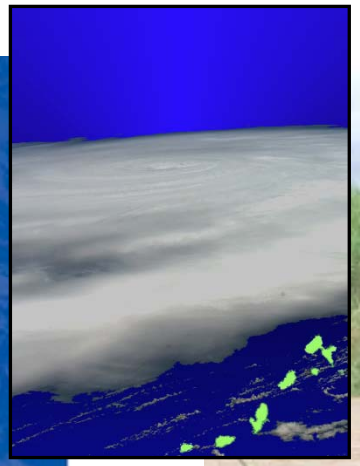
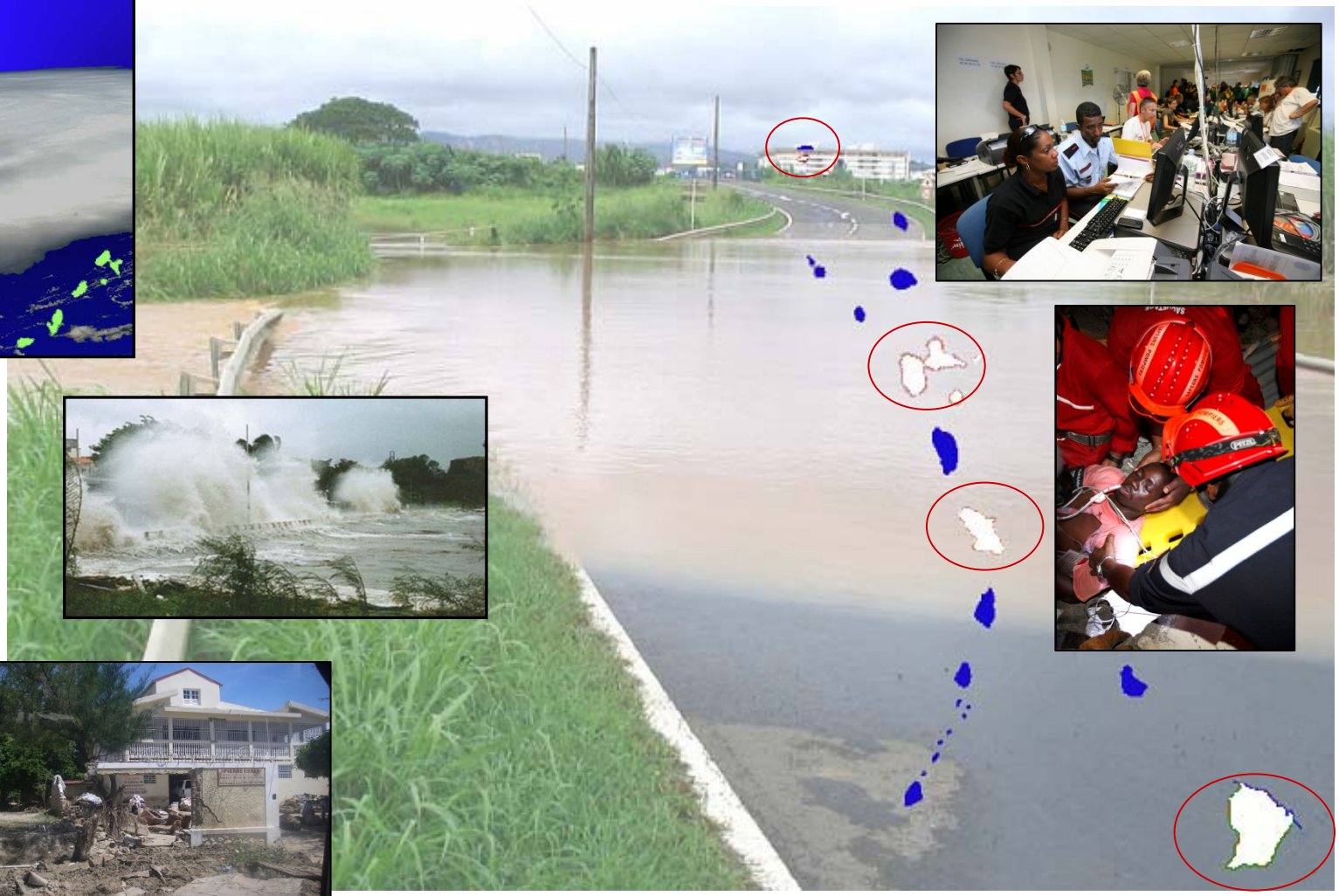
Météo-France contribution to support DRM in the French West Indies





Lieutenant-colonel Philippe COVA
HEADQUARTERS FOR THE CARIBBEAN ZONE

Jean-Noel DEGRACE
METEOFRANCE Antilles-Guyane

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Toujours un temps d'avance

Executive Summary

- French legislation on risk prevention and crisis management
- French Civil Defence Organization
- Support of Météo-France in a global risk management system
- Multi-Hazard Approach applied within the Vigilance concept

French legislation
on risk prevention and crisis management

The law for natural and technological risks – 2003 July 30th

- imposes to assess and reduce the risk before a crisis,
- is administrated by the Ministry of Sustainable Development
- restricts urban planning to accomodate living conditions with nature-induced constraints
- encourages protection measures (water basin retention, territory management,…)
- promotes wide and detailed information of the citizens about risks

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French legislation
on risk prevention and crisis management

The law for civil protection crisis management – 2004 August 13th

- defines administrative and operational ruling on crisis management,
- recalls that the citizen has a basic responsability regarding his/her own security,
- asserts that any operational response requires continuous watch on several risks.

The Orientation Council for Major Natural Hazard Management is now the national platform within ISDR scheme

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Legal Framework for Civil Defence response

ORSEC 04' : Organization of Civil Defence response

1 - Establishment of a Civil Defence network

2 - Identification and prior assessment of risks

3 - A general organizational structure for managing all types of events (*including specific arrangements for unusual events*)

4 - Preparedness, exercise and training phases

5 - Continuous improvement (*feedback and lessons learnt*)

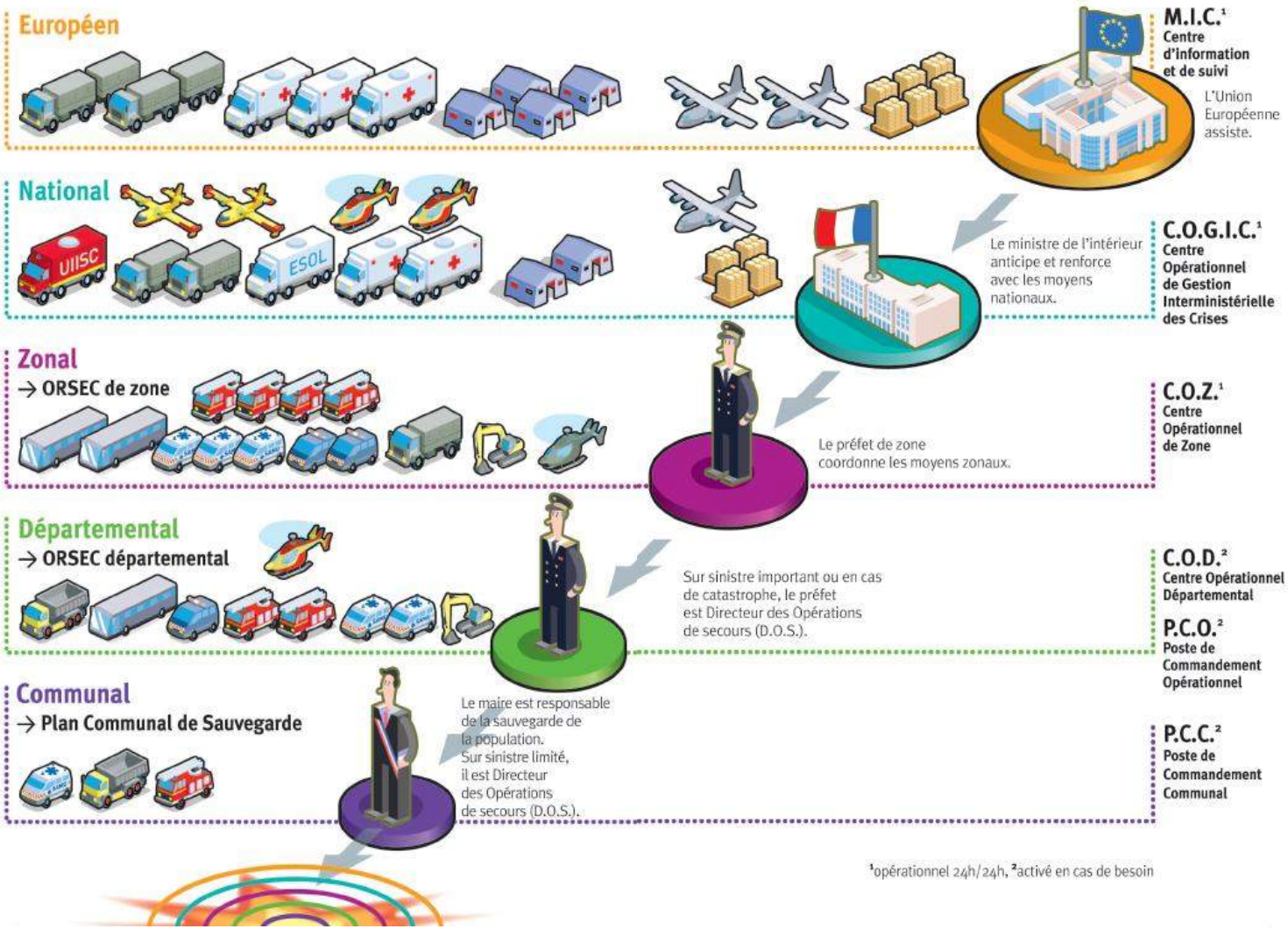
French Civil Defence Organization

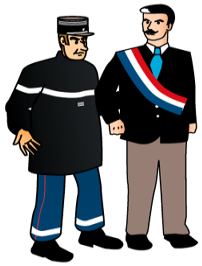
Assistance

Anticipation

Coordination

Management



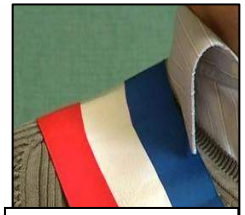


DOS + COS

Director of the operations

Chief of the operations

***Commune* <=> Town**



Mayor

→ Safeguard plan

Preparedness

Public information

Reduction in population Vulnerability

DOS + COS

Director of the operations

Chief of the operations

***Département* <=> County**

Prefect

→Disaster contingency plan

→Risk prevention plan

Preparedness

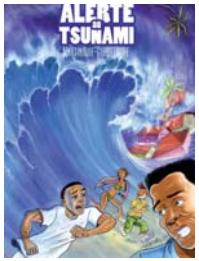
Disaster management

- ***Alerts***
- ***Response***
- ***Mobilization of public or private means***

Importance of operational cooperation between Météo-France and Civil Protection in all the DRM phases

PREVENTION

Awareness Education
Communication



Risk prevention scheme,
Data networks,
Technical and scientific tools…

PREPAREDNESS

Operational Cooperation

Real time : VIGILANCE ,
Operational plans,
Technical and scientific tools…

RESPONSE

RECOVERY

FEED-BACK

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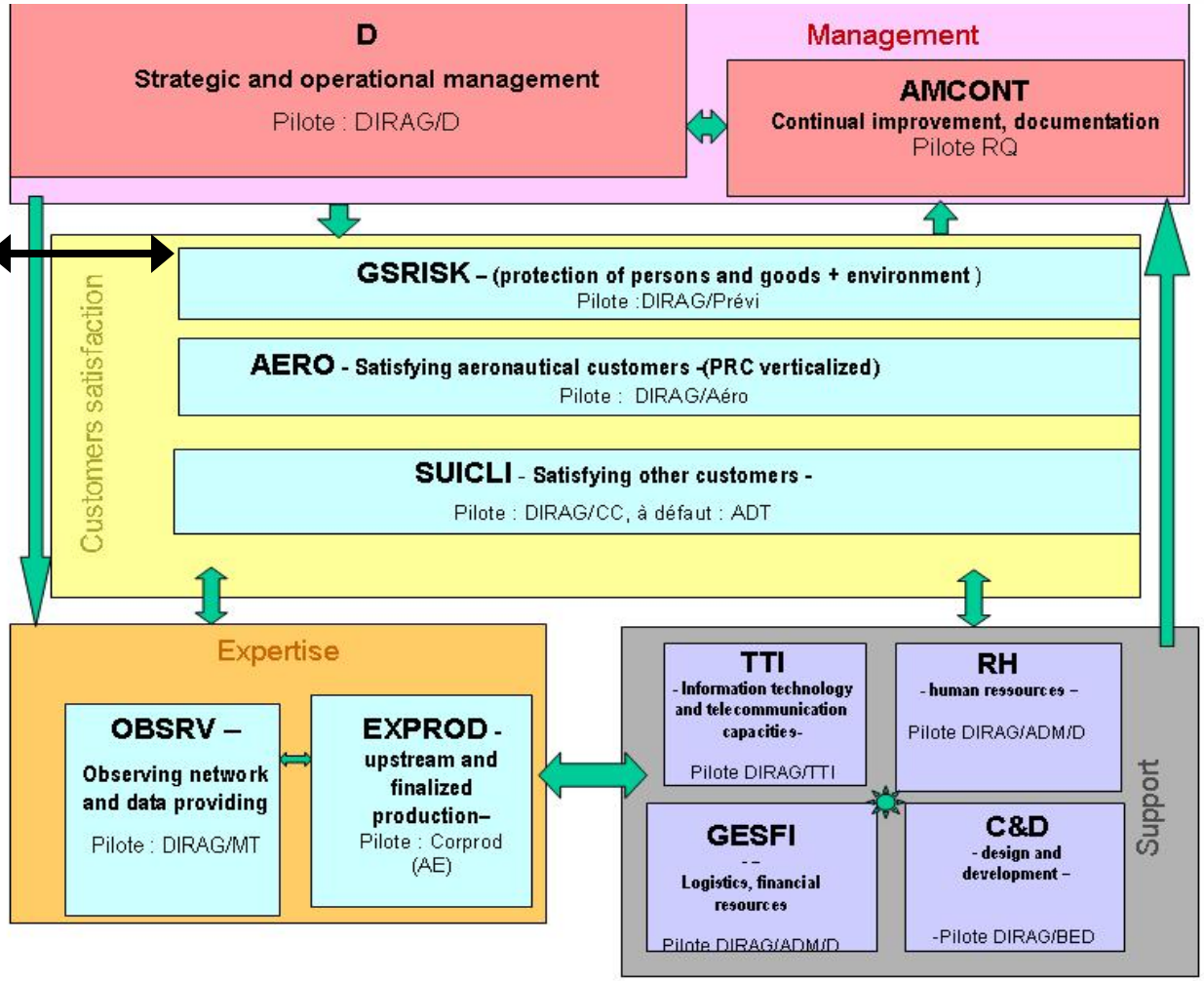
Specific QMS in Météo-France « Antilles –Guyane » based on users needs and customers satisfaction

DRM

Civil Protection,

MHEWS stakeholders



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The VIGILANCE SYSTEM : the commun foundation stone for operational cooperation between Civil Protection, Météo-France and other MHEWS Stakeholders

In Météo-France « Antilles-Guyane »: the Vigilance system is the pillar of the DRM process in the QMS

* Regional system and QMS process but local expertise and management
* Specific SOPs in each «département » under the regional QMS
* Regional real-time forecast and warning coordination between the 3 Met Services

In the « Préfecture de zone » : the Vigilance system is a specific zonal contingency plan

* Adapted in each « departement » for local management by the Civil Protection
* Through « departemental » contingency plans that are based on the « departemental » vigilance procedures of Météo-France

The VIGILANCE SYSTEM has been developped (from 2004 to 2006) by « Etat Major de Zone » and Météo-France with all the stakeholders around the table

* Civil protection, Fire department, Roads and infrastructure managers, Direction de l'environnement, Hospital managers, School and Education departement, mayors, …

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METEOROLOGICAL « VIGILANCE »
in the French « ANTILLES-GUYANE » region.

GOAL : to strengthen and frame cooperation and real-time coordination between Météo-France and Civil Protection in the MHEWS context and to ensure effective warning information to the population

¤ **Progressive increase/decrease of watch and warning levels with related individual and collective measures**

¤ **User friendly and complete information, open to everybody**

→ Internet, phone, email, fax , mobile

¤ **Same process of warning, all year long**

→ for any kind of danger

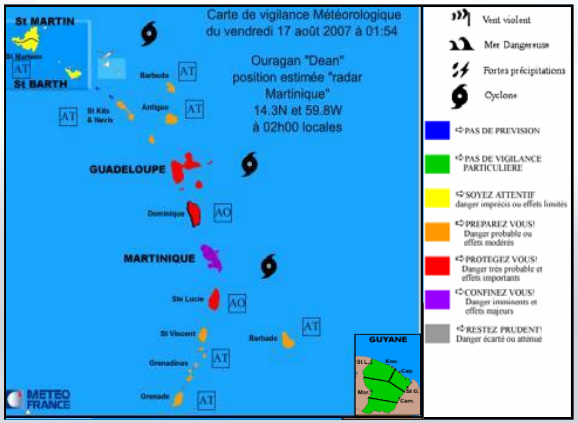
→ for any type of population

→ for all the islands of the FWI and French Guiana

¤ **Adapted lead-time**

→ Depending on the hazard and its predictability

→ Depending on the requirement by Civil Protection or/and other stakeholders to put in operations safety measures



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METEOROLOGICAL « VIGILANCE » : Principle

ASSESS THE RISK

A type of hazard , A colour for the level of the danger , A slogan

- **Strong winds**
- **Dangerous sea**
- **Heavy rain, Thunderstorm**
- **Cyclone**

+

- **No danger**
- **Be (or keep being) attentive !** Imprecise danger / limited effects
- **Be prepared !** Probable danger / moderate effects
- **Protect yourself !** High probable danger / heavy effects
- **Stay safely enclosed !** Imminent danger with catastrophic effects
- **Keep being careful.** reduced or moved away danger but ...

Coordination

GIVE ADAPTED MEASURES

Individual behaviour

+

Collective measures

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Liberté Égalité Fraternité
RÉPUBLIQUE FRANCAISE

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METEOROLOGICAL « VIGILANCE » : to meet the local needs

Use of human expertise and flexibility in decision making to better meet the needs of Civil Defence

DANGER = NATURAL HAZARD

\+ VULNERABILITY

\+ STAKES

¤ **Human expertize is needed in the assessment of the level of danger**

→ Flexibility in the lead-time for forecasts and warnings

→ Flexibility in the threshold (rainfall, winds , waves ..) but with guidelines

→ Uncertainties, predictability, hazard itself, vulnerability, stakes, … taken in account

¤ **Flexibility to change the level of vigilance, in close coordination between Météo-France and the Civil Protection**

→ up or down grading the level of vigilance according to the status of the phenomena and the forecasts

¤ **Flexibility in the choice of collective measures**

→ under the repsonsibility of the « Prefet », in the « crisis management team »

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MEASURES and BEHAVIOR

Depending on :

→ the hazard

→ The level (color) of risk

Specific measures of prevention, protection and behaviour have to be applied in social and economical sectors and also by every citizen.

.

Individual behaviour measures

→ Pre-defined in collaboration with the Civil Defence, they give advice to prepare and to behave before, during and after the event

→ Included in « Follow-up » bulletins of each island .

→ Also available from the web site by click on the colour key

Collective measures

→ Also pre-defined by Civil Defence with other stakeholders,

→Concern instructions for schools, industries, airport, shops, …

→ The collective measures are decided by the representative of the government in real time

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Recommandation for individual behavior

Example

ORANGE : BE PREPARED !

- Keep beeing informed of weather bulletins and measures or instructions to follow (Internet, Answering machine,radio, TV, …),

- Make your house ready (protect the openings, put important things in safe places, , etc.),

- Move things that might be reached by flood,

- Protect your boats, hawling them on to dry land or under shelter.,

- Bring animals into shelters (cattle, fowl, …),

- Do some last minute shopping so as to be self sufficient for a few days,

- Fill up gas tank of your car without panicking and paralysing gas stations,

- Mind perishable goods stored up in deep freeze (they may go bad in case of prolonged electricity failure),

-Protectt important personal documents (ID cards, health and vaccination records, bills, insurance policy, …),

-Get some cash to be able to buy some essentiels (cash dispenser may be out of order).

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Collective Instructions

Example

RED : PROTECT YOURSELF !

- **The economic activity must be stopped and the economic actors must implement the protection measures of their company or trades and release the maximum of their personnel,**
- **All public transport have to be stopped (bus, shared taxi, shuttles, …) ; the closure of the airport must be considered in the best timely manner,**
- **All public exhibitions (sporti, cultural, etc…) are cancelled,**
- **All the exits at sea professional are prohibited,**
- **All the devices of crisis management are activated,**
- **The media must broadcast warning information in a continuous way**
- **etc.**

Not all the collectives measures are to be taken ; the "DOS" can decide in real-time which are applicable , according to information from technical experts.

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REAL-TIME RISK ASSESSMENT

Each regional forecast office (Martinique, Guadeloupe and French Guyana) assess the dangers for its own area of responsability (St-Martin / St-Barth depend on Guadeloupe)

It is based on a probabilistic approach to evaluate the risk of impact (hazard, vulnerability, stakes). The probability is strongly correlated with the forecast range and the predictability.

4 levels of impacts are combined with 4 levels of probabilities

→ **Forecast impact** **low** (imprecise), **moderate**, **important** and **major.**
→ **Probability** :**low**, **moderate/high**, **very high** and **certain** (or imminent)

	Impact	Light or imprecise	Moderate	Deep	Very deep (major)
Probability					
low		1	1	1 2	2
Moderate to high		1	1 2	2 3	3
Very high		1	2	3	3
Certain …(imminent)		1	2	3	4

Correspondance in terms of lead time for Tropical cyclones

Timing / Impact	+ 48h	42h 48h	36h 42h	30h 36h	24h 30h	18h 24h	12h 18h	06h 12h	00h 06h
Light or Imprecise									
Moderate									
Deep									
Very deep Major									

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Aligment with the Warning System from RSMC Miami

→Official alerts on the « vigilance » charts for all the Lesser Antilles:

PT = Préalerte Tempête = Storm Watch
AT = Alerte Tempête = Storm Warning
PO = Préalerte Ouragan = Hurricane Watch
AO = Alerte Ouragan = Hurricane Warning

Vigilance VS RSMC, function of the type of tropical cyclones and the lead time

Anticipation / Type	Trop. Dep	Week T.Storm	Strong T.Storm	Hurricane
48 hours or more	NIL	P T Storm Watch	P T Storm Watch	P O Hurricane Watch
24 - 48 hours	NIL	P T Storm Watch	P T Storm Watch	P O Hurricane Watch
18 - 24 hours	NIL	A T Storm Warning	A T Storm Warning	A O Hurricane Warning
6 - 18 hours	NIL	A T Storm Warning	A T Storm Warning	A O Hurricane Warning
3 - 6 hours	NIL	A T Storm Warning	A T Storm Warning	A O Hurricane Warning

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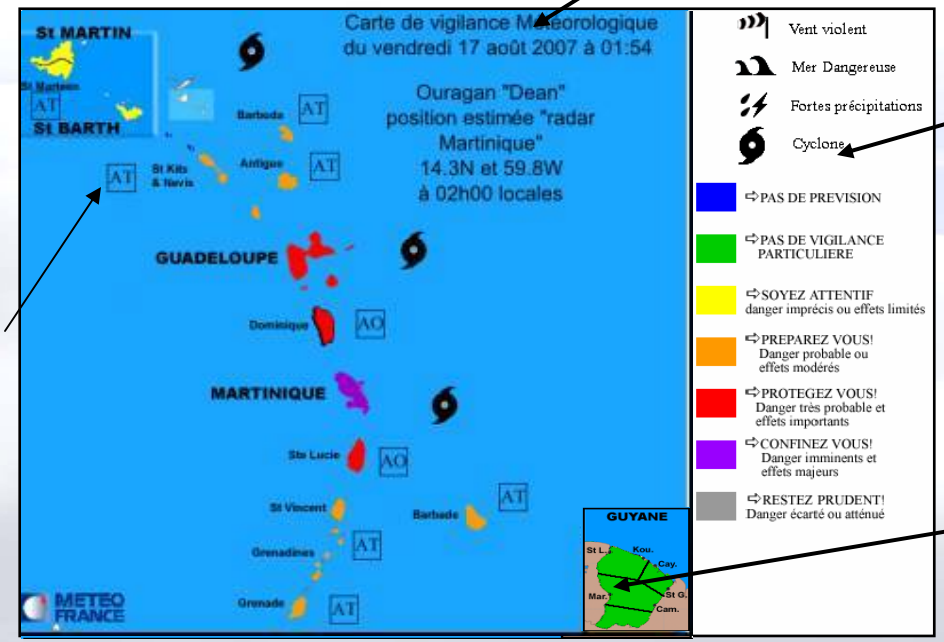
PRODUCTS : the « vigilance » map

Date and hour production



Official RSMC WARNING

Key of hazard and colour pictograms

4 sub-regions for the French Guiana

- **Routine Production twice a day around 6.00 am and 5.00 pm local time**
- **Updated as often as needed (when a noteworthy change in the current or forecast meteorological situation occurs)**
  - **→ at least every 6 hours in case of cyclone in level yellow, orange or grey**
  - **→ at least every 3 hours in case of red or purple**

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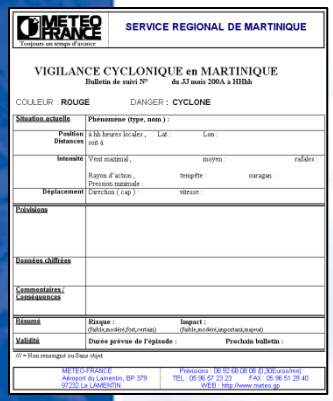
PRODUCTS : the « follow up » bulletins



METEO FRANCE — SERVICE REGIONAL DE MARTINIQUE

VIGILANCE CYCLONIQUE en MARTINIQUE

Bulletin de suivi N° du JJ mois 200A à HHh

COULEUR : ROUGE DANGER : CYCLONE

Situation actuelle	Phénomène (type, nom) :
Position Distances	à hh heures locales , Lat : Lon : sont à
Intensité	Vent maximal : moyen : rafales :
	Rayon d'action : tempête : ouragan :
	Pression minimale :
Déplacement	Direction (cap) : vitesse :
Prévisions	
Données chiffrées	
Commentaires / Conséquences	
Résumé	Risque : (faible,modéré,fort,certain) Impact : (faible,modéré,important,majeur)
Validité	Durée prévue de l'épisode : Prochain bulletin :

/// = Non renseigné ou Sans objet

METEO-FRANCE Aéroport du Lamentin, BP 379 97232 Le LAMENTIN — Prévisions : 08 92 68 08 08 (0,30Euros/mn) TEL : 05 96 57 23 23 FAX : 05 96 51 29 40 WEB : http://www.meteo.gp

Colour	minimum Frequency
	12 h
Cyclone	6 h
	6 h
	3 h
	3 h
	6 h

Content:

Analysis (location, intensity, movement, …)

-Forecast (Schedule,)

-Possible consequences for each area under the threat

-Probabilities (low, moderate/high, very high, certain) of impact (low, moderate, important, major)

- Individual mesures pre-defined by the civil protection.

Two types of bulletins :

- One for the tropical cyclones , another for the rest
- Only one « follow up » bulletin for the 4 sub-regions of the French Guiana

Production schedule

-As soon as the level of vigilance is different from green, bulletins are produced for each region concerned

-Updated as soon as needed, at least at any change of coulour**.**

-Specific « back to green » bulletin at the end of the event.

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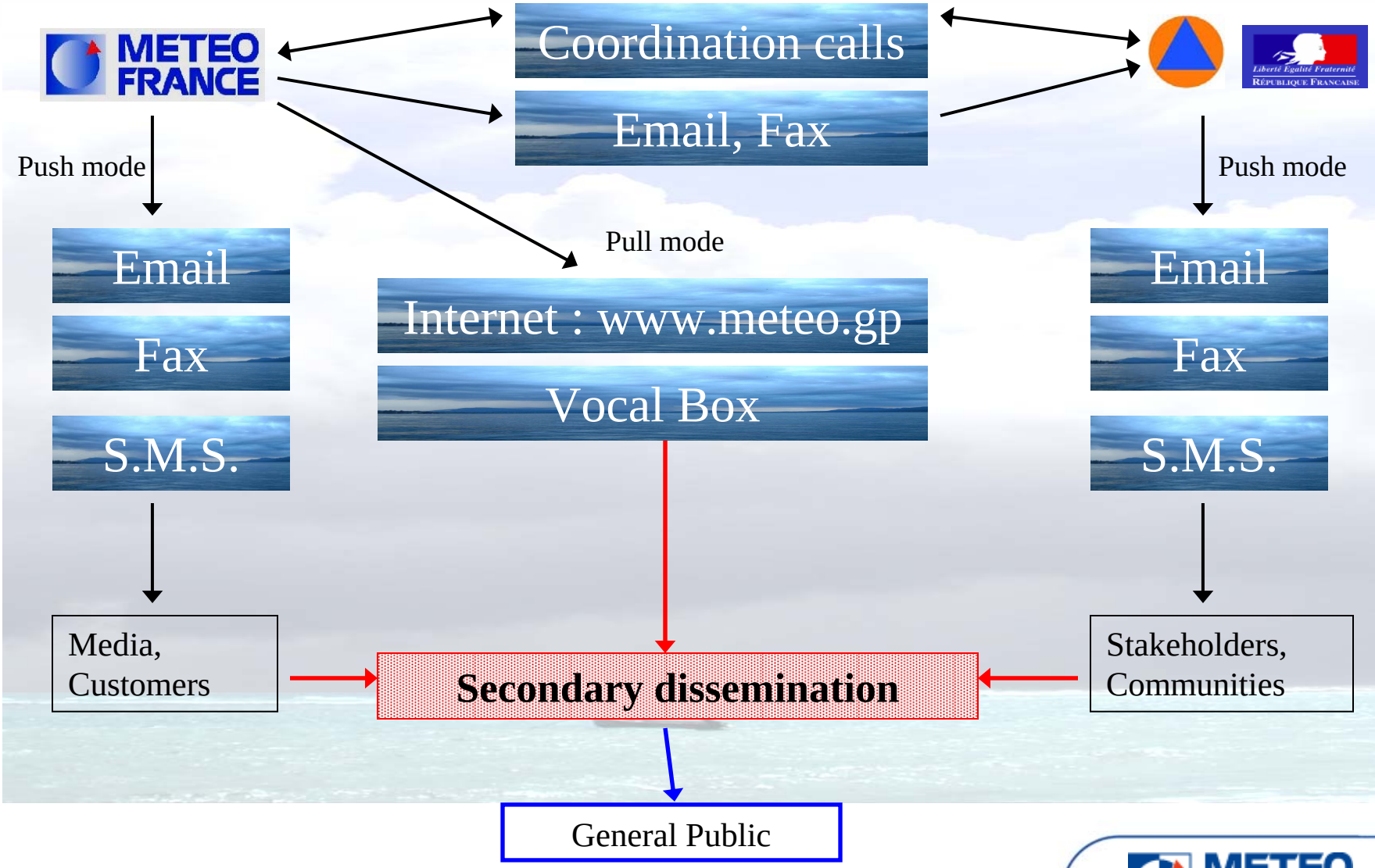
DISSEMINATION AND ACCESS



EDUCATION and AWARENESS

Communication plan

- materials designed by Meteo-France and produced by Civil Defence

  •Example in Martinique :

  500.000 high- quality coloured brochures
  (160.000 delivered in all mail boxes)

  10.000 posters

- Intense TV – RADIO campaigns

- Guidelines for « Vigilance » on the WEB

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Continual improvment in Météo France and civil protection: Key of the success

Feed back

- from Civil Defence to Meteo-France and « vice versa »
- from EWS stakeholders to Civil Defence and Meteo-France
- through
  - * Regular / routine feedback mechanisms (surveys, meetings, etc.)
  - * « Retex » = specific post-event feedback

Exercice

- organized by Civil Defence at « departemental » level, with communities involment
- with several stakeholders
- input from Meteo-France with regard to the « virtual » scenario

Yearly meeting

- before each rainy (hurricane) season
- with all the stakeholders

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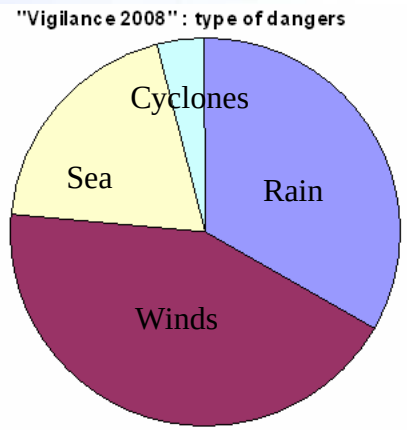
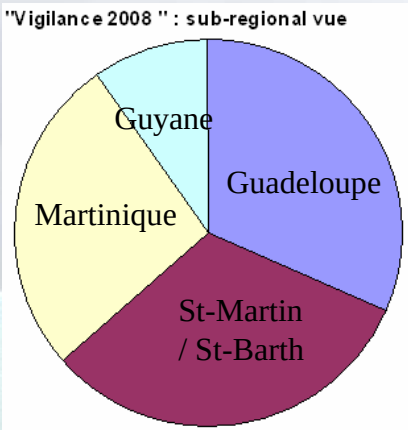
Feedback mechanisms from Civil Protection
→ Yearly assessment of the Vigilance system

YEAR : 2008	St-Martin St-Barth	Guadeloupe	Martinique	Guyane	TOTAL
TOTAL	13	13	11	4	41
Type of danger					
Heavy rain/thunderstorm	5	7	5	0	17
Strong winds	7	6	5	4	22
Dangerous sea	3	4	3	0	10
Cyclones	1	1	0	0	2
Evaluation of the forecasts		in percentage			
Good to very good		63	55	50	
Sufficiently good		16	46	50	
False alarm		21	9	0	
Non detection		0	0	0	
Anticipation		in percentage			
Good to very good		74	82	25	
Sufficiently good		11	9	75	
Too late		15	9	0	
Global evaluation		in percentage			
Good to very good		42	55	0	
Sufficiently good		26	27	100	
Not sufficiently good		16	18	0	
Bad		16	0	0	





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Feedback mechanisms from Civil Protection
→ Yearly assessment of the Vigilance system

Lead time for warnings (2009)

Well-timed	enough for partial anticipation	too early	too late
70,0%	6,7%	0,0%	23,3%
63,2%	10,5%	0,0%	26,3%
66,7%	0,0%	0,0%	33,3%
67,3%	7,3%	0,0%	25,5%

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