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U.S. INDIAN OCEAN TSUNAMI WARNING SYSTEM (IOTWS)  
PROGRAM

# PROCEEDINGS OF TSUNAMI ALERT RAPID NOTIFICATION SYSTEM (TARNS)

THIRD WORKSHOP: TSUNAMI WARNING SIMULATION  
EXERCISES

FEBRUARY 2007

February 2007 Version 1.0

Prepared for the United States Agency for International Development  
by the IRG-Tetra Tech Joint Venture



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# **Tsunami Alert Rapid Notification System (TARNS)** (Interagency Coordination in Response to Emergency Warning)

## **Third Workshop: Tsunami Warning Simulation Exercises**

### ***Proceedings***

6-8 February 2007  
Cholapruek Resort, Nakorn Nayok, Thailand

#### **Implementing Agency:**

National Disaster Warning Center, Thailand (NDWC)

#### **Facilitating Institution:**

United States Department of Agriculture, Forest Service (USFS)  
National Oceanic and Atmospheric Administration (NOAA)  
through the U.S. Indian Ocean Tsunami Warning System (IOTWS) Program

#### **Supported by:**

United States Agency for International Development (USAID)



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## **1. Background**

The Tsunami Alert Rapid Notification System (TARNS) is a set of common protocols and procedures used to ensure that tsunami advisories or warnings are sent from a national focal point to all relevant national and local officials so that the public receives the information quickly and accurately. The Thai National Disaster Warning Center (NDWC) adopted TARNS to enhance and refine Thailand's national early warning system. The TARNS program is supported by the U.S. Indian Ocean Tsunami Warning System (IOTWS) Program with experts from the U.S. Department of Agriculture's Forest Service (USFS) and the National Oceanic and Atmospheric Administration (NOAA).

The National Disaster Warning Center of Thailand signed a Memorandum of Agreement with USAID's Regional Development Mission for Asia (RDM/A) in March 2006 to enhance interagency coordination on TARNS in response to emergency warning in Thailand. In May 2006 during the first TARNS workshop, participants formed an Interagency Workgroup, chaired by the Vice Minister to the Office of the Prime Minister, to facilitate interagency coordination for early warning and to develop a comprehensive integrated plan for an effective disaster warning dissemination system.

During February 6-8, 2007, the US IOTWS Program and NDWC conducted the third workshop in Nakorn Nayok, Thailand, to conduct a tabletop tsunami warning simulation exercise and to develop a template for conducting an Indian Ocean tsunami warning simulation exercise in Thailand. Approximately 80 government officials at all levels, the private sector, local organizations, and international observers from Indonesia gathered together to learn about U.S. experiences on warning simulation exercises. Participants then developed a template and conducted a tabletop tsunami warning exercise for Thailand. The list of participants is attached in Annex 7.

## **2. Workshop Objectives**

The specific objectives of the workshop were to:

- Share U.S. expertise on creating and conducting warning simulation exercises
- Develop a template for conducting an Indian Ocean tsunami warning simulation exercise in Thailand
- Conduct a tabletop tsunami warning exercise Inaugural Session

## **3. Summary of the Speeches**

*Dr. Smith Dharmasaroja, Chairman, Committee of National Disaster Warning Administration*

Dr. Smith welcomed the participants and resource persons attending the third TARNS workshop. Dr. Smith mentioned that NDWC achieved significant progress after the first and second TARNS workshop. Four committees were formed for the tsunami early warning dissemination system. With support from the United Nations Development

Program (UNDP), the Asian Disaster Preparedness Center (ADPC), and the Intergovernmental Oceanographic Commission (IOC), adaptive learning for effective early warning at the provincial, district, sub-district, and village levels was introduced. Finally, he hoped NDWC would test their TARNs framework during this workshop and finalize the template for a full-scale exercise.

*Mr. Orestes Anastasia, US IOTWS Program Manager, USAID Regional Development Mission/Asia (RDM/A)*

Mr. Anastasia expressed his gratitude to NDWC and other partner agencies at the national and local levels for the excellent progress in the establishment of TARNs in Thailand and in making it a benchmark for the Indian Ocean region. He mentioned that the US IOTWS Program also works in Indonesia, Sri Lanka, India, and Maldives, and that it is heartening to see the tremendous efforts being exerted in Thailand to address the need to develop an effective warning system for the country. The development of TARNs in Thailand has many challenges. The system must ensure that appropriate technologies, coordination mechanisms, and partnerships are used to rapidly deliver messages so people in danger can get to safety on time. Both warnings and “all clear” messages are critical for the warning system to be effective, and to help build trust that the system is reliable over time. Finally, he congratulated the NDWC, its staff, and all of its partners’ efforts to get the TARNs program up and running. It is a remarkable undertaking and represents one of only a few similar programs for rapid warning notification in the world. He believes the system in Thailand will serve as a model that will contribute to the development of early warning systems that are a part of the US IOTWS Program in other countries. USAID and the U.S. Government as a whole are very pleased to be able to continue the long-standing cooperation between the two countries.

#### **4. Summary of the Workshop Presentations**

- Dr. Smith gave the keynote presentation on the progress being made on TARNs in Thailand.
- Mr. Anastasia presented progress of the US IOTWS Program in the region and other activities under the Program.
- Ms. Deanne Shulman, Senior Emergency Management Specialist, US Forest Service, presented background information on the U.S. perspective on the TARNs partnership program in Thailand and discussed the beginning of the program, lessons learned, and how to sustain the program’s achievements. She also provided a presentation on the principles of simulation exercises.
- Mr. Waiyapot Worakanok, Assistant Executive Director (Technical and Research), NDWC, presented a review of the first and second workshops’ achievements and related initiatives that help make TARNs a success.
- Mr. Ed Young, Deputy Director, Pacific Region National Weather Service, NOAA, presented a case study of a tsunami warning simulation exercise from a regional perspective.

- Mr. George Crawford, Earthquake Program Manager, Washington Emergency Management, presented a short video of the La Push, Washington, simulation exercise and recounted experiences of tsunami warning simulation exercises and routine equipment testing procedures in the state of Washington.
- Mr. Phatandit Kulphaichitra, Executive Vice President, Radio Amateur Society of Thailand under the Royal Patronage of H.M. the King, presented the Open Care System on supporting interagency linkages using intra-networking.
- Ms. Tipsakorn Aiadmusik, NDWC, presented NDWC's decision-making processes on disaster awareness tools.
- Mr. Ekachai Charoenchum, DDPM, provided an update on DDPM's warning dissemination network.
- Mr. S.H.M Fakhruddin, US IOTWS Technical Specialist, presented the strengths and weaknesses of Thailand's communications system for tsunami warning dissemination.

Workshop participants divided into small groups to discuss specific objectives and an evaluation process for a tsunami warning simulation exercise in Thailand. A summary of the recommendations is included in Annex 1.

Based on all of the presentations, participants recommended a design for a tsunami warning simulation exercise in Thailand and procedures for routine testing of equipment. The recommended design for the tsunami warning exercise is described in Annex 2.

Finally, NDWC facilitated and conducted a tabletop exercise on Day Three to identify weaknesses and gaps in the plan. Some major elements that had been overlooked include the following:

- What is the condition of people in the real situation?
- What is the availability and capability of communication equipment?
- How to communicate with tourists who are sleeping in hotels?
- How to connect with other people when the communication system fails?
- How to inform people who are far from the siren towers, such as fishermen who are out at sea without communication systems?

These are some of the real challenges that exist in situations where disaster warnings are required. Thus the plan needs to focus on these particular issues. NGOs, foundations, businesses, and other agencies in the specific area that are able to coordinate and disseminate messages should be highly engaged and use a common alerting system (e.g. bamboo sticks, drums, loudspeakers, etc). Most importantly, disaster managers should define 1) who to communicate with, and 2) the next steps to take after receiving warning information.

It was also recommended that agencies with warning dissemination responsibilities should often test the equipment, such as siren towers and backup generators. Since the

technology is rapidly developing, countries are able to improve their warning systems and send critical messages to more people in shorter periods of time.

## **5. Workshop Evaluation**

Workshop organizers provided an evaluation questionnaire to participants to solicit their feedback on the types of activities they had conducted or planned as a result of attending TARNs workshops, as well as any concrete steps undertaken to improve the national and local tsunami warning system. A summary of the evaluations is presented in Annexes 3 and 4.

## **6. Closing Session**

The workshop was closed with remarks from Dr. Smith Dharmasaroja and Ms. Deanne Shulman. Dr. Smith mentioned that TARNs is very important at critical moments, and NDWC will start initiatives to incorporate communities' knowledge into the alert system through the adaptive learning process. He mentioned that strong public awareness regarding a full-scale simulation exercise is required throughout the country to avoid any misunderstanding and consequent problems. He concluded by thanking USAID for generously providing support to implement the TARNs program in Thailand. Ms. Deanne Shulman thanked participants for providing constructive comments, taking part in the tabletop exercise, and identifying gaps and weaknesses in the simulation plan, which is valuable in developing a concrete follow-up plan for early warning in Thailand.

The date for the full-scale exercise has been fixed for the month of July, and the first high-level officials' coordination meeting is scheduled for March 30, 2007, to plan for the simulation exercise.



## **Annex I: Recommendations for Objectives and an Evaluation Process for the Tsunami Early Warning Simulation Exercise**

In the small group discussion, participants were asked to identify objectives and an evaluation process for the simulation exercise and to design a simulation exercise for Thailand.

### **Objectives**

Any kind of simulation exercise needs to have clear objectives. Participants identified objectives as follows:

1. To test equipment that will be used for disseminating the warning message.
2. To study weaknesses and strengths of the plan.
3. To prepare and educate people about their responsibilities during disasters.
4. To establish committees and specify their responsibilities.
5. To evaluate the capacity of warning procedures.
6. To increase coordination and harmony during emergency situations.
7. To increase public awareness on disasters and basic knowledge on disaster response. Community members and institutions in risk areas should have a mutual understanding on:
  - a. Basic knowledge on disaster response.
  - b. Skills on interpreting and understanding warning messages.
  - c. Their own responsibilities.
  - d. Evacuation plans and evacuation routes.
  - e. How to strengthen security systems in the community.

Participants also gave numerous comments and recommendations on issues regarding the development of a tsunami warning simulation exercise.

1. Understand the responsibility of each staff/organization, and the SOPs on disaster response should be designed with the same framework. Practice simulation exercises according to the responsibility of each institution.
2. Identify and solve problems that may occur between organizations during the simulation exercise. All organizations have to keep in mind that they have to save lives and property systematically.
3. Messages should reach the target groups as fast as possible.
4. Messages from meteorology departments are quite technical so the warnings will be understood according to the level of each receiver's understanding. Interpretation of messages is sometimes required.

5. Support from all partners and other agencies is needed if a disaster manager/unit has no response or is disconnected from their own network.
6. Establish a radio system that can connect to the internet.
7. Prepare backup generators for the communication system in case power is down or a satellite collapses.
8. Simulation exercise procedures and responsibilities need to be clarified according to the group of people, type of disaster, and geography because these different factors result in different impacts and response.
9. Everyone should pay attention during the exercise and do their best.
10. Operating systems in each organization, especially in Thailand, still start from the top down, so the process of disseminating warning messages will take time before it reaches the community level. The first objective is to make this process as fast as possible, and the message has to be correct. The last user (people in risk areas, staff, and agencies) should receive the same message as was sent from the first place.
11. Exercises should be conducted to practice both the top-down communication (province to district to community level) and horizontal communication (within organizations and with other organizations). Furthermore, warning messages need to be understood so people are confident in responding to the message.

### ***Evaluation Process***

In developing an evaluation process for tsunami warning, participants identified four items on which to focus:

- a) Communication system
- b) Standard Operating Procedures (SOPs)
- c) Organizations
- d) Community members

Participants' comments on these items include the following:

1. Measure increases in public awareness through participation in trainings and exercises, and coordination among the organizations.
2. SOPs on disasters for each organization should have the following characteristics:
  - a. Responsibility/task is specified clearly for every single organization.
  - b. People should be provided reliable information.
  - c. All staff in disaster management agencies and residents in risk areas should have disaster preparedness training.
  - d. Time used for the simulation exercise and dissemination of warning messages should be as little as possible.
  - e. SOPs used in real situations should be efficient.

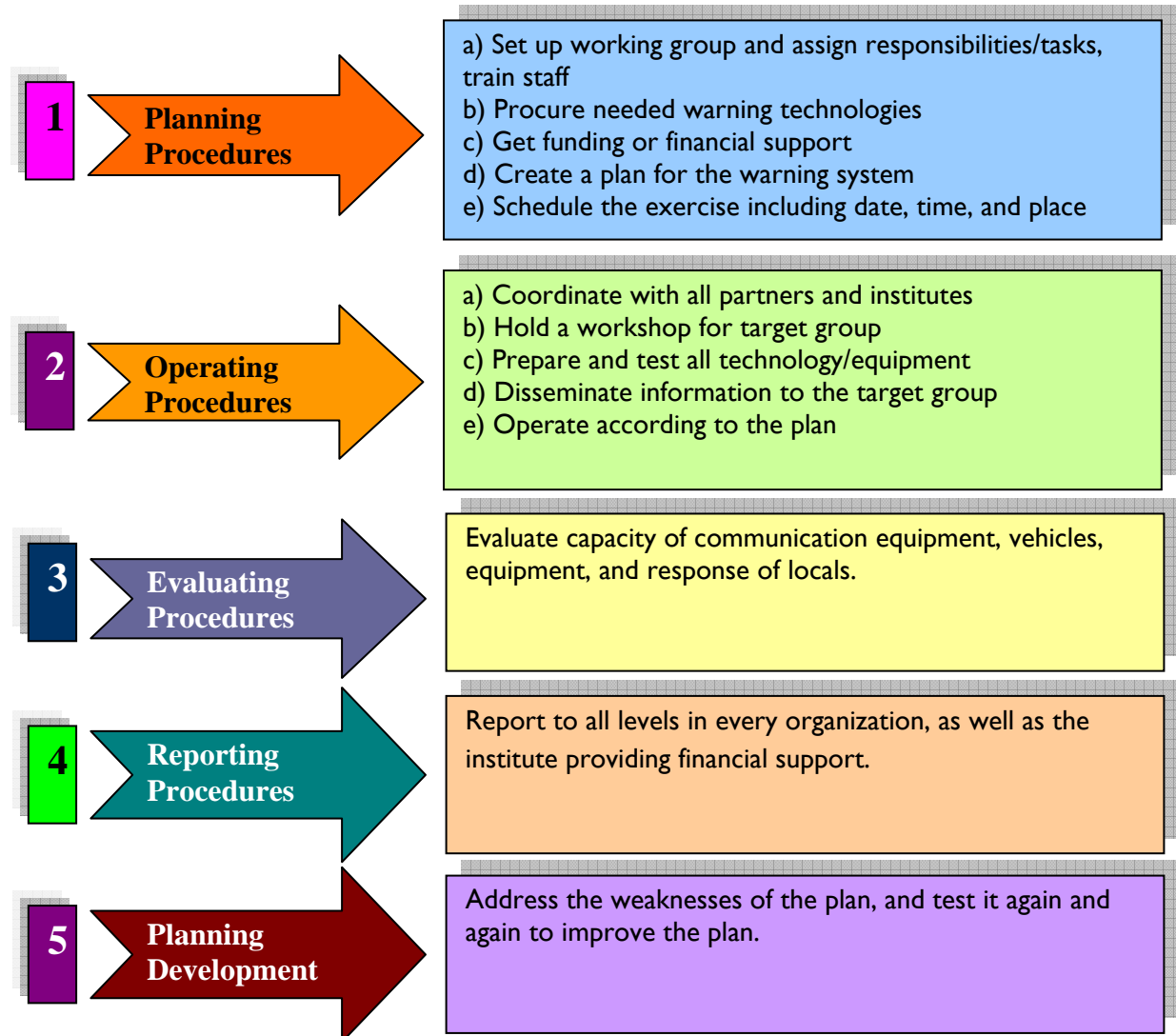
3. Meteorological departments or other national warning centers can evaluate their achievements from the number of people who access the website and the number of calls through their hotline.
4. The Radio Amateur Society can evaluate effectiveness through feedback from people who receive warning information and increases in membership.
5. The National Telecommunication Commission/Public Relations Department can also measure audience ratings during broadcasts and on websites as well as the number of members.
6. Examine feedback from warning receivers such as government offices, the business sector, institutes, and staff in risk areas who respond back to the head office or their supervisors.
7. Create an action plan with the participation of people in the community such as hotels, schools, and community members.
8. Systematize the plan.
9. Use two-way communication.
10. Evaluate in the site so siren towers and other equipment can be tested.
11. Collect data on the number of participants in the simulation exercise.
12. Use a capacity evaluation form for communication equipment.
13. Distribute a questionnaire for participants after the exercise.
14. Whether the warning message system succeeds or fails can easily be determined by monitoring how much time is used between NDWC sending the warning message and the people at risk receiving the message. If people do not get message or they receive the wrong message, it shows the gap(s) in the system that must be solved accordingly.

## Annex 2: Design of the Tsunami Warning Simulation Exercise

The small group breakout sessions discussed how to design and develop simulation exercises. The group summaries are as follows:

The simulation exercise can be divided into five procedures as shown in the figure below.

### Simulation Exercise Development Procedures



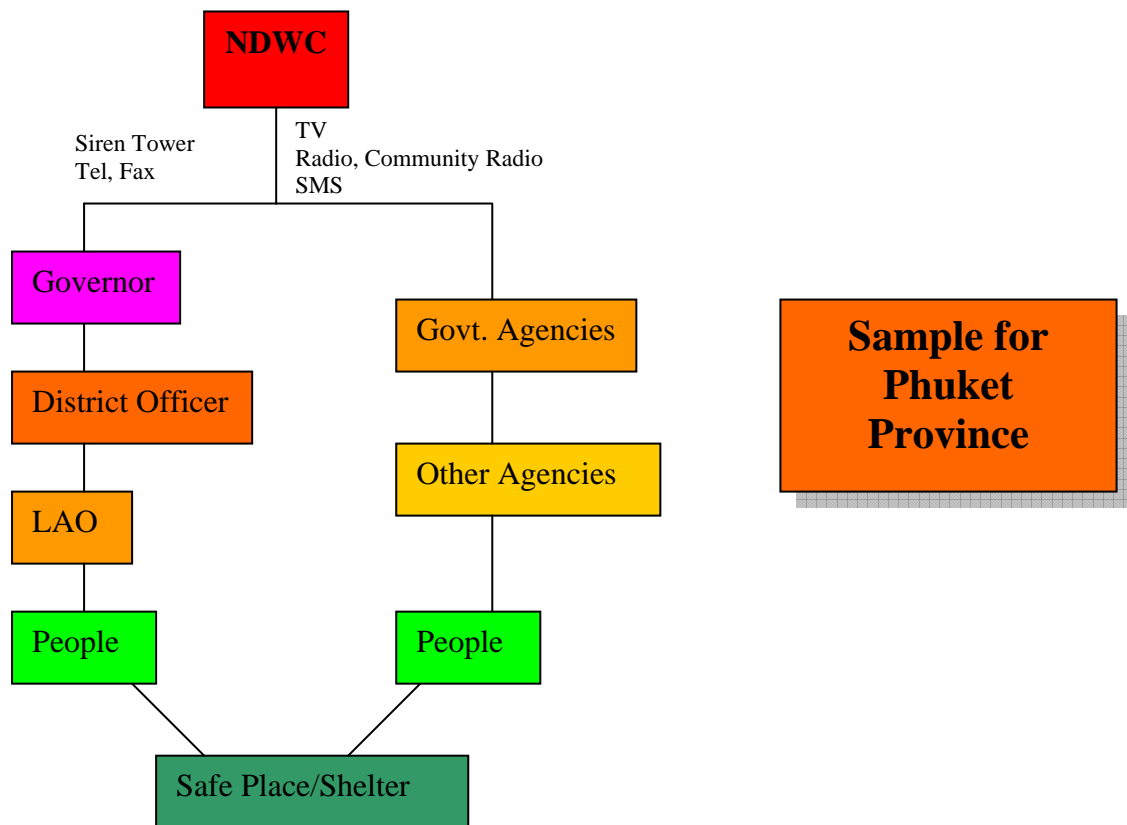
The warning message from NDWC will be sent by TV, radio, SMS, fax, and phone directly to the governors and other related agencies from the national to community levels. The warning message can also be sent directly to the community through the siren towers. When the related agencies get the message, they have to take action immediately according to their role and responsibilities.

For schools, the directors of schools or teachers will have an important role in giving the alert and coordinating with other agencies in the area, such as the police and civil defense volunteers. Homeroom teachers will gather students and take them to safe places, while other teachers can help inform people living near the school, especially the parents of

schoolchildren, to avoid panic. However, parents, hotels, and vendors have to be informed and trained about the evacuation drill beforehand.

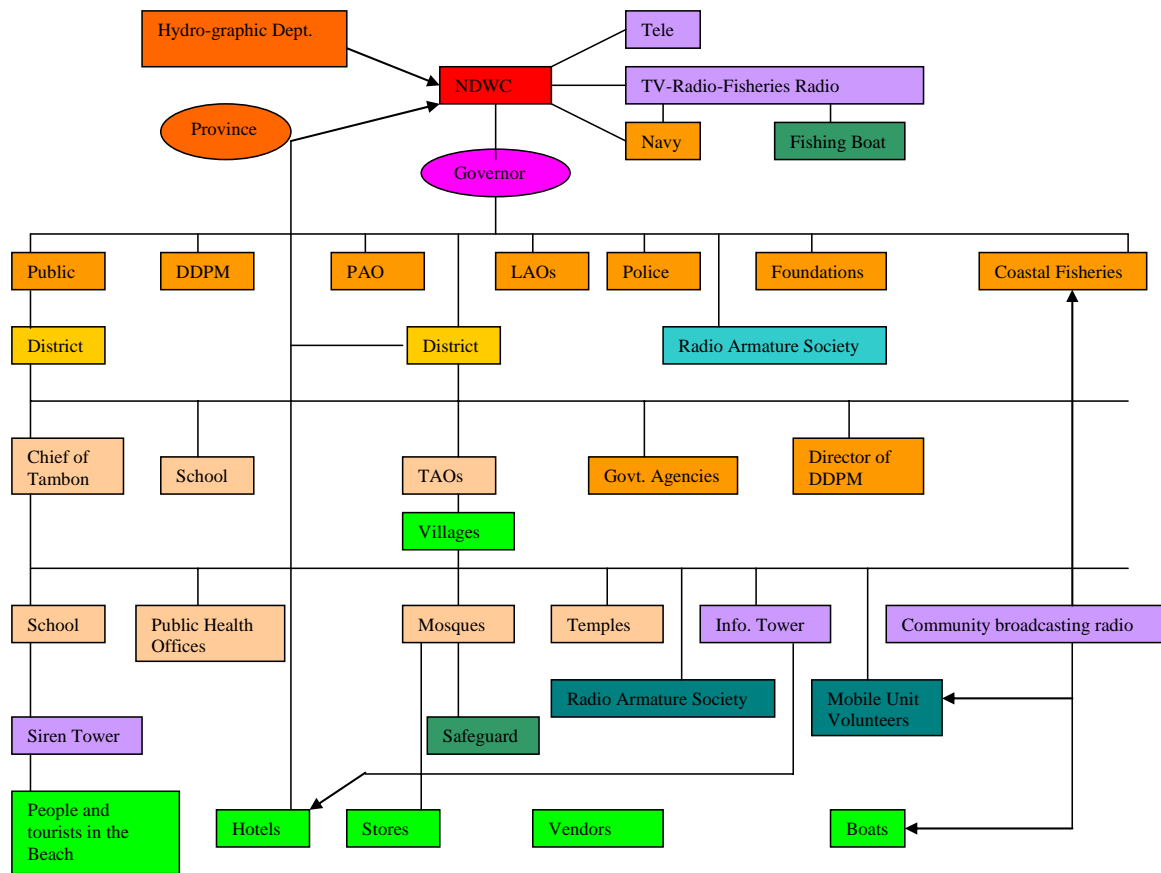
All communication pathways need to be used (phone, siren, etc) to disseminate information, and each institute should have a backup generator in case power goes down or the satellite phone system collapses. Then telephone, fax, CB radio, vans, and loudspeakers are required as well. All equipment should be available and ready to use at all times. Moreover, agencies should have a standard operating procedure for the simulation exercise and practice it from time to time. That will help to minimize the time required during simulation exercises (and actual emergencies) to receive a message till evacuation.

### Warning Dissemination Process for Phuket Province



For provincial levels, when NDWC get warning data from the Hydrographic Department or other partners, the message can be sent to the public directly through all communication channels to relevant entities. The governor in the province acts as a commander and distributes information to other related agencies in the province. This communication system consumes a bit more time for the message to reach the community level because the message has to pass through many offices (top-down system). If all agencies have a standard SOP for disaster management and clearly understand their responsibilities as well as their stakeholders, they can respond to the warning message very quickly. For example, every single teacher in the school will have their own tasks during the disaster, but the most important is to inform students and parents and move them to higher ground. Now, every community has an information center to receive/send information to community people. A proposed standard process is shown in the figure below.

## Proposed Warning Dissemination Process



### Annex 3: Activities Carried Out by Agencies to Enhance TARNs

Participants reported the following activities as implemented or planned in their agencies.

	Activities	Implemented /Completed	Planned/ planning process	Establishment process/Will do in future
	<b>A. Regulatory Framework</b>			
1	Made a written plan or guidelines, recognized operation process at community level for warning system	TMD	NTC	Ranong S
		DDPM	Pang Nga School	Satoon S
		KS Phuket	Patong M	Trang S
		Red Cross	Fisheries Radio P	Krabi S
		TAO Pang Nga	DoLA	
2	Changed my organization's procedure/protocols/checklist/ communication map to disseminate warning and decision making process	TMD	Pang Nga School	Krabi S
		Phuket School	KS Phuket	Trang S
		Ranong S	PRD	
		TAO Pang Nga	Fisheries Radio P	
		NDWC	DoLA	
		DDPM	Red Cross	
3	Informed my agency/community about siren protocols from NDWC	KS Phuket	Pang Nga School	Ranong S
		Phuket School	Patong M	PRD
		TAO Pang Nga	Fisheries Radio P	Krabi S
		TMD		
		Red Cross		
		NDWC		
		DDPM		
4	Equipped fishing/tourist boats with communication system to receive warnings	KS Phuket	NDWC	Trang S
		Fisheries Radio P	Patong M	
		TMD		
		DDPM		
		Red Cross		
5	Improved outreach brochures/evacuation maps/warning system for tourists	NDWC	Pang Nga School	Ranong S
		DDPM	DoLA	TAO Pang Nga
		Red Cross	Patong M	
			KS Phuket	
			TMD	
6	Conducted evacuation	KS Phuket	Pang Nga School	Ranong S

	Activities	Implemented /Completed	Planned/ planning process	Establishment process/Will do in future
	drill/simulation exercise plan in national, provincial, and local level in cooperation with all agencies such as TAO, PAO, school, hotel, etc.	Phuket School		Krabi S
		TAO Pang Nga		DoLA
		Patong M		
		TMD		
		Red Cross		
		NDWC		
		DDPM		
	<b>B. Coordination</b>			
7	Improved coordination with other agencies for information sharing and efficiency of warning	Paya-Insee	Pang Nga School	Ranong S
		TMD	NTC	MolCT
		NDWC	KS Phuket	Trang S
		Fisheries Radio P	TAO Pang Nga	
		DDPM	Phuket School	
		Red Cross	PRD	
		Patong M	DoLA	
8	Learned about scope of work of other agencies on tsunami and disaster warning	Paya-Insee	Pang Nga School	MolCT
		NTC	DoLA	
		KS Phuket	Ranong S	
		Red Cross		
		TAO Pang Nga		
		Fisheries Radio P		
		Patong M		
		Phuket School		
		PRD		
		Trang S		
		TMD		
		NDWC		
DDPM				
	<b>C. Communication Technology</b>			
9	Identified communication systems available in my community and other agencies	Paya-Insee	Pang Nga School	MolCT
		Phuket School	KS Phuket	Ranong S
		Patong M	TAO Pang Nga	
		Fisheries Radio P	DoLA	



	Activities	Implemented /Completed	Planned/ planning process	Establishment process/Will do in future
		Trang S	DDPM	
		PRD	Red Cross	
		TMD		
		NDWC		
10	Improved communication among the agencies responsible for tsunami warning	PRD	NTC	DDPM
		TMD	Pang Nga School	Ranong S
		NDWC	Phuket School	
		Red Cross	Patong M	
			DoLA	
			TAO Pang Nga	
			Fisheries Radio P	
11	Learned about two-way communication systems for follow up and feedback on warning dissemination	Phuket School	Pang Nga School	MoICT
		PRD	KS Phuket	
		TMD	Fisheries Radio P	
		NDWC	DoLA	
		DDPM	TAO Pang Nga	
			Ranong S	
			Red Cross	
			Patong M	
12	Planned appropriate technologies for community/agency/ organization	Phuket School	NTC	MoICT
		TMD	KS Phuket	Ranong S
		NDWC	Fisheries Radio P	
			DoLA	
			TAO Pang Nga	
			PRD	
			DDPM	
			Red Cross	
			Patong M	
13	Established a program for routine testing of sirens/loud speakers	Pang Nga School	Phuket School	Ranong S
		Fisheries Radio P	DoLA	
		TMD	Red Cross	
		NDWC	Patong M	
		TAO Pang Nga		
14	Identified and connected with underutilized and unused communication systems	PRD	KS Phuket	Ranong S
		Fisheries Radio	DoLA	DDPM

	Activities	Implemented /Completed	Planned/ planning process	Establishment process/Will do in future
	available from other agencies or organizations	P		
		TMD	Phuket School	
		NDWC	Patong M	
		Red Cross		
	<b>D. Capacity Building</b>			
15	Learned about the natural phenomenon of tsunamis and signs of its onset	Pang Nga School	NTC	
		KS Phuket	Ranong S	
		Phuket School	Red Cross	
		TAO Pang Nga	Patong M	
		DoLA		
		Fisheries Radio P		
		Trang S		
		Krabi S		
		PRD		
		TMD		
		NDWC		
		DDPM		
16	Transferred/shared my lessons learned with my community/ schoolchildren/agency staff	KS Phuket	NTC	
		TAO Pang Nga	DoLA	
		Fisheries Radio P	Pang Nga School	
		Patong M	Ranong S	
		Phuket School	Red Cross	
		TMD		
		Trang S		
17	Developed training materials/ activities for operation and maintenance of warning equipment	Pang Nga School	Red Cross	Ranong S
		TMD	Patong M	KS Phuket
		Fisheries Radio P	DoLA	Krabi S
		TAO Pang Nga		
		NDWC		
18	Developed preparedness materials to support provincial and local agencies	KS Phuket	NTC	Ranong S
		Red Cross	Patong M	
		TAO Pang Nga	Fisheries Radio P	
		Trang S	DoLA	

	Activities	Implemented /Completed	Planned/ planning process	Establishment process/Will do in future
		TMD	Phuket School	
		NDWC		
19	Designed training procedures for people who will carry the warning	KS Phuket	Phuket School	Trang S
		TAO Pang Nga	Fisheries Radio P	
		TMD	DoLA	
		DDPM	Red Cross	
			Ranong S	
			Patong M	
20	Gained awareness of roles and responsibilities of NDWC	KS Phuket	Pang Nga School	
		PRD	Ranong S	
		TAO Pang Nga	DoLA	
		Fisheries Radio P	Patong M	
		Krabi S		
		Red Cross		
		DDPM		
		TMD		
21	Learned about civil defense plan to use at national/provincial/district level	KS Phuket	NTC	
		PRD	Pang Nga School	
		TAO Pang Nga	Fisheries Radio P	
		MoICT	DoLA	
		Krabi S	Patong M	
		TMD	Ranong S	
		DDPM	Red Cross	
		NDWC		
22	Other Activities:			
22/1	Prepared manual on disasters for the public		NDWC	Jan-Feb 07

S = School  
M = Municipality  
P = Phuket

## Annex 4: Concrete Steps to Improve National–Local Tsunami Warning System

	Activities	Location of Activity	Agency Involved
1	Paya-Insee, a Bangkok-based NGO prepared a CB/HF frequency network plan in the six tsunami-affected coastal provinces. Waiting for funding from the government and private sector participation	6 Provinces in South	Paya-Insee
2	Evacuation plan and drill was done in coordination with TAO. Transferred knowledge to schoolchildren and asked for support from private organization.	Pang Nga	Pang Nga School
3	Developed evacuation drill plan and signage of evacuation route. Integrated knowledge and provided training to community and students.	Phuket	Kamil School Phuket
4	Phuket school community developed warning system plan and exercise plan and is practicing them twice a semester. Also improved the communication plan. Each drill gives better ideas for improvement. Indicators used to evaluate were time and safety, but the drill at every community/ village level was not done, since that required coordination from many agencies.	Phuket	Phuket School
5	Public Relations Department presents the information in the office for further distribution.	National	Public Relation Department
6	In Ranong, government implemented evacuation drill plan which is not realistic.	Ranong	Ranong School
7	Satoon school provided training to students. Held an exhibition and introduced play/games for preparedness.	Satoon	Satoon School
8	DDPM started "OPEN CARE", a web-enabled interagency information dissemination system to collect data, support coordination, and make use of volunteer network in each area.	National	DDPM
9	NDWC developed communication processes, better interagency coordination, and focused on communities and their understanding.	National	NDWC
10	Krabi school prepared evacuation a map, plan, and route, and conducted a simulation once.	Krabi	Krabi School
11	TAO Pang Nga incorporated warning equipment in the community and created a communication network.	Pang Nga	TAO Pang Nga

	<b>Activities</b>	<b>Location of Activity</b>	<b>Agency Involved</b>
12	Fisheries radio has improved communication network and signals, and ensured good maintenance and practice communication drill regularly.	Phuket	Fisheries Radio Phuket
13	Krabi school transferred knowledge and incorporated it in several subjects in school curriculum.	Krabi	Krabi School
14	Pang Nga school authority will transfer the knowledge to village people on the warning system and will develop a warning communication plan.	Pang Nga	Pang Nga School
15	DoLA developed a prevention plan and provided knowledge to its agency staff. Also developed a communication plan and arranged guard for 24 hrs	National	Department of Local Administration

## Annex 5: Scenarios for Tabletop Exercise

### Introduction to Scenarios

1. We will be conducting two tsunami warning scenarios this afternoon and evening.
2. The objective of these scenarios is to explore the coordination aspects of a tsunami warning and identify efficiencies and gaps.
3. After we finish this introduction, you will be asked to join with colleagues from your agency. Please wait until we complete the instructions before you move from your seat.
4. Arrange yourselves as best as possible in the order in which you might receive the warning. With masking tape, secure the paper with your agency name to the floor and stand around it.
5. You will be given different colored ribbons and scissors with the following designation: (Assign colors and communications technique)
6. A tsunami warning will be issued by the PTWC and JMA. You will then stretch the appropriate colored ribbon between your group and the agency to whom you would pass the message. Use the appropriate color ribbon to indicate a completed notification and what mechanism is used (i.e. landline phone, fax, satellite communication, radio, TV, text message on cellphone, etc.)
7. You must wait until you receive the notification in order to pass it on to the agencies you are responsible for notifying.
8. If you need permission from someone to pass on the warning, or you have to follow some type of internal agency procedure prior to passing the message, please take the time to write down what procedure you must follow on a blank piece of paper. After you have written these down, only then can you stretch the ribbon to the entities that receive the notification from you. If an agency is not present and you need to pass the warning to them, write the agency name on a paper, affix to the floor and stretch the ribbon between agencies to the end user. In other words, role player agencies/entities that are absent from the room.
9. Let's introduce our "end-user" who must receive this tsunami warning. They each are labeled and will be waiting in the lobby to get the warning. They will also carry a sign that says "yes" or "No" on whether they have been notified.
10. Introduce "end-users" and constraints on mechanisms for notification.
11. Run an example using Bapon – NDWC – DDPM national – DDPM provincial – governor's office – DDPM province – DDPM district – DDPM sub-district – police/local leaders
12. Ask them to group and affix agency label on the floor and prepare agency labels for those that are absent. Affix those to the floor also.

## **Scenario A**

It is 10:00 am Tuesday morning. NDWC has received a tsunami warning from the Pacific Tsunami Warning Center.

### ***End-users include:***

- Child in a school or school principal – hears radio
- Fisherfolk in small boat without radio of any kind – doesn't hear siren, TV, or radio
- Fisherfolk in a larger boat with ham radio – doesn't get siren, TV, or radio
- Harbor master in harbor area outside siren grid – doesn't get siren
- Tourist in hotel room with loud air-conditioner, sleeping heavily while recovering from too much partying the night before who only speaks German (doesn't hear siren, doesn't understand TV or radio)
- Small shop owner – hears radio and TV
- Food vendor on the beach – hears siren
- Masseuse in a building near the beach in an area without siren coverage – no siren, no TV, no radio
- Tourist scuba diving – doesn't hear siren, TV, or radio
- Patient in a clinic close to the beach – hears siren and radio – has no way to move from bed
- Passenger on a bus – doesn't hear siren, TV, or radio

## **Scenario B**

It is 3:00 am Sunday morning. NDWC has just received a tsunami warning from the Pacific Tsunami Warning Center.

### ***“End-users” include***

- Tourist in hotel room with loud air-conditioner, sleeping heavily while recovering from too much partying the night before, who speaks only German – doesn't hear siren, doesn't understand TV or radio
- Person asleep in a house in a village with loudspeaker operated by the sub-district – doesn't get siren, doesn't have TV or radio on
- Person asleep in a house covered by the siren grid and with a mosque loudspeaker – the siren doesn't work – doesn't get siren, doesn't have TV or radio on
- Harbor master in area outside the siren grid – no siren, no TV, no radio
- Fisherfolk without radio of any kind – no siren, no radio, no TV

## **Discussion Guide**

### ***Plenary Discussion:***

- 1) Ask each agency to share who they received the message from and who they passed it to. Ask each agency about internal processes/approvals that had to be conducted prior to passing the message on to other agencies.
- 2) Ask each agency to describe the efficiencies and gaps in the process
- 3) Ask the group to give feedback on the whole process.



## Annex 6: Agency Contact Details

Acronyms	Agency	Address/ Contact person	Phone/Fax
NTC	National Telecommunication Commission	Mr. Shatchai Nuchanon, Director, Radio Emergency Control Room, Thai National Telecommunication Commission	T 02 2796196, M 081 9373489, 081 9073399
Pang Nga School	Pang Nga School	Mr. Tanich Jitprasan, Director	T 076-593245, F 076-446339, bannamken@yahoo.com
KS Phuket	Kamil School Phuket		T076342606, E-suthas925@hotmail.com, M084-1877920
Satoon S	Satoon School	Mrs. Urai Thammapprechataworn	T 0818981546, T 074731017
DDPM	Department of Disaster Preparedness and Mitigation		T 0813064567, 022417450-6, E- nrp20@hotmail.com
Phuket S	Phuket School	Precha Puanrak, President	T 076-279239, M 0869536599, E-rachpracha36@hotmail.com, www.rpg36.ac.th
PRD	Public Relation Department		T 02 6182323, 0819302906, E- weerasacc@yahoo.com, weerasac@prdnorth.in.th
MoiCT	Ministry of Information & Communication Technology		E- chanai@mictmail.com
Pating M	Patong Municipality		T 076342600, 0840518334
Fisheries Radio P	Fisheries Radio Phuket	Fisheries Radio Phuket	T 0899723459. www.ssrinark@yahoo.com
TMD	Thai Meteorological Department	Dr. Wattana, Director, TMD	02 3994561
NDWC	National Disaster Warning Center	Ubon Janprasert, Policy and Plan Analyst	T 025901803-04
Paya-Insee	Paya-Insee	Paya-Insee/ Mr. Saksi Sansuk, Director of Paya Special Operation Center, 127, Pattanakarn Rd, Suan Luang, Bangkok 10250	Phone: 02719-4499
Ranong S	Ranong School		T 0833923767, E-banhardsydum@thaimail.com
Krabi S	Krabi School	Mr. Chumpornpan Anusorn, Director	T0895864735, 075631983, 075644192, E-anusornchumpornpan@hotmail.com

TAO Pang Nga	District Offices		
DoLA	Department of Local Administration		

## Annex 7: List of Participants

No.	Name	Address
1	Dr. Smith Dharmasaroja Vice Minister of the Office of the Prime Minister	Chairman of the Committee for the Development of an Early Warning System for Thailand, Government House Thanon Pissanulok Dusit Bangkok 10300
2	Lieutenant General Dr. Amnat Barlee Director, Relief and Public Health Bureau	สำนักงานบรรเทาทุกข์และประชานามัยพิทักษ์สภากาชาดไทย (Thai Red Cross) 1871 ถนนอังรีดูนังต์ แขวงวังใหม่ เขตปทุมวัน กทม 10330
3	Rear Adm. Thaworn Charoendee NDWC	National Disaster Warning Center Rattana Thibet Rd., Bang Kra Sor, Muang, Nonthaburi 11000
4	Mr. Waiyapot Worakanok	National Disaster Warning Center Rattana Thibet Rd., Bang Kra Sor, Muang, Nonthaburi 11000
5	Pol. Maj. Gen. Surapong Pongaram	
6	Mr. Prasertsak Daipi	สภากาชาดไทย 1871 ถ. อังรีดูนังต์ ปทุมวัน กทม 10330
7	Mr. Amnat Jnantuya	1871 ถ. อังรีดูนังต์ ปทุมวัน กทม 10330
8	ดร.วัฒนา กันบัว Dr. Wattana Kanbua	ศูนย์อุตุนิยมวิทยาทะเล Thai Meteorological Department 4353 Sukhumvit Road, Bangna, Bangkok 10260, Thailand
9	Capt. Chaiwoot Nawikanjana ผู้อำนวยการกองสมุทรศาสตร์ กองทัพเรือ	กรมอุทกศาสตร์ กองทัพเรือ (Hydrographic Department, Royal Thai Navy), 222 กรมอุทกศาสตร์ ริมทางรถไฟเก่า ต.บางนา เขตบางนา กทม 10250
10	Mr. Weerasac Chergchow	กรมประชาสัมพันธ์ 9 ถ.พระราม 6 พญาไท กทม. 10400
11	Dr. Pornpet Panjapiyakul	สำนักงานพัฒนาระบบบริการสุขภาพ 646 ซ.เสนานิคม 1 แขวงลาดยาว เขตจตุจักร กทม 10500
12	Mr. Shatchai Nuchanon	สำนักกำกับดูแลกิจการโทรคมนาคม สำนักงานคณะกรรมการกิจการโทรคมนาคมแห่งชาติ The National Telecommunications Commission
13	Mr. Phatanadit Kulphaichitra	สมาคมวิทยุสมัครเล่น, Radio Amateur Society of Thailand under the Royal Patronage of H.M. the King, 1768 Thai Summit Tower, 10th-12th Floor and IT Floor, New Petchaburi Road, Bangkapi, Haiy Khwang, Bangkok 10310
14	Mr. Saksri Saensuk	ผอ.ศูนย์ปฏิบัติการพิเศษวิทยุสมัครเล่น มูลนิธิองค์กรอาสาสมัคร ศูนย์วิทยุสมัครเล่น 127 ถ.พัฒนาการ 29 แขวง เขตสวนหลวง กรุงเทพฯ 10250
15	Mr. Kitti Meekrin	มูลนิธิองค์กรอาสาสมัคร ศูนย์วิทยุสมัครเล่น 127 Pattanakon 29 Road Bangkok 10250 Thailand
16	Pol. Col. Teerapol Thipjaran	สถานีตำรวจภูธรอำเภอกระทุ่ม จ.ภูเก็ต (Phuket Police) 68 ถนนไสน้ำเย็น ต.ป่าตอง อ.กระทุ่ม จ.ภูเก็ต 83150 68 Sainamyen Road, Patong Phuket 83150

17	Dr.Tavida Kamolvej	มหาวิทยาลัยธรรมศาสตร์ 2 ถนนพระจันทร์ พระนคร กรุงเทพฯ 10200
18	Mr. Suthas Vorasri	ผู้อำนวยการโรงเรียนบ้านกะหลิม (Ban Kalim School) 63/115 ซอยวิรัชพงษ์หยก 3/6 ถนนเจ้าพระตะวันตก ต.วิชิต อ.เมือง จ.ภูเก็ต 83000
19	Mr. Boonchuay Chaopaknam ที่ปรึกษา ศกษ.	ที่ปรึกษา ศกษ. 48 ซ.ลาดปลาเค้า 33 ถ.ลาดปลาเค้า แขวงจรเข้บัว เขตลาดพร้าว กรุงเทพฯ 10230
20	Mr. Sathid Sigkha	ที่ปรึกษา ศกษ. 103 ม.7 หมู่บ้านอุบลชาติ ต.หน้าไม้ อ.ลาดหลุมแก้ว จ.ปทุมธานี 12140
21	Mr. Ekachai Charoenchum หัวหน้ากลุ่มงานปฏิบัติการ	ศูนย์อำนวยการบรรเทาสาธารณภัย กรมป้องกันและบรรเทาสาธารณภัย กระทรวงมหาดไทย ถ.อุททองนอก เขตคูสิต กทม
22	Assoc. Prof. Absornsuda Siripong ที่ปรึกษา ศกษ.	ภาควิชาวิทยาศาสตร์ทางทะเล คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
23	Mr. Yongyut Doungwang	สำนักงานป้องกันและบรรเทาสาธารณภัย ภูเก็ต 29/1 ถ.ดำรง ต.ตลาดใหญ่ อ.เมือง จ.ภูเก็ต 83000
24	Mr. Chodok V. Poonsawat	มูลนิธิราชประชานุเคราะห์ในพระบรมราชูปถัมภ์ 511 ถ.เลียบคลองสอง, แขวงบางชัน เขตคลองสามวา กทม 10510
25	Mr. Seksun Srinark	สถานีวิทยุประมงชายฝั่งจังหวัดภูเก็ต (Phuket Coastal Fisheries Radio Station) ม.7 ต.รัชฎา อ.เมือง จ.ภูเก็ต 83000
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27	Mr. Ruangsak Konsap	ผู้ใหญ่บ้าน หมู่ 3 ต.ลำแก่น อ.ท้ายเหมือง จ.พังงา
28	Mr. Pravitt Rattanachot	สำนักงานเทศบาลเมืองป่าตอง ถนนราชปทานุสรณ์ ต.ป่าตอง อ.กระบุรี จ.ภูเก็ต
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31	Mr. Amnaj Ratkul	สำนักงานเทศบาลเมืองป่าตอง ถนนราชปทานุสรณ์ ต.ป่าตอง อ.กระบุรี จ.ภูเก็ต
32	AVM. Sanoh Waritswad	สำนักงานผู้ทรงคุณวุฒิกองทัพอากาศ กองบัญชาการกองทัพอากาศ แขวงคลองถนน, เขตสายไหม กทม 10210
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35	Group Captain Chitipat Bejraburnin	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi 11000

36	Group Captain Somsak Khaosuwan	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
37	Mr. Raywat Pongsuwan Information Receptin Unit	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
38	Dr. Cherdsak Virapat IOI, NDWC	Chief of International Coordination National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
39	Mr. Tinnakorn Tatong Information and Warning Disseminaiton Unit	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
40	Mr. Kunjapong Anuratpanich Technical Information Unit	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
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48	Ms. Ketsaya Praseethong NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
49	Mrs. Arunya Marykery NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
50	Ms. Porntip Phunsawap NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
51	Mr. Prasert Kunneang NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
52	Mr.Kanisorn Yongcharoen NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
53	Mr.Suparat Wisadsak	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
54	Mr. Supamit jantakham	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
55	Mr. Jaturong Pinkasorn NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
56	Mr. Sirichoke Sirisophon NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
57	Mr. Sakchai Boonsanong NDWC	National Disaster Warning Center Rattanathibet Rd., Bang Kra Sor, Muang, Nonthaburi   1000
58	Ms. Pimkarn Sabprung	Pacific Disaster Center, Thailand

59	Mr. Gede Sudiarta	Head of the Bali Office and Senior Disaster Management Trainer, Indonesian Red Cross
60	Dr. (Mr.) Subagio Senior Member of Indonesian Team Director of Government Institutions Communications	Directorate General of Media Communications and Information Dissemination Ministry of Communications and Information Technology Indonesia
61	Mr. Indra Catri	Special Asst to the Mayor of Padang City West Sumatera, Indonesia
62	Mr. Aim Zein Padang Advisor	GTZ GI-TEWS Last Mile Project Radio Pronews 90 FM Gd. Melati Duo, Jl. Belanti Raya Lolong UK, Padang 25136 - Indonesia
63	Mr. Edward H. Young Deputy Director and Chief of Technical Services for the NOAA	National Weather, Service Pacific Region Headquarters, 737 Bishop Stret, Suite 2200 Honolulu, Hawaii, U.S.A. 96813-3213
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65	Ms. Phanrudee, ADPC	Asian Disaster Preparedness Center PO Box 4, Klong Luang, Pathumthani
66	Mr. Attha Waiwongkijkan Training and Assistant US Indian Ocean Tsunami Warning System Program	Chartered Square Building, 18th Floor, Unit 1802 152 North Sathorn Road, Bangrak, Bangkok, Thailand
67	Mr. Stanley Goosby	Pacific Disaster Center, Hawaii 1305 N. Honoopno St. Suite 2 Kinei, Maui, Hawaii, U.S.A. 96779
68	Mr. Orestes Anastasia USAID/ RDMA	U.S. Agency for International Development Regional Development Mission, Diethelm Towers A, 10th Floor, 93/1 Wireless Road Bangkok 10330
69	Dr. Piyachatr Pradubraj USAID/ RDMA	U.S. Agency for International Development Regional Development Mission, Diethelm Towers A, 10th Floor, 93/1 Wireless Road Bangkok 10330
70	Ms. Parichatt Krongkant US IOTWS	Program Integrator (USAID Contractor) Indian Ocean Tsunami Warning System (IOTWS) Program Chartered Square Building, 18th Floor, Unit 1802 152 North Sathom Road, Bangrak, Bangkok 10500
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73	Ms. Deanne Shulman Disaster Mitigation Programs	Office of International Programs USDA Forest Service
74	Dr. Joesph Chung UNISDR	Senior regional Coordinator UN International Strategy for Disaster Reduction - Bangkok
75	Mr. Sanny Jegillos UNDP	UNDP Regional Center in Bangkok 4th Floor, UN Service Building Rajdamnern Nok Avenue, Bangkok, Thailand

76	Mr. Theerapol Tanadtanusilp (ผช. ประชาสัมพันธ์ จ.ตราด)	ศาลากลางจังหวัดตราด ถนนราษฎร์นิยม อ.เมือง จ.ตราด 23000
77	Mr. Sukhothai Topong	ผู้อำนวยการโรงเรียนวันสุวรรณศิริเขต 68 ซ.เชิงทะเล 8 ถ.ศรีสุนทร ต.เชิงทะเล อ.ถลาง จ.ภูเก็ต 83110
78	Mr. Sutham Mingwan	โรงเรียนท่าฉัตรไชย, -อ.ถลาง จ.ภูเก็ต - 61/3 ม.5 บ้านท่าฉัตรไชย ต.ไม้ขาว อ.ถลาง จ.ภูเก็ต 83110
79	Mr. Precha Peonrak นายวิระ ชัชเวช	ผู้อำนวยการโรงเรียนราชประชานุเคราะห์ 36, ม.3 ถ.ริมหาด ต.กมลา อ.กระบุรี จ.ภูเก็ต 83150, ผู้อำนวยการโรงเรียนพระราชทานทับละมุ
80	Mr. Wira Chachavet	ม.5 ต.ลำแก่น อ.ท้ายเหมือง จ.พังงา
81	Mr. Thawit Jitprasan	ผู้อำนวยการการโรงเรียนบ้านน้ำเค็ม จ.พังงา ค/ตจ
82	Mr. Prasit Satgapornjaturawit	ผู้อำนวยการโรงเรียนราชประชานุเคราะห์ 35 จ.พังงา
83	Mr. Kriengsak Intaring	โรงเรียนราชประชานุเคราะห์ 35 จ.พังงา
84	Ms. Preeyada Wannasirot	ร.ร.พระราชทานทับละมุ 42/5 ม.2 ต.ท่าอยู่ อ.ตะกั่วทุ่ง จ.พังงา
85	Mrs. Rattanawadee Sirikaew	ผู้อำนวยการโรงเรียนบ้านคลองประสงค์, -149/31 ถ.กระบี่ ต.ปากน้ำ อ.เมือง จ.กระบี่ 81000, - ต.คลองประสงค์ อ.เมือง จ.กระบี่ 81000
86	Mr. Anusorn Chumpornpan	ผู้อำนวยการโรงเรียนบ้านคลองม่วง -ม.2 ต.หนองทะเล อ.เมือง จ.กระบี่ -135/5 ถนนกระบี่ อ.ปากน้ำ อ.เมือง จ.กระบี่ 81000
87	Mr. Somkiat Phaisarnkularaya	ผู้อำนวยการโรงเรียนบ้านหาดยาว จ.กระบี่
88	Mr. Adisak Boodlei	ผู้อำนวยการโรงเรียนบ้านบากัน - ม.2 ต.อ่าวลึกน้อย อ.อ่าวลึก จ.กระบี่ 81110 - ม.3 ต.อ่าวลึกน้อย อ.อ่าวลึก จ.กระบี่
89	Mr. Samut Nantasin	ผู้อำนวยการโรงเรียนบ้านมดตะนอย 28/1 ม.3 ต.เกาะลิบง อ.กันตัง จ.ตรัง
90	Mr. Sunan Kongkleang	ผู้อำนวยการโรงเรียนบ้านปากเมง จ.ตรัง
91	Mr. Somphat Chaiphadungniran	ผู้อำนวยการโรงเรียนบ้านบางเนียง จ.พังงา
92	Mr. Yuan Pongsirikul	อาจารย์โรงเรียนบ้านบางค้างคาว จ.ตรัง 115 ม.1 ต.กะสาเส อ.ติเตา จ.ตรัง 92150
93	Mr. Manut Chansakul	ผู้อำนวยการโรงเรียนบ้านบางเบน - 243/1 ม.1 ต.หวาง อ.เมือง จ.ระนอง 85000 - ม.4 ต.ม่วงกลาง อ.กะเปอร์ จ.ระนอง 85120
94	Mr. Kanen Prateepwattanapan	ผู้อำนวยการโรงเรียนบ้านต้นหยงโป 93/34 ถ.ป่านชวลี ต.พิมาน อ.เมือง จ.สตูล 91000
95	Mr. Amroong Hemra	ผู้อำนวยการโรงเรียนบ้านบ่อเจ็ดลูก 882 ม.4 ถ.ละงู-ปากบารา ต.ปากน้ำ อ.ละงู จ.สตูล 91110

96	Mr. Kovit Kanuy	ผู้อำนวยการโรงเรียนบ้านบุญโยช 135 ม.2 ต.แหลมสน อ.ละงู จ.สตูล
97	Mr. Sad Kasam	โรงเรียนบ้านบุญโยช
98	Mr. Choolee Phonlasit	ผู้อำนวยการโรงเรียนบ้านปากน้ำ 34 ม.2 ต.ปากน้ำ อ.เมือง จ.ระนอง
99	Mr. Wichan Payongsak	ผู้อำนวยการโรงเรียนบ้านหาดทรายดำ 47/1 ม.2 ต.บางรี อ.เมือง จ.ระนอง 85000
100	Mrs. Urai Thamprechathaworn	ผู้อำนวยการโรงเรียนบ้านหาดทรายขาว 95 ถ.สตูลธานี ซอย 17 ต.พิมาน อ.เมืองสตูล จ.สตูล 91000
101	Mrs. Supawadee Nakwichien	ผู้อำนวยการโรงเรียนบ้านทะเลนอก 26/4 ม.4 ต.บ้านนา อ. กะเปอร์ จ.ระนอง
102	Mrs. Sumalee Prachuab	ผู้อำนวยการสำนักแผ่นดินไหว 4353 ถนนสุขุมวิท บางนา กทม 10260
103	Mrs. Somsri Horkanya	กระทรวงเทคโนโลยีสารสนเทศและการสื่อสาร 89/2 ม.3 อาคาร 9 บมจ.ทีโอที ถ.แจ้งวัฒนะ เขตหลักสี่ กทม 10210
104	Ms. Chanai Phungphai	กระทรวงเทคโนโลยีสารสนเทศและการสื่อสาร 89/2 ม.3 อาคาร 9 บมจ.ทีโอที ถ.แจ้งวัฒนะ เขตหลักสี่ กทม 10210
105	Mr. Songapiratch Singhto หัวหน้าเจ้าหน้าที่แผนและโครงการ	สถานีวิทยุโทรทัศน์กองทัพบก 64/86 ม.เฉลิมเอมร็ด ต.อ้อมเกร็ด อ.ปากเกร็ด จ.นนทบุรี 11120
106	Mr. Cheewin Siriratyporn กรรมการปกครอง	ศูนย์สื่อสารกรมการปกครอง เขต 9 (จังหวัดปราจีนบุรี) ศูนย์ราชการจังหวัดปราจีนบุรี ต.ไม้เตี๊ต อ.เมือง จ.ปราจีนบุรี 25230
107	Mr. Noppadol Taesakul กรรมการปกครอง	ศูนย์สื่อสารกรมการปกครอง เขต 9 (จังหวัดปราจีนบุรี) ศูนย์ราชการจังหวัดปราจีนบุรี ต.ไม้เตี๊ต อ.เมือง จ.ปราจีนบุรี 25230
108	Mrs. Ubon Chanprasert สำนักพัฒนาระบบบริการสุขภาพ	กรมสนับสนุนบริการสุขภาพ กระทรวงสาธารณสุข 100/67 ม.4 ต.โสนลอย อ.บางบัวทอง จ.นนทบุรี
109	Dr. Nikhom Jarumane	มหาวิทยาลัยราชภัฏภูเก็ต
110	Mr. Nitit Pucomme	สำนักบริการวิชาการ มหาวิทยาลัยศิลปากร



## Annex 8: Workshop Agenda

### WORKSHOP OBJECTIVES

- Share U.S expertise on creating and conducting warning simulation exercises
- Develop a template for conducting an Indian Ocean tsunami warning simulation exercise in Thailand
- Tabletop tsunami warning exercise

### TRAVEL DAY: Monday, 5 February 2007

09:15 – 11:00	Travel to workshop site
11:00 – 12:00	Check into the Hotel & Registration
18:30 – 20:00	Dinner

### DAY 1 PROGRAM: Tuesday, 6 February 2007

#### Expected Outcome for Day 1:

Participants gain knowledge on development of tsunami warning simulation exercises.

08:30 – 09:00	Registration
09:00 – 10:30	Opening Session <ul style="list-style-type: none"><li>• Welcome Address and Update Report by Rear Admiral Thaworn Chareondee, Vice Executive Director, NDWC</li><li>• Opening Addresses<ul style="list-style-type: none"><li>❖ Government of Thailand – Dr. Smith Dharmasaroja, Chairman, National Disaster Warning Administration</li><li>❖ Government of the United States – Mr. Orestes Anastasia, IOTWS Program Manager, USAID</li></ul></li><li>• Keynote Presentation: Tsunami Early Warning System of Thailand – Update on recent developments and successes - Dr. Smith Dharmasaroja, Chairman, National Disaster Warning Administration</li><li>• Presentation: Update on US Perspective on TARNs Partnership Program in Thailand – Ms. Deanne Shulman, Senior Emergency Management Specialist, US Forest Service</li></ul>
10.30 – 10.45	Coffee Break
10:45 – 11:30	Workshop Introduction and Overview <ul style="list-style-type: none"><li>• Meetings and business arrangements – Dr. Tavidia Kamolvej, Workshop Facilitator and Disaster Management Expert</li><li>• Introductions of workshop participants and agency role in TARNs – Facilitator</li><li>• Overview of workshop process and outcomes – Facilitator</li><li>• Review of workshop agenda - Facilitator</li></ul>

11:30 – 12:00	Presentation: Recap of First and Second TARNs Workshop Outcomes and Update on recent activities – Mr. Waiyapot Worakanok, Assistant Executive Director (Technical and Research), NDWC
12:00 - 13:00	Lunch
13:00 – 14:00	Presentation: Case Study of a Tsunami Warning Simulation Exercise from a Regional Perspective followed by Q&A: Mr. Ed Young, Deputy Director of Pacific Region National Weather Service, NOAA
14:00- 15:00	Presentation Followed by Q&A: Case Study of the LA Push, Washington Simulation Exercise with Video - Mr. George Crawford, Earthquake Program Manager, Washington Emergency Management
15:00 – 15:15	Coffee Break
15:15 – 16:00	Presentation followed by Q&A: Principles of Simulation Exercises –Deanne Shulman, USDA Forest Service
16:00 – 17:00	Small Group Discussions: Develop recommendations for specific objectives and an evaluation process for a tsunami warning simulation exercise in Thailand
17:00 – 17:45	Small Group report out
17:45 – 18:00	Wrap-up for Day 1: Facilitator
18:30 – 20:00	Dinner

## **DAY 2 PROGRAM: Wednesday, 7 February 2007**

### **Expected Outcome for Day 2:**

Participants gain in-depth knowledge of both principles and the practice of tsunami warning simulation exercise development

08:45-09:00	Review of Day 2 Process and Expected Outcomes – Facilitator
09:00 – 10:00	Presentation Followed by Q&A: Experience in Washington State of tsunami warning simulation exercises and routine equipment testing procedures - Mr. George Crawford, Earthquake Program Manager, Washington Emergency Management
10:00 – 10:30	Coffee Break

10:30 – 11:30 Small Groups: Based on all the presentations, recommend a design for a tsunami warning simulation exercise in Thailand and procedures for routine testing of equipment. Describe in detail.

11:30 – 12:00 Small group report out: Facilitator

12:00 - 13:00 Lunch

13:00- 13:30 Small group report out: Facilitator

13:30 – 14:00 Presentation: Open Care – Mr. Phatandit Kulphaichitra, Executive Vice President, Radio Amateur Society of Thailand under the Royal Patronage of H.M. the King

14:00 14:30 How NDWC take Decision on Disaster Aware by Ms. Tipsakorn Aiadmusik, NDWC

14:30 – 15:00 Coffee Break

15:00 – 15:30 Presentation: Update on DDPM warning dissemination network – Mr. Ekachai Charoenchum, DDPM

15:30- 16:00 Presentation: Analysis of Existing Warning Dissemination Capacity in Thailand – Mr. S.H.M. Fakhruddin, Technical Specialist, US IOTWS

16:00- 17:00 Description of Tabletop Exercise for Day 3: Mr. Waiyapot Worakanok, AED (Technical and Research), NDWC

### **DAY 3 PROGRAM: Thursday, 8 February 2007**

#### **Expected Outcome for Day 3**

Conduct and assess “tabletop” tsunami warning simulation exercise

09:00 – 09:15 Review of the Day 3 Process and Expected Outcome: Facilitator

09:15 – 10:45 Table-top Exercise: Facilitator and all participants

10:45 – 11:00 Coffee Break

11:00 – 12:00 Discussion on Lessons Learned about tsunami warning in Table Top Exercise: NDWC and all participants

12:00 – 13:00 Lunch

13:00 – 13:30 Evaluation of the activity of the Table Top Exercise: Facilitator and all participants

13:30 – 14:00 The Way Forward: Scheduling of Full Scale Tsunami Warning Simulation Exercise – NDWC and USAID

14:00 - 14:30	Evaluation of the impacts of the TARNS workshops
14:30- 14:45	Certificates presentation - NDWC
14:45 - 15:00	Formal Workshop Close: NDWC
15:00	Depart for Bangkok

## Annex 9: TARNS Collaborative Activity Plan

An interagency workgroup has been formed, chaired by His Excellency Dr. Smith Dharmasaroja, Vice Minister to the Office of the Prime Minister. The interagency workgroup will aim to enhance interagency coordination for early warning and work to develop a comprehensive integrated plan for effective disaster warning dissemination. The NDWC will serve as the lead coordinating agency for the Thai Government, and work in partnership with the U.S. Government team to help replicate the TARNS approach in other countries across the Indian Ocean Region.

The TARNS program will be implemented in four workshops and two simulation exercises:

- Workshop 1: TARNS System Design and Plan (*Completed, May 24-26, 2006*)
- Workshop 2: Enhance Communication, Technology, and Relationships with Media (*Completed July 26-28, 2006*)
- Workshop 3: Development of Framework Plan for TARNS (*Completed February 6-8, 2007*)
- Workshop 4: Regional Model of Tsunami Alert Rapid Notification System
- Simulation Exercise 1: Field visit at provincial, district and TAO level to enhance TARNS (*Completed August 2006-January 2007*)
- Simulation Exercise 2: Full-scale exercise on alert rapid notification system

A planned program of specific future collaborative activities with a timeline is shown in the table below. It is important to note that due to funding parameters of the U.S. government, all activities under the US IOTWS Program must be completed by September 30, 2007.

<b>Timeframe</b>	<b>Activity</b>
May 24-26, 2006 (Completed)	First TARNS workshop to develop system design and plan for interagency coordination to deliver early warnings to people
July 26-28, 2006 (Completed)	Second TARNS workshop to develop communication system, technology and media training
October 24, 2006 (Completed)	Planning Meeting of TARNS 3 <sup>rd</sup> Workshop
August 2006-January 2007 (Completed)	Field visits at the provincial, district, TAO and community level to develop robust TARNS
February 6-8, 2007 (Completed)	Third TARNS workshop to develop plan for the TARNS, tabletop exercise
July 2007	Full-scale exercise
August 2007	Regional Model showcase of TARNS