Change management in the EU regulatory framework

→ Presentation contents

    → The change management process in the EU regulatory framework

    → The regulatory steps of conducting a safety assessment

→ The presentation is simplified, it is a generic view and does not go in to details.

EU rules on change management - Overview

→ An ANSP conducting a change must conduct a safety assessment, and show that the change will be safe and compliant with the regulation.

→ For remote towers the key to this is understanding how the system impacts the requirements on the service. For example: when will the controllers see aircraft on final approach, and what is the effect of this on the service?

→ The competent authority verifies that the ANSP complies with the requirements, but the ANSP has to be able to explain the change correctly.

→ In order to explain the change correctly, the ANSP has to analyse and understand the change.

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Notification to Competent Authority

→ When an ANSP is planning a change to the functional system it shall notify the competent authority of this change.

→ The process for this is determined by each competent authority.

→ Normally for the ANSP this forms part of the change management process, which is approved by the competent authority.

→ For a change like a transition to remote tower this would be well in advance of the planned change, and there would be several updates of the documents throughout the process.

→ Parts of the project may also be divided into several changes.

Competent Authority decision to review

→ When the competent authority receives a notification of a change to the functional system, they shall decide if they are reviewing the change or not.

→ This decision is based on documented criteria, and a review shall be conducted if either:

  → The complexity of the argument, or

  → The severity of the possible consequences of the change;

are significant or unfamiliar to the ANSP.

→ The review can be adapted depending on the complexity, for a remote tower transition the review would likely be fairly significant.

Competent Authority review process

→ The NCA has several tools available for the review, commonly used are document reviews and audits.

→ For a complex change, such as a remote tower transition, the review may be divided into several streams, e.g. technology, training, operations.
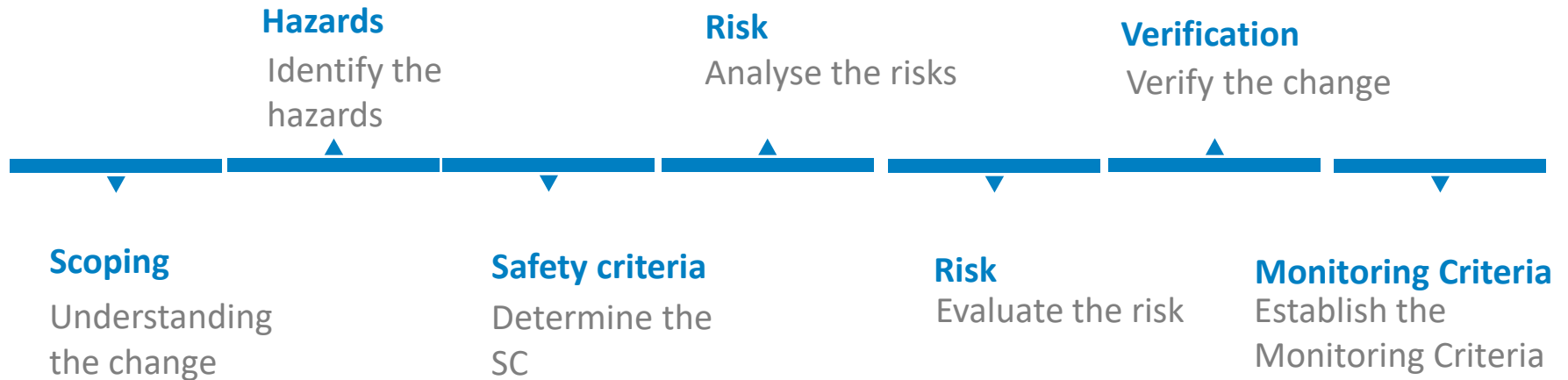
Competent Authority decision following review

→ To conclude the review the competent authority shall either approve, or reject, **the argument** related to the change. It is not an approval of the change itself.

→ The competent authority may stipulate conditions for the approval.

→ The approval can be done in parts, so that part of the change can be conducted (for example installation work required can be conducted).

The Safety Case

→ The safety case is the complete argument, which is supported by evidence, that show that the change will be sufficiently safe.

→ This includes the safety assessment, as well as all the evidence related to the change.

→ The Safety Case shall provide assurance, with sufficient confidence, that the change is safe to conduct and transition into service.

Steps when performing a safety assessment

Hazards
Identify the hazards

Risk
Analyse the risks

Verification
Verify the change

Scoping
Understanding the change

Safety criteria
Determine the SC

Risk
Evaluate the risk

Monitoring Criteria
Establish the Monitoring Criteria

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Scoping the change

→ The first step is to analyse and "scope" the change.

→ This scoping will impact the further flow of the process.

→ Some examples of the questions considered in this step:

What services are impacted? For R-TWR likely ATC, FIS, CNS, maybe alerting service?

Are others impacted? For example: Aerodrome operator, other ATS units, airspace users?

Are there impacts to degraded modes/fallback/contingency?

Hazard identification

→ Hazard in the EU framework is any condition, event, or circumstance, that can lead to harmful effect.

→ The identification may disregard hazards that are not considered credible.

→ The identification should include both new hazards and existing hazards impacted by the change.

The R-ATS technology is a likely starting point for new hazards, for example screen or camera failures.

For R-ATS there is a need to have a wide range of competencies, so that all operational and technical hazards are covered.

The hazards will form input to later stages in the safety assessment process.

Determine the Safety Criteria

→ Safety criteria are used to determine the acceptable level of safety, using measurable level of risk.

→ They are used as a key part of the argument, to show that the change is safe and can be implemented.

→ Safety criteria can be related both to risk, but also to other data (with some conditions), then called a proxy.

Safety criteria must be measurable, show that the change is safe, and cover the full scope of the change.

The selection of safety criteria can have a large impact on the continuous safety work of the ANSP.

Some examples can be frequency of events (such as technical issues) but also amount of accidents (harder to measure due to rate being so low).

Analyse the risks

→ This step links the previously identified hazards and proxies to potential "harmful effect".

→ The outcome is also classified to show the severity of the outcome.

→ The risks are evaluated in all stages of change, including transition.

→ Evaluation is also made for normal, and abnormal, modes of operation.

After this step there should be a link, showing how each identified hazard can lead to a harmful effect.

This link is often a key part in showing that the change is sufficiently safe, and that the safety case is sufficiently detailed.

For remote tower this can be very complicated, but a well conducted analysis will also be very useful for the continuous safety work after the implementation.

Evaluate the risks

→ This step analyses the expected outcome of the change on the safety performance.

→ After the evaluation a comparison can be made against the safety criteria.

→ In this step potential mitigations are identified, and the analysis updated.

This step can be made several times, as mitigations are applied and evaluated.

Also this evaluation has to be made for the entire process and all operational modes and conditions.

After this step there should be evidence to show that the SC are fulfilled, or that more work is needed.

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Verify the change

→ This step is a "wrap up" of the entire analysis.

→ After this step there should be evidence of all the actions from the entire safety assessment.

→ This step also links many other related activities to the safety assessment.

Verification of the scope is made, to show that the safety assessment covers the full scope.

The verification should also show where more evidence is needed for the safety case.

The verification checks that the change meet the safety criteria, and that the service (and technology) behaves as specified in the change process.

Establish the monitoring criteria

→ The monitoring criteria are used after the change implementation, to show that the change remains safe during the operation.

→ This step of the safety assessment is therefore forward looking.

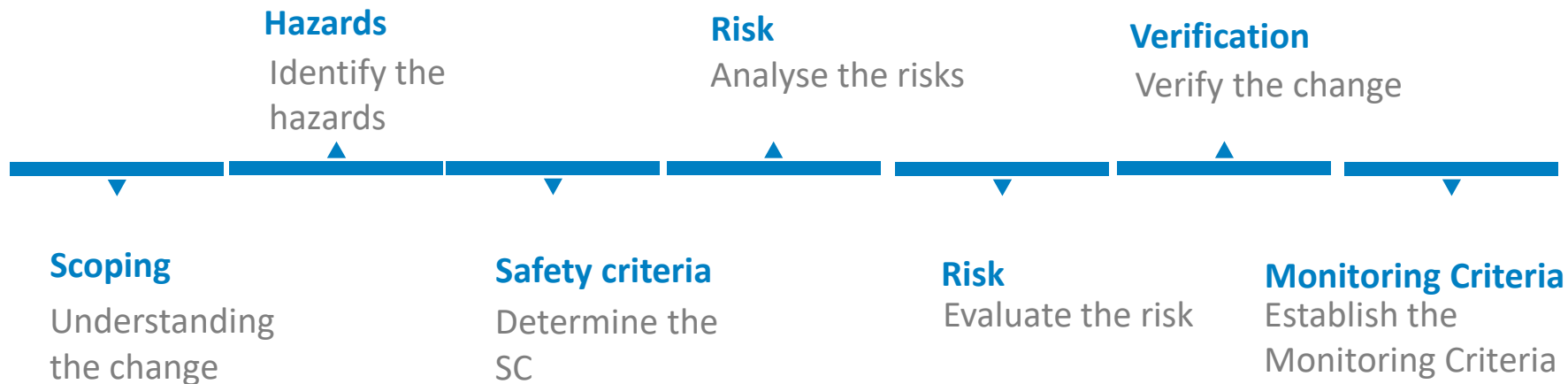→ Also here there is connection to the ongoing safety management of the ANSP.

Monitoring criteria should show that the assumptions made in the argument are valid, and that proxies or other properties behave as predicted.

Monitoring very specific items may take more work, but be easier to analyse. There is a balance here (just as when establishing safety criteria or proxies).

Monitoring will eventually become part of the continuous safety work of the ANSP.

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Summary and key points

→ The change management process is dependent on the change complexity and scope.

→ It depends on the roles of the ANSP and the NCA. The ANSP must analyse and understand the change, so they can explain it to the NCA.

→ There is no right or wrong in this process. Everything has to be analysed depending on the change that's being carried out.

→ Experience show that an ANSP that perform the change management well, can draw benefit from this later during the operation after the change.