# A Blueprint for CAP-Based Alerting Systems

## Overcoming the Challenges in Small Island Developing States

World
Meteorological
Organization
Weather · Climate · Water

**R3i**
Regional Risk
Reduction Initiative

UN
D P

Empowered lives.
Resilient nations.

This project is financed by the EU and implemented by UNDP

# Contents

# Acronyms and Abbreviations

| | |
|---|---|
| **CAP** | Common Alerting Protocol |
| **CIMH** | Caribbean Institute for Meteorology and Hydrology |
| **CL** | Capability Level |
| **CTIC** | Caribbean Tsunami Information Centre |
| **EARs** | Emergency Alert Radios |
| **EWS** | Early Warning System |
| **GIS** | Geographic Information Systems |
| **ITU** | International Telecommunication Union |
| **OASIS** | Organisation for the Advancement of Structured Information Standards |
| **OCTs** | Overseas Countries and Territories |
| **NOAA** | National Oceanic and Atmospheric Administration |
| **NWS** | National Weather Service |
| **POE** | Public Education and Outreach |
| **R3I** | Regional Risk Reduction Initiative |
| **RDS** | Radio Data System |
| **RSS** | Real Simple Syndication |
| **SIDS** | Small Island Developing States |
| **SMS** | Short Message Service |
| **UNDP** | United Nations Development Programme |
| **USGS** | United States Geological Service |
| **WebEOC** | Web-based Emergency Operations Centre |
| **WMO** | World Meteorological Organisation |

# Introduction

When data shows weather conditions threatening landfall of a tropical cyclone, scientists and emergency managers rush to evaluate the danger. Airborne and satellite observations supplement surface-based data, helping local authorities decide where and when to issue official public alerts. With today's sophisticated earth observations, maps, communications and information technology, countless lives are saved by early warning. Yet, for many events, in places around the world, societies continue to suffer immensely from disasters. Lives that might have been saved are still being lost, often for lack of reliable, timely warnings reaching affected populations. And, in some cases, when warnings are timely, an uneducated or unprepared public will be unable to act quickly enough to protect their lives and/or property.

In the Caribbean, a situation exists across many countries where there are many steps between a notification of a hazard threat being received by the authorities e.g. meteorological office, national disaster office, police department, etc. and being disseminated to the public. For instance, the Met Office may need to inform the Prime Minister or Governor that a hurricane is approaching, who then gives authorisation to the NDO to inform emergency services and district emergency organisations. Meanwhile the Met Office is contacting the media houses to disseminate information to the general public. Depending on the type of hazard, the process flow, parties involved and dissemination media used may vary. More significantly, for rapid onset events such as a tsunami, such an extensive process reliant on human intervention and repetition, uses valuable time and creates room for error in transmission and misinterpretation, which can lead to greater losses. Herein lies the case for the Common Alerting Protocol (CAP).

It is a major challenge to assure that standards-based, all-hazards, all-media public alerting becomes available to societies worldwide. International organisations such as United Nations Development Programme (UNDP), International Telecommunication Union (ITU), and the World Meteorological Organisation (WMO), among others, are urging nations to implement the CAP as an essential communications formatting step as countries address this worldwide challenge. Regardless of the type of hazard situation, authorities should have the capability to quickly warn everyone at risk, using all available media and communicating in multiple languages as necessary. This resource addresses the implementation of early warning systems (EWS) based on the CAP, specifically the design and technical elements which should be considered, based on the experience of the R3I pilot in the Caribbean. It must be noted that there must be a legal and procedural support structure for the EWS, designating relevant responsibilities, defining policies and guidelines, etc which create the institutional platform and authority for the EWS. Any of the R3I pilot countries may be contacted for more details on their experience (Annex I) and a template policy is also provided (Annex II).

# The Regional Risk Reduction Initiative (R3I)

Like the other small island developing states (SIDS) in the region, the English and Dutch overseas countries and territories (OCTs) in the wider Caribbean region are highly vulnerable to various natural hazards and climate change impacts, and have fragile ecosystems. Settlements are often concentrated in low-lying coastal areas and other hazard-prone locations.

The R3I was a 4-year project (2009-2012) funded by the European Commission (€4.932m) and implemented by UNDP's sub-regional office for Barbados and the OECS with the objective of developing the local capacities for disaster risk management of the beneficiary territories, namely Anguilla, Aruba, Bonaire, British Virgin Islands, Cayman Islands, Curaçao, Montserrat, Saba, Sint Eustatius, Sint Maarten, and Turks and Caicos Islands by:

• Increasing capacity in hazard mapping and associated vulnerability assessments, to further be incorporated into spatial information systems to inform planning and development processes
• Developing a regional EWS pilot for the OCTs, based on the ITU automated alert protocol for warnings
• Building capacities in response, rescue and recovery through the use of risk assessment and mitigation practice in order to shorten recovery periods
• Strengthening local disaster management structures and capacities in terms of tools and best practices to support comprehensive disaster risk management schemes
• Enhancing cooperation and coordination between the OCTs, with documentation and dissemination of best practices

By emphasising intra-regional learning and sharing of tools, knowledge and best practices, the R3I has enhanced the territories' individual and collective capacities to predict and prepare for disasters, thus improving resilience and reducing risk and subsequent loss.

## EWS CAP Capability Levels

The OCTs have different systems in place and varying "Capability Levels" (CLs) for disseminating timely and accurate information to all citizens at risk, especially when alerts must be received within minutes as in a tsunami situation. The R3I pilot aimed to bring Aruba, Montserrat and Sint Maarten from their starting state (CL0/CL1) to CL2 and Anguilla from CL2 to CL3, while simultaneously learning from the experience so that other countries could more easily undergo the process of transitioning to CAP as a means to better safeguard lives, assets and livelihoods.

For the purposes of defining the scope of the pilot and measuring progress, EWS professionals working with R3I helped to define Capability Levels (CL). They are defined as follows:

| Capability Level | Characteristics |
|---|---|
| 0. No all-hazard public warning system | Limited or undetermined administrative or technical programme for all-hazard public warning. May have warning policy for particular hazards and/or audiences. |
| 1. Administrative capability | Legal and policy framework for all-hazard public warning in place, but limited or no technical facilities for all-hazard origination, aggregation and dissemination. May have technical capabilities for specific hazards and/or audiences. |
| 2. Initial operational capability | Functioning capability to originate alerts for all hazards and to disseminate them to at least limited audiences via at least one delivery means. |
| 3. Effective operational capability | Functioning capability to originate alerts for all hazards, to disseminate alerts to the public via multiple delivery means, and to share alert information with other organisations and governments. |

# The Common Alerting Protocol (CAP)[1]

The Common Alerting Protocol (CAP) is an international standard for disseminating warnings/alerts/notifications, adopted by the ITU and the Organisation for the Advancement of Structured Information Standards (OASIS), which provides an open, non-proprietary digital message format for all types of alerts and notifications. Version 1.2 (CAP 1.2) was adopted in 2010. It does not address any particular application or telecommunications method. The CAP format is compatible with emerging techniques, such as Web services, as well as existing formats, while offering enhanced capabilities that include:

•Flexible geographic targeting using latitude/longitude shapes and other geospatial representations in three dimensions;
•Multilingual and multi-audience messaging;
•Phased and delayed effective times and expirations;
•Enhanced message update and cancellation features;
•Template support for framing complete and effective warning messages;
•Compatible with digital signature capability; and,
•Facility for digital images and audio.

## Design Principles[2]

Among the principles which guided the design of the CAP Alert Message were:

• **Interoperability** – the CAP Alert Message should provide a means for interoperable exchange of alerts and notifications among all kinds of emergency information systems.
• **Completeness** – the format should provide for all the elements of an effective public warning message.
• **Simple implementation** – the design should not place undue burdens of complexity on technical implementers.

---

1 OASIS (2010) Common Alerting Protocol version 1.2 http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.pdf
2 ibid

- **Simple XML and portable structure** – although the primary anticipated use of the CAP Alert Message is as an XML document, the format should remain sufficiently abstract to be adaptable to other coding schemes.
- **Multi-use format** – one message schema supports multiple message types (e.g. alert, update, cancellations, acknowledgements, error messages) in various applications (actual, exercise, test, system message).
- **Familiarity** – the data elements and code values should be meaningful to warning originators and non-expert recipients alike.
- **Interdisciplinary and international utility** – the design should allow a broad range of applications in public safety and emergency management and allied applications and should be applicable worldwide.

## The Benefits of CAP

With adequate alerting, people can act to reduce damage and loss of life from natural and man-made hazard events. The key is to distribute timely and appropriate alerts to everyone who needs them, and to only those who need them.

Appropriate and complete alerting is a complex challenge given the wide variety of warning systems. Many are specific to a certain type of disaster, such as an earthquake or hurricane, or to a certain warning medium, such as a siren or television announcement. Because CAP communications can replace single-purpose interfaces between alert sources and dissemination media, CAP serves as a kind of "universal adaptor" for alert messages.
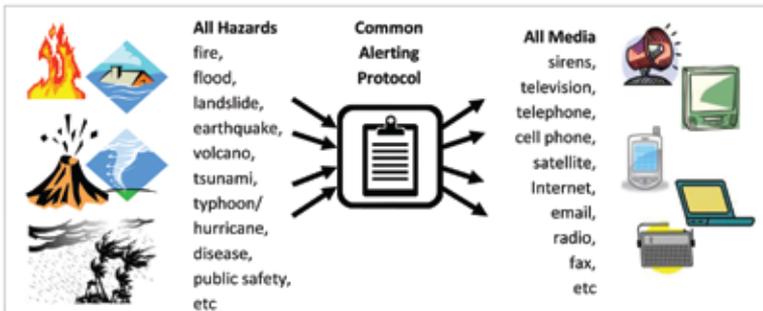


Figure 1: How a CAP-based early warning system (EWS) works
(Adapted from http://www.wmo.int/pages/prog/amp/pwsp/CommonAlertingProtocol_en.html)

Some of the key benefits of using a CAP-based approach are:
- **Single input:** the alert message sender can activate multiple warning systems with a single input, reducing the cost and complexity of notifying many warning systems.
- **Standardised message templates:** standardised alerts from many sources can be compiled for situational awareness and pattern detection. Managers are then able to monitor at any one time the whole picture across all types of local, regional, and national alerts.

- **Consistent information:** Research has found that people do not typically act on the first warning signal, but begin looking for confirmation. Only when convinced that the warning is not a false alarm, will people act. Therefore, it is very important that use of CAP helps people obtain corroboration/confirmation of warnings coming through multiple official channels.
- **System compatibility:** CAP is compatible with all kinds of public alerting information systems, including broadcast radio and television as well as data networks. Rather than being defined for a particular communications technology, CAP defines a digital message format applicable to all types of alerts. CAP is therefore compatible with new technologies such as web services, as well as existing formats. CAP is also very useful where alerting systems serve multilingual and special needs populations.
- **Message targeting:** The geographic information in a CAP alert allows targeting of landline and cellular telephones, radio and television sets, and alerting sirens, as well as the pagers of emergency responders and the networks of law enforcement. Messages can be confined to the most relevant parties based on location e.g. flooding in the northeast of the island, or by user group e.g. fire and police officers. CAP alert messages can also be used at the actual sensor systems, as a format for direct reporting of relevant events to collection and analysis centres.

# General System Design

## All Hazards, All Media

Before the advent of the CAP standard, it was typical for emergency management systems to have many wholly distinct mechanisms for obtaining and disseminating emergency information. Such mechanisms might interface with a centralised incident management system, but information could be very inconsistent across different types of hazards and different media.

The design of a CAP-based EWS helps to minimise such inconsistencies, leveraging the common data model given by the CAP content standard. This leads to greater effectiveness of alerting, whether to the public at large or internally within the emergency management community, thus strengthening the reliability of the system and public confidence. It also leads to greater efficiency of the EWS, notably through components that are more interoperable.

## Design Requirements[3]

The CAP should:

- Provide a specification for a simple, extensible format for digital representation of warning messages and notifications;
- Enable integration of diverse sensor and dissemination systems;

---

**3** OASIS (2010) Common Alerting Protocol version 1.2 http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.pdf

- Be usable over multiple transmission systems, including both TCP/IP-based networks and one-way "broadcast" channels;
- Support credible end-to-end authentication and validation of all messages;
- Provide a unique identifier (e.g. an ID number) for each warning message and for each message originator;

- Provide for multiple message types, such as:
  - o Warnings
  - o Acknowledgements
  - o Expirations and cancellations
  - o Updates and amendments
  - o Reports of results from dissemination systems
  - o Administrative and system messages

- Provide for multiple message types, such as:
  - o Geographic targeting
  - o Level of urgency
  - o Level of certainty
  - o Level of threat severity

- Provide a mechanism for referencing supplemental information (e.g. digital audio or image files, additional text);
- Use an established open-standard data representation;
- Be based on a programme of real-world cross-platform testing and evaluation;
- Provide a clear basis for certification and further protocol evaluation and improvement; and,
- Provide a clear logical structure that is relevant and clearly applicable to the needs of emergency response and public safety users and warning system operators.

## Data Flow: Input, Processing, Output

In simple terms, the emergency alerting process can be viewed as centred on a country alerting authority and having three parts: relevant data and other alerts are communicated as **input**; the country alerting authority **decides** on appropriate actions; and **alerting messages** are then disseminated to various audiences (other authorities, responders, general public, etc.).

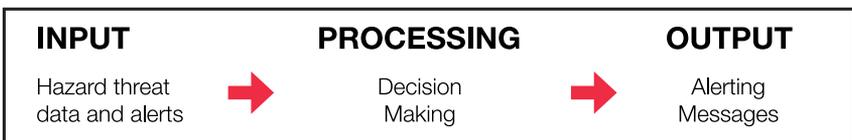| **INPUT** | | **PROCESSING** | | **OUTPUT** |
|-----------|---|----------------|---|------------|
| Hazard threat data and alerts | ➡ | Decision Making | ➡ | Alerting Messages |

Figure 2: Flow of data in an early warning system

Any operational alerting process today deals with a wide variety of information inputs. Information relevant to hazard threats comes in from many sources, including sensors as well as people. These inputs are communicated with many technologies (telephone, radio, Internet, etc.). The information also takes many forms (raw data, text, audio, maps, pictures, video, etc.), often specific to the type of information service (news wires, weather notices, seismic monitoring, traffic reports, etc.).

With a CAP-based approach, the alerting process can be streamlined through tools that convert much of this diverse information into CAP format. CAP conversion tools are already available and others can be built as needed.

## Hosting of CAP Sources and Alert News Feeds

An essential feature of a CAP-based EWS is a set of CAP sources and news feeds published by country alerting authorities. These CAP sources and news feeds can be hosted anywhere on the Internet and any of three general approaches could be used for such hosting:
1.      CAP sources and/or news feeds hosted on a locally managed, Internet-accessible server;
2.      CAP sources and/or news feeds hosted on one or more Internet-accessible servers maintained by another alerting authority under a sharing arrangement; and
3.      CAP sources and/or news feeds hosted on Internet-accessible servers maintained by external hosting services.

## Evolving to a CAP-based EWS

Each country has a range of challenges to address in the broad context of disaster risk management. Some need greater legal and organisational clarity with regard to authorities and responsibilities in the event of particular types of emergencies. Others need to institute well-documented Standard Operating Procedures (SOPs) covering at least their most typical emergencies. In addition, many emergency managers confront basic challenges concerning sufficient resources for staff, equipment, and services.

It is not necessary that challenges such as these be addressed before the country can begin to implement a CAP-based EWS. Rather, new procedures and technologies associated with the CAP-based EWS can be introduced incrementally if necessary to simplify or expedite implementation. With few exceptions, the new CAP-based EWS components are independent and can be introduced separately as opportunities arise. It seems quite likely that the extreme alternative approach – a comprehensive restructuring of SIDS emergency management – would entail unachievable political and resource commitments.

The R3I CAP-based EWS is expected to evolve from processes already in operational use within the particular country alerting authority. As with all mission critical operations, the new CAP-based EWS components should be introduced first in a test environment to smooth the transition of processes.

# Ten Steps for New EWS Countries

The principal objectives for a country piloting a CAP-based EWS should be that an alerting authority will be able to:

- originate alerts in CAP format for any kind of hazard;
- disseminate alerts in CAP format to the public via multiple delivery means; and
- share alert information in CAP format with other organisations.

The 10 actions listed below provide incremental steps towards building an operational, CAP-based EWS i.e. attaining CL3. These steps, and the subsequent detailed results, were used for the R3I pilot EWS countries and serve as a guide of good practices for new EWS countries.

| | |
|---|---|
| 1. | Learn some basics about CAP |
| 2. | Use existing CAP sources |
| 3. | Consider tools to convert inputs into CAP |
| 4. | Acquire CAP mapping tools |
| 5. | Implement CAP alert source |
| 6. | Publish CAP alert news feed |
| 7. | Register a SIDS alerting authority |
| 8. | Choose an internet host for CAP sources and news feeds |
| 9. | Consider other interfaces for CAP dissemination |
| 10. | Develop public outreach and education |

Results would be achieved by the technical and management staff of each country, through familiarisation and computer-based training in addition to onsite support and remote consultation from experts who may be from experienced countries or consultants. The public education and outreach campaign for the country would be based on in-country research, and executed with expert support by the country and possibly external contracted support.

## 1.Learn Some Basics about CAP

Most of the subject countries alerting authorities are not familiar with CAP and basic education is necessary to achieve the benefits of CAP-based alerting. This is a matter of on-going capacity development and is complementary to training that may be entailed with any particular alerting system component.

For a basic introduction to CAP, this 10-minute video is a useful learning resource: http://www.youtube.com/watch?v=n0iKp60jjtY. Other sources online provide basic education about freeware to generate CAP alerts and about web applications to monitor CAP sources such as weather and earthquake alerts.

Staff of the country alerting authority could be educated on use of CAP with mapping software, including standalone or web-based mapping freeware and commercial packages.

With further technical and policy education, the country alerting authority could issue its own CAP alerts. The country alerting authority might then encourage other current or potential partners to make use of and/or publish CAP alert sources. Staff could also be educated on ways to exploit CAP for internal communications before, during, and after an incident occurs.

It may be that some country alerting authority staff are already gaining such education on their own. However, a focused emphasis on CAP education would be more effective and efficient in identifying and/or sponsoring development of training materials and services appropriate to the particular country alerting authority. Such CAP education is prerequisite to leveraging the other related opportunities that will surface as use of CAP broadens across the regional and the global communications infrastructure.

## 2.Use Existing CAP Sources

The country alerting authority can select from various sources of alerting information that are already available and published via CAP news feeds, or could easily be accessed as CAP sources. Important alerts available as CAP feeds include earthquake and volcano alerts from the USGS, as well as hurricane and tsunami alerts from NOAA/NWS.

**RESULTS OF STEP 1**

**Education and training products and services**
Some of the education and training products and services relevant to CAP-based alerting are available online at little or no cost, while others are associated with particular CAP-based products and services.

**Contact organisations**
These will be organisations that have implemented CAP and are willing to be contacted for advice on which educational products and services are most useful.

**Opportunities for joint action**
These potential joint actions will be for acquisition of training and/or integration into alerting products and services commonly used in the region.

**RESULTS OF STEP 2**

**Contact organisations**
Those that have implemented CAP and are willing to be contacted for advice on available CAP feeds.

**Demonstrated use of authoritative CAP sources**
The country alerting authority will have demonstrated the ability to use one or more existing authoritative CAP sources. This can be accomplished by the country alerting authority subscribing to existing news feeds in CAP format.

It may be that the dissemination of CAP format alerting information can be initiated most readily within a government. However, governments should anticipate the involvement of other stakeholders. This could include other governments and alerting authorities in the region, and possibly other commercial and non-government organisations, including telecommunications providers, tourist industry companies, and international aid agencies.

## 3.Consider Tools to Convert Inputs into CAP

Operational aler;ting processes today deal with many and varied inputs, including sensors as well as people. Inputs come into the country alerting process via telephone, radio, Internet, etc. in forms such as text, audio, maps, and images, from a range of sources (police and fire departments, news wires, weather services, seismic monitoring, etc.).

As a country implements its CAP-based approach in its EWS, much of this diverse information could be converted into CAP format using available interface tools or custom programming. Under control of customised rules, such an interface tool can either receive alerts directly or monitor and fetch alerts available from external non-CAP sources. The tool would relay those that need to be routed into the CAP-based EWS. Some tools in this vein are tied to particular CAP-based software; other tools are associated with general Internet services such as Google Public Alerts freeware, common mapping platforms such as the CAP-enabled aspects of the ESRI geographic information system (GIS) software, and emergency management freeware such as Sahana.

There are also systems with content relevant for public alerting that are not yet CAP-enabled. For instance, the DEWETRA regional forecasting tool, managed by the Caribbean Institute for Meteorology and Hydrology (CIMH) and the Caribbean Tsunami Information Centre (CTIC), would be helpful for real-time hydro-meteorological and tsunami alerts. In such cases, the managers of those systems should be encouraged to add software adaptors so the system could interoperate with the CAP-based EWS.

**RESULTS OF STEP 3**

**Existing and potential interface tools for CAP conversion**
The country alerting authority will have evaluated some existing and potential interface tools for converting alerting information inputs to CAP format, including whether such conversion would likely be cost effective.

**Opportunities for joint action**
These potential joint actions will be for acquisition of interface tools commonly used across the region, such as WebEOC.

**RESULTS OF STEP 4**

**Demonstrated use of mapping tools**
The country alerting authority will have demonstrated the ability to use mapping tools that support the interactive generation of CAP alerts and/or display of CAP formatted alerting information.

**Contact organisations**
Those that have implemented CAP and are willing to be contacted for advice on which mapping tools they found useful.

**Opportunities for joint action**
These potential joint actions will be for acquisition of mapping tools and/or integration into alerting products and services commonly used in the region.

Official alerting messages to the public are often disseminated by authorities that are government agencies, and government agencies are often sources of hazard threat data and alerts. In addition to the typical government emergency management office, each country alerting authority may interact with various government agencies, e.g. police, fire, medical/health, social services, water, public works, airport authority, port authority, energy, and telecommunications. These agencies should also be encouraged to implement CAP news feeds. Alerting authorities should also explore arrangements for alerts in CAP format to be originated from public or private utilities, alerting for situations such as planned outages of power and water, traffic disruptions, etc. These sources may be initially restricted to the emergency management community, but eventually most CAP news feeds should be publicly accessible as well.

## 4.Acquire CAP Mapping Tools

Mapping of hazard threats and incidents is often of interest to an originator or user of CAP format alerting information. For the originator of an alert, software lets the originator draw an alerting area on a map and generates the set of latitude/longitude points describing the area (in CAP, either a polygon or a circle). Software for generating CAP alerts or annotating maps that incorporate CAP alerts is available in commercial products and as freeware, supporting most of the platforms in common use: PCs, smartphones, tablets, etc. Mapping platforms commonly used in emergency management that are CAP-enabled include the ESRI GIS software, Google Maps and Google Earth.

## 5.Implement CAP Alert Source

To realise CAP-based alerting, the key requirement is that alerting authorities disseminate at least some of their alerting information in CAP format. Therefore, the country alerting authority should implement at least one dissemination source of CAP format alerting information. This can be accomplished using various CAP-enabled products and services, including but not limited to Google Public Alerts, ESRI GIS, and Sahana.

Potential users should have secure access to these sources and authentication should be supported as well. Access to CAP format sources may be restricted to access within the emergency management community initially, but publicly accessible CAP format sources should be made available eventually.

## 6.Publish CAP Alert News Feed

A source of CAP format alerting information is like a collection of news articles. To expose those articles to potential users, the items in the source should be published as a "news feed". The country alerting authority simply implements an Internet-accessible news feed associated with one or more of its sources of CAP format alerting information.

CAP news feeds in emergency alerting systems should be implemented using the standard for Internet news feeds known as Real Simple Syndication (RSS). The choice of RSS is driven by the fact that RSS is ubiquitous throughout the Internet, supporting nearly all news publishers and "blogs" (web logs). Consequently, freely available Internet tools make it easy for users to subscribe to RSS feeds. In the case of CAP feeds of the emergency alerting system, potential users would be able to subscribe independently to CAP news feeds as desired.

**RESULTS OF STEP 5**

**Implemented CAP source**
The country alerting authority will have implemented at least one source of alerting information in CAP format, hosted on the Internet in any of various ways discussed elsewhere in the system design portion of this document.

**Contact organisations**
Organisations that have implemented CAP and are willing to be contacted for advice on hosting and implementation of one or more sources of alerts

**RESULTS OF STEP 6**

**Published RSS news feed for CAP**
The country alerting authority will have published at least one RSS news feed associated with one or more of its CAP dissemination sources.

**Contact organisations**
Organisations that have implemented CAP and are willing to be contacted for advice on publishing CAP feeds

## 7. Register an Alerting Authority

The CAP format alerting information available via RSS feeds is of interest not only to emergency management offices but to many other individuals and organisations involved in evaluating hazard threats, reporting, alerting, dispatching, or otherwise dealing with the effects of emergency situations. Yet, potential users need a mechanism to help them discover these sources and CAP news feeds. In keeping with ITU and WMO recommendations, alerting authorities that are endorsed by governments should have their alerting information sources and/or CAP news feeds registered at least in the international Register of Alerting Authorities. WMO maintains this registration tool and provides a technical document on how to assign identifiers[4].

## 8. Choose an Internet Host for CAP Sources and News Feeds

As noted previously, an essential feature of the CAP-based alerting system is a set of CAP sources and news feeds published by official alerting authorities. These CAP sources and news feeds can be hosted anywhere on the Internet, and any of three general approaches could be used for such hosting.

One approach is that a country alerting authority could publish its CAP sources and/or news feeds on one or more of its own Internet-accessible host servers. A second approach is to publish on one or more Internet-accessible servers maintained by another alerting authority under a host sharing arrangement. A third approach is to publish its CAP sources and/or news feeds on Internet-accessible servers maintained by hosting services, which provide specifically dedicated services or more generic "cloud" hosting services.

## 9. Consider Other Interfaces for CAP Dissemination

Many communication facilities can be used to meet the dissemination objectives of a country alerting authority, especially as the emergency alerting system becomes CAP-enabled. Tools for interfacing CAP messages to many specific communication facilities are currently available: tools for triggering sirens, calling telephones, sending faxes,

**RESULTS OF STEP 7**

**Registered alerting authority**
The country alerting authority will have registered or updated the register entry for at least one alerting authority, together with alert sources and CAP news feeds if available, in the international Register of Alerting Authorities
http://www-db.wmo.int/alerting/authorities.html

**RESULTS OF STEP 8**

**Providers to support hosting of CAP sources and news feeds**
The country alerting authority will have evaluated some providers of freeware, commercial software, hardware, training and other relevant services to host CAP sources and news feeds on the Internet. Some SIDS in the R3I CAP-enabled EWS project already indicated interest in procuring and/or sharing an Internet-based server.

**Contact organisations**
These have implemented CAP and are willing to be contacted for advice on Internet hosting.

---

4 http://www.wmo.int/pages/prog/amp/pwsp/documents/AIR_PWS-20.pdf

sending e-mail, sending SMS messages, converting text to speech, translating to additional languages, re-directing traffic, etc. The cost effectiveness of developing and/or deploying such tools varies according to the existing infrastructure, the particular technologies involved (hardware and/or software), and how the facilities are deployed[5].

## 10. Develop and Implement Public Outreach and Education

Public Education and Outreach (POE) plays an integral role in EWS and must be factored in at the same time as the EWS system is being developed in each country. EWS technology works hand-in-hand with promoting public understanding on how these tools are used and what actions citizens are required to take.

Successful communications include identifying country priorities and reaching consensus with country managers and other stakeholders on EWS POE priorities, developing a strategic plan and implementing a POE campaign with accountability and timelines. Stakeholder consultations will also identify available resources and how they can be leveraged to better implement the POE campaign.

In the R3I pilot, the POE strategy provided a variety of customised, "Stay Safe" branded products in multiple languages such as fact sheets, public service announcement (PSA) videos, posters, bumper stickers, Powerpoint presentations, a "sign up" website for the public to register to receive alerts, and a "Click to Download" link button for participating websites.

**RESULTS OF STEP 9**

**Existing and potential interfaces, and recommendations for new alert and warning tools for CAP dissemination**
The country alerting authority will have evaluated some existing and potential CAP-enabled interfaces to alerting facilities, where such an approach appears to be cost effective. The SIDS in the R3I CAP-enabled EWS project acquired the following CAP-enabled facilities: smartphones with feedback, cable TV interrupt, radio interrupt, computer pop-up, e-mail list notification, CAP activation interface for sirens, CAP interface for Radio Data System (RDS), and marine alert radio transmitters. Further investigation is also being done into rain gauges and cell broadcast.

**Contact organisations**
Organisations that have implemented CAP and are willing to be contacted for advice on CAP-enabled interfaces to alerting facilities

**Opportunities for joint action**
Potential joint actions for acquisition of interfaces and/or integration into alerting products and services commonly used in the region.



Figure 3: An example from Aruba of a public outreach product for the national early warning system

---

5  For a review of the applicability of cell broadcast technology, being deployed in countries such as the Netherlands, please refer to the R3I resource "Cell Broadcast Technology for Public Warning", accessible on the UNDP Barbados and the OECS website.

Please refer to the following websites to see POE products developed for the pilot countries (valid until December 2014):
• http://kynthiaart.com/ews/anguilla/
• http://kynthiaart.com/ews/aruba/
• http://kynthiaart.com/ews/montserrat/
• http://kynthiaart.com/ews/sint-maarten/

The PSA videos can be viewed at: http://www.youtube.com/user/staysafeca/videos?flow=grid&view=1.

The registration websites for the R3I pilot countries can also be accessed and are open to anyone:
• http://www.anguilla-alerts.net/
• http://www.aruba-alerts.net/
• http://www.montserrat-alerts.net/
• http://www.sint-maarten-alerts.net/

A number of critical lessons and recommendations emanated during the implementation of the "Stay Safe" POE in the pilot countries. These are summarised in Table 2[6].

## RESULTS OF STEP 10

**Stakeholder meetings**
Each country will begin/continue dialogue between the National Disaster Office and various stakeholders, e.g. emergency response services, meteorological offices, on the type of communications and accountabilities necessary to build the support, cooperation and the trust required to work together on short and long-term EWS public information needs.

**POE Strategic Plan**
A draft POE strategic campaign plan will be developed, informed by stakeholder meetings and resource constraints and agreed to by a consensus of disaster managers and other stakeholders. Priorities, clarification of responsibilities, and a realistic implementation timetable are key components.

**Development of POE products**
As defined in the Strategic Plan and agreed by stakeholder, country-customised products would be centred on the five main alert responses: Prepare to Evacuate, Shelter-In-Place, Evacuate, Restricted Area, and All Clear.

Table 2: Lessons and recommendations from the implementation of the Public Outreach and Education campaign in the R3I EWS pilot countries

| EWS POE aspect | Lessons and recommendations |
|---|---|
| Work with a team | Collaboration strengthens capacity building |
| Scheduling and timing | Develop a strong communications decision team anchored in trust |
| Build and maintain support and buy-in | Activate the involvement of POE early in the EWS process<br>Ensure adequate planning, production and implementation cycle |
| Technical matters | Build capacity through expertise and local knowledge<br>Without political and bureaucratic buy-in, POE is ineffective<br>Consistent, long-term POE effort produce best results<br>Dedicated POE managerial and administrative capacity is needed<br>Keep stakeholders involved<br>POE increases awareness and drives technology demand<br>Advanced alerting technologies could disadvantage some populations<br>Introduce alerting options in a timely manner<br>Build in redundancy when choosing alerting technologies<br>Choose translators carefully |

6 A more extensive discussion is contained in the R3I resource "A Winning Campaign – Public Outreach in Early Warning: Lessons Learned in Caribbean Small Island Developing States", accessible on the UNDP Barbados and the OECS website.

| EWS POE aspect | Lessons and recommendations |
|---|---|
| **Public outreach and education strategy** | Introduce and build behavioural messaging<br>Know your audience and be strategic<br>Need to ensure consistency<br>Choose POE launch date wisely and match launch event with community preferences |
| **Identifying success** | Access and communication with a new stakeholder group<br>Stronger community ties<br>Evaluate communication tactics and tools<br>Focus on POE despite other priorities |
| **Opportunities to explore** | Increased use of social media<br>More regional promotion for EWS<br>Shareable repository of best practices/lessons learned in disaster communications and education |

# Conclusion

The "soft" (legislation, policies, SOPs, etc) and "hard" (equipment and infrastructure) components of the EWS must be considered equally important. The soft machinery provides the scope of the responsibility and liability of institutions involved, as well as giving the official authority in which the public places its confidence. As such, there must also be mechanisms for authentication of alert messages so the public is assured that they are coming from a reliable and official source. An incremental approach to technical implementation will assist with the process of securing buy-in from stakeholders, management of resources, as well as introducing the EWS to the public.

Stakeholders must also include the private sector and providers of communication services. While many countries already have legal agreements with telecommunications providers, TV and radio stations to facilitate dissemination of emergency messages from the government, there may be a level of reluctance on the part of the provider to assent to technologies such as broadcast interrupt or cell broadcast for various reasons e.g. loss of control, level of liability, technical concerns. Therefore such discussions must be broached in the design phase when dissemination tools are being identified.

As the implementation process progresses, countries will need to monitor the soft and hard mechanisms. The effectiveness of the tools and the POE campaign will also need to be evaluated once the system is operational. Some of the indicators that can be used include:

• Legislative requirements to provide alert and warning to the public approved
• Policy and SOPs/guidelines for emergency alerting defined and approved
• Warnings disseminated based on Common Alerting Protocol 2.0
• Risk of false notification and warning minimised
• Reduced panic by adequate and consistent information
• Public awareness raised and trust built with public

- Standardised messages disseminated through all media
- Alerting enhanced for non-English speakers
- Impacts from disaster on the residents, visitors and government reduced

The CAP is proving to be a method for increasing the efficiency of dissemination of alerts about natural or man-made hazards, which is valuable in the Caribbean which high levels of vulnerability exist and human resources are limited.

# Annex I: Useful Resources

**OASIS**

OASIS (2010) Common Alerting Protocol version 1.2 http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.pdf

**WMO**

Introduction to Common Alerting Protocol (2010) http://www.youtube.com/watch?v=n0iKp60jjtY

The Common Alerting Protocol (CAP) Standard http://www.wmo.int/pages/prog/amp/pwsp/CommonAlertingProtocol_en.html

Alerting authorities by WMO member or organisation http://www-db.wmo.int/alerting/authorities.html

WMO (2010) Administrative Procedure for Registering WMO Alerting Identifiers http://www.wmo.int/pages/prog/amp/pwsp/documents/AIR_PWS-20.pdf

**UNDP**

R3I project page: http://www.bb.undp.org/regional-risk-reduction-initiative

UNDP (2012) A Winning Campaign – Public Outreach in Early Warning: Lessons Learned in Caribbean Small Island Developing States

UNDP (2012) Cell Broadcast Technology for Public Warning

"Stay Safe" campaign public education videos (5 languages) http://www.youtube.com/user/staysafeca/videos?flow=grid&view=1

**R3I Pilot Disaster Management Offices**

**Anguilla**
Director: Ms Melissa Meade
Department of Disaster Management
James Ronald Webster Building, The Valley
Tel: +264 4972926
Email: melissa.meade@gov.ai

**Montserrat**
Director: Mr Billy Darroux
Disaster Management Coordination Agency
Yellow Hill Road, St John's
Tel: +664 4917166
Email: darrouxb@gov.ms

**Aruba**
Director: Mr Jaime Donata
Crisis Management Office
L.G. Smith Boulevard 158, Oranjestad
Tel: +297 588010
Email: crisis.mgmt.off@setarnet.aw

**Sint Maarten**
Head: Mr Paul Martens
Section Disaster Management
Sint Maarten Fire Department, Jackal Road 5, Cay Hill
Tel: +721 5426669
Email: paul.martens@brandweersxm.net

# Annex II: Template Warning Policy

**POLICY RESPECTING USE OF [COUNTRY'S] NATIONAL WARNING SYSTEM**

## A.    Background

At the 2005 World Conference on Disaster Reduction in Hyogo, Japan, the international community adopted the Hyogo Framework for Action 2005-2015 which sets out, among other things, the enhancement of early warning systems in respect of all-hazards, as a priority.

The [name of national disaster office] is established by [relevant legal provision] and is mandated to undertake responsibility for the implementation of the disaster risk management programme in [country name].  The establishment of an all-hazard warning system with a Common Alert Protocol backbone is viewed as a critical component of that programme.

In particular, [fill in position title that has the delegated authority and is typically in charge of the operations department responsible for a country alert and warning procedures], and by extension the Government of [country name], must ensure the following:

a. adequate monitoring and forecasting capabilities in respect of all threats;

b. the maintenance of adequate and functioning warning and alerting systems;

c. timely release of credible alerts and warnings to the publics of (insert country name); and

d. the development of local capacity in respect of disaster management through training.

## B.    Statement of Purpose

The purpose of this Policy is to establish authority for the system administration, control, access, maintenance and use of the [name of country warning system]. This Policy is therefore intended to facilitate the development of procedures to immediately notify the at-risk communities of any significant emergency or dangerous situation in [country name].

A central feature of this Policy is that an individual (that is to say, an operator) will have access at all times (that is to say 24/7) to the system interface so as to ensure, in the case of a threat or disaster, timely broadcast or publication of the appropriate safety and security warnings and notifications to the at-risk population. The operator must seek to provide timely notification when specific actions must be taken by members of the at-risk population so as to maintain safety and security within the community.

In summary, the [name of country warning system] should be used to alert households and businesses of imminent or active threats to people and property in their area. In order to earn and preserve the public's trust, confidence and support, the [name of country warning system] will only be used in emergency incidents that may affect public safety. Only those individuals with proper training and authority to use the system will activate the [name of country warning system].

## C.    Definitions

In this Policy document, the following words have the meaning ascribed to them:

**"activator"** refers to emergency management personnel who is pre-approved in accordance with this Policy and who is trained to activate the [name of country warning system];

**"active event"** is an incident currently impacting the lives, the property or the safety of the public;

**"all-clear notification"** means notification emanating from the [name of operations department responsible for a country alert and warning procedures] that an event or disaster has passed or no longer poses a threat to [country name];

**"at risk",** in relation to any person or community, means the likelihood of safety being directly endangered by an emergency situation or incident;

**"authoriser"** refers to a person who is pre-approved by the [name of operations department responsible for a country alert and warning procedures] in accordance with this Policy, and who is identified as having delegated authority to an Activator to activate the [name of country warning system] on behalf of a Requester;

**"[name of NDO]"** is the department in the public service of the Government which facilitates the coordination of the activities respecting the management of emergencies in [country name];

**"discretionary activation"** refers to activation for any incident which does not meet the criteria for required activation;

**"IHR"** refers to the International Health Regulations (2005) adopted by the Fifty-eighth World Health Assembly of the World Health Organisation on 23 May 2005 and which entered into force on 15 June 2007;

**"imminent event"** means an event which is expected by the emergency manager or Incident Commander to become active;

**"National (IHR) Focal Point"** is the entity delegated for communication with the WHO IHR Contact Point in respect of matters specified in the IHR;

**"public safety event"** means an emergency incident impacting or with the potential to impact one or more members of the public that may result in loss of life or quality of life;

**"requester"** means any person approved, according to signed agreement or current pre-identified position in accordance with this Policy to request the [name of country warning system] be used during an imminent or active public safety incident;

**"required activation"** means certain hazards:

a.      exist in the county that can cause an immediate public safety impact; and

b.      in respect of which [name of country warning system] activation is required.

## D.     System Overview

The [name of country warning system] is a combination of several technologies with a Common Alerting Protocol (CAP) backbone which disseminate warning and hazard information to the public. Currently the [name of country warning system] employs [name of country's alert and warning tools].

The [name of country warning system] is operated by the [name of operations department responsible for a country's alert and warning procedures]. Alerts (that is

to say, warning products) can be sent by other organisations [names of organisations, committees, etc. who are approved in the event that an emergency occurs, for which they have been pre-authorised to activate]. [This section should include all references to other backup operations including other countries — and responsible person's titles — that may be established by policy and written agreement to provide backup alert and warning for the country].

The classes of the warning products which the [name of operations department responsible for a country's alert and warning procedures] may utilise are set out in Part 1 of the Annex to this Policy. The [name of operations department responsible for a country's alert and warning procedures]will make these warning products available:

a.      through the Government website [URL for country website];

b.      [if appropriate to country's procedures] directly by email and/or fax through the [name of operations department responsible for a country's alert and warning procedures] to media outlets (for broadcast), and Government departments and other major key recipients (including [names of relevant country departments/organisations]); or

c.      [if appropriate to country's procedures] in the case of tsunami, by use of sirens, etc.

*Provided as an example of additional reporting responsibilities that may be required:*
In addition, where the threat relates to a tsunami, the [name of operations department responsible for a country's alert and warning procedures] must notify the [names of officials' titles as appropriate to country's procedures] by telephone before issuing a [insert type of] warning.

*All related procedures taken as a result of this notification should be listed herein, such as those following provided by example.*
While not responsible for passing warning products to the public, the Office of the [title] is responsible for ensuring that warning products are passed on to [specified entities], and that the arrangements are in place to ensure the community is aware of the meaning of the warning products and the accompanying safety messages.

### Planning phase (i.e. normal business)

The [name of operations department responsible for a country's alert and warning procedures] should take a risk-based and collaborative approach to the development of plans, warning systems and contact lists. This approach should identify those elements within the community vulnerable to a disaster threat, take account of complementary existing warning systems in operation, and encourage community resilience by advocating for the community and businesses to make their own arrangements for the receipt of warnings. In this approach, the responsibilities of the [name of operations department responsible for a country's alert and warning procedures] itself and appropriate methods of delivering on these responsibilities should also be clearly defined.

**During an event**

The [name of operations department responsible for a country's alert and warning procedures] should carry out its responsibilities defined in the planning phase. It is anticipated that these may include responsibility for ensuring warning products are passed on to:

a.      [list all national committees designated by legislation];

b.      government managed facilities and other at-risk institutions; and

c.      any other vulnerable land and marine based elements of the community.

The [name of operations department responsible for a country's alert and warning procedures] disaster contingency plans should contain a communications strategy with pre-scripted messages based on established messages to be delivered by identified leaders or other designated representatives. In addition the plans must specify the roles and actions to be assigned to the operators including the procedures for the confirmation of threats and the verification of information.

Any decision to supplement any [name of operations department responsible for a country's alert and warning procedures] warning product must be initiated by duty staff at the [name of operations department responsible for a country's alert and warning procedures].

The [name of operations department responsible for a country's alert and warning procedures] will ensure the dissemination of warnings to vulnerable communities.

## E.      Community Impact of [name of country warning system]

Due to the robustness of the [name of country warning system], its impact on the community level is an overwhelmingly positive one. The use of readily available technologies to issue alerts means that warning information can be disseminated in a manner of seconds (that is to say in real time) to the at risk community utilising as many methods as possible. The use of readily available technologies to issue alerts also brings the financial impact of the [name of country warning system] to the community to nearly zero as specialty equipment is not necessary to utilise the system.

## F.      Broadcast Priorities

1.      The severity of the emergency will dictate which broadcast will have priority in the event that there are two or more urgent messages to be broadcast.  Priority will be determined by the [title of responsible personnel] and in accordance with the [name of authorising document, e.g. National Disaster Management Plan, etc.]

2.      Generally emergency broadcasts to any at risk community shall take priority over staff notification.

## G.        Prohibited Uses

The [name of country warning system] shall not be used for any of the following purposes:

a.        Any message of a commercial nature;

b.        Any message of a political nature; or

c.        Any message relating to non-official, non-public safety business (articles, meetings, etc).

## H.        System Administration

Data entry and database management will be strictly limited to the officials of the [names of responsible department(s)].

1.        Characteristics of alerts

All alerts (notification messages) must contain the following core or basis information — the nature of the threat or event; the location of the threat or event; and the actions required to be taken by the population at risk.

2.        Levels of Emergency Notification

Three levels have been recommended in this Policy document, namely "Watch", "Warning" and "All Clear". The terms "imminent" and "active" are used to describe the status of the threat or event.  These levels of Emergency Notification are not described with respect to any timeframe because the use of the expression "watch" or "warning" in the context of any threat is expected to convey the urgency of the situation. For example, it is fully appreciated that the timeframe for action and decision making in the case of a tsunami threat is not the same as the timeframe for action and decision making in the case of a pandemic threat.

## I.        Notification Procedures

A critical aspect of disaster risk reduction is clear articulation of alerts to the at risk communities so as to obtain the desired responses. But more importantly, the alerts must emanate from reliable sources.

| The following events can require activation of the [name of country warning system] | Sources of Information |
|---|---|
| Earthquakes and other seismic events | |
| Hurricanes and other weather-related threats | e.g. Meteorological Office |
| Industrial accidents and fires | |
| Road accidents | |
| Epidemic/pandemic | e.g. Ministry of Health |
| Air incident | |
| Oil spill incident | |
| Riot incident | |
| Water incident | e.g. Coast Guard |

Flooding
Landslide
Hurricane/tropical force winds
Missing person                                        e.g. Police Department
Tsunami
Terrorism
Hazardous materials (hazmat) incident

These events as well as their activation level are to be specified in the [name of country warning system] Use Manual.  Any additions to this list will be contained in the [name of country warning system] Use Manual and the most recent copy of this document should be consulted in the event of a proposed activation.

## J.      Maintaining and Testing Response Arrangements

The [name of operations department responsible for a country's alert and warning procedures]  and other agencies with responsibilities for the transmission of all-hazard warning products will review and update details of recipients of the warning service weekly, monthly or quarterly as the need arises.

The [name of country warning system] is to be tested at least two times each year through the promulgation of 'No Threat' warnings as part of a standard dissemination system to all stakeholders.

**Maintenance and Testing Schedule:**

**Weekly Test**
**Monthly Test**
**Semi-annual Test**

**Level 1 Exercise**
**Level 2 Exercise**
**Level 3 Exercise**

## K.      Issues to Consider Prior to Activation

There are basically two issues which need consideration before the [name of country warning system] is activated. These issues related to the geographic area and location to be notified and the frequency of notification.

1.      Geographic area and location to be notified

It is important to determine whether the geographic area or location of the territory which is intended to be notified is the correct geographic area or location. It is advisable to issue the notification for a little larger area to facilitate the growth of the incident. However, the accuracy and correctness of the area of the territory must be ensured.

2.      Frequency of notification

It is important to determine whether additional notifications will be needed.  If the Requester (a Requester may also be an Activator) believes the incident may grow or shift direction, that belief should be recorded and plans and preparations must be made for a secondary notification. It is of utmost importance to make and keep a record of all areas notified to facilitate an "All Clear" notification if the event requires such a notification.

## L.      Activation Process

Upon the identification of a hazard or for any other proposed use of [name of country warning system], the procedure set out in this section must be followed.  The list of persons who are approved as **Requesters** and/or **Activators** are set out in this section.

1.      The **Requester's** main mandate is to gather as much information about the impending threat as possible in as quickly a manner as possible. Depending on the severity and onset of the incident, detailed investigative and/or confirmation procedures may not be prudent, however all possible efforts should be made to verify the accuracy of information contained in the request. A log of requests for activation must be recorded for tracking purposes.

2.      The Requester then contacts the appropriate **Activator** (requestor and activator may be the same individual), who is empowered to give permission for the activation of the [name of country warning system] based on the report received or to deny the request if insufficient basis is found for activation. Regardless of whether a request for activation was accepted or rejected a log of requests received for activation must be recorded. Any action taken by the Activator should be logged for record tracking purposes.

In all activations or uses of the [name of country warning system] it is imperative that proper logging of all actions takes place. In situations requiring an "All Clear" to be sent it is the responsibility of the Requester to issue this request as a separate event.

## M.      Approved Requesters and Activators

The [title of operations department head] of the [name of operations department responsible for a country's alert and warning procedures]  or designee shall ensure that a list of names and positions for the Requesters and Activators is maintained and kept current and that a reference copy of that list is kept at both the National Emergency Operations Centre and the [name of operations department responsible for a country's alert and warning procedures].

1.      Approved Requesters for use of the [name of country warning system]

The [name of operations department responsible for a country's alert and warning procedures] should prepare the appropriate checklists, Operations Manuals and in-depth training as required for all approved Activators.

The following institutions are pre-approved to request the activation of the [name of country warning system]:

[as appropriate to country's procedures this may include but is not limited to Police

Dispatch; Fire and Rescue Service; Ministry of Health; Information Technology; and Tourism Authority].

2.        Approved Activators of the use of the [name of country warning system]

The following institutions and authorities are pre-approved to activate the [name of country warning system]:

[List all that are appropriate, some examples to consider are provided]

> a.The Director of the [name of operations department responsible for
>    a country's alert and warning procedures];
> b.The National (IHR) Focal Point;
> c.The Chief Medical Officer;
> d.The Chief Fire Officer; and
> e.The Commissioner of Police/the Police Chief, as appropriate.

For further information consult the [name of country warning system]. Use Agreement (if any); or the [name of country warning system] Worksheet.

The [name of operations department responsible for a country's alert and warning procedures] must ensure that the contact list of the approved Requesters and Activators is managed in accordance with relevant legislation and includes sufficient redundancy to ensure that the relevant persons can be contacted at any time of the day or night as needs arises.

## N.        Passing Messages

Broadcast media will carry messages distributed directly by the [name of operations department responsible for a country's alert and warning procedures]. Radio and television broadcasts may be preceded by [reference any, as appropriate] if authorised by the [name of operations department responsible for a country's alert and warning procedures].

## O.        Public Outreach and Education

The [name of operations department responsible for a country's alert and warning procedures] will prepare and execute, in consultation with [list of relevant agencies, particularly those responsible for origination, requesting and activation] a Public Outreach and Education (POE) Strategy designed to inform the public of the appropriate responses to various messages. The standardised messages to be used will be Prepare to Evacuate, Shelter-In-Place, Evacuate, Restricted Area, and All Clear. The POE Strategy will take into account the needs of special groups, e.g. hearing and sight impaired, foreign language speakers, in its dissemination mechanisms.

**ANNEX**
**PART 1**
**CLASSES OF ALERTS/WARNINGS PRODUCTS**

The classes of the warning products which the [name of operations department responsible for a country's alert and warning procedures] may issue include:

a.      National "No Threat" Bulletin: To advise people that an event has been assessed and that no disaster threat exists in respect of the territory.

b.      National Watch: To advise people that a disaster threat to the territory may exist and that they should look out for further updates and to advise them of the level of threat (marine or land) and action they should take.

c.      National Warning: To advise people that a disaster threat to the territory exists.

d.      National Watch or Warning Cancellation: to advise when the main threat to the territory has passed or a disaster fails to eventuate.

e.      National Warning Summary: To provide the public, media and emergency authorities with the status of the disaster warnings nationally.

f.      Event Summary: To provide the public, media, emergency authorities and Government with summary information that can be used in post-event analysis.

**EXAMPLE 1      Sea Swell Watch**

FROM ……. UNTILL …….. THE COAST OF [name of country] WILL BE INFLUENCED BY SWELLS. PERSONS USING [name of country] BEACH OR MARINE FACILITIES SHOULD BE CAUTIOUS.

**EXAMPLE 2      Tropical Storm Watch**

WEATHER RADAR INDICATES THAT TODAY ……….. FROM ….. THROUGH …... SHOWERS/THUNDERSTORMS WILL MOVE OVERHEAD [name of country].
RAIN INTENSITY WILL BE …… TO …….
AREAS WHERE THE HIGHEST CLOUD TOPS WILL PASS OVERHEAD WILL RECEIVE THE MOST RAINFALL ACCUMULATION.

**EXAMPLE 3      Tsunami Watch**

AN EARTHQUAKE WITH ITS EPICENTER AT …… OCCURRED AT ……
A TSUNAMI WATCH IS VALID FOR [name of country]. ALL PERSONS USING [name of country] BEACH AND MARINE FACILITIES SHOULD EVACUATE IMMEDIATELY THE COASTAL AREAS.