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 is

1) Evaluate and validate the Tsunami Watch/Warning Centers’ dissemination process of issuing tsunami messages to the NEAM region.

(2) Evaluate and validate the process for countries to receive and confirm tsunami messages.

(3) Develop and implement mechanisms for the regular update of NTWC and TWFP contacts.

(4) Help the establishment of Standard Operational Procedures as regards the communications used to disseminate and receive tsunami messages in the NEAM region.

NEAMTWS-VII during 23-25 November 2010 in Paris-France, 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 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 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.

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, NEAMWave12, 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 this system available to them at the operational level. During the Tsunami and Civil Protection Workshop at JRC in Ispra, Italy, 15-16 June, the participation of the Monitoring and Information Centre (MIC) as an observer was agreed. 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 THE 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 NEAMTWS-VII in Paris, November 2010, and are listed below:

i. TT-CTE suggests that other communication systems, like GTS, should be used in future Communication Test Exercises.

ii. TT-CTE recommends the use of multiple phone lines in parallel to speed up the delivery of messages by fax.

iii. TT-CTE recommends that, for future exercises, participants report more accurately the reception time of their fax messages

iv. TT-CTE recommends that the TOR for future exercises should clarify the rules used for the numbering of Tsunami Communication Test Messages.

v. 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.

2. 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-ECTE1, 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.

2.1 TIMETABLE OF NEAMTWS-ECTE1

During the TT-CT&TE meeting in Paris, 11 March 2011, it was in principle agreed to conduct and evaluate NEAMTWS-ECTE1 well before the 2nd TT-CT&TE meeting, which will be held during the 3rd week of September 2011. The exact time of the NEAMTWS-ECTE1 will be determined during the Tsunami and Civil Protection Workshop in ISPRA, Italy, 15-16 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.

10 August: Conduct of ECTE1.

10 August: Questionnaire’s 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.

2.2 EXERCISE DESCRIPTION

NEAMTWS-ECTE1 will simulate the dissemination of tsunami messages by one candidate RTWC 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's 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 IIa and IIb).
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 1.1h, also given at the NEAMTWS web site.

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

2.3.1 The Need for GTS for a fully operational NEAMTWS

GTS connects meteorological and other centers 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 WMO. The structure of the GTS makes use of terrestrial communications circuits to disseminate data, products, and bulletins over a tiered network. The three tiers of the GTS are the World Meteorological Centers (WMC), the Regional Telecommunications Hubs (RTH), and the National Meteorological Centers (NMC).

NTWCs and RTWPs should employ backup communications for data and information collection required to detect a tsunami. Alternative communication paths within a center should be employed by tsunami warning centers. In the event of the failure of one of a center’s primary communication links, such as e-mail or fax, information can be rerouted 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.

2.3.2 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. The abbreviated GTS header has the following format in general:

\[ T_1T_2A_1A_2ii CCCC YYGGgg BBB \]

where

\[ T_1T_2 \] : data type and/or form designators.

\[ T_1=W \text{ (Warning)}^* \]
\[ T_2=E \text{ (Tsunami, when } T_1=W) \]

\* In the case of NEAMTWS, this WMO terminology applies to all levels of NEAMTWS Tsunami messages.
A1A2: geographical and/or data type and/or time designators. A1A2 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 bulletins issues two or more bulletins with the same T1T2A1A2 and CCCC the ii shall be used to differentiate the bulletins and will be unique to each bulletin.

CCCC: International four-letter location indicator of the station or centre originating or compiling the bulletin, as agreed internationally, and published in WMO-No. 9, Volume C1, Catalogue of Meteorological Bulletins. 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 bulletins;
- CCx for corrections to previously relayed bulletins;
- AAx for amendments to previously relayed bulletins; 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:

<table>
<thead>
<tr>
<th>Tsunami Watch, Advisory and Tests</th>
<th>France</th>
<th>Portugal</th>
<th>Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsunami Information Bulletin</td>
<td>WEMQ40 LFPW</td>
<td>WENT40 LPMG</td>
<td>WEME40 LTAA</td>
</tr>
<tr>
<td></td>
<td>WEMQ42 LFPW</td>
<td>WENT42 LPMG</td>
<td>WEME42 LTAA</td>
</tr>
</tbody>
</table>

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 don’t request action; it is only an information.
Sample GTS message for NEAMTWS-ECTE1 is given in Annex IIb. 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-IIb, TSUWCT in the second line stands for Tsunami Warning Centre Turkey. During the Tsunami and Civil Protection Workshop at JRC in Ispra, Italy, 15-16 June, 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.

2.3.3 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:

1- type of transmission mode existing in the WMO-NR (email, ftp,..)
2- 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 2.3.2)

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.

2.4 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.

2.5 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 IIIa and IIIb.

Participants are especially encouraged to read the Exercise Reports of previously conducted CTEs, which can be found at the IOC Tsunami web site.

2.6 EVALUATION OF NEAMTWS-ECTE1

The evaluation will be conducted by filling a questionnaire (see the proposed questionnaires in Annexes IVa and IVb, one for the message provider and the other for the message receivers). These questionnaires should be answered shortly after the end of the exercise and they must be sent via e-mail 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
E-mail: 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 NEAMTWS ICG. The decision on NEAMTWS-ECTE2 will be made based on the discussions among with reference to this evaluation report.

2.7 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: 1st Announcement
14 October: 2nd Announcement
26 October: Conduct of ECTE2
26 October: Questionnaire’s should be sent back.
4 November: Report should be distributed to the Exercise Participants for validation.
11 November: Report should be validated.
14 November: Report will be distributed to the TT members.
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:

1. 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

2. 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

3. Prepare and conduct the test and organize its assessment

4. Contribute to reviewing and proposing amendments to the relevant parts of the Operational Users Guide in the light of experience with the tests

5. Based on experience gained, set-up procedures for the first NEAM Tsunami exercise to be conducted in 2012

6. 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.
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)... NOAA(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
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)... NOAA(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-IIIa

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:
Fax¹:
E-mail:
Mailing address:

¹ Include all the lines used by the Fax machine in case of parallel broadcasting.
ANNEX-IIIb

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-IVa

Evaluation Questionnaire to Message Provider

1- Provide the time\(^1\) of delivery of each message by email.
2- Provide the time\(^1\) of delivery of each message by fax.
3- Provide the time\(^1\) 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\(^2\) machine (if available) and a copy of the messages distributed by email\(^3\) and GTS.

\(^1\) All times should be provided in Universal Time.
\(^2\) Please verify that the time-stamp information is visible on the document.
\(^3\) Preferably the message text appended to this report should be copied from directly from the mailbox server (see Annex VIII for an example), in order to provide all the details on timing and routing.
ANNEX-IVb

Evaluation Questionnaire to Message Receiver

1-Did you receive the communication test message by email?
2-Provide the time\(^1\) stamp of the email message
3-Provide the time\(^1\) 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\(^1\) stamp of the fax message
8-Provide the time\(^1\) 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\(^1\) stamp of the GTS message.
13-Provide the time\(^1\) 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\(^2\) message received and a copy of the messages received by email\(^3\) and GTS.

\(^1\) All times should be provided in Universal Time.
\(^2\) Please verify that the time-stamp information is visible on the document. See Annex IX for an example of time stamp.
\(^3\) Preferably the message text appended to this report should be copied from directly from the mailbox server(see Annex VIII for an example), in order to provide all the details on timing and routing.
## Established NEAMTWS TNCs and TWFPs as of 15 June 2011

<table>
<thead>
<tr>
<th>Member State</th>
<th>TNC</th>
<th>TWFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELGIUM</td>
<td>Centre Gouvernementale de Coordination et de Crise</td>
<td>Centre Gouvernementale de Coordination et de Crise</td>
</tr>
<tr>
<td>BULGARIA</td>
<td>Bulgarian Institute of Oceanology (BAS)</td>
<td>Bulgarian Institute of Oceanology (BAS)</td>
</tr>
<tr>
<td>CAPE VERDE</td>
<td>Instituto Nacional de Meteorologia e Geofísica</td>
<td>Instituto Nacional de Meteorologia e Geofísica</td>
</tr>
<tr>
<td>CROATIA</td>
<td>Institute of Oceanography and Fisheries*†</td>
<td>National Protection and Rescue Directorate – National Center 112</td>
</tr>
<tr>
<td>CYPRUS</td>
<td>Cyprus Oceanography Centre, University of Cyprus*</td>
<td>Cyprus Oceanography Centre, University of Cyprus*</td>
</tr>
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<td>Danish Meteorological Institute</td>
<td>Danish Meteorological Institute</td>
</tr>
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<td>EGYPT</td>
<td>National Institute of Oceanography and Fisheries (NIOF)</td>
<td>National Research Institute of Astronomy and Geophysics (NRIAG)</td>
</tr>
<tr>
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<td>Estonian Marine Institute, University of Tartu*</td>
<td>Estonian Marine Institute, University of Tartu*</td>
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<tr>
<td>FINLAND</td>
<td>Finnish Institute of Marine Research</td>
<td>Monitoring Center for Natural Disasters, Finnish Meteorological Institute</td>
</tr>
<tr>
<td>FRANCE</td>
<td>Ministère de l’Ecologie, du Développement et de l’Aménagement Durables</td>
<td>Laboratoire de Géophysique, Commissariat à l’Énergie Atomique (CEA)</td>
</tr>
</tbody>
</table>
| 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* |
| MONACO       | Centre Scientifique de Monaco | Compagnie des Sapeurs-Pompiers de Monaco |
| NETHERLANDS  | KNMW Royal Netherlands Meteorological Institute |  |
| NORWAY       | Directorate for Civil Protection and Emergency Planning (DSB) |  |
| POLAND       | Centre for Coordination of Rescue Operations and Protection of Population, National Headquarters of the State Fire Service |  |
| PORTUGAL     | Instituto de Meteorologia | Instituto de Meteorologia |
| ROMANIA      | National Institute for Earth Physics | National Institute for Earth Physics |
| RUSSIAN FEDERATION | State Institute Research and Production Association “Typhoon” | State Institute Research and Production Association “Typhoon” |
| SLOVENIA     | Environment Agency of the Republic of Slovenia (EARS) |  |
| SPAIN        | Instituto Español de Oceanografía | Direcccion General de Proteccion Civil y Emergencias |
| SWEDEN       | Swedish Civil Contingencies Agency (MSB) | Swedish Meteorol. & Hydrological Institute (SMHI) |
| SYRIA        | Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology | Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology |
| TURKEY       | Kandilli Observatory and Earthquake Research Institute (KOERI) | Kandilli Observatory and Earthquake Research Institute (KOERI) |
| UKRAINE      | Marine Hydrophysical Institute, National Academy of Sciences of Ukraine*† |  |
| UNITED KINGDOM | National Oceanographic Centre (NOC) | Humanitarian Operations, Department for International Development (DFID) |

**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 co-ordinated 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.

The GTS has a hierarchical structure on three levels. The Main Telecommunication Network (MTN), linking together three World Meteorological Centres (WMCs) (Melbourne, Moscow and Washington) and 15 Regional Telecommunication Hubs (RTHs) (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

<table>
<thead>
<tr>
<th>Country</th>
<th>Service or Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>The Hydrometeorological Institute</td>
</tr>
<tr>
<td>Algeria</td>
<td>Ministère des Transports</td>
</tr>
<tr>
<td>Belgium</td>
<td>Institut Royal Météorologique</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>Meteorological Institute</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>National Institute of Meteorology and Hydrology</td>
</tr>
<tr>
<td>Croatia</td>
<td>Meteorological and Hydrological Service</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Meteorological Service</td>
</tr>
<tr>
<td>Denmark</td>
<td>Danish Meteorological Institute</td>
</tr>
<tr>
<td>Egypt</td>
<td>The Egyptian Meteorological Authority</td>
</tr>
<tr>
<td>Estonia</td>
<td>Estonian Meteorological and Hydrological Institute</td>
</tr>
<tr>
<td>Finland</td>
<td>Finnish Meteorological Institute</td>
</tr>
<tr>
<td>France</td>
<td>Météo-France</td>
</tr>
<tr>
<td>Georgia</td>
<td>Department of Hydrometeorology</td>
</tr>
<tr>
<td>Germany</td>
<td>Deutscher Wetterdienst</td>
</tr>
<tr>
<td>Greece</td>
<td>Hellenic National Meteorological Service</td>
</tr>
<tr>
<td>Iceland</td>
<td>Icelandic Meteorological Office</td>
</tr>
<tr>
<td>Ireland</td>
<td>The Irish Meteorological Service</td>
</tr>
<tr>
<td>Israel</td>
<td>Israel Meteorological Service</td>
</tr>
<tr>
<td>Italy</td>
<td>Servizio Meteorologico</td>
</tr>
<tr>
<td>Latvia</td>
<td>Latvian Environment, Geology and Meteorology Agency</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Service Météorologique</td>
</tr>
<tr>
<td>Libyan Arab Jamahiriya</td>
<td>Libyan National Meteorological Centre</td>
</tr>
<tr>
<td>Malta</td>
<td>Meteorological Office</td>
</tr>
<tr>
<td>Monaco</td>
<td>Mission Permanente de la Principauté de Monaco</td>
</tr>
<tr>
<td>Montenegro</td>
<td>Hydrometeorological Institute of Montenegro</td>
</tr>
<tr>
<td>Morocco</td>
<td>Direction de la Météorologie Nationale</td>
</tr>
<tr>
<td>Netherlands (the)</td>
<td>Royal Netherlands Meteorological Institute</td>
</tr>
<tr>
<td>Norway</td>
<td>Norwegian Meteorological Institute</td>
</tr>
<tr>
<td>Poland</td>
<td>Institute of Meteorology and Water Management</td>
</tr>
<tr>
<td>Portugal</td>
<td>Instituto de Meteorología</td>
</tr>
<tr>
<td>Romania</td>
<td>National Meteorological Administration</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Russian Federal Service for Hydrometeorology and Environmental Monitoring</td>
</tr>
<tr>
<td>Serbia</td>
<td>Republic Hydrometeorological Service of Serbia</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Meteorological Office</td>
</tr>
<tr>
<td>Spain</td>
<td>Agencia Estatal de Meteorología</td>
</tr>
<tr>
<td>Sweden</td>
<td>Swedish Meteorological and Hydrological Institute</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>Ministry of Defence Meteorological Department</td>
</tr>
<tr>
<td>Tunisia</td>
<td>National Institute of Meteorology</td>
</tr>
<tr>
<td>Turkey</td>
<td>Turkish State Meteorological Service</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Ukrainian Hydrometeorological Center</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Met Office</td>
</tr>
</tbody>
</table>
From: ???@?? Thu Jun 24 10:05:46 2010
Return-Path: <hl_ntwc@gein.noa.gr>
Delivered-To: pt.ntwc@meteo.pt
Received: from cris.meteor.pt (cris.meteor.pt [193.137.20.2])
    by afrodite.meteor.pt (Postfix) with ESMTP id B356815456A9
    for <pt.ntwc@meteo.pt>; Thu, 24 Jun 2010 10:05:47 +0100 (WEST)
Received: from ste.anubis.internal (unknown [80.67.96.165])
    (using TLSv1 with cipher ADH-AES256-SHA (256/256 bits))
    (No client certificate requested)
    by cris.meteor.pt (Postfix) with ESMTP id 840886A204P
    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 ESMTP 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 ESMTP id D92E17D8159;
    Thu, 24 Jun 2010 10:05:18 +0100 (WEST)
Received: from unknown (localhost [127.0.0.1])
    by egelados.gein.noa.gr (8.12.10-8Jun/8.12.10) with ESMTP id 859956ef005648;
    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.albrune@cfa.fr, pt.ntwc@meteo.pt, twfp_tr@boun.edu.tr
Subject: TSUNAMI COMMUNICATION TEST MESSAGE NUMBER D01
Message-ID: <20100624120455.00000538a@unknown>
Organization: Geodynamics Institute
MIME-Version: 1.0
Content-Type: text/plain; charset=UTF-8
X-Origin: 4Be55f2977a9b9bc52e30f7d7fddf9

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001
NATIONAL OBSERVATORY OF ATHENS (NOA)
ISSUED AT 0900 UTC 24 JUN 2010
EXAMPLE OF TIME STAMPS ON A FAX MESSAGE.
Only the bottom line provides the reception time.

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001
INSTITUTO DE METEOROLOGIA, I.P. (IM)
ISSUED AT 09:35Z 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 - EWWF PARTICIPANTS IN THE SECOND NEAMTS COMMUNICATION TEST EXERCISE
SUBJECT - SECOND NEAMTS 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 NEAMTS-CTE INSTRUCTIONS

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

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 001
ANNEX-X

REFERENCES

Second NEAMTWS Tsunami Communication Test Exercise (Manual)
V. 1, 12. September 2010

NEAMTWS Task Team on Communication Test Exercises (TT-CTE) Intersessional Activity Report, Version 1, 11th November 2010

Second NEAMTWS Tsunami Communication Test Exercise (NEAMTWS-CTE2)
Preliminary Post Exercise Report, Version 1, 11th November 2010


NOAA web site, NECP Central Operations
http://www.nco.ncep.noaa.gov/sib/decoders/CREXLIB/toc/tidedcod/

Tsunami Warning Center Reference Guide
U.S. Indian Ocean Tsunami Warning System Program

WMO Web Site http://www.wmo.int/pages/prog/www/TEM/GTS/index_en.html

WORLD METEOROLOGICAL ORGANIZATION MEETING OF EXPERT TEAM ON DATA REPRESENTATION AND CODES; ET/DR&C/Doc. 3.1.3(1) (12.IV.2007), EUMETSAT, 23-27 April 2007

WORLD METEOROLOGICAL ORGANIZATION, COMMISSION FOR BASIC SYSTEMS, OPAG ON INFORMATION SYSTEMS & SERVICES, Joint implementation-coordination meeting on the GTS-WIS MTN and meeting of the CBS Expert Team on GTS-WIS operations and implementation; Geneva, 16-19 May 2006; ISS/ICM-MTN & ET-OI 2005/Doc.4.3 (11.V.2006)

Interim Operational Users Guide for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), version 1.9, also provided at the IOC web site