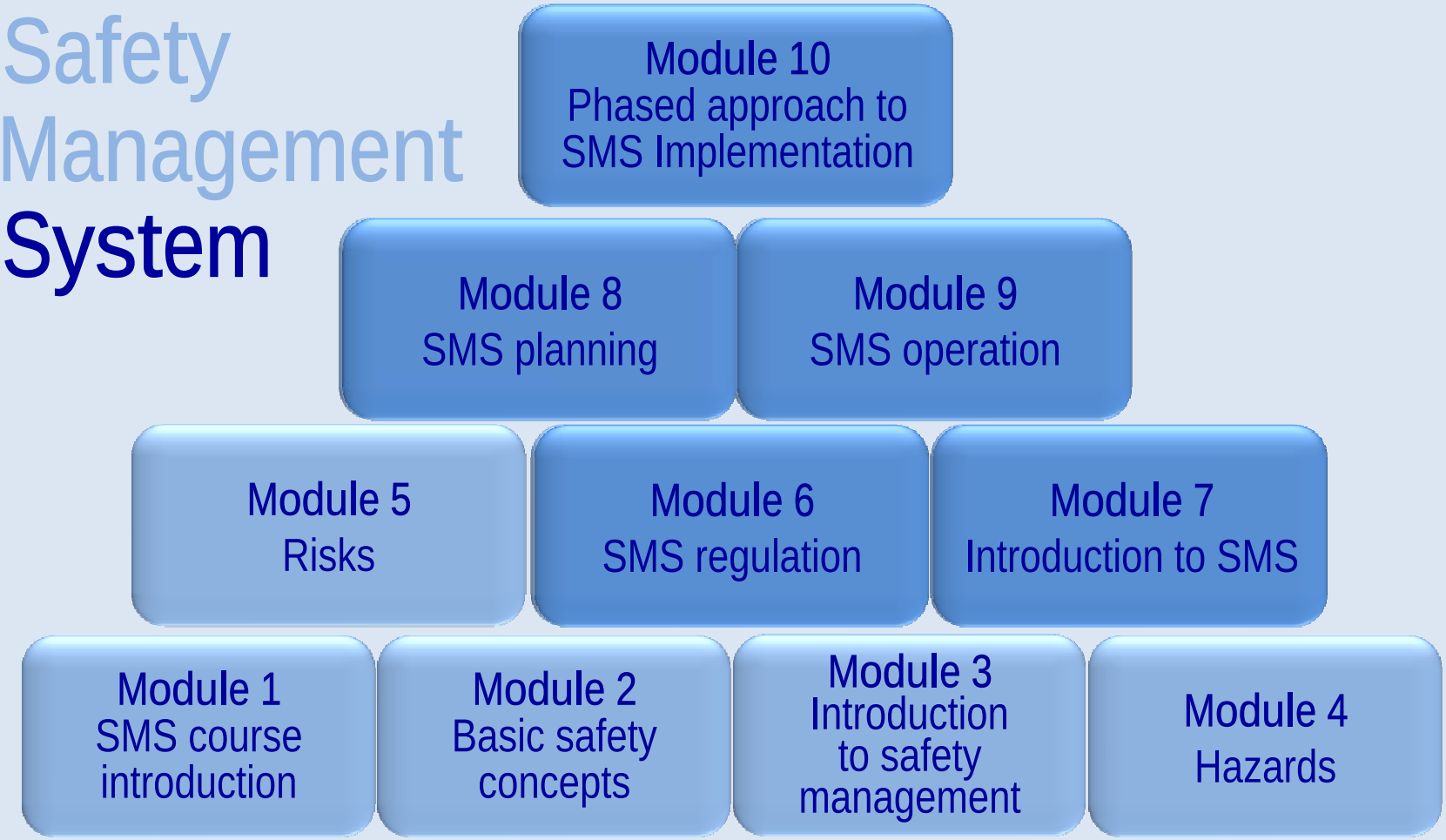
Safety Management Systems (SMS) Course

Module N° 10 – Phased approach to SMS implementation

Building an SMS

Safety Management System



Objective

- *At the end of this module participants will be able to develop a proposal for an SMS standard, based upon a phased implementation, and explain the organization of a State's safety programme.*

Outline

- Why a phased approach to SMS?
- The four phases
- The State's safety programme
- CAAs – Four steps to support SMS implementation
- Points to remember
- Exercise 10/01 – Model of SMS regulation – Outline of an SMS Standard
- Exercise 10/02 – *Collision between two aircraft at Milano-Linate International Airport (See Handout N° 6)*

Why a phased approach to SMS?

- To provide a manageable series of steps to follow in implementing an SMS.
- To effectively manage the workload associated with SMS implementation.
- To pre-empt a “ticking boxes” exercise.
- Four implementation phases are proposed.
- Each phase is based upon the introduction of specific SMS elements.

Phase 1 – Planning

- Provides:
  - a blueprint on how the SMS requirements will be met and integrated to the organization's work activities, and
  - an accountability framework for the implementation of the SMS.

Phase 1 – Planning

1. Identify the accountable executive and the safety accountabilities of managers.

   Elements 1.1 and 1.2

2. Identify the person (or planning group) within the organization responsible for implementing the SMS.

   Element 1.3

3. Describe the system (Air operator, ATC services provider, approved maintenance organization, certified aerodrome)

   Element 1.4

Phase 1 – Planning

4. Conduct a gap analysis of the organization's existing resources compared with the national and international requirements for establishing a SMS.
   Element 1.4
5. Develop an SMS implementation plan that explains how the organization will implement the SMS on the basis of national requirements and international SARPs, the system description and the results of the gap analysis.
   Element 1.4
6. Develop documentation relevant to safety policy and objectives
   Element 1.6
7. Develop and establish means for safety communication
   Element 4.2

Phase 2 – Reactive processes

1. Puts into practice those elements of the SMS implementation plan that refer to the safety risk management component – reactive processes.
   Elements 2.1 and 2.2
2. Training relevant to reactive processes:
   - The SMS implementation plan components.
   - The safety risk management component.

   Element 4.1
3. Documentation relevant to reactive processes :
   - The SMS implementation plan components.
   - The safety risk management component.

   Elements 1.4 and 1.6

Phase 3 – Proactive and predictive processes

1. Puts into practice those elements of the SMS implementation plan that refer to the safety risk management component – proactive and predictive processes.

   Elements 2.1 and 2.2

2. Training relevant to proactive and predictive processes.

   Element 4.1

3. Documentation relevant to proactive and predictive processes.

   Elements 1.4 and 1.6

Phase 4 – Operational safety assurance

1. Development of acceptable level (s) of safety
2. Development of safety indicators and targets
3. SMS continuous improvement

   Elements 3.1, 3.2 and 3.3
4. Training relevant to operational safety assurance

   Element 4.1
5. Documentation relevant to operational safety assurance

   Element 1.6

The bridge

Civil Aviation Authority

Service Providers SMS

State's safety programme

- Definition
  - *An integrated set of regulations and activities aimed at improving safety.*

State’s safety programme

- Implementation
  - Develop the State’s safety programme around the following four components:
    1. State’s safety policy and objectives
    2. State’s safety risk management
    3. State’s safety assurance
    4. State’s safety promotion

State’s safety programme components

1. State’s safety policy and objectives

- How the CAA will oversee the management of safety in the State.
  - A definition of CAA requirements, responsibilities and accountabilities regarding the State’s safety programme.
  - Similar to the equivalent SMS component.

State's safety programme components

2. State's safety risk management

- Establishment of controls which govern how service providers SMS will operate:
  - Standards/requirements for service providers SMS
  - Same processes as SMS
    - Hazard identification and risk management
  - Different outputs
    - New/modified rules and/or regulations (i.e., controls) which govern how service providers SMS operate.

State’s safety programme components

3. State’s safety assurance

- Ensuring that the operation of service providers SMS follows established controls (standards / requirements)
  - Oversight, inspections and audits
  - Data tracking and analysis
    - Data driven targeting of oversight on areas of greater concern/need.

State’s safety programme components

4. State’s safety promotion

- Support the integration of the State safety programme with the operation of service providers SMS
  - Training, communication and dissemination of safety information
  - Dual-track promotion
    - Within the CAA
    - Among service providers it oversees

State’s safety programme framework

1. State’s safety policy and objectives
   - 1.1 CAA safety standards
   - 1.2 CAA safety responsibilities and accountabilities
   - 1.3 Accident and incident investigation
   - 1.4 Enforcement policy
2. State’s safety risk management
   - 2.1 Safety requirements for service providers SMS
   - 2.2 Approval of service providers acceptable levels of safety
3. State’s safety assurance
   - 3.1 Safety oversight
   - 3.2 Safety data collection, analysis and exchange
   - 3.3 Safety data driven targeting of oversight on areas of greater concern or need
4. State’s safety promotion
   - 4.1 Internal training, communication and dissemination of safety information
   - 4.2 External training, communication and dissemination of safety information

CAAs – Four steps to support SMS implementation

STEP 1 – State's safety programme gap analysis:

- Conduct a gap analysis vis-à-vis the current status in the State of the following:

1. State's safety policy and objectives
   - 1.1 CAA safety standards
   - 1.2 CAA safety responsibilities and accountabilities
   - 1.3 Accident and incident investigation
   - 1.4 Enforcement policy
2. State's safety risk management
   - 2.1 Safety requirements for service providers SMS
   - 2.2 Approval of service providers acceptable levels of safety
3. State's safety assurance
   - 3.1 Safety oversight
   - 3.3 Safety data driven targeting of oversight on areas of greater concern or need
4. State's safety promotion
   - 4.1 Internal training, communication and dissemination of safety information
   - 4.2 External training, communication and dissemination of safety information

CAAs – Four steps to support SMS implementation

STEP 2 – CAA training programme:

- Develop a training programme for CAA officers to:
  - provide knowledge of safety management concepts and ICAO SARPs on safety management in Annexes 6, 11 and 14, and related guidance material; and
  - develop knowledge to certify and oversee the implementation of key components of an SMS, in compliance with the national regulations and relevant ICAO SARPs.

CAAs – Four steps to support SMS implementation

STEP 3 – Implementation SMS SARPs:

- Develop SMS regulations for operators/service providers.
  - Refer to the SMS components and elements as per the ICAO SMS training course.
- Prepare guidance material for the implementation of SMS.
  - Refer to ICAO Doc 9859 and the ICAO SMS training course.

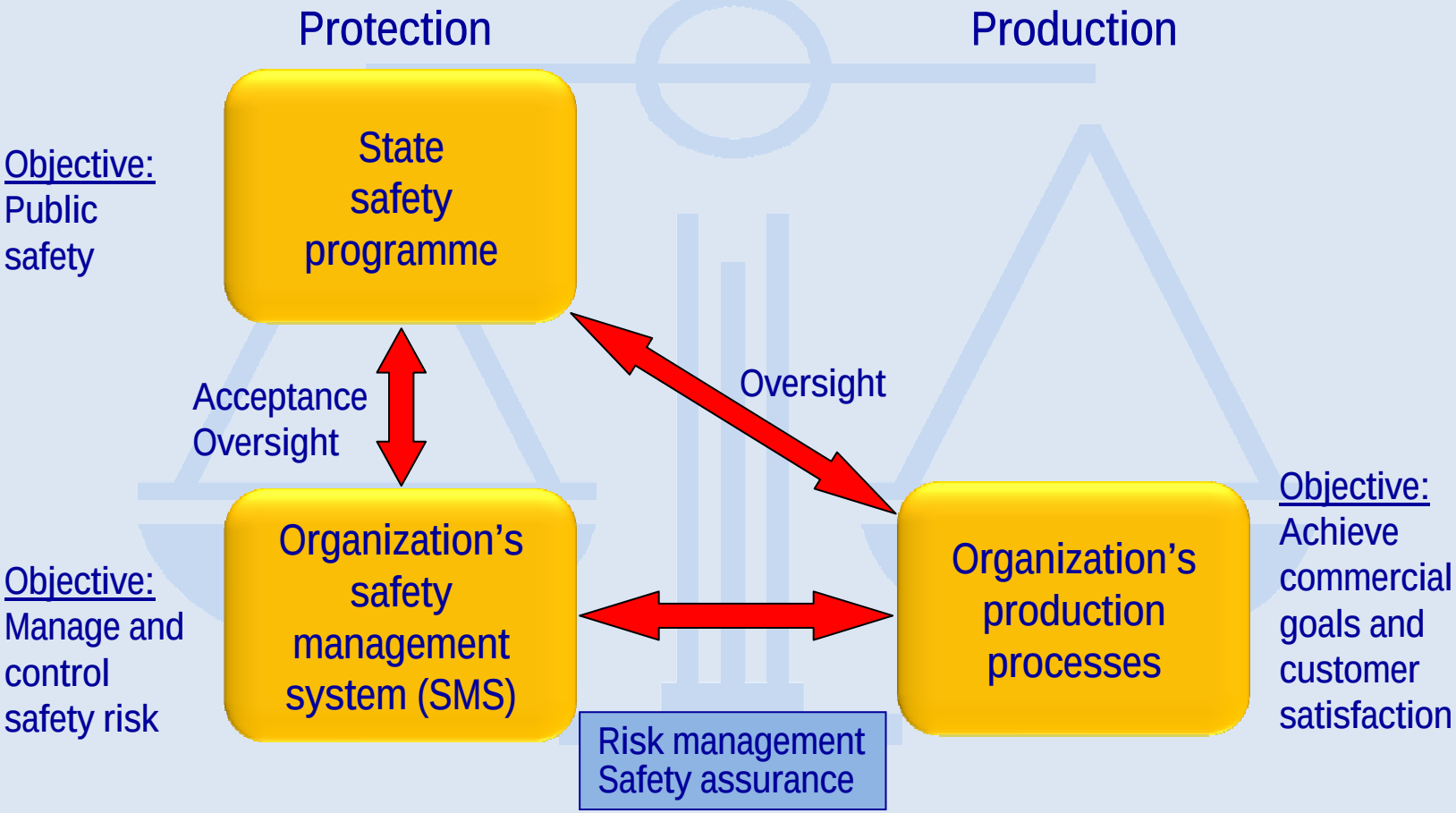
CAAs – Four steps to support SMS implementation

STEP 4 – CAA enforcement policy:

- As part of the State's safety programme, revise the CAA's enforcement policy.
  - Operators/service providers allowed to deal with deviations/minor violations internally, within the context of the SMS, to the satisfaction of the authority.
  - Gross negligence, wilful deviation and so forth to be dealt through established enforcement procedures.

A vision of the future – Integration

State's safety programme + Service providers SMS =
Integrated safety system



Points to remember

1. *Reduce a complex task to series of manageable steps.*
2. *Avoid a bureaucratic exercise (“Ticking boxes”).*
3. *Element allocation under a particular phase may slightly vary depending upon the specific Annex.*
4. *The State’s safety programme*
5. *The CAAs four steps to support SMS implementation.*

Phased approach to SMS implementation

Exercise 10/01 – Model of SMS regulation – Outline of a SMS standard

Model of SMS regulation – Outline of a SMS Standard

- Group activity:
  - A facilitator will be appointed, who will coordinate the discussion.
  - A summary of the discussion will be written on flip charts, and a member of the group will brief on their findings in a plenary session.

Model of SMS regulation – Outline of a SMS Standard

- Group assignment:
  - On the basis of what was presented and discussed in modules 6 to 9, develop a model of SMS regulation, that addresses the following three general areas:
    1. Scope and application
    2. Main definitions *(Do not develop)*
    3. General contents *(Only headlines)* of the SMS regulation

Phased approach to SMS implementation

Exercise 10/02 – Collision between two aircraft at Milano-Linate International Airport *(Handout N° 6)*

Milano-Linate International Airport accident

- Group activity:
  - A facilitator will be appointed, who will coordinate the discussion.
  - A summary of the discussion will be written on flip charts, and a member of the group will brief on their findings in a plenary session.

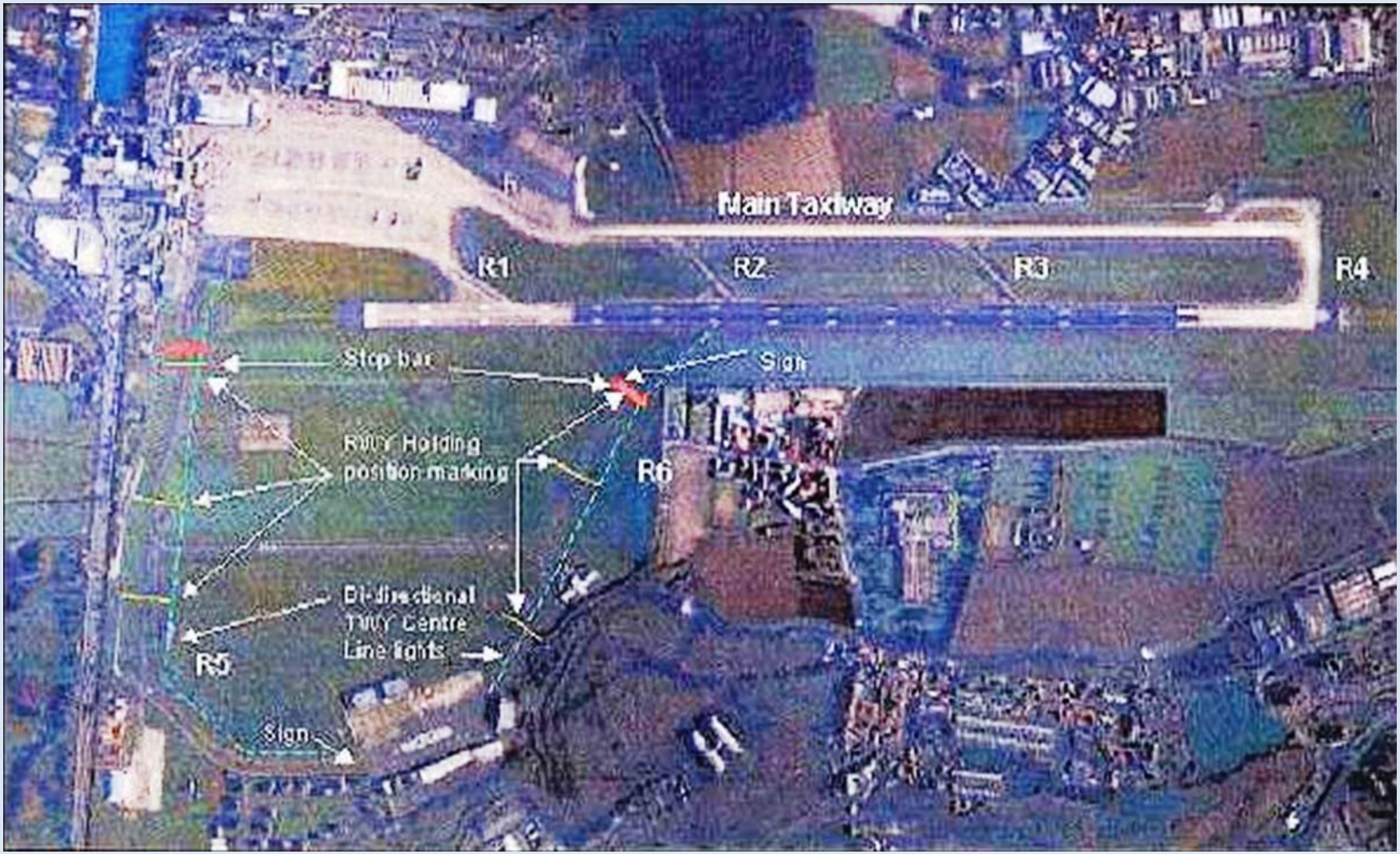
Milano-Linate International Airport accident

- Scenario
  - An MD-87 taxied to the holding point for runway 36R. Heavy fog had delayed the flight by more than one hour. While the visibility was improving, RVR was still only 225 metres.
  - A Cessna Citation parked at the West Apron was cleared to taxi via taxiway Romeo 5 and to report reaching the first holding point. The crew read the clearance back correctly, but entered taxiway Romeo 6.

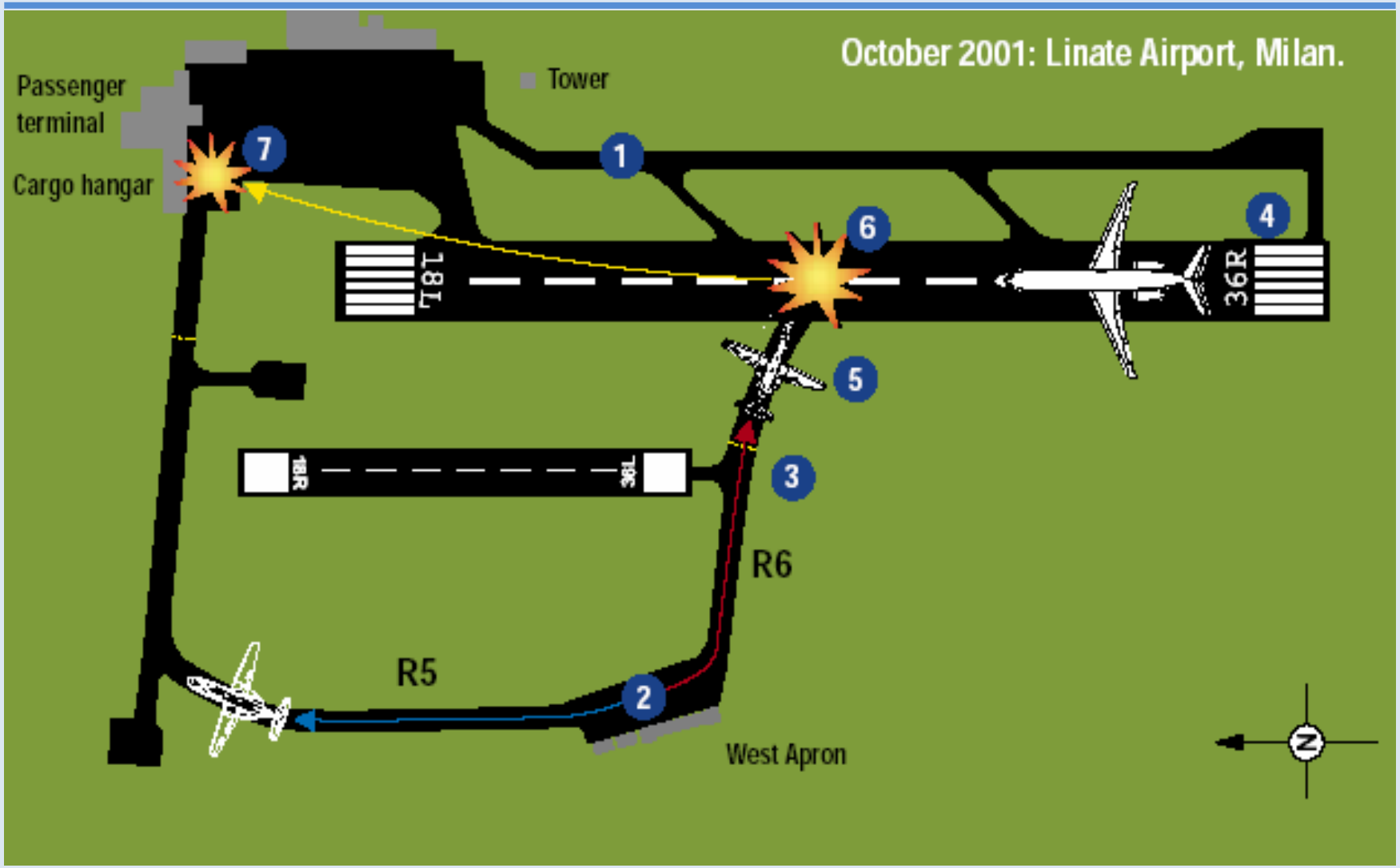
Milano-Linate International Airport accident

- ... Scenario
  - The Cessna Citation's crew called for clearance to proceed from the Romeo 5 holding point though it was in fact at the Romeo 6 holding point.
  - The MD-87 was cleared for take-off.
  - The Cessna Citation crossed the holding point for runway 36R-18L.
  - The two aircraft collided.
  - The MD-87 skidded off the runway into a baggage hangar adjacent to the passenger terminal.

Milano-Linate International Airport accident



Milano-Linate International Airport accident



Milano-Linate International Airport accident

Milano-Linate International Airport accident

Milano-Linate International Airport accident

- After analysis of evidence available and information gathered, it can be assumed that the immediate cause for the accident has been the runway incursion in the active runway by the Cessna.

- The obvious consideration is that the human performance issues related to the Cessna crew – during low visibility conditions – must be weighted against the scenario that allowed the course of events that led to the fatal collision.

Milano-Linate International Airport accident

- Equally it can be stated that the system in place at Milano-Linate aerodrome was not geared to trap misunderstandings, inadequate procedures, human errors and faulty airport layout.
- The aerodrome standard did not comply with ICAO Annex 14.
- No functional Safety Management System (SMS) was in operation.

Milano-Linate International Airport accident

- Group assignment – Task Nº 1
  - List the type of operation or activity.
  - State the generic hazard(s)
  - State the specific components of the hazard(s).
  - State the hazard-related consequences and assess the risk(s).
  - Assess existing defences to control the risk(s) and resulting risk index.
  - Propose further action to reduce the risk(s) and resulting risk index.
  - Establish individual responsibility to implement the risk mitigation
  - Complete the following Table 10/01.

Table 10/01 – Hazard identification and risk management

Nº	Type of operation or activity	Generic hazard	Specific components of the hazard	Hazard-related consequences	Existing defences to control risk(s) and risk index	Further action to reduce risk(s) and resulting risk index	Responsible person
1					*Risk index:* *Risk tolerability:*	*Risk index:* *Risk tolerability:*	
2					*Risk index:* *Risk tolerability:*	*Risk index:* *Risk tolerability:*	
3					*Risk index:* *Risk tolerability:*	*Risk index:* *Risk tolerability:*	
4					*Risk index:* *Risk tolerability:*	*Risk index:* *Risk tolerability:*	
5					*Risk index:* *Risk tolerability:*	*Risk index:* *Risk tolerability:*	

Milano-Linate International Airport accident

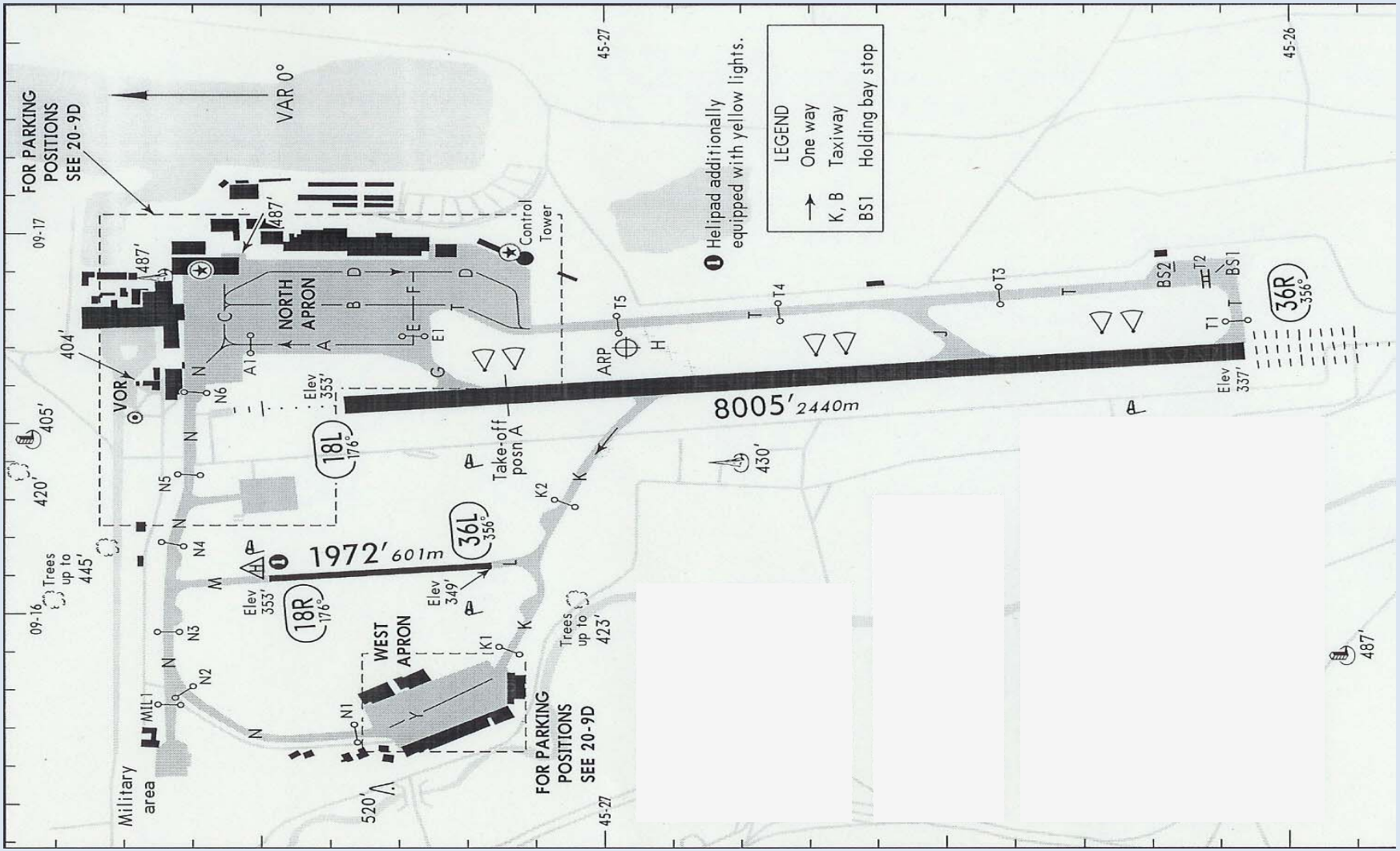
❖ Group assignment – Task Nº 2

- The accident investigation has identified that no functional Safety Management System (SMS) was in operation at Milano-Linate International Airport.
- Therefore you should:
  - Develop a SMS implementation plan for Milano-Linate International Airport
  - Complete the Gantt the following Table 10/02 – SMS implementation plan.

Table 10/02 – SMS implementation plan

Nº	Component/element	Date:				Date:				Date:				Date:			

Milano-Linate actual aerodrome layout



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