

AEROPORTI ITALIANI

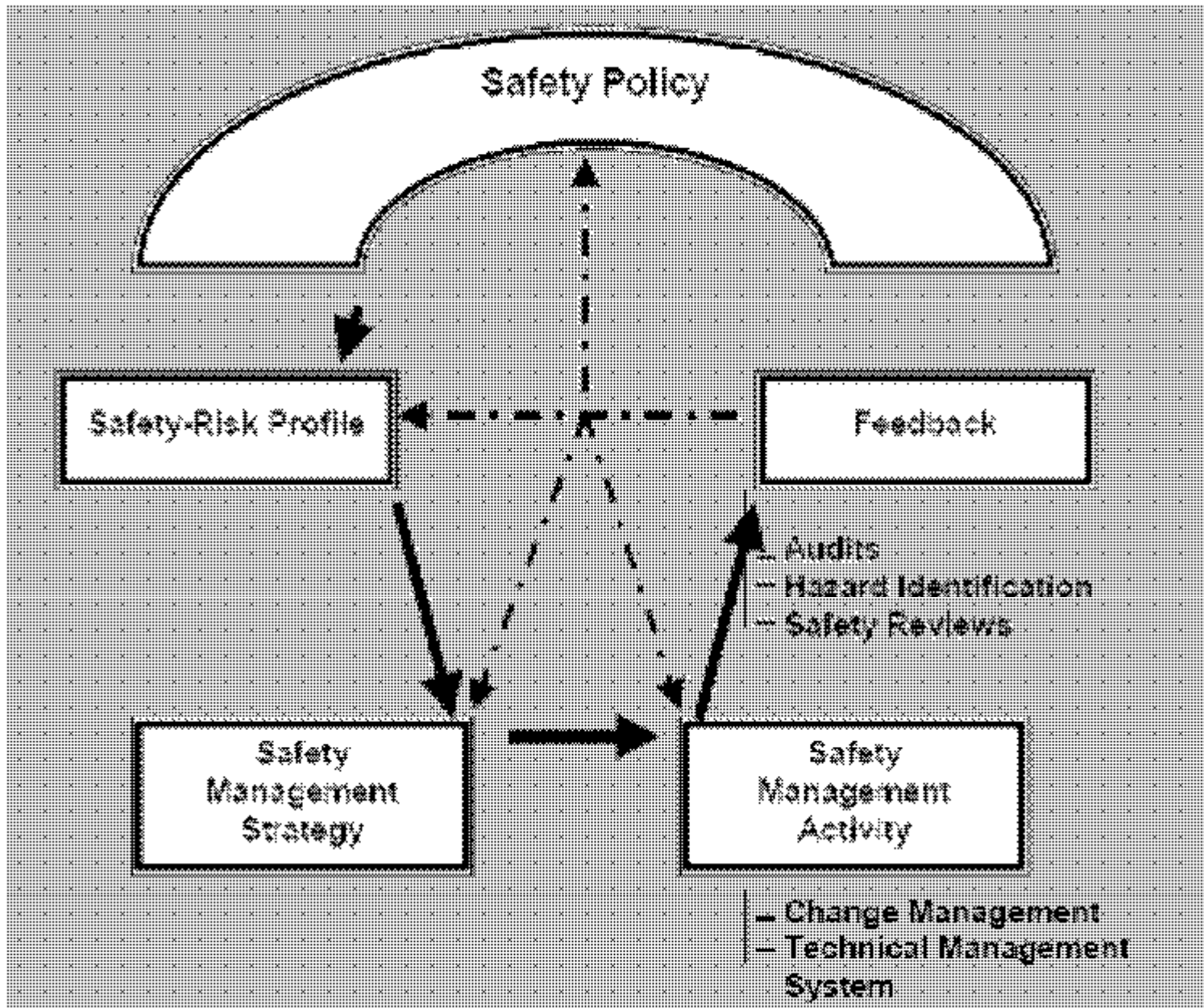
&

SAFETY MANAGEMENT SYSTEM

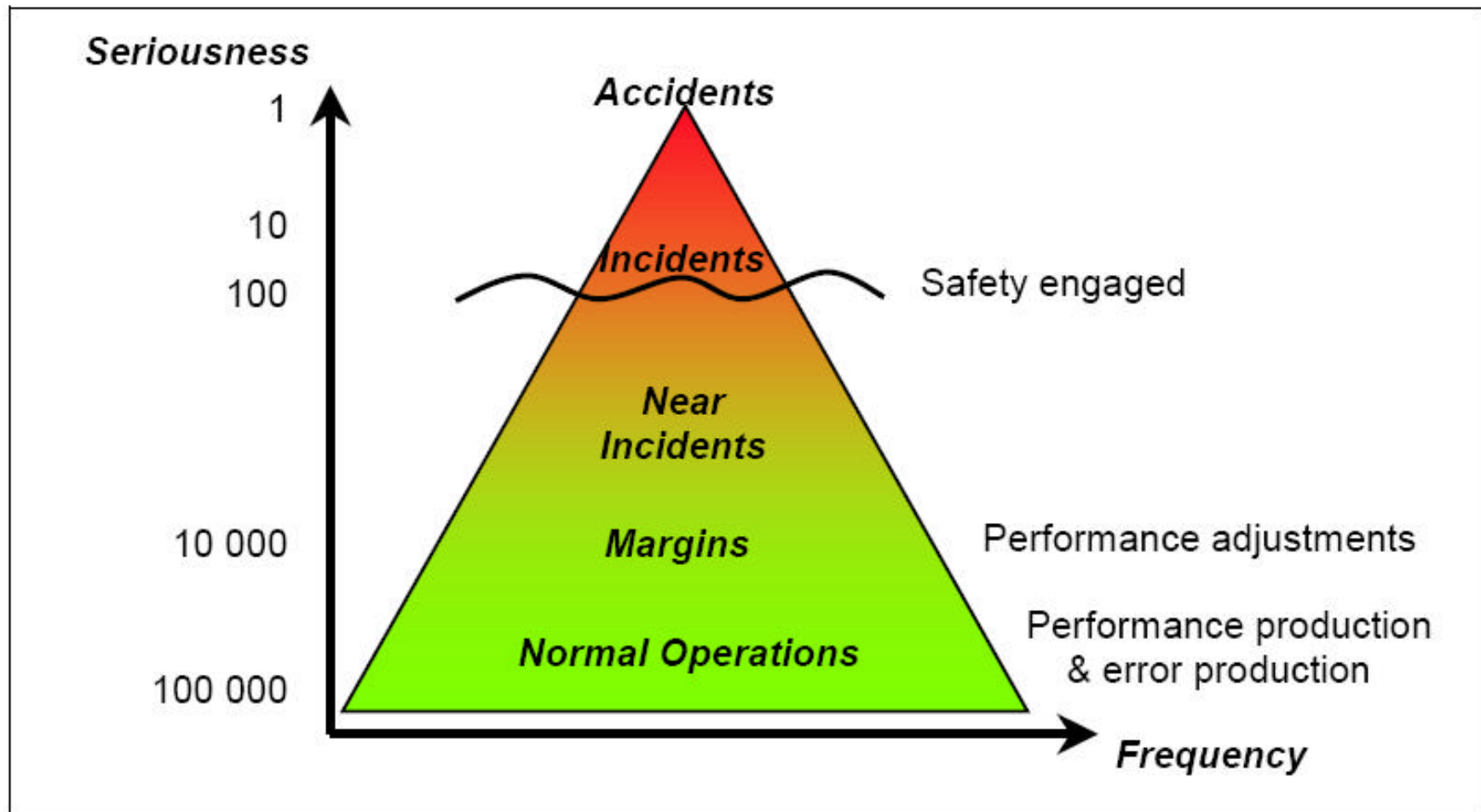
WORKING

PAPERS

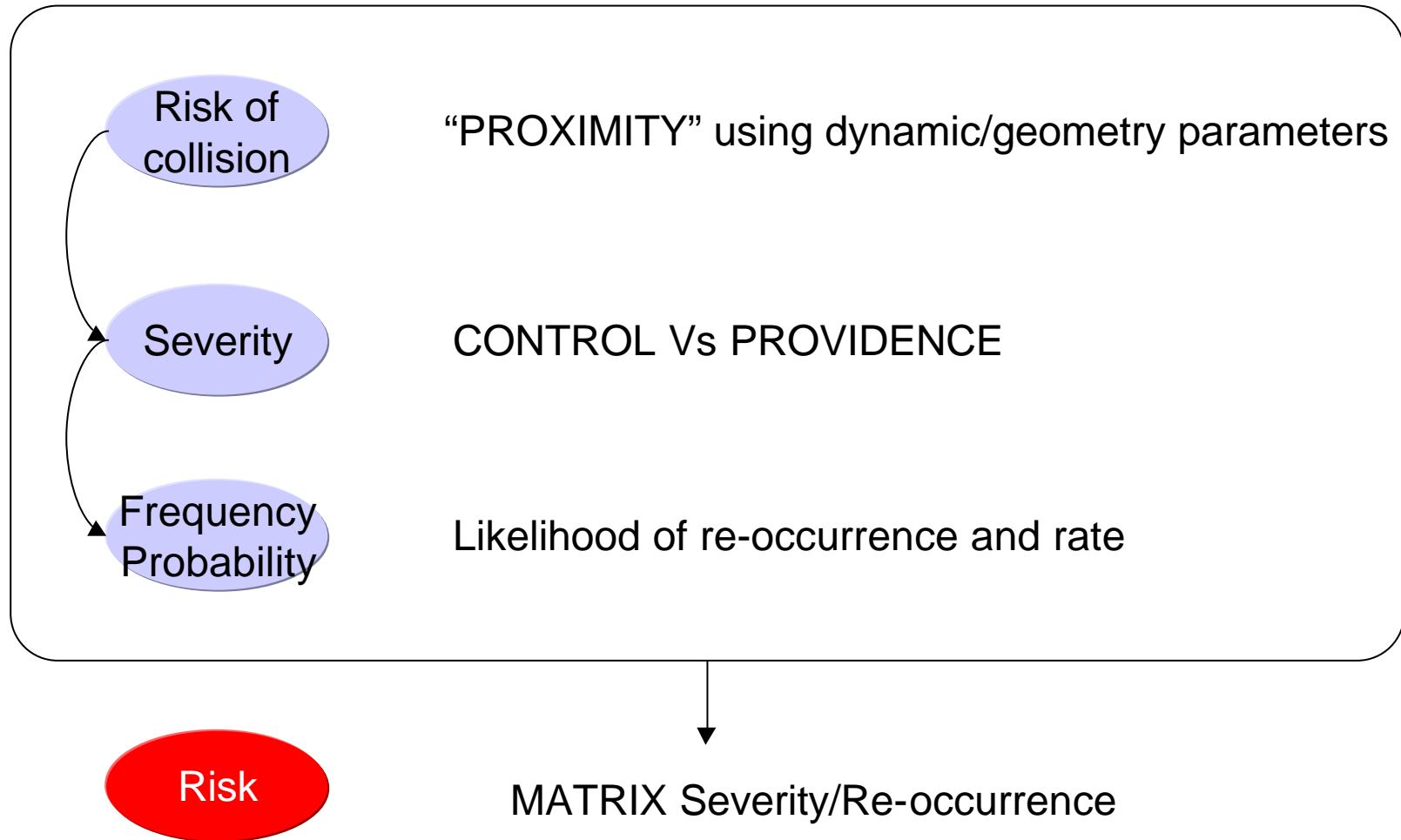
21 MARZO 2006



RELAZIONE TRA INTENSITA E FREQUENZA DEGLI EVENTI



MATRICE



CLASSIFICATION

very frequent frequent occasional rare extremely rare	1	E1	D1	C1	B1	A1
	2	E2	D2	C2	B2	A2
	3	E3	D3	C3	B3	A3
	4	E4	D4	C4	B4	A4
	5	E5	D5	C5	B5	A5
		E	D	C	B	A
		no safety effect	not determined	significant	major	serious

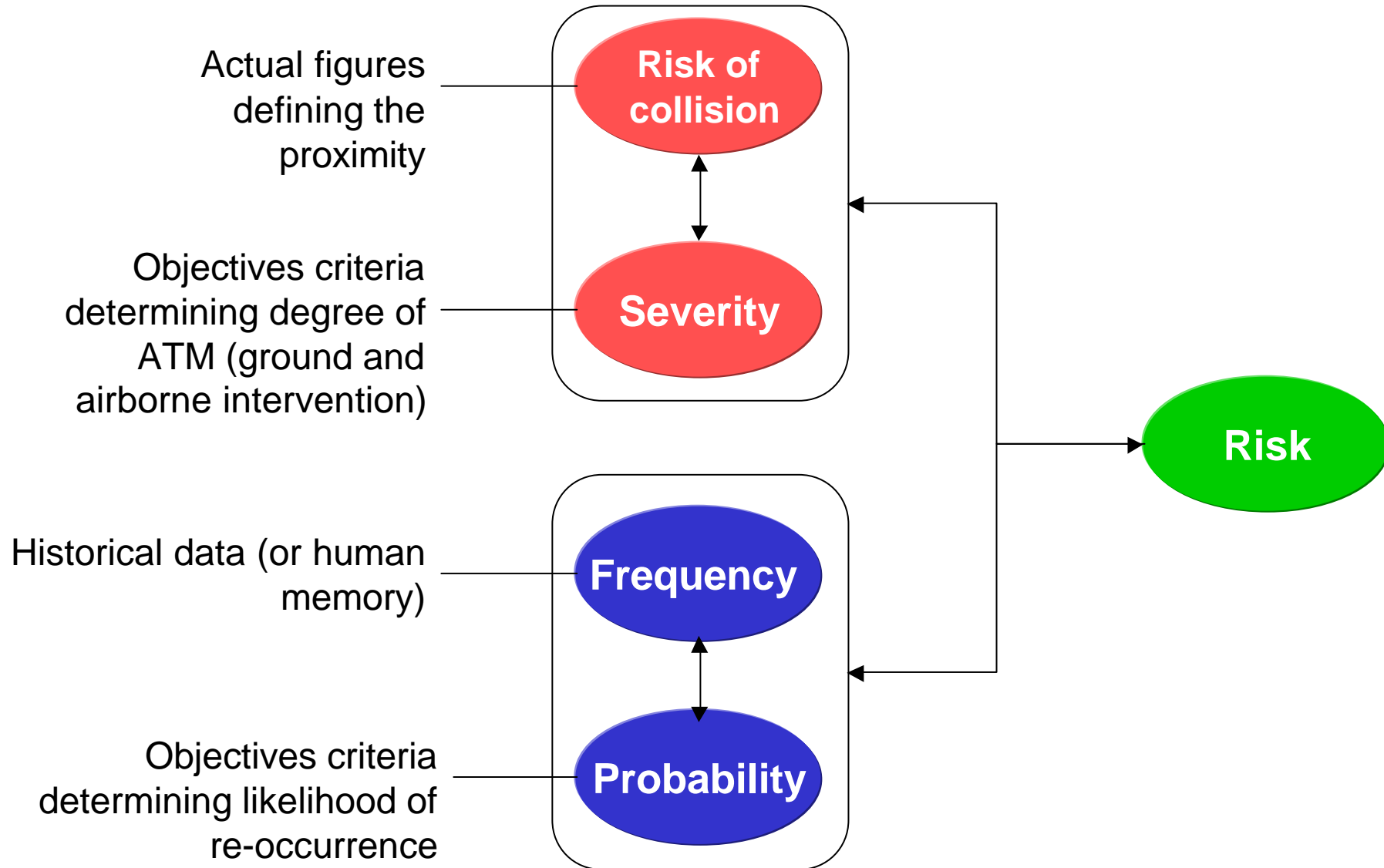
CLASSIFICATION

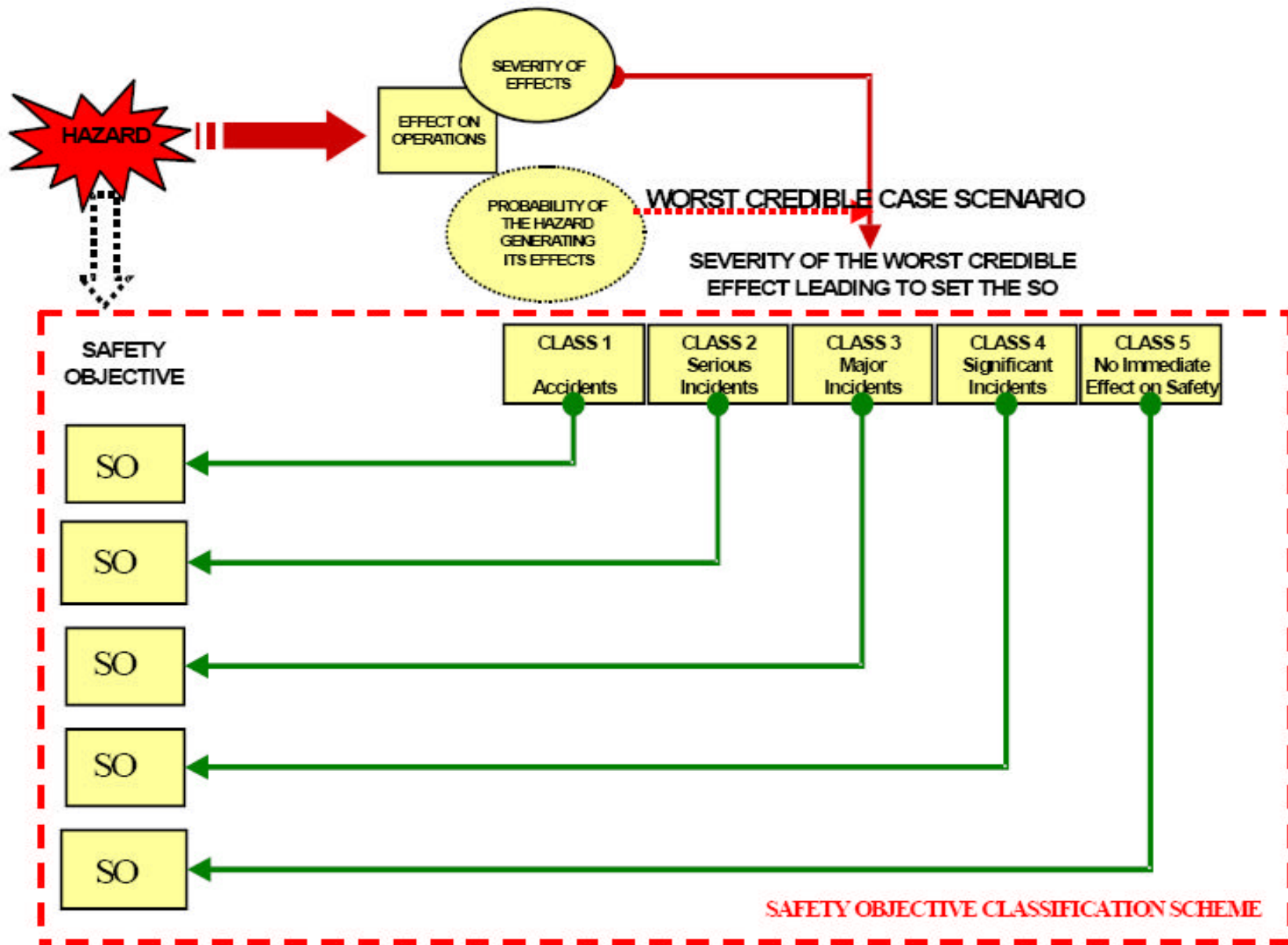
very frequent frequent occasional rare extremely rare	1	E1	D1	C1	B1	A1	AA1
	2	E2	D2	C2	B2	A2	AA2
	3	E3	D3	C3	B3	A3	AA3
	4	E4	D4	C4	B4	A4	AA4
	5	E5	D5	C5	B5	A5	AA5
		E	D	C	B	A	AA
		no effect on ATM services	not determined	Ability to provide safe but degraded services	Partial inability to provide safe ATM services	Serious inability to provide safe ATM services	Total inability to provide safe ATM services

VALUTAZIONE SCHEMI ATTUALI

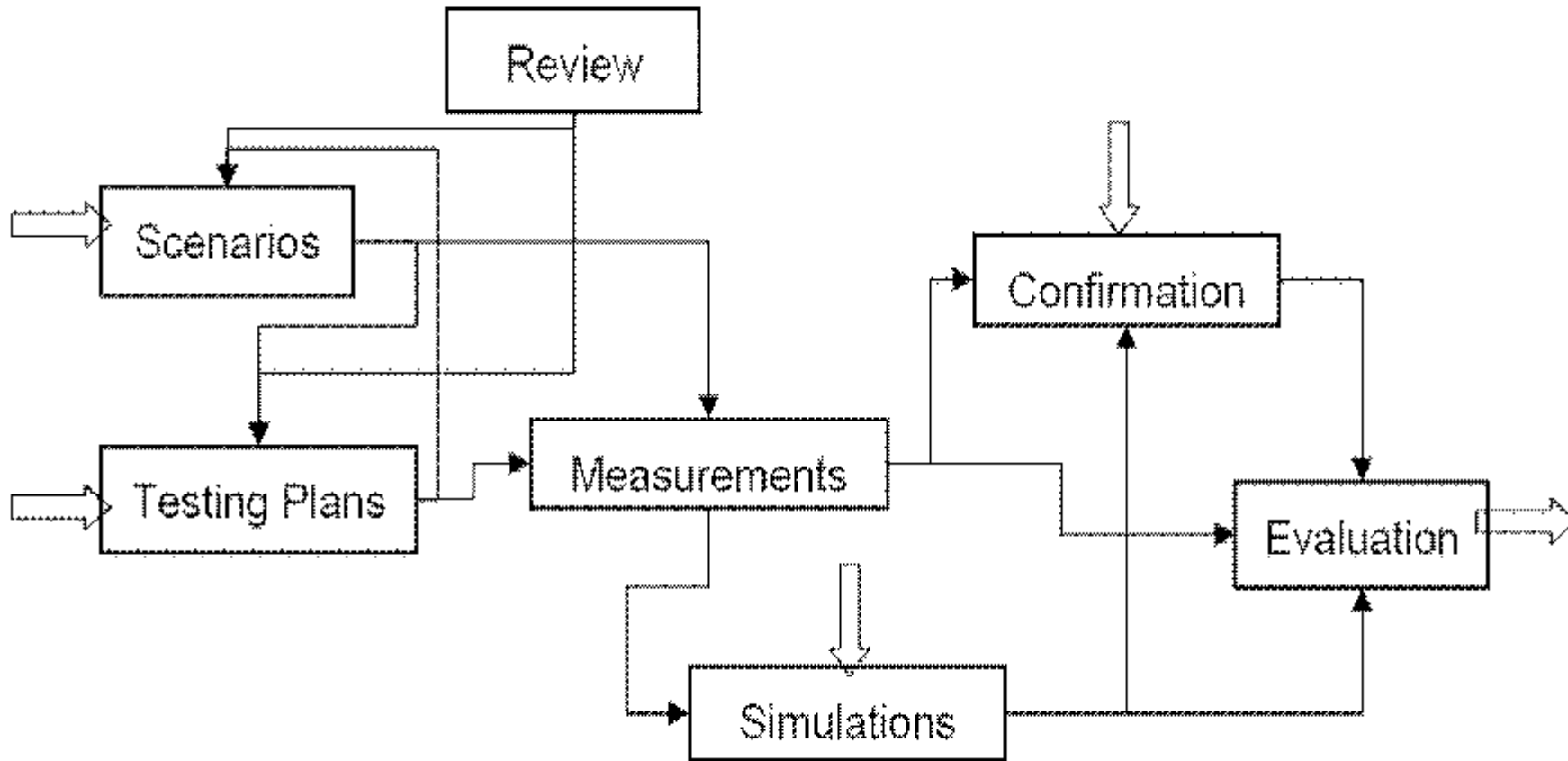
scheme criteria		NATS	SCTA	UK SRG	UK AB	ICAO AIRPROX	ASR
Scope	ATM (global)	no	no	no	no	no	no
	ATM (Ground)	yes	yes	yes	yes	yes	yes
	ATM (specific)	no	no	no	no	no	no
Risk of collision		yes	yes	yes	yes	yes	yes
Severity		yes	yes	yes	yes	no	yes
Frequency		no	no	yes	no	no	no
Probability		no	no	no	no	no	no
Risk		no	no	yes	no	no	no

METODOLOGIA PROPOSTA

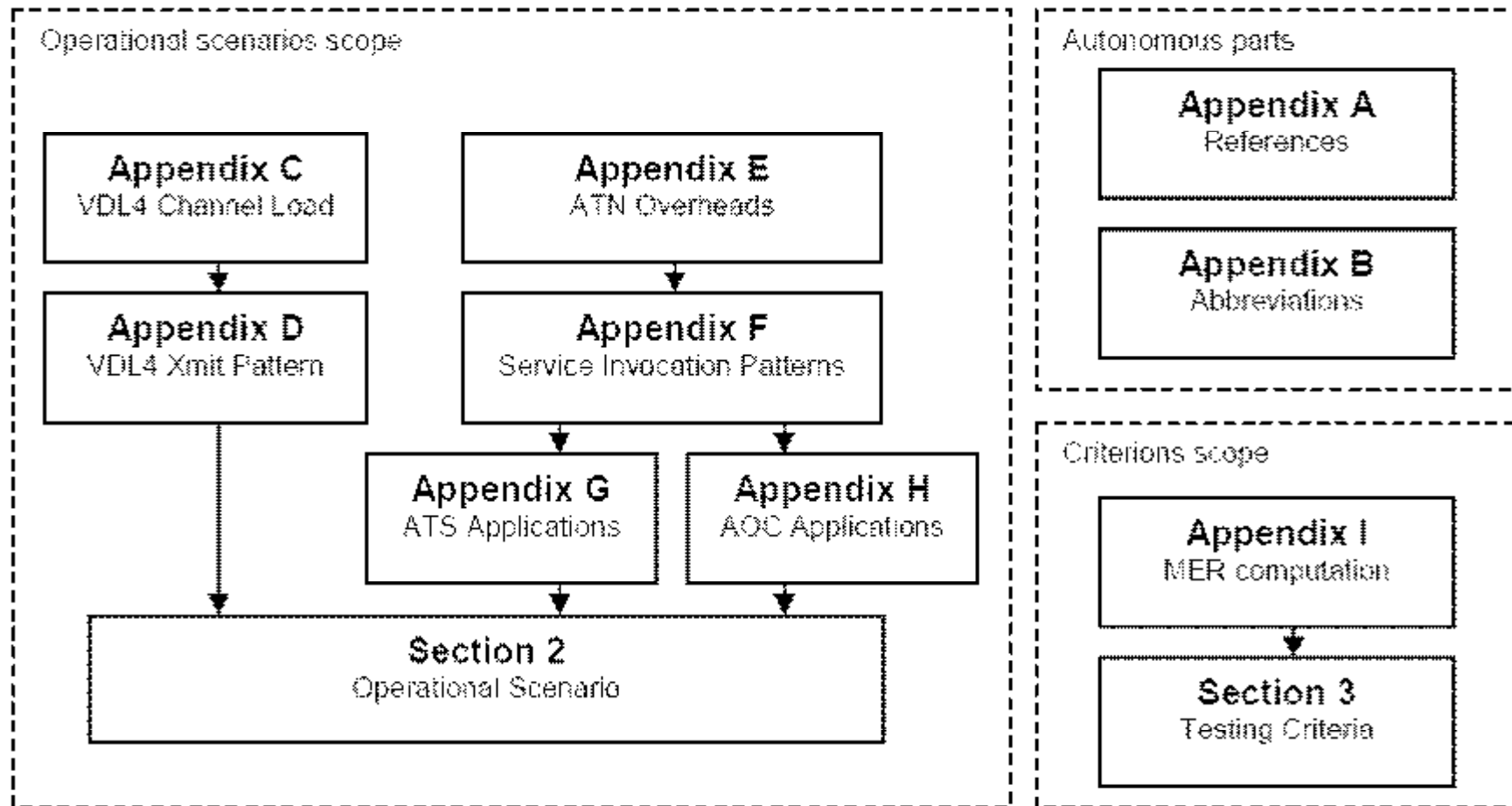




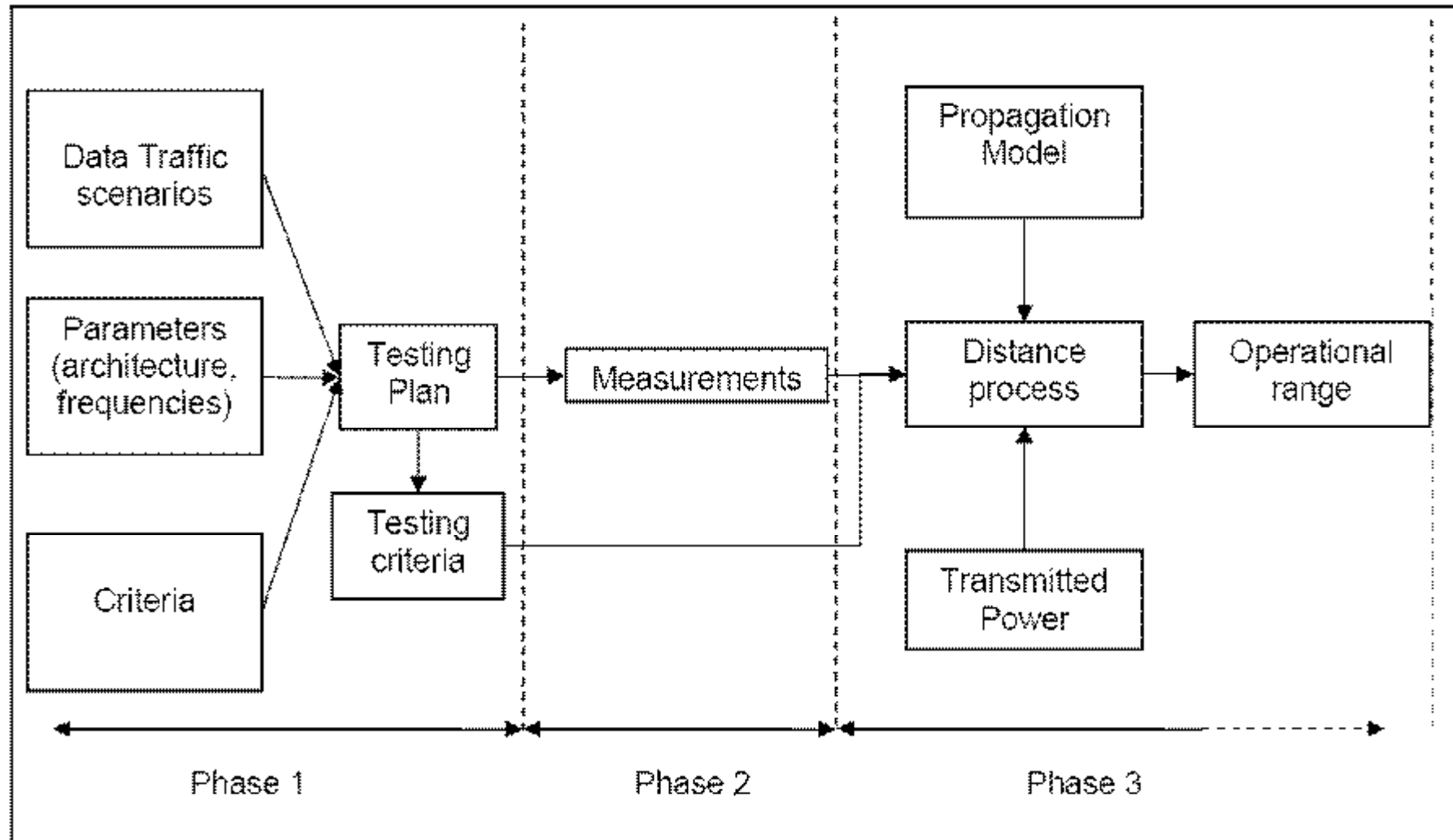
INTERAZIONI E SEQUENZE



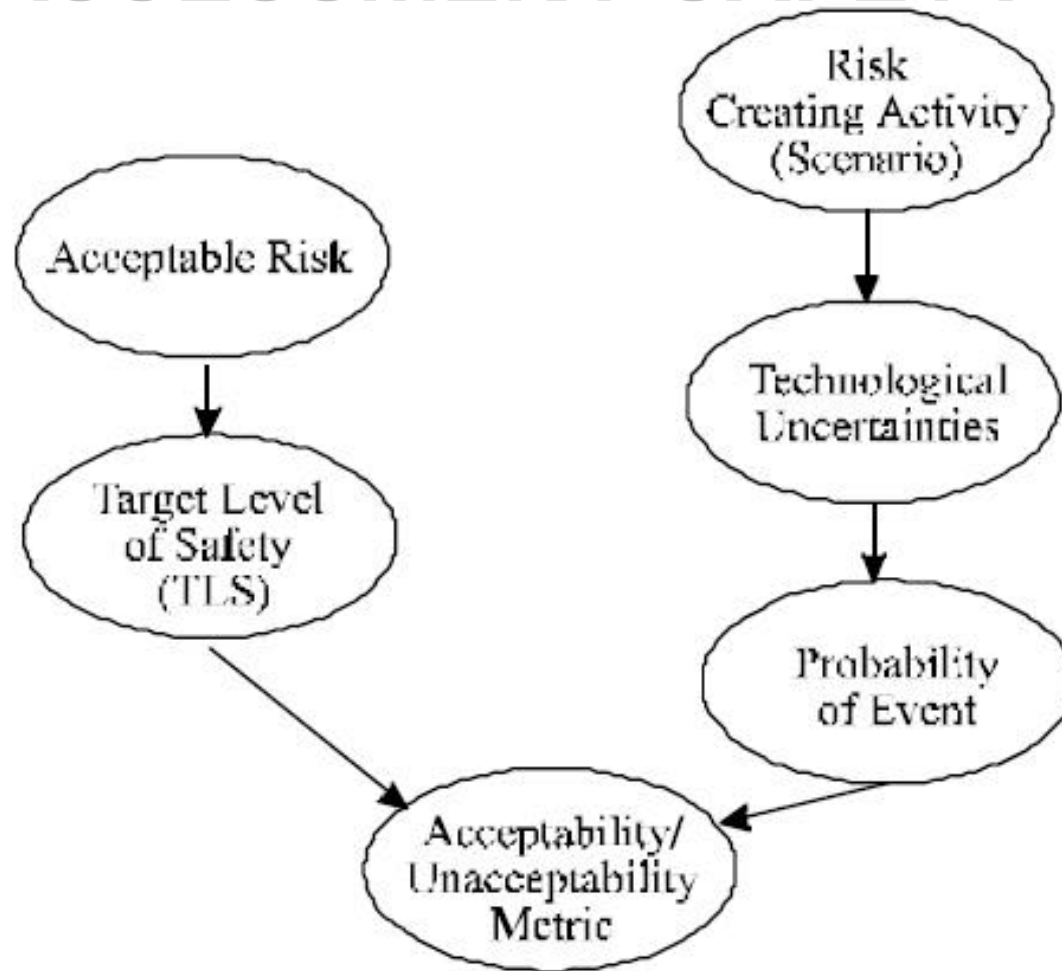
SCENARIO OPERATIVO



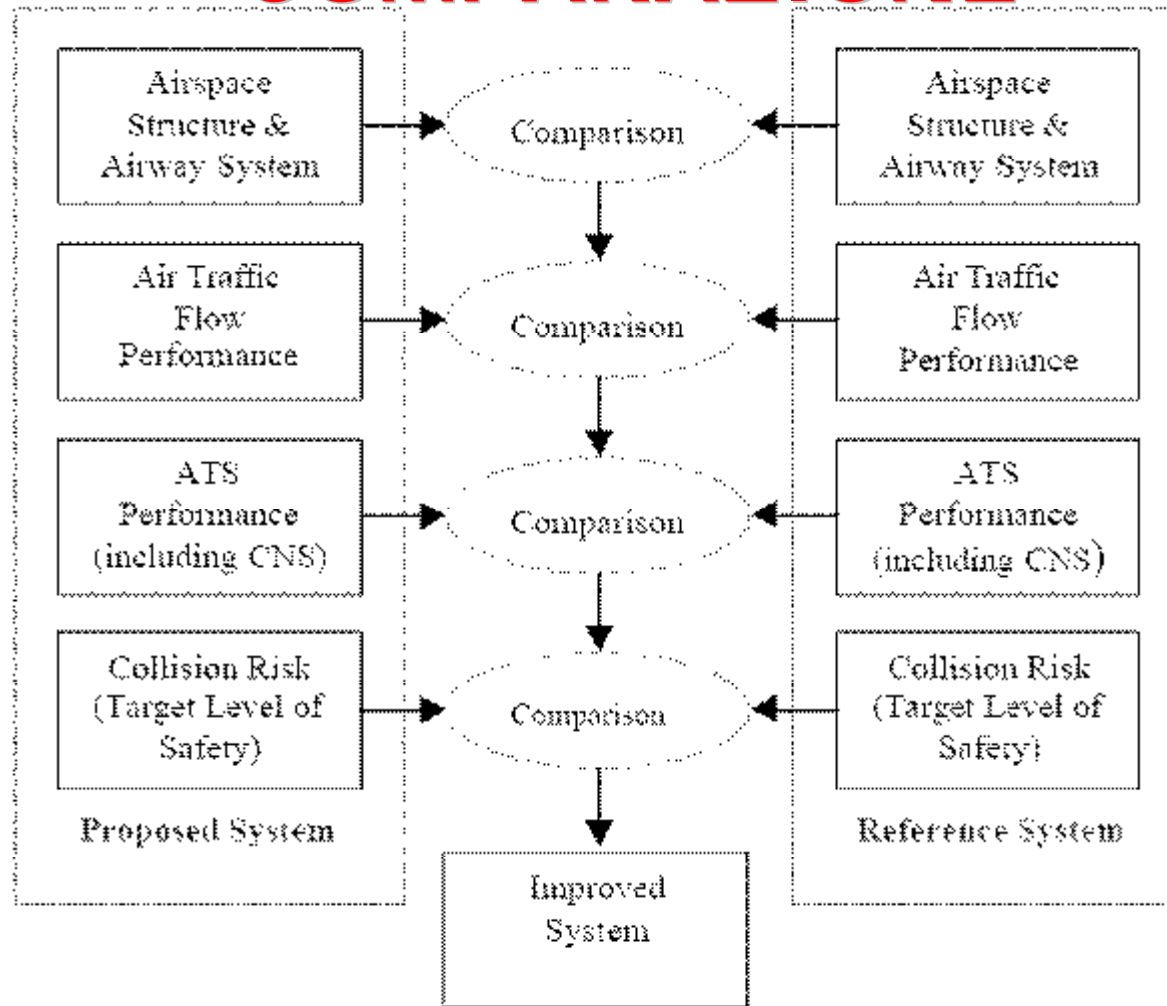
METODOLOGIA : PANORAMA



METODOLOGIA GENERICA ASSESSMENT SAFETY LEVEL



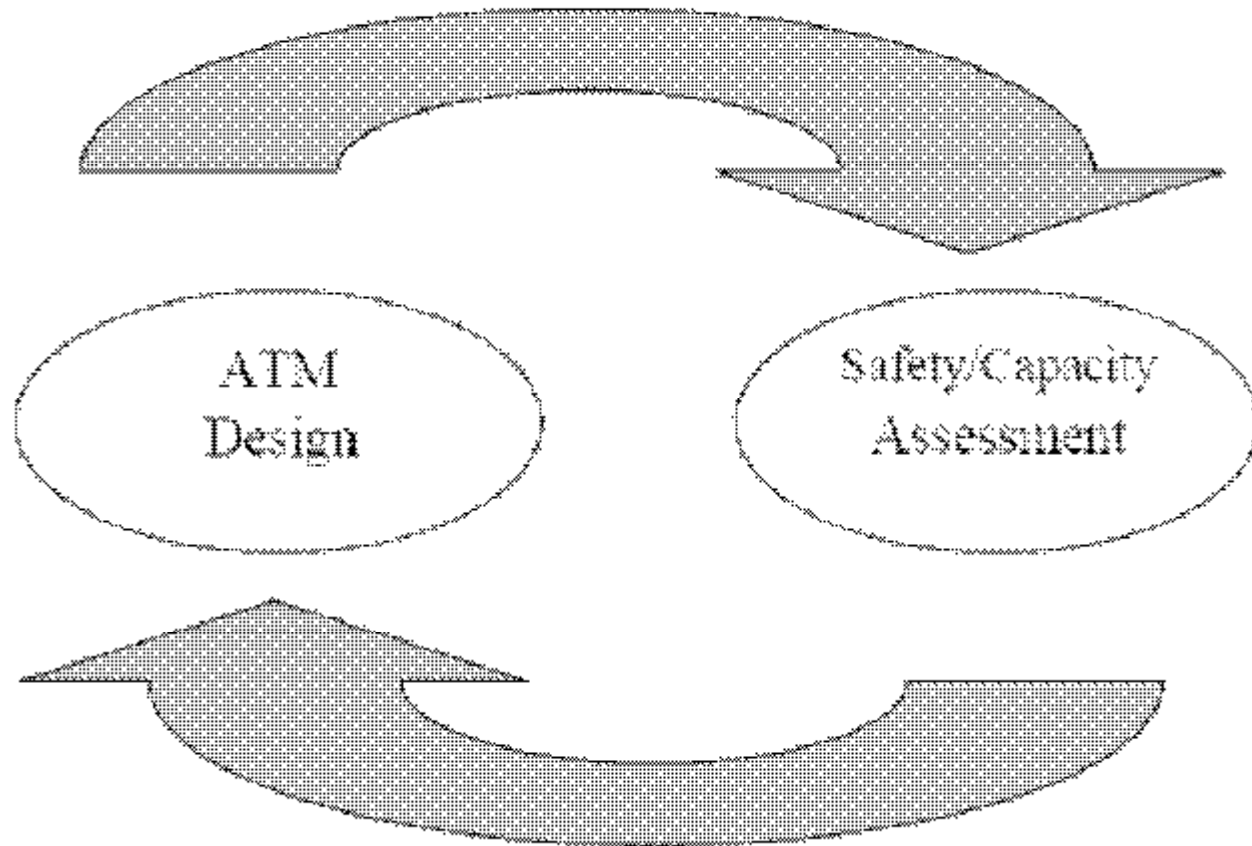
ICAO: METODOLOGIA BASE E COMPARAZIONE



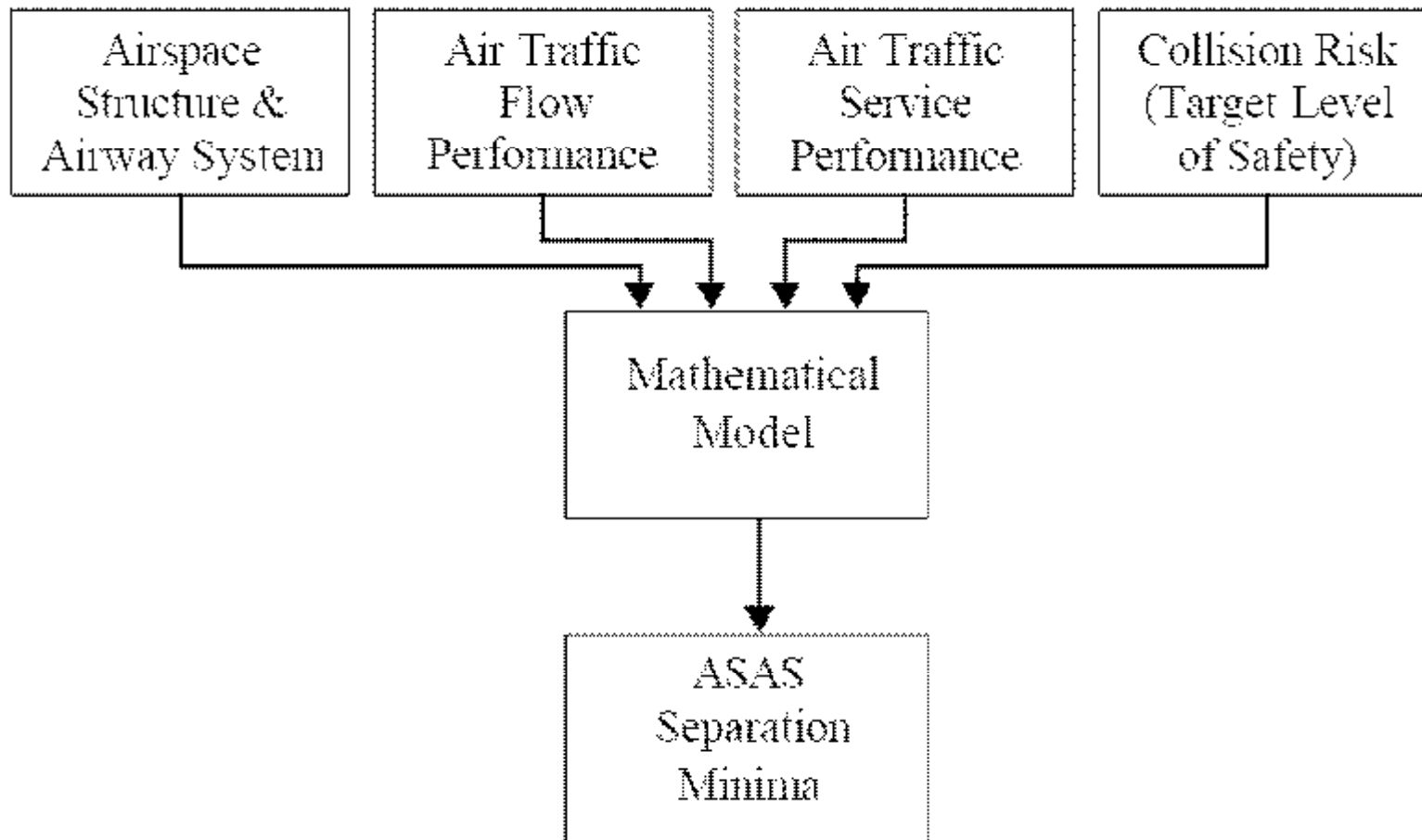
HAZARD: CLASSIFICAZIONE MATRICE

1 Catastrophic	2 Hazardous	3 Major	4 Minor	5 No effect
Complete loss of safety margin	Large reduction in safety margins	Significant reduction in safety margins	Slight reduction in safety margins	No effect on safety margins
An operational hazard that has the potential for one or more catastrophic accidents.	An operational hazard that has the potential for one or more aircraft to deviate from their cleared route of flight such that collision or terrain avoidance manoeuvres are required to avoid a catastrophic accident.	An operational hazard that has the potential for one or more aircraft to deviate from their cleared route of flight such that surveillance and communication combined with ATC or flight crew procedures provide the capability to detect and correct the deviation.	An operational hazard that in itself has no direct impact on the safety of flight operations but has the potential to affect safety either indirectly or in combination with other hazards, for example, by increasing the workload of the controller, flight crew, or by degrading a functional capability needed in the provision of an Air Traffic Service used in the mitigating string for an operational hazard.	An operational event that can result in no hazardous condition, that is, has no potential for direct or indirect impact to the safety of flight operations.
Complete loss of separation from another aircraft, terrain, objects, or obstacles.	Large reduction in separation as for example in a near mid-air collision.	Significant reduction in separation between aircraft.	Slight reduction in separation.	
Operational hazard results in a complete loss of flight control.	Small number of fatalities, numerous severe injuries, and/or major aircraft or system damage.	Minor injuries and/or minor damage to aircraft or systems.	Physical discomfort and/or negligible damage to aircraft or systems.	
No independent source of mitigation, such as ATC intervention and/or flight crew procedures could reasonably be expected to prevent a catastrophic accident				
Many fatalities and/or hull loss.				

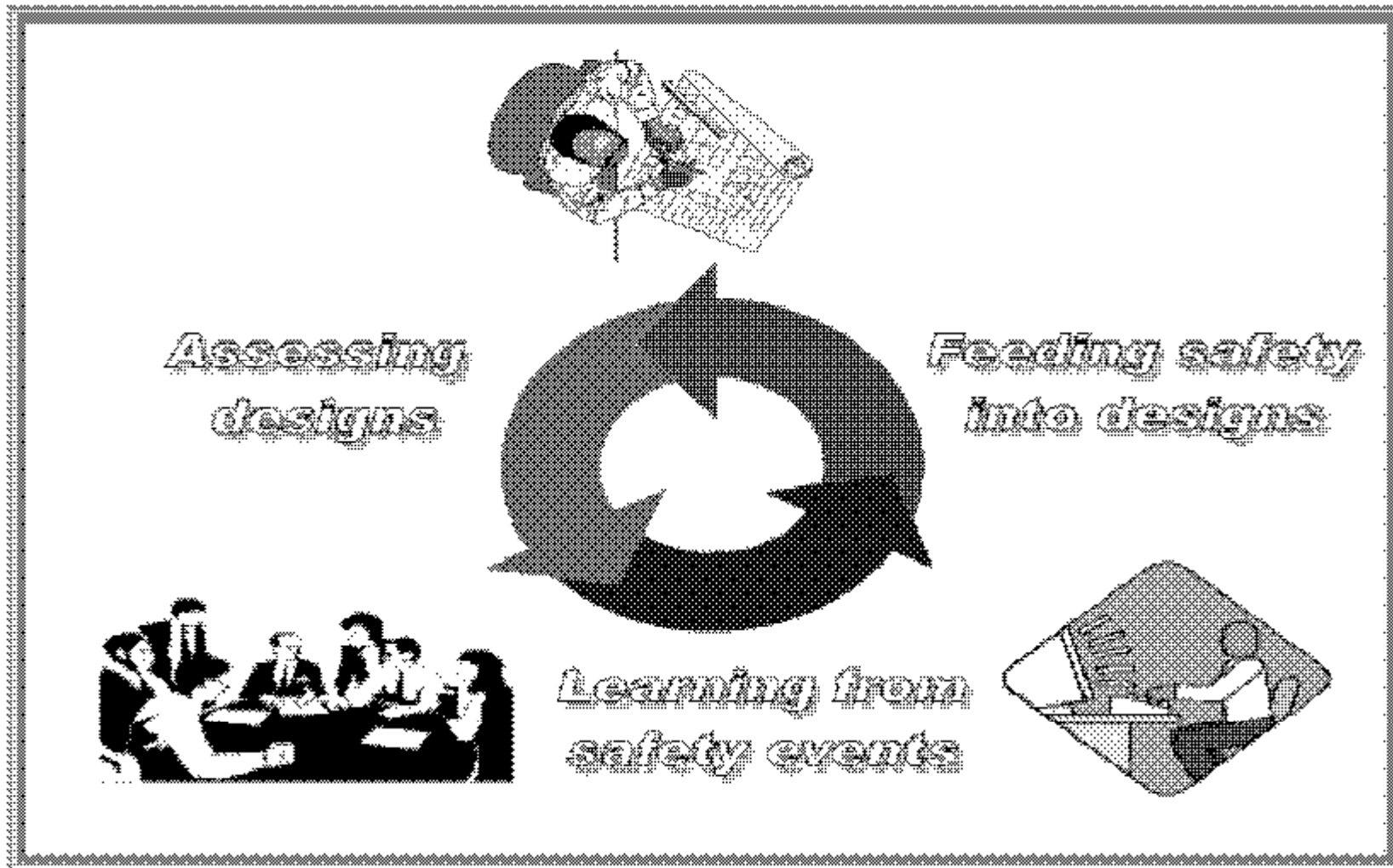
NLR: PROPOSED SAFETY FEEDBACK IN ATM DESIGN



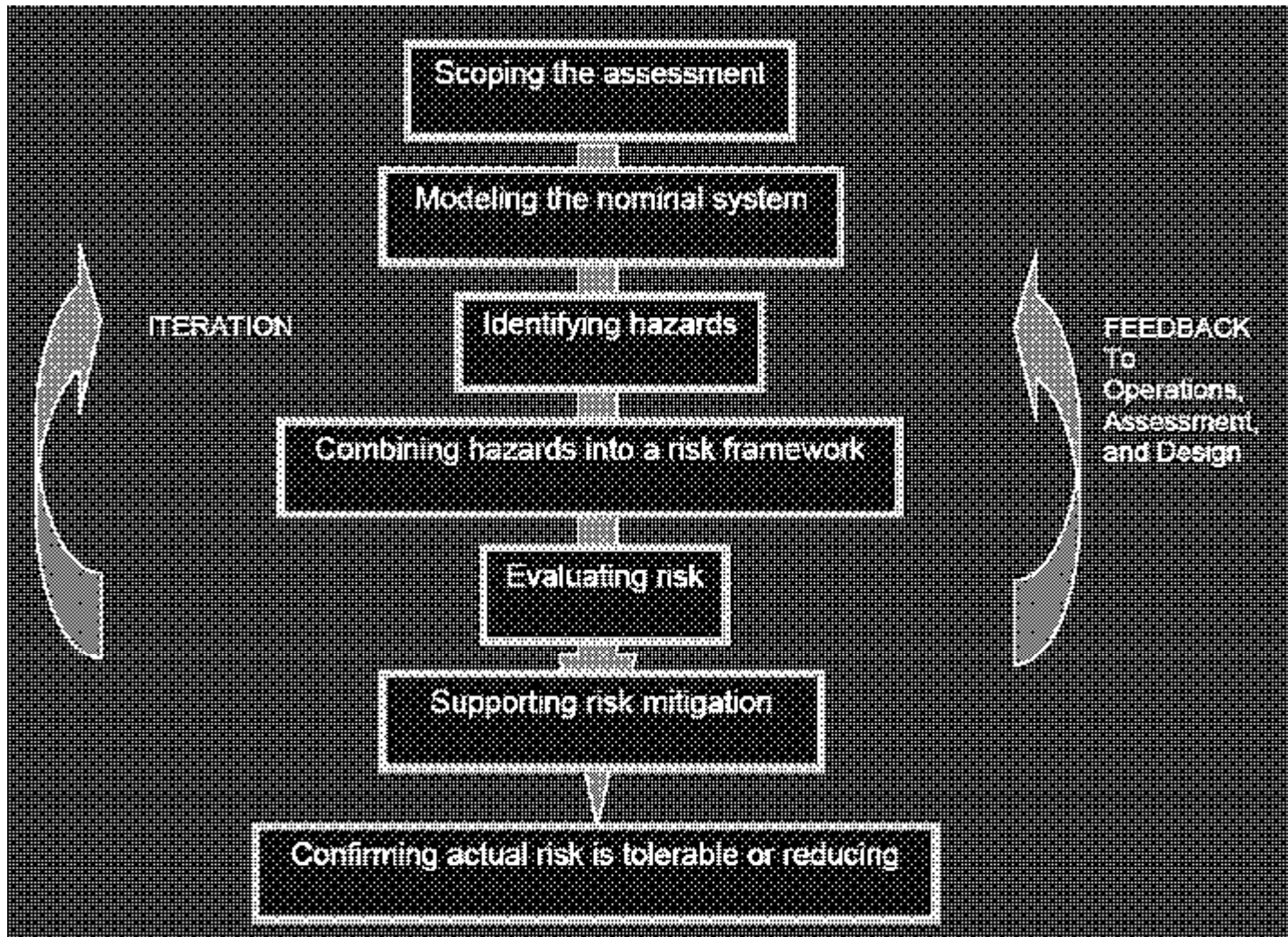
METHODOLOGY CLASSIFYING INFORMATION



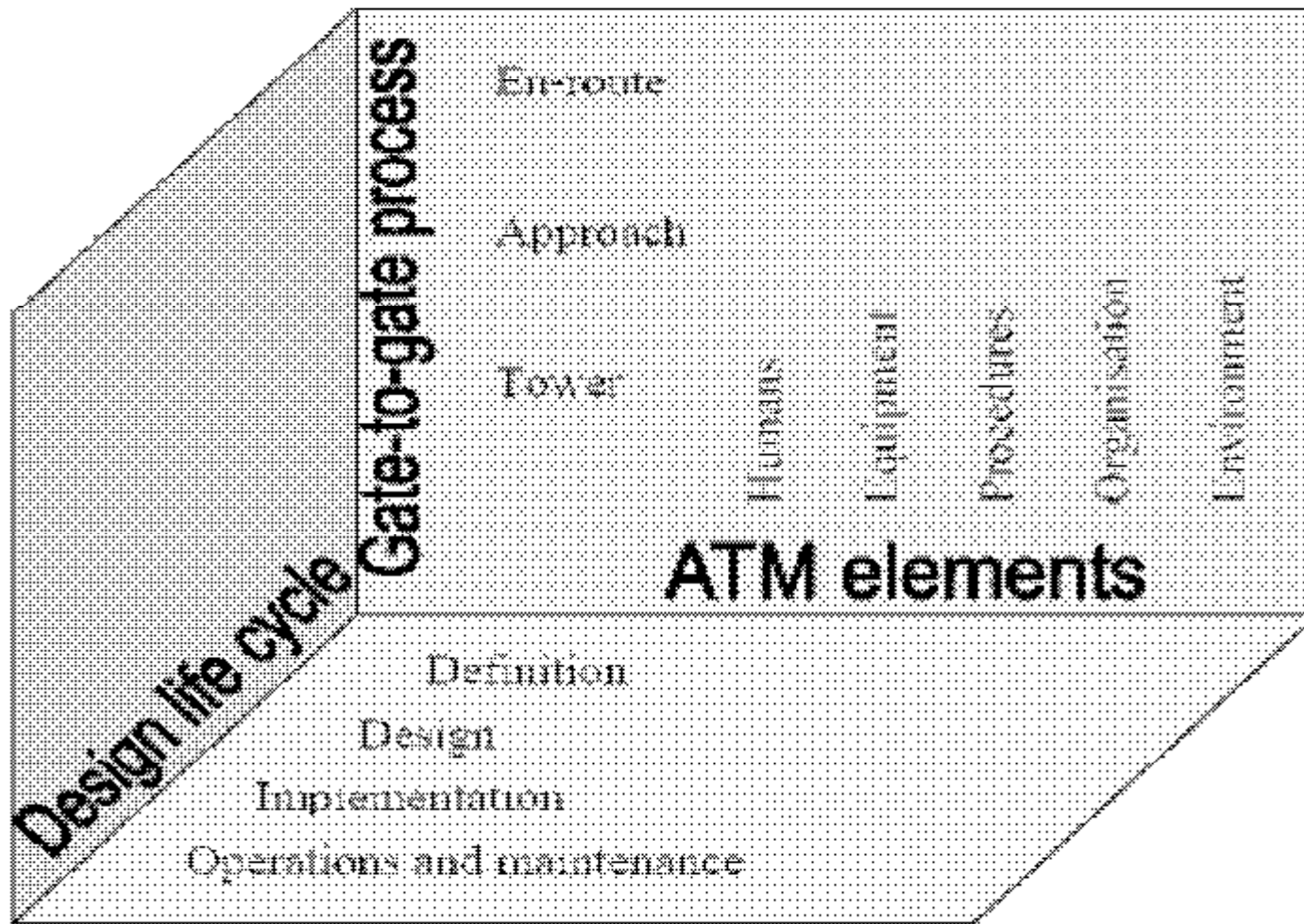
SAFETY CRITERIA



SEVEN STAGE SAFETY ASSESSMENT PROCESS



CONTEXTUAL FOR SAFETY DIMENSIONS IN ATM



SAFETY MANAGEMENT SYSTEM: AUDITING SAFETY

WHERE WE ARE

Benefits of a SMS are not fully recognised

- There is no understanding of the link between policy & procedures

The impact on safety of changes to units & equipment is recognised

- A checklist of key points exists to use to assess change
- There is much reliance on managers' experience

The benefits of safety auditing are being recognised

- Ad-hoc audits occur but there is no strategy underlying them



WHERE WE WANT TO BE

SMS is under development

- SMS exists but is not comprehensive
- Recognises the safety impact of organisational changes
- Few employees understand policy & local procedures link

Change management exists for units & equipment

- There is a recognised need to include people & organisational structure effects in change analysis
- Process and checklists exist for assessing changes

Ad-hoc safety audits are undertaken in response to problems

INTEGRATED TEAMS

WHERE WE ARE

The safety benefits of team-working are recognised

- Individuals recognise that their actions have safety implications on others
- Small local groups are formed in an ad-hoc manner to address particular issues
- Safety effort is carried out external to project teams although they do have ready access to project team members and information



WHERE WE WANT TO BE

EEC staff work as local teams to meet local needs

- Individuals consider safety implications in all actions
- High level cross organisational issues are addressed by formal cross company teams**
- Teams are set up to address particular high-level company wide safety issues
 - A small number of reasonably senior level staff are involved in this activity
 - Safety personnel are core to project

RESPONSIBILITY FOR SAFETY

WHERE WE ARE

Safety specialists are considered to be accountable for safety

- Safety specialists undertake safety activity in isolation from staff
- Safety is generally assumed to be the responsibility of the safety department

Staff believe that safety personnel should carry out all risk assessments etc

Staff are aware that they share some responsibility for safety

- Staff take action based on safety specialists advice
- Safety activities are led by safety specialists



WHERE WE WANT TO BE

Staff initiate some safety activities

- Risk assessments are carried out by staff before any change is made

There is considerable reliance on safety specialists for safety advice

RISK ASSESSMENT AND MANAGEMENT

WHERE WE ARE

The need for safety measures to assess trends is recognised. A limited portfolio of reactive safety measures exists. An awareness of the importance of risk assessment exists.

- Attention is concentrated on a few (up to 3) reactive safety measures
- Risk assessments are used as a proactive measure to identify safety risks
- A non-systematic risk assessment process is in use
- Risk assessment may be inappropriate and is reliant on individual experience from specialists or experienced



WHERE WE WANT TO BE

Limited portfolio of reactive & proactive safety measures exists. Risk assessment are applied to non-routine tasks

- Majority reactive safety measures are in place but it is recognised that more proactive measures are required
 - Risk assessments are fully documented
 - Only safety specialists are involved in risk assessment
- The effectiveness of safety measures is starting to be considered

TRAINING AND COMPETENCE

WHERE WE ARE

A limited safety training programme exists.

- Safety training is provided as needs arise on an ad-hoc basis on specific projects or activities.
- There is a reliance on transfer of skill / knowledge from one worker to a trainee.
- Advice tends to be based on past activities and experience.

Staff may be assigned to work on safety activities based on their availability rather than having training or relevant experience, though they will usually be supervised by someone who is qualified.

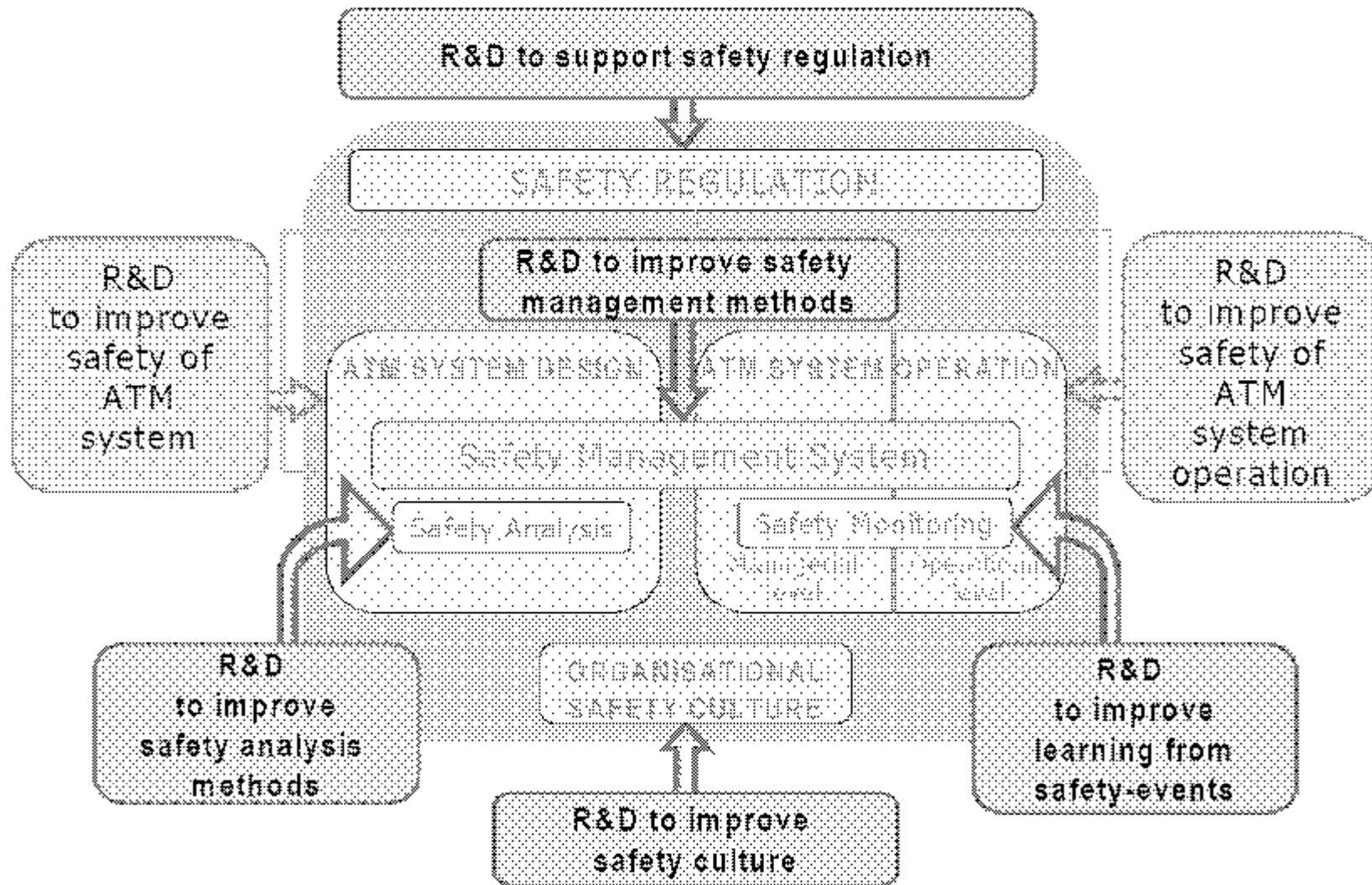


WHERE WE WANT TO BE

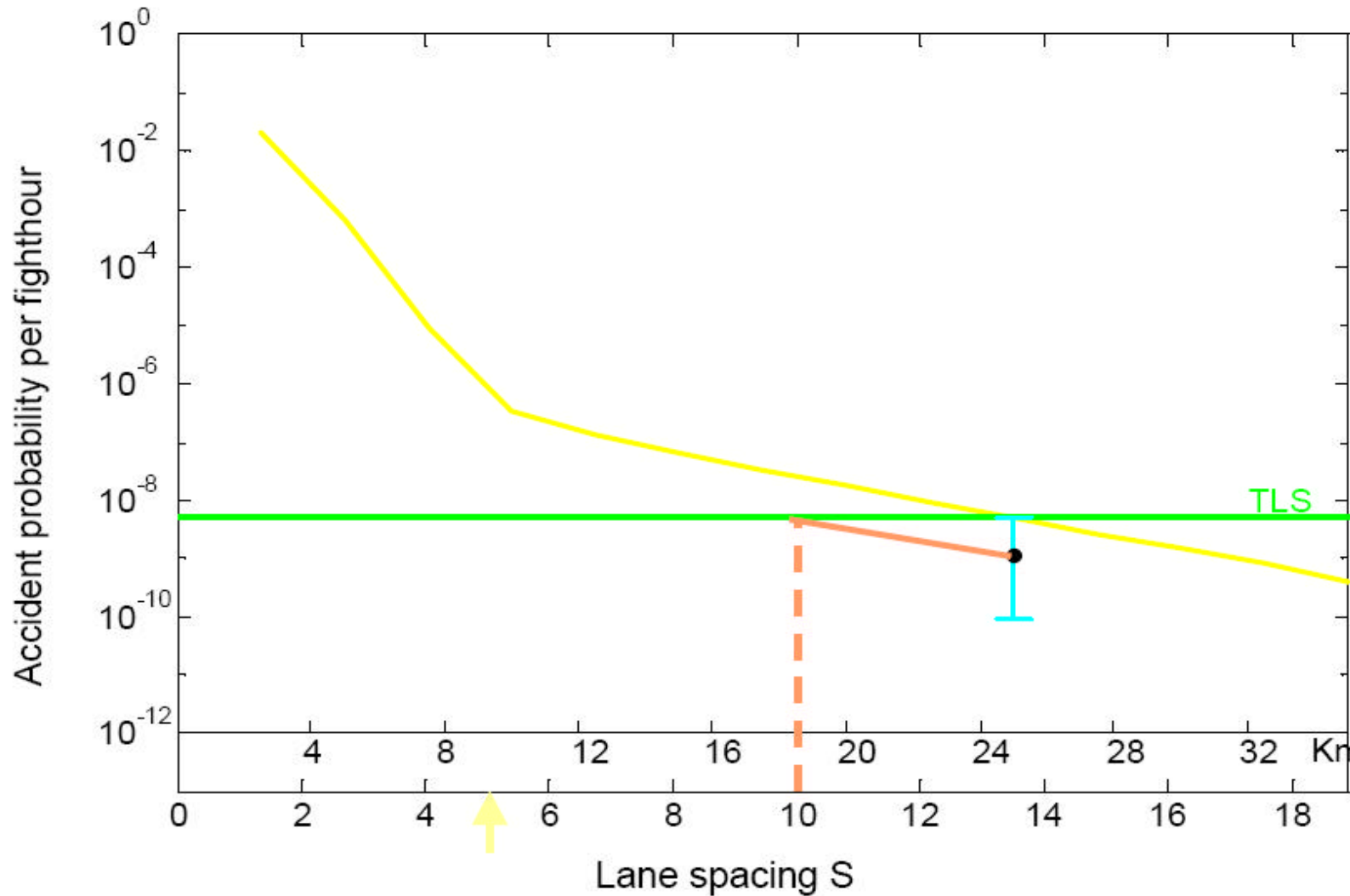
An employee safety training programme exists.

- Mainly focused on classroom training.
- Competence standards are not being developed.
- Training is often provided in response to problems.
- Front-line staff receive training as required.
- Staff assigned to carry out safety activities will have experience in areas related to safety.

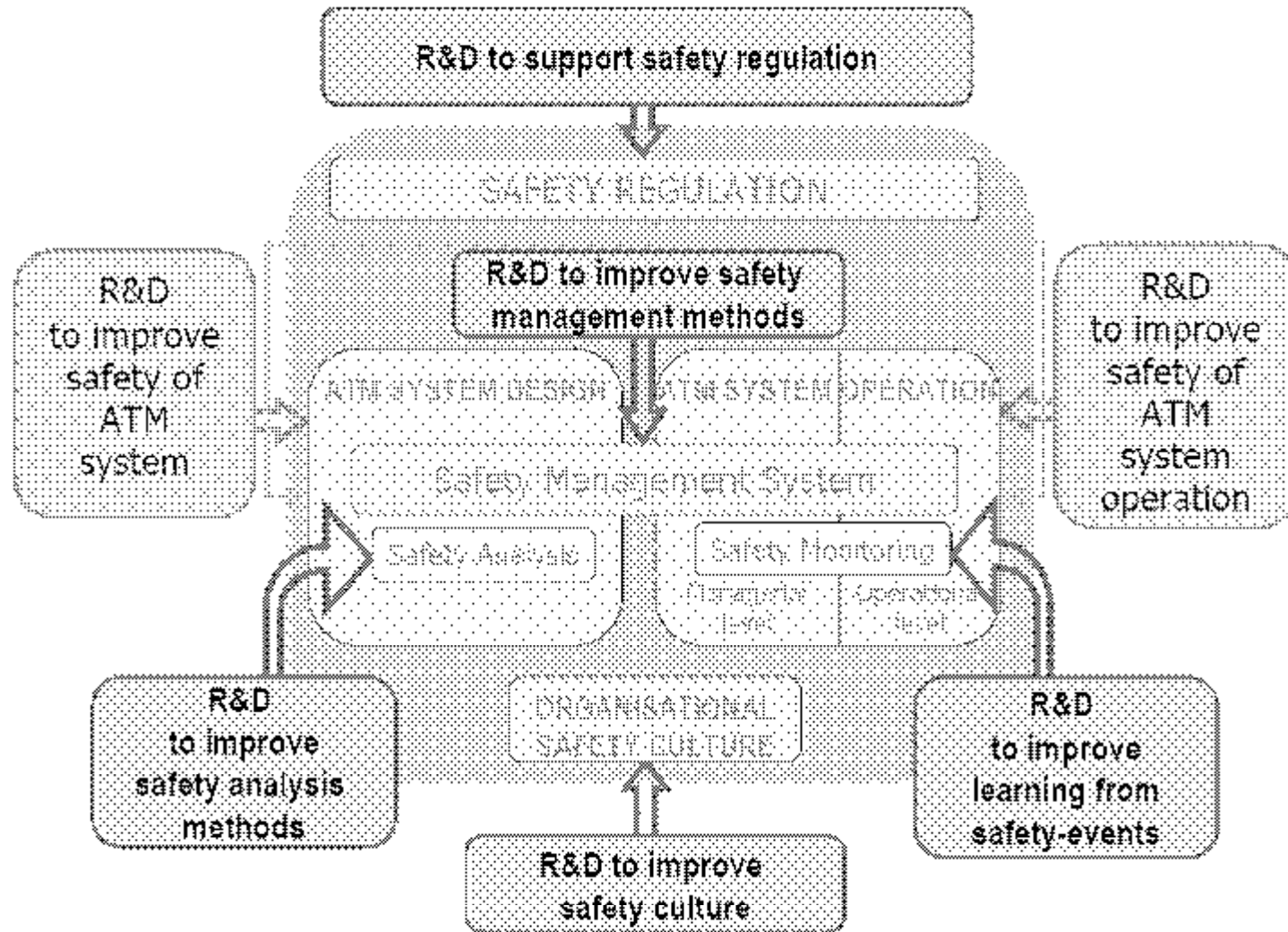
SAFETY R&D FRAMEWORK



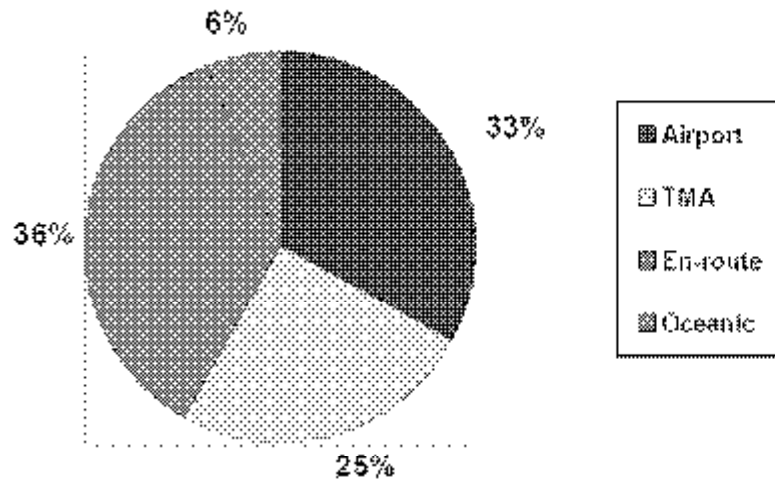
ACCIDENT PROBABILITY: EN ROUTE LANES SPACING



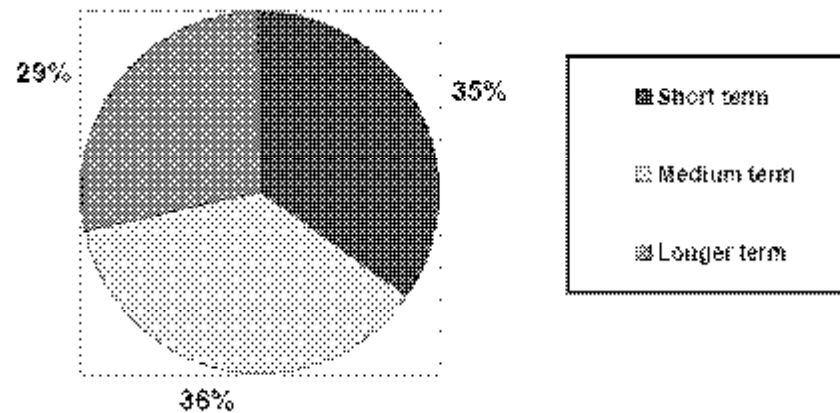
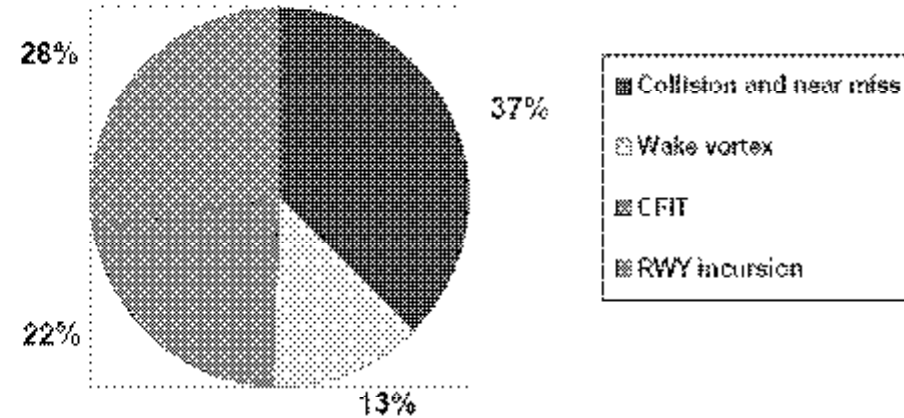
SAFETY STRATEGIC PLAN: ACTION LINES



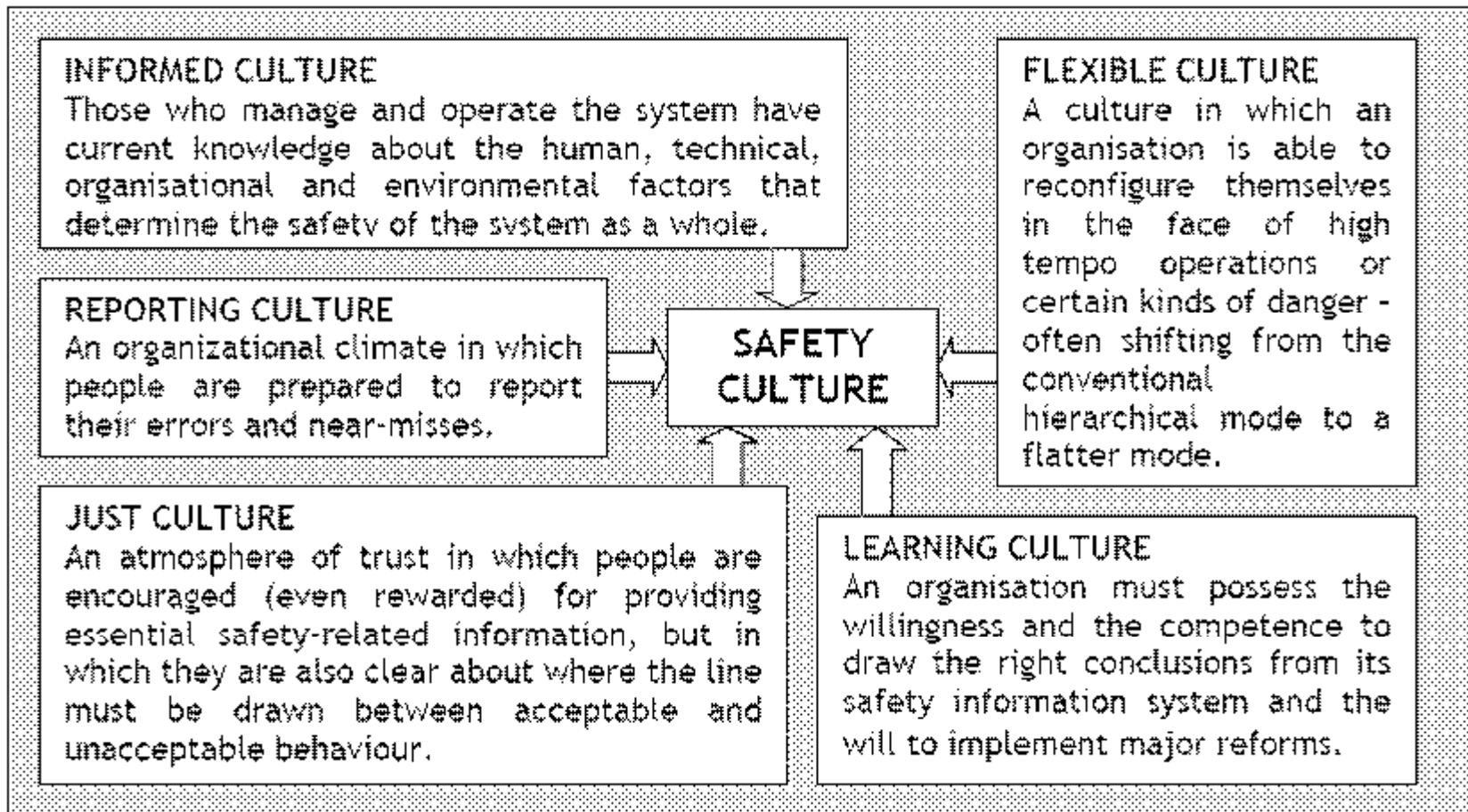
HAZARD: CLASSIFICAZIONE FATTORI



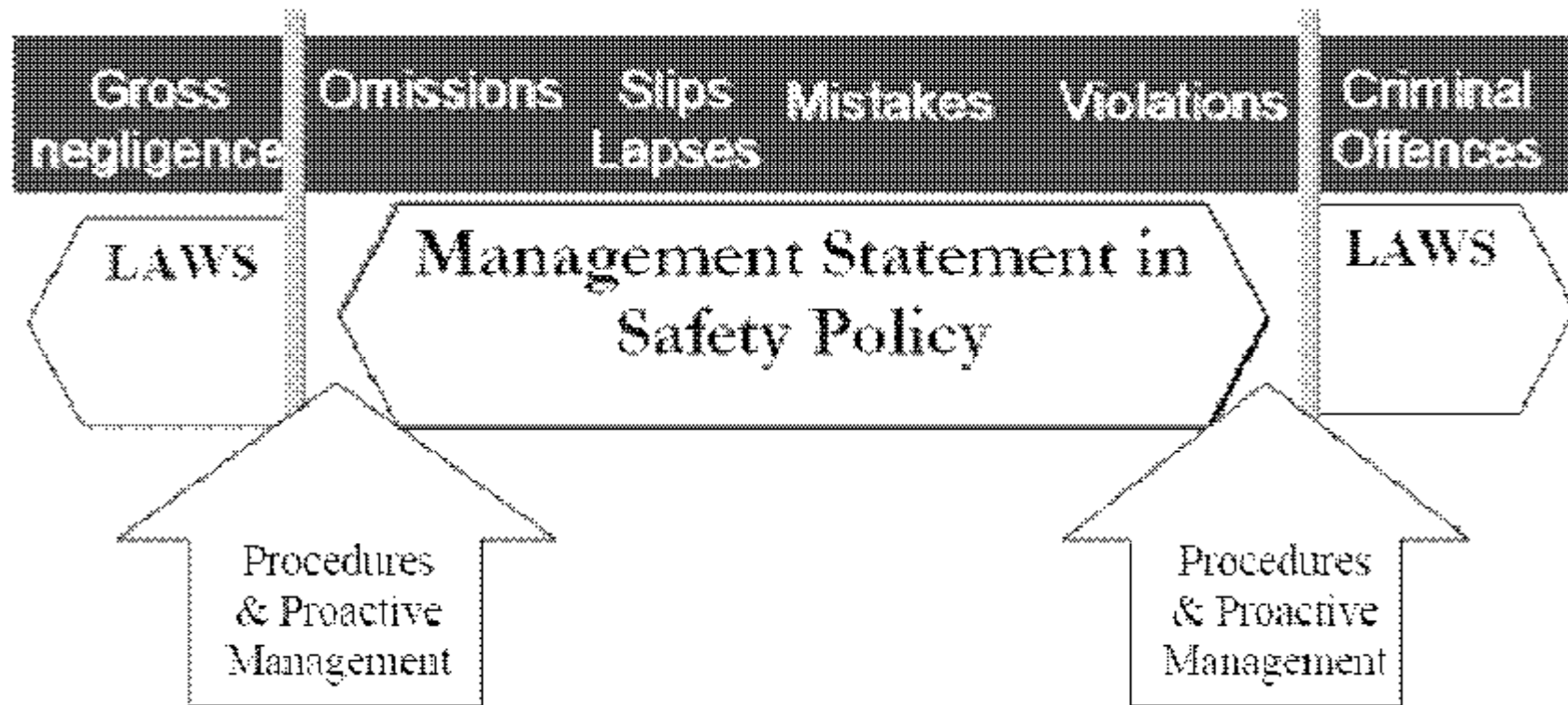
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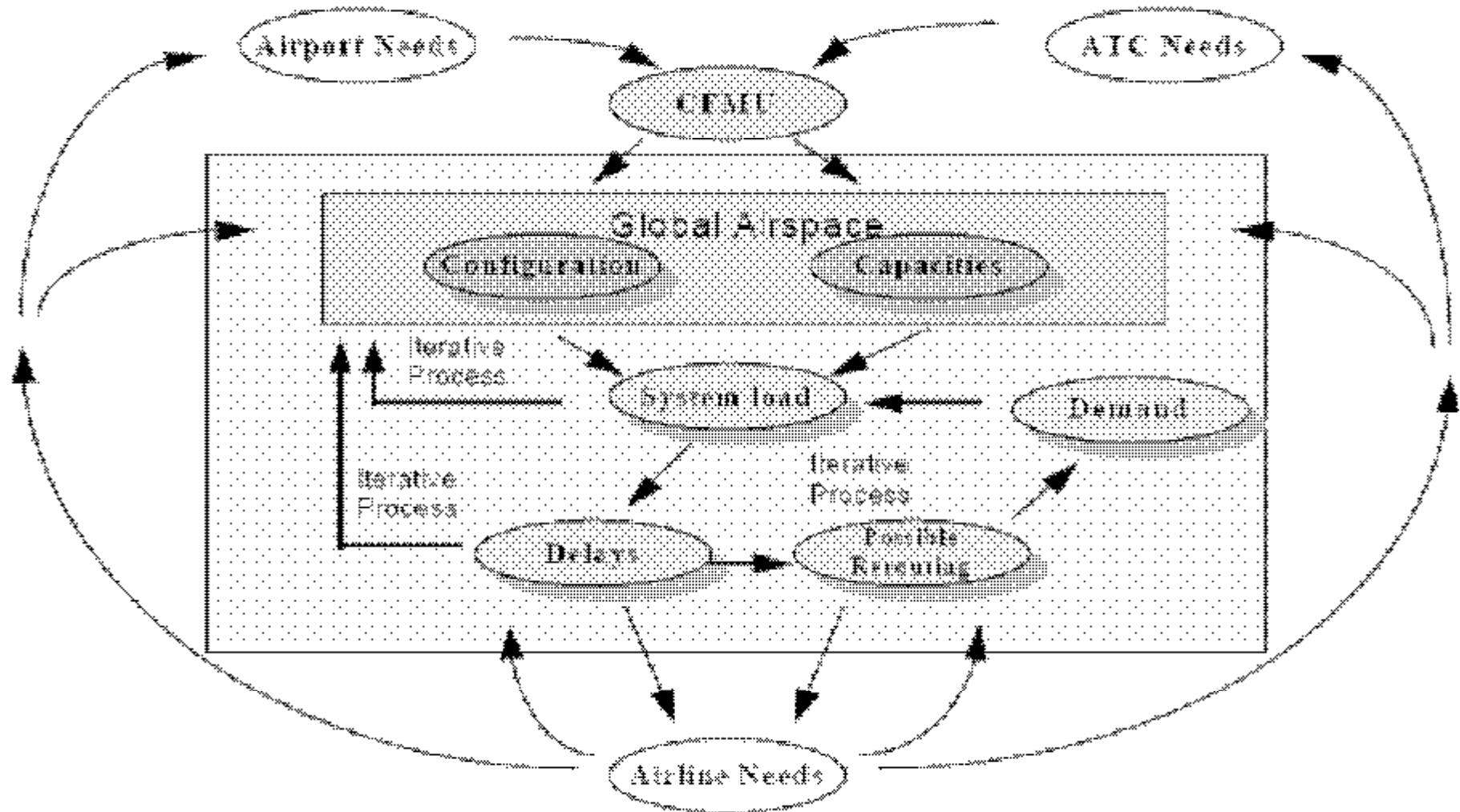
REASON: COMPONENTI DELLA "SAFETY CULTURE"



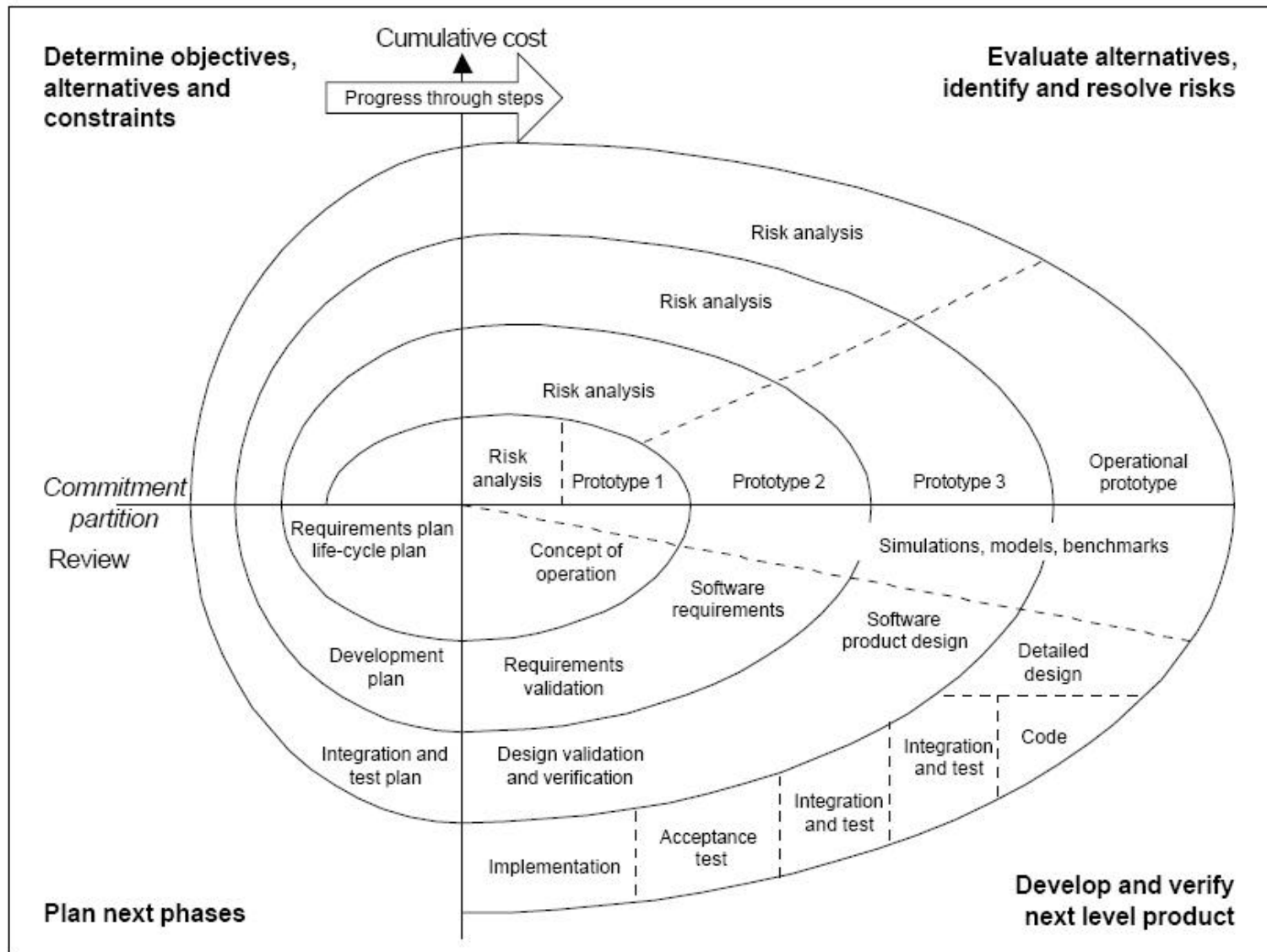
BAD BEHAVIOURS – P.STASTNY: SIXTH GAIN World Conference



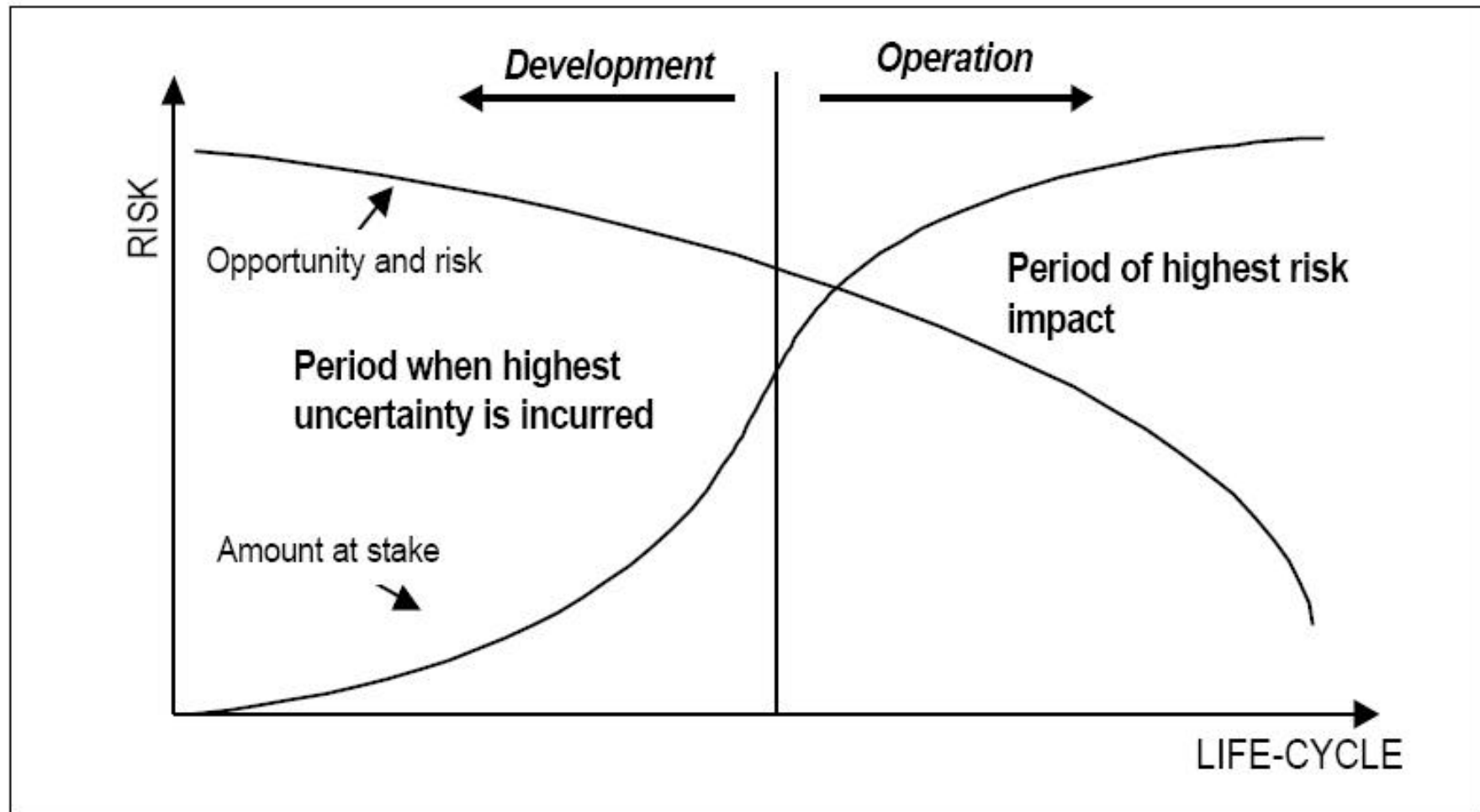
AMOC: AIR TRAFFIC FLOW MANAGEMENT SIMULATION



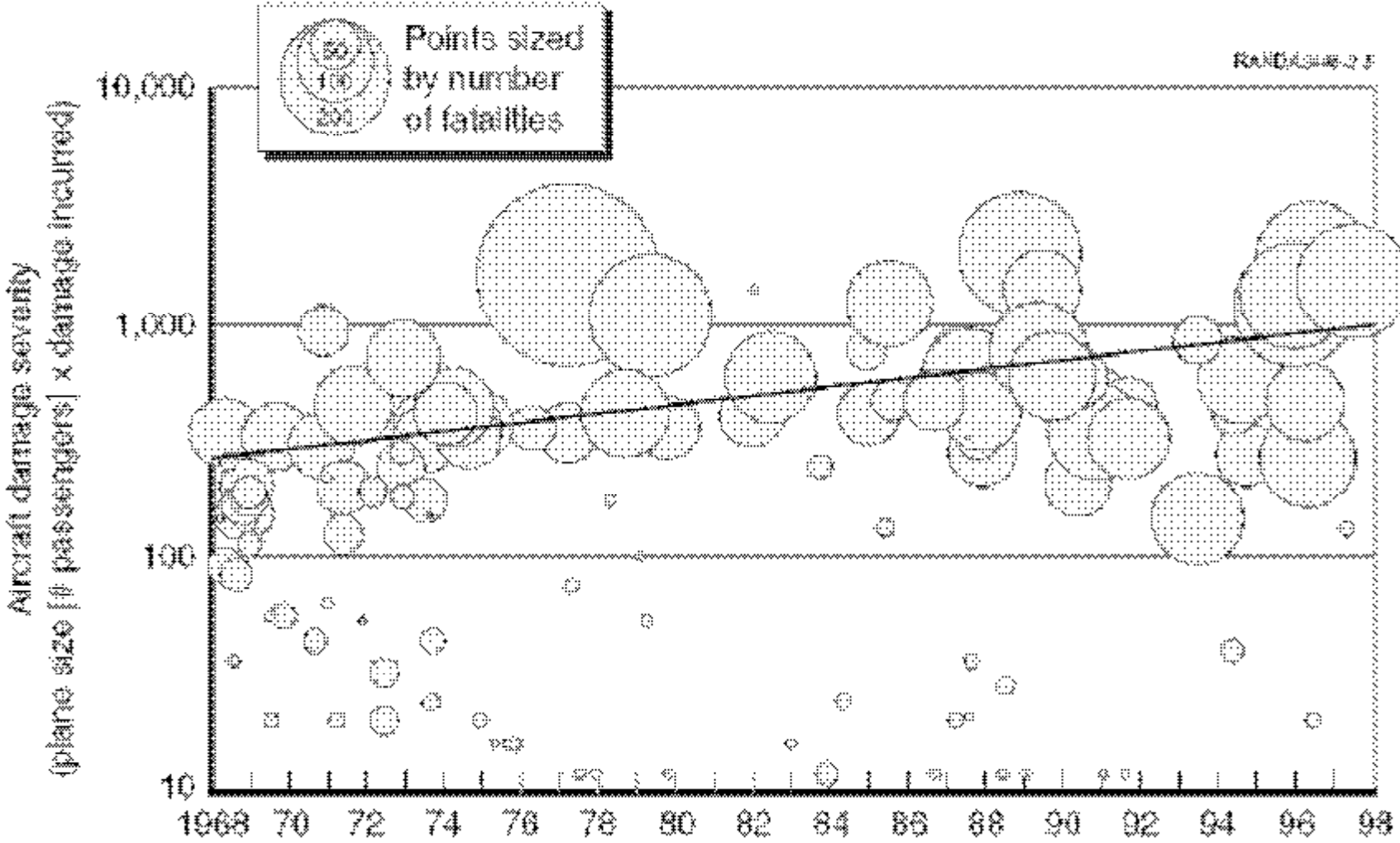
BOEHM 1988: ITERATIVE SPIRAL MODEL



RISK: SYSTEM LIFE CYCLE



ACCIDENT DATABASE



working papers - prima,

CONTINUA