



PROCEDIMIENTO OPERATIVO INTEGRAL

**PARA LOS DECISORES SOBRE LA ORGANIZACIÓN
Y EL FUNCIONAMIENTO DEL SISTEMA DE ALERTA TEMPRANA
ANTE LA AMENAZA O LA AFECTACIÓN DE EVENTOS
HIDROMETEOROLÓGICOS EXTREMOS**

COMPREHESIVE OPERATIONAL PROCEDURE FOR DECISION MAKERS ABOUT THE ORGANIZATION AND THE OPERATION OF THE EARLY WARNING SYSTEM BEFORE THE THREAT OR THE EFFECTS OF EXTREME HYDROMETEOROLOGICAL EVENTS

National General Staff of Civil Defense
Institute of Meteorology
National Institute of Hydraulic Resources
JANUARY 2017

GENERAL COORDINATION:

National General Staff of Civil Defense

UNDP COORDINATING TEAM:

Eng. Liliana Pino Carballido
Arch. Rosendo Mesías González
B. Elvilayne Vidal Medina
B. Dayana Kindelán Peñalver

EDITION:

LILIAN SABINA ROQUE

EDITION DESIGN:

GEORDANYS GONZÁLEZ O'CONNOR

ISBN 978-959-224-396-5

© National General Staff of Civil Defense, 2017

© About this edition: Casa Editorial Verde Olivo, 2017

Reproduction without consent of the National General Staff of Civil Defense is prohibited.

The points of view expressed in this publication do not necessarily reflect the views of the European Union, the United Nations or the United Nations Development Programme (UNDP).

Acronyms and abbreviations

AATCT*: Early Warning Notice of Tropical Cyclone

AECT*: Tropical Cyclone Special Notice

AMA*: Environment Agency

CDM*: Municipal Defense Council

CDP*: Provincial Defense Council

RRMC: Risk Reduction Management Center

CMP*: Provincial Meteorological Center

CNP*: Forecast National Center

TC: Tropical Cyclone

CD: Civil Defense

DPP*: Provincial Forecast Groups / Departments

EMNDC*: National Civil Defense Staff

INRH*: National Institute of Hydraulic Resources

INSMET*: Institute of Meteorology

OPM: Operational Procedures Manual

WMO: World Meteorological Organization

EWP: Early Warning Point

PD*: Management Position

HVR: Hazard, Vulnerability and Risk

EWS: Early Warning System

TS: Tropical Storm

VHF: Very High Frequency

(*) Refers to Spanish acronyms

Introduction

The Cuban Early Warning System (EWS) for hydro-meteorological events has been the fundamental support for the effective protection of people before the impact of this type of events, whose severity has been increasing in recent years by the increasingly marked influence of climate change. Its improvement has been developing from the analysis of the experiences accumulated during the response to these phenomena throughout the years. In our country, the EWS is composed of four basic elements, if any of them fails, timely and effective protection cannot be guaranteed. They are:

1. Surveillance and forecast
2. Risk assessment and decision making
3. Dissemination of public messages
4. Timely protection measures.

The EWS is formed and organized in normal situations and guarantees the first stage in the response to any event. Learning from the confrontation with more than 25 tropical cyclones (of them 19 hurricanes, 9 of which, great intensity ones), floods and other extreme phenomena in the last 20 years, and the lessons learned after the passage of Hurricane Sandy in 2012, revitalized the Early warning system of our country for extreme hydro-meteorological events, with the aim of guaranteeing timely decision making in the protection of people, goods and economy resources, a more rational use of our resources, as well as making it more cohesive and efficient in order to face current challenges.

This document establishes the procedures for organization and performance of the basic elements of the EWS to face extreme hydro-meteorological events in the territories, as part of the continuous improvement of our Civil Defense System, with the accompaniment of the United Nations Development Programme (UNDP).

In the development of this procedure the project developed to revitalize the hydro-meteorological EWS of the eastern part of the country has played a decisive role, which was improved and published within the framework of the project "Strengthening the Hydro-meteorological Early Warning System to protect the population and economic resources in areas vulnerable to flooding in the provinces of Villa Clara and Sancti Spiritus "(FORSAT); both with the support of the Disaster Preparedness ECHO Programme (DIPECHO). Due to its successful results, this system was selected by the World Meteorological Organization (WMO) as one of the best practices on this subject in the world.

Monitoring and forecast

During the proximity of an extreme hydro-meteorological event

Institute of Meteorology

Facing the proximity of an extreme hydro-meteorological event, and according to the guidelines of the Operational Procedures Manual (MPO) for hazardous weather phenomena of the National Forecast Center (CNP) in the Institute of Meteorology (INSMET), this institute must follow the following instructions:

- When there is the possibility of direct or indirect damage to Cuba, within a period of no less than 72 hours, the CNP prepares a Tropical Cyclone Early Warning Notice (AATCT) which should express the following parameters: position of the center; direction of movement and translation speed; speed, distribution and if possible the extension of the winds with hurricane strength and tropical storm; development possibilities; possible impact and estimated time to affect the national territory.

- When a tropical cyclone is expected to affect Cuba directly, from 66 to 48 hours, INSMET issues the Special Notice of Tropical Cyclone (AECT), which will include, in addition to what was stated above, an assessment of its possible intensification and direct affectation. If the TC is expected to affect Cuba as a hurricane, the first AECT will be issued 66 hours before the impact to Cuba is expected and the next one 48 hours before this forecast occurs.
- 48 hours before the impact of the rains, for rainy events that may affect the areas of national interest basins, data will be provided on the persistence of the event and the distribution of rainfall, taking into account the birth of rivers and estimated intensities.
- In terms less than 48 hours before the impact of the event or when the meteorological event is expected to affect Cuba as tropical storm (ST), the CNP prepares meteorological information including: data on the characteristics of the event, the forecast of its future trajectory, organization in the case of tropical cyclones, possible entry point of the center of the hurricane to the national territory; estimate of the range of winds with hurricane strength and tropical storm; data about estimated maximum height for storm surge and wave tides; general assessment of the coastal segments with greatest flooding danger; distribution, persistence and intensity of rainfall accompanying the event and an assessment on the most probable places to be impacted by the rains associated to the event, and additionally by the sea and the winds in the case of hurricanes.

In the case of depressions, tropical storms and rainy events not associated with tropical cyclones, data on distribution, persistence and intensity of rainfall are provided for the threatened areas of the country. This information is sent to the EMNDC, the INRH, the HVR Group of the AMA and to the territories, through the Provincial Forecast Departments (DPP) of the Provincial Meteorological Centers (CMP), who, based on the data received, prepare a proper meteorological information to the territory with more precise evaluations of the event impact, including:

- Persistence of the event in the territory, and a more specific distribution of rainfall in important areas of the province and the ranges of intensities expected.
- Height of storm surge and wave. The greater danger zones are highlighted, linking them to the coastal flood hazard map of the HVR study in the province and according to the expected category of the hurricane. An assessment is included on the possible retention of water evacuation in river mouths.
- Precision of the winds range with hurricane strength and tropical storm, and reference is made to the maximum expected speeds according to the hazard information of the HVR study.
- Affectations produced by similar events in the past.

This information is addressed to the head of the Civil Defense, the first secretary of the PCC in the territory, the Provincial Defense Council (when activated), the Provincial Delegation of Hydraulic Resources and the RRMCC, where the HVR Group is located.

National Institute of Hydraulic Resources (INRH) and provincial delegations

Specialists from the National Institute of Hydraulic Resources, based on the meteorological information on rains, the hydrological and hydraulic situation of the threatened territories and the behavior of rainfall in the previous days, model the most likely scenarios of possible floods. This information is sent to the EMNDC, the INSMET CNP, the AMA HVR Group and the PDs of the INRH delegations. The content of the information to be sent by the INRH flood service is:

- Expected runoff volumes in the flooding areas and in the elevations and watersheds identified in HVR studies. The levels that could reach the main rivers and areas of interest.
- The levels that could reach the waters in the dams and other hydraulic works.
- The maximum permissible volume to be kept in the reservoirs without affecting the stability of the hydraulic construction. The impact on reservoirs that are in hydrological prevention.

- The status of mini-hydroelectric plants and aqueducts linked to works that may have problems during the impact of the event and the measures to be executed.
- The possible waves of active flooding in case of dam's damage.

The Provincial Delegation of Hydraulic Resources uses as initial information the meteorological assessment by the CMP, the hydrological and hydraulic situation of the territory, as well as the floods susceptibility map of the HVR study in the province. With this data, they model every six hours the impact of the floods that the rains could produce, including the possibility of landslides in high risk areas, the overflow of rivers and micro-dams; reporting the same content expressed in the point above to the CDP, the CMP and the RRMC; as well as conciliating the results with the INRH.

DURING THE IMPACT

During the impact of the event the information focuses on the rains forecast, the persistence of the winds in the case of hurricanes and the possible affectation of the surge.

a) National level

- The INSMET CNP issues the meteorological information after the incidence of the event; this is basically related to the weather forecast affectation to the national territory, the possible trajectory and its organization. The information also includes the prediction about the persistence, intensity and distribution of the rains, as well as the impact of the sea and the scope and strength of the winds. The recipients of this information are expressed in the section of the Institute of Meteorology of the previous chapter, which now reduces its term to three hours.
- The National Hydrological Service, based on meteorological information on rainfall, real-time measurements of the rainfall, the hydrological and hydraulic situation and the danger maps that correspond to the rainy event, model the impact of floods on the affected zone more accurately. The recipients of this information are expressed in the section of the Institute of Meteorology of the previous chapter, which now reduces its term to three hours.

b) Provincial level

- The forecast group of the CMP based on the same sources and data keeps the meteorological information, with greater emphasis on the rains.
- The Provincial Delegation of Hydraulic Resources on the basis of the meteorological information, the hydrological and hydraulic situation created by the rains, the calculation of runoff and the hazard map of floods from the HVR study corresponding to the coming event, models the most probable scenarios according to the behavior of rainfall. From this, it informs and proposes:
 - The dammed levels and volumes, the discharges that may occur and the operations to be carried out in the reservoirs in order to guarantee its stability and to store as much water as possible, taking into account the forecasts of levels and the recommendations of the engineering subgroup.
 - The forecast of flow rates and the delay times for different hydrological closures.
 - The maximum permissible volume to be stored in the reservoirs without affecting the stability of the construction.
 - The measures to be taken downstream the water curtain of the dam (engineering measures and / or protection of personnel, population and goods) depending on the constructive conditions, the weather forecast and rain analysis.
 - The measures to be adopted in the aqueducts linked to the works which may present problems due to the impact of the event.
- This information is also sent to the authorities of the threatened municipalities, where the president of the CDM is advised by the specialists of the CD HVR Group, the subgroup of water and the RRMC. They adapt the impact of the event to the characteristics of the territory, up to

the Popular Council level, according to the HVR study, the information transmitted by the Early Warning Points (those that are integrated into the Special Daily Rain Network) and the experiences of the effects caused by similar previous phenomena.

- The HVR Group is currently working with the risk information corresponding to the category of the event being faced, according to the reports of rainfall measurements. To calculate the impact of the sea and the winds, work is done with the risks maps corresponding to the estimated category with which the extreme hydro-meteorological event must affect the territory.
- The heads of groups and subgroups will inform the state of compliance with the measures of protection for this moment in the CDP and CDM.
- At the same time, public hydro-meteorological information is prepared for the mass media at all levels, which is transmitted in the media by each specialist.

c) Municipal level

- It evaluates the hydrological and hydraulic situation created by the rains and points out the most likely flood scenarios (for rivers and micro-dams overflow downstream spillways, in low and difficult drainage areas, in flood plains of rivers not regulated by reservoirs) and the possibilities of sliding in areas of high danger. The specific information by the Early Warning Points (EWP) will be taken into account.
- It points out the measures to be adopted related to protection of the population and resources (works) of the economy, prioritizing those that may present problems due to the impact of the event or those with physical vulnerability (structural, non-structural and functional).

d) Popular Council level

- Points out the measures necessary to continue in execution to carry out the people and resources' protection that are still at risk, or to mitigate the effects caused by other probable scenarios of floods (by overflows of rivers and micro-dams downstream of the spillways, low and difficult drainage areas, flood plains of rivers not regulated by reservoirs), by the possibilities of landslides in areas of high danger, by the probable affectations in the safe water supply service, by the amount of population and sectors of production and services that can be affected.
- Evaluates the measures to be proposed or adopted in the aqueducts that guarantee water supply and availability as well as coverage of chemical products for its treatment. The estimated time of recovery from damage is also evaluated.

At the municipal level and in the Defense Zones, when the systems supply, reservoirs, micro-dams or rivers are outside the territorial limits of the Defense Zone, it should be considered to establish cooperation with neighbors in the exchange of information and coordinated protection means execution.

II. Risk assessment and decision making

The Defense Councils adopt timely, well-founded, effective (even in situations that may have never been faced) decisions and avoid unexpected or improvised measures. They must take into account the following elements:

a) Risk assessment

To support decision making, risk assessment is carried out by the following actors in the territory: the head of the Civil defense body or Civil Defense Group, together with the RRMC and the representatives of the CMP, of the Provincial Delegation of Hydraulic Resources and the HVR Group. To do this, several scenarios are analyzed in different schedules (mainly every six hours), calculating the time in which the rains and winds of tropical storm or of

hurricane begin to impact the territory, as well as the extension of the affectation or impact radius (see Annex 1).

Before the impact, the prepared risk map is taken and the scenarios are compared to the hydro-meteorological assessment and the results of the HVR study, pointing out:

- The experiences of the affectations caused by similar events.
- The level of people exposure.
- Other possible areas of affectation outside the radius of impact previewed, due to the present vulnerabilities and the vital systems located in these.
- The state of risk perception of the population located in the possible areas of affectation.
- The status of compliance with the measures directed by the Civil Defense towards the evacuation centers, food preparation or other facilities located in possible areas of affectation used for protecting the population. Which of them should be protected and which should be activated to supply those places.
- The number of homes that can be affected by the destructive factors of the event.
- The animals that must be protected.
- Crop areas that may be affected.
- The tendency of the sanitary hygienic situation in the territory.

Considering all of the above, the territorial actors determine and propose to CDP and CDM:

- The amount of population and the priority for protection, at times, based on the calculation made and considering the technical condition of the houses or other vulnerabilities.
- Those facilities which depend on the vitality of the territory or others located in the possible areas of affectation to which special attention must be paid for the protection of economic resources.
- The resources that may be affected at times as of calculation made.
- The places where the cleaning and sanitizing actions must be increased before the impact of the event.
- The number of unhealthy neighborhoods, shanty-towns, buildings in bad technical condition that may be affected.
- Facilities that require special attention in the protection of the economic resources.

Directors and delegates or heads of groups and subgroups of the CDP and of the CDM inform the president of the Defense Council of the order and priorities to protect people and economic resources, the state of the assurances for this and the time for its execution, as well as with whom they should strengthen cooperation (see Annex 2: Information to be provided by territorial actors to the head of Civil Defense or President of the Defense Council).

b) Decision making

Upon receiving the risk assessment, the Head of Civil Defense, the first secretary of the PCC in the territory and the president of the CDP (when activated), have the main elements for decision making, in which they must pay special attention to:

- The order of protection for people and economic resources, with the corresponding assurances, according to the level of risk they are exposed to and the characteristics of the event.
- The order for animal protection and the level of security by providing them water and food.
- Sanitary hygienic measures to be carried out immediately.
- The rational use of resources available for the response, in correspondence with the magnitude of the impact.
- The main cooperation measures, especially those involving the Revolutionary Armed Forces, the Ministry of the Interior and neighboring territories.
- The organization of the information system, including data broadcasted by the automatic stations and the EWP.
- The time available for reporting the groups and subgroups.

- Provide information to the CDM about the possible effects that can occur in the territory, warning about those that can occur in a municipality, after the impact of the event, and the probable affectations in neighboring municipalities. Also the cooperation and the exchange of information in a permanent way should be highlighted.

At the municipal level, the above mentioned procedures are carried out scaling up to Popular Council level.

The CDP and the CDM legally record the decisions made, sending them to the lower level management bodies and to others in charge of its execution. These data are included in the information notes to give accurate information about the areas of bigger risk, as well as the indications for the protection of people and the economy goods, taking into account the characteristics of the threatening event.

In addition, the beginning of the priority public messages that must be disseminated by the media is established.

III. Public messages dissemination

In the national and provincial television channels, hydro-meteorological information is disseminated, as well as information notes from competent authorities, based on the use of the application developed by specialists from the CMP of Cienfuegos that allows to illustrate the possible destructive effects of the event that is monitored by means of maps and schemes in third dimension.

The specialists of the national, provincial and municipal radio stations adapt the information broadcasted by the TV and the municipal RRMC and adapt it for transmission through VHF radio equipment for mountain communities or other difficult access places, even, for its dissemination by loudspeakers and other alternative means.

The dissemination of public messages will be made according to the specifications stated in Annex 3.

IV. Timely protection measures

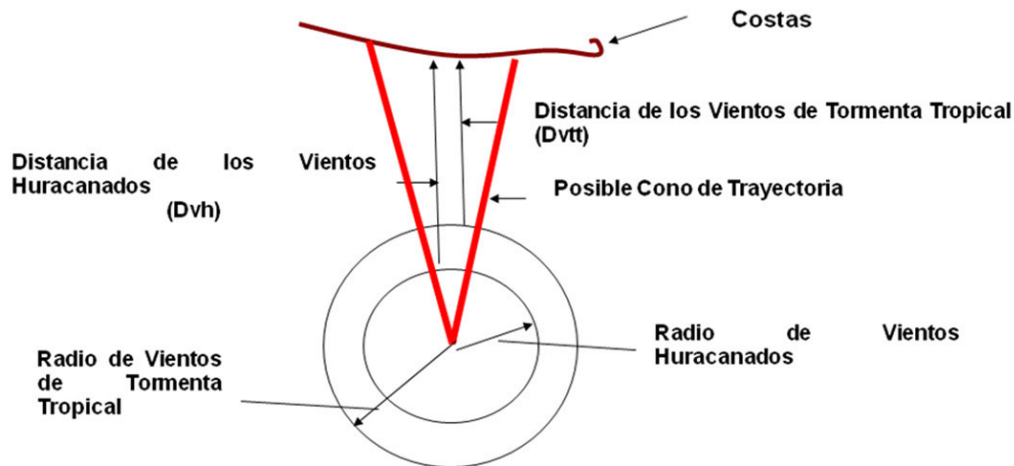
To guarantee that the effectiveness of the hydro-meteorological monitoring is transformed into timely protection measures for people and economy goods, the response actions of the municipal Disaster Risk Plans (DRP) and of the Defense Zones must correspond to:

- The updating of the risk level (qualitative and quantitative) associated to the impact of rains, winds and the sea, by means of a balance of the actions carried out to reduce the main risks down to the Popular Council level.
- The characteristics of the likely events to face, differentiating the confrontation measures to extreme events and those with less severe impacts.
- The real danger and risk perception of the population according to exposition level (population preparation).

The general protection measures that must be executed in the face of these events can be found in the Methodological Guide for Disasters Reduction established by the National General Staff of Civil Defense, which must be adapted and / or expanded, according to the characteristics of the territory.

Annexes

ANNEX 1



Scheme and formulas for calculating the impact of an event

Data example for calculation:

1. Event translation speed (V): 7 kilometers per hour
2. Radius of the tropical storm winds: 70 from the center
3. Wind radius with hurricane strength: 45 kilometers from the center
4. Distance of the tropical storm winds from the coast (Dvtt): 145 kilometers
5. Distance of the hurricane winds from the coast (Dvh): 211 kilometers

Tropical Storm Winds Impact Time

$$(Ttt) = Dvtt / V = 145/7 = 21 \text{ hrs}$$

Hurricane strength winds impact time

$$(Th) = Dvh / V = 211/7 = 30 \text{ hrs}$$

ANNEX 2

Content of the information to be submitted to the Civil Defense head or president of the Defense Council by the directors and delegates in the territory or by heads of groups and subgroups of CDP and CDM before the impact of a hydro-meteorological event or during heavy rains.

Transportation

- Possible impact to infrastructure due to wind and floods. Material losses that may occur.
- Number of population to be transferred and calculation of motor resources. Priorities
- Amount of economic resources to be protected and availability according to capacity (m³) and weight (t). Priorities
- Availability, quantity and use of transport used to compliance with protection measures for the population and their goods (state transport and non-state forms of service provision, areas of responsibility).
- Availability, quantity and use of transport used for the protection of economic resources (includes the protection of animals, if considered). Priorities and staging.
- Availability and quantity of means to be used as sanitary transportation.

- Itineraries to be used considering the state of the road infrastructure and the possible flooded zones.
- Transportation assigned to other agencies.
- Calculation of fuel and lubricant consumption. Coverage.
- Technical assurance with mobile and stationary workshops to be used.
- Reserve of resources for recovery. Use proposal
- Cooperation.

Communications

- Possible impact of the winds on the infrastructure, effects on the flooding areas and material losses that can occur.
- Quantity, availability and use of resources to guarantee the direction of response actions (phased), as well as the recovery, reception and broadcasting of information.
- Quantity, availability and use of resources to guarantee information to the population. Use of radio and television broadcasters.
- Reliability in the use of resources and means of communication. Redundancy.
- Availability of emergency generators and fuel coverage.
- Use of mobile communication media.
- Availability and use of radio amateurs' emergency network.
- Cooperation with other territories or sectors in the use of communication resources.
- Distribution of the telephone directory in the management positions.
- Reserve radio-communication systems.
- Reserve of resources for recovery. Use proposal

Construction

- Material losses that may occur.
- Quantity, availability and use of forces and means to guarantee the distribution of supplies or resources through the restoration of roads and bridges, and the pruning and cutting of fallen trees.
- Quantity, availability and use of forces and means to guarantee the collection of solid waste (mainly in the evacuation centers, food processing and urban areas). Priority and staging.
- Quantity, availability (water, transportation and food) and use of the means and resources to form engineering brigades for classification of collapsed structures.
- Guarantee of sanitary and protective hygienic measures in cemeteries and micro-dumping areas.
- Securing and completing protection means for the personal.
- Drainage situation and proposal of measures to be executed in the liquid waste evacuation facilities.
- Calculation of fuel and lubricant consumption. Coverage.
- Itineraries to be used considering the state of the infrastructure road (bridges, roads, sewage, factory works).
- Guaranteeing, quantity, availability and possibility of forces and means for the execution of recognition, exploration, cleaning, collection of debris and pruning actions.
- Use of other engineering machines through cooperation. Quantity, availability, possibility and terms for starting the works.
- Guaranteeing, quantity, availability and possibility of forces and means for building shoring up and / or demolition. Staging of employment by zones.
- Availability and coverage for use of local construction materials.
- Estimated assessment of the repair needs for roofs kits, roof sheets, temporary shelters, tarps (tents) and others.
- Resources reserve for recovery. Use proposal

Health

- Material losses that may occur. Facilities that can have effects on their services based on functional vulnerabilities.
 - Quantity, availability (water, transport, food) and use of the forces and means that make up the surgical ambulatory, toxicological, epidemiological brigades, complex and easy rescue teams, among others.
 - Availability and coverage of medical attention, specialized medical and laboratory services.
 - Availability (in personnel, equipment and resources) and coverage of the medical consultations or medical posts that guarantee the response and recovery.
 - Availability of the collection points for the injured people.
 - Logistic assurance in the continuity of medical care, specialized medical, laboratories. Needs
 - Conditions of emergency generators. Availability and coverage.
 - Area to which more psychological support attention should be given.
 - Protection measures taken in the care of disabled people, the elderly, pregnant women, hemodialysis patients and others with special attention, staying in homes that may be isolated.
 - Compliance with the deployment of surgical medical brigades to communities (zones) that may be left uncommunicated. Assurances.
 - Availability of sanitary transportation. Distribution, coverage, completion and needs.
- Cooperation with other sectors of the territory.

- The quality of water and food. Prioritize evacuation and food preparation centers, including those belonging to non-state forms of service provision, where a complex hygienic-sanitary situation could be created.
 - Level of chlorine tablets coverage, diagnostic means, patterns, disinfectants, formaldehyde.
- Needs

- Status of certification and availability of shelter areas or temporary facilities.
- Estimated evaluation of hygiene kits needs, water deposits, tarps and others.
- Measures to raise health risk perception in the population.
- Reserve of resources for recovery. Use proposal
- Red Cross:
 - Evaluation of critical areas located in the flood areas based on the results of the Vulnerability and Capacities Analysis (VCA) performed. Proposal of protection measures for the population.
 - Availability of rustic means for the completion of the forces involved in carrying out the actions of light rescue and first aid (pickaxes, shovels, jibs, wheelbarrows, etc.).
 - Availability of the operations and first aid groups. Distribution, employment staggering and assurances.
 - Availability and use of sanitary brigades, together with the grassroots organizations of the Federation of Cuban Women.
 - Real possibilities in the territory to meet the needs of hygiene kits, repair of roofs, roof sheets, water tanks, chlorine tablets, temporary shelters, tarps and others.
 - Reserve of resources for recovery. Use proposal

Water

- Material losses that may occur.
- Technical condition of reservoirs and supply possibilities of those who deliver water to the population. Quality level of Water.
- Availability of water supply.
- Possibility and coverage of chemical products in the water supply facilities. Needs
- Coverage with emergency generators in water supply and purification facilities. Needs
- Measures taken in the water reservoirs and supply wells facing the possibility of contamination.
- Providing means of protection for operators in water purification facilities.
- Expected runoff volumes in flood areas identified in the HVR studies; watersheds, levels

that could reach the main rivers, micro-dams or other areas of interest, flooding possibilities due to overflow. Proposed protective measures to be carried out.

- State of obstruction in channels and rivers. Possibility of flooding due to overflow of the latter and micro-dams.
- Modeling result of the floods, clearly specifying the places of greatest danger.
- Maximum allowable volume to be stored in the reservoirs without affecting the stability of the hydraulic work. Proposal of protection measures for the population living downstream of the reservoirs.
- Probable effects due to landslides in areas of greater danger.
- Reserve of resources for recovery. Use proposal

Food

- Material losses that may occur in this area.
 - Assurance for compliance with the food standard of evacuees (take into account that evacuees between 0-2 years have a different diet). Needs
 - Availability for the preparation of food. Coverage of fuels, water and disinfectants. Needs
 - Availability for the protection of economic resources located in warehouses, store houses and other facilities. Priorities
 - Availability and coverage for the distribution of food and domestic fuel in areas that may be isolated after the impact of the event. Distribution terms.
 - Protection and security measures for the production and conservation of dairy and meat products.
 - Level of completion of antitoxic kits in places that handle hazardous substances.
 - State of protection of irrigation machines, windmills, fishing vessels, harvest farms.
 - State of conditioning (compliance) of the measures for Animal Protection. Security and coverage with water and food.
 - State of conditioning (compliance) of the measures for protection, support for counter-epizootic actions or sanitary recovery of industries and collection centers.
 - Protection, availability and coverage of veterinary diagnostic and plant health laboratories.
 - Availability, quantity and use of non-state forms of services provision for people's food.
- Areas of responsibility.
- Main plantations to which attention should be paid. Realization of crop harvesting and distribution proposal.
 - Level of coverage of diagnostic means, patterns, disinfectants, insecticides, pesticides, herbicides.
 - Estimated assessment of food kits needs, water tanks and others.
 - Proposal of measures to be taken against the possibility of water, grass and animal food contamination. Organization and needs for protection (transport, fuel, lubricants, rest points).
 - Reserve of resources for recovery. Use proposal

Energy

- Material losses that may occur in this area.
- Protection of renewable energy generation resources. Deadlines for its start-up after the impact of the event. Priorities
- Availability, technical status and protection of generators. Coverage with fuels and lubricants.
- Water, transportation, food availability. Completion and use of response and recovery teams (brigades) (electricity, response to accidents with dangerous substances, confrontation with oil spills, etc.). Staging and distribution.
- Availability, completion and use of laboratories.

- State of compliance with protection measures in the fuel handling facilities (racking), salt mines, thermoelectric plants, refineries, gas generation plants and other facilities. Start of technological stop and time for Start-up and availability after the impact of the event.
- Reserve of resources for recovery. Use proposal. Coverage. Needs

Industry

- Material losses that may occur in this area.
- Availability and coverage of raw materials to guarantee the production of priority resources for recovery (tiles, prefabricated elements, bags, deposits and water tanks, means for sanitization, disinfectants, etc.). Needs
- Possibilities of means production to guarantee the completion of the forces involved in the response (complex and light rescue, shoring, for handling corpses, bags, etc.).
- Start of the technological stop and time for start-up and availability after the impact of the event.
- Reserve of resources for recovery. Use proposal Coverages. Needs.
- Availability and coverage of local materials use.

State reserve

- Material losses that may occur.
- Assurance for the compliance of the warehouse protection measures.
- Availability for the protection of economic resources located in warehouses, store-places and other facilities. Priorities
- Availability and coverage for resources distribution.
- Measures to be executed for resources protection that are found in flooding zones or areas that can be isolated after the impact of the event. Execution time.
- Coverage of fuels, lubricants, water and firefighting devices. Needs
- Reserve of resources for recovery. Use proposal.

ANNEX 3

Dissemination of public messages

Weather Information

- General information on the characteristics of the event and its location using geographical references of the national territory so that people understand how far it is from Cuba (province).
- In the case of tropical cyclones, the possible trajectory and organization of the event, the direction and translation speed of the maximum sustained winds are also reported, as well as the provinces that may be affected will be informed. Scope of the winds with hurricane and tropical storm strength and expected maximum gusts, clearly defining the geographical limits of the probable affectation.
- Possible persistence and superficial distribution of rainfall, in understandable words and terms. The intensity of rainfall is only reported in qualitative terms, never with figures.
- In the case of hurricanes, and when there is certainty of the category that will affect the country, the most likely areas of coastal floods are reported and the range of winds with strength of hurricane and tropical storm, specifying geographic names of popular knowledge. In the case of the provinces (municipalities), the height of the waves associated to the storm surge is expressed. When there is certainty about the probable category of hurricane that will affect the country, the scope of the coastal floods is added, according to the danger information of the HVR study of the province. An assessment is included on the possible retention of water evacuation in river mouths.

- This information is prepared by the Insmet CNP and the CMP, and is accompanied by eloquent satellites and radars images, as well as schemes and graphs to facilitate their interpretation. At municipal level photos of previous events occurred that were similar to what is expected to impact are exposed. Show people indiscipline committed and raise awareness about the need to comply with the behavior rules.
- A summary is added to this information on the affectations caused by similar events that have damaged the territory. In the case of the provinces (municipalities), information of events documented in the Risk Reduction Management Centers (RRMC) is disseminated.

Hydrological information

- It exemplifies the results of the hydrological modeling carried out, explaining the different scenarios most likely to flooding in the threatened territories in the next 12 to 24 hours; as well as the significant accumulations of rain, rivers grown, pouring reservoirs and other consequences of rainfall, as landslides.
- It is based on the hazard map of the HVR studies according to the event as such, in a way that can offer enough elements for the population to have a clear idea of the situation that can be created by the rains.
- Probable damages in areas of higher landslides risk.
- Data on the most significant rainfall accumulations, the conditions of the phreatic ground water, basins, reservoirs and other hydraulic constructions such as micro-dams.
- Information about similar previous events.
- The municipal media reproduce the provincial hydro-meteorological information, but the specialists from the HVR and the RRMC can expand the information from the HVR studies.