A GUIDE TO RADIO COMMUNICATIONS STANDARDS FOR EMERGENCY RESPONDERS

Prepared Under United Nations Development Programme (UNDP) and the European Commission Humanitarian Office (ECHO) Through the Disaster Preparedness Programme (DIPECHO)

Regional Initiative in Disaster Risk Reduction

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Introductory Remarks and Acknowledgments

This manual is written to provide a standard of operation and a guide for training and message handling techniques and net procedures for Radio Emergency Service operators at the national and as well as with local radio networks. Instructions and general operating procedures presented in this Standard Operating Procedure (SOP) are applicable to all message traffic handling. All radio operators are encouraged to use this document in training and/or activated net operations.

The United Nations Development Programme (UNDP) and DIPECHO has prepared this document based on standartized international communications protocols. Adaptations were made to make communications protocols more user friendly to the target audience comprised of countries such as Mozambique, Malawi, Madagascar and Comoros.

This document also benefited from combined efforts and valuable contribution of Dr Jane S. P. Mocellin, a.i DIPECHO Regional Coordinator on behalf of UNDP. A consultant , B. Donaldson, have greatly contributed to the process of preparation of this document and gave useful advice and suggestions and finalizing it. Special thanks to WFP Mozambique (World Food Programme) for their review on the initial draft.

Communication Operations and Procedures

1. Communications in Emergencies

Effective communication linkages among the Emergency Operations Centers (EOC) and front-line responders to meet the needs of affected communities is critical in the aftermath of a disaster, especially with the growing emphasis on devolution of disaster management to the community level. However, failure of electronic communications has been a major problem on numerous occasions impeding disaster response.

In addition to rapid response, there is also a requirement for continued community information post-impact, such as warnings of additional threats and of emergency/disaster management arrangements in their local areas. The goal of any communication system is to maximize the number of people who take appropriate and timely action for ensuring safety and protecting of life and property of affected communities communication systems. It should encompass three equally important elements:

- Detection and warning;
- Dissemination of warning down to the community level; and
- Subsequent quick response.

Developing and implementing common technical characteristics and guidelines for radio communication systems for early warning and disaster relief, would promote a common technical basis in planning for and responding effectively to an emergency. Such systems that have a common basis, would also benefit from cooperation among countries when there is a

trans-border disaster by allowing an effective and appropriate humanitarian assistance with all the necessary operational requirements.

Basic radio operating procedures are used for the following reasons:

- Non-standard radio communications can result in misunderstood messages;
- Terminology and procedures used to exchange information vary among different organizations;
- In emergency or poor operating conditions, radio traffic becomes congested and accuracy can suffer; and
- Information may be easily compared thus the work of different assessment teams is complementary.

The Role of the Radio Telephone Operator (RTO)

Emergency communications are not a just function of technology and access alone. Information flows in cascades and chains, between the point of origin and ultimate use. Such cascades often involve multiple actors and points where information is interpreted, reformulated, and transmitted to the next set of actors. The emergency communication Radio Telephone Operator (RTO) is responsible for ensuring that information during disaster response or crisis management activities is quickly and accurately passed to all agencies involved in the response operation.

Description of Duties

The RTO performs the following duties:

- Maintains radio contact with all stations and vehicles

in radio network(s) under their responsibility;

- Ensures efficient communications and information flow for all units and Agencies;
- Communicates with all applicable supporting networks including the United Nations (UN) and relevant Non-governmental Organizations (NGOs) in the region ensuring radio communications for operational and security purposes;
- Logs all communications and dispatch without delay to the receiving Officer or Unit (database entry as applicable);
- Keeps all necessary messages sent and received strictly confidential;
- Ensures all network users are complying with proper radio procedures, and full call signs are enforced, English language, etc. is strictly adhered to;
- Advises radio room supervisor immediately of faults in the telecommunication networks and undertake all necessary actions to provide a prompt reestablishment of service. Security is always the main priority;
- Assesses overall communications needs, obtain frequencies, and develop the communications plan as needed;
- Installations, operates, and maintains communications systems, including: radio, satellite, telephone, Internet, Geographic Positioning System (GPS 's) and networks during incidents;
- Adheres to all safety procedures; and
- Develops requests for replacement, or repair, for consumable, inoperative, lost, damaged, or destroyed communications items.

Radio Operator Logs

Accurate logs provide a time line and account for assigned personnel and resources and are necessary in case your first responder needs to receive replies later. Thus whenever a message is sent or received they need to be recorded in a Logbook. The Emergency Operations Center (EOC) communications manager must check the logbooks at least each day to make sure that messages were passed on and were not forgotten.

Use the mnemonic ASAP as an aid to information management:

ACCURATE: Precise, clear.
SPEEDY: Quickly copied and delivered
APPROPRIATE distribution: The right person gets the information
PERMANENTLY recorded.

Radio Logs

- All messages received either by phone or radio should be logged before being dispatched;
- All outgoing satphone calls should be logged in an appropriate sheet; and
- All contacts should mainly be on High Frequency (HF) or Very High Frequency (VHF). All telephone calls should be logged or entered in the database or manual record as applicable.

Log Format Example				
Call From	Calls	Message Text	Time	Action Taken
AB 21	Base	Flash report # 24	16:50	Filed with EoC manager

Programming Radios

Most modern radios offer a digital selective call (Selcall) encoding facility that allows programming in the frequencies of several other stations. By entering the identity number of any of these stations, the radio at the receiving end, rings like a telephone. The Selcall feature can be used in conjunction with an emergency button. By pressing the button, a distress call is automatically sent to all the numbers programmed. A technician can do this, but it is up to the individual responder to ensure the assigned communication equipment is properly functioning and has the appropriate channels/ frequencies.

Care of Equipment and Operator Maintenance

Communications equipment should be installed and serviced only by qualified technical personnel. However, operators should perform regular maintenance as follows:

- Visually check of all connections, wires and antennas;
- Scheduled 'on air' testing;
- Keep batteries charged and remove dry cells batteries from equipment in storage;
- Keep the radio clean, dry, and dust free; and
- Check all accessories.

If a fault is found, the radio should be labeled and the fault described with sufficient information to aid repair and return of the repaired item. Accessory items should also be included.

Solar Panels

Solar panels typically deliver 15 to 18 Volts (V) at 600 to 1 500 milliamperes (mA) in full sunlight. This will not damage a high-

capacity battery, such as a deep-cycle unit. All you need to do is hook up the battery, put the solar panel in full sunlight, and charge. The battery will regulate the maximum voltage from the panel. Most are polarity protec-ted with a diode in series with the positive voltage line, so when it gets dark, and the output voltage drops, the diode ensures that the panel won't start drawing current from the battery.

Communication equipment are expensive items, easily mislaid and attractive to thieves. All staff is advised to keep positive control of their assigned equipment at all times.

When using a solar panel to recharge a smaller battery, such as a Nickel-Cadmium (NiCd) battery or gelled-electrolyte lead-acid battery, more attention to detail is required. These types of batteries can suffer damage if charged too quickly, so a regula-ted charge is necessary.

Types of Radios

Long-range radios are HF radios, which can communicate several hundred kilometers and in some circumstances, several thousand. HF radio is the backbone of communications to remote areas. It may not be a fast means of delivering large amounts of data, but it still has a vital role to play in two-way access to remote areas. HF should be retained as a backup network where better and more sophisticated solutions exist as many of these fail during severe weather and natural disasters. By adding relatively inexpensive digital modems, a reasonable quality digital data communications system can be implemented.

The HF Digital E-mail

HF e-mail is a low cost system in terms of hardware and operational costs. It is good for long distance communication offering longer transmission than voice.

Short-range radios are usually Very High Frequency (VHF) radios. They can communicate a few kilometers directly (line-of-sight), but using a repeater station (on a hilltop or a high building) can increase their capacity to several tens of kilometers. Typical ranges for VHF radios are:

- Handheld to handheld: 2 - 5 km;
- Vehicle unit to vehicle unit: up to 20 km;
- Base unit to handheld: up to 15 km;
- Base unit to vehicle unit: up to 30 km; and
- Base unit to base unit: up to 50 km.

Improved Communication Technologies

The new communication and information technologies that have emerged over the last two decades lend themselves to greater possibilities of integration of different communication systems. The interoperability of various communication systems including Internet, mobile phones, fax, and e-mail, is increasingly becoming functional. As a result, the possibilities for application of communication technologies in mitigation, prevention, and response to disasters, are also increasing.

Satellite Communications

A lesson learned from recent disasters, was the power of the satellite-based communications for disaster management. While conventional communications outlets (i.e., wireless

phones and landlines) were either damaged or overwhelmed in many disaster situations hindering the efficient and timely transfer of information, satellite-based communication systems remained relatively intact. The following is a brief description of alternatives communication ensuring interoperable communications remains available among all agencies if the radio net is adversely affected by critical events.

Benefits of Using Satellite

- **Highly Survivable.** (Physical survivability and robustness) Groups of satellites can cover virtually the Earth's entire surface;
- **Instant Infrastructure.** Satellite service can be offered in areas where there is no terrestrial infrastructure and the costs of deploying a cable or microwave network are prohibitive. It can also support services in areas where existing infrastructure is outdated, insufficient, or damaged;
- **Independent of Terrestrial Infrastructure.** Satellite service can provide additional bandwidth to divert traffic from congested areas, provide overflow during peak usage periods, and provide redundancy in the case of terrestrial network outages;
- **Temporary Network Solutions.** In relief situations, satellite-based communication can often provide the only practical, short-term solution for getting necessary information in and out.; and
- **Rapid Provisioning of Services.** Since satellite solutions can be set up quickly, communications networks and new services can be quickly recovered and reconfigured. In addition, services can be expanded electronically without traditional terrestrial networks. As a result, a high level of communications

rapidly achieved without high budget ex-penditures.

Satellite Phones

Satellite phones (satphones), are battery-operated phones that have some similarities to cell phones but much greater coverage. They use satellites rather than cell towers to communicate. They are also much more expensive to purchase and operate than cell phones. Satphones need a clear line-of-sight to the satellite in order to maintain a signal. This generally means that in order to use the satphone, you have to be outside with as unobstructed view of the sky as possible, or hookup to antenna extensions available through which you can use indoors or under restricted line of sight situations.

When the use of transfering data such as e-mails or text messages ir required, most satphones have a relatively slow data transfer rate of 2,400 Bits per Minute (bps). Although newer satphones are more data transfer capable, they still don't equate with the data rates of cellular phones.

Some satellite networks have collaborated with cellular Global System for Mobile (GSM) networks to provide Internet service and e-mail through satphone in addition to offering GSM roaming. This allows a satphone customer that lives or works at the fringes of a GSM zone to utilize GSM networks when possible, and satellite calls when necessary. Coupled with a built-in GPS, satphones are ideal for disaster or relief situations.

Mobile Data Terminals / Mobile Satellite Service (MSS) Mobile satellite systems, or terminals used for 'communications on the move' include equipment that can be transported and operated from inside a car, truck, or maritime vessel, as well as in helicopters and other aircraft, including

commercial airplanes. This kind of terminal is useful where data-intensive, high-speed connections are needed on an expedited basis for damage assessment, medical evacuation, and telemedicine or other applications for voice, video, and data. Depending on the satellite system and type of equipment, it can be operational in anywhere from 5-30 minutes, usually without expert technical staff, and can be deployed anywhere. Benefits include:

- Offers broadband data up to 492kbps;
- Offers streaming data rates on demand up to 256 Kilobites per second (kbps);
- Responders can speak to offsite leadership, while sending a live video update;
- No technical expertise required;
- Easily carried in a backpack for quick mobility; and
- Communications-on-the-move terminals are available for vehicles.

Satellite VSAT Networks

A satellite Very Small Aperture Terminal (VSAT) network consists of a pre-positioned, fixed, or transportable VSAT that connects to a hub station to provide broadband communications to hospitals, command posts, emergency field operations, and other sites.

VSATs are relatively low cost to purchase and consist of 2 to 4 foot antennas equipped with a fixed mount that can be made survivable to over 100 Miles per Hour (mph) winds. There are also variants of VSATs that are transportable and can be on the air within 30 minutes requiring no special tools or test equipment for installation.

A typical VSAT used by a first responder may have full two-way connectivity up to several Megabits per Second (Mbps) for any desired combination of voice, data, video, and Internet service capability. VSATs are also capable of supporting higher bandwidth requirements of up to 4 Mbps outbound and up to 10+ Mbps inbound.

2. Radio Procedures

The secret to working quickly and efficiently in an emergency net, is to use standard procedures. The techniques presented here are the most common. Many people with radios have a tendency to talk and/or repeat too much. Say what you need to say without unnecessary repeats. Keep in mind that you must strive to get your message through the first time.

The more serious or complex the situation, the more important these procedures become. The information contained herein must be practiced until it is second nature. Practicing proper day-to-day radio procedures makes emergency radio procedures automatic and reduces confusion. The secret to working quickly and efficiently in an emergency is to use common approved radio communication procedures and guidelines, and practice, practice, practice.

Guiding Principles of Good Communication

- Use plain language and common terminology prowords-Do not use slang;
- Avoid use of technical jargon unless it is operationally necessary;
- Keep your radio transmissions short and simple. Remember that somebody on the other end needs to write down the essential elements; and

- Speak clearly and slowly so you can be easily understood.

Sensitive Message Traffic

Because radio systems can be monitored, care should be taken to ensure that sensitive information, such as security concerns, financial transfers, and personal information, is not transmitted on radio conversations and should sent by other means, e.g. telex, satphone, or personal contact.

Radio Checks and Signal Reports

Radio checks are essential before departing a depot or base, and when first using a radio after deployment in the field. These checks are particularly important because they enable faulty equipment to be detected, and replaced before operations are commenced. When testing a radio or establishing a communication link or network, it may be necessary to exchange signal strength reports with the other station/s. Signal strength reports are as follows:

- Loud and clear (100% readability);
- Readable (good readability 90–100%);
- Weak readable (fair readability 50–90%);
- Unreadable (readability of less than 10%); and
- Nothing heard (no signal heard, check for faults).

"INDIA 21" this is "INDIA 34" RADIO CHECK OVER
"INDIA 34" this is "INDIA 21" I READ YOU LOUD AND CLEAR send message OVER.

Components of All Radio Transmissions

Call Signs

Call signs are used to identify stations on a network and full call signs should be used only at the initiation of a conversation. The use of full call signs on every transmission is unnecessary and wastes time. However, where there is a risk of confusion, use full call signs.

When sending traffic the first thing you should always say the 1. twice. Followed by 2. THIS IS and your 3. CALL SIGN. Be to ensure you say "OVER" at the end of each transmission segment and finally, the sending call sign is responsible for ending the transmission, all you must do is at the end of your last message in which you expect no reply from, instead of **"OVER"**, just say **"OUT."** However, do not say over and out! You will create confusion if you reverse the first three steps, especially during emergencies and when you are communicating with a dispatcher or people who do not know you.

Receiving a Message

To receive a message:

- Turn the ON/OFF switch to the ON position. (This switch may include other functions, i.e. volume or Mute/Squelch);
- Set the volume control to the mid position;
- Set the mute control, if fitted, until a rushing noise is heard;
- Reset the volume to a comfortable listening level;
- Reset the mute control, if fitted, until the rushing noise

is just silenced. Do not advance this control further as weak signals will not be heard;
- Select the correct channel using the channel switch control;
- On receiving a call, reply with your radio call sign; and
- After the message is complete, respond to the call.

Transmitting a Message

- Ensure no one else is transmitting at the same time. Wait for ongoing discussions to finish completely before beginning transmission;
- Make your message brief but precise;
- Use the standard procedure words;
- Use call signs instead of personal names;
- Do not identify organizations or personnel by name over the radio;
- Begin by pressing the 'transmit' button and saying: “Hello [their call sign] this is [your call sign] over”. Then release the 'transmit' button immediately;
- After they respond their call sign, send over”, you press the 'transmit' button, say your call sign again, send your message, and end with “over” or “out”. Release the 'transmit' button;
- Break the message into sensible passages with clear pauses between;
- Maintain clear speech with normal rhythm and moderate volume;
- Hold the microphone approximately 5 cm. from your mouth;
- Avoid excessive calling. Use radios for work-related purposes only; and
- Never transmit specific security-related information or travel plans or discuss transfer of cash or goods.

- **"WHISKEY NOVEMBER INDIA 21, "WHISKEY NOVEMBER INDIA 21, THIS IS DELTA CHARLIE INDIA 34 HOW COPY OVER**
- **"INDIA 21, THIS IS INDIA 34, I READ YOU LOUD AND CLEAR SEND MESSAGE OVER**
- **RODGER 21 the bridge at the river crossing is passable, OVER."**
- **RODGER 34 good to hear we will meet you on the south side,OVER." 21, NEGATIVE, lets meet at the North end of the bridge OVER. "34, RODGER OUT."**
- ***See full set of prowords below*.**

Relay

- The proword RELAY TO followed by an address designator indicates that the station called is to relay the message to the stations indicated; and
- When more than one station is called, the call sign of the station designated to perform the relay will precede the proword.

Relay To

- The proword RELAY THROUGH allows a station to indicate a third station that can relay a message;
- The proword THROUGH ME allows a third station to indicate that it is in contact with the required station and able to relay the message; and
- In all cases – whether the originating station can or cannot hear the relaying station – the relaying station must inform the originating station if it has not been able to relay the message.

INDIA 45 THIS IS INDIA 34 RELAY FOR INDIA 21OVER
THIS IS INDIA 45 RODGER BASE WAIT ONE
BREAK… BREAK… BREAK… INDIA 21 THIS IS INDIA 45 I HAVE MESSAGE FROM BASE
THIS IS 21 RODGER 45 SEND MESSAGE OVER
RODGER 21 MESSAGE FOLLOWS- PRIOR TO MEETING AT BRIGDE ENSURE TO PICKUP THE GPS AT YOU LOCATION OVER
RODGER 45 GOOD COPY OUT.
INDIA BASE THIS IS INDIA 45
RODGER 45 THIS IS INDIA BASE SEND MESSAGE OVER
INDAI BASED THIS IS INDIA 45 YOUR MESSAGE HAS BEEN RECIECED BY 21
RODGER 45 OUT

Repetitions

Before receipting a message that is unclear, stations should request repetitions. For this purpose, the proword SAY AGAIN may be used alone or in conjunction with prowords that identify the portion of the message that is unclear. In complying with requests for repetitions, the transmitting station must identify the portion that is being repeated. When it is necessary to ask for repetitions after a message has been receipted, identify the message being queried as well as the portion required.

INDIA 21 SAY AGAIN ALL BEFORE, ALL AFTER, FROM, TO, WORD BEFORE, WORD AFTER

Corrections

When an operator makes an error while transmitting a message, he/should should use the proword CORRECTION, followed by the last word or phrase correctly transmitted. Then continue transmission.

If an operator discovers an error in a message after it has been receipted, he/she should send an abbreviated service message, identifying the message and the portion to be corrected.

Canceling Messages

During the transmission of a message (anytime up to the ending proword OVER or OUT), the message may be cancelled by use of the proword DISREGARD.

DISREGARD THIS TRANSMISSION - OUT.

A message that has been completely transmitted can only be cancelled by another message.

Read Back

To ensure that a message has been accurately received, the originating station may request that all or part of the message be read back, using the proword READ BACK and identifying the segment Specify which stations are to read back by saying their call numbers before the proword READ BACK. Remaining stations should keep silent.

INDIA 21 READ BACK TIME, READ BACK GRID, READ BACK TEXT, etc.

Acknowledgment of Messages

- It is the prerogative of the originator to request an ACKNOWLEDGMENT to a message from any or all addressees of that message. (An acknowledgment should not be confused with a reply or receipt);
- The request for acknowledgment of a message normally is included in the text of that message;
- If the message has been transmitted, the request for acknowledgment will constitute a new message;
- Acknowledgments are originated only by the addressee to whom the request for acknowledgment was made; and
  A prompt reply referring to the message may serve in lieu of an acknowledgment.

Break-In Procedure

A station having a message of higher precedence than the transmission in progress, may break in and thus suspend that transmission in the following manner:

- **Flash -** Break in at once and transmit the message;
- **Immediate -** May break in at once and pass the message. If necessary, a preliminary call may be made before transmitting the message; and
- **Priority -** As for IMMEDIATE except that only long ROUTINE messages should be interrupted.

When spoken three times, these prowords, means, "Cease transmissions immediately. Silence will be maintained until the station breaking in has passed the message".

ALL STATIONS BREAK-BREAK-BREAK- This is Whiskey Alfha-21 with a priority message for Whiskeybase….

Long Message Procedure

If the information will take more than thirty seconds to send, or is longer than 15 words, the following LONG MESSAGE procedure should be used:

- The messages are to be written down in segments, each lasting 15 words or approximately thirty seconds. Remember 'I SPELL', 'FIGURES' and other prowords are included in this rule;
- Each segment, except for the last segment, is to terminate with the proword 'MORE TO FOLLOW OVER';
- When segmenting a written message prior to offering, the initiating station must ensure that the end of each segment does not end with: phonetics (e.g. DAMAGE I SPELL DELTA ALPHA MIKE ALPHA GOLF ECHO-damage); and figures or punctuation;
- Receiving stations are to acknowledge each segment with ROGER OVER or, if necessary, ask for repetitions;
- After obtaining receipts for each segment from all receiving stations the sender must pause for five seconds. This will allow other stations to interject for any urgent traffic transmissions;
- The station initiating a long message may interrupt its transmission to send a more urgent one;
- If there is no interjection the calling station transmits the last word or phrase contained in the previous segment and proceeds immediately with the new segment; and
- When the calling station completes the last segment

of the message, the proword OVER is used. Recipients who have successfully received the whole message then respond with ROGER OUT.

Phonetic Alphabet

Phonetic Alphabet		
Letter	**Phonetic Equivalent**	**Pronounced**
A	Alpha	AL FAH
B	Bravo	BRAH VOH
C	Charlie	CHAR LEE or SHAR LEE
D	Delta	DELL TAH
E	Echo	ECK OH
F	Foxtrot	FOKS TROT
G	Golf	GOLF
H	Hotel	HOH TELL
I	India	IN DEE AH
J	Juliet	JEW LEE ETT
K	Kilo	KEY LOH
L	Lima	LEE MAH
M	Mike	MIKE
N	November	NO VEM BER
O	Oscar	OSS CAH
P	Papa	PAH PAH
Q	Quebec	KEH BEC
R	Romeo	ROW ME OH
S	Sierra	SEE AIR RAH
T	Tango	TANG GO
U	Uniform	YOU NEE FORM or OO NE FORM
V	Victor	VIK TAH
W	Whiskey	WISS KEY
X	Xray	ECKS RAY
Y	Yankee	YANG KEY
Z	Zulu	ZOO LOO

Pronunciation of Figures

When figures are transmitted, they should be pronounced as shown below. When misunderstanding is likely or dangerous, figures should be spoken digit-by-digit, preceded by the proword "FIGURES." This proword warns that figures follow immediately, to help distinguish them from other similarly pronounced words. Examples of spoken numbers:

Numerical Pronunciations	
Numeral	**Spoken As**
Ø	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-ER
5	FIFE
6	SIX
7	SEV-EN
8	AIT
9	NIN-ER

Mixed Groups

In transmitting a mixed group of letters and figures the prowords 'Figures' and 'I spell' are used as follows:

India 21 this is India 34 the bridge is at map location AB7 - I SPELL, alpha bravo FIGURE Seven'.

RODGER 34 good copy will meet you there OUT

Standard Procedure Words- (Prowords)

Prowords. When passing formal traffic prowords are used to ensure brevity and clarity in sending the message.

PROWORDS LISTED ALPHABETICALLY	
Proword	**Definition**
ALL AFTER*	The portion of the message to which I have reference is all that which follows
ALL BEFORE*	The portion of the message to which I have reference is all that which proceeds
BREAK	I hereby indicate the separation of the text from other portions of the message
CORRECT	You are correct or what you have transmitted is correct
CORRECTION	An error has been made in this transmission. Transmission will continue with the last word correctly transmitted. An error has been made in this transmission (or message indicated) The correct version is _____ That which follows is a corrected version answer to your request for verification
DISREGARD THIS TRANSMISSION	This transmission is in error. Disregard it. (This proword shall not be used to cancel any message that has been completely transmitted and for which receipt or acknowledgment has been received)
DO NOT ANSWER	Stations called are not to answer this call, receipt for this message, or otherwise to transmit in connection with this transmission. When this proword is employed, the transmission shall be ended with the proword "OUT
FIGURES	Numerals or numbers follow (Optional)
FROM	The originator of this message is indicated by address designation immediately following
GROUPS	This message contains the number of groups indicated
INFO	The addressees immediately following are addressed for information
I READ BACK	The following is my response to your instructions to read back
I SAY AGAIN	I am repeating transmission or portion indicated

Proword	Definition
I SPELL*	I spell the next word phonetically
I VERIFY	That which follows has been verified at your request and is repeated. (To be used as a reply to verify)
MESSAGE *	A message, which requires recording, is about to follow (Transmitted immediately after the call)
MINIMIZE	Please limit your transmissions to essential traffic. Emergency operational traffic is in progress. MINIMIZE is imposed by Net Control or by the Incident Commander
MINIMIZE LIFTED	Minimize is lifted by Net Control or by the Incident Commander
MORE TO FOLLOW	Transmitting station has additional traffic for the receiving station
OUT	This is the end of my transmission to you and no answer is required or expected. (Since OVER and OUT have opposite meanings, they are never used together
OVER	This is the end of my transmission to you and a response is necessary. Go ahead; transmit
READ BACK*	Repeat this entire transmission back to me exactly as received
RELAY (TO)	Transmit this message to all addresses (or addresses immediately following this proword). The address component is mandatory when this proword is used
ROGER	I have received your last transmission satisfactorily
ROUTINE	Precedence ROUTINE. Reserved for all types of messages that are not of sufficient urgency to justify a higher precedence, but must be delivered to the addressee without delay
SAY AGAIN	Repeat all of your last transmission. (Followed by identification date means "Repeat _____ (portion indication)"
SERVICE	The message that follows is a service message
SPEAK SLOWER	Your transmission is at too fast a speed. Reduce speed of transmission
THIS IS	This transmission is from the station whose designator immediately follows

Proword	Definition
TIME	That which immediately follows is the time or date/time group of the message
TO	The addressee(s) immediately following is (are) addressed for action
UNKNOWN STATION	The identity of the station with which I am attempting to establish communication is unknown
VERIFY	Verify entire message (or portion indicated) with the originator and send correct version. (To be used only at the direction of the addressee to which the questioned message was directed)
WAIT	I must pause for a few seconds
WAIT OUT	I must pause for more than a few seconds
WILCO	I have received your signal, understand it, and will comply. (To be used only by the addressee. Since the meaning of ROGER is included in that of WILCO, the two prowords are never used together
WORD AFTER*	The word of the message to which I have reference is that which follows
WORD BEFORE*	The word of the message to which I have reference is that which precedes
WORDS TWICE*	Communication is difficult. Transmit each phrase twice. This proword may be used as an order, request, or as information

These prowords are used in transmission of messages that must be written down by the receiver

SUMMARY	
Do	**Don't**
Always speak distinctly at a regular, medium speed, and pitch your voice slightly higher than normal; Practice and become thoroughly proficient in the use of the phonetic alphabet, and the 24 hour clock method of time; Always obey the instructions of the net control station. If you disagree, argue about it after the operation or exercise; Always think about what you are going to say before you start your transmission and then keep it short and concise; Be aware of your position in the net order of calling and answering. Remember who answers imme-diately before you; Offer to relay messages if you become aware that stations you can hear clearly are having trouble communicating with each other; Develop the habit of always carrying a notebook and pencil with you as this will enable you to write down messages as they are given to you; and Practice voice procedures regularly in order to retain your skill level.	Shout; drop your voice towards the end of sentences; Develop 'personal quirks' such as 'OVER and OUT' 'negative copy' 'ROGER ROGER', 'do you read' and other non-standard words or phrases; use an abbreviation unless you are positive there can be no misunderstanding; Leave or close down your station without permission from the net control station; and Use profane or obscene language, waste airtime, and doesn't offer unnecessary traffic, particularly in times of emergency.

Alert Reports

Typically, the National Weather Service is responsible for issuing all severe weather alerts. The National Weather Service, when issuing severe weather alerts, uses the terms "Watch" and "Warning." When conditions are favorable for severe weather to develop, the National Weather Service will issue. Upon receipt of these messages the radio operator should reference the quick guide bellow.

An "ADVISORY." When severe weather watches are issued, you should be alert for changes in the weather and be prepared to act quickly.

A "WARNING" means that severe weather is actually occurring or is imminent WITHIN THE NEXT 12 HOURS.

Advisory - These will be sent by the National Emergency Center, or equivalent, to the provincial EMC instructing them to -Seek further information- according to local emergency contingency plans
Subject- (Advisory)
DATE and TIME OF REPORT (d/m/y/24:00- local time):
TYPE OF DISASTER: (1. *Cyclone----Wind event*, 2. Flood, 3. Drought, 4. Earthquake, 5. Manmade A. Conflict, B. Technical) *SEE NOTE ABOVE*
Name of (1. city/urban centre/village 2. region, province, and/or district (be aware of conflicting local names)
Worst affected areas – Map coordinates OR
DATE and TIME OF INCEDENT Or ESTIMATED TIME of IMPACT (d/m/y/24:00- local time)
FURTHER INFORMATION - @address
WARNING - These will be sent by the National Emergency Center, or equivalent, to the provincial EMC instructing them to -Take appropriate actions- according to local emergency contingency plans

Subject - (WARNING)
DATE and TIME OF REPORT (d/m/y/24:00- local time):
TYPE OF DISASTER E: (1. Cyclone, 2. Flood, 3. Drought, 4. Earthquake, 5. Manmade A. Conflict, B. Technical) *SEE NOTE ABOVE*
TName of (1. city/urban centre/village 2. region, province, and/or district (be aware of conflicting local names)
Worst affected areas - Map coordinates OR
DATE and TIME OF INCEDENT Or ESTIMATED TIME of IMPACT (d/m/y/24:00- local time):
• FURTHER INFORMATION- @address
FLASH REPORT- These will be sent by the National Emergency Center, or equivalent, to the provincial EMC immediately after impact
Subject- (1. Test 2. Exercise 3. ACTUAL)
• DATE and TIME OF REPORT (d/m/y/24:00- local time):
• TYPE OF DISASTER E: (1. Cyclone, 2. Flood, 3. Drought, 4. Earthquake, 5. Manmade A. Conflict, B. Technical) *SEE NOTE ABOVE*
Name of (1. city/urban centre/village 2. region, province, and/or district (be aware of conflicting local names)
• Worst affected areas -Map coordinates OR
• Distance and Direction from closest Major city/urban centre/village
• DATE and TIME OF INCIDENT (d/m/y/24:00- local time):
• FURTHER INFORMATION - @address

Flash Report

Its purpose is to notify or confirm that the disaster has occurred.

Reports from the field to higher

Field Flash Report

Its purpose is to notify or confirm that the disaster has occurred and gives a first indication of extent of damage, and any preliminary emergency response gaps identified for external relief or support requirements.

Initial Report

Should follow the flash report as soon as possible (within a matter of hours). It's purpose is to inform the National, Regional, and International response systems of the severity of the disaster and, provides the information needed to identify additional resources as needed. The report should therefore briefly summarize:

- The severity of the disaster (without necessarily providing precise figures); be more clear here providing a scale of storm violence and damaged caused;
- Actions being taken locally;
- Local coping capacities (including locally available resources);
- The immediate priorities for external relief, where it required and in approximately what quantities;
- Possible, if there are alternatives, suggest the best logistical means of delivering that relief; and

- A forecast of possible future development including new risk.

Interim Report

Build on earlier report providing more precise early information, the emphasis of interim report will shift from the needs for relief to the needs for rehabilitation and reconstruction (e.g. repairs to damaged structures, restoration of agriculture, animal husbandry, fisheries and industrial production) as the emergency phase transitions from emergency relief to early and longer term recovery and rehabilitation.

It is not necessary to repeat what has already been said in earlier report unless the earlier details require updating. Interim report should provide forecasts (with inputs from specialist and people who have experience of previous disasters) and highlight information that may not otherwise be obvious to the recipient, e.g.:

- Potential problems;
- Change, patterns, trends and indicators; and
- Particulars of especially vulnerable groups, and any other special concerns.

Specialist or Technical Report

It will provide supplementary technical details (e.g. civil engineers, expanded emergency health care and livelihood operations) and will be done by specialist according to the needs presented in the Flash and or the Initial reports usually within 5-7 days post event.

Message Format

Effective warning systems need to reach everyone who is at risk, wherever they are and whenever the event occurs, yet must not alarm people unnecessarily. Systems must be easy to use, reliable and secure. An effective warning message delivered by such a system must be accurate, specific and action-oriented, must be understandable in terms of languages and special needs, with attention to the prior knowledge and experience of the receivers. It is also critical that times, places and instructions are easily understood. To ensure speed and accuracy when sending reports using the following format and procedures will be used:

- Message formats are broken into sections (alphabetical) and line numbers #; and
- Each report builds on the next so as to clearly present the most update information and prior information can be easily accessed from.

Note for Assessors

The following are rules for report writing:

- Reports should be frequently updated and not repeat information that has already been provided (if necessary emphasize "since last report");
- Reports should be instantaneously disseminated, even if certain information is lacking;
- Missing information can be provided in the update;
- Be explicit and precise and double check figures;
- Avoid vague and ambiguous words and phrases;
- Follow the instructions and definitions for filling out reporting forms (see bottom or backside of forms); and

- When summarizing numbers of people affected, houses destroyed, area affected – try not to present only actual numbers, but also the percentages. Only then it is possible for decision-makers to get a picture of the severity or extent of the situation.

Information such as 5,000 houses destroyed has little value without knowing whether these are 10% or 80% of the total number of houses. Although the survey forms do not always explicitly ask for percentages, the total numbers can be derived for example by adding houses undamaged + slightly damaged + destroyed. Also, baseline information could deliver total numbers for deriving percentages.

- Meet critical reporting timelines-but remember safety first;
- Leave the columns open if the information is not available; and
- Take note of missing lines and update as soon as possible in following SITUATION REPORT.

How to send information after you have conducted your initial assessment:

- Always include the header as this gives the vital assessor information such as whom conducted the assessment, location;
- Always fill in a written copy of the form for archival use;
- When sending the message, there are two parts. Part one is the *sector* letter code, i.e. general situation is letter *Alpha*. This will then be followed with the section line number. Line number one: total population – do not repeat the question;

Example: "Echo Oscar Charlie 21, this is Victor Delta Charlie 45, *long message*, over."
"Victor Charlie Delta 45, this is Echo Oscar Charlie 21, read you loud and clear, pass message, over."
Rodger EOC 21, *initial assessment as follows*:
Sector (Alpha);
Line one: 2578;
Line two: *male* 1230 *female* 1348 < 5 235;
Line three: 6;
Line four: 700;
Line five: *female* 45, *unaccompanied* 180;

- At the end of each section the receiving station will acknowledge receipt of section and will ask for any line clarification if needed; and
- When sending via satphone, radio, data fax, or other wireless means do not send the questions-only the answers.

Examples of Transmission Reports

FIELD FLASH REPORT- These will be sent from the field to the EOC - Immediately after impact-
A. Subject- FLASH REPORT DATE and TIME OF REPORT (d/m/y/24:00- local time):
B. TYPE OF DISASTER: 1. Cyclone, 2. Flood, 3. Drought, 4. Earthquake, 5. Conflict, 6. Technical)
C. LOCATION – Name of 1. city/urban centre/village 2. Region, province, and/or district (be aware of conflicting local names) 3. Map coordinates 4. Distance and Direction from closest Major city/urban centre/village
D. DATE and TIME OF INCIDENT (d/m/y/24:00- local time):
E. PERFFERED MEANS OF NEXT COMMUNICATION 1. Cell- # 2. Radio-freq 3. Internet-@address

F. SITUATION:
1. *Number of people affected
2. What is the immediate risk to life
* If a number is not possible then give %

G. ESTIMATED TOTAL POPULATION AFFECTED
1. *Serious trauma #
2. Dead #
3.Homeless #
4. Displaced #
5. Evacuated #
*Injuries that exceed local medical capacities- Broken bones, surgery…
**Projected displaced

H. Shelter
1. Minor damage #
2. Moderate damage #
3. Destroyed #
Minor-building safe to occupy- Moderate-roof and walls intact but needs repair before use - Destroyed- Needs rebuilding

Priority needs
Specify: - Unmet priority needs under the following sub-headings: search and rescue, medical teams and supplies, shelter, blankets, clothing, household utensils, water and sanitation's, food items, logistics, communications, repairs to infrastructure, expertise for assessment and coordination.
Assistance items which are not needed
Additional comments

FIELD INTIAL REPORT-
These will be sent from the field to the EOC – WITHIN 12 HOURS OF IMPACT-

A. Subject- FLASH REPORT
DATE and TIME OF REPORT (d/m/y/24:00- local time):

B. TYPE OF DISASTER:
1. Cyclone, 2. Flood, 3. Drought, 4. Earthquake, 5. Conflict, 6. Technical)

C. LOCATION-
Name of 1. City/urban centre/village 2. Region, province, and/or district (be aware of conflicting local names) 3. Map coordinates 4. Distance and Direction from closest Major city/urban centre/village

D. DATE and TIME OF INCEDENT (d/m/y/24:00- local time):

E. PERFFERED MEANS OF NEXT COMMUNICATION
1. Cell- # 2. Radio-freq 3. Internet-@address

G. ESTIMATED TOTAL POPULATION AFFECTED
1. *Serious trauma #
2. Dead #
3.Homeless #
4. Displaced #
5. Evacuated #
*Injuries that exceed local medical capacities- Broken bones, surgery…
**Projected displaced

H. Shelter
1. Minor damage #
2. Moderate damage #
3. Destroyed #
Minor-building safe to occupy Moderate-roof and walls intact but needs repair before use Destroyed- Needs rebuilding

I. Critical infrastructure
Damage by Sector:
1. Buildings (type of construction)
2. Lifelines and critical facilities:
3. Transport and infrastructure (roads, railways, bridges, ports, airports)
4. Telecommunications
5. Health facilities
6. Public utilities (electricity, gas, fuel, water supply, sanitation)
7. Agriculture and fisheries (crops, livestock, irrigation, fishing boats and equipment)

Priority needs
Specify: - unmet priority needs under the following sub-headings: search and rescue, medical teams and supplies, shelter, blankets, clothing, household utensils, water and sanitation's, food items, logistics, communications, repairs to infrastructure, expertise for assessment and coordination
Assistance items which are not needed
Additional comments:

Initial Assessment	
Sector	**Interim report format - Line number**
(A) General Situation of the Population	1. Total population affected (include host population as well as displaced), including age (under 5 years) 2. Male and female ratio 3. Average family size 4. Numbers of arrivals in displaced populations (internally or refugees) 5. Identify vulnerable populations (numbers of female- or child-headed households, unaccompanied children, disabled, elderly, single women, pregnant and lactating women, etc.)
(B) Geographic Situation General situation	Roads (starting from; and arriving at) 1. Land 2. Air 3. Fluvial (maritime/rivers) 4. Availability of services of electric energy, communication and fuel 5. Special conditions 6. Public buildings (Churches Mosques, meeting halls…) 7. Total # - A. fully damaged b. partially c. functional 8. Security 9. Other
(C) Health Situation	1. Health of the people 2. causes for attention per type of illness 3. availability of medicines, medical supplies and others 4. Health personnel 5. Number of doctors 6. Nurses 7. Technicians 8. Health facilities 9. Name of health centres 10. Category of health centre 11. Laboratories and blood banks 12. Number of available beds 13. State of operation a. >60% fully damaged, b. 30-60 % partially, c. functional <30%
(D) Food and Nutrition	1. Food Assistance 2. Means to prepare food 3. Food reserve:

Sector	Interim report format - Line number
(E) Water	1. State of water sources in the zone 2. Reticulated (central) 3. fully damaged b. partially c. functional 4. Decentralized (Wells, borehole) 5. fully damaged b. partially c. functional 6. Alternative sources of water supply
(F) Basic and Environmental Sanitation	1. Sewer-Central - a. fully damaged b. partially c. functional 2. Latrine-Household - a. fully damaged b. partially c. functional 3. Risks of diseases from vectors 4. Rubbish disposal
(G) Shelters	1. Number and types of shelters needed 2. Family 4-8 people 3. Single -1-2 person 4. Cooking Sets 5. Stoves and fuel 6. Temporality conditions of the shelter and Risk level
(H) Livelihood (recovery)	1. Crops- Estimated H/A 2. Livestock- Estimated Dead 3. Fishing boats and Equipment-
(I) Protection	1. Situation of orphans or children separated from their families. 2. Reports of mistreatment, rape, and sexual abuse 3. Elderly care centers
(J) Education	1. Number of schools. a. >60% fully damaged, b. 30-60 % partially, c. functional <30% 2. Number of students. 3. Proportion of loss of furnishings and didactic material
(K) Organization and Coordination	1. Organisation or person responsible for sector coordination 2. Contributions in emergency supplies, money, and personnel 3. Flow of information 4. Recommendations and Comments 5.Outline immediate actions required (be sure to identify the action items, referenced by paragraph number, in the first paragraph of the cable). If additional expertise or assessments is needed, specify what type and when 6. LOCAL RESPONSE Operations/Mobilization of Resources 7. Specify: - search and rescue actions, evacuations, assessment, mobilization of local resources, distribution of relief 8. Constraints- Specify: - areas where national response capacity seems to be overburdened 9. International response 10.Priority needs Specify: - unmet priority needs under the following sub-headings: search and rescue, medical teams and supplies, shelter, blankets, clothing, household utensils, water and

(K) Organization and Coordination	sanitation's, food items, logistics, communications, repairs to infrastructure, expertise for assessment, trauma counseling, protection and coordination. - Quantities etc 11.Government requests 12.Specify: by whom and to whom- whether provisions have been assured 13.Resources mobilized 14.Specify: funds, materials, transport, personnel - origin, amount, destination, expected duration 15.Coordination Specify: mechanisms for coordination of teams, donors and government (e.g. meetings, significant decisions)

General Characteristics of Disaster Events

Landslides, Mud, and Debris Flows

General Characteristics

Mud and debris flows can arise as a result of heavy storms, abundant rains, breaks of mountain (usually glacial) lakes, or in hot weather as a result of intensive glacier melting. This is a process whereby considerable mud flows are carried out along the bottom of mountain valleys. Very often debris flows cut off rivers. When this occurs, a dam may form resulting in flooding upstream. A break in this dam, however, may cause flooding down the river stream.

Typical Effects

- *Physical damage* - Everything in the path of debris flows is usually destroyed, including roads, bridges, electric lines, and constructions. Often irrigation nets are destroyed and agricultural areas are covered with silt; and
- *Casualties* - People in the path of a mud flow may perish. In addition, people may be lost and injured as a result of secondary floods.

Assistance Needs

In the direct impact area of mudslides, there may be a need for search and rescue of victims. In isolated locations there may be a need to use special equipment. Emergency shelter may be required for those whose homes have been lost or damaged. Secondary effects of mud flows, such as flooding, may require additional assistance measures and possibly use of earth

removal equipment. Emergency shelter may be required for those whose homes have been lots or damaged. Experts trained in landslide hazard evaluation should be consulted to determine whether slide conditions pose an additional threat to rescuers or residents. If the landslide is related to an earthquake or flood, assistance to the landslide-affected area will be part of the total disaster assistance effort.

Volcanic Eruptions

General characteristics

Types of volcanoes are cindercones, shield volcanoes, composite volcanoes and lava domes. Magma flowing out to the surface is lava and all solid particles ejected are tephra. Damage results from the type of material ejected such as ash, pyroclastic flows (blasts of gas containing ash and fragments), mud, debris, and lava flows.

Typical Effects

- *Settlements, infrastructure and agriculture* -Complete destruction of everything in the path of pyroclastic, mud or lava flows, including vegetation, agricultural land, human settlements, structures, bridges, roads and other infrastructure. Structures may collapse under theweight of wet ash. Transportation by land, sea and air may be affected;
- *Crops and food supplies*-Destruction of crops in path of flows, livestock may inhale toxic gases or ash, grazing lands may be contaminated; and
- *Casualties and health*-Deaths from pyroclastic flows, mud flows and possibly lava flows and toxic gases. Injuries from falling rock and burns, respiratory difficulties

from gas and ash. Fracture injuries are the most widespread problem.

Assistance Needs

Response to a volcanic eruption must be swift and efficient. Effective warning systems must be in place. Initially, local authorities must ensure that the area is evacuated and medical care is provided to victims. Search and rescue will also be important. Feeding and shelter is normally required and may be assisted by donations or personnel from foreign sources.

The secondary response by local authorities involves relocating victims and providing financial assistance for replacement housing, agriculture and small businesses. Volcano disasters occasionally require temporary shelters, but more often, large volcanoes such as Nevado Del Ruiz in Colombia, Pinatubo in Phillippines , and Montserrat in the Caribbean, and Le Karthala in Comoros, continue to erupt in a manner that threatens large populations for months to years. This may necessitate permanent resettlement of residents or long-term emergency settlements. Emphasis should also be placed on re-establi-shing infrastructure and communications that have been damaged or disrupted. Cleanup of ash from open water sources is an important step in the recovery process. Volcanic ash makes excellent foundation material for roads, runways and building sites.

Tsunamis

General Characteristics

Tsunami waves are barely perceptible in deep water and may measure 160 km between wave crests. They may consist of ten

or more wave crests and can move up to 800 km per hour in deep ocean water, diminishing in speed as they approach the shore. They may strike shore in crashing waves or may inundate the land. Whether or not there is severe flooding will depend on the shape of the shoreline and tides.

Typical Effects

- *Physical damage*-The force of water can raze everything in its path but the majority of damage to structures and infrastructure results from flooding. Withdrawal of the wave from shore scours out sediment and can collapse ports and buildings and batter boats;
- *Crops and food supplies*-Harvests, food stocks, livestock, farm implements and fishing boats may be lost. Land may be rendered infertile due to salt water incursion; and
- *Casualties and public health*-Deaths occur primarily by drowning and injuries from battering by debris.

Assistance Needs

Initial local responses include:

- Implement warning and evacuation procedures (before the event);
- Perform search and rescue in the disaster area;
- Provide medical assistance;
- Conduct disaster assessment and epidemiological surveillance; and
- Provide short-term food, water and shelter.

Secondary responses include:

- Repair and reconstruct buildings and home; and
- Provide assistance to agricultural areas.

Earthquake

General Characteristics

Shaking of earth caused by waves on or below the earth's surface causing: surface faulting; aftershocks; tsunamis; tremors, vibrations; liquefaction; and landslides.

Typical Effects

- *Physical damage*-Damage or loss of structures or infrastructure. Fires, dam failures, landslides, flooding may occur;
- *Casualties*-Often high, particularly near epicenter, in highly populated areas or where buildings are not resistant;
- *Public health*-Fracture injuries most widespread problem;
- *Water supply*-Severe problems likely due to damage to water systems, pollution of open wells and changes in water table; and
- Secondary threats due to flooding, contaminated water supply, or breakdown in sanitary conditions.

Assistance Needs

The immediate impact of an earthquake affects all sectors of a community. Local authorities should initially emphasize search

and rescue assistance. Emergency medical assistance must be provided, especially during the first 72 hours. An emergency situation and needs assessment should be conducted during the first 36-72 hours. Finally, the survivors will require relief assistance such as food, water, and emergency shelter. Attention should be given to re-opening roads, re-establishing communications, contacting remote areas and conducting disaster assessments.

At the end of the emergency period, long-term recovery needs to take priority. The post earthquake period presents an opportunity to minimize future risks through enactment or strengthening of land use and building codes as rebuilding takes place. The focus should be on:

- Repair and reconstruction of water, sewer, electrical services and roads;
- Technical, material and financial assistance for repair and reconstruction of houses and public buildings (preferably by incorporating earthquake resistant techniques);
- Programs to rejuvenate the economy; and
- Financial assistance for loans to individuals and businesses for economic recovery.

Droughts

General Characteristics

The reduction of water or moisture availability is temporary and significant in relation to the norm. Meteorological drought is reduction in rainfall and hydrological drought is reduction in water resources. Agricultural drought is the impact of drought

on human activity influenced by various factors: the presence of irrigation systems, moisture retention capacity of the soil, the timing of rainfall and adaptive behavior of farmers.

Typical Effects

- *Economic*-Losses in production of crops, dairy and livestock, timber and fisheries; loss of national economic growth and development; income losses for farmers and others directly affected; losses from tourism and recreational businesses; loss of hydroelectric power and increased energy costs; decline in food production and increased food prices; unemployment from drought related production declines; revenue losses to government and increased strain on financial institutions;
- *Environmental*-Damage to the habitat of animal and fish species; wind and water erosion of soils; damage to plant species; effects on water quality (salination); effects on air quality (dust, pollutants, reduced visibility); and
- *Social/heath*-Food shortage effects (malnutrition, famine); loss of human life from food shortage or drought-related conditions; conflicts between water users; health problems due to decreased water flow; inequity in the distribution of drought impacts and relief assistance; decline in living conditions in rural areas; increased poverty, reduced quality of life; social unrest and civil strife; population migration for employment or relief assistance.

Assistance Needs

The drought affected population will need assistance to

replace assets lost during the period of temporary food insecurity and, where realistic, to reestablish their livelihoods. The severity of the food insecurity episode will determine the nature and scale of rehabilitation requirements. Such provisions may include seeds, tools, cooking utensils, blankets, and support until households are capable of supporting themselves.

Floods

General Characteristics

There are several types of floods:

- *Flash floods*-accelerated runoff, dam failure, breakup of ice jam;
- *River floods*-Slow buildup, usually seasonal; and
- *Coastal floods*-Associated with storm surges, tsunami waves, tropical depressions and cyclones.

Typical Effects

- *Physical damage*-Structures damaged by washing away, becoming inundated, collapsing, and impact of floating debris;
- *Casualties and public health*-Deaths from drowning but few serious injuries. Possible outbreaks of malaria, diarrhea and viral infections;
- *Water supplies*-Possible contamination of wells and groundwater. Clean water may be unavailable;
- *Crops and food supplies*-Harvests and food stocks may be lost due to inundation. Animals, farm tools and

seeds may be lost; and
- Secondary threats due to landslides from saturated soils and debris flows. Damage greater in valleys than open areas.

Assistance Needs

The initial response by local authorities, organizations and population will include:

- Evacuation and emergency shelter;
- Search and rescue;
- Medical assistance;
- Provision of short term food and water;
- Water purification;
- Epidemiological surveillance;
- Reestablishment of logistical and communications networks;
- Disaster assessment;
- Brush and debris clearance; and
- Provision of seeds for planting.

Chemical and Industrial Accidents

General Characteristics

Chemical and industrial accidents release hazardous (toxic) substances into the environment. These substances released into the air or water can travel long distances and have major affects to the population and animals.

Typical Effects

- *Physical damage*-Damage or destruction may occur to

structures and infrastructure. Transportation accidents damage vehicles and other objects on impact. Industrial fires may reach high temperatures and affect large areas;

- *Casualties*-Many people may be killed or injured and require medical treatment;
- Crop, livestock and food supplies—May contaminate crops, food supplies and livestock; and
- *Environmental*-Contamination of air, water supply, and land may occur. Areas may become uninhabitable. Ecological systems may be disrupted even on a global scale.

Assistance Needs

In the event of a chemical disaster, medical and emergency teams should remove all injured persons from the scene of the emergency. All persons should leave the area unless protected by special equipment. They should stay away until safe return to the area has been determined and announced to the public. In the case of water contamination, alternate sources have to be identified.

Clean up of the effects of the disaster may require more resources than are locally available; international emergency assistance may be required. The affected areas should be monitored continually following the disaster.

Thorough investigation and documentation of the emergency must occur.

Tropical Cyclones

General Characteristics

When the cyclone strikes land, high winds, exceptional rainfall and storm surges cause damage with secondary flooding and landslides.

Typical Adverse Effects

- *Physical damage*-Structures lost and damaged by wind force, flooding, storm surge and landslides. Erosion could occur from flooding and storm surges;
- *Casualties and public health*-Generally there are relatively few fatalities but there may be numerous casualties requiring hospital treatment. Storm surges usually cause many deaths but few injuries among the survivors. Injuries that do occur may be caused by flying debris or flooding. Contamination of water supplies may lead to viral outbreaks and malaria;
- *Water supply*-Open wells and ground water may be contaminated by flood waters and storm surges. Normal water sources may be unavailable for several days; and
- *Crops and food supplies*-High winds and rain can ruin standing crops, tree plantations and food stocks.

Below are standardized wind reference tables, to allow disaster managers to make informed decisions of effects of wind speed in marine and land assets.

Wind Reference Tables

Initial Assessment				
Force	**Win (Knots)**	**WMO Classification**	**Appearance of Wind Effects**	
			On the Water	**On Land**
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze 	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze 	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale 	Moderately high (13-20 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs

Force	Win (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
10	48-55	Storm	Very high waves (20-30 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane 	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

The **Saffir Simpson Scale** is used to classify Hurricanes according to intensity. In this scale, hurricanes are classified into one of five categories as shown below.

Saffir/Simpson Hurricane Scale 				
Category	Central Pressure Mean (millibars)	Winds mph (km/h)	Surge (ft)	Damage
1	980 or more	74 - 95mph (119 - 151km/h)	4-5	Minimal
2	965 - 979	96 - 110mph (152 - 176km/h)	6-8	Moderate
3	945 - 964	111-130mph (177 - 209km/h)	9-12	Extensive
4	920 - 944	131 - 155mph (210 - 248km/h)	13-18	Extreme
5	less than 920	more than 155mph (248km/h)	more than 18	Catastrophic

Displaced Populations

General Characteristics

Displaced populations may include people settling in temporary settlements or camps after a mass population movement; non-combatant individuals and families forced to leave their homes due to consequences of conflict but who remain inside their country; people expelled or fleeing a country, especially as an ethnic or national group, forced out for economic or political reasons; and people forced to leave their homes as a result of drought, famine, or other disaster, usually in search of food.

Typical Effects

Loss of means of livelihood, loss of normal sources of food, lack of fuel for cooking, lack of potable water, communicable diseases and overcrowding, possibly large numbers of unaccompanied children, lack of shelter and household necessities.

Emergency Needs

While needs will vary according to the situation, in general they will include:

- Water supply and sanitation; and
- Short-term and long-term food.