

**TSUNAMI EARLY WARNING  
AND MITIGATION SYSTEM  
IN THE NORTH-EASTERN ATLANTIC,  
THE MEDITERRANEAN  
AND CONNECTED SEAS**

**First Enlarged Communication  
Test Exercise (ECTE1)**

**Exercise Manual & Evaluation Report**

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**UNESCO 2011**

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Report prepared by:       Co-Chairs of NEAMTWS TT-CT&TE  
                                  Mr Öcal Necmioğlu  
                                  Dr Alexander Rudloff

**Acknowledgements:**

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Öcal Necmioğlu  
Boğaziçi University, Kandilli Observatory and Earthquake Research Institute Istanbul-Turkey

Dr Alexander Rudloff  
GFZ German Research Centre for Geosciences, Potsdam

19 December 2011

**I.**

# **Exercise Manual**

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## 1. INTRODUCTION

The Regional Tsunami Watch Centres (RTWC), National Tsunami Warning Centres (NTWC) and Tsunami Warning Focal Points (TWFP) must keep a high level of readiness so as to be able to act efficiently and effectively to provide for the public's safety during fast-onset and rapidly-evolving natural disasters like the tsunamis. To maintain this high state of operational readiness and especially for infrequent events such as tsunamis, tsunami watch/warning centres and emergency agencies must regularly practice their response procedures to ensure that vital communication links work seamlessly, and that agencies and response personnel know the roles that they will need to play during an actual event. For this purpose, Tsunami Communication Test Exercises (CTEs) must be conducted regularly, ideally every 1 to 3 months on a fully operating system.

General objectives of a CTE are:

- (i) Evaluate and validate the Tsunami Watch/Warning Centers' dissemination process of issuing tsunami messages to the NEAM (North-Eastern Atlantic, Mediterranean and Connected Seas) region.
- (ii) Evaluate and validate the process for countries to receive and confirm tsunami messages.
- (iii) Develop and implement mechanisms for the regular update of NTWC and TWFP contacts.
- (iv) Help the establishment of Standard Operational Procedures (SOP) as regards the communications used to disseminate and receive tsunami messages in the NEAM region.

During the seventh session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS-VI/3) held in Paris, France, from 23 to 25 November 2010, it was established a Task Team on Communication Test and Tsunami Exercises (TT-CT&TE) with the Terms of References detailed in Annex I of this document. TT-CT&TE is responsible for the preparation and conduct of the First Enlarged Communication Test Exercise (NEAMTWS-ECTE1) and organization of its assessment. The aim of the NEAMTWS-ECTE1 is to refine procedures for testing the communication of tsunami alert messages between National Tsunami Warning Centres and **all Tsunami Warning Focal Points (TWFPs)**, including speed and availability within NEAM region. CTEs, conducted during the previous intersessional period, highlighted the importance of having other communication method like Global Telecommunication System (GTS), and therefore utilization of GTS during the NEAMTWS-ECTE1 is another aim of the Exercise.

TWFPs are the key players in terms of translating the warning message into essential information for Civil Protection and Disaster Management Authorities (CP-DMA), especially if they are not CP-DMA by themselves. Therefore, NEAMTWS-ECTE1 is an important tool in terms of seeking the involvement of CP-DMAs, especially considering the first Tsunami Exercise in the NEAM region, NEAM Wave 12, which is currently being planned and is expected to take place in the second half of 2012.

NEAMTWS-ECTE1 will address the questions related to the evaluation and issuance of the warning message by tsunami watch/warning centres, as in the previous CTEs, but will also attempt to assess the national and/or local response and warning dissemination mechanisms once emergency authorities receive a warning. NEAMTWS-ECTE1 will involve all possible TWFPs using conventional message dissemination channels that have been previously subject to test between candidate RTWC and NTWCs. Message dissemination using GTS will be only available between TWFPs that have that system available to them at the operational level. During the Tsunami and Civil Protection Workshop at the Joint Research Centre (JRC) in Ispra, Italy, on 15 and 16 June 2011, it was agreed the participation of the Monitoring and Information Centre (MIC) as an observer. MIC is encouraged to fill also the questionnaires related to the exercise.

This manual together with the report of previously conducted CTEs are available through the IOC website.

## **2. RECOMMENDATIONS AND CONCLUSIONS OF TASK TEAM ON COMMUNICATION TEST EXERCISE (TT-CTE)**

TT-CTE was the responsible Task Team for the CTEs during the previous intersessional period. Recommendations and conclusions of TT-CTE were submitted in the Intersessional Activity Report during the seventh session of NEAMTWS held in November 2010 in Paris, France, and are listed below:

- TT-CTE **suggests** that other communication systems, like GTS, should be used in future Communication Test Exercises.
- TT-CTE **recommends** the use of multiple phone lines in parallel to speed up the delivery of messages by fax.
- TT-CTE **recommends** that, for future exercises, participants report more accurately the reception time of their fax messages
- TT-CTE **recommends** that the Terms of Reference (TOR) for future exercises should clarify the rules used for the numbering of Tsunami Communication Test Messages.
- TT-CTE **recommends** that future exercises will endorse the definition of the reference time as was adopted in CTE2, the time when the decision is taken at the NTWC/RTWC that a tsunami message has to be issued, presumably based on earthquake information.

## **3. PREPARATION, IMPLEMENTATION, AND EVALUATION OF NEAMTWS-ECTE1**

During the TT-EC&TE Meeting in Paris, 11 March 2011, it was agreed that Turkey, while still making preparations to obtain GTS capacity, would most likely be the originator of the NEAMTWS-CTE1, whereas Portugal offered also to be the next originator towards the end of the year for the possible NEAMTWS-ECTE2. At the time of the TT-EC&TE meeting, France was making necessary preparations, and France and Portugal had already conducted GTS test among themselves. Since all three possible candidates (France, Portugal and Turkey) for the NEAMTWS-ECTE1 were still trying to obtain full GTS capability, a further evaluation was made during the Tsunami and Civil Protection Workshop in ISPRA, Italy, 15-16 June 2011, to decide on the message provider for the first Enlarged CTE. IM (Portugal) confirmed that they would be in a position to act as Message Provider by September 2011, whereas CEA (France) reported that they will be in a position to act as Message Provider by early 2012. KOERI (Turkey) reported that they are already in 24/7 operational status and they have established GTS communication link through ftp and e-mail in collaboration with Turkish State Meteorological Service and working towards establishing their own stand-alone GTS system. Based on these status reports, it was confirmed that KOERI would be the Message Provider in NEAMTWS-ECTE1. CEA suggested and stated their willingness to participate in a pre-exercise GTS communication test between CEA and KOERI.

It's important to emphasize that, as indicated above, message recipients will involve all possible TWFPs, whether they have the GTS capability or not, since NEAMTWS-ECTE1 will also utilize conventional message dissemination channels.

### **3.1 TIMETABLE OF NEAMTWS-ECTE1**

During the TT-CT&TE meeting held on 11 March 2011 in Paris, France, it was in principle agreed to conduct and evaluate NEAMTWS-ECTE1 well before the second TT-CT&TE meeting, which will

be held during the third week of September 2011. The exact time of the NEAMTWS-ECTE1 will be determined during the Tsunami and Civil Protection Workshop in Ispra, Italy, on 15 and 16 June 2011, based on the evaluation of the readiness of the candidate message originators. Considering the time needed for reporting the questionnaires and evaluation, it is suggested to conduct the exercise no later than mid-August.

- |                  |   |  |
|------------------|---|--|
| 4 July           | – | 1st Announcement   |
|                  | – | 1st Announcement to be sent to TWFPs not only through Permanent Missions but also directly to their registered e-mail addresses. |
| 3 August         |   | 2nd Announcement   |
| <b>10 August</b> | – | <b>Conduct of ECTE1</b>  |
|                  | – | Questionnaires should be sent back by the end of the exercise day for evaluation.  |
| 2 September      |   | Report should be distributed to the Exercise Participants for validation.  |
| 9 September      |   | Report should be validated by the participants.  |
| 12 September     |   | Report will be distributed to the TT members.  |
| 19 September     |   | Report will be evaluated during the TT meeting   |

### 3.2 EXERCISE DESCRIPTION

NEAMTWS-ECTE1 will simulate the dissemination of tsunami messages by one RTWC candidate, and its timely reception by the NTWCs and all participating TWFPs. It will try to evaluate the communications delays that may be involved in the international communication systems, and identify possible bottlenecks by requiring the record of adequate time stamps. To do this properly, it is desirable that all exercise participants have their equipments synchronized, either to local time or universal time. If possible, each exercise participant should provide the methods and procedures used to ensure the synchronization of equipments, PCs and fax.

The NEAMTWS-ECTE1 will use email, fax and GTS as means of communication. It will be conducted in such a way to be completed in a timely manner during reasonable work hours across the time zones found in the NEAM region, most likely between 10.00-14.00 UTC. It is important to note that, while being an old generation of communication technology, the well-proven reliability of GTS in case of emergency situations makes its use indispensable.

NEAMTWS-ECTE1 begins by the broadcast of a Tsunami Test Message by one of the candidate RTWC. (See the message description in Annex-II.A and Annex-II.B).

In order to simulate the best way possible the future operation of a RTWC, we should consider as time zero of the evaluation (time stamp zero or TS0) the instant when the message provider is aware that a Tsunami message has to be delivered. The message should already be pre-formatted, missing only the time stamp on the header. The message provider will then take all the actions required to issue this message by e-mail, fax and GTS to all possible message recipients. This means that the preparation latency from the message provider can be also evaluated.

The participant NTWC/TWFP then receives this message. It is required that the operator that receives the message takes note of the time when the message was received by the local equipment (TS1), and the time when the message was read and understood by the operator



(TS2). The copies of the documents to be included in the report should have as much detail as possible, regarding time-stamping and routing.

The NEAM-RTWC text messages format and content, including information on the rules used for the numbering of Tsunami Communication Test Messages, can be found in Interim Operational Users Guide for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), version 1.1g, also given at the NEAMTWS website.

([http://www.ioc-tsunami.org/index.php?option=com\\_content&view=article&id=10&Itemid=14&lang=en](http://www.ioc-tsunami.org/index.php?option=com_content&view=article&id=10&Itemid=14&lang=en))

### 3.3 UTILIZATION OF GLOBAL TELECOMMUNICATIONS SYSTEM (GTS) DURING NEAMTWS-ECTE1

#### 3.3.1 The Need for GTS for a fully operational NEAMTWS

GTS connects meteorological and other centres throughout the world. Its primary purpose is to distribute meteorological, hydrological, and other data, products, alerts, and warnings to the global meteorological community, composed of member nations of the World Meteorological Organization (WMO). The structure of the GTS makes use of terrestrial communications circuits to disseminate data, products, and messages over a tiered network. The three tiers of the GTS are the World Meteorological Centres (WMC), the Regional Telecommunications Hubs (RTH), and the National Meteorological Centres (NMC).

NTWCs and RTWPs should employ backup communications for data and information collection required to detect a tsunami. Alternative communication paths within a centre should be employed by tsunami warning centres. In the event of the failure of one of a centre's primary communication links, such as e-mail or fax, information can be re-routed through a secondary connection. GTS is among the robust communications methods that are used for the transmission of tsunami warnings. A general overview of GTS can be found in Annex VI.

#### 3.3.2 GTS Header Format for Tsunami Warning Messages

Detailed information for the GTS format can be found at Manual on the Global Telecommunication System, Volume I (WMO-No. 386). In general, the abbreviated GTS header has the following format:

**T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii CCCC YYGGgg BBB**

Where:

**T<sub>1</sub>T<sub>2</sub>** data type and/or form designators

T<sub>1</sub>=W (Warning)\*

T<sub>2</sub>=E (Tsunami, when T<sub>1</sub>=W)

*\*In the case of NEAMTWS, this WMO terminology applies to all levels of NEAMTWS Tsunami messages.*

**A<sub>1</sub>A<sub>2</sub>** geographical and/or data type and/or time designators

A<sub>1</sub>A<sub>2</sub> is one of the following:

ME Eastern Mediterranean area

MM	Mediterranean area
MP	Central Mediterranean area
MQ	Western Mediterranean area
NT	North Atlantic area

**ii** A number with two digits. When an originator or compiler of messages issues two or more messages with the same T1T2A1A2 and CCCC the ii shall be used to differentiate the messages and will be unique to each message.

**CCCC** International four-letter location indicator of the station or centre originating or compiling the message, as agreed internationally, and published in WMO-No. 9, Volume C1, Catalogue of Meteorological Messages. Examples are:

LFPW	Toulouse (Centre Régional de Télécommunications)
LPMG	Lisboa (MET COM Centre)
LTAA	Ankara (Turkish State Meteorological Service)

**YYGGgg** International date-time group, where

YY Day of the month.

GGgg UTC time of the compilation of the message.

**BBB** An abbreviated heading defined by T1T2A1A2 ii CCCC YYGGgg shall be used only once. Consequently, if this abbreviated heading has to be used again for an addition, a correction or an amendment, it shall be mandatory to add an appropriate BBB indicator, identified by a three-letter indicator which shall be added after the date-time group. The BBB indicator shall have the following forms:

RRx for additional or subsequent issuance of messages;

CCx for corrections to previously relayed messages;

AAx for amendments to previously relayed messages; where x is an alphabetic character of A through X.

For example,

WEME40 LTAA YYGGgg CCA; for the same hour, when the warning message is updated for the first time.

WEME40 LTAA YYGGgg CCB; for the same hour, when the warning message is updated for the second time.

Example Headers for France, Portugal and Turkey are the following:

	<i>France</i>	<i>Portugal</i>	<i>Turkey</i>
<b><i>Tsunami Watch, Advisory and Tests</i></b>	<i>WEMQ40 LFPW</i>	<i>WENT40 LPMG</i>	<i>WEME40 LTAA</i>
<b><i>Tsunami Information Message</i></b>	<i>WEMQ42 LFPW</i>	<i>WENT42 LPMG</i>	<i>WEME42 LTAA</i>

The first type of message with the header format xxxx40 request an action from the recipient (Watch-Warning or respond to the communication test); hence these messages are the highest priority. The second type of message with the header format xxxx42 do not request action; it is only an information.

Sample GTS message for NEAMTWS-ECTE1 is given in Annex-II. The header can be followed by an identifier used by the Tsunami Warning Centre (independent of any format requirement) as a part of the text message. For example, in Annex-II, TSUWCT in the second line stands for Tsunami Warning Centre Turkey. During the Tsunami and Civil Protection Workshop at JRC on 15 and 16 June in Ispra, Italy, it was decided that an official letter from IOC/NEAMTWS Secretariat should be sent to WMO informing on these headers and requesting the prioritization and re-routing of Communication Test Exercise Messages.

### 3.3.3 GTS Capacity Building

TWFPs should contact their national representative for WMO (WMO-NR; see Annex VII) to establish the necessary infrastructure for GTS including hardware and software. TWFPs can receive the messages through e-mail, ftp and/or in-situ satellite system, which are connected to the GTS system hosted by WMO-NR. TWFP contact info should be registered at GTS also through the WMO-NR.

To establish a link between the WMO-NR and the TWFP, the TWFP has to contact its WMO-NR requesting :

- Type of transmission mode existing in the WMO-NR (email, ftp,..).
- The establishment of a MoU or other type of agreement to receive the messages.

The TWFP has to provide the list of messages header he would like to receive (see section 3.3.2).

The best method to validate this link in reception is to request also the tide gage data of the stations in the Mediterranean sent by GTS. For example, France is currently sending data of 9 stations every 6 minutes. Receiving these data gives the transmission latency between the WMO-NR and the TWFP. France, in order to ensure robustness, highest availability of the link, and minimum transmission latency, implemented a MPLS link between the CENALT and Météo-France Toulouse.

The Communication test will validate the first part of the transmission, namely the latency between the RTWC and the WMO-NR.

## 3.4 MESSAGE SECURITY

Message security is a major concern raised during many NEAMTWS meetings. In NEAMTWS-ECTE1, the message authorship will be ensured by validating the fax number, and/or fax-id code, email address and message headers that the Message Provider will use for the exercise and that are known beforehand. It is suggested that the final announcement of the NEAMTWS-ECTE1 be

sent from the message provider address, with a copy to the message recipient addresses in order to ensure that the anti-spam and firewall software operating in the Message Receivers networks do not block the Communication Test Exercise message.

### 3.5 EXERCISE PARTICIPANTS

There are two types of exercise participants: The message provider and the message receivers. The provider is the RTWC candidate in the NEAM region that wishes to participate. The basic requirements for a provider is to be able to disseminate messages to multiple recipients using email, fax and GTS.

The NEAMTWS-ECTE1 provider must give the following information:

- Name of Agency.
- Contact name.
- Communication contacts (email, fax, phone, ...).
- Mailing address.
- Email used to broadcast the communication test message.
- Fax numbers and id codes used to broadcast the communication test message (all lines available).
- GTS message header information.

For each Message Receiver Agency it is required to give the following information:

- Name of Agency.
- Contact name.
- Communication contacts (email, fax, phone,...).
- Mailing address.
- Email used to receive the communication test message.
- Fax number used to receive the communication test message.

Multiple addresses can be provided and the participation of Civil Protection-Disaster Management Officers is encouraged. The forms to be filled by the Message Provider and Message Receivers for the NEAMTWS-ECTE1 are given in Annex III.

Participants are especially encouraged to read the Exercise Reports of previously conducted CTEs, which can be found at the IOC Tsunami website. (<http://www.ioc-tsunami.org/>)

### 3.6 EVALUATION OF NEAMTWS-ECTE1

The evaluation will be conducted by filling a questionnaire (see the proposed questionnaires in Annex IV, one for the message provider and other for the message receivers). These questionnaires should be answered shortly after the end of the exercise, and they must be sent via email to the responsible Co-Chairperson of TT-CT&TE by the end of 10 August 2011:

Mr Ocal Necmioglu  
Boğaziçi University  
Kandilli Observatory and Earthquake  
Research Institute (KOERI)  
Cengelkoy Uskudar

34684 Istanbul, Turkey  
Tel: +90 216 516 32 60  
Fax: +90 216 332 26 81  
Cel: +90 532 638 54 19  
Email: [ocal.necmioglu@boun.edu.tr](mailto:ocal.necmioglu@boun.edu.tr)

After reception of all the questionnaires, the responsible co-chairperson of TT-CT&TE will prepare the Exercise Report that will be circulated among participants before further distribution to the Architecture Task Team and ICG/NEAMTWS. The decision on NEAMTWS-ECTE2 will be made based on the discussions among with reference to this evaluation report.

### 3.7 POSSIBLE TIMETABLE FOR NEAMTWS-ECTE2

During the Tsunami and Civil Protection Workshop at JRC in Ispra, Italy, 15-16 June, it was anticipated that most likely a second exercise will be necessary. A possible timetable for NEAMTWS-ECTE2 is presented below:

30 September 2011	– 1st Announcement
	– 1st Announcement to be sent to TWFPs not only through Permanent Missions but also directly to their registered email addresses
14 October 2011	2nd Announcement
<b>26 October 2011</b>	– <b>Conduct of ECTE2.</b>
	– Questionnaires should be sent back.
4 November 2011	Report should be distributed to the Exercise Participants for validation.
11 November 2011	Report should be validated.
14 November 2011	Report will be distributed to the TT members
23–25 November 2011	NEAMTWS-VIII in Santander, Spain.

## ANNEX I

### **TERMS OF REFERENCE OF THE TASK TEAM ON THE COMMUNICATION TEST AND TSUNAMI EXERCISES**

#### **Mandate**

As part of the preparations phase for the NEAMTWS, the Task Team on Communication Test and Tsunami Exercises will:

- Refine procedures for testing the communication of tsunami alert messages between National Tsunami Warning Centres and Tsunami Warning Focal Points, including speed and availability within NEAMTWS region.
- Conduct a Workshop ahead of the enlarged Communication Test to inform about the procedures and discuss the practical means of the Tsunami Exercise in 2012. Participants: NTWC, TWFPs, TNCs, Civil Protection authorities, IT experts, representatives of relevant organizations working in the NEAMTWS region.
- Prepare and conduct the test and organize its assessment.
- Contribute to reviewing and proposing amendments to the relevant parts of the Operational Users Guide in the light of experience with the tests.
- Based on experience gained, set-up procedures for the first NEAM Tsunami exercise to be conducted in 2012.
- Report to ICG/NEAMTWS-VIII.

#### **Modus operandi**

The Task Team will mainly work by correspondence, but hold a first meeting at the beginning of 2011 and a final one, in preparation for the next ICG meeting. Other meetings will be held as needed.

The offer of JRC to host the workshop is acknowledged.

ANNEX II

**SAMPLE TEST MESSAGES**

**Sample Message Test for email and fax**

**Subject:** TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

**Body:**

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)  
ISSUED AT 1430Z 10 AUG 2011

... TSUNAMI COMMUNICATION TEST ...

THIS TEST APPLIES TO ... CGCC(BELGIUM)... BAS(BULGARIA)... INMG(CAPE VERDE)...  
NPRD(CROATIA)... COC(CYPRUS)... DMI(DENMARK)... NRIAG(EGYPT)... EMI(ESTONIA)...  
MCND(FINLAND)... GSC(FINLAND)... CENALT(FRANCE) ... BSH(GERMANY...  
DWD(GERMANY)... NOA(GREECE) ... DPC (ITALY) ... GNC(LEBANON)... MFA(MALTA)...  
CSPM(MONACO)... KNMW(NETHERLANDS)... DCPEP(NORWAY)... NCCROPP(POLAND)...  
IM (PORTUGAL)... NIEP(ROMANIA)... SIRPAT(RUSSIAN FEDERATION)... DGPCE(SPAIN)...  
SMHI(SWEDEN)... SWO(SYRIA)... DEMP(TURKEY)... HO/DFID(UNITED KINGDOM

FROM – KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO – TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION TEST  
EXERCISE

SUBJECT – FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION TEST

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS  
AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND SEND IT  
ACCORDING TO THE NEAMTWS-ECTE1 INSTRUCTIONS

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

**Sample Test Message for GTS**

**Body:**

WEME40 LTAA YYGGgg

TSUWCT

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)  
ISSUED AT 1430Z 10 AUG 2011

... TSUNAMI COMMUNICATION TEST ...

THIS TEST APPLIES TO ... CGCC(BELGIUM)... BAS(BULGARIA)... INMG(CAPE VERDE)...  
NPRD(CROATIA)... COC(CYPRUS)... DMI(DENMARK)... NRIAG(EGYPT)... EMI(ESTONIA)...  
MCND(FINLAND)... GSC(FINLAND)... CENALT(FRANCE) ... BSH(GERMANY...  
DWD(GERMANY)... NOA(GREECE) ... DPC (ITALY) ... GNC(LEBANON)... MFA(MALTA)...  
CSPM(MONACO)... KNMW(NETHERLANDS)... DCPEP(NORWAY)... NCCROPP(POLAND)...  
IM (PORTUGAL)... NIEP(ROMANIA)... SIRPAT(RUSSIAN FEDERATION)... DGPCE(SPAIN)...  
SMHI(SWEDEN)... SWO(SYRIA)... DEMP(TURKEY)... HO/DFID(UNITED KINGDOM

FROM – KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO – TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION TEST  
EXERCISE

SUBJECT – FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION TEST

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS  
AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND SEND IT  
ACCORDING TO THE NEAMTWS-ECTE1 INSTRUCTIONS

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001



ANNEX III

**INFORMATION ON MESSAGE PROVIDER AND RECEIVER**

**Information on message provider**

Email used to broadcast the communication test message:

Fax number used to broadcast the communication test message:

Fax ID code that is automatically broadcast:

Name of Agency:

Contact name:

*Contacts:*

Phone:

Fax<sup>1</sup>:

E-mail:

Mailing address:

<sup>1</sup>*Include all the lines used by the Fax machine in case of parallel broadcasting.*

**Information on message receiver**

Email used to receive the communication test message:

Fax number used to receive the communication test message:

Name of Agency:

Contact name:

*Contacts:*

Phone:

Fax:

E-mail:

Mailing address:

ANNEX IV

**EVALUATION QUESTIONNAIRE**

**Evaluation questionnaire to message provider**

- 1) Provide the time<sup>1</sup> of delivery of each message by email.
- 2) Provide the time<sup>1</sup> of delivery of each message by fax.
- 3) Provide the time<sup>1</sup> of delivery of each message by GTS and explain the procedure used.
- 4) Did you receive any error messages? If yes, describe the errors observed for all dissemination technologies and addresses concerned.
- 5) Did you use an operational service to deliver the email messages or prepared a special one?
- 6) Describe briefly the service used for email distribution.
- 7) Did you use an operational service to deliver the fax messages or prepared a special one?
- 8) Did you use an operational service to deliver the GTS messages or prepared a special one?
- 9) Describe briefly the preparation made in your agency for the Communication Test Exercise.
- 10) Describe briefly the procedures taken during the exercise, before time zero, and after time zero.
- 11) Describe briefly the service used for fax distribution.
- 12) Did you synchronize the PC before distributing the email messages? If yes, describe briefly the procedure used.
- 13) Did you synchronize the fax machine before sending the messages? If yes, describe briefly the procedure used.
- 14) Describe in detail the procedure of sending the GTS message and report any problems observed.
- 15) Did you find the exercise useful in assessing the readiness of your agency to distribute tsunami related messages?
- 16) Do you have any comments on the exercise?
- 17) Do you have any suggestions for the next exercises?
- 18) Please annex to this report the confirmation sheets from the fax<sup>2</sup> machine (if available) and a copy of the messages distributed by email<sup>3</sup> and GTS.

---

<sup>1</sup> All times should be provided in Universal Time.

<sup>2</sup> Please verify that the time-stamp information is visible on the document.

<sup>3</sup> Preferably the message text appended to this report should be copied from directly from the mail box server (see Annex VIII for an example), in order to provide all the details on timing and routing.

**Evaluation questionnaire to message receiver**

- 1) Did you receive the communication test message by email?
- 2) Provide the time<sup>1</sup> stamp of the email message
- 3) Provide the time<sup>1</sup> when the email message was received and understood by the operator.
- 4) Was the provider e-mail address as expected?
- 5) Was the e-mail message complete as expected? If not, report the differences.
- 6) Did you receive the communication test message by fax?
- 7) Provide the time<sup>1</sup> stamp of the fax message
- 8) Provide the time<sup>1</sup> when the fax message was received and understood by the operator
- 9) Was the provider fax number as expected?
- 10) Was the fax message complete as expected? If not, report the differences.
- 11) Did you receive the communication test message by GTS?
- 12) Provide the time<sup>1</sup> stamp of the GTS message.
- 13) Provide the time<sup>1</sup> when the GTS message was received and understood by the operator.
- 14) Was the GTS message complete as expected? If not, report the differences.
- 15) Did the operator that received the message understand it's content and knew how to respond to it?
- 16) Describe briefly the preparation made in your agency for the Communication Test Exercise.
- 17) Did you synchronize the PC before distributing the email messages? If yes, describe briefly the procedure used
- 18) Did you synchronize the fax machine before sending the messages? If yes, describe briefly the procedure used.
- 19) Did you find the exercise useful in confirmation communication contacts and delays?
- 20) Do you have any comments on the exercise?
- 21) Do you have any suggestions for the next exercises?
- 22) Please annex to this report a copy of the fax<sup>2</sup> message received and a copy of the messages received by email<sup>3</sup> and GTS.

---

<sup>1</sup> All times should be provided in Universal Time.

<sup>2</sup> Please verify that the time-stamp information is visible on the document. See Annex IX for an example of time stamp.

<sup>3</sup> Preferably the message text appended to this report should be copied from directly from the mail-box server (see Annex VIII for an example), in order to provide all the details on timing and routing.

ANNEX V

ESTABLISHED NEAMTWS TNCS AND TWFPs AS OF 15 JUNE 2011

Member State	TNC	TWFP
BELGIUM	Centre Gouvernementale de Coordination et de Crise	Centre Gouvernementale de Coordination et de Crise
BULGARIA	Bulgarian Institute of Oceanology (BAS)	Bulgarian Institute of Oceanology (BAS)
CAPE VERDE	Instituto Nacional de Meteorologia e Geophísica	Instituto Nacional de Meteorologia e Geophísica
CROATIA	Institute of Oceanography and Fisheries*†	National Protection and Rescue Directorate – National Center 112
CYPRUS	Cyprus Oceanography Centre, University of Cyprus*	Cyprus Oceanography Centre, University of Cyprus*
DENMARK	Danish Meteorological Institute	Danish Meteorological Institute
EGYPT	National Institute of Oceanography and Fisheries (NIOF)	National Research Institute of Astronomy and Geophysics (NRIAG)
ESTONIA	Estonian Marine Institute, University of Tartu*	Estonian Marine Institute, University of Tartu*
FINLAND	Finnish Institute of Marine Research	Monitoring Center for Natural Disasters, Finnish Meteorological Institute
		Government Situation Center, Prime Minister's Office
FRANCE	Ministère de l'Ecologie, du Développement et de l'Aménagement Durables	Laboratoire de Géophysique, Commissariat à l'Énergie Atomique (CEA)
GERMANY	Federal Maritime and Hydrographic Agency (BSH)	1) Federal Maritime and Hydrographic Agency (BSH)
		2) Deutscher Wetterdienst
GREECE	National Observatory of Athens (NOA)	National Observatory of Athens (NOA)
IRELAND	Geological Survey of Ireland*	
ISRAEL	Israel Oceanographic and Limnological Research*	
ITALY	Dipartimento della Protezione Civile	Dipartimento della Protezione Civile
LEBANON	Geophysical National Center, National Council for Scientific Research	Geophysical National Center, National Council for Scientific Research
MALTA	Ministry of Foreign Affairs*	Ministry of Foreign Affairs*

<b>Member State</b>	<b>TNC</b>	<b>TWFP</b>
<b>MONACO</b>	<b>Centre Scientifique de Monaco</b>	<b>Compagnie des Sapeurs-Pompiers de Monaco</b>
NETHERLANDS		<b>KNMW Royal Netherlands Meteorological Institute</b>
NORWAY		<b>Directorate for Civil Protection and Emergency Planning (DSB)</b>
POLAND		<b>Centre for Coordination of Rescue Operations and Protection of Population, National Headquarters of the State Fire Service</b>
<b>PORTUGAL</b>	<b>Instituto de Meteorologia</b>	<b>Instituto de Meteorologia</b>
<b>ROMANIA</b>	<b>National Institute for Earth Physics</b>	<b>National Institute for Earth Physics</b>
<b>RUSSIAN FEDERATION</b>	<b>State Institute Research and Production Association “Typhoon”</b>	<b>State Institute Research and Production Association “Typhoon”</b>
SLOVENIA	<b>Environmenta Agency of the Republic of Slovenia (EARS)</b>	
<b>SPAIN</b>	<b>Instituto Español de Oceanografía</b>	<b>Direccion General de Proteccion Civil y Emergencias</b>
<b>SWEDEN</b>	<b>Swedish Civil Contingencies Agency (MSB)</b>	<b>Swedish Meteorol. &amp; Hydrological Institute (SMHI)</b>
<b>SYRIA</b>	<b>Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology</b>	<b>Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology</b>
<b>TURKEY</b>	<b>Kandilli Observatory and Earthquake Research Institute (KOERI)</b>	<b>Kandilli Observatory and Earthquake Research Institute (KOERI)</b>
		<b>Office of Prime Ministry, disaster and emergency management Directorate</b>
UKRAINE	Marine Hydrophysical Institute, National Academy of Sciences of Ukraine*†	
<b>UNITED KINGDOM</b>	<b>National Oceanographic Centre (NOC)</b>	<b>Humanitarian Operations, Department for International Development (DFID)</b>

**Bold:** all information provided

\* Official form not provided

† Validation required either through the PermDel, Head of the UNESCO NatCom or the Minister of Foreign Affairs

ANNEX VI

**GENERAL OVERVIEW OF GTS**

WMO's Global Telecommunication System (GTS) is the communications and data management component that allows the World Weather Watch Programme (WWW) to operate through the collection and distribution of information critical to its processes. GTS is defined as: *"The coordinated global system of telecommunication facilities and arrangements for the rapid collection, exchange and distribution of observations and processed information within the framework of the World Weather Watch."* It is implemented and operated by National Meteorological Services (Annex VIII) of WMO Members and International Organizations, such as ECMWF and EUMETSAT.

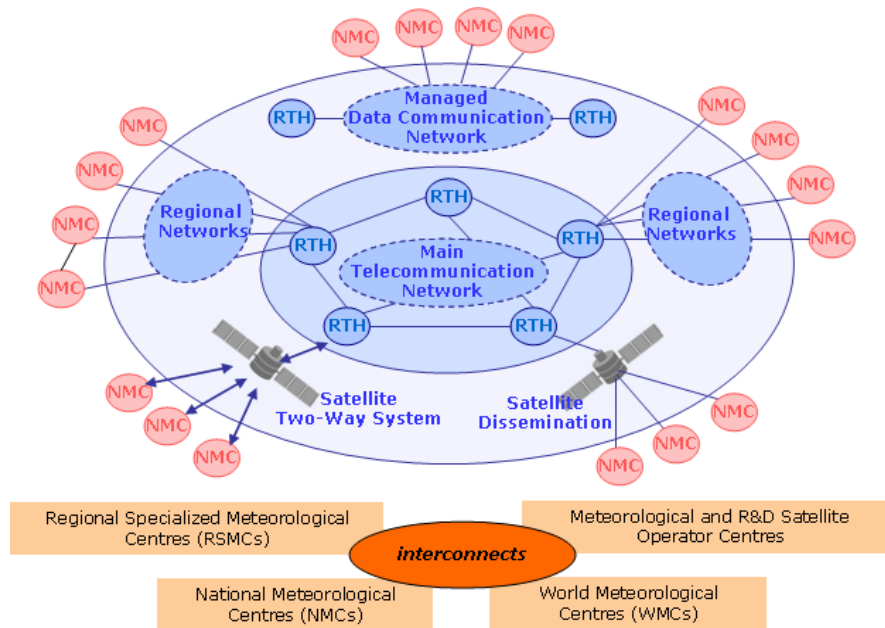


Figure VI-1. Structure of GTS

GTS also provides telecommunication support to other WMO programmes, facilitating the flow of data and processed products to meet requirements in a timely, reliable and cost-effective way, ensuring that all Members have access to all meteorological and related data, forecasts and alerts. This secured communication network enables real-time exchange of information, critical for forecasting and warnings of hydrometeorological hazards in accordance with approved procedures.

The GTS has a hierarchical structure on three levels. The Main Telecommunication Network (MTN), linking together 3 World Meteorological Centres (Melbourne, Moscow and Washington) and 15 Regional Telecommunication Hubs (Algiers, Beijing, Bracknell, Brasilia, Buenos Aires, Cairo, Dakar, Jeddah, Nairobi, New Delhi, Offenbach, Toulouse, Prague, Sofia and Tokyo). This core network has the function of providing an efficient, rapid and reliable communication service between the Meteorological Telecommunication Centres (MTCs).

The Regional Meteorological Telecommunication Networks (RMTNs) is an integrated network of circuits covering the six WMO regions – Africa, Asia, South America, North America, Central America & the Caribbean, South-West Pacific, Europe and Antarctic – and interconnecting the MTCs thus ensuring the collection of observational data and regional selective distribution of meteorological and other related information to Members. Until the integrated network is completed, HF-radio-broadcasts may be used in order to meet the requirements of the WWW for the dissemination of meteorological information.

The National Meteorological Telecommunication Networks (NMTNs) enable the National Meteorological Centres (NMCs) to collect observational data and receive and distribute meteorological information on a national level.

Satellite-based data collection and/or data distribution systems are also integrated in the GTS as an essential element of the global, regional and national levels of the GTS. Data collection systems operated via geostationary or near-polar orbiting meteorological/environmental satellites, including ARGOS, are widely used for the collection of observational data from *Data Collection Platforms*. International data distribution systems operated either via meteorological satellites such as the Meteorological Data Distribution (MDD) of METEOSAT, or via telecommunication satellites, such as RETIM or FAX-E via EUTELSAT are efficiently complementing the point-to-point GTS circuits. Several Countries, including Argentina, Canada, China, France, India, Indonesia, Mexico, Saudi Arabia, Thailand and the USA, have implemented satellite-based multi-point telecommunication systems for their national Meteorological Telecommunication Network.

The MTCs function is to accommodate the volume of meteorological information and its transmission within the required time limits for global and interregional exchange of observational data, processed information and any other data required by its Members. Regional Telecommunication Hubs (RTHs) on the MTN perform an interface function between the RMTNs and the MTN.

The GTS is an integrated network of surface-based and satellite-based telecommunication links of point-to-point circuits, and multi-point circuits, interconnecting meteorological telecommunication centres operated by countries for round-the-clock reliable and near-real-time collection and distribution of all meteorological and related data, forecasts and alerts. This secured communication network enables real-time exchange of information, critical for forecasting and warning of hydrometeorological hazards.

WMO GTS is the backbone system for global exchange of data and information in support of multi-hazard, multipurpose early warning systems, including all meteorological and related data; weather, water and climate analyses and forecasts; tsunami related information and warnings, and seismic parametric data. WMO is building on its GTS to achieve an overarching WMO Information System (WIS), enabling systematic access, retrieval, and dissemination and exchange of data and information of all WMO and related international programmes.



ANNEX VII

**LIST OF NATIONAL METEOROLOGICAL SERVICES IN NEAM REGION**

Albania	The Hydrometeorological Institute
Algeria	Ministère des Transports
Belgium	Institut Royal Météorologique
Bosnia and Herzegovina	Meteorological Institute
Bulgaria	National Institute of Meteorology and Hydrology
Croatia	Meteorological and Hydrological Service
Cyprus	Meteorological Service
Denmark	Danish Meteorological Institute
Egypt	The Egyptian Meteorological Authority
Estonia	Estonian Meteorological and Hydrological Institute
Finland	Finnish Meteorological Institute
France	Météo-France
Georgia	Department of Hydrometeorology
Germany	Deutscher Wetterdienst
Greece	Hellenic National Meteorological Service
Iceland	Icelandic Meteorological Office
Ireland	The Irish Meteorological Service
Israel	Israel Meteorological Service
Italy	Servizio Meteorologico
Latvia	Latvian Environment, Geology and Meteorology Agency
Lebanon	Service Météorologique
Lithuania	Lithuanian Hydrometeorological Service
Libya	Libyan National Meteorological Centre
Malta	Meteorological Office
Monaco	Mission Permanente de la Principauté de Monaco
Montenegro	Hydrometeorological Institute of Montenegro
Morocco	Direction de la Météorologie Nationale
Netherlands (the)	Royal Netherlands Meteorological Institute
Norway	Norwegian Meteorological Institute
Poland	Institute of Meteorology and Water Management
Portugal	Instituto de Meteorologia
Romania	National Meteorological Administration
Russian Federation	Russian Federal Service for Hydrometeorology and Environmental Monitoring

Serbia	Republic Hydrometeorological Service of Serbia
Slovenia	Meteorological Office
Spain	Agencia Estatal de Meteorología
Sweden	Swedish Meteorological and Hydrological Institute
Syrian Arab Republic	Ministry of Defence Meteorological Department
Tunisia	National Institute of Meteorology
Turkey	Turkish State Meteorological Service
Ukraine	Ukrainian Hydrometeorological Center
United Kingdom	Met Office

ANNEX VIII

EXAMPLE OF MESSAGE DETAILS AVAILABLE IN THE SERVER MAIL BOX

```
From ???@??? Thu Jun 24 10:05:46 2010
Return-Path: <hl_ntwc@gein.noa.gr>
Delivered-To: pt.ntwc@meteo.pt
Received: from eris.meteo.pt (eris1.meteo.pt [193.137.20.2])
    by afrodite.meteo.pt (Postfix) with ESMTTP id B35684546A9
    for <pt.ntwc@meteo.pt>; Thu, 24 Jun 2010 10:05:47 +0100 (WEST)
Received: from ste.anubis.internal (unknown [80.67.98.165])
    (using TLSv1 with cipher ADH-AES256-SHA (256/256 bits))
    (No client certificate requested)
    by eris.meteo.pt (Postfix) with ESMTTPS id 840886A204F
    for <pt.ntwc@meteo.pt>; Thu, 24 Jun 2010 10:04:20 +0100 (WEST)
Received: from mx.anubis.local (ste [10.1.2.2])
    by ste.anubis.internal (Postfix) with ESMTTP id 2012A7D815C
    for <pt.ntwc@meteo.pt>; Thu, 24 Jun 2010 10:05:19 +0100 (WEST)
Received: from egelados.gein.noa.gr (egelados.gein.noa.gr [194.177.194.10])
    by mx.anubis.local (Postfix) with ESMTTP id D92B17D8159;
    Thu, 24 Jun 2010 10:05:18 +0100 (WEST)
Received: from unknown (localhost [127.0.0.1])
    by egelados.gein.noa.gr (8.12.10+Sun/8.12.10) with ESMTTP id o50956nf005048;
    Thu, 24 Jun 2010 12:05:06 +0300 (EEST)
Date: Thu, 24 Jun 2010 12:04:55 +0300
From: hl_ntwc <hl_ntwc@gein.noa.gr>
To: Nicolas.alabrune@cea.fr, pt.ntwc@meteo.pt, twfp_tr@boun.edu.tr
Subject: TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001
Message-ID: <20100624120455.0000538a@unknown>
Organization: Geodynamics Institute
X-Mailer: Claws Mail 3.7.6 (GTK+ 2.16.0; i586-pc-mingw32msvc)
Mime-Version: 1.0
Content-Type: text/plain; charset=UTF-8
X-EsetId: 4DE50F2977A9B96C52E30F7D7FFEF9

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001
NATIONAL OBSERVATORY OF ATHENS (NOA)
ISSUED AT 0900 UTC 24 JUN 2010
```

ANNEX IX

EXAMPLE OF TIME STAMPS ON A FAX MESSAGE

Only the bottom line provides the reception time.

<b>9/30/2010 9:39 AM</b> FROM: IM-LI TO: 0033169267085 PAGE: 001 OF 001
TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001 INSTITUTO DE METEOROLOGIA, I.P. (IM) ISSUED AT 0935Z 30 SEP 2010
... TSUNAMI COMMUNICATION TEST ... THIS TEST APPLIES TO ... CEA/DASE (FRANCE) ... PROTEZIONE CIVILE (ITALY) ... NOA (GREECE) ... KOERI (TURKEY)
FROM - INSTITUTO DE METEOROLOGIA, I.P. (IM) TO - TWFP PARTICIPANTS IN THE SECOND NEAMTWS COMMUNICATION TEST EXERCISE SUBJECT - SECOND NEAMTWS TSUNAMI COMMUNICATION TEST
THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI WARNING SYSTEM
RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND SEND IT ACCORDING TO THE SECOND NEATWS-CTE INSTRUCTIONS
THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST THIS WILL BE THE FINAL MESSAGE ISSUED
TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001
1
<b>30/09/10 11:41</b> Pg: 1

ANNEX X

**REFERENCES**

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**II.**

## **Evaluation Report**

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## 1. INTRODUCTION

The seventh session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS) was held from 23 to 25 November 2010 in Paris, France. It established a Task Team on Communication Test and Tsunami Exercises (TT-CT&TE), which is responsible for the preparation and conduct of the Enlarged Communication Test Exercise (NEAMTWS-ECTE1) in 2011 and the organization of its assessment. The aim of the NEAMTWS-ECTE1 was to refine procedures for testing the communication of tsunami alert messages between National Tsunami Warning Centres and **all nominated Tsunami Warning Focal Points (TWFPs)** of the participating Member States, including speed and availability within NEAM region. CTEs conducted during the previous inter-sessional period concentrated on other communication methods like Global Telecommunication System (GTS), and therefore utilization of GTS during the NEAMTWS-ECTE1 was another focus of the Exercise.

TWFPs are the key players in terms of translating/interpreting the warning message into essential information for the national Civil Protection and Disaster Management Authorities (CPA-DMA), especially if the TWFPs are not CPA-DMA by themselves. Therefore, NEAMTWS-ECTE1 has been considered as an important tool in terms of seeking the involvement of CPA-DMAs, especially considering the first Tsunami Exercise in the NEAM region, NEAM Wave 12, which is currently being planned and is expected to take place in the second half of 2012.

NEAMTWS-ECTE1 aimed to address the questions related to the evaluation and issuance of the warning message by tsunami watch/warning centres, as in the previous CTEs, but also attempted to assess the national and/or local response and warning dissemination mechanisms once emergency authorities receive a warning. NEAMTWS-ECTE1 involved all possible TWFPs in 31 countries using conventional message dissemination channels that have been previously subject to test between candidate RTWC and NTWCs. Message dissemination using GTS was considered to be only available between TWFPs that have this system available to them at the operational level. It is important to note that while during the previous test exercises (CTE1 and CTE2), the total number of delivery addresses were 8, it has increased up to 139 in ECTE1. Figure 1 shows the participation in ECTE1.

Orange and green colours indicate message recipient countries, where the latter have provided the evaluation questionnaires in addition. The 31 Member States of the ICG/NEAMTWS are: Belgium, Bulgaria, Cape Verde, Croatia, Cyprus, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Lebanon, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovenia, Spain, Sweden, Syria, Turkey, Ukraine, and United Kingdom.

The initial discussion of this Evaluation report took place during the NEAMTWS Task Team on Communication Test and Tsunami Exercise on 19 September 2011, upon which, in contrary to the original plan, it was decided to not to conduct ECTE-2 this year but to conduct a smaller scale communication test (SSCT-1) focusing on the problem areas of ECTE1, such as fax and GTS, to consolidate the lessons learnt from NEAMTWS-ECTE1. SSCT-1 was conducted on 26 October 2011 around 9:00 UTC and it involved only fax and GTS messages. The message provider was Kandilli Observatory and Earthquake Research Institute (KOERI) again. During SSCT-1, fax recipients were limited to those that have experienced a communication problem during the NEAMTWS-ECTE1. This report, therefore, includes also an evaluation of SSCT-1, given in Annex XVI.

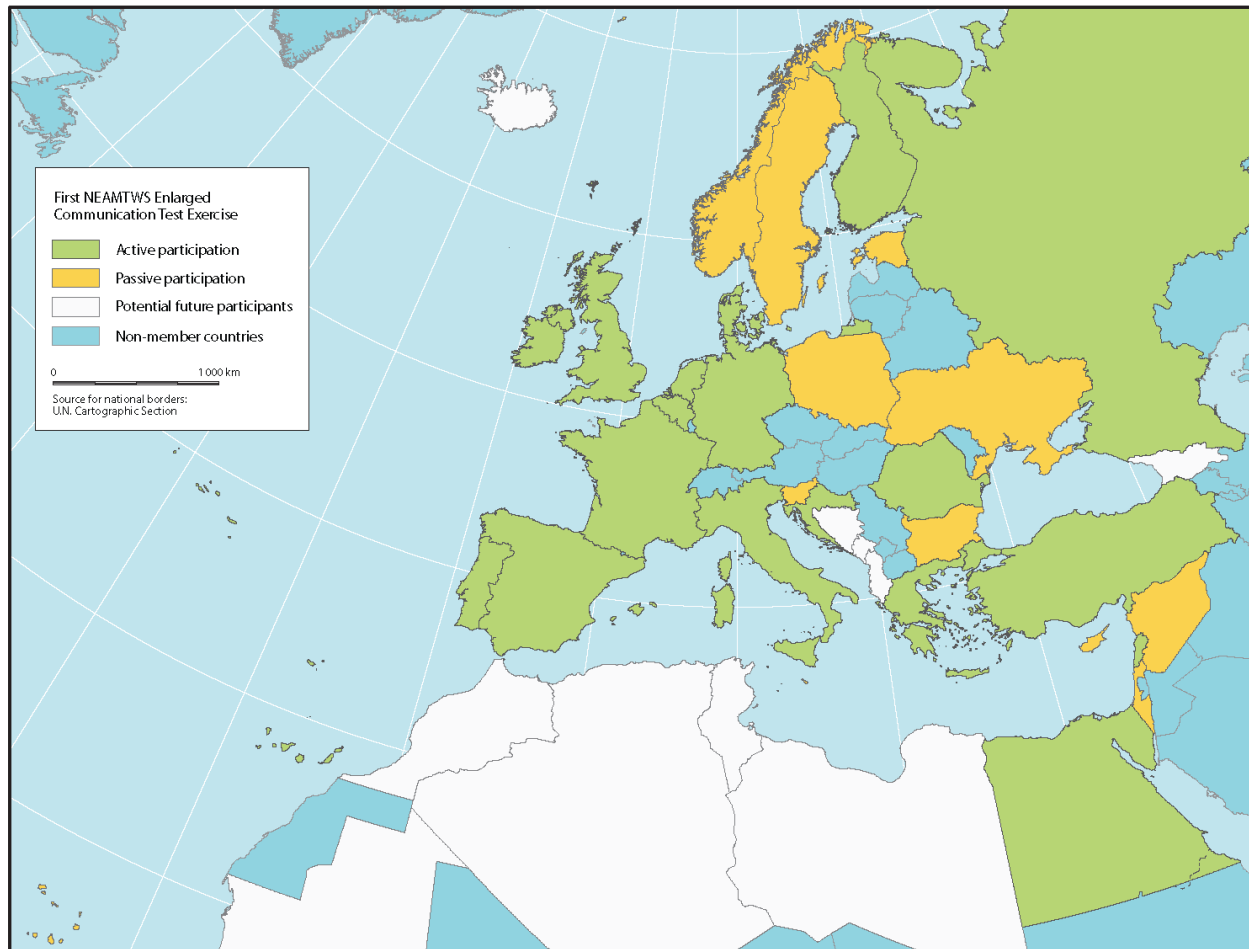


Figure.1 Map showing NEAMTWS-ECTE1 participant countries

## 2. RECOMMENDATIONS AND CONCLUSIONS OF THE PREVIOUS TASK TEAM (TT-CTE)

In 2010, TT-CTE was the responsible Task Team for the CTEs during the previous intersessional period. Recommendations and conclusions of TT-CTE were submitted in the Intersessional Activity Report during the seventh session of NEAMTWS held in November 2010 in Paris, France, and are listed below:

- (i) TT-CTE **suggested** that other communication systems, like GTS, should be used in future Communication Test Exercises.
- (ii) TT-CTE **recommended** the use of multiple phone lines in parallel to speed up the delivery of messages by fax.
- (iii) TT-CTE **recommended** that, for future exercises, participants report more accurately the reception time of their fax messages.
- (iv) TT-CTE **recommended** that the TOR for future exercises should clarify the rules used for the numbering of Tsunami Communication Test Messages.
- (v) TT-CTE **recommended** that future exercises will endorse the definition of the reference time as was adopted in CTE2: The time when the decision is taken at the NTWC/RTWC that a tsunami message has to be issued, presumably based on earthquake information.



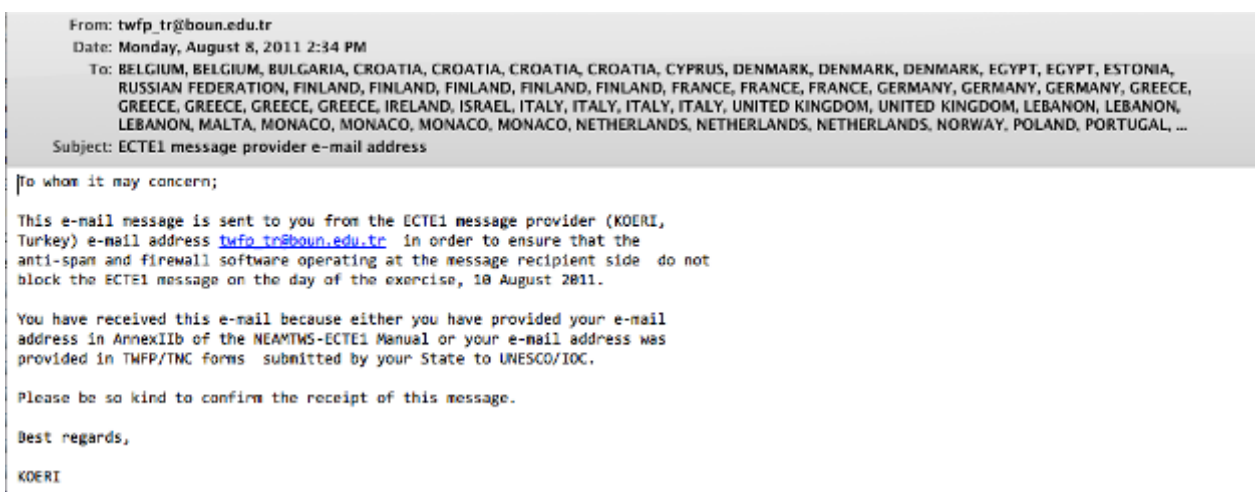
Annex III forms (Exercise Manual, IOC/2001/TS/98) sent to either IOC Secretariat or Co-Chair of TT-CT&TE did provide different and/or additional information with respect to what was provided in TWFP Contact List. This, as a result, led to several inconveniences as various cross-checks were necessary to perform. Moreover, in most cases, the information requested in Annex III forms were provided by not specifically using Annex III; i.e. by sending an email with the information requested.

#### Recommendation 2

Participants should be requested strongly to use the Annex III form available in the Tsunami Early Warning and mitigation system in the North-eastern Atlantic, the Mediterranean and connected seas. First Enlarged Communication Test Exercise (ECTE1).  
(Exercise Manual, IOC/2001/TS/98)

### 3.2.1 Preparations concerning email

In the ECTE1 Exercise Manual, it is suggested that the final announcement of the NEAMTWS-ECTE1 should be sent from the message provider address, with a copy to the message recipient addresses in order to ensure that the anti-spam and firewall software operating in the Message Receivers networks do not block the Communication Test Exercise Message. The final announcement, however, was not sent from the message provider address, but an email distribution list was prepared and the message provider conducted a preliminary test on 8 August 2011. The text of this e-mail is given below. The preliminary test indicated that glitches with four email addresses. One email address did not exist at all, and the TWFP of one country has reported that he stepped down as TWFP since 2009, although without officially informing the IOC Secretariat.



Preliminary e-mail sent to ECTE1 participants

#### Recommendation 3

Countries should be encouraged on a regular basis to keep the contact information of their TWFP up to date.

Moreover, the message provider contacted the IT department and asked them to provide email logs after ECTE1. It was also found out that the email server had a limit of maximum 100 email addresses in order to avoid distribution of spam email.

**Recommendation 4**

Message providers should check any limitation in the number of email recipients. A preliminary test to detect possible issues with e-mail dissemination should be conducted 3 days before the exercise.

**3.2.2 Preparations concerning fax**

The message provider had a fax server with 8 channels available for the ECTE1. The fax server has been tested and a mal-functioning modem was replaced prior to ECTE1. Fax numbers sequenced in such a way so that a fax has been sent to the primary fax number of each country first, where countries are sorted in alphabetical order. The alternate fax numbers of each country follows this first group of fax numbers. The logic is presented in Table 1.

001_COUNTRY-1	INSTNO-1	FAXNO-PRIM
00N_COUNTRY-N	INSTNO-1	FAXNO-PRIM
101_COUNTRY-1	INSTNO-2	FAXNO-PRIM
10N_COUNTRY-N	INSTNO-2	FAXNO-PRIM
201_COUNTRY-1	INSTNO-1	FAXNO-ALT

Table 1.The systematic sequencing of fax numbers

In order to prevent unnecessary blockings, the fax server is set up in such a way that for each number there will be three attempts to send the fax message, where in each attempt the fax recipient will be ringed 4 times.

**Recommendation 5**

Fax servers should be set up in a way so that each recipient fax number will be subject to at least three attempts to send the fax message, where in each attempt the fax recipient will be ringed at least five times.

**Recommendation 6**

It is recommended to use at least an 8-channel fax server for the fax dissemination.

**3.2.3 Preparations concerning GTS**

A collaboration agreement had been signed with Turkish State Meteorological Service (TSMS) for the GTS capacity building. Initially, an ftp link has been established which allowed the message provider to send GTS messages through an internet connection to TSMS. A preliminary GTS test has been conducted on 26 July 2011 between CENALT (France) and KOERI successfully, using this communication link. This connection was extended later to an in-situ GTS connection after installing a dedicated satellite hub and modem directly connected to GTS. Representatives of TSMS paid a visit to KOERI on 5 August 2011 to install the relevant systems and software. A second GTS test has been conducted on 8 August 2011 between CENALT (France) and KOERI successfully using this in-situ GTS link.

**3.2.4 Other preparations relevant to ECTE1**

Annex III (IOC/2001/TS/98Vol.1) was provided to the participants only at the time of the Second Announcement, on 3 August 2011, namely.

**Recommendation 7**

Annex III (Exercise Manual, IOC/2001/TS/98) information should be made available at the time of the First Announcement and should be sent as a separate document.

Participants provided Annex III forms to the IOC Secretariat and/or to the TT-CT&TE Co-Chair responsible for ECTE1, however it was not clear to whom and by when these forms should be sent.

**Recommendation 8**

TT-CT&TE should decide to whom forms of Annex III of the ECTE1 (Exercise Manual, IOC/2001/TS/98) should be sent and a deadline at least five days before the conduct of the exercise should be introduced in the next ECTE.

**4. NEAMTWS-ECTE1 STORY BOOK**

The Messages for email, fax and GTS were pre-formatted, missing only the time information on the header. T0 time (as adopted from the CTE2, as the instant when the message provider is aware that a Tsunami message has to be delivered) was 10:36:00 UTC. The Co-Chair requested the operator the start of the exercise at T0. The operator used an interface to access the GTS pre-formatted message, which automatically updated the time information of the message and send the GTS message (Annex VI) using the same interface at 10:36:35 UTC ( Annex VII). The operator then, manually accessed the folder of the pre-formatted messages in order to select the pre-formatted message for email. The operator copied and pasted the message body and subject to the email interface and selected the previously created email distribution lists from the interface and sent the email test message (Annex III) at 10:38:09 (Annex IV). The operator then copied the pre-formatted fax message, and accessed manually the fax server to send the message. The operator then, selected the previously created fax-number list and sent the fax message at 10:39. The operator then, realized that time information of the message was not updated and performed the necessary action to delete the fax message from the fax server, upon which a confirmation of deletion was provided by the system. The operator updated the time information of the fax message and sent a second fax message at 10:49.

At the time of the exercise, there were five persons in the operator room: the operator, Co-Chair of TT-CT&TE, correspondents of Le Monde and Le Figaro newspapers, and a camera-man from a Turkish News Agency.

**Recommendation 9**

The use of following parameters in addition to T0 for the evaluation of message provider's performance is recommended:

T1G: time stamp of GTS message.

T1E: time stamp of e-mail message.

T1F: time stamp of fax message.

**5. EVALUATION OF NEAMTWS-ECTE1**

**5.1 EVALUATION OF THE MESSAGES AND DISSEMINATION DELAYS**

One of the feedbacks after the exercise was that the names of some countries and institutions were not reflected in the message body. Moreover, during the preparation phase, the secretariat

checked and provided the abbreviations of the institutions in the NEAM region. In one case, an abbreviation different than what was provided in TWFP contact list was used.

#### Recommendation 10

The names of countries/institutions and corresponding abbreviations to be used in the test messages are to be taken from I-OUG.

#### Recommendation 11

Participants should be urged to read the communication test exercise documentation in detail and report any inconsistencies to the responsible TT-CT&TE Co-Chair. The manual should also clearly reflect this issue.

### 5.1.1 Evaluation of E-MAIL message dissemination

The evaluation of the e-mail message dissemination was done mainly based on the email logs received by the IT department of Boğaziçi University (KOERI). The latency of 129 seconds between T0 and T1E (time stamp of email message) can be considered acceptable. This relatively long time delay is a result of the manual operation of the email dissemination.

Upon dissemination of the email message, a problem in the message text format was observed at the email addresses of the message provider, included in the email dissemination list. However, the email message was displayed correctly on the email interface used by the message provider. At the recipient level, some email recipients have received the email message with the wrong formatting (Figure 2) whereas some of them have not observed any problems with the text characters (Figure 3).

```
... TSUNAMI COMMUNICATION TEST ...
THIS TEST APPLIES TO &#8230; CGCCR(BELGIUM)&#8230; BAS(BULGARIA)&#8230;
INMG(CAPE VERDE)&#8230; NPRD(CROATIA)&#8230; OC(CYPRUS)&#8230;
DMI(DENMARK)&#8230; NRIAG(EGYPT)&#8230; EMI(ESTONIA)&#8230; FMI(FINLAND)&#8230;
FMI(FINLAND)&#8230; CENALT(FRANCE) &#8230; BSH(GERMANY&#8230;
DWD(GERMANY)&#8230; NOA(GREECE) &#8230; DPC(ITALY) &#8230; NCGR(LEBANON)&#8230;
MFA(MALTA)&#8230; SPMC(MONACO)&#8230; KNMW(NETHERLANDS)&#8230;
DSB(NORWAY)&#8230; NHQSFS(POLAND)&#8230; IM (PORTUGAL)&#8230;
NIEP(ROMANIA)&#8230; NPO "Typhoon"(RUSSIAN FEDERATION)&#8230;
DGPCE(SPAIN)&#8230; SMHI(SWEDEN)&#8230; SWO(SYRIA)&#8230; DEMP(TURKEY)&#8230;
DFID(UNITED KINGDOM)

FROM &#8211; KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO &#8211; TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION TEST
EXERCISE
SUBJECT &#8211; FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION TEST
```

Figure 2. Snapshot from the e-mail test message with a problem in the character-set used.

```

... TSUNAMI COMMUNICATION TEST ...
THIS TEST APPLIES TO ... CGCCR(BELGIUM)... BAS(BULGARIA)... INMG(CAPE VERDE)... MPRD(CROATIA)... OC(CYPRUS)...
MFA(MALTA)... SPMC(MONACO)... KMHU(NETHERLANDS)... DSB(NORWAY)... NHQSFS(POLAND)... IM (PORTUGAL)... NIEP(ROMAN

FROM - KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO - TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION TEST EXERCISE
SUBJECT - FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION TEST

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS AND TO TSUNAMI WARNING FOCAL
RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND SEND IT ACCORDING TO THE NEAMTWS
    
```

Figure 3. Snapshot from the e-mail test message with no problem in the character-set used.

The message provider has not a clear answer for this formatting issue. One possible explanation is the use of Mac OS system for creation of the pre-formatted test message, where message dissemination took place on a Windows operating system. The other explanation could be the use of ISO-8859-9 character set in the email program, which is specific to Turkish language. Moreover, different character sets used by the message receivers could also be an explanation.

**Recommendation 12**

ASCII character set should be used in all kinds of messages and/or message templates.

Statistical evaluation of the dissemination performance of the email message is given in Table 1 and detailed information can be found in Annex IV. Total number of e-mail recipients were 78, where 74 recipients received the e-mail message and 4 recipients did not. Overall it can be argued that the email message has been disseminated in a very short time and the average delay is less than 1 minute.

Number of countries:	<b>31</b>
Number of e-mail recipients:	<b>78</b>
Number of e-mail delivered:	<b>74</b>
MIN of e-mail delivery time:	<b>0:00:01</b>
MAX of e-mail delivery time:	<b>0:17:05</b>
MEDIAN of e-mail delivery time:	<b>0:00:20</b>
MEAN of e-mail delivery time:	<b>0:00:54</b>

Table 1. Statistical evaluation of the dissemination performance of the e-mail message

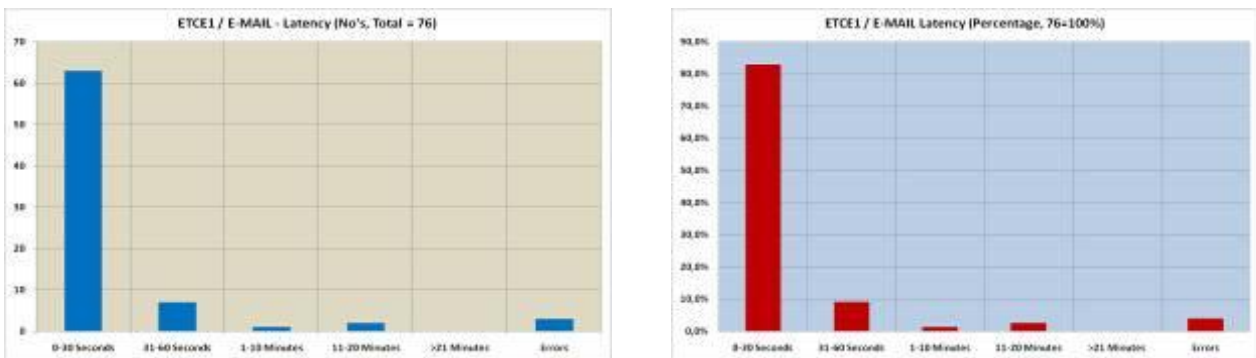


Figure 4. Graphical evaluation of the dissemination performance of the e-mail message



### 5.1.2 Evaluation of FAX message dissemination

Concerning the first fax message, the delay of 180 seconds between T0 and T1F1 can be considered acceptable. However, the first fax message had a wrong time information on the message text. The operator performed the necessary action to delete the fax message from the fax server, upon which a confirmation of deletion was provided by the system. The operator updated the time information of the fax message and sent a second fax message at 10:49 (T1F2). However, it was later realized that the first fax message was indeed sent. It is important to note that only one fax message was intended to be sent, as indicated in the message body. This error could have been prevented if an automatic system was in place and/or if the operator had updated the time information. Nevertheless, as the intention of the message provider was to send only one fax message (second fax message of the exercise), the latency of 780 seconds between T0 and T1F2 can be considered poor.

#### Recommendation 13

For the easier evaluation of fax message dissemination, the sequencing of the fax numbers should be done in such a way so that in each group, the last two digits of the three digit fax sequence code would always correspond to the same country, sorted in alphabetical order.

An example is given below:

101_COUNTRY-1 . .	INSTNO-1	FAXNO-PRIM
1XX_COUNTRY-N	INSTNO-1	FAXNO-PRIM
201_COUNTRY-1 . .	INSTNO-2	FAXNO-PRIM
1XX_COUNTRY-N	INSTNO-2	FAXNO-PRIM
201_COUNTRY-1 . .	INSTNO-1	FAXNO-ALT

Table 2. The proposal for systematic sequencing of fax numbers. The first digit identifies the first group of fax messages, consisting of each country's primary fax number. The following two digits are indicating the unique sequence number for each country sorted in alphabetical order.

#### Recommendation 14

TT-CT&TE should focus on the number of fax numbers to be used during any kind of message dissemination. It is recommended to limit the number of fax numbers to 2 per country/per institute, where the number of institutes per countries should be limited to 2, also. If required, messages could be distributed by the primary or alternate TWFPs to other national organizations. Any arrangement for this should be within the discretion of the respective country.

Statistical evaluation of the dissemination performance of the second fax message is given in Table 3 and detailed information can be found in Annex V. Among the 52 registered recipients, 35

have received the fax message whereas 17 did not. Five countries have not received any fax messages from the message provider. Four of these countries have provided no alternate fax numbers, however 26 countries have received at least one fax message. In one case, message provider had the wrong fax number entered in the database.

Number of countries:	<b>31</b>
Number of fax numbers:	<b>52</b>
Number of faxes delivered:	<b>35</b>
MIN fax transmission duration	<b>00:43.0</b>
MAX fax transmission duration:	<b>01:44.0</b>
MEDIAN fax transmission duration:	<b>00:56.0</b>
MEAN fax transmission duration:	<b>01:01.9</b>
MIN fax delivery time*:	<b>01:00.0</b>
MAX fax delivery time:	<b>23:00.0</b>
MEDIAN fax delivery time:	<b>05:00.0</b>
MEAN fax delivery time:	<b>07:08.6</b>
* excluding 00:00:00 delivery times which are not correct due to the min resolution of the fax delivery time.	

Table 3. Statistical evaluation of the dissemination performance of the second fax message

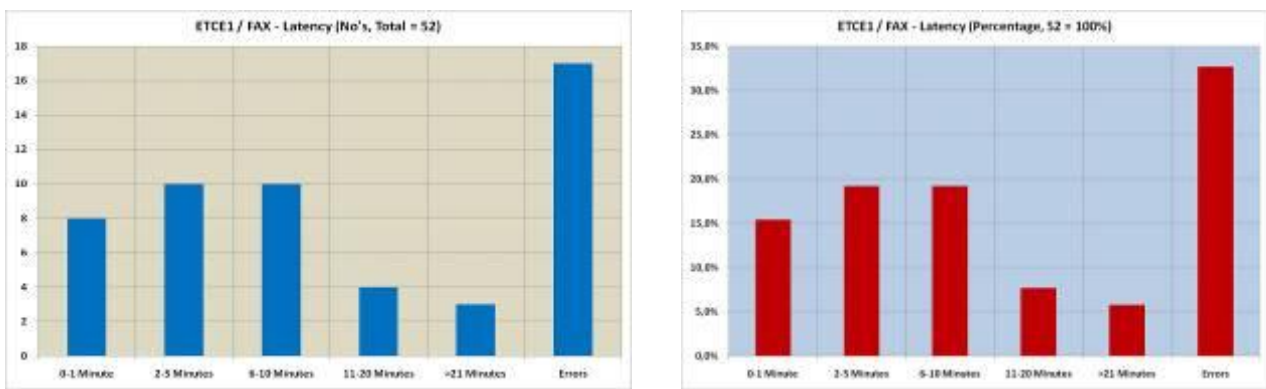


Figure 5. Graphical evaluation of the dissemination performance of the second fax message

**Recommendation 15**

Countries should be encouraged to provide alternate fax numbers.

**5.1.3 Evaluation of GTS message dissemination**

The latency of 36 seconds between T0 and T1G (time stamp of GTS message) can be considered very good. This short time delay is a result of the previously created interface allowing the operator to access a pre-formatted text message and to send it by refreshing the time information.

Statistical evaluation of the dissemination performance of the GTS message is given in Table 4 and detailed information can be found in Annex IX.

Number of GTS Receiver Countries:	<b>9</b>
Min Latency:	<b>0:02:25</b>
Max Latency:	<b>0:13:41</b>
Mean Latency:	<b>0:04:25</b>
Median Latency:	<b>0:05:16</b>

Table 4. Statistical evaluation of the dissemination performance of the GTS message

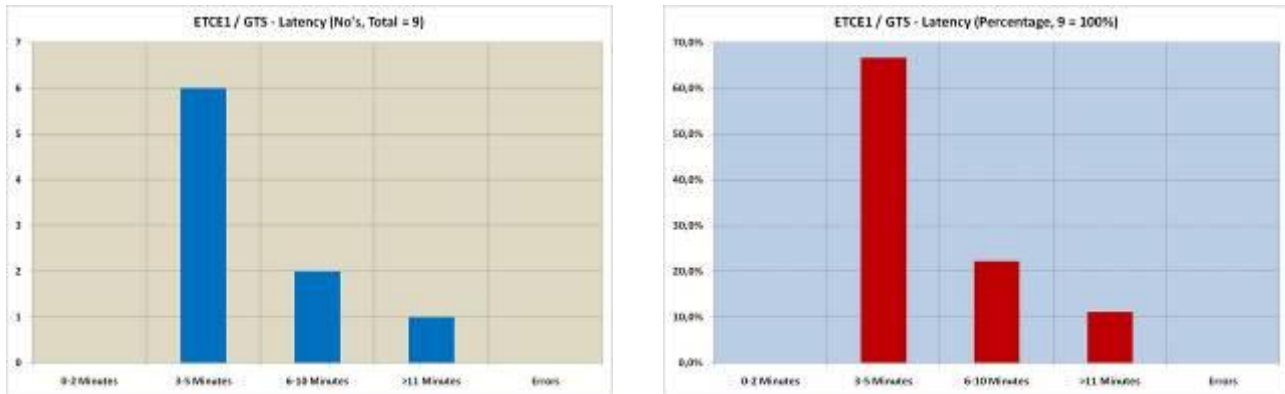


Figure 6. Graphical evaluation of the dissemination performance of the GTS message

During ECTE1, IM from Portugal has received two GTS messages, where one message did not include the second line with “TSUWCT”. Further investigation by Météo-France indicated that the GTS message was forwarded by Offenbach without modification, whereas Rome (Servizio Meteorologico) forwarded the message without the TSUWCT in the second line. The GTS system run with duplication of transmission: normally, the message is the same and in the recipient side, just the first one is taken into account by the system. Servizio Meteorologico has been conducted on this issue at a later date, and to the reasonable fact that the logs for the ECTE1 days were not available, they have been asked to track the issue at the next exercise. SSCT-1 showed, however, that this duplication was due to automatic forwarding of the GTS messages to a NATO ACOWEX communication channel by Turkish State Meteorological Service (TSMS). Please refer to Annex-VI for details.

One country reported that two GTS messages were received almost at the same time originating from the Russian Meteorological Service (Russian Federal Service for Hydrometeorology and Environmental Monitoring), one of them relative to a Pacific Ocean exercise, was received during the exercise. This issue has been further investigated and it has been found that indeed, a message with a different header but same message body was sent by the Russian Meteorological Service using the GTS (See Annex VIII).

#### Recommendation 16

TT-CT&TE should evaluate this issue further. The manuals for next CTEs should clearly indicate that no other country/institution other than the Message Provider is entitled to broadcast the CTE message.l

#### Recommendation 17

IOC/NEAMTWS Secretariat should officially contact WMO informing on the prioritization (using the priority code 80) and re-routing of GTS messages with the headers defined in the NEAMTWS-ECTE1 Manual within WMO Region VI.

Despite the fact that GTS has been utilized for the first time, it can be argued that the message have been distributed successfully through GTS, though the mean latency time is higher in comparison to email but comparable to fax. Nevertheless, it should be reminded that GTS is a more reliable system among the dissemination channels utilized.

## 5.2 EVALUATION OF TWFP RESPONSE

Detailed information on TWFP response can be found in Annex X. Twenty-one institutions from 19 countries out of 31 have provided Annex IV forms of Exercise Manual (IOC/2001/TS/98) . Among those, only 10 forms included the copies of the messages received. There were 12 institutions providing comments and 6 institutions providing suggestions. Despite the character-set problem in the-mail message, some institutions stated they have received the email message as expected. The sending of two fax messages made the evaluation of the fax dissemination based on Exercise Manual Annex IV almost impossible. Most of the institutions have either synchronized the email and the fax systems or have an automatic system for this. Four countries have complained that they have not received the evaluation questionnaire attached to the test message, and one country suggested that the use of email and fax is not enough for testing communication issues, and the use of GTS should be considered. This would indicate that at least 5 institutions (23% of ECTE1 Manual Exercise Annex IV providers) have not paid enough attention to the Manual before the exercise. In one case, there was also a clear misunderstanding of synchronization. Other issues reported in Annex IV of the ECTE1 Manual Exercise can be summarized as the following:

- One country requested the update of a TWFP fax number.
- One country received the fax message from a meteorological institute in NEAM region.
- One country received a different GTS message from a Meteorological Institute.
- Two institutions complained that the contact information provided on the Annex III of ECTE1 Manual Exercise led to a confusion to whom the evaluation questionnaire should be sent. The manual, however, was clear on this issue.
- One country reported that local newspapers reported about the exercise without any initiative from TWFP, drawing the attention of the public and even the attention of the Turkish diplomatic mission.
- One country suggested the use of the telephone as additional communication tool for the tsunami message.
- One country suggested to have a better layout (using bold text for main info,...) for the tsunami message, also reorganizing the information sequence according to the following criteria: 1. Object, 2. Priority of the message, 3. From, 4. To.
- One country suggested that in ECTE2 it would be appropriate to have a simplified text of the message but, at the same time, to translate essential contents into three languages: English, French, Arabic.
- One country suggested to eventually consider, maybe for 2012, a more realistic exercise, which allows testing other features of the TWS (given a specific tsunamigenic earthquake, prepare and send proper messages according to the scenario, etc.)
- Several countries found the pre-testing of the email dissemination as useful.
- Several countries suggested to go ahead with ECTE2.

### Recommendation 18

TT-CT&TE should evaluate these suggestions in detail.

Recommendation 19

Participants should be requested strongly to archive copies of e-mail, fax and GTS messages included in the evaluation questionnaire.

Almost all institutions conducted preparatory work for the exercise, such as synchronization of fax and email system, implementing an audio alert system sensitive to the message subject, performing controls on anti-spam filters and firewalls, contacted the National Meteorological Services, conducted internal communication and coordination activities, conducted prior internal test of automatic forwarding by email of GTS messages, informed the local government agencies on ECTE1, provided training to the staff on 24/7 duty, sent emails to WMO RTH (Regional Telecommunication Hubs) to ensure the re-routing of the GTS messages with the specific headers defined in the manual, developed codes to automatically detect GTS messages and send them as internal email, and developed codes to send the incoming faxes as internal emails.

During the evaluation, it became obvious that the available questionnaires provided in the NEAMTWS-ECTE1 Manual Exercise were inadequate and may be misleading at times. In its Annex IV, it was not clear to which email/fax number the questionnaire applies. The time information requested for receipt and understanding the message should be clearly separated. Moreover, some message receivers have suggested the form to be distributed as a word file rather than as an annex in the manual.

Recommendation 20

All times in the evaluation questionnaires should be reported in HH:MM:SS UTC format.

Recommendation 21

TT-CT&TE should decide on whether in the future telephone lines should also be used for communication tests.

Recommendation 22

New formats for Annex III and Annex IV (NEAMTWS-ECTE1 Manual Exercise) should be introduced by the TT-CT&TE. Please see proposed forms in Annexes XII and XV of this report.

Recommendation 23

Participants are recommended to develop codes to automatically detect GTS messages and send them as internal email and to send the incoming faxes as internal emails.

## 6. INTERACTION WITH THE MEDIA

A press release was made on 2 August 2011 by the UNESCO Press service, under Media Advisory No. 2011-114 (Annex XI). Neither the NEAMTWS Chairperson nor Co-Chairs of TT-CT&TE, however, did not clear this press release prior to its release. Moreover, the press release included some factual errors and misleading statements that raised concern. While fully agreeing with the need of press releases and other activities concerning the interaction with the media, it is important to note that the wrong descriptions of the NEAMTWS activities may cause serious problems right away. The press release included statements such as:

*“The Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and connected seas (NEAMTWS) will be tested on 10 August.”*

*“The purpose of the test of the warning system, first established in 2005[...], is to ensure effective communication between regional and national centres and tsunami warning focal points.”*

*“...from the Istanbul Observatory and Earthquake Research Institute (KOERI, Turkey).”*

*“A more comprehensive test of a regional tsunami scenario involving the participation of the media will be conducted during 2012.”*

Factual errors in this press release that , unfortunately, was the first source of information of the press agencies that have globally distributed this message further. Various newspapers, news agencies and TV channels<sup>1</sup> have interviewed the representatives of the NEAMTWS, and especially during the three days period starting from the day before the exercise, this has affected the productivity of the responsible Co-Chair of TT-CT&TE. However, it should be pointed out, that such a high level of media interest was not anticipated in the beginning. Moreover, the evaluation questionnaire provided in Annex IV of the ECTE1 Manual Exercise was not designed for a quick evaluation, especially considering that the requested information was provided in a very disorganized way by most of the participants anyway. It should be also noted that the participants were not requested to provide their results as soon as possible but on the same day of the exercise.

#### Recommendation 24

Press releases on ICG Sessions should also be issued. Moreover, press releases concerning Communication and Tsunami Exercises should be prepared in advance.

## **7. CONCLUDING RECOMMENDATIONS**

In addition to all recommendations above, concluding recommendations are presented below:

#### Recommendation 25

ECTE-1 was considered to be a success by the TT-CT&TE, and in contrary to the original plan, it is suggested to conduct a smaller scale communication test focusing on the problem areas of ECTE1, such as fax and GTS, to consolidate the lessons learnt from ECTE1. The date of this exercise will remain as 26<sup>th</sup> October, as originally scheduled for ECTE2.

#### Recommendation 26

Message providers are encouraged to make use of an interface especially created for message dissemination by accessing pre-formatted messages and updating the time information and channelling the messages to e-mail, fax and GTS dissemination to avoid human errors.

#### Recommendation 27

As agreed during the Tsunami and Civil Protection Workshop at JRC on 15 and 16 June in Ispra, Italy, the Monitoring and Information Centre (MIC) should participate in the Enlarged CTEs. The First and Second Announcements of ECTE2 should also be sent to MIC.

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<sup>1</sup> Newspapers: Le Monde, Le Figaro, Sabah (TR), Vatan (TR); Radio: Deutsche Welle Turkish; TV: TRT Haber (TR-State TV-Live at studio), TGRT Haber (TR-Live from KOERI), Kanaltürk (TR), NTV (TR).

## **8. TIMETABLE FOR NEAMTWS-ECTE2**

As reflected in Recommendation 25, ECTE-1 was considered to be a success by the TT-CT&TE, and in contrary to the original plan, it was suggested to conduct a smaller scale communication test focusing on the problem areas of ECTE1, such as fax and GTS, to consolidate the lessons learnt from ECTE1. The date of this exercise remained as 26<sup>th</sup> October, as originally scheduled for ECTE2. The announcement of this small scale exercise was done on 21 October via e-mail. Details and evaluation of SSCT-1 is given in Annex XVI.

## **9. OVERALL ASSESSMENT OF NEAMTWS-ECTE1**

Through the ECTE1, ICG/NEAMTWS was able to test the communication related issues with 139 end-users belonging to 42 agencies in 31 countries. 14 of these agencies are identified as Civil Protection Agencies. All of the countries have received at least one message. A methodical and detailed analysis of the ECTE1 has been provided in this report. Four of five recommendations of the TT-CTE were successfully implemented in this exercise and 27 new recommendations were provided in order to improve all aspects of a CTE, ranging from the manual to the interaction with the media, but especially focusing on the technical and procedural improvements. GTS has been used successfully. Nineteen countries of 31 (61%) have actively participated in ECTE1, which should be considered as a good level of participation, especially considering that this was the first test with the participation of TWFPs. Some technical problems during the ECTE1 have helped to clearly identify certain operational and procedural issues on which NEAMTWS should conclude some guidelines. Despite its own problems, the interaction with the local and international media has contributed considerably to the increase of public awareness in at least certain parts of NEAM Region. In conclusion, ECTE1 should be considered as a success. A second communication test will be conducted on 26 October 2011 focusing on the problem areas of ECTE1, such as fax and GTS, to consolidate the lessons learnt from ECTE1.

ANNEX I

ECTE1 FIRST ANNOUNCEMENT



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
COMMISSION OCÉANOGRAPHIQUE INTERGOUVERNEMENTALE  
COMISIÓN OCEANOGRÁFICA INTERGUBERNAMENTAL  
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ  
اللجنة الدولية الحكومية لعلوم المحيطات  
政府间海洋学委员会

UNESCO - 1, rue Mollat - 75732 Paris Cedex 15  
cable address: UNESCO Paris - telex: 204461 Paris - fax: (33) (0)1 45 68 58 12 - contact phone: (33) (0) 1 45 68 39 83/84  
E-mail: w.watson-wright@unesco.org

**IOC Circular Letter No. 2396**  
(Available in English and French only)

IOC/WWW/BA/SB/UW/rs  
Paris, 4 July 2011

- To :** ICG/NEAMTWS Tsunami Warning Focal Points (TWFP) and Tsunami National Contacts (TNC)  
ICG/NEAMTWS Chair and Vice-Chairs
- cc. :** Official National Coordinating Body for liaison with the IOC Member States  
Permanent Delegates/Observer Missions to UNESCO of IOC Member States  
National Commissions for UNESCO of IOC Member States

**Subject: Invitation to participate to the first NEAMTWS Enlarged Communication Test Exercise (NEAMTWS-ECTE1) on 10 August 2011**

We have the pleasure to announce the first NEAMTWS Enlarged Communication Test Exercise (NEAMTWS-ECTE1), which will be conducted on 10 August 2011. The NEAMTWS-ECTE1 will involve the National Tsunami Warning Centres (NTWC) and the Tsunami Warning Focal Point (TWFP).

The Regional Tsunami Watch Centres (RTWC), National Tsunami Warning Centres (NTWC) and Tsunami Warning Focal Points (TWFP) must keep a high level of readiness so as to be able to act efficiently and effectively to provide for the public's safety during fast-onset and rapidly-evolving natural disasters like the tsunamis. To maintain this high state of operational readiness and especially for infrequent events such as tsunamis, tsunami watch/warning centres and emergency agencies must regularly practice their response procedures to ensure that vital communication links work seamlessly, and that agencies and response personnel know the roles that they will need to play during an actual event.

.../...

Chairperson	Vice-Chairpersons		
Lic Javier A. VALLADARES Capitán de navío (Ret.) Licenciado en Oceanografía Física Asesor Científico en Ciencias del Mar Dirección de Relaciones Internacionales Secretaría de Ciencias, Tecnología e Innovación Productiva Av. Córdoba 831 4to. Piso (C1054AAH) Buenos Aires ARGENTINA	Dr Savithri (Savi) NARAYANAN Domimon Hydrographer/Director-General Ocean Sciences-Canadian Hydrographic Service Fisheries & Oceans Canada 615, Booth St., Suite 311 Ottawa, Ontario, K1A 0E6 CANADA	Prof. Chent SAMMARI Chef, Laboratoire du milieu marin Institut National des Sciences et Technologies de la Mer (INSTM) 28, rue 2 mars 1934 2025 Salammbô TUNISIE	Nicolay N. MIKHAILOV Head, Oceanographic Data Centre Russian Federal Service for Hydrometeorology & Environmental Monitoring All-Russia Research Institute of Hydrometeorological Information - WDC 6, Korolev St., Obninsk Kaluga Region 249020 RUSSIAN FEDERATION
<b>Executive Secretary</b> Dr Wendy WATSON-WRIGHT Intergovernmental Oceanographic Commission — UNESCO 1, rue Mollat 75732 Paris Cedex 15, FRANCE	Julian A. REYNA MORENO Capitán de navío Secretario Ejecutivo Comisión Colombiana del Océano Transversal 41, No. 27-50 Piso 4º - CAN Bogotá, DC COLOMBIA	Dr Sang-Kyung BYUN Principal Research Scientist Climate Change & Coastal Disaster Research Dept Korea Ocean Research & Development Institute (KORDI) Ansan, P.O. Box 29 425-600 Seoul REPUBLIC OF KOREA	



NEAMTWS-VII during 23-25 November 2010 in Paris-France, established a Task Team on Communication Test and Tsunami Exercises (TT-CT&TE) which is responsible for the preparation and conduct of NEAMTWS-ECTE1 and organization of its assessment. The aim of the NEAMTWS-ECTE1 is to refine procedures for testing the communication of tsunami alert messages between National Tsunami Warning Centres and all Tsunami Warning Focal Points (TWFPs), including speed and availability within NEAMTWS region. CTEs conducted during the previous intersessional period highlighted the importance of having other communication method like Global Telecommunication System (GTS), and therefore utilization of GTS during the NEAMTWS-ECTE1 is another aim of the Exercise.

NEAMTWS-ECTE1 will address the questions related to the evaluation and issuance of the warning message by tsunami watch/warning centres, as in the previous CTEs, but will also attempt to assess the national and/or local response and warning dissemination mechanisms once emergency authorities receive a warning. NEAMTWS-ECTE1 will involve all possible TWFPs using conventional message dissemination channels that have been previously subject to test between candidate RTWC and NTWCs. Message dissemination using GTS will be only available between TWFPs that have this system available to them at the operational level.

More information on the nature of exercise together with technical details concerning the conduct and evaluation of the exercise can be found in the NEAMTWS-ECTE1 Manual, attached to this Circular Letter. A [dedicated website](#) has been prepared for the Exercise where all relevant information and documentation can be accessed.

Thank you in advance for your cooperation.

Yours sincerely,

François Schindelé  
Chairman, ICG/NEAMTWS



Wendy Watson-Wright  
Assistant Director-General, UNESCO  
Executive Secretary, IOC



ANNEX II

**ECTE1 REMINDER  
(SECOND ANNOUNCEMENT)**

Reminder : The first NEAMTWS Enlarged Communication Test Exercise (NEAMTWS-ECTE1) will be conducted on 10 August 2011

You forwarded this message on 8/4/11. [Show Forward](#)

From: Saidi, Rime <ri.saidi@unesco.org>  
Date: Wednesday, August 3, 2011 12:15 PM  
To: Saidi, Rime <ri.saidi@unesco.org>  
Subject: Reminder : The first NEAMTWS Enlarged Communication Test Exercise (NEAMTWS-ECTE1) will be conducted on 10 August 2011

**Attachments:**

TWFP Form.doc	47.96 KB	Open
ECTE1_AnnexIIa_Turkey_KOERI.pdf	85.39 KB	Save
NEAMTWS-ECTE1_Manual.pdf	841.3 KB	Remove

Dear all,

We have the pleasure to remind you that the first NEAMTWS Enlarged Communication Test Exercise (NEAMTWS-ECTE1) will be conducted on 10 August 2011. The NEAMTWS-ECTE1 will involve the National Tsunami Warning Centres (NTWC) and the Tsunami Warning Focal Point (TWFP).

For those countries who have not indicated any number and email address, please transmit the attached form to the secretariat. In all other cases, we will be using the primary email address and fax number for receiving tsunami bulletins indicated in the TWFP form.

Please find also attached AnnexIIa, which includes information on the message provider.

More information on the nature of exercise together with technical details concerning the conduct and evaluation of the exercise can be found in the NEAMTWS-ECTE1 Manual, attached to this email.

All relevant documentation and updated information on the Exercise can be accessed through the IOC website [http://www.ioc-tsunami.org/index.php?option=com\\_ce&task=viewEventRecord&eventID=967&lang=en](http://www.ioc-tsunami.org/index.php?option=com_ce&task=viewEventRecord&eventID=967&lang=en) <[http://www.ioc-tsunami.org/index.php?option=com\\_ce&task=viewEventRecord&eventID=967&lang=en](http://www.ioc-tsunami.org/index.php?option=com_ce&task=viewEventRecord&eventID=967&lang=en)> .

Thank you in advance for your cooperation.

Secretariat to ICG/NEAMTWS

Schedule "Send & Receive All" will run in 2 minutes

ANNEX III

**TEST MESSAGE FOR EMAIL AND FAX**

**Subject:** TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

**Body:**

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

ISSUED AT 1036Z 10 AUG 2011

... TSUNAMI COMMUNICATION TEST

THIS TEST APPLIES TO ... CGCCR(BELGIUM)... BAS(BULGARIA)... INMG(CAPE VERDE)...  
NPRD(CROATIA)... OC(CYPRUS)... DMI(DENMARK)... NRIAG(EGYPT)... EMI(ESTONIA)...  
FMI(FINLAND)... FMI(FINLAND)... CENALT(FRANCE) ... BSH(GERMANY)...  
DWD(GERMANY)... NOA(GREECE) ... DPC(ITALY) ... NCGR(LEBANON)... MFA(MALTA)...  
SPMC(MONACO)... KNMW(NETHERLANDS)... DSB(NORWAY)... NHQSFS(POLAND)... IM  
(PORTUGAL)... NIEP(ROMANIA)... NPO "Typhoon"(RUSSIAN FEDERATION)...  
DGPCE(SPAIN)... SMHI(SWEDEN)... SWO(SYRIA)... DEMP(TURKEY)... DFID(UNITED  
KINGDOM

FROM – KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO – TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION TEST  
EXERCISE

SUBJECT – FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION TEST

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE

TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL

TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS  
AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND SEND IT  
ACCORDING TO THE NEAMTWS-ECTE1 INSTRUCTIONS

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST

THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

ANNEX IV

DETAILED INFORMATION ON EMAIL DISSEMINATION

<b>E-MAIL</b>						
4	5	6	7	8	9	10
pre-test on 8 August	KOERI sent the e-mail message at ES0	Annex IIIb	TWFP List	received at ES1L (log)	received at ES1A (Annex IVb)	latency ES1L-ES0
yes	10:38:09		X	10:38:27	10:38	00:00:18
no	10:38:09		X	10:38:27	10:38	00:00:18
yes	10:38:09		X	10:38:27	10:40	00:00:18
yes	10:38:09	X	X	10:38:27	10:38:11	00:00:18
no	10:38:09		X	10:38:27		00:00:18
yes	10:38:09			10:38:27		00:00:18
no	10:38:09			10:38:27		00:00:18
yes	10:38:09		X	10:38:27	10:38	00:00:18
yes	10:38:09	X	X	10:38:27	10:39	00:00:18
no	10:38:09		X	10:38:28		00:00:19
no	10:38:09		X	10:38:28	10:38	00:00:19
yes	10:38:09		X	10:38:28	10:39:58	00:00:19
no	10:38:09		X	10:38:28		00:00:19
no	10:38:09		X	10:38:28		00:00:19
yes	10:38:09	X		10:38:28	10:38	00:00:19
yes	10:38:09		X	10:38:28		00:00:19
yes	10:38:09		X	10:38:28		00:00:19
no	10:38:09		X	10:38:28		00:00:19
no	10:38:09	X		10:38:28		00:00:19
yes	10:38:09	X		10:38:28	10:38	00:00:19
yes	10:38:09		X	10:38:28		00:00:19
no	10:38:09		X	10:38:28		00:00:19
yes	10:38:09		X	10:38:28	10:38:31	00:00:19
no	10:38:09		X	10:38:28		00:00:19
no	10:38:09		X	10:38:28		00:00:19
yes	10:38:09		X	10:38:28		00:00:19
yes	10:38:09		X	10:38:28		00:00:19
no	10:38:09	X	X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
yes	10:38:09	X		10:38:29	10:43	00:00:20
yes	10:38:09		X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
yes	10:38:09		X	10:38:29	10:38	00:00:20
yes	10:38:09		X	10:38:29		00:00:20
yes	10:38:09	X		10:38:29		00:00:20
yes	10:38:09		X	10:38:29	10:38:14	00:00:20
yes	10:38:09		X	10:38:29		00:00:20

Country and Institution names are removed from the original sheet produced by the co-chairs. Empty cells in columns 6 and 7 indicate that the e-mail address was provided neither by Annex IIIb nor TWFP List, but via a separate e-mail.

<b>E-MAIL</b>						
4	5	6	7	8	9	10
<b>pre-test on 8 August</b>	<b>KOERI sent the e-mail message at ES0</b>	<b>Annex IIIb</b>	<b>TWFP List</b>	<b>received at ES1L (log)</b>	<b>received at ES1A (Annex IVb)</b>	<b>latency ES1L-ES0</b>
yes	10:38:09		X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
no	10:38:09		X	10:38:29		00:00:20
no	10:38:09	X		10:38:30	10:43	00:00:21
N/A	10:38:09		X	10:38:30		00:00:21
no	10:38:09		X	10:38:30		00:00:21
no	10:38:09		X	10:38:30		00:00:21
no	10:38:09		X	10:38:30		00:00:21
yes	10:38:09		X	10:38:31		00:00:22
yes	10:38:09			10:38:31		00:00:22
no	10:38:09		X	10:38:31		00:00:22
no	10:38:09		X	10:38:31		00:00:22
yes	10:38:09		X	10:38:31		00:00:22
no	10:38:09	X		10:38:32	10:38	00:00:23
no	10:38:09		X	10:38:32		00:00:23
yes	10:38:09	X		10:38:32	10:38:26	00:00:23
no	10:38:09		X	10:38:32		00:00:23
no	10:38:09		X	10:38:32		00:00:23
yes	10:38:09		X	10:38:33		00:00:24
no	10:38:09		X	10:38:33		00:00:24
no	10:38:09	X		10:38:36	10:40	00:00:27
no	10:38:09		X	10:38:36		00:00:27
no	10:38:09		X	10:38:36		00:00:27
yes	10:38:09	X		10:38:42	10:38	00:00:33
yes	10:38:09		X	10:38:42		00:00:33
yes	10:38:09		X	10:38:45	10:38:40	00:00:36
yes	10:38:09		X	10:38:45		00:00:36
yes	10:38:09		X	10:38:45		00:00:36
no	10:38:09		X	10:38:48		00:00:39
no	10:38:09		X	10:38:56	10:38:11	00:00:47
no	10:38:09		X	10:45:14		00:07:05
no	10:38:09	X		10:55:14	11:02	00:17:05
no	10:38:09	X		10:55:14		00:17:05
N/A	10:38:09		X	N/A		N/A
N/A	10:38:09		X	N/A		N/A
N/A	10:38:09		X	N/A		N/A

Country and Institution names are removed from the original sheet produced by the co-chairs. Empty cells in columns 6 and 7 indicate that the e-mail address was provided neither by AnnexIIIb nor TWFP List, but via a separate e-mail.

ANNEX V

**DETAILED INFORMATION ON FAX DISSEMINATION  
FOR THE SECOND FAX MESSAGE (Log information is included)**

<b>FAX</b>										
3	4	5	6	7	8	9	10	11	12	13
Log Time FSL0	Attempts	Log Transmission Time FSL1	Log Transmission Duration	Latency FSL1-FSL0	Annex IV/b Transmission Time FSA1	Annex IIIa	TWFP List	Modem	Status	Error Code
10:49	0	10:49	00:44,0	00:00,0			X	COM08	Sent	
10:49	0	10:49	01:27,0	00:00,0			X	COM07	Sent	
10:49	0	10:49	00:46,0	00:00,0			X	COM06	Sent	
10:49	0	10:49	00:45,0	00:00,0	10:49		X	COM02	Sent	
10:49	0	10:49	01:37,0	00:00,0			X	COM05	Sent	
10:49	0	10:50	00:56,0	01:00,0		X	X	COM09	Sent	
10:49	0	10:50	00:49,0	01:00,0		X	X	COM03	Sent	
10:49	0	10:50	00:56,0	01:00,0	10:51	X	X	COM08	Sent	
10:49	0	10:51	00:56,0	02:00,0		X	X	COM02	Sent	
10:49	0	10:51	00:59,0	02:00,0			X	COM06	Sent	
10:49	0	10:51	01:00,0	02:00,0		X	X	COM04	Sent	
10:49	0	10:52	01:36,0	03:00,0			X	COM05	Sent	
10:49	0	10:52	00:56,0	03:00,0		X	X	COM09	Sent	
10:49	0	10:52	01:24,0	03:00,0	10:52		X	COM02	Sent	
10:49	0	10:53	00:43,0	04:00,0			X	COM04	Sent	
10:49	0	10:53	00:56,0	04:00,0		X		COM09	Sent	
10:49	0	10:54	00:56,0	05:00,0			X	COM04	Sent	
10:49	0	10:54	00:45,0	05:00,0			X	COM08	Sent	
10:49	0	10:55	01:44,0	06:00,0				COM05	Sent	
10:49	0	10:56	00:56,0	07:00,0				COM06	Sent	
10:49	0	10:56	00:56,0	07:00,0				COM08	Sent	
10:49	0	10:56	00:55,0	07:00,0				COM07	Sent	
10:49	0	10:57	00:56,0	08:00,0	10:57			COM07	Sent	
10:49	0	10:57	01:14,0	08:00,0				COM08	Sent	
10:49	0	10:58	00:45,0	09:00,0	11:06			COM02	Sent	
10:49	0	10:59	00:58,0	10:00,0			X	COM03	Sent	
10:49	0	10:59	00:57,0	10:00,0				COM04	Sent	
10:49	0	10:59	00:56,0	10:00,0				COM09	Sent	
10:49	1	11:04	01:10,0	15:00,0			X	COM04	Sent	
10:49	1	11:05	01:26,0	16:00,0			X	COM08	Sent	
10:49	1	11:06	00:56,0	17:00,0				COM07	Sent	
10:49	1	11:07	01:18,0	18:00,0	11:07			COM04	Sent	
10:49	2	11:10	00:54,0	21:00,0			X	COM04	Sent	
10:49	2	11:11	00:56,0	22:00,0			X	COM03	Sent	
10:49	2	11:12	00:58,0	23:00,0			X	COM06	Sent	
	3						X		NO	Busy Signal
	3						X		NO	SE Code 20
	3					X			NO	Busy Signal
	3						X		NO	SE Code 20
	3					X			NO	SE Code 0
	3						X		NO	No connection

<b>FAX</b>										
3	4	5	6	7	8	9	10	11	12	13
Log Time FSL0	Attempts	Log Transmission Time FSL1	Log Transmission Duration	Latency FSL1-FSL0	Annex IVb Transmission Time FSA1	Annex IIIa	TWFP List	Modem	Status	Error Code
	3						X		NO	SE Code 20
	3						X		NO	Not compatible
	3						X		NO	No connection
	3					X			NO	SE Code 20
	3					X	X		NO	Busy Signal
	3								NO	No connection
	3								NO	No connection
	3								NO	No connection
	3								NO	No connection
	3								NO	Busy Signal
	3								NO	SE Code 20
Error Code 0: Unknown Error										
Error Code 20: problem negotiating the session parameters										

Country and Institution names are removed from the original sheet produced by the co-chairs. Empty cells in columns 9 and 10 indicate that the fax number was provided neither by AnnexIIIb nor TWFP List, but via a separate e-mail.

ANNEX VI

**GTS MESSAGE**

WEME40 LTAA 101036

TSUWCT

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

ISSUED AT 1036Z 10 AUG 2011

... TSUNAMI COMMUNICATION TEST ...

THIS TEST APPLIES TO ... CGCCR(BELGIUM)... BAS(BULGARIA)... INMG(CAPE VERDE)...  
NPRD(CROATIA)... OC(CYPRUS)... DMI(DENMARK)... NRIAG(EGYPT)... EMI(ESTONIA)...  
FMI(FINLAND)... FMI(FINLAND)... CENALT(FRANCE) ... BSH(GERMANY)...  
DWD(GERMANY)... NOA(GREECE) ... DPC(ITALY) ... NCGR(LEBANON)... MFA(MALTA)...  
SPMC(MONACO)... KNMW(NETHERLANDS)... DSB(NORWAY)... NHQSFS(POLAND)... IM  
(PORTUGAL)... NIEP(ROMANIA)... NPO "Typhoon"(RUSSIAN FEDERATION)...  
DGPCE(SPAIN)... SMHI(SWEDEN)... SWO(SYRIA)... DEMP(TURKEY)... DFID(UNITED  
KINGDOM

FROM – KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO – TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION TEST  
EXERCISE

SUBJECT – FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION TEST

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE

TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL

TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS  
AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND SEND IT  
ACCORDING TO THE NEAMTWS-ECTE1 INSTRUCTIONS

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST

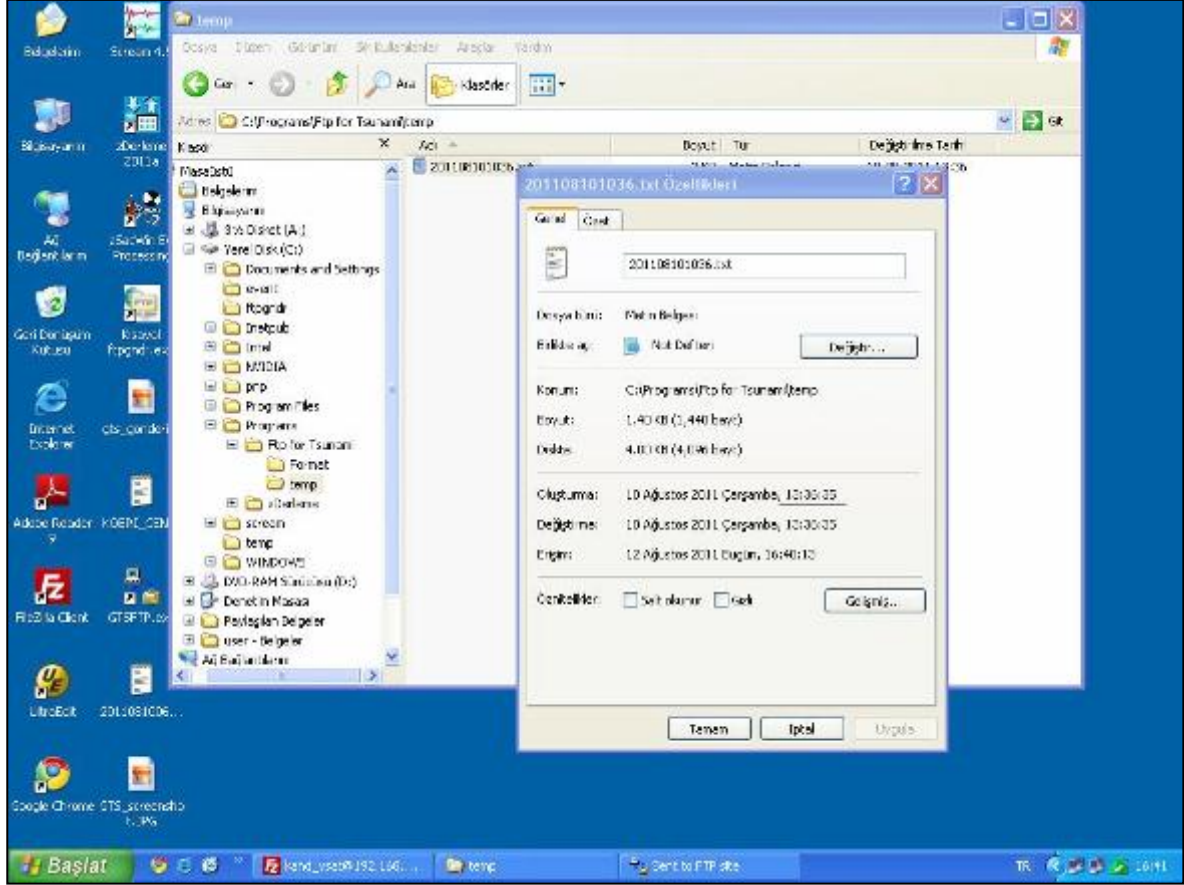
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001=



ANNEX VII

GTS MESSAGE TIME STAMP



ANNEX VIII

**GTS MESSAGE SENT BY THE RUSSIAN METEOROLOGICAL SERVICE  
WITH A DIFFERENT HEADER BUT SAME MESSAGE BODY DURING THE ECTE1**

WEME40 RUMS 080735

TSUWCT

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

RUSSIAN FEDERAL SERVICE FOR HYDROMETEOROLOGY AND ENVIRONMENTAL  
MONITORING

ISSUED AT 1430Z 10 AUG 2011

... TSUNAMI COMMUNICATION TEST ...

THIS TEST APPLIES TO ... CGCC(BELGIUM)... BAS(BULGARIA)... INMG(CAPE VERDE)...  
NPRD(CROATIA)... COC(CYPRUS)... DMI(DENMARK)... NRIAG(EGYPT)... EMI(ESTONIA)...  
MCND(FINLAND)... GSC(FINLAND)... CENALT(FRANCE) ... BSH(GERMANY...  
DWD(GERMANY)...

NOA(GREECE) ... DPC (ITALY) ... GNC(LEBANON)... MFA(MALTA)... CSPM(MONACO)...  
KNMW(NETHERLANDS)... DCPEP(NORWAY)... NCCROPP(POLAND)... IM (PORTUGAL)...  
NIEP(ROMANIA)... SIRPAT(RUSSIAN FEDERATION)... DGPCE(SPAIN)... SMHI(SWEDEN)...  
SWO(SYRIA)... DEMP(TURKEY)... HO/DFID(UNITED KINGDOM)

FROM – KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)

TO – TWFP PARTICIPANTS IN THE FIRST NEAMTWS ENLARGED COMMUNICATION  
TEST EXERCISE SUBJECT – FIRST NEAMTWS ENLARGED TSUNAMI COMMUNICATION  
TEST

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH CENTERS  
AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE  
AND SEND IT ACCORDING TO THE NEAMTWS-ECTE1 INSTRUCTIONS

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001=

ANNEX IX

**DETAILED INFORMATION ON GTS DISSEMINATION**

<b>GTS</b>					
2	3	4	5	6	7
<b>initial sending at GS0</b>	<b>message received by GTS at GS1</b>	<b>latency GS1-GS0</b>	<b>received at GS2</b>	<b>latency GS2-GS0</b>	<b>latency GS2-GS1</b>
10:36:35	10:37:30	00:00:55	10:39	00:02:25	00:01:30
10:36:35	10:37:30	00:00:55	10:39	00:02:25	00:01:30
10:36:35	10:37:30	00:00:55	10:39:32	00:02:57	00:02:02
10:36:35	10:37:30	00:00:55	10:39:33	00:02:58	00:02:03
10:36:35	10:37:30	00:00:55	10:41	00:04:25	00:03:30
10:36:35	10:37:30	00:00:55	10:41:20	00:04:45	00:03:50
10:36:35	10:37:30	00:00:55	10:42	00:05:25	00:04:30
10:36:35	10:37:30	00:00:55	10:45	00:08:25	00:07:30
10:36:35	10:37:30	00:00:55	10:50:16	00:13:41	00:12:46

ANNEX X

TSUNAMI WARNING FOCAL POINT RESPONSE

<b>TWFP Response</b>									
3	4	5	6	7	8	9	10	11	12
<b>provided Annex IVb</b>	<b>e-mail as expected</b>	<b>fax as expected</b>	<b>GTS as expected</b>	<b>PC sync</b>	<b>Fax Sync</b>	<b>Message Copies provided</b>	<b>Exercise Usefulness</b>	<b>Comments</b>	<b>Suggestions</b>
yes	yes	yes	N/A	no	no	no	yes	no	no
no									
no									
yes	yes	yes	N/A	yes	yes	yes	yes	no	no
no									
no									
yes	no	no	yes	UTC	UTC	yes	yes	yes	no
no									
yes	yes	N/A	N/A	no	no	no	yes	yes	yes
no									
yes	yes	no	yes	no	no	yes	yes	yes	no
no									
no									
yes	no	no	yes	no	yes	yes	yes	yes	no
yes	yes	yes	N/A	IT	yes	fax	yes	yes	yes
yes	yes	yes	yes	IT	yes	fax, GTS	yes	yes	yes
no									
yes	yes	yes	N/A	yes	yes	yes	yes	yes	no
yes	yes	N/A	yes	no	?	no	yes	yes	no
no									
yes	yes	yes	N/A	yes	yes	yes	yes	yes	yes
yes	yes	N/A	yes	UTC	yes	yes	yes	yes	no
no									
no									
yes	yes	no	N/A	IT	IT	no	yes	no	no
yes	yes	yes	yes	no	no	no	yes	no	no
no									
no									
yes	no	yes	no	IT	IT	yes	yes	yes	yes
yes	yes	no	N/A	no	no	fax	yes	no	no
yes	yes	yes	yes	no	yes	no	yes	no	no
no									
yes	yes	N/A	N/A	IT	no	e-mail	yes	no	no
no									
no									
no									
no									
yes	yes	yes	N/A	yes	yes	fax	yes	no	no
yes	yes	yes	N/A	yes	yes	yes	yes	no	no
no									
yes	no	N/A	N/A	yes	?	no	yes	yes	yes
no									

Red Information provided in the Evaluation Questionnaire is wrong based on evidence (copy of the message) available.  
 Green Information provided in the Evaluation Questionnaire matches the evidences (copy of the message) provided.  
 Yellow Information cannot be confirmed since the evidence (copy of the message) was not provided.

ANNEX XI

**UNESCO PRESS RELEASE FOR NEAMTWS-ECTE1**

*UNESCO Media Advisory No.2011-114*

**First test of the Mediterranean Tsunami Warning System**

Paris, 02 August – The Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and connected seas (NEAMTWS) will be tested on 10 August.

The purpose of the test of the warning system, first established in 2005 under the aegis of UNESCO's Intergovernmental Oceanographic Commission (IOC), is to ensure effective communication between regional and national centres and tsunami warning focal points.

Thirty-one countries\* will take part in the exercise which will include sending test messages via electronic mail, fax and the Global Telecommunication System (GTS)\*\* from the Istanbul Observatory and Earthquake Research Institute (KOERI, Turkey) to all the national centres and tsunami warning focal points in the region concerned. This should reveal possible dysfunctions in the dissemination of warnings. Indeed, the fast transmission of data and reactivity of national centres and country focal points are crucial for the effectiveness of the entire tsunami warning system.

Historically strong seismic activity has been observed in the Mediterranean and North-eastern Atlantic, albeit less frequently than in the Pacific Ocean. A powerful earthquake in the Azores-Gibraltar Fault zone and subsequent tsunami destroyed the city of Lisbon in 1755. In 1908, a tsunami took the lives of 85,000 people in Messina (Italy). Weaker tsunamis have been observed more recently, notably the one generated off the coast of Algeria in 2003.

The Tsunami Early Warning System for the North-eastern Atlantic, the Mediterranean and connected seas is one of four regional Early Warning and Mitigation Systems which are coordinated by the IOC globally. Similar systems already exist for the Pacific and Indian oceans and for the Caribbean.

A more comprehensive test of a regional tsunami scenario involving the participation of the media will be conducted during 2012.

\*\*\*\*

\*The 31 Member States of the Intergovernmental Coordinating Group of the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and connected seas (ICG/NEAMTWS): Belgium, Bulgaria, Cape Verde, Croatia, Cyprus, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Lebanon, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovenia, Spain, Sweden, Syria, Turkey, Ukraine, United Kingdom.

\*\* The World Meteorological Organization's GTS is the communications and data management component that allows the World Weather Watch to operate through the collection and distribution of information critical to its processes and warnings.

Media contact: Agnès Bardou, UNESCO Press Service

ANNEX XII

**INFORMATION ON MESSAGE PROVIDER**  
(Proposed Annex III in the document IOC/2011/TS/98Vol.1)

**Name of the Country:**

**Name of the Institution:**

**Email address to broadcast the  
communication test message:**

**Fax number to broadcast the  
communication test message:**

Fax ID code:

**GTS Message Header:**

**TWFP Information<sup>1</sup>**

Name:

E-mail address:

Fax:

Mailing address:

---

<sup>1</sup>Please note that this information is only to identify the person responsible for sending the message.

ANNEX XIII

**INFORMATION ON MESSAGE RECEIVER**  
(Proposed Annex III in the document IOC/2011/TS/98Vol.1)

**COUNTRY:**

**INSTITUTION:**

**Email addresses to receive the test message:**

Primary e-mail address:

Alternate e-mail address (if any):

**Fax numbers to receive the test message:**

Primary fax number:

Alternate fax number:

**Contact Info:**

Name:

E-mail:

Fax:

Mailing Address:

ANNEX XIV

**EVALUATION QUESTIONNAIRE FOR MESSAGE PROVIDER**

(Proposed Annex IV in the first part of this document)

*Please note that all times should be provided in Universal Time in HH:MM:SS format. Please copy and paste confirmation sheets from the fax machine (if available), and a copy of the messages distributed by email, fax and GTS. Please verify that the time-stamp information is visible on the documents, if applicable. Preferably the e-mail message text appended to this report should be copied directly from the mail-box server in order to provide all the details on timing and routing.*

<b>1. COUNTRY:</b>			
<b>2. INSTITUTION:</b>			
<b>3. Provide T0 Time:</b>			
<b>4. Provide times of message delivery for each communication technology below:</b>			
	<b>E-MAIL</b>	<b>FAX</b>	<b>GTS</b>
<i>time stamp:</i>			
<b>5. Provide a detailed story of all activities starting from T0 and TN (end of the exercise). Did you receive any error messages or observed any problems? If yes, describe them for all dissemination technologies and addresses concerned.</b>			
<b>6. Describe the operational service to deliver the e-mail messages.</b>			
<b>7. Describe the operational service to deliver the fax messages.</b>			
<b>8. Describe the operational service to deliver the GTS messages.</b>			
<b>9. Describe briefly the preparation made in your agency for the Communication Test Exercise</b>			
<b>10. Describe briefly the procedures taken during the exercise, before time zero, and after time zero.</b>			
<b>11. Did you synchronize the PC before distributing the email messages? If yes, describe briefly the procedure used.</b>			
<b>12. Did you synchronize the fax machine before sending the messages? If yes, describe briefly the procedure used.</b>			
<i>(to continue)</i>			



<b>13. Did you find the exercise useful in assessing the readiness of your agency to distribute tsunami related messages?</b>
<b>14. Do you have any comments on the exercise, including the exercise manual and/or information received related to the exercise?</b>
<b>15. Have you and/or your institution been contacted by media concerning the exercise before/during/after the exercise? Please provide brief information if applicable.</b>

ANNEX XV

**EVALUATION QUESTIONNAIRE TO MESSAGE RECEIVER**  
(Proposed Annex IV in the first part of this document)

Please note that all times should be provided in Universal Time in HH:MM:SS format, where applicable. Please copy and paste into this questionnaire e-mail, fax and GTS messages received for each delivery.

<b>1. COUNTRY:</b>					
<b>2. INSTITUTION:</b>					
<b>3. Provide the time stamps of the messages received through each communication technology:</b>					
<b>E-MAIL</b>		<b>FAX</b>		<b>GTS</b>	
<b>4. Provide times of message delivery for each communication technology:</b>					
<b>Primary E-MAIL</b>	<b>Alternate E-MAIL</b>	<b>Primary FAX</b>	<b>Alternate FAX</b>	<b>GTS</b>	
<i>[type e-mail address]</i>	<i>[type e-mail address]</i>	<i>[type fax number]</i>	<i>[type fax number]</i>		
<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	
<b>5. Provide times for each communication technology when the message is read and understood by the operator:</b>					
<b>Primary E-MAIL</b>	<b>Alternate E-MAIL</b>	<b>Primary FAX</b>	<b>Alternate FAX</b>	<b>GTS</b>	
<i>[type e-mail address]</i>	<i>[type e-mail address]</i>	<i>[type fax number]</i>	<i>[type fax number]</i>		
<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	
<b>6. Was the provider e-mail address as expected?</b>					
<b>7. Was the e-mail message complete as expected? If not, report the differences.</b>					
<b>8. Was the provider fax number as expected?</b>					
<b>9. Was the fax message complete as expected? If not, report the differences.</b>					
<b>10. Was the GTS message complete as expected? If not, report the differences.</b>					
<i>(to continue)</i>					

<b>11. Did the operator that received the messages understand its content and knew how to respond to it?</b>	
<b>12. Describe briefly the preparation made in your agency for the Communication Test Exercise.</b>	
<b>13. Did you synchronize the PC before distributing the email messages? If yes, describe briefly the procedure used.</b>	
<b>14. Did you synchronize the fax machine before receiving the messages? If yes, describe briefly the procedure used.</b>	
<b>15. Did you find the exercise useful in confirmation communication contacts and delays?</b>	
<b>16. Do you have any comments on the exercise, including the exercise manual and/or information received related to the exercise?</b>	
<b>17. Do you have any suggestions for the next exercises?</b>	
<b>18. Have you and/or your institution been contacted by media concerning the exercise before/during/after the exercise? Please provide brief information if applicable.</b>	

## ANNEX XVI

### SMALL SCALE COMMUNICATION TEST – 1

#### (SSCT-1)

The initial discussion of this evaluation report took place during the NEAMTWS Task Team on Communication Test and Tsunami Exercise on 19 September 2011, upon which, in contrary to the original plan, it was decided to not to conduct ECTE-2 this year but to conduct a smaller scale communication test (SSCT-1) focusing on the problem areas of ECTE1, such as fax and GTS, to consolidate the lessons learnt from NEAMTWS-ECTE1. SSCT-1 was announced on 21.10.2011 (Annex XVI-a) and conducted on 26 October 2011 around 9:00 UTC and it involved only fax and GTS messages. The message provider was Kandilli Observatory and Earthquake Research Institute (KOERI) again. During SSCT-1, fax recipients were limited to those that have experienced a communication problem at NEAMTWS-ECTE1. However, GTS message was received by any institution in the NEAM region with access to GTS. SSCT-1 Questionnaire (Annex XVI-b) was returned by 9 countries, where 5 countries reported back on Fax and 5 countries reported back on GTS dissemination.

#### **Evaluation of Fax Message Dissemination**

18 fax numbers in 13 countries have been tested during SSCT-1. Detailed information on fax dissemination is given in Annex XVI-x. 7 of 18 recipients have successfully received the fax message. Initially, a fax server with 8 communication ports have been utilized for the test, which allowed the message provider to monitor the transmission status in real-time. Since the number of successful transmission were observed to be low during the SSCT-1, it was decided to send a follow-up fax message (Annex XVI-x) manually on the same day with the aim of determining possible fax server related issues. During this manual attempt, 5 recipients from 11 received the fax message. However, since manual sending of fax message during real operations are not foreseen, the evaluation given in Annex XVI-x only includes the results from automatic sending.

Fax error log indicates that the main reasons of fax message dissemination failures are the following:

No connection: No connection to the remote fax device could be established.

Busy signal: The line was in use during the time of dialling.

Unknown errors: An error occurred and the cause of the error cannot be determined, or the modem has not returned an error code.

Problems negotiating the session parameters: This problem is typically related to the modems signal processor or with the fax line (i.e. caused by line noise or bad signal quality).

Unspecified Transmit Phase D error: This indicates a communication error, usually because the fax hardware is incompatible, often caused by outdated hardware.

No response to EOP repeated 3 times: This indicates a communication error, usually because the fax hardware is incompatible, often caused by outdated hardware. This appears to be a known problem that is caused by a bug in the modem software. And typically occurs with certain types of US-Robotics and 3Com modems. It could be solved by running the modem in fax class 1 mode. The modem does not detect the acknowledgement signal for a successful page transmission from the remote fax machine when this error happens, so the fax is transmitted multiple times, depending on the number of transmission attempts configured in the fax server.

For successful transmissions, transmission duration ranged between 53 sec and 1 min 25 sec, whereas message delivery took between 1 min 25 sec and 26 min 10 sec.

### **Evaluation of GTS message dissemination**

The main reason to include the GTS in the SSCT-1 was the duplication of the GTS message during ECTE-1 initially assumed to be caused by the GTS regional meteorological centre in Italy, Servizio Meteorologico (SM). SM was contacted prior to the SSCT-1 and their evaluation pointed out that SM received two GTS messages initiated by the Turkish State Meteorological Service (TSMS) in Ankara, Turkey. TSMS was asked for clarification and the following investigation showed that the single GTS message received from KOERI was automatically forwarded to a NATO ACOWEX communication channel and was indeed duplicated by TSMS. Necessary configuration changes were made at TSMS to prevent this misbehaviour. However, message recipients during the SSCT-1 have reported the receipt of 4 GTS messages (Annex XVI-d). Further investigation pointed out that the second duplication was made by the CENALT due to a specific configuration at the time of the test resulting in re-sending of the messages received on GTS. As a result, CENALT has changed its GTS configuration. It was also observed that some institutions have received the GTS message without the TSUWCT in the second line, as during ECTE1. This clearly indicates that GTS messages are subject to modification during re-routing, which in principle should not happen.

### **Conclusions**

SSCT-1 was focusing on the problem areas of NAMTWS-ECTE1 and helped to identify in detail the problems and their causes. The number of questionnaire's returned back indicated again the importance of the use of system logs for the evaluation of Communication Tests. Concerning the fax dissemination, there has been no pattern observed based on a specific modem and error. Also, some of the recipients were successfully sent the fax message during the manual attempt following SSCT-1, however this does not indicate that the problem is due to the fax server. In the future, recipients might be asked to provide detailed information on the type of the fax machine utilized, such as manufacturer, model number, and settings used. Nevertheless, expert support will be needed to evaluate the fax dissemination in such great detail. Both ECTE-1 and SSCT-1 clearly indicates that message dissemination using fax is the least effective communication method utilized and subject to deficiencies beyond the control of the message provider and/or recipient. GTS dissemination should be considered as very effective, yet more testing needs to be done to obtain a sufficient maturity of the use of GTS within NEAM region.

Appendix XVI-a

**SSCT-1 Announcement**

Subject: NEAMTWS-ECTE1 follow-up: small-scale communication test on 26 October 2011

Dear NEAMTWS-ECTE1 (First Enlarged Communication Test Exercise) participant,

This is to inform you that the Task Team on Communication Test and Tsunami Exercise of NEAMTWS acknowledged NEAMTWS-ECTE-1 as a success during its meeting on 19 September 2011, and in contrary to the original plan, it was decided to not to conduct ECTE-2 this year but to conduct a smaller scale communication test (SSCT-1) focusing on the problem areas of ECTE1, such as fax and GTS, to consolidate the lessons learnt from NEAMTWS-ECTE1. NEAMTWS-ECTE-2 will be conducted in 2012.

SSCT-1 will be conducted on 26 October 2011 around 9:00 UTC and it will involve only fax and GTS messages. The message provider will be Kandilli Observatory and Earthquake Research Institute (KOERI) again. Information on the message provider is the same as NEAMTWS-ECTE-1 and can be found attached to this e-mail for your convenience.

Please note that fax recipients are limited to those that have experienced a communication problem during the NEAMTWS-ECTE1. These institutions are listed below. This means only these institutions should expect to receive a fax message. However, GTS message should be received by any institution in the NEAM region which has access to GTS.

BULGARIA - Institute of Oceanology (BAS)  
CYPRUS - Oceanography Center, University of Cyprus  
EGYPT - National Institute of Oceanography and Fisheries (NIOF)  
FINLAND - Government Situation Center Finland  
FINLAND - Finnish Meteorological Institute  
GERMANY - Deutscher Wetterdienst (DWD)  
LEBANON - Center for Geophysical Research (CNRS)  
MONACO - Compagnie des sapeurs pompiers de Monaco  
POLAND - National Centre for Coordination of Rescue Operations and Protection of Population  
RUSSIA FEDERATION - State Institution Research and Production Association "Typhoon"  
SLOVENIA - Environmenta Agency of the Republic of Slovenia (EARS)  
SPAIN - Direccion General de Proteccion Civil y Emergencias  
SPAIN - Instituto Espanol de Oceanografia (IEO)  
SYRIA - Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology  
UNITED KINGDOM - National Oceanography Center (NOC)

Please find attached a questionnaire to be filled out **only by the institutions above and by the institutions with GTS capability**. We would like to request to fill out the questionnaires on 26 October after the test asap and send it to the following e-mail address:

[ocal.necmioglu@boun.edu.tr](mailto:ocal.necmioglu@boun.edu.tr)

Thank you for your cooperation.

Appendix XVI-b

**SSCT-1 QUESTIONNAIRE**

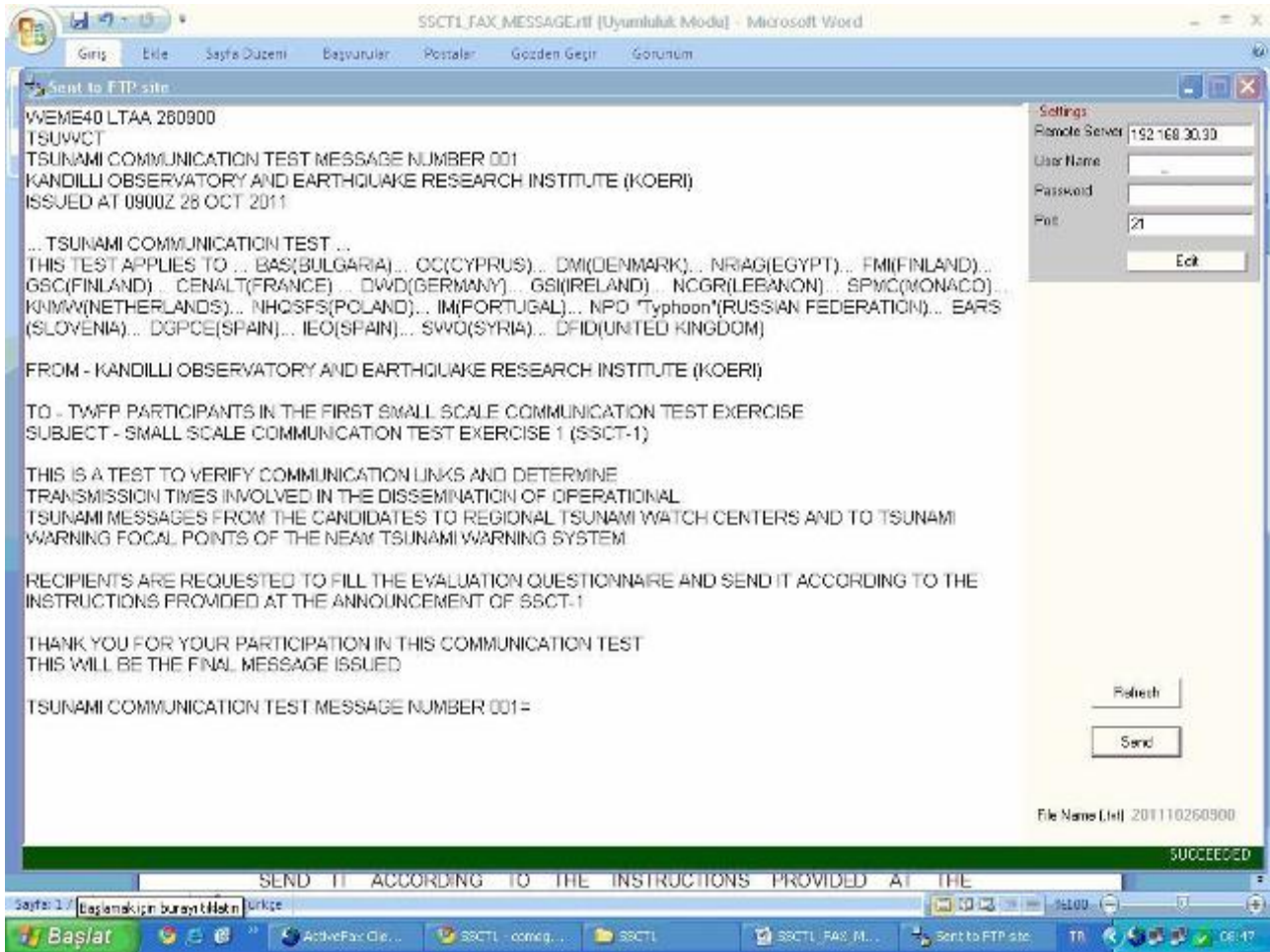
**SSCT-1  
SMALL SCALE COMMUNICATION TEST EXERCISE  
EVALUATION QUESTIONNAIRE TO MESSAGE RECEIVER**

Please note that all times should be provided in Universal Time in HH:MM:SS format, where applicable. Please copy and paste into this questionnaire e-mail, fax and GTS messages received for each delivery.

<b>1. COUNTRY:</b>				
<b>2. INSTITUTION:</b>				
<b>3. Provide the time stamps of the messages received through each communication technology:</b>				
<b>E-MAIL</b>	<b>FAX</b>		<b>GTS</b>	
N/A				
<b>4. Provide times of message delivery for each communication technology:</b>				
<b>Primary E-MAIL</b>	<b>Alternate E-MAIL</b>	<b>Primary FAX</b>	<b>Alternate FAX</b>	<b>GTS</b>
N/A	N/A	<i>[type fax number]</i>	<i>[type fax number]</i>	N/A
N/A	N/A	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>
<b>5. Provide times for each communication technology when the message is read and understood by the operator:</b>				
<b>Primary E-MAIL</b>	<b>Alternate E-MAIL</b>	<b>Primary FAX</b>	<b>Alternate FAX</b>	<b>GTS</b>
N/A	N/A	<i>[type fax number]</i>	<i>[type fax number]</i>	
N/A	N/A	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>	<i>[type time in UTC HH:MM:SS format]</i>
<b>6. Was the fax message complete as expected? If not, report the differences.</b>				
<b>7. Was the GTS message complete as expected? If not, report the differences.</b>				
<b>8. Describe briefly the preparation made in your agency for the Small Scale Test Exercise.</b>				
<b>9. Did you synchronize the fax machine before receiving the messages? If yes, describe briefly the procedure used.</b>				
<b>10. Did you find the exercise useful in confirmation communication contacts and delays?</b>				
<b>11. Do you have any comments on the exercise?</b>				

Appendix XVI-c

**SSCT-1 GTS MESSAGE**





Appendix XVI-d

**FOUR GTS MESSAGES RECEIVED BY SSCT-1 PARTICIPANTS**

Examples provided by CENALT-FRANCE

**MESSAGE #1**

WEME40 LTAA 260900  
TSUWCT  
TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE  
(KOERI)  
ISSUED AT 0900Z 26 OCT 2011

... TSUNAMI COMMUNICATION TEST ...

THIS TEST APPLIES TO

BAS(BULGARIA)  
QC(CYPRUS)  
DMI(DENMARK)  
NRIAG(EGYPT)  
EMI(FINLAND)  
GSC(FINLAND)  
CENALT(FRANCE)  
DWD(GERMANY)  
GSI(IRELAND)  
NCGR(LEBANON)  
SPMG(MONACO)  
KNMW(NETHERLANDS)  
NHOSES(POLAND)  
IM(PORT  
UGAL)  
NPO "Typhoon"(RUSSIAN FEDERATION)  
EARS(SLOVENIA)  
DGPEE(SPAIN)  
IEC(SPAIN)  
SWQ(SYRIA)  
DEID(UNITED KINGDOM)

FROM - KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH  
INSTITUTE (KOERI)

TO - TWFP PARTICIPANTS IN THE FIRST SMALL SCALE  
COMMUNICATION TEST EXERCISE  
SUBJECT - SMALL SCALE COMMUNICATION TEST EXERCISE 1 (SSCT-1)

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF  
OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI  
WATCH CENTERS AND TO TSUNAMI WARNING FOCAL POINTS OF THE  
NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION  
QUESTIONNAIRE AND SEND IT ACCORDING TO THE INSTRUCTIONS  
PROVIDED AT THE ANNOUNCEMENT OF SSCT-1

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001-

MESSAGE #2

WEME40 LTAA 260900  
TSUWCT  
TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE  
(KOERI)  
ISSUED AT 0900Z 26 OCT 2011

... TSUNAMI COMMUNICATION TEST  
THIS TEST APPLIES TO BAS(BULGARIA) OC(CYPRUS) DMI(DENMARK)  
NRI(EGYPT) FMI(FINLAND) GSC(FINLAND) CENALT(FRANCE)  
DWD(GERMANY) GSI(IRELAND) NCGR(LEBANON) SPMC(MONACO)  
KNMW(NETHERLANDS) NIQSFS(POLAND) IM(PORTUGAL) NPO  
"TYPHOON"(RUSSIAN FEDERATION) LARS(SLOVENIA) DGPCE(SPAIN)  
IEQ(SPAIN) SWO(SYRIA) DFID(UNITED KINGDOM)

FROM - KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH  
INSTITUTE (KOERI)

TO - TWFP PARTICIPANTS IN THE FIRST SMALL SCALE  
COMMUNICATION TEST  
EXERCISE  
SUBJECT - SMALL SCALE COMMUNICATION TEST EXERCISE 1 (SSCT-1)

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF  
OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI  
WATCH  
CENTERS AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM  
TSUNAMI  
WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION  
QUESTIONNAIRE AND  
SEND IT ACCORDING TO THE INSTRUCTIONS PROVIDED AT THE  
ANNOUNCEMENT OF  
SSCT-1

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001-

**MESSAGE #3**

WEME40 LTAA 260900  
TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE  
(KOERI)  
ISSUED AT 0900Z 26 OCT 2011

... TSUNAMI COMMUNICATION TEST ...  
THIS TEST APPLIES TO  
BAS(BULGARIA)  
CC(CYPRUS)  
DMI(DENMARK)  
NRIAG(EGYPT)  
EMI(FINLAND)  
GSC(FINLAND)  
CENALT(FRANCE)  
DWD(GERMANY)  
GSI(IRELAND)  
NCCB(LEBANON)  
SPMC(MONACO)  
KNMW(NETHERLANDS)  
NIQSES(POLAND)  
IM(PORT  
UGAL)  
NPO "Typhoon"(RUSSIAN FEDERATION)  
EARS(SLOVENIA)  
DGRCE(SPAIN)  
IEC(SPAIN)  
SWQ(SYRIA)  
DEID(UNITED KINGDOM)

FROM - KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH  
INSTITUTE (KOERI)

TO - TWFP PARTICIPANTS IN THE FIRST SMALL SCALE  
COMMUNICATION TEST EXERCISE  
SUBJECT - SMALL SCALE COMMUNICATION TEST EXERCISE 1 (SSCT-1)

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF  
OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI  
WATCH CENTERS AND TO TSUNAMI WARNING FOCAL POINTS OF THE  
NEAM TSUNAMI WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION  
QUESTIONNAIRE AND SEND IT ACCORDING TO THE INSTRUCTIONS  
PROVIDED AT THE ANNOUNCEMENT OF SSCT-1

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001-

**MESSAGE #4**

WEME40 LTAA 260900  
TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE  
(KOERI)  
ISSUED AT 0900Z 26 OCT 2011

... TSUNAMI COMMUNICATION TEST  
THIS TEST APPLIES TO BAS(BULGARIA) OC(CYPRUS) DMI(DENMARK)  
NRIAG(EGYPT) FMI(FINLAND) GSC(FINLAND) CENALT(FRANCE)  
DWD(GERMANY) GSI(IRELAND) NCGR(LEBANON) SPMC(MONACO)  
KNM(NETHERLANDS) NHQSFS(POLAND) IM(PORTUGAL) NPO  
"TYPHOON"(RUSSIAN FEDERATION) EARS(SLOVENIA) DGPCE(SPAIN)  
IEQ(SPAIN) SWO(SYRIA) DFID(UNITED KINGDOM)

FROM - KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH  
INSTITUTE (KOERI)

TO - TWFP PARTICIPANTS IN THE FIRST SMALL SCALE  
COMMUNICATION TEST  
EXERCISE  
SUBJECT - SMALL SCALE COMMUNICATION TEST EXERCISE 1 (SSCT-1)

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF  
OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI  
WATCH  
CENTERS AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM  
TSUNAMI  
WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION  
QUESTIONNAIRE AND  
SEND IT ACCORDING TO THE INSTRUCTIONS PROVIDED AT THE  
ANNOUNCEMENT OF  
SSCT-1

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001-

Appendix XVI-e

**ON SSCT-1 GTS DISSEMINATION LOG**

Input Log;

26.10.2011, 09:01:23, WEME40 LTAA 260900, 1328, 5:58, , 201110260900.txt,

Input OK

Output Log;

26.10.2011, 09:06:37, WEME40 LTAA 260900, 1319, 2:18, 688,

Z\_\_C\_LTAA\_20111026090605.\_\_\_999999\_99999\_\_MW\_235.bin, Output OK

26.10.2011, 09:06:37, WEME40 LTAA 260900, 1319, 2:31, 419, LTAA\_00150960,

Output OK

26.10.2011, 09:06:37, WEME40 LTAA 260900, 1319, 2:14, 8, LTAA00281514.b,

Output OK

26.10.2011, 09:06:36, WEME40 LTAA 260900, 1319, 2:17, 345,

Z\_\_C\_LTAA\_20111026090605.\_\_\_999999\_99999\_\_MW\_710.bin, Output OK

26.10.2011, 09:01:23, WEME40 LTAA 260900, 1328, 2:31, 418, LTAA\_00150959,

Output OK

26.10.2011, 09:01:23, WEME40 LTAA 260900, 1328, 2:18, 682,

Z\_\_C\_LTAA\_20111026090100.\_\_\_999999\_99999\_\_MW\_232.bin, Output OK

26.10.2011, 09:01:23, WEME40 LTAA 260900, 1328, 2:14, 7, LTAA00281513.b,

Output OK

26.10.2011, 09:01:23, WEME40 LTAA 260900, 1328, 2:17, 339,

Z\_\_C\_LTAA\_20111026090100.\_\_\_999999\_99999\_\_MW\_707.bin, Output OK

26.10.2011, 09:01:23, WEME40 LTAA 260900, 1328, 5:117, 689, mss\_mw\_00007418,

Output OK

Appendix XVI-f

SSCT-1 GTS DISSEMINATION INFO

<b>GTS</b>			
<b>initial sending at</b>	<b>first message received at</b>	<b>last message received at</b>	<b>latency (first message)</b>
9:01:23	9:13:08*		0:11:45
9:01:23	9:02:59	9:07:01	0:01:36
9:01:23	9:15		0:13:37
9:01:23	9:03:12	9:06:14	0:01:49
9:01:23	9:02:09	9:07:56	0:00:46

\* through e-mail



Appendix XVI-g

SSCT-1 FAX MESSAGE

26/10/2011 Wed 12:01

BÜ KRDAE ULUSAL DEPREM İZLEME MERKEZİ +902163083061

ID: #2146 1 / 1

**Subject:** TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

**Body:**

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001  
KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI)  
ISSUED AT 0900Z 26 OCT 2011

... TSUNAMI COMMUNICATION TEST ...

THIS TEST APPLIES TO ... BAS(BULGARIA)... OC(CYPRUS)... DMI(DENMARK)...  
NRIAG(EGYPT)... FMI(FINLAND)... GSC(FINLAND)... CENALT(FRANCE) ...  
DWD(GERMANY)... GSI(IRELAND)... NCGR(LEBANON)... SPMC(MONACO)...  
KNMW(NETHERLANDS)... NHQSFS(POLAND)... IM(PORTUGAL)... NPO  
"Typhoon"(RUSSIAN FEDERATION)... EARS(SLOVENIA)... DGPCE(SPAIN)...  
IEO(SPAIN)... SWO(SYRIA)... DFID(UNITED KINGDOM)

FROM – KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE  
(KOERI)

TO – TWFP PARTICIPANTS IN THE FIRST SMALL SCALE COMMUNICATION TEST  
EXERCISE  
SUBJECT – SMALL SCALE COMMUNICATION TEST EXERCISE 1 (SSCT-1)

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE  
TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL  
TSUNAMI MESSAGES FROM THE CANDIDATES TO REGIONAL TSUNAMI WATCH  
CENTERS AND TO TSUNAMI WARNING FOCAL POINTS OF THE NEAM TSUNAMI  
WARNING SYSTEM

RECIPIENTS ARE REQUESTED TO FILL THE EVALUATION QUESTIONNAIRE AND  
SEND IT ACCORDING TO THE INSTRUCTIONS PROVIDED AT THE  
ANNOUNCEMENT OF SSCT-1

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST  
THIS WILL BE THE FINAL MESSAGE ISSUED

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001

Appendix XVI-h

SSCT-1 FOLLOW-UP FAX MESSAGE

SSCT-1 FOLLOW-UP FAX MESSAGE

TO WHOM IT MAY CONCERN;

THIS FAX MESSAGE HAS BEEN SENT TO YOU MANUALLY FROM KOERI (ISTANBUL-TURKEY)

YOU HAVE RECEIVED THIS FAX BECAUSE ACCORDING TO OUR FAX LOG, THE SSCT-1 FAX MESSAGE SENT TO YOU THROUGH THE FAX SERVER AT 09:00 UTC TODAY MORNING WAS NOT DELIVERED TO YOU.

PLEASE BE SO KIND TO INFORM US UPON RECEIPT OF THIS FAX BY SENDING US AN E-MAIL TO THE FOLLOWING ADRESS:

[ocal.necmioglu@boun.edu.tr](mailto:ocal.necmioglu@boun.edu.tr)

THIS WILL HELP US TO IDENTIFY WHETHER THE FAX SERVER CAUSES THE DELIVERY PROBLEM.

THANK YOU FOR YOUR COOPERATION.

KOERI



Appendix XVI-i

**DETAILED INFORMATION ON SSCT-1 FAX DISSEMINATION**

TIME (UTC)	Modem	ERROR	DURATION	TRANSMISSION DURATION	FAX USER CODE	ATTEMPT NO
9:00	COM03	NO ERROR - SENT	0:01:25	0:01:25	002	1
9:00	COM04	NO ERROR - SENT	0:00:55	0:00:55	005	1
9:01	COM08	No Connection	0:00:00		006	1
9:07	COM02	NO ERROR - SENT	0:01:23	0:01:25	006	2
9:01	COM07	SE Code 20	0:00:09		007	1
9:05	COM02	SE Code 20	0:00:09		007	2
9:10	COM05	SE Code 20	0:00:08		007	3
9:11	COM03	SE Code 20	0:00:08		007	4
9:15	COM06	SE Code 20	0:00:08		007	5
9:20	COM05	SE Code 20	0:00:09		007	6
9:24	COM02	SE Code 20	0:00:09		007	7
9:01	COM09	SE Code 20	0:00:08		009	1
9:05	COM03	SE Code 20	0:00:08		009	2
9:10	COM06	SE Code 0	0:00:52		009	3
9:12	COM06	SE Code 20	0:00:08		009	4
9:16	COM05	SE Code 20	0:00:08		009	5
9:21	COM04	NO ERROR - SENT	0:00:53	0:00:53	009	6
9:00	COM05	No Connection	0:00:00		016	1
9:06	COM02	SE Code 20	0:00:09		016	2
9:11	COM02	Busy Signal	0:00:00		016	3
9:11	COM06	SE Code 20	0:00:09		016	4
9:15	COM04	SE Code 54	0:02:08		016	5
9:22	COM03	SE Code 20	0:00:08		016	6
9:25	COM03	SE Code 20	0:00:09		016	7
9:02	COM02	SE Code 50	0:01:11		018	1
9:06	COM04	SE Code 0	0:00:59		018	2
9:12	COM03	NO ERROR - SENT	0:00:54	0:00:54	018	3
9:02	COM04	SE Code 54	0:01:22		022	1
9:07	COM05	SE Code 20	0:00:08		022	2
9:13	COM02	SE Code 20	0:00:08		022	3
9:14	COM02	SE Code 20	0:00:08		022	4
9:18	COM02	SE Code 20	0:00:08		022	5
9:24	COM03	SE Code 20	0:00:08		022	6
9:32	COM03	SE Code 20	0:00:08		022	7
9:00	COM06	No Connection	0:00:00		024	1
9:06	COM03	No Connection	0:00:00		024	2
9:14	COM03	No Connection	0:00:00		024	3
9:18	COM04	Busy Signal	0:00:00		024	4
9:21	COM02	No Connection	0:00:00		024	5
9:25	COM07	No Connection	0:00:00		024	6
9:32	COM02	No Connection	0:00:00		024	7
9:00	COM07	SE Code 20	0:00:08		025	1
9:04	COM03	SE Code 20	0:00:08		025	2
9:09	COM05	SE Code 20	0:00:08		025	3
9:10	COM08	SE Code 20	0:00:08		025	4
9:14	COM06	SE Code 20	0:00:08		025	5
9:19	COM04	NO ERROR - SENT	0:00:53	0:00:53	025	6
9:00	COM08	SE Code 20	0:00:08		026	1
9:04	COM05	SE Code 0	0:00:50		026	2
9:10	COM02	SE Code 20	0:00:08		026	3
9:11	COM02	SE Code 0	0:00:50		026	4

TIME (UTC)	Modem	ERROR	DURATION	TRANSMISSION DURATION	FAX USER CODE	ATTEMPT NO
9:15	COM05	SE Code 20	0:00:08		026	5
9:20	COM02	SE Code 20	0:00:08		026	6
9:25	COM06	SE Code 20	0:00:08		026	7
9:00	COM09	SE Code 20	0:00:08		028	1
9:04	COM06	SE Code 20	0:00:08		028	2
9:10	COM03	SE Code 20	0:00:08		028	3
9:11	COM05	SE Code 20	0:00:08		028	4
9:16	COM02	SE Code 20	0:00:08		028	5
9:22	COM05	SE Code 20	0:00:08		028	6
9:25	COM04	NO ERROR - SENT	0:01:10	0:01:10	028	7
9:01	COM02	SE Code 20	0:00:07		031	1
9:04	COM09	SE Code 20	0:00:08		031	2
9:09	COM06	SE Code 20	0:00:07		031	3
9:10	COM07	SE Code 20	0:00:07		031	4
9:14	COM08	SE Code 20	0:00:07		031	5
9:19	COM05	SE Code 20	0:00:08		031	6
9:27	COM03	SE Code 20	0:00:08		031	7
9:01	COM07	No Connection	0:00:00		101	1
9:04	COM04	Busy Signal	0:00:00		101	2
9:09	COM07	Busy Signal	0:00:00		101	3
9:13	COM05	Busy Signal	0:00:00		101	4
9:17	COM05	Busy Signal	0:00:00		101	5
9:22	COM06	Busy Signal	0:00:00		101	6
9:25	COM05	Busy Signal	0:00:00		101	7
9:02	COM03	Busy Signal	0:00:00		104	1
9:06	COM05	Busy Signal	0:00:00		104	2
9:11	COM04	Not suitable	0:00:00		104	3
9:12	COM04	Not suitable	0:00:00		104	4
9:17	COM06	Busy Signal	0:00:00		104	5
9:22	COM07	Busy Signal	0:00:00		104	6
9:25	COM09	Busy Signal	0:00:00		104	7
9:02	COM07	No Connection	0:00:00		115	1
9:08	COM04	Busy Signal	0:00:00		115	2
9:13	COM07	No Connection	0:00:00		115	3
9:18	COM03	No Connection	0:00:00		115	4
9:24	COM04	Busy Signal	0:00:00		115	5
9:26	COM02	No Connection	0:00:00		115	6
9:32	COM04	Busy Signal	0:00:00		115	7
9:02	COM09	SE Code 20	0:00:09		131	1
9:06	COM06	SE Code 20	0:00:08		131	2
9:11	COM05	SE Code 20	0:00:09		131	3
9:11	COM07	SE Code 20	0:00:08		131	4
9:15	COM08	SE Code 20	0:00:09		131	5
9:20	COM06	SE Code 20	0:00:09		131	6
9:25	COM08	SE Code 20	0:00:08		131	7
9:00	COM02	SE Code 20	0:00:08		301	1
9:04	COM02	SE Code 20	0:00:08		301	2
9:09	COM04	NO ERROR - SENT	0:01:10	0:01:10	301	3

ANNEX XVII

**ACRONYMS LIST**

<b>CP-DMA</b>	Civil Protection and Disaster Management Authority
<b>CTE</b>	Communication Test Exercise
<b>ECMWF</b>	European Centre for Medium-Range Weather Forecasts
<b>ECTE1</b>	First Enlarged Communication Test Exercise
<b>EUMETSAT</b>	European Organization for the Exploitation of Meteorological Satellites
<b>GTS</b>	Global Telecommunication System
<b>ICG</b>	Intergovernmental Coordination Group
<b>IOC</b>	UNESCO Intergovernmental Oceanographic Commission
<b>JRC</b>	Joint Research Centre
<b>MDD</b>	Meteorological Data Distribution
<b>MIC</b>	Monitoring and Information Centre
<b>MTN</b>	Main Telecommunication Network
<b>NEAM</b>	North-Eastern Atlantic, Mediterranean and Connected Seas
<b>NEAMTWS</b>	Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas
<b>NMC</b>	National Meteorological Centre
<b>NTWC</b>	National Tsunami Warning Centre
<b>RMTN</b>	The Regional Meteorological Telecommunication Network
<b>RTH</b>	Regional Telecommunications Hub
<b>RTWC</b>	Regional Tsunami Watch Centre
<b>SOP</b>	Standard Operational Procedure
<b>TNC</b>	Tsunami National Contact
<b>TOR</b>	Terms of Reference
<b>TSMS</b>	Turkish State Meteorological Service
<b>TSUWCT</b>	Tsunami Warning Centre Turkey
<b>TT-CT&amp;TE</b>	Task Team on Communication Test and Tsunami Exercises
<b>TWFP</b>	Tsunami Warning Focal Point
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WIS</b>	WMO Information System
<b>WMC</b>	World Meteorological Centre
<b>WMO</b>	World Meteorological Organization
<b>WWW</b>	World Weather Watch Programme

**IOC Technical Series**

<b>No.</b>	<b>Title</b>	<b>Languages</b>
1	Manual on International Oceanographic Data Exchange. 1965	(out of stock)
2	Intergovernmental Oceanographic Commission (Five years of work). 1966	(out of stock)
3	Radio Communication Requirements of Oceanography. 1967	(out of stock)
4	Manual on International Oceanographic Data Exchange - Second revised edition. 1967	(out of stock)
5	Legal Problems Associated with Ocean Data Acquisition Systems (ODAS). 1969	(out of stock)
6	Perspectives in Oceanography, 1968	(out of stock)
7	Comprehensive Outline of the Scope of the Long-term and Expanded Programme of Oceanic Exploration and Research. 1970	(out of stock)
8	IGOSS (Integrated Global Ocean Station System) - General Plan Implementation Programme for Phase I. 1971	(out of stock)
9	Manual on International Oceanographic Data Exchange - Third Revised Edition. 1973	(out of stock)
10	Bruun Memorial Lectures, 1971	E, F, S, R
11	Bruun Memorial Lectures, 1973	(out of stock)
12	Oceanographic Products and Methods of Analysis and Prediction. 1977	E only
13	International Decade of Ocean Exploration (IDOE), 1971-1980. 1974	(out of stock)
14	A Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment and Baseline Study Guidelines. 1976	E, F, S, R
15	Bruun Memorial Lectures, 1975 - Co-operative Study of the Kuroshio and Adjacent Regions. 1976	(out of stock)
16	Integrated Ocean Global Station System (IGOSS) General Plan and Implementation Programme 1977-1982. 1977	E, F, S, R
17	Oceanographic Components of the Global Atmospheric Research Programme (GARP) . 1977	(out of stock)
18	Global Ocean Pollution: An Overview. 1977	(out of stock)
19	Bruun Memorial Lectures - The Importance and Application of Satellite and Remotely Sensed Data to Oceanography. 1977	(out of stock)
20	A Focus for Ocean Research: The Intergovernmental Oceanographic Commission - History, Functions, Achievements. 1979	(out of stock)
21	Bruun Memorial Lectures, 1979: Marine Environment and Ocean Resources. 1986	E, F, S, R
22	Scientific Report of the Intercalibration Exercise of the IOC-WMO-UNEP Pilot Project on Monitoring Background Levels of Selected Pollutants in Open Ocean Waters. 1982	(out of stock)
23	Operational Sea-Level Stations. 1983	E, F, S, R
24	Time-Series of Ocean Measurements. Vol.1. 1983	E, F, S, R
25	A Framework for the Implementation of the Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment. 1984	(out of stock)
26	The Determination of Polychlorinated Biphenyls in Open-ocean Waters. 1984	E only
27	Ocean Observing System Development Programme. 1984	E, F, S, R
28	Bruun Memorial Lectures, 1982: Ocean Science for the Year 2000. 1984	E, F, S, R
29	Catalogue of Tide Gauges in the Pacific. 1985	E only
30	Time-Series of Ocean Measurements. Vol. 2. 1984	E only
31	Time-Series of Ocean Measurements. Vol. 3. 1986	E only
32	Summary of Radiometric Ages from the Pacific. 1987	E only
33	Time-Series of Ocean Measurements. Vol. 4. 1988	E only

(continued)

No.	Title	Languages
34	Bruun Memorial Lectures, 1987: Recent Advances in Selected Areas of Ocean Sciences in the Regions of the Caribbean, Indian Ocean and the Western Pacific. 1988	Composite E, F, S
35	Global Sea-Level Observing System (GLOSS) Implementation Plan. 1990	E only
36	Bruun Memorial Lectures 1989: Impact of New Technology on Marine Scientific Research. 1991	Composite E, F, S
37	Tsunami Glossary - A Glossary of Terms and Acronyms Used in the Tsunami Literature. 1991	E only
38	The Oceans and Climate: A Guide to Present Needs. 1991	E only
39	Bruun Memorial Lectures, 1991: Modelling and Prediction in Marine Science. 1992	E only
40	Oceanic Interdecadal Climate Variability. 1992	E only
41	Marine Debris: Solid Waste Management Action for the Wider Caribbean. 1994	E only
42	Calculation of New Depth Equations for Expendable Bathymetographs Using a Temperature-Error-Free Method (Application to Sippican/TSK T-7, T-6 and T-4 XBTS. 1994	E only
43	IGOSS Plan and Implementation Programme 1996-2003. 1996	E, F, S, R
44	Design and Implementation of some Harmful Algal Monitoring Systems. 1996	E only
45	Use of Standards and Reference Materials in the Measurement of Chlorinated Hydrocarbon Residues. 1996	E only
46	Equatorial Segment of the Mid-Atlantic Ridge. 1996	E only
47	Peace in the Oceans: Ocean Governance and the Agenda for Peace; the Proceedings of <i>Pacem in Maribus XXIII</i> , Costa Rica, 1995. 1997	E only
48	Neotectonics and fluid flow through seafloor sediments in the Eastern Mediterranean and Black Seas - Parts I and II. 1997	E only
49	Global Temperature Salinity Profile Programme: Overview and Future. 1998	E only
50	Global Sea-Level Observing System (GLOSS) Implementation Plan-1997. 1997	E only
51	L'état actuel de l'exploitation des pêcheries maritimes au Cameroun et leur gestion intégrée dans la sous-région du Golfe de Guinée ( <i>cancelled</i> )	F only
52	Cold water carbonate mounds and sediment transport on the Northeast Atlantic Margin. 1998	E only
53	The Baltic Floating University: Training Through Research in the Baltic, Barents and White Seas - 1997. 1998	E only
54	Geological Processes on the Northeast Atlantic Margin (8 <sup>th</sup> training-through-research cruise, June-August 1998). 1999	E only
55	Bruun Memorial Lectures, 1999: Ocean Predictability. 2000	E only
56	Multidisciplinary Study of Geological Processes on the North East Atlantic and Western Mediterranean Margins (9 <sup>th</sup> training-through-research cruise, June-July 1999). 2000	E only
57	Ad hoc Benthic Indicator Group - Results of Initial Planning Meeting, Paris, France, 6-9 December 1999. 2000	E only
58	Bruun Memorial Lectures, 2001: Operational Oceanography – a perspective from the private sector. 2001	E only
59	Monitoring and Management Strategies for Harmful Algal Blooms in Coastal Waters. 2001	E only
60	Interdisciplinary Approaches to Geoscience on the North East Atlantic Margin and Mid-Atlantic Ridge (10 <sup>th</sup> training-through-research cruise, July-August 2000). 2001	E only
61	Forecasting Ocean Science? Pros and Cons, Potsdam Lecture, 1999. 2002	E only

No.	Title	Languages
62	Geological Processes in the Mediterranean and Black Seas and North East Atlantic (11 <sup>th</sup> training-through-research cruise, July- September 2001). 2002	E only
63	Improved Global Bathymetry – Final Report of SCOR Working Group 107. 2002	E only
64	R. Revelle Memorial Lecture, 2006: Global Sea Levels, Past, Present and Future. 2007	E only
65	Bruun Memorial Lectures, 2003: Gas Hydrates – a potential source of energy from the oceans. 2003	E only
66	Bruun Memorial Lectures, 2003: Energy from the Sea: the potential and realities of Ocean Thermal Energy Conversion (OTEC). 2003	E only
67	Interdisciplinary Geoscience Research on the North East Atlantic Margin, Mediterranean Sea and Mid-Atlantic Ridge (12 <sup>th</sup> training-through-research cruise, June-August 2002). 2003	E only
68	Interdisciplinary Studies of North Atlantic and Labrador Sea Margin Architecture and Sedimentary Processes (13 <sup>th</sup> training-through-research cruise, July-September 2003). 2004	E only
69	Biodiversity and Distribution of the Megafauna / Biodiversité et distribution de la mégafaune. 2006 Vol.1 The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean / Ecosystème de nodules polymétalliques de l'océan Pacifique Est équatorial Vol.2 Annotated photographic Atlas of the echinoderms of the Clarion-Clipperton fracture zone / Atlas photographique annoté des échinodermes de la zone de fractures de Clarion et de Clipperton Vol.3 Options for the management and conservation of the biodiversity — The nodule ecosystem in the Clarion Clipperton fracture zone: scientific, legal and institutional aspects	E F
70	Interdisciplinary geoscience studies of the Gulf of Cadiz and Western Mediterranean Basin (14 <sup>th</sup> training-through-research cruise, July-September 2004). 2006	E only
71	Indian Ocean Tsunami Warning and Mitigation System, IOTWS. Implementation Plan, 7–9 April 2009 (2 <sup>nd</sup> Revision). 2009	E only
72	Deep-water Cold Seeps, Sedimentary Environments and Ecosystems of the Black and Tyrrhenian Seas and the Gulf of Cadiz (15 <sup>th</sup> training-through-research cruise, June–August 2005). 2007	E only
73	Implementation Plan for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), 2007–2011. 2007 ( <i>electronic only</i> )	E only
74	Bruun Memorial Lectures, 2005: The Ecology and Oceanography of Harmful Algal Blooms – Multidisciplinary approaches to research and management. 2007	E only
75	National Ocean Policy. The Basic Texts from: Australia, Brazil, Canada, China, Colombia, Japan, Norway, Portugal, Russian Federation, United States of America. (Also Law of Sea Dossier 1). 2008	E only
76	Deep-water Depositional Systems and Cold Seeps of the Western Mediterranean, Gulf of Cadiz and Norwegian Continental margins (16 <sup>th</sup> training-through-research cruise, May–July 2006). 2008	E only
77	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – 12 September 2007 Indian Ocean Tsunami Event. Post-Event Assessment of IOTWS Performance. 2008	E only
78	Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS) – Implementation Plan 2008. 2008	E only

(continued)

No.	Title	Languages
79	Filling Gaps in Large Marine Ecosystem Nitrogen Loadings Forecast for 64 LMEs – GEF/LME global project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
80	Models of the World’s Large Marine Ecosystems. GEF/LME Global Project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
81	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – Implementation Plan for Regional Tsunami Watch Providers (RTWP). 2008	E only
82	Exercise Pacific Wave 08 – A Pacific-wide Tsunami Warning and Communication Exercise, 28–30 October 2008. 2008	E only
83.	<i>Cancelled</i>	
84.	Global Open Oceans and Deep Seabed (GOODS) Bio-geographic Classification. 2009	E only
85.	Tsunami Glossary	E, F, S
86	Pacific Tsunami Warning System (PTWS) Implementation Plan ( <i>under preparation</i> )	
87.	Operational Users Guide for the Pacific Tsunami Warning and Mitigation System (PTWS) – Second Edition. 2011	E only
88.	Exercise Indian Ocean Wave 2009 (IOWave09) – An Indian Ocean-wide Tsunami Warning and Communication Exercise – 14 October 2009. 2009	E only
89.	Ship-based Repeat Hydrography: A Strategy for a Sustained Global Programme. 2009	E only
90.	12 January 2010 Haiti Earthquake and Tsunami Event Post-Event Assessment of CARIBE EWS Performance. 2010	E only
91.	Compendium of Definitions and Terminology on Hazards, Disasters, Vulnerability and Risks in a coastal context	<i>Under preparation</i>
92.	27 February 2010 Chile Earthquake and Tsunami Event – Post-Event Assessment of PTWS Performance (Pacific Tsunami Warning System). 2010	E only
93.	Exercise CARIBE WAVE 11 —A Caribbean Tsunami Warning Exercise 23 March 2011 Vol.1 Participant Handbook / Exercise CARIBE WAVE 11 —Exercice d’alerte au tsunami dans les Caraïbes. Manuel du participant / Ejercicio Caribe Wave 11. Un ejercicio de alerta de tsunami en el Caribe, 23 de marzo de 2011. Manual del participante. 2010	E/F/S
94.	Cold seeps, coral mounds and deep-water depositional systems of the Alboran Sea, Gulf of Cadiz and Norwegian continental margin (17th training-through-research cruise, June–July 2008)	<i>Under preparation</i>
95.	International Post-Tsunami Survey for the 25 October 2010 Mentawai, Indonesia Tsunami	<i>Under preparation</i>
96.	Pacific Tsunami Warning System (PTWS) 11 March 2011 Off Pacific coast of Tohoku, Japan, Earthquake and Tsunami Event. Post-Event Assessment of PTWS Performance	<i>Under preparation</i>
97.	Exercise PACIFIC WAVE 11: A Pacific-wide Tsunami Warning and Communication Exercise, 9–10 November 2011 Vol. 1 Exercise Manual. 2011	E only
98.	Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and connected seas. First Enlarged Communication Test Exercise (ECTE1). Exercise Manual and Evaluation Report. 2011	E only