ESCAP/WMO
Typhoon Committee

WMO ESCAP
Panel on Tropical Cyclones
for the Bay of Bengal & the
Arabian Sea

QUICK REFERENCE GUIDE ON SYNERGIZED STANDARD OPERATING PROCEDURES (SSOPs) FOR COASTAL MULTI-HAZARDS EARLY WARNING SYSTEM

MAY 2015

UNITED NATIONS
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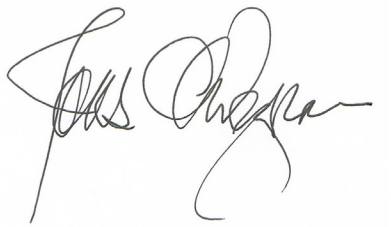
FOREWORD

This Quick Reference Guide is a summary of the Manual on Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-Hazards Early Warning System. It contains a summary of the basic ideas and methods for development and implementation of SSOPs. It is an operational guide for an organization to quickly and easily start or review implementation of the SSOP process. It provides ideas on SSOP format, SSOP examples, and a checklist for reviewing SSOPs. For areas where more information is required, different Modules within the SSOP Manual can be reviewed. In addition, it is recommended and encouraged to review the entire Manual to gain a better understanding of ways to promote community resilience and to improve the policy and institutional arrangements at all levels of government using integrated, effective SSOPs for multi-hazards EWS.

For the Lists of Acknowledgments and References and a complete Executive Summary, please see the SSOP Manual.



James C Weyman,
Project Manager/Technical Advisor

1. OVERVIEW

1.1 Contents of Quick Reference Guide

- Writing Effective SSOPs
- SSOP Development and General SSOP Format
- Basic SSOP Template and Example
- SSOP Checklist
- SSOP Example: Actions Before A Tropical Cyclone Season

1.2 Definitions

To use the SSOP Quick Reference Guide, certain definitions are necessary. These are:

Synergy
- To create SOPs through a cooperative development, review, analysis, and documentation process in a Multi-hazardsand multi-agency way so the whole is greater than the sum of its parts.

Standard Operating Procedures (SOPs)
- To identify, coordinate, integrate and document, in a logical order or sequential, a standard set of steps to be followed to ensure tasks are performed in the same way and to the same standard each time.

Multi-hazards
- To identify and incorporate similarities of hazards into SSOPs. For example, this may include:
  1. Processes involved in monitoring and observing;
  2. Stages of alerts and warnings, for example, green, blue, yellow, red levels or other standard colors or levels;
  3. Coordination among agencies; and
  4. Processes of issuing and disseminating warnings.

- This approach can make an EWS and supporting SSOPs more sustainable because they would be used more frequently than stand-alone, single hazard methods.

Multi-Agency
- To coordinate and integrate different agencies' inter-related roles and responsibilities into each other's SOPs.

Sub-National
- Levels between the national level and the community level. This would include provinces, territories, states, regions, divisions, governorates, prefectures, districts, and planning areas.

Time-line Concept
- Tasks listed in chronological order of how they are to be performed.

2. WRITING EFFECTIVE SSOPs[1]

2.1 Purposes of SSOPs

- Ensure tasks are performed in the same way and to the same standard each time;
- Maintain high quality and consistent service in hazard situations;
- Discuss, determine, and approve the most efficient and effective method to perform tasks before an emergency occurs;
- Improve cooperation and integration of different tasks among agencies involved in EWS; and
- To reduce training time.

2.2 Necessity of SSOPs

- Ensure tasks are preformed within the country's documented EWS;
- Describe and document EWS roles and responsibilities;
- Incorporate concepts of multi-hazards, multi-agencies, and integration;
- Consideration of vulnerable and special needs individuals; and
- Establish a standard training program.

2.3 Approach

- Emphasis on impact-based warnings and alerts

The type of weather producing the hazard can be different (heavy rain, inundation, strong winds, etc.) but produce similar effects/impacts at the community level. This then can serve as a possible basis for synergy and multi-hazards. SSOPs developed for coastal inundation impacts can be used with different levels of changes for tsunami, storm surge, high waves, river flooding, and poor drainage in heavy rain.

- Bottom-Up Approach

SSOPs are mostly developed at a national level, then downward to the sub-national and then to the local levels.

Possible Use of Impact-based, "Bottom-up Approach" for SSOP Development Effective

With new emphasis on impact-based warnings and forecasts, a "bottom up" concept may be more effective. It may be easier to incorporate synergy for multi-hazards, multi-agency, and multi-levels of government by beginning the development of SSOPs at the local community level rather than national level. By involving the communities at a very early stage of SSOP development, impacts and the specific needs of the communities can be the foundation rather than having many national and sub-national level SSOPs which would have to be merged into one meaningful system.

- Good, trusting partnerships and relationships with other agencies and stakeholders are very important in the preparation, coordination, and implementation of multi-agency, multi-level integrated SSOPs. This helps to ensure the required information gets to the people at risk in a timely, clear and understandable manner and often reduces the time required to prepare effective SSOPs.

2.4 Before Writing an SSOP

Before preparing an SSOP, consider:

- What is the specific task to be accomplished and what is the expected outcome?
- Who will be using the SSOP?
- In what ways will the SSOP be used?
- Who should be involved in the development of the SSOP?
- Will vulnerable and disabled persons be affected and how?
- What type of synergy can be incorporated into the SSOP'

1 This section is a compilation of information on effective SSOPs from many different sources which can be found in the SSOP Manual.

When should you write or rewrite an SSOP

Write an SSOP when:

- No SSOPs are currently available for specified tasks;
- New information suggests there is a way to improve performance;
- Workers' evaluations identify required changes in existing SSOPs;
- An incident occurs that indicates limitations in effectiveness or efficiency; and
- New equipment, processes, or responsibilities create new work situations.

Who should you write an SSOP for

- Write the SSOP for the person(s) who will perform the tasks;
- Consider such factors as age, education/ training, knowledge, skills, and experience;
- Higher level multi-agency SSOPs are prepared and agreed to by different agencies;
- Agency specific SSOPs are prepared for a single agency and can help to complete the tasks defined in the higher level SSOPs.

Who should write and review SSOPs

- Identify or designate a knowledgeable person to lead the development effort;
- A team of people from different areas with different knowledge and experience should be involved in the development process;
- Involve other agencies who have interrelated tasks to incorporate multi-agency aspects; and
- Team approach can help the implementation process and training because several people will be knowledgeable on the process and expected outcomes.
- Persons not involved in the SSOP development process should review and test the SSOP to ensure accuracy.

2.5 Different Styles of SSOPs

There are different ways to prepare SSOPs depending upon: the task to be completed, the complexity of the task, the length of the task, and the level of the SSOP. Five different formats are provided and suggestions on when these might be used. An SSOP can follow one of these formats, a combination of two or more formats, or a format developed by the country involved. Whatever format that allows personnel to perform the task most effectively and efficiently is the one that should be used.

Many Decisions?	Best SSOP Format
No	Simple Steps
No	Ranked Order Steps
Yes	Graphic Flow Chart
Yes	Annotated Pictures
Yes	Branching Flow Chart

2.5.1 Simple steps or checklist

These are easy to write and follow and are good for short, simple tasks.

Modified Example from Malaysia's Guidelines for Media Management Center (MMC) on Disaster/Crisis Section, Section 6, Early Response of MMC

Duties of the MMC Officer immediately after reporting to Disaster Operations Commander (DOC) are to:

1. Set up and operate MMC;
2. Place directional signs to MMC at strategic locations at the disaster site for the local and international mass media;
3. Request all the local and international media to register and provide them with the pass for access to MMC;
4. Obtain the necessary information on the disaster from DOC for dissemination to the media. DOC must sign the information document before disseminating it;
5. Prepare and coordinate the schedule and information for approved government officials/leaders to brief the media; and
6. Arrange the necessary equipment for the media.

2.5.2 Ranked ordered steps

This is an extension of the simple steps format. It works better for tasks that require additional detail or sub-steps within each primary step.

Expanded Example with Sub-Steps based upon Malaysia's Guidelines for Media Management Center (MMC) on Disaster/Crisis Section 6. Early Response of MMC (Expanded sub-sections not part of Malaysia's SSOP, but added for this Guide as an example)

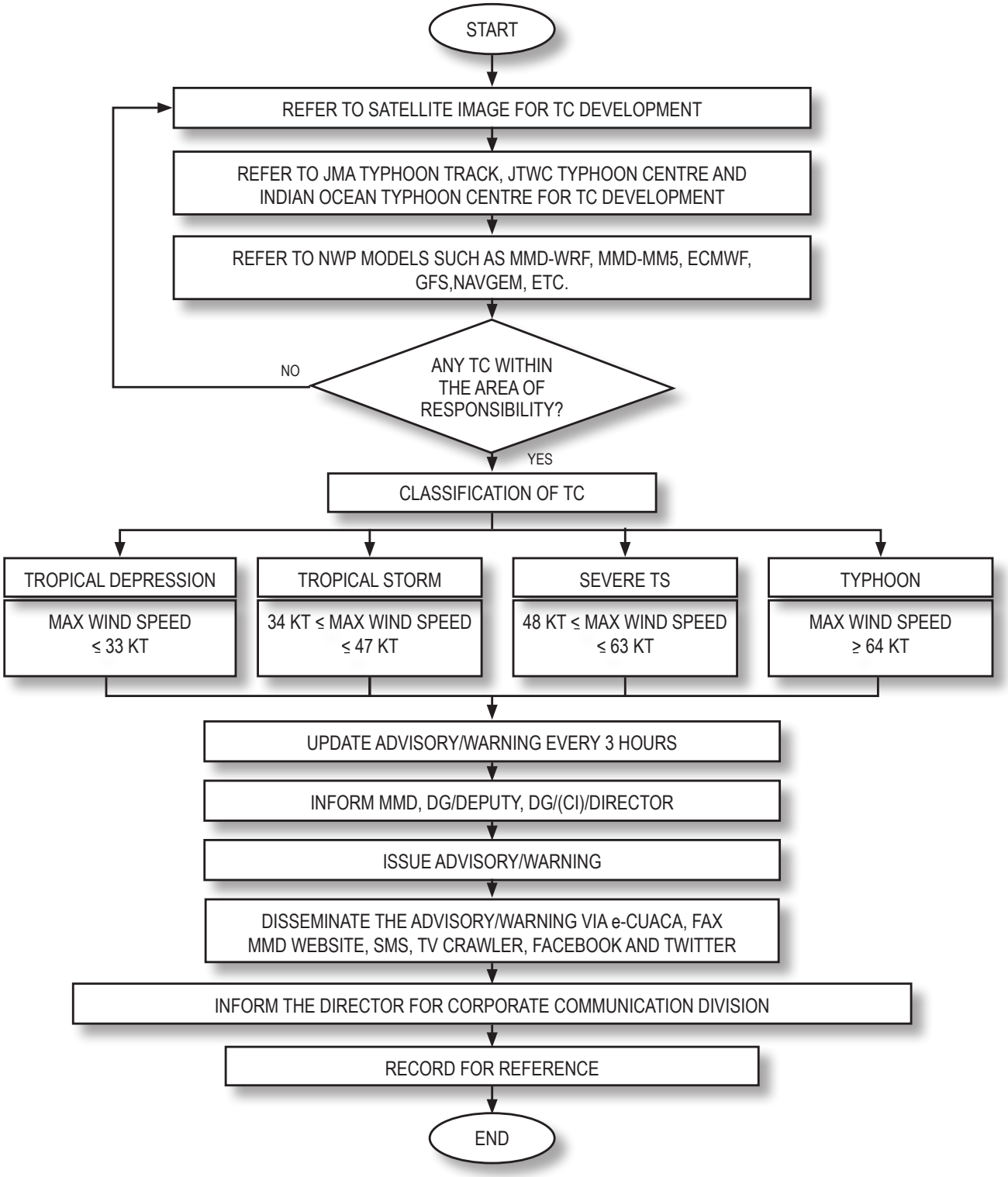
Duties of the MMC Officer immediately after reporting to Disaster Operations Commander (DOC) are to:

1. Set up and operate MMC:
   a. Locate building where the MMC will be located;
   b. Locate and place 3 tables, 1 podium, 15 chairs, 2 desks in the MMC;
   c. Position MMC computer on one desk and ensure there is internet capability;
   d. Set up projector to display graphics for media presentation;
   e. Locate sound system and ensure microphones are on and operational; and
   f. Prepare blank media pass before opening the MMC so they can be rapidly completed as the press arrives.
2. Place directional signs and sign post of MMC at a strategic location at the disaster site for the local and international mass media:
   a. There are 5 directional signs. Place these at different locations within the disaster site;
   b. Place the large MMC sign at the entrance to the MMC; and
   c. Inform various officials and emergency personnel of the location of the MMC in case they are asked for comments or location of MMC.
3. Request all the local and international media to register and provide them with the pass for access to MMC:
   a. Place a table by the entrance of the MMC and ensure it is staffed at all time;
   b. Prepare a register sheet with entries for name, news affiliation, local address, cell phone number, and email address and ensure every media representative completes all sections; and
   c. After registering, provide each media representative a pass with their names, news affiliation, and picture (if possible) on it.
4. Obtain the necessary information on the disaster from DOC for dissemination to the media. DOC must sign the information document before disseminating it;
   a. Coordinate with DOC in person if possible or via cell phone if cannot coordinate in person;
   b. After reaching agreement on the information to disseminate, type the information to be released, print a copy, and have DOC review and sign it; and
   c. Once the signed information document is completed, make copies and distribute it to the media.
5. Prepare and coordinate the schedule and information for approved government officials/leaders to brief the media:
   a. Coordinate with the DOC and obtain approval for the list of government officials/leaders who will provide interviews;
   b. Coordinate schedule of approved speakers with the individual speakers to ensure their availability; Provide schedule to the media;
   c. Attempt to schedule at least on interview every hour to maintain a constant flow of information to the media;
   d. Prepare a briefing based upon DOC approved information for officials/leaders to brief the media; and
   e. Ten minutes before each interview, remind speakers of time and place, and remind media representatives of the upcoming interviews.
6. Arrange the necessary equipment for the media:
   a. Print media will usually need a place to prepare their reports and then a method to send them and
   b. Video media will need a place to conduct interviews or to film their segments. Ensure the appearance of this is good and well-lit.

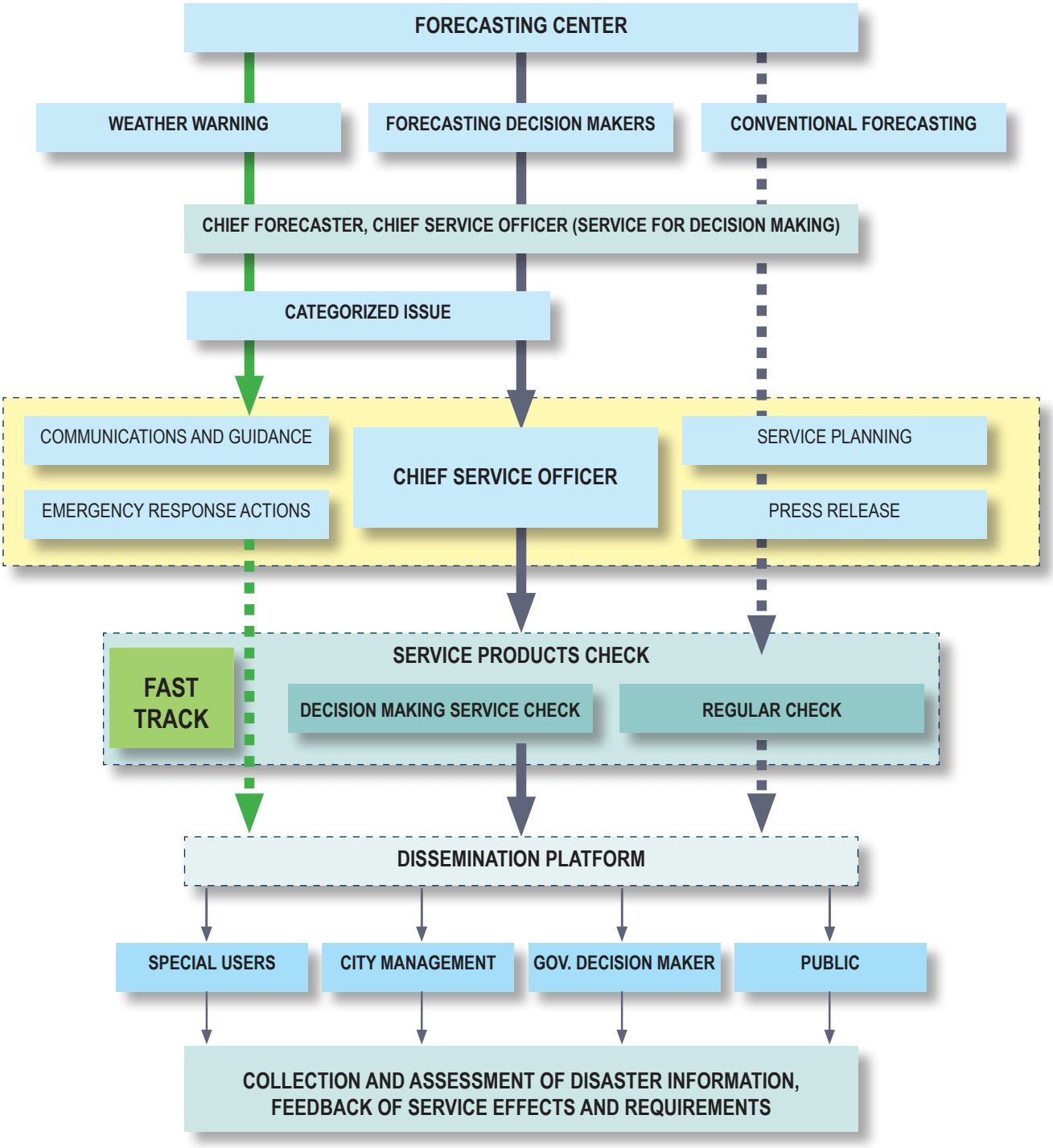
2.5.3 Graphic flow chart

This is a graphical version of a SSOP. It works well for tasks where activities must be done in a specific order.

Example: Malaysia Flowchart for Issuance and Dissemination of Tropical Cyclone Advisory/Warning



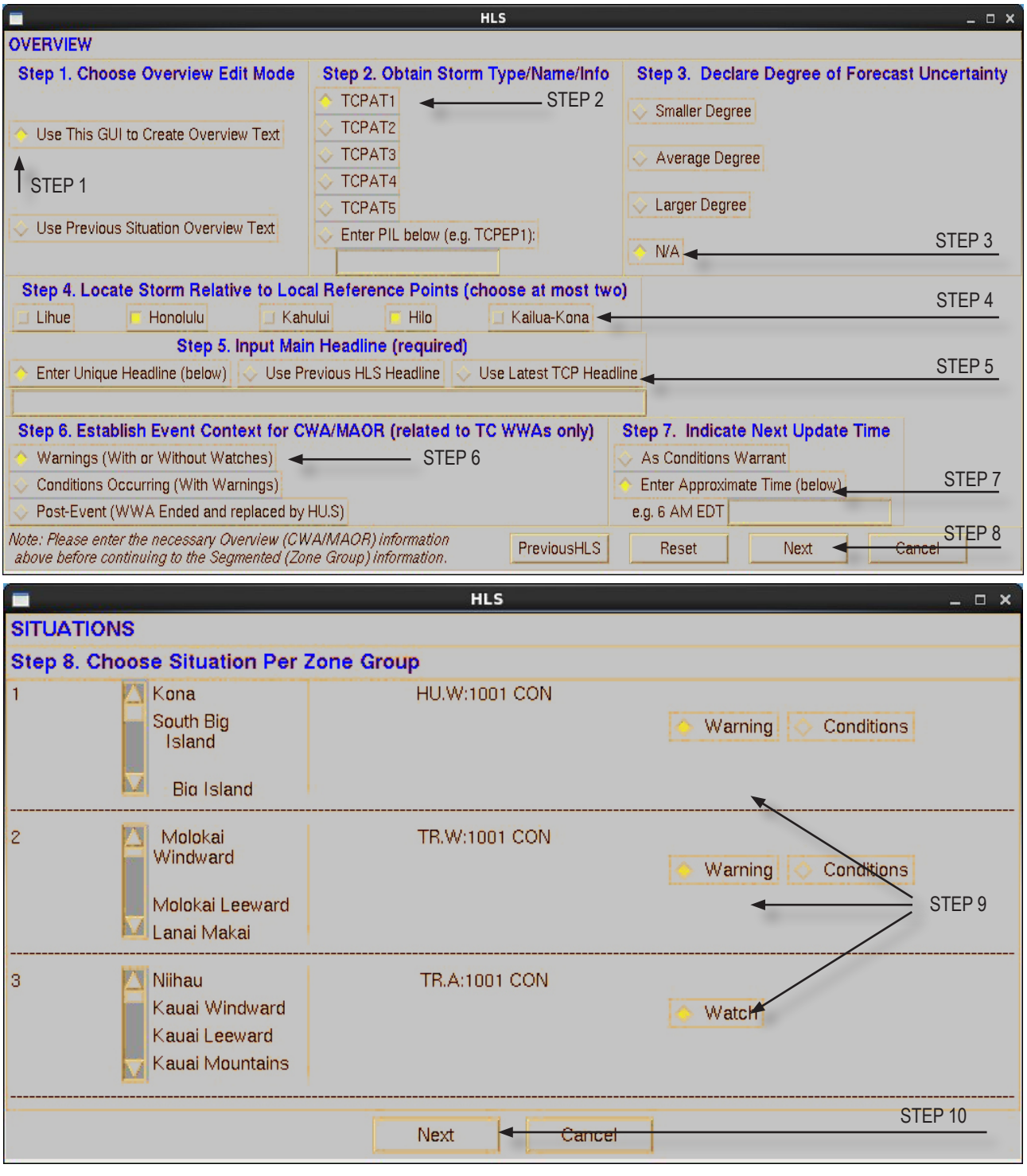
Example: Shanghai Meteorological Service Flowchart for Fast Track Mechanism Used During Emergencies.

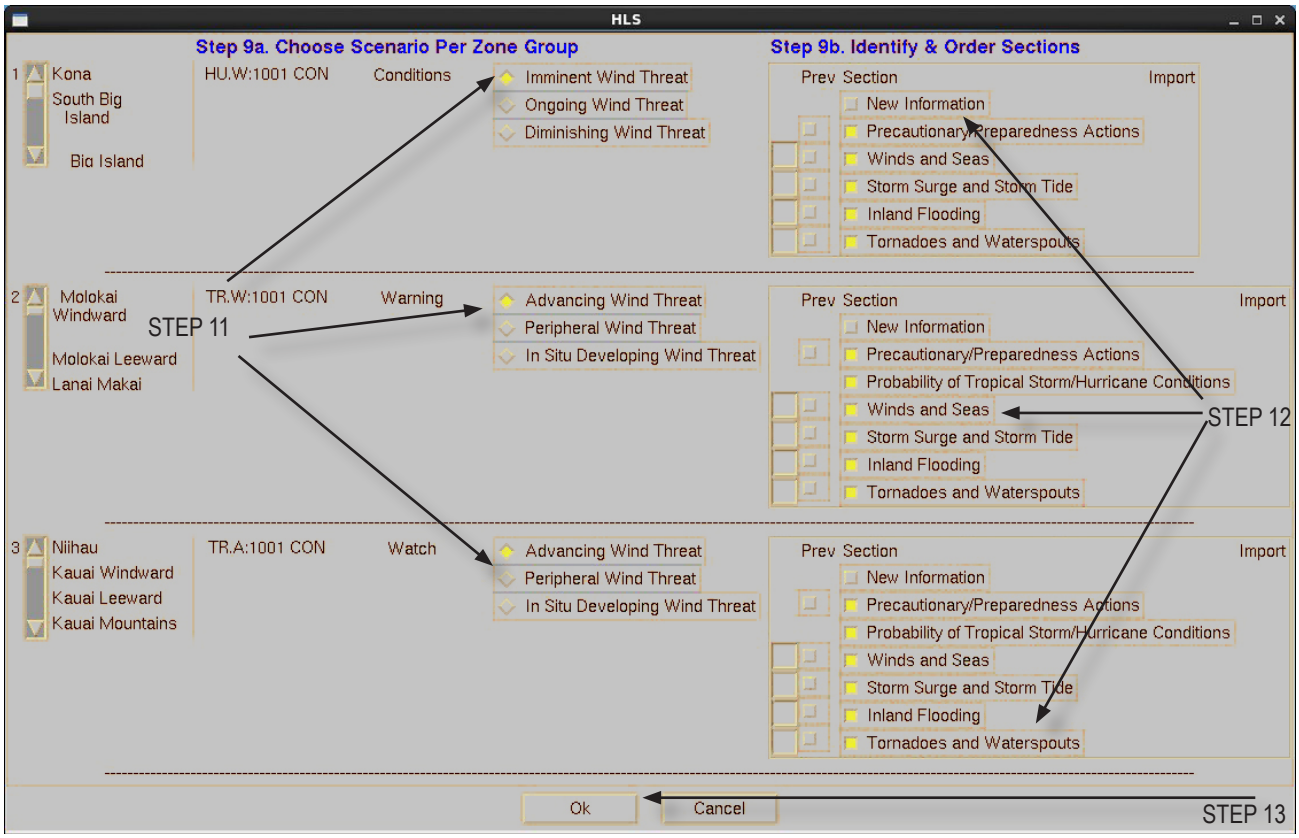


2.5.4 Annotated Pictures

This format works well in complex processes where steps involve computer entries. Because pictures can dramatically reduce the need for written explanations, this format helps to shorten complex and detailed SSOPs.

Example: USA example for entering warning information into computer system.





Step 1: Select whether you want to use a new over view or the previous one.

Step 2: Select the correct WMO Header for this product.

Step 3: Select the degree of uncertainty associate with this tropical cyclone forecast.

Step 4: Determine and enter closest reference point for the location of the tropical cyclone. Up to two references can be used.

Step 5: Enter the mandatory main headline for the system.

Step 6: Select warning, watch, or none for the area affected.

Step 7: Enter the next update time. Can choose a specific time or as conditions warrant.

Step 8: Select “Next” and click on it to go to the next page. If errors were made, reset and start again. If the product is no longer needed it can be canceled.

Step 9: For each of the five designated areas, select Watch, Warning, or Non-Event/Pre-Event (need a headline for these if different).

Step 10: Select “Next and click on it to go to the next page. The process can also be canceled here.

Step 11: Choose wind threat for warning areas, impacts for post-events, and continue or cancel a non event.

Step 12: Based upon Watch, Warning, or Non-Event/Pre-Event category, select the statements to be included and the priority that these statements will be listed.

Step 13: Select “OK” to generate the product and to dissemination it through the correct dissemination channels. It can still be cancelled at this point.

2.5.5 Branching flowchart

This format makes complex SSOPs easier to follow, especially those with a number of decisions that affect subsequent steps. Boxes within the flow chart can also be expanded to include checklists or sub steps.

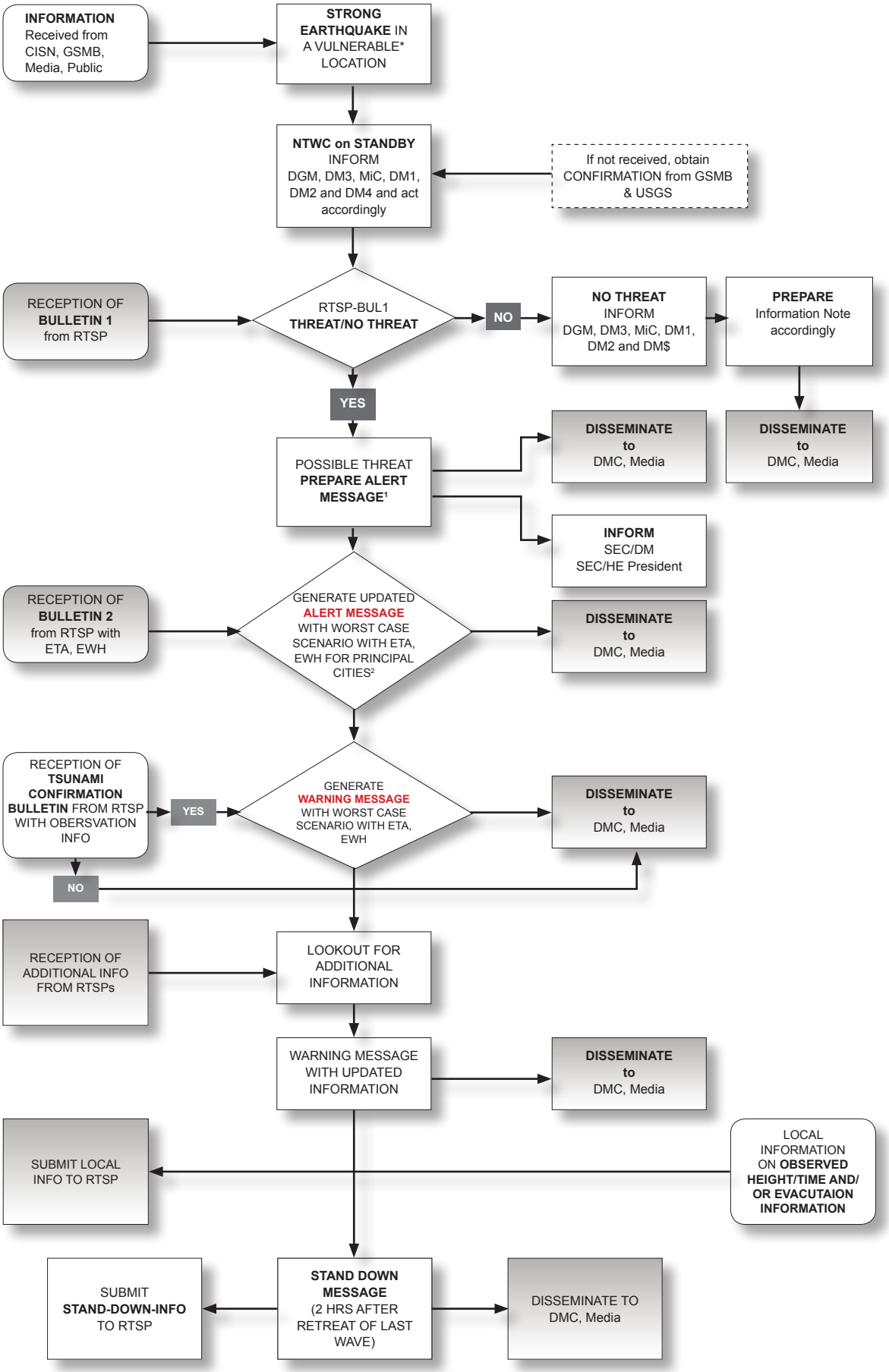
Example: A branching flowchart SSOP used by Sri Lanka for identifying and issuing warnings for tsunami. The information below applies to the flowchart..

*** Vulnerable Location is defined as the western part of the SUNDA or MAKRAN subduction zones.**

DGM: Director General of Meteorology
DM3: Director (Forecasting & Decision Support)
MiC: Meteorologist in Charge (Forecasting Div.)
DM1 : Director (Research & Development)
DM2 : Director (Observation Network & Instrument)
DM$: Director (Data Processing & Archiving)

SEC /DM : Secretary, Ministry of Disaster Mangmt
SEC/HE President : Secretary to the President

DGM: 0718460124, 0112694104, 0112687343
DM3: 0716281134, 0112691443, 0112656309
MiC: 0774368390, 0112682661, 0112973836
DM1: 0777391366, 0112686499, 0112701694
DM2: 0773437063, 0112692756, 0112235412
DM$: 0714293358, 0112665088, 0112893512


INFORMATION Received from CISN, GSMB, Media, Public
STRONG EARTHQUAKE IN A VULNERABLE* LOCATION
NTWC on STANDBY INFORM DGM, DM3, MiC, DM1, DM2 and DM4 and act accordingly
If not received, obtain CONFIRMATION from GSMB & USGS
RECEPTION OF BULLETIN 1 from RTSP
RTSP-BUL1 THREAT/NO THREAT
NO
NO THREAT INFORM DGM, DM3, MiC, DM1, DM2 and DM$
PREPARE Information Note accordingly
YES
DISSEMINATE to DMC, Media
DISSEMINATE to DMC, Media
POSSIBLE THREAT PREPARE ALERT MESSAGE1
INFORM SEC/DM SEC/HE President
RECEPTION OF BULLETIN 2 from RTSP with ETA, EWH
GENERATE UPDATED ALERT MESSAGE WITH WORST CASE SCENARIO WITH ETA, EWH FOR PRINCIPAL CITIES2
DISSEMINATE to DMC, Media
RECEPTION OF TSUNAMI CONFIRMATION BULLETIN FROM RTSP WITH OBERSVATION INFO
YES
GENERATE WARNING MESSAGE WITH WORST CASE SCENARIO WITH ETA, EWH
DISSEMINATE to DMC, Media
NO
RECEPTION OF ADDITIONAL INFO FROM RTSPs
LOOKOUT FOR ADDITIONAL INFORMATION
WARNING MESSAGE WITH UPDATED INFORMATION
DISSEMINATE to DMC, Media
SUBMIT LOCAL INFO TO RTSP
LOCAL INFORMATION ON OBSERVED HEIGHT/TIME AND/ OR EVACUTAION INFORMATION
SUBMIT STAND-DOWN-INFO TO RTSP
STAND DOWN MESSAGE (2 HRS AFTER RETREAT OF LAST WAVE)
DISSEMINATE TO DMC, Media

3. SSOP DEVELOPMENT AND GENERAL SSOP FORMAT

Caution: Must Allow Sufficient Time to Prepare Effective SSOP

Preparing, documenting, reviewing, testing, approval, and implementation of SSOPs will require more time and coordination than a person usually estimates. Therefore begin preparation of required SSOPs far in advance of when they might be needed to allow sufficient time to accomplish all of the needed steps.

3.1 Suggestions to consider when writing SSOPs

NOTE: Consider the following items and the items under General SSOP Format Guide as suggestions to consider. Not every item needs to be included. Each item should be considered, but only include those that fit your need and situation. Also, it may be useful for some countries to alter the order of the suggestions sections to fit their need.

1. Explain the reasons behind certain steps. This might help people to understand the importance and order of the tasks/steps.

2. Make SSOPs clear and simple, write in short sentences, and when possible, begin with an action verb. Uncommon or unclear acronyms and abbreviations should not be used.

3. Create detailed SSOPs for long or complex tasks, especially if performed infrequently. If the task is simple or employees are familiar with the task, then a shorter SSOP will work.

4. Break into sections SSOPs that are a long list of steps. For example, “Getting ready for the process,” “Initial steps,” and “Final steps.”

5. Explain when and how each person will perform specific steps when multiple people must use the same SSOP.

6. Inform all personnel when an SSOP is completed and approved SSOP.

7. Train the people who will be using the SSOP.

8. Review the operational effectiveness of SSOPs after a few weeks or when a significant event occurs.

9. Keep a computer accessible file, if possible, and at least one notebook with paper copies as a backup.

3.2 General SSOP Format Guide

3.2.1 Title Page

The first page of each SSOP should be a title page and can have the following information:

- The emblem representing the agency of country.
- The name of the organization.
- The name of the weather event covered by this the SSOP. For example, tropical cyclone, marine, flooding, or other areas.
- An identification number or document control number. These numbers can be based upon the weather item for the SSOP. Such as TC-1, TC-2, TC-3 for tropical cyclones and M-1, M-2, M-3 for marine program.
- Name of person or team who developed SSOP.
- Name, signature and date of the person who approved the SSOP.
- Implementation date.
- Distribution list.
- Partners or other agencies involved if it is for inter-agency use.
- Acknowledgements.
- Revision history log.

See “Basic SSOP Template” for an example.

3.2.2 Header on top of each page and a footer for each page

The header can be the SSOP number, a short title identifying the activity, the implementation date. A

footer can include the page number or other information. For example:

Header
SSOP TC-1 (Before Season) 26 September 2014

Footer
Page 1 of 12

3.2.3 Table of Contents

This is needed to quickly locate specific sections. If the SSOP is short then this may not be needed.

3.2.4 Include Specific Information as Needed

This specific information should be considered and incorporated into the SSOP as necessary.

a. Background. In most cases, the hazard may need to be defined along with important geographical and climatological information concerning the hazard;

b. Purpose. Describe the requirements as listed in laws or agency directives;

c. Scope. Indicate which specific tasks are included in this SSOP and which are not. Can also include geographic and climatology information if needed;

d. Applicability. Specify who or what section of the organization does this SSOP apply to;

e. Task. Develop an overall task description. Include the number of people required, skills required, the equipment and supplies needed, and a description of the finished product or result;

f. Summary of SSOP. Briefly summarize the procedure;

g. Definitions. Identify any acronyms, abbreviations or specialized terms used; and

h. Cautions. List any cautions or possible interference people should be aware of as they perform the tasks;

3.2.5 Procedures

a. Identify all pertinent steps, specific order, timing sequence, estimate of time to complete, and materials needed to accomplish the procedure;

b. Include information on any SSOP which is referenced or is interconnected with other SSOPs. Cite the other SSOP, attach a copy, or develop a flow diagram to show the interactions of SSOPs (see Figure 3.1 for example);

c. Checklists.
- Many activities use checklists to ensure that steps are followed in order and documents completed actions;
- Any checklists should be referenced in the appropriate step;
- Include on the checklist or in the step how the checklist should be completed;
- Specify where blank and completed copies of the checklists should be located.
- A checklist is not an SSOP, but a part of one.

Figure 3.1 Flow of SSOPs. SSOP 1 leads to SSOPs 2 and 3, SSOP 2 leads to both SSOPs 4 and 5, and SSOP 3 leads only to SSOP 6.

3.2.6 Reference Section

Include information on any additional documents or procedures that relate and or could be helpful for this SSOP. The reference material provided in this section should not be used doing a real hazardous situation, but used for training or reviewing in preparation of an event.

4. BASIC SSOP TEMPLATE AND EXAMPLE

(See section 3.2 General SSOP Format Guide for additional guidance)
(Based on an example provided by Abdul Majid)

1. Header

SSOP TCF-001 (High Wind Warning) 30 March 2015

2. Emblem and Organization

National Meteorological and Hydrological Service of Rainland

3. SOP for coastal flooding due to heavy rains caused by the tropical cyclone (Title)

4. SSOP Number: TCF-001

5. Prepared By: Flood Team (Abdul Majid, Leader; with Olavo Rasquinho; Jinping Liu; Denise Lau and Lisa Kou)

6. Approved By: _____SIGNATURE_____ Date: _____
James Weyman

7. Implementation Date: _____

8. Distribution List: See Attachment 1

9. Partner Agencies:
Rainland Disaster Management Office
Daily News of Thunder
Rainland National Tsunami Warning Center

10. Acknowledgements:
Thank you to the Flood Team, under the direction of Abdul Majid, for their hard work in developing this SSOP, the coordination and collaboration of the partner organizations, and to the NMHS Rainland Administration Section for formatting and publishing this document.

11. Revision History

Number	Prepared by	Approved By	Implementation Date
____	_____	_____	_____
____	_____	_____	_____

Table of Contents

1. Background

A general description of the hazard, impacts, areas most affected, time of year the hazard occurs, how often has the hazard occurred in the past, and other related information can be included to explain the importance of the hazard and why the SSOP needs to be done correctly.

2. Purpose

The SOP has been written to provide a generalized example of a flood SOP for tropical countries which experience tropical cyclones and associated heavy rain. It is also meant to provide an example of synergy in SSOP development.

3. Scope

This SSOP addresses the tasks related to the issuance of a flood alert, the coordination required, and monitoring of the situation.

4. Applicability

This SOP applies to those countries which are subject to tropical cyclones which produce heavy rain and floods along the coastal belt.

5. Task

The DFF must continually monitor a tropical cyclone's strength and movement through coordination with the DMF. Based upon the expected rainfall and storm surge, the DFF must run the flood models, coordinate with the NMHS Director or Deputy Director and DMO, and issue alerts, watches, and warning for different water levels as needed.

6. Summary

Floods associated with a tropical cyclone occurrence can be devastating to many people who live and/or work along the rivers. Thus they need accurate and timely flood information to take actions to save lives or protect their property.

7. Definitions, Flood Levels Color Coding, and Acronyms

Danger Level:

Danger level is the level at which the river is bankfull (the level that is as high as the river can be without flooding).

Low Flood:

Flood level is between the danger level and 50 centimeters above the danger level.

Medium Level Flood:

Flood levels ranging between the upper limit of the low flood and 50 centimeters above this limit (total of 100 centimeters above danger level).

High Flood:

Flood levels ranging between the upper limit of medium flood and 50 centimeters above this limit (total of 150 centimeters above the danger level).

Very High Flood:

Flood levels above the upper limit of the high flood.

Flood Levels Color Coding:

Flood level:	Color Code
Low Flood:	Blue
Medium Flood:	Yellow
High Flood:	Indigo
Very High Flood:	Red

Flood Products Issued:

Alert:	Flood conditions expected within 36 hours
Watch:	Flood Conditions expected within 24 hours
Warning:	Flood Conditions expected within 12 hours

Acronyms:

AOI:	Area of interest
DFF:	Duty Flood Forecaster
DMF:	Duty Meteorological Forecaster
DMO:	Disaster Management Office
TC:	Tropical Cyclone

8. Cautions

River flooding in a coastal area during a tropical cyclone event is caused by two factors. One is heavy rain falling in the river basin and flowing into the river. The second is associated with storm surge. A strong storm surge can push water up a river raising the river height and also block the water trying to drain out of the river. So each of these must be considered.

9. Procedures

Example:

In accordance with SOPs TC-001, TC-002, and TC-003, the DMF will use all available meteorological means/technologies to track an approaching TC; notify the NMHS Director and Deputy Director when the TC is forecasted to be in the AOI within 3 days; coordinate with DMO; issuance and disseminate the appropriate TC alert, watch, or warning (SSOP DIS-001); and notify the DFF providing the location, intensity, and future movement of the TC.

a. Based upon the forecast of the tropical cyclone track, the amount of rain, and the height of the storm surge, and the current river flow information, the DFF will run the flood models (see attached checklist) to estimate the possibility to flood, height of expected flood, and the time the flood is expected to occur.

b. When alert conditions are met (flooding expected within 36 hours), in coordination with the Director or Deputy Director, issue the flood alert, the expected time of occurrence, and the forecasted highest flood level expected with associated color scale.

c. Disseminate the flood alert to all concerned in accordance with flood dissemination SSOP DIS-001.

d. When disseminating an alert, watch, or warning, ensure the media has received it and set up methods for providing updated information to the media.

e. DFF will coordinate with DMF to continuously monitor the movement and intensity of the TC, expected rainfall, expected storm surge, and timing. When significantly changes occur or are forecasted, DFF will run the flood models (see attached worksheet) with the updated information to determine whether to upgrade, down grade, or keep current status of the product type and expected levels of flooding.

f. The DFF will also continue to coordinate with the DMO throughout the event to keep them aware of the situation and what is expected.

g. If watch conditions (flooding expected in 24 hours) are met, and in coordination with the Director or Deputy Director, issue the flood watch and expected levels and associated color codes, and then dissemination according to SSOP DIS-001.

h. Once the watch is issued, the DFF will collect the river flow, rainfall data, and storm surge expected from all of the available rain gages and river stations and run the flood forecast models (see checklist) every 6 hours to update the forecasted level and timing for the rivers. Based upon these data, evaluate upgrading, down grading, or continuing the watch and updating the expected levels and the associated color codes.

i. If flooding warning conditions (flood expected in 12 hours) are met and in consultations with: authorities for the river reaches; Director or Deputy Director; and DMO, issue the warning, the expected time and forecasted level with associated color coded information.

j. Disseminate warning in accordance with SOP DIS-001.

k. In a warning situation, continuously monitor the situation and run the flood forecast models every 3 hours with updated rain, river data, and storm surge values and evaluate whether to up/down grade or continue warning and flood levels.

l. When flooding has ended or is no longer expected, in coordination with the Director or Deputy Director and DMO, issue an advisory terminating the flood warnings.

m. Collect all relative information regarding the flood event and save for post-event analysis to evaluate for performance and any improvement areas.

References:

SSOP DIS-001	Synergized Dissemination Procedures
SOP TC-001	Detection of a Tropical Cyclone
SOP TC-002	Tropical Cyclone Enters AOI
SSOP TC-003	Coordination with Partner Agencies

5. SSOP CHECKLIST

Checklist for Effective SSOPs for EWS

SSOP Development

- ☐ Are new SSOPs written when new equipment or processes create new work situations?
- ☐ Are such factors as the age, education, knowledge, skills, experience and training of the person(s), and the "social culture" or work history within which the individuals work considered in the SSOPs?
- ☐ Did the development process consider how people learn and accomplish tasks (visual, hearing, physical limitations, memory problems, language proficiency)?
- ☐ Were new SSOPs reviewed and tested before implementation?
- ☐ Were appropriate different styles of SSOPs (simple step, hierarchical step, linear graphic flow chart, annotated pictures, and/or branching flowchart) used?
- ☐ Were appropriate QC procedures and QC material prepared to successfully demonstrate performance of the method?

SSOP Content and Use

- ☐ Are SSOPs in compliance with agency and government regulations?
- ☐ Are safety, health and environment concerns incorporated into the traditional how-to-operate or how-to-do steps?
- ☐ Are there SSOPs for different levels of activities?
- ☐ Are SSOPs that involve a long list of steps broken into separate logical sections of about 10 steps per section?
- ☐ Are SSOPs written in short and imperative sentences (usually begin with an action verb in the form of a command); are not too wordy or vague (vagueness often increases the likelihood of errors or inconsistency); and use acronyms and abbreviations sparingly?
- ☐ Are SSOPs clear and brief and emphasize critical steps and warns about safety issues?
- ☐ Are all personnel knowledgeable on SSOPs for their area of work?
- ☐ Do the SSOPs include in advance things to know about upcoming steps that require caution, precision, timing, assistance, and personal protective equipment?
- ☐ Does each SSOP have:
  - A title that clearly identifies the activity or procedure and uses descriptive action words?
  - An SSOP identification number, date of issue and/or revision, the name of the applicable agency, division, and/or bureau to which the SSOP applies?
  - Name of Organization or project for which the SSOP was prepared?
  - Names of people who prepared the SSOP?
  - Signatures and dates of the individuals who approved the SSOP?
  - Implementation Date?
  - Acknowledgements?
  - Revision history log?
- ☐ Is the SSOP Table of Contents a quick reference guide?
- ☐ Is the Purpose, Scope and Applicability identified?
- ☐ Is an overall task described which includes the number of people required for the task, their skill levels, the equipment and supplies required, any personal protective or safety equipment required, and a description of how the finished product or result should look?

- Are there:
  - A summary of method?
  - A summary of the procedure?
  - Acronyms, abbreviations and specialized terms defined?
  - Health and Safety Warnings included?
  - Cautions listed for possible equipment damage, possible invalidation of results, etc. in beginning and at critical steps in the procedure?
  - Interferences listed which may interfere with the final results?
  - Personnel qualifications, if applicable, (the minimal experience that the SSOP follower should have to complete the task satisfactorily and citing any applicable requirements, like certification or training) provided?
  - A list Equipment and Supplies included?

- For the Procedures:
  - Are all pertinent steps identified in sufficient detail?
  - Is the specific order, timing sequence and times allowed, and materials needed to accomplish the procedure and how they are to be used if appropriate included?
  - Is active voice and present verb tense used?
  - Is the "you" avoided?
  - If another SSOP is referenced, is it identified and where it can be found?
  - Are terms and concepts defined when needed?
  - Are health and safety warnings placed prominently in the SSOP?
  - Are procedures with more than 10 steps broken into logical sub-tasks?
  - Are checklists used? Are they appropriately referenced and/or attached?

- Are QC activities designed to allow self-verification of the quality and consistency of the work?

- Are documents or procedures that interface with the SSOP fully referenced (including version), such as related SSOPs and published literature or methods manuals?

SSOP Documentation

- Is a historical record kept of all SSOPs when modifications are made to that process and when an SSOP must be revised?

- Are computer accessible files and at least one notebook as backup of all approved SSOPs available?

SSOP Monitoring, Review and Training

- Are employees trained on new SSOPs?

- Are SSOPs used to facilitate training in procedures, for both new personnel, those that need re-training (i.e., after extended absence from a position), or for cross training through step-by-step instructions to ensure that nothing is missed?

- Is an annual evaluation and review system established to be certain that over time all the steps of SSOP are still correct and appropriate for the production system?

- Do workers routinely evaluate existing SSOPs, work practice guidelines, and other documents for possible revisions to SSOPs?

- Are procedures in place to ensure that SSOPs are followed consistently over time?

- Are references to performing SSOP tasks included in conducting performance evaluations?

- Are SSOPs used to regularly evaluate work activity and possible improvements?

6. REFERENCE TO OTHER SSOP EXAMPLES

Other excellent SSOP examples are found in the appendixes to the SSOPs Manual. These include Appendix IV Example 1, a working draft “SOP Philippines Tropical Cyclone Early Warning System;” Appendix IV Example 2, Central Pacific Hurricane Center SOP, “Actions to be Taken Before the Start of Hurricane Season;” Appendix IV Example #3 – Aviation Support (From Bangladesh) and Appendix IV Example #4 - Joint SSOP Indian National Centre for Ocean Information Service and Indian Meteorological Division/RSMC.

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