

## 01 – Safety/Monitoring Criteria

CANSO-EUROCONTROL Workshop – JAN-2019

### #1 – Safety Criteria

- Harmful effect
- Use of Proxies
- Centralized management of Safety Criteria (incl. Proxies)
- Use of modelling:
  - Simple vs complex models,
  - Reused vs self-developed models
  - Hazard-log, USC



## #1 – Monitoring Criteria

- The “system” is monitored but...  
Is the “changed-system” monitored?
- How to link the elements that have changed to the monitoring system?
- Do not re-invent the wheel
- Could be implemented ASAP
- Centralized management of Monitoring Criteria (similar to or even with the Safety Criteria (incl. Proxies))



01 – Safety/Monitoring Criteria

## **SAFETY CRITERIA**

## ATS.OR.210 Safety criteria (a) and (b)



- Safety acceptability based on the analysis of the risks risk differentiated
  - types of operations and
  - stakeholder classes,
- Safety acceptability assessed by using specific and verifiable safety criteria criterion shall be
  - an explicit, quantitative level of safety risk or
  - another measure that relates to safety risk.

PROXY in  
AMC & GM

## ATS.OR.210 Safety criteria (c)



- Safety criteria:
  - Are justified
  - When fulfilled, predict that the FS as safe as before or (exceptional case) the ATSP shall provide an argument justifying that:
    - any temporary reduction in safety will be offset by future improvement in safety; or
    - any permanent reduction in safety has other beneficial consequences;
  - Set SC shall ensure risk is acceptable risk
  - Safety improvement when practicable

## Proxy - AMC



AMC2 ATS.OR.210(a) Safety criteria:

Other measures related to safety risks - Proxies

- Proxies shall:
  - a) When justifiable causal relationship exists between the proxy and the harmful effect,
  - b) A proxy is sufficiently isolated and
  - c) The proxy is measurable
    - quantitatively or
    - qualitatively

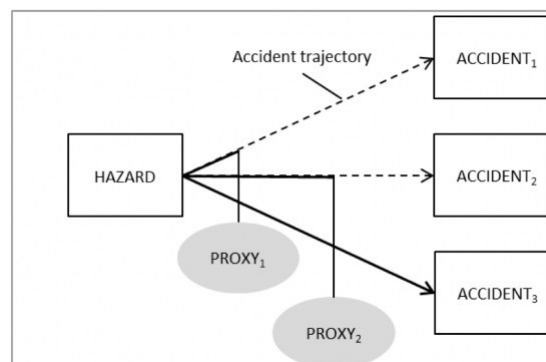
## Proxy definition (GM)



A proxy is a measure of a certain property along the causal trajectory between the hazard/event and the harmful effects of the hazard/event in question

AMC

1. Causality
2. Independence
3. Measurable



# Types of accidents



## Examples of Accidents/Incidents

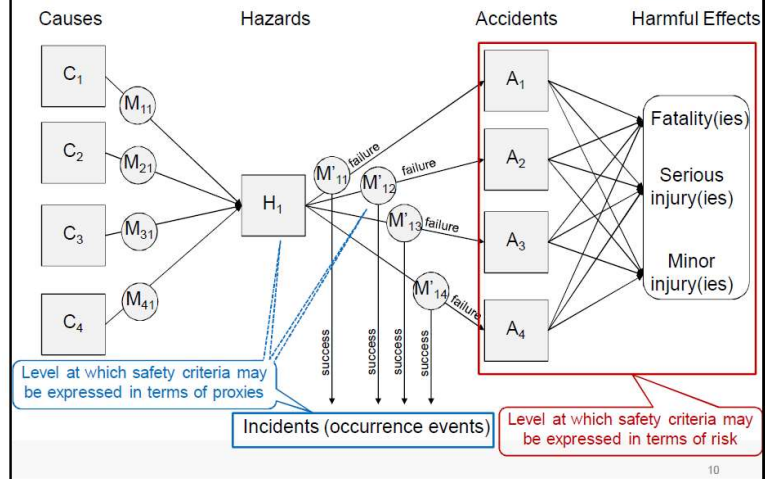


Types of Accident		Examples of Incidents
Mid Air Collision (MAC)		Separation Minima Infringement (SMI)
Wake-induced accident		Wake turbulence encounter
Controlled Flight Into Terrain (CFIT)		Controlled Flight Towards Terrain (CFTT)
Runway Collision (RC)		Runway Incursion
Taxiway Collision (TC)		Taxiway Incursion

# Safety Criteria vs. Proxies



## SAC Expressed in Terms of Risk vs. Proxies



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## MONITORING CRITERIA

### Monitoring criteria and requirements

ATM/ANS.OR.C.005 Safety support assessment and assurance of changes to the functional system

- b) A service provider other than an air traffic services provider shall ensure that the safety support assessment referred to in point (a) comprises:
  - 2) specification of the **monitoring criteria** necessary to demonstrate that the service delivered by the changed functional system **will continue to behave** only as **specified in the specified context**.

ATS.OR.205 Safety assessment and assurance of changes to the functional system

- b) An air traffic services provider shall ensure that the safety assessment referred to in point (a) comprises:
  - 6) the specification of the **monitoring criteria** necessary to demonstrate that the service delivered by the changed functional system **will continue to meet the safety criteria**.

## AMC1 ATM/ANS.OR.C.005(b)(2) - Monitoring Criteria (SSA)



Non-ATSP should ensure that within the SSA process for a change, the **monitoring criteria** that are to be used to demonstrate that ... that the **changed service continues to meet its specification**.

These criteria should be such that:

- a) they indicate that the assumptions made in the safety support case remain valid; and
- b) if the properties being monitored remain within the bounds set by these criteria, the service will be behaving as specified.

## AMC1 ATS.OR.205(b)(6) - Monitoring Criteria (SA)



ATSP should ensure that within the SA process for a change, the **monitoring criteria**, that are to be used to demonstrate that ... the **changed service continues to meet the safety criteria**.

These criteria are specific to the change and should be such that they indicate that:

- a) the assumptions made in the argument remain valid;
- b) critical proxies remain as predicted in the safety case and are no more uncertain; and
- c) other properties that may be affected by the change remain within the bounds predicted by the safety case.

## The key...

- The F.S. is currently monitored, and (assumption?) is continuously meeting the criteria (safety / specs)
- Is the current monitoring system adequate to ensure that the “Changed F.S.” still continuously meet the criteria (safety / specs)?
  - ➔
    - How to link the changed F.S. to the monitoring system?
    - Do we need an updated Monitoring System to continuously demonstrate meeting the safety criteria?

## Conclusions

- 1 or 2 proxies and monitoring requirements per hazard
- 15 hazards per change
- 15 changes per year
- 10 years



~5000 proxies and monitoring requirements to manage

**Makes no sense**



**Need for coordinated management of Proxies and Monitoring Criteria/Requirements at Unit level**



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## CONCLUSIONS

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## Any Questions

