users that allow even for free comments. The service started in 2004 when only 3 questionnaires were received for 3 earthquakes. In 2009 the number of earthquakes covered was 795 and the number of questionnaires was 3716. It must be acknowledged the efforts by EMSC to propose questionnaires in different languages, including English and French, but also less spoken languages like Greek, Bulgarian, etc.

After an earthquake occurrence it has been noticed that there is an EMSC web traffic peak or surge, since people rush on the internet to find more information on the earthquake. Identifying the IP addresses of the users and mapping the localities that exhibit a significant increase of visitors result in a map of increased traffic that can be considered as a complementary piece of information for a macroseismic map. This map has been called felt map by the EMSC since all connecting users have presumably felt the earthquake, and it is stressed that it can be made available very rapidly, that is in 5-10 minutes after the earthquake. Quite often the felt map is the very first information available on the earthquake location and the felt area extension. This is a very original development of the EMSC, that is conducting serious research on it and is currently working to detect the surge of the web traffic in an automatic way in order to reduce the delay of the felt map production below the threshold of 5 min.

The EMSC has introduced also new tools to disseminate information following the recent technological developments in communications. Among these, the most successful was the RSS (Really Simple Syndication) feed tool oriented to cell phones and PDA systems that was introduced in 2007 and that in 2009 reached the daily value of 588 (measured as the number of unique users). For web people a special

widget has been conceived and created that can be added to a personal web portal such as igoogole. It was used by as many as 253 unique users per day in 2009.

The EMSC system is operational 24/7 thanks to the support of the LDG/CEA (Laboratoire de Géophysique, Commissariat à l'Énergie Atomique, Bruyères-les-Châtel, France), and relies on a back-up centre located at the IGN (Instituto Geográfico Nacional, Madrid). The performance of the service has steadily increased in the last five years: the percentage of hours when the EMSC has been offline in a year has been always below 1% and was only 0.3% in 2009, and, likewise, the number of hours when IGN has been on duty (replacing EMSC) has decreased down to 55 in 2009.

The earthquake notification service (ENS) is a service designed to send immediate information on damaging earthquakes to end-users through messages sent by fax, SMS and e-mails. The time delay is decreasing with time: it was on average 40 minutes in 2004 and about 21 minutes in 2009. The end-users of the alert increased from 1000 in 2004 to 7541 in 2009 and include the European Civil Protection Unit, the European Humanitarian Office (ECHO), the United Nation Office for the Coordination of the Humanitarian Affairs (OCHA), the Euro-Asiatic Disaster Reaction and Coordination Center (EADRCC-NATO), Civil Protection agencies, a dozen of rescue teams and about 7000 individual subscribers. Since 1987 EMSC is an independent center for the EUR-OPA agreement and provides a Special Alert Service to the EUR-OPA member states.

The alert through the ENS is sent for earthquakes that are potentially damaging in the Euro-Mediterranean region and for large events in the world ($M > 5$ in Euro-Med, $M > 6$ in Continental Asia, $M > 7$ worldwide). The number of the earthquake notifications disseminated by the ENS was stable in the last years, since this is mainly related to the occurrence of sizable earthquakes and was around 150 per year. Of the 135 notifications disseminated in 2009 nine were EUR-OPA alerts: of these 6 regarded the far eastern Russia, and 3 were in the Euro-Mediterranean region (the 06/Apr $M_w = 6.3$ earthquake of L'Aquila in Italy, the 01/Jul $M_w = 6.4$ earthquake in Crete, Greece and the 07/Sep $M_w = 5.9$ earthquake in Georgia).

The EuroMed Seismological Bulletin is produced for earthquakes with $M > 3$ that are located in the Euro-Mediterranean area. It is produced by collecting and associating all the available seismic waves' arrival times, by locating the earthquakes, and after a validation process. The result is to reproduce the seismic bulletins produced by the national existing networks, but with refined location and sensible improvements obtained for earthquakes in the border regions and offshore. The existing data base includes about 10 millions arrival times concerning 394,000 events collected from 73 contributing networks with about 2400 seismic stations, for published bulletins covering the period 1998-2005. Bulletins for the years 2006 and 2007 are also available on line on the EMSC web site. Major changes for the 2008 and the following bulletins will be the drop of the $M = 3.0$ threshold and the earthquake location using the AK135 global velocity model according to the IASPEI recommendation.

The EMSC is involved in several research and applicative projects of international level. The most relevant ones are:

- EERWEM: (Earthquake Monitoring and Risk in Western Mediterranean), aiming at the coordination of the seismic networks in the Western Mediterranean with real-time sharing of seismic waveform data. The Memorandum of Understanding has been signed by several institutions and bodies (ESCM and RENASS (France), ISRabat (Morocco), CSG and CRAAG (Algeria), ROA and UCM (Spain), IM and IST (Portugal), University of Malta, GEOFONE/GFZ (Germany)).
- SAFER: (Seismic eArly warning For EuRope). It is a 36-month European funded project started in June 2006, ended in June 2009 and coordinated by GFZ (Germany), where the main EMSC involvement regarded the cooperation with ORFEUS to test earthquake early warning algorithms on the VEBSN (Virtual European Broadband Seismograph Network) collected data, to evaluate their performances and to real-time disseminate the results to the project partners.
- NERIES: (Network of Earthquake Research Institutes for Earthquake Seismology). It is a 4-year European funded project started in June 2006 and coordinated by ETHZ, Zurich (Switzerland), involving 23 research institutes in 13 European countries. Here the main EMSC involvement regards the development of a strategy for the creation of a unified portal for access to European seismological data (seismic, accelerometric, historical seismicity, ...) and to the related services (shakemaps, rapid damage estimates, ...), which has been undertaken in close relationship with ORFEUS.

The activities of the EMSC are at the top level in Europe and also when viewed in the international global frame, as regards the services provided. These are adequate for the today technology and it is quite appreciable that EMSC is making continuous efforts to exploit new technological tools as soon as they are available, with the aim to extend the range of information provided and to enlarge the number of the

potential end-users and to reduce the time delay for the dissemination. It is also worth of consideration that EMSC services could not be provided without the contribution of a network of national and international seismological organisations ensuring a stable flow of data to the EMSC data base. Therefore it is not surprising that one of the EMSC priorities was first the creation of such a network and is today the maintenance and the extension of the network, which is very valuable and unique and which is the result of intense collaborations and of fruitful and accepted coordination. It is further worth of appreciation that EMSC has established close links with the most important seismological research and operational centres in Europe and is partner of projects financed by the European Union. This has the double advantage to provide support to research activities undertaken in the EMSC and to improve the EMSC knowhow in terms of scientific achievements and methods and in terms of up-to-date technology and next future applications.

Conclusions

In appreciation of the activities undertaken by the EMSC, the commission proposes to continue to support the work of the Centre at least at the same financial level as today's and to allow it to use the label of European Centre. The committee proposes, therefore, that the European EUR-OPA Centre label be maintained for EMSC.

III. CEMEC CENTRE (San Marino)

Topics of interest and scientific activities

In the context of the Agreement, the Centre's task is to organise training sessions in the sphere of care in emergency situations. In 2009 its work programme included the following courses:

- Forensic medicine, health legislation and organisation of emergency medical relief (2 days, 12 participants)
- Psychology in emergency and disaster situations (2 days, 8 participants)
- Sanitary organisation in emergency and disaster situations (3 days, 17 participants)
- Managing collective NRBC emergencies (2 days, 11 participants)
- The veterinary aspects of disasters (1 day, 10 participants)

This makes a total of ten days' teaching to 58 participants on Agreement-related topics.

In addition, the Centre held an international Italo-Russian seminar comparing different ways of organising disaster relief (1 day, 160 participants).

Outside the subject area of the Agreement, the Centre also organises first aid training activities. In 2009 it held the following courses in this field:

- Cardio-pulmonary resuscitation in children for non-health professionals (two one-day sessions, each with 10 participants)
- As above, but including defibrillation and intended for health professionals (1 day, 10 participants)
- Advanced cardio-pulmonary resuscitation (3 days, 17 participants)
- Advanced cardiac resuscitation (2 days, 10 participants)
- Basic pre-hospital trauma (1 day, 24 participants)
- Advanced pre-hospital trauma (3 days, 10 participants)
- Basic toxicology (3 days, 22 participants)

This makes a total of fifteen days' teaching to 113 participants on non-Agreement-related topics.

The auditors note therefore that the Centre's activities, which are relatively small-scale, are now focused for the most part on training in response to day-to-day emergencies, which lie outside the scope of the Agreement. Another cause for concern is that, for several years, the Centre has only received Italian participants for training. This does not tally with its international role. This situation was already highlighted in our 1998 and 2006 reports and it appears that no progress has been made in opening the Centre up to other target groups. What is more, the teachers themselves are all Italian and the classes are taught in Italian. Furthermore, as noted above, the scientific committee has only three non-Italian members, which does not make it very representative in terms of international disaster medicine.

In addition, the report of the scientific committee's annual meeting speaks of the Centre's involvement in the international research projects "Child Trauma Network" and "EPSSES", but the exact nature of the Centre's contribution to those projects is none too clear.

The auditors regret the fact that they were unable to meet the Centre managers, particularly its co-ordinator, Professor Barelli, to discuss this matter and ask what action was planned to open up the centre to a more international audience, which is crucial for it to fulfil its vocation as a European Centre. They wish to point out that regularly holding international seminars like the one in November 2009 could be one way of achieving this goal.

Conclusions

Subject to their reservations concerning the charging of non-eligible courses to the OPA grant, the auditors' findings with regard to the structural and administrative aspects of the CEMEC were satisfactory, meaning that the conclusions of the previous audit still apply. The regulatory and staffing arrangements are suited to the tasks to be performed, as are the premises and equipment. The financial management aspects give no grounds for criticism.

There is, however, good reason for us to reiterate our comments concerning the low level of international representation among the Centre's management team. A stronger international element would make it possible to attract more international participants to the Centre's courses and disseminate its publications more widely. Reference is made, in this connection, to the reports of 1998 and 2006. Unless the situation changes, the question of continuing to award the European Centre label could be raised.

IV. ICOD Centre, La Valetta, Malta

Scientific and programme aspects

The reservations expressed in the previous report about the consistency of the ICOD's activities with the 2002-2006 Medium-Term Plan still applied to the financial year 2006. However, the centre's activities are more in line with the 2007-2011 MTP, especially as regards training and education. The multi-year project on interactive education media developed in several languages over the years usefully complements the work of the Be-Safe-Net Centre in Cyprus.

One part of the evaluation is to be completed by the evaluation on file made by Professor Michel Vigneaux.

V. Conclusions and suggestions

The committee reiterates most of its 2008 and 2009 conclusions. As in the past, the committee's recommendations often called for greater international co-operation with centres belonging to the Agreement or other institutions pursuing similar goals, even though several of the centres do have substantial networks of scientific contacts. Reference is made to the comment (under 'Structures', above) concerning the international membership of the governing bodies, which is essential, in spite of the financial questions it raises. The committee reiterates the comment concerning the need for activities funded under the Agreement to be aimed more at international objectives in the sense of modelling and exportability of the scientific and technical results with a view to enabling the international community and, in particular, the other countries in the Agreement to derive maximum benefit from the work done in the individual centres.

The following experts assisted the sub-committee in carrying out the audits in 2010:

- CSEM: Professor Stefano Tinti, University of Bologna, Italy;
- ICOD: Professor Michel Vigneaux, President of FER, Chair of the Programme Sub-Committee, Bordeaux, France
- CEMEC: Dr Bernard Nemitz, professor, Amiens, France;
- CEISE: At the request of the Executive Secretariat, the task was performed by the undersigned alone.