

# EXPECT THE UNEXPECTED AND KNOW HOW TO RESPOND



## The DARWIN Resilience Management Guidelines and their testing in Healthcare and Aviation related Pilot Cases

2<sup>nd</sup> IMPROVER/ERNICIP Workshop

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# Outline

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- DARWIN consortium
- Resilience Engineering in DARWIN
- **DARWIN Resilience Management Guidelines (DRMG)**
- **DRMG Development Process**
  - Example of Concept Card 2.3
- **DRMG Evaluation Process**
- Pilot Exercises
  - Example of Pilot Exercise 1

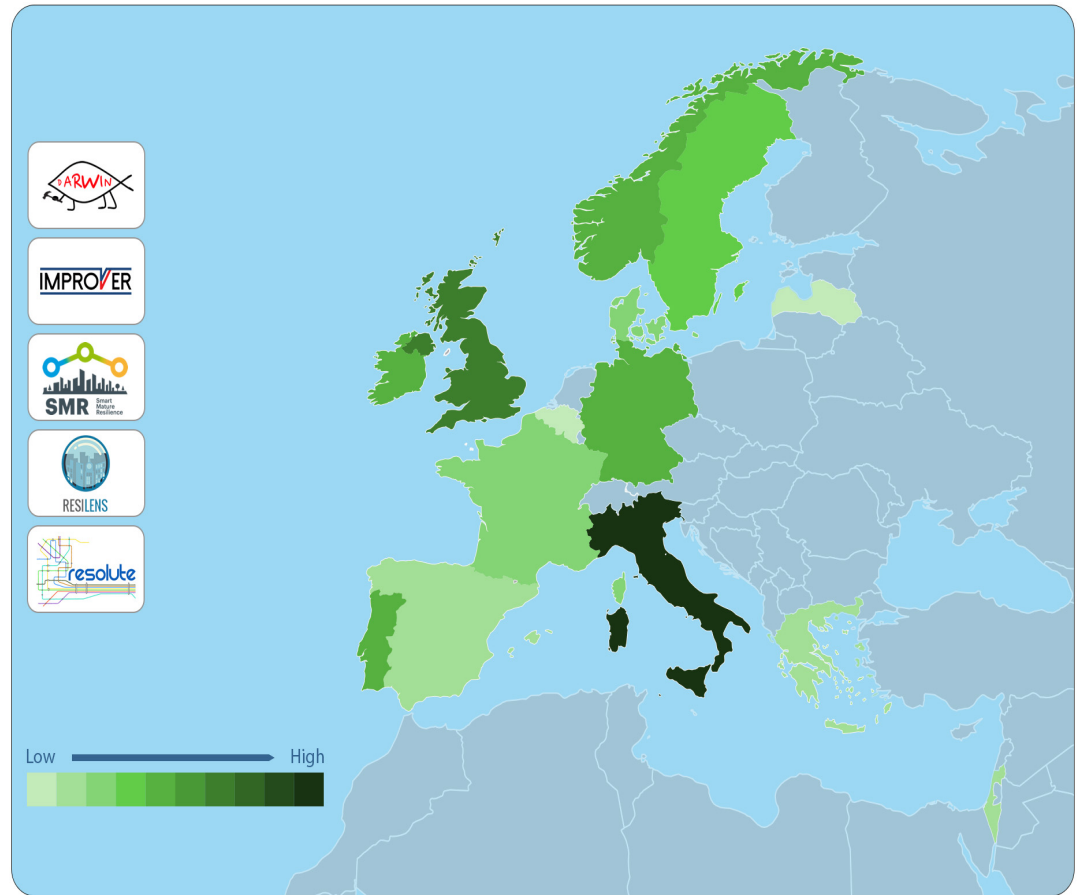


# DARWIN Consortium

Part of the  
H2020-DRS-7 team

53 organizations

13 European countries



Picture prepared by CARR Communication

# DARWIN Consortium

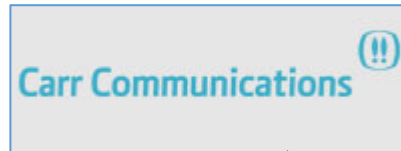
June 2015 – May 2018

## Partners

- 9 organizations
- 6 European countries

## DARWIN Community of Practitioners (DCoP)

- 50 members
- 8 EU and other countries



## Crisis ongoing work current definition\*

“Any event or situation that threatens an organisation and requires a **strategic, adaptive, and timely response in order to preserve its viability and integrity**”

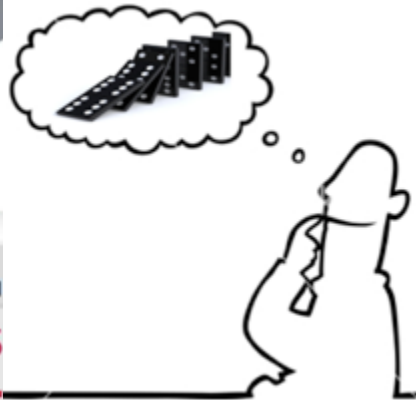
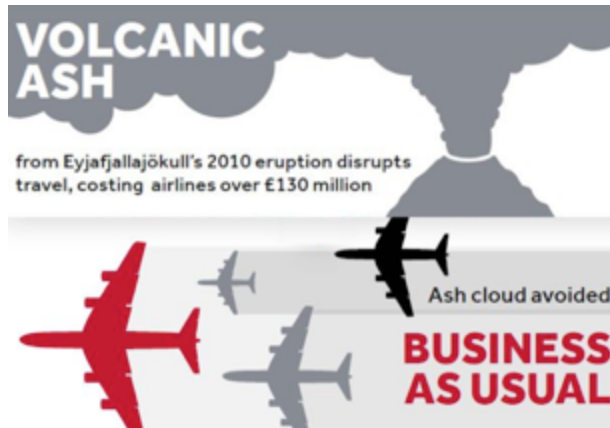
- Note 1: threats may involve (or be addressed to) core activities, reputation, objectives, assets, environment, preservation of life and health, services, etc.
- Note 2: There is a high level of uncertainty in a crisis
- Note 3: It may imply to adaptive mobilization of the **resilience capacity** of the organisation”

With permission -- The WG is preparing a Technical Standard Crisis Management – Guidance for developing a strategic capability



# Resilience Engineering in DARWIN

## Challenge



### The difficulty

Handling **surprises**  
and  
**cascading effects**

### Current methods

Mainly  
**linear thinking**  
dealing with  
**expected situations**

### The need

Escaping  
**oversimplifications**  
Building up standards

## Reference Definition

“The ability to **resist, absorb, accommodate to and recover from** the effects of disturbances and changes in a timely and efficient manner, including through **adaptation and restoration of basic structures and functions** (UNISDR, 2009; Hollnagel, 2011)”.

## Main Focus

Improve the ability of stakeholders to **anticipate, monitor, respond & adapt, learn & evolve** to operate efficiently in the face of crises.



## Strategy

- Developing **DARWIN Resilience Management Guidelines (DRMG)** addressed to Critical Infrastructure (CI) stakeholders

## Domains

- Focus on **Air Traffic Management** and **Healthcare**
- **Generalization to other domains** (thanks to the Community of Practitioners).

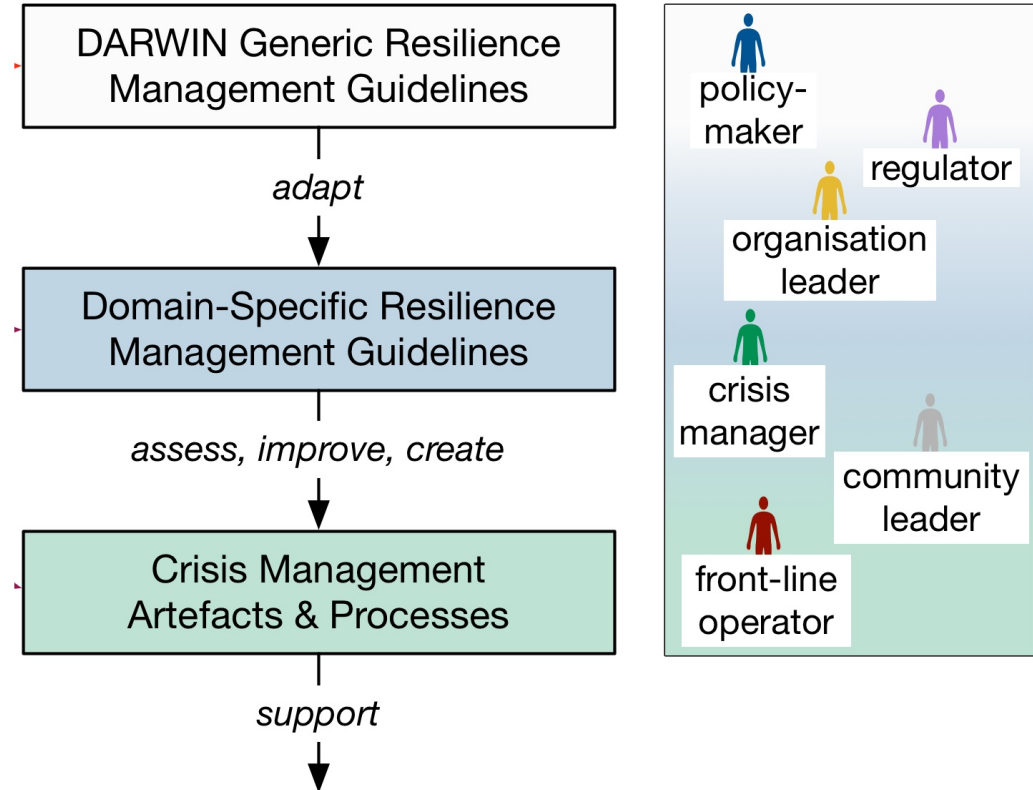




# DARWIN Resilience Management Guidelines (DRMG)

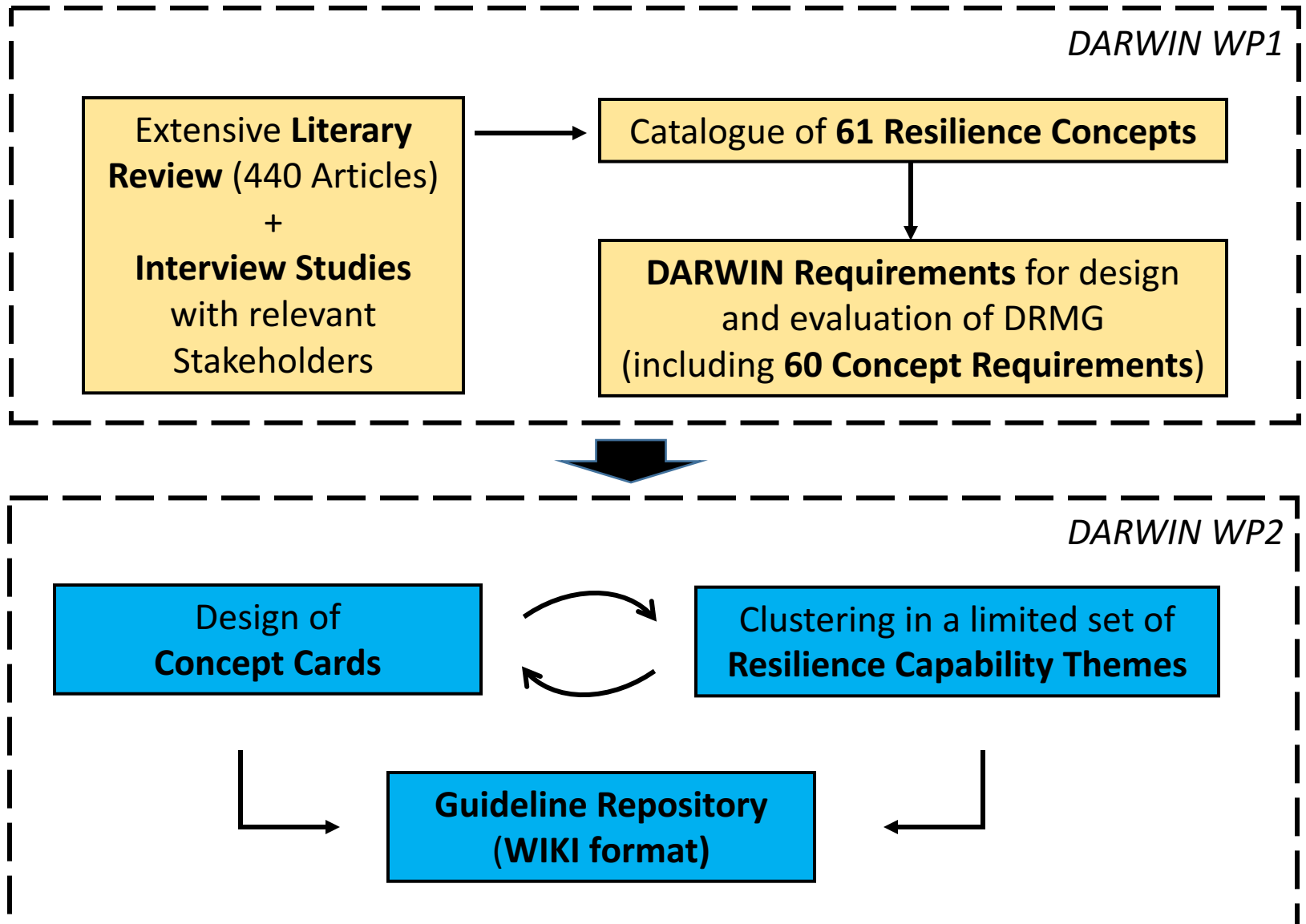
## Guiding principles to help CI stakeholders in

- **Assessing, improving, creating** their own guidelines/procedures
- Developing a **critical view of their own crisis management activities**, based on resilience management concepts.



Resilience management before, during and after crises:  
Anticipate - Monitor - Respond and adapt - Learn and evolve

# DRMG Development Process



# DRMG Development Process: a snapshot of the WIKI Repository



Page Discussion

Read

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View history



More

Search



## The DARWIN Resilience Management Guidelines

Move

Refresh

View guidelines  
Browse by resilience abilities  
Browse by functions of crisis management

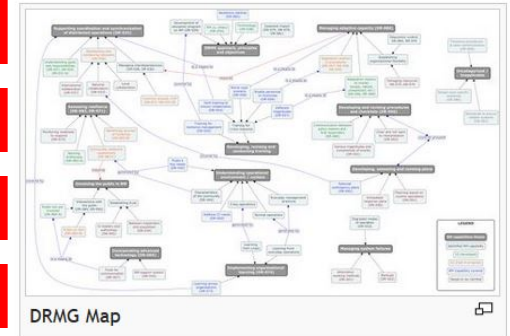
Terminology  
Approach, principles and objectives  
Field Guide

Developers' pages  
All concept cards  
Management pages  
All categories

Tools  
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### Contents [hide]

- 1 DRMG approach, principles and objectives
- 2 Supporting coordination and synchronisation of distributed operations
  - 2.1 Promoting common ground in cross-organizational collaboration in crisis management
  - 2.2 Establish networks for promoting inter-organizational collaboration
  - 2.3 Ensure that the actors involved in resilience management have a clear understanding of their responsibilities and the responsibilities of other involved actors
- 3 Managing adaptive capacity
  - 3.1 The Darwin Resilience Management Guidelines should be easily adaptable to both expected and unexpected events (all-hazard approach)
  - 3.2 Support, articulate and maintain a legitimate and transparent space of maneuver relative to normative plans and procedures
- 4 Assessing resilience
  - 4.1 Assessing community resilience to understand and develop its capacity to manage crises
  - 4.2 Noticing brittleness
- 5 Developing, revising and conducting training
- 6 Developing and revising procedures and checklists
  - 6.1 Systematic management of policies involving policy-makers and operational personnel for dealing with emergencies and disruptions
- 7 Involving the public in Resilience Management
- 8 Understanding operational environment and context
- 9 Managing system failures



**DRMG Map**

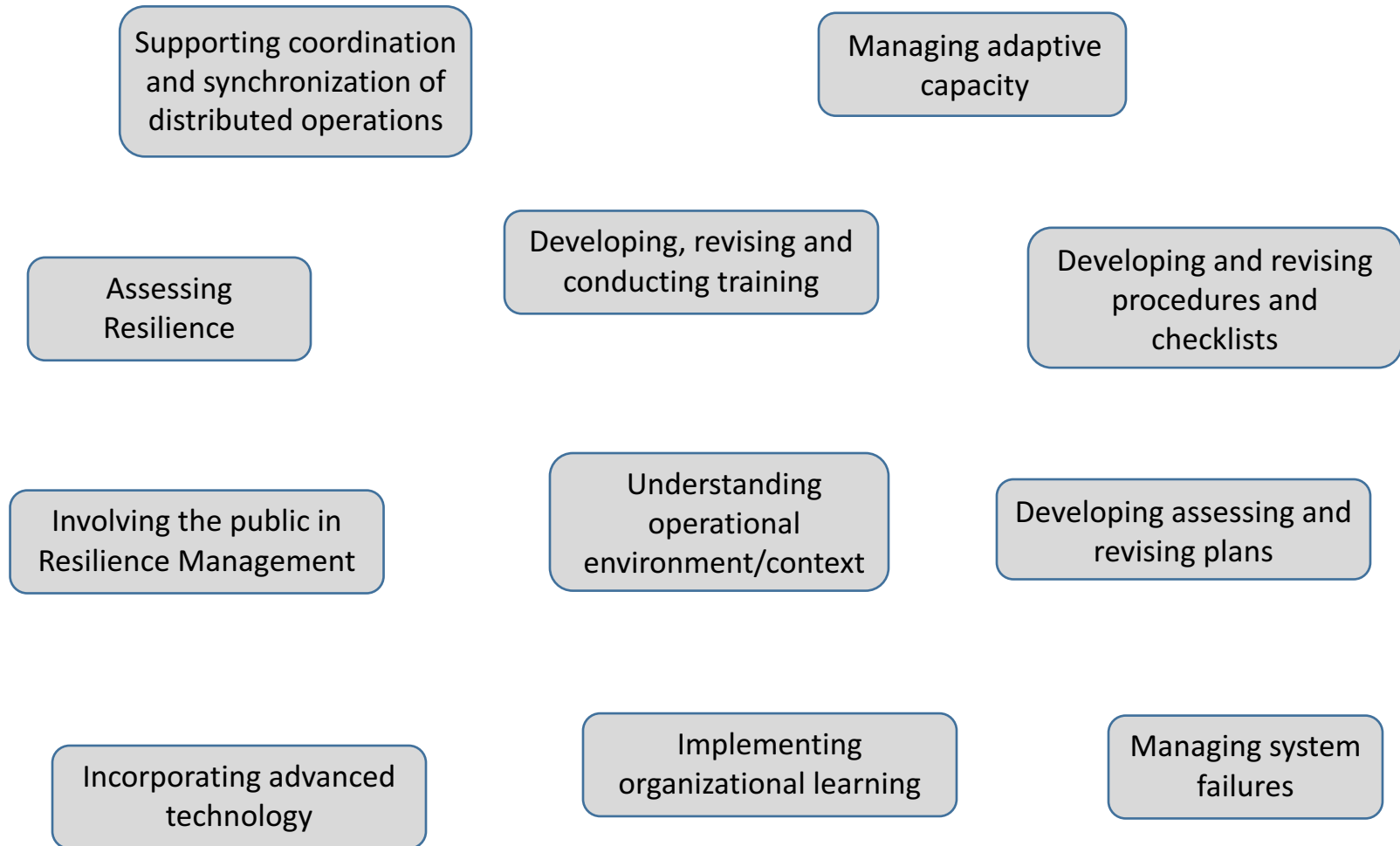
[www.bit.do/DRMG](http://www.bit.do/DRMG)

**Access Details**

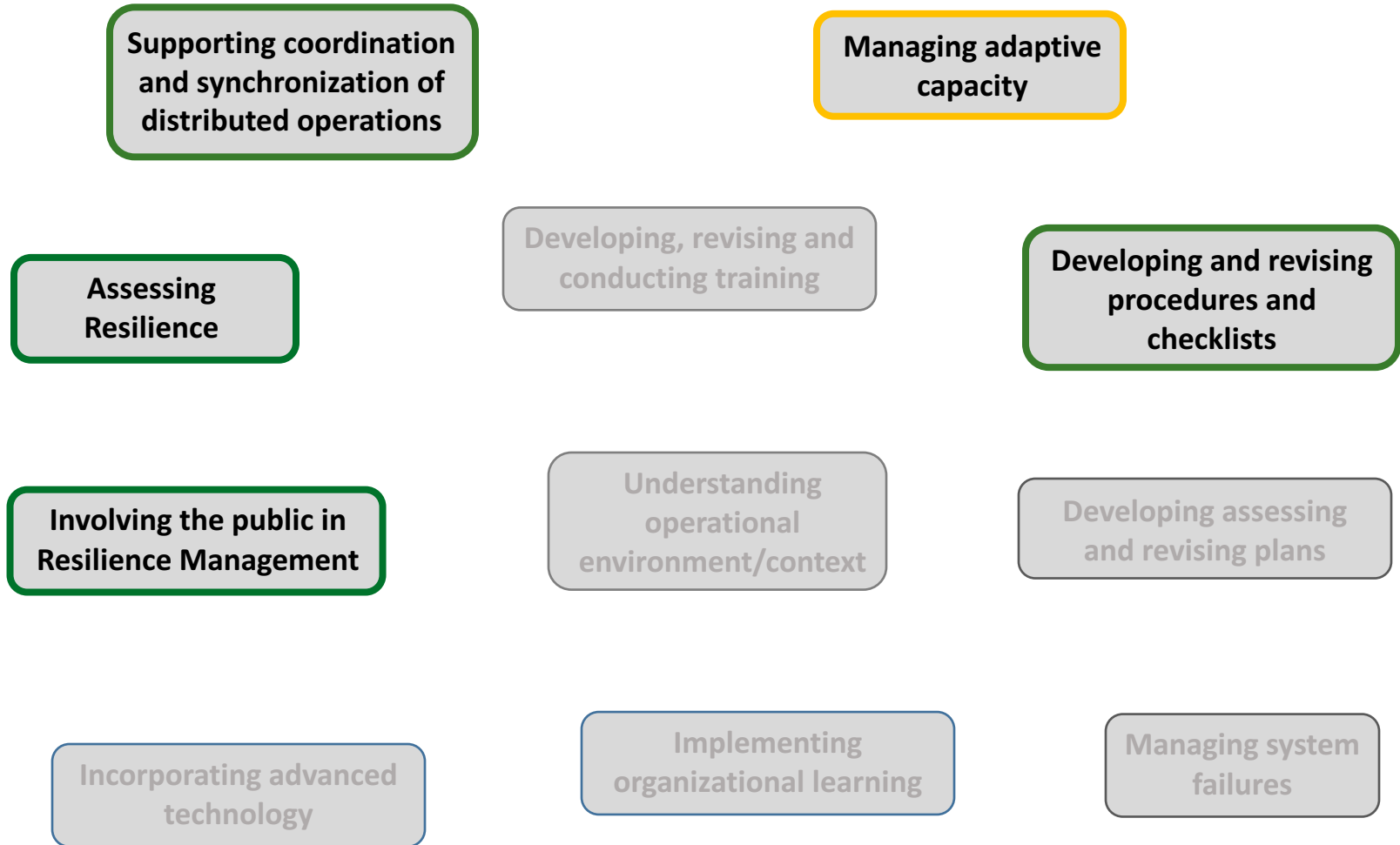
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# DRMG Development Process: Resilience Capability Themes



# DRMG Development Process: Resilience Capability Themes



Developed

In progress

Not yet developed



# DRMG Development Process: Resilience Capability Themes

Supporting coordination  
and synchronization of  
distributed operations

Managing adaptive  
capacity

Assessing  
Resilience

Developing and revising  
procedures and  
checklists

Involving the public in  
Resilience Management

# DRMG Development Process: Resilience Capability Themes

Supporting coordination  
and synchronization of  
distributed operations

Managing adaptive  
capacity

Assessing  
Resilience

Developing and revising  
procedures and  
checklists

Involving the public in  
Resilience Management

# DRMG Development Process: Currently available Concept Cards

## Generic Concept Cards

Supporting coordination and synchronization of distributed operations

- 2.1 Promoting Common Ground
- 2.2 Establishing networks
- 2.3 Understanding roles and responsibilities

Managing adaptive capacity

- 3.1 Adaptation to expected and unexpected events
- 3.1 Adaptation relative to procedures

Assessing Resilience

- 4.1 Assessing Community Resilience
- 4.2 Noticing brittleness
- 4.3 Identifying sources of resilience

Developing and revising procedures and checklists

- 6.1 Systematic management of policies involving policy-makers and operational personnel

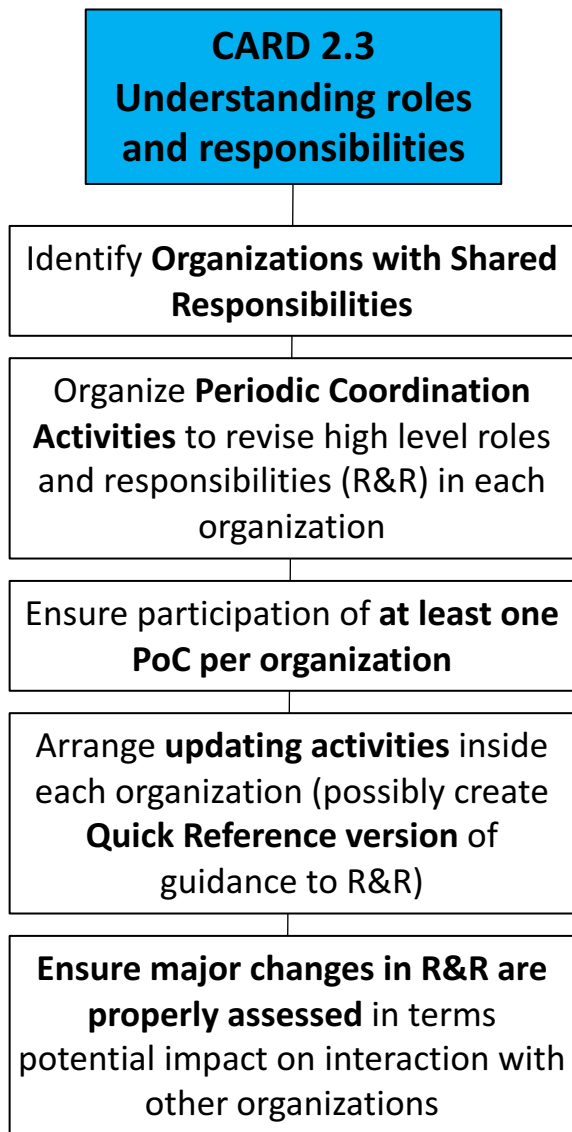
Involving the public in Resilience Management

- 7.1 Communicating with public not yet affected by the crisis





# DRMG Development Process: Example of CARD 2.3



## Reference Example

- Updating process of Airport Emergency Plan (collaboration between ANSPs, Civil Aviation Authority, Airport Authority, Fire Brigade, etc.)

## Mechanism

- Periodic coordination ensures shared procedure to be maintained up to date, also after changes in individual organizations.

## Expected Outcome:

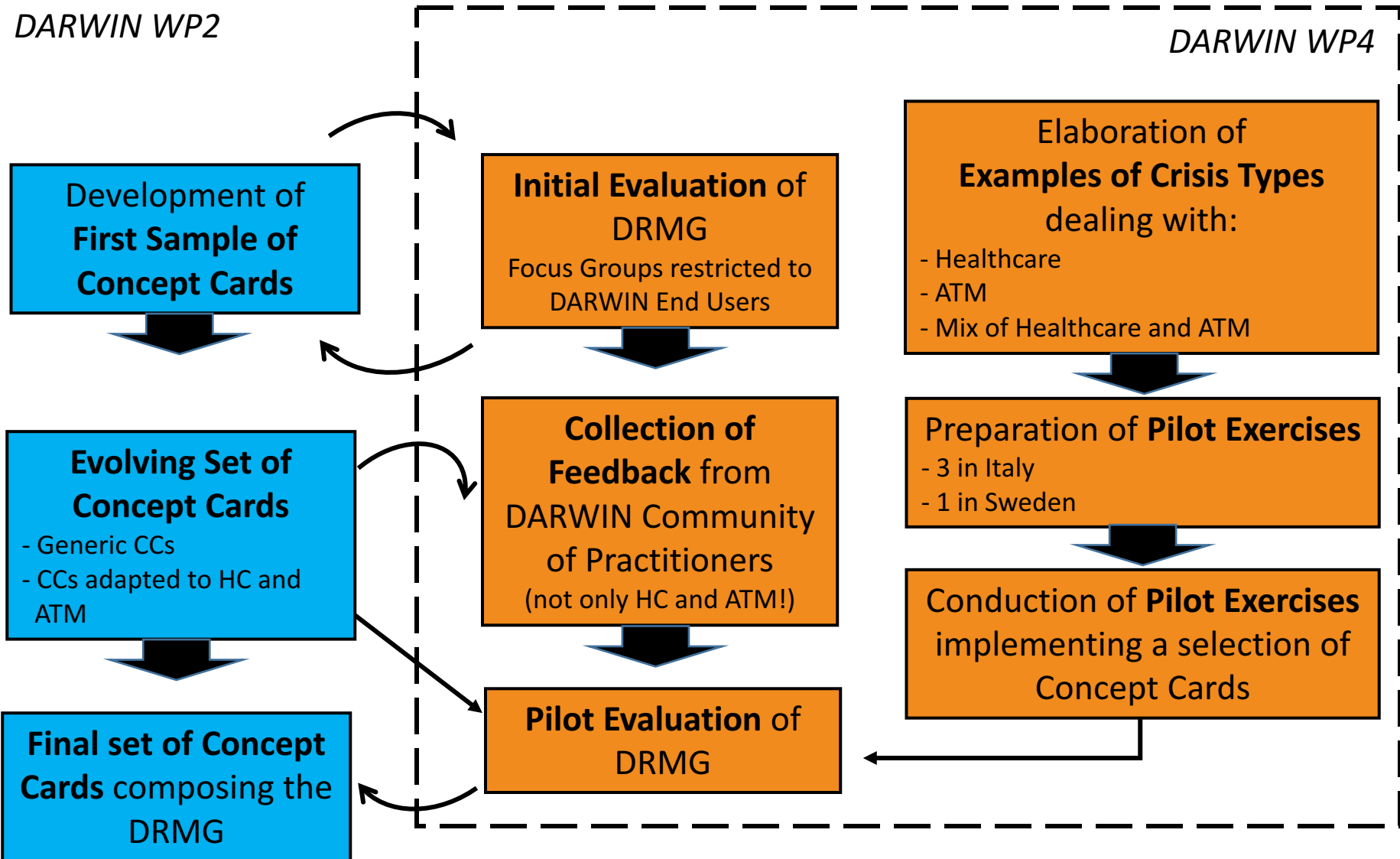
- Improved “readiness to act” in case of crisis.



# DRMG Evaluation Process

DARWIN WP2

DARWIN WP4



## Pilot Exercises: selection of reference crisis types

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1. Aircraft crashing in urban area close to Rome Fiumicino Airport shortly after taking off (**ATM-HC**)
2. Blackout in Rome Area Control Centre (**ATM**)
3. Disease outbreak during flight due to land at Rome Fiumicino (**HC-ATM**)
4. Collision between Oil Tanker and Passenger Ferry leaving Gotland Islands in severe weather conditions (**HC**)

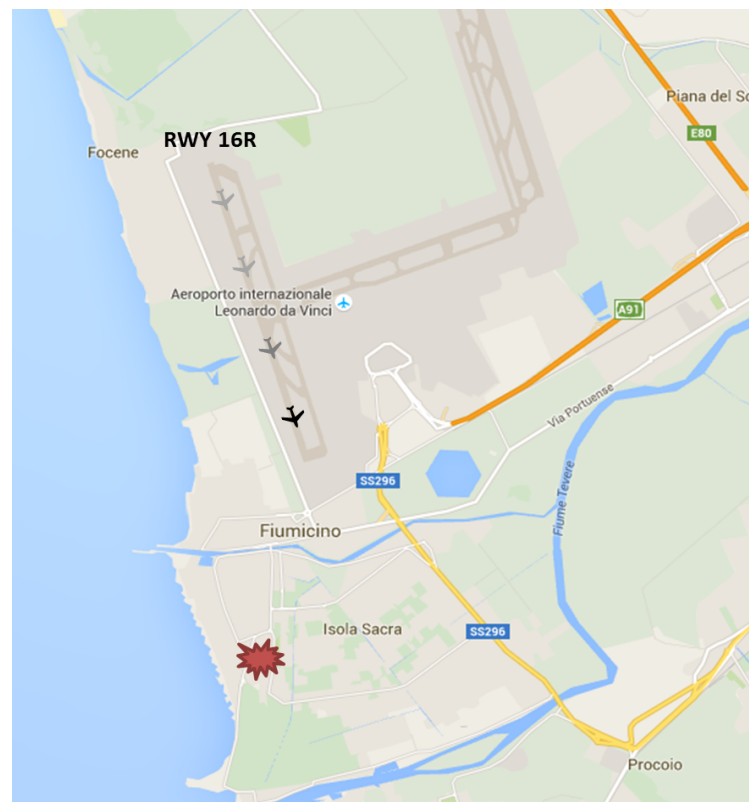
## Pilot Exercise: **Example of Pilot 1**

### Aircraft crashing in urban area close to Rome Fiumicino Airport shortly after taking off

*Egypt Air Airbus A321 (carrying approx. 180 passengers) crashes into terrain following left engine explosion.*

***20 Passengers die, 120 are seriously injured** (traumas, burns, asphyxiation, collapses), **40 are lightly or moderately injured**. Other people die on the ground.*

*The event occurs at **12.00 am (peak hour for departures)**. **Airport is suddenly closed**. Departing traffic is stopped. Incoming traffic diverted to alternate airports.*

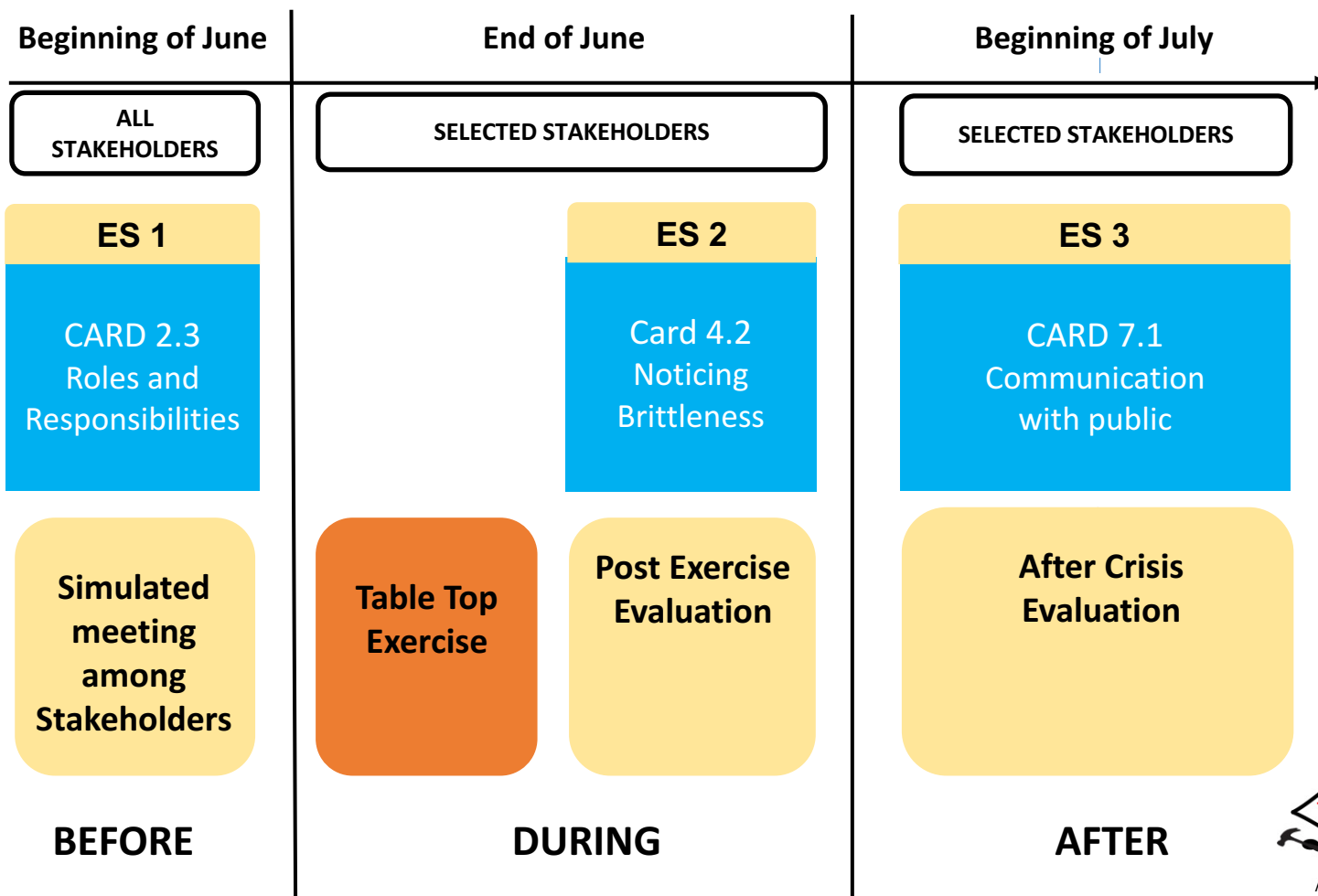


→ Initial suspects of **terrorist attack**



# Pilot Exercises: **Example of Pilot 1**

## Aircraft crashing in urban area close to Rome Fiumicino Airport shortly after taking off



# Thanks for your attention

Any question?

Any Suggestion?

[www.bit.do/DRMG](http://www.bit.do/DRMG)

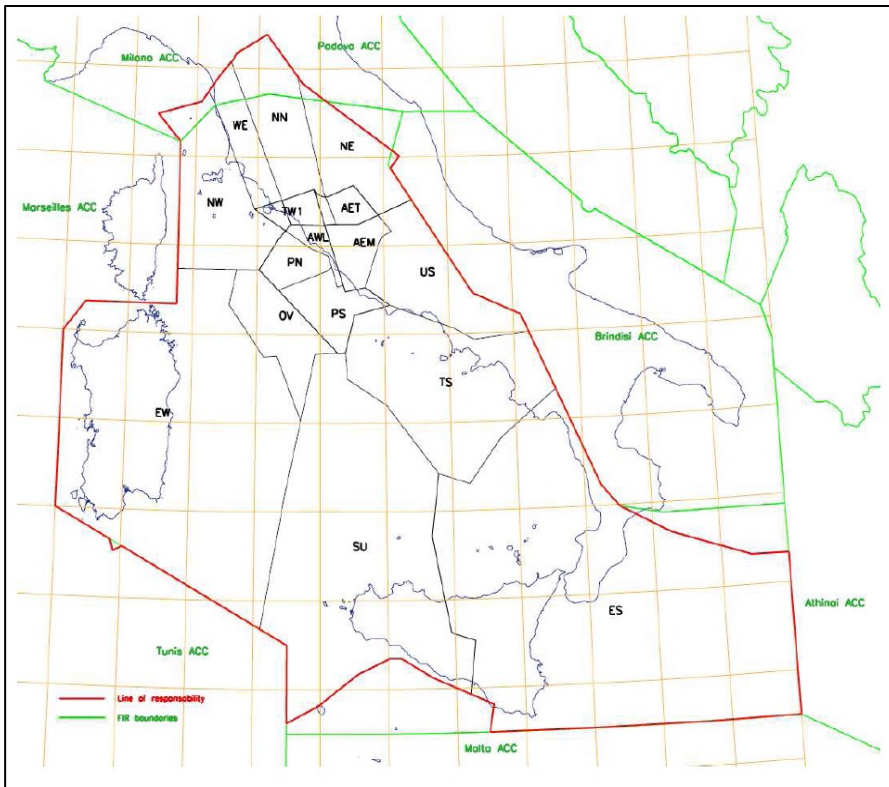
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### Total loss of radar information at Rome Area Control Centre



*During a routine summer day, at about 07.00 pm o'clock (which is the peak hour for arrival traffic), a **loss of surveillance tracks at the Controller Working Positions** occurs.*

*The **RADAR local area network** has been **accessed by an internal intruder**, who was connected physically to the network with its laptop and used advanced tools to perform a **“denial of service” attack**. Overload generated, putting the **network out of service for 1 hour**.*

→ *Initial suspects of terrorist attack*



## Disease outbreak during flight due to land at Rome Fiumicino

*In a flight due to arrive in Fiumicino one passenger shows symptoms like **severe cough, very high fever, excessive sweating, vomit.***

*There are 20 minutes left before landing. The **pilot in command advises Roma Area Control Centre (ACC)** that there is a suspicious case on board.*

*The ACC calls the **USMAF (Maritime, Air and Border Health Office)** and the airport E.R. in order to take the passenger when the flight will land and to carry him through the sanitary dedicated area.*

*The on-board personnel asks the **other passengers to fill in a “passenger locator card”***

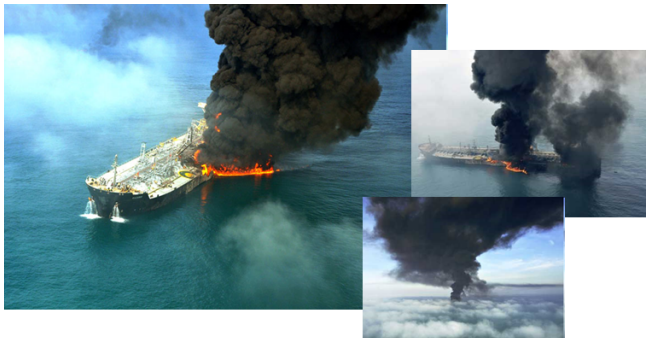


→ *The passenger dies after 12 hours*

## Crisis type for **Pilot Exercise 4** (Lead: FOI-KMC)

### Collision between Oil Tanker and Passenger Ferry leaving Gotland Islands in severe weather conditions

*At 6 p.m. on Friday, 13 December 2015 a cruise ship (11,000 GT; 1,800 PAX) is leaving the Gotland island towards the Swedish east coast.*



*At the same time an oil tanker (62,000 GT) is heading towards the passage between the Gotland and Öland islands.*

*A severe storm with rainfalls and snowfall, in combination with **miscommunication between the cruise ship and the oil tanker, causes a collision.***

*The collision sparks a fire on the oil tanker, which in turn spreads on the cruise ship.*

*Most of the **passengers** are from Nordic countries, but there is also a large group of Italians on board.*

***They suffer different levels of burns, falling down injuries, smoke inhalations, cuts and bruises as well as cases of shock.***

