



Aviation safety and security  
laboratory



# Performance-based Audit Checklist Using Systemic Approach to Safety

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# Motivation & Current State



**Shift from compliance-based to performance-based audits**



**Application of systemic safety analysis in state safety oversight**



**Limit the current subjective approach to evaluate organization's performance**

# Selection of Audit Scope & Method

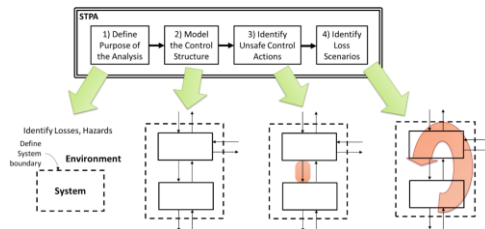
▶ Cooperation with the Civil Aviation Authority of the Czech Republic

▶ Training organizations:

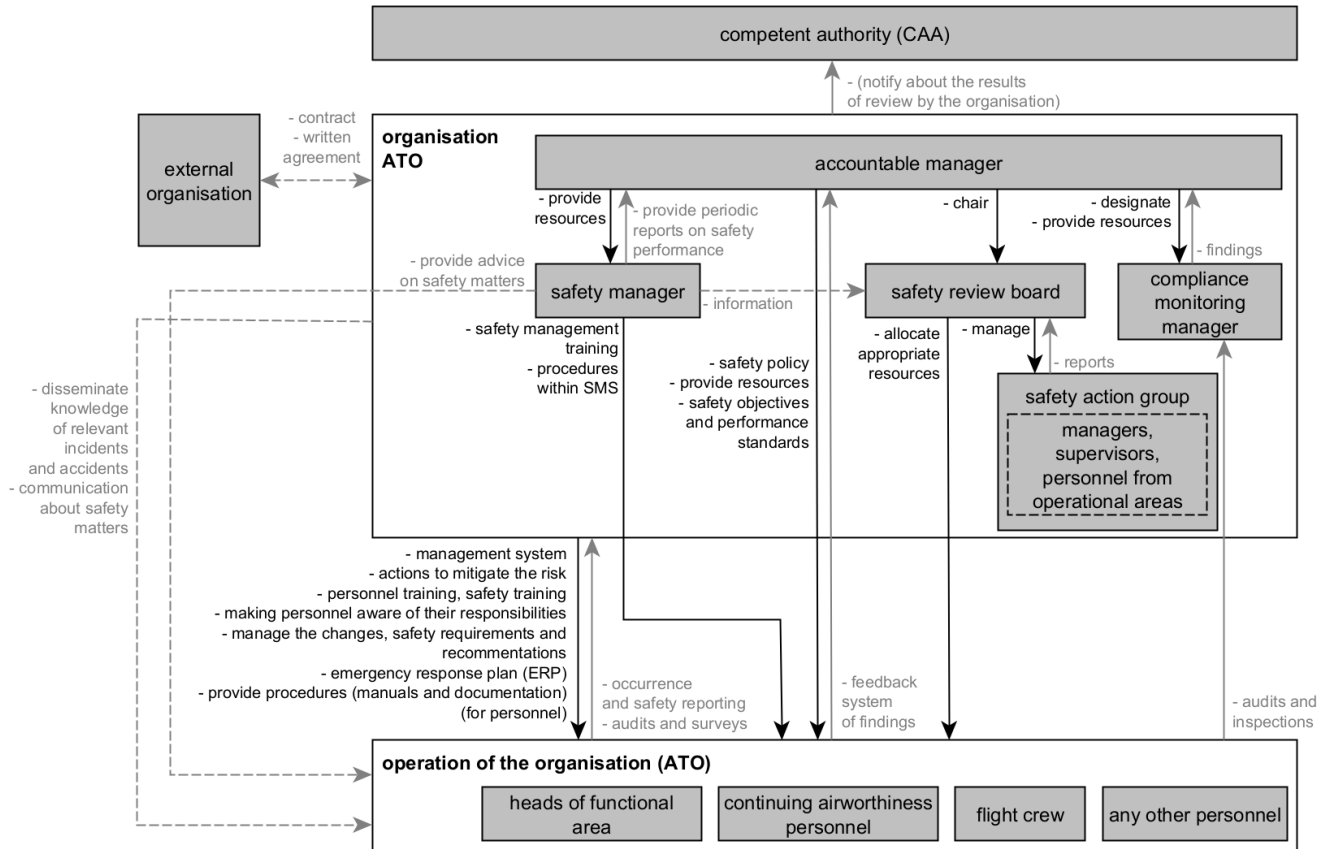
*Easy Access Rules for Aircrew (Regulation (EU) No 1178/2011)*

– *Part ANNEX VII (Part-ORA) – SUBPART GEN – GENERAL REQUIREMENTS – SECTION II – Management*

▶ STPA



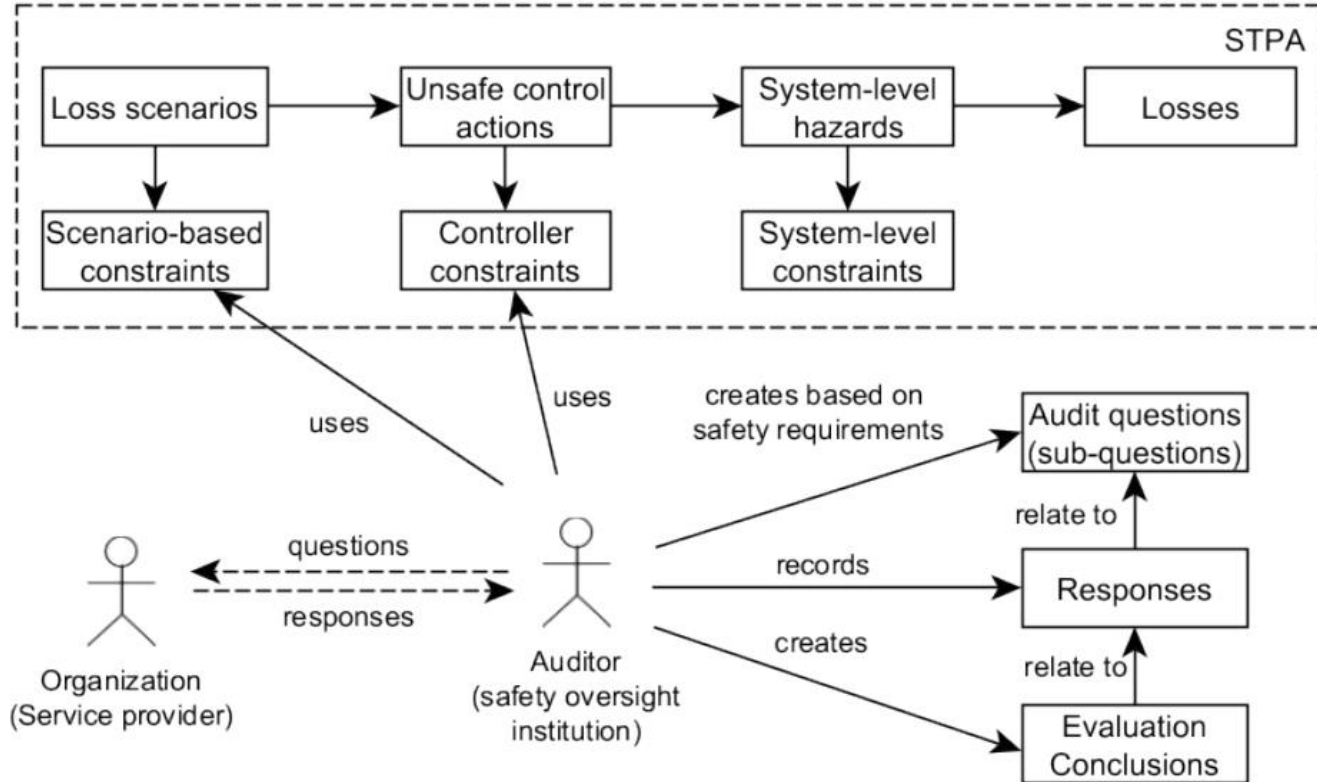
# STPA – Step 2



# STPA – Steps 3 & 4

Loss Scenario	Loss Scenario-Based Safety Requirement	Controller Constraint	Audit Questions
The organization is managed, but not according to the Documentation [UCA-1b] because the internal processes of updating the documentation are lagging behind the practice.	Internal documentation updating processes must keep up with practice.	CC-1b The organization must be managed according to documentation.	How does internal documentation management work in the organization? Is the organization able to update internal documentation flexibly and on time?
The organization takes risk mitigation measures too late when there is a need to address the situation immediately [UCA-2c] because it is not aware of the nature of the risks.	The organization must be aware of the risk's nature.	CC-2c The organization must take risk mitigation measures on time, if immediate reaction is required.	How does the organization perform risk assessment? Is this assessment adequate given the nature of the risks it manages?
The organization requires employees to have responsibilities other than those documented [UCA-4b] because it assigns specific responsibilities only verbally and does not document them.	The organization must document all responsibilities.	CC-4b The organization shall require employees to take on only the responsibilities that are documented.	Do the documented responsibilities match the actual responsibilities of the employees in the given roles?

# Creation of Audit Questions



# Audit Checklist

No.	Part of Documentation	Audit Questions
1	<p>ORA.GEN.200</p> <p>(a) The organization shall establish, implement and maintain a management system that includes:</p> <p>(5) documentation of all management system key processes, including a process for making personnel aware of their responsibilities and the procedure for amending this documentation;</p>	<p><b>Does the organization inform employees about their responsibilities?</b></p> <ul style="list-style-type: none"><li>• Do you have employee responsibilities documented?</li><li>• How do you inform employees about their responsibilities? (How does a new employee learn about their responsibilities?)</li><li>• Do you require employees to work outside their responsibilities? Do you inform them in advance?</li></ul>
2	<p>AMC1 ORA.GEN.200(a)(3)</p> <p>(e) The management of change</p> <p>The organisation should manage safety risks related to a change. The management of change should be a documented process to identify external and internal change that may have an adverse effect on safety. It should make use of the organisation's existing hazard identification, risk assessment and mitigation processes.</p>	<p><b>Does the organization set safety requirements within the management of change to ensure safety?</b></p> <ul style="list-style-type: none"><li>• How do you perform hazard analysis within change management?</li><li>• How do you assess risks?</li><li>• How do you set safety requirements within change management?</li><li>• Show an example of a safety requirement that you have specified within change management.</li></ul>

# Pros & Cons



## Benefits:

- **Reusable audit checklists**
- **Questions ordered in logical structure**
- **Supportive to new auditors**
- **Link compliance with performance-based audits**



## Limitations:

- **Time-consuming to perform initial STPA analysis**
- **Checklist can be extensive**
- **Systemic approach typically not adopted in SSO (requires training)**
- **Tested on few cases only**



# Summary



- The audit checklists was **tested during routine audits of the CAA** (4 audits in different types of organizations)
- A person who has **limited experience with auditing** the given area would be able to **ask and assess the organization's answers easily** with the proposed checklist
- Commonly used **documentation is sufficient**
- Applicable for **internal audits** of organizations as well as **external audits** by authorities



## Remaining challenges:

- To focus on the answers recording and their assessment
- **Fully, partially,** or **does not meet** categories is insufficient for the performance-based audit

# Materials



- LALIŠ, A., K. GRÖTSCHELOVÁ a S. STOJIĆ. **Methodology for using the theory of STAMP safety model by the Civil Aviation Authorities**. 2023. Available: [https://uld.fd.cvut.cz/wp-content/uploads/2024/04/Methodika\\_073\\_EN-1.pdf](https://uld.fd.cvut.cz/wp-content/uploads/2024/04/Methodika_073_EN-1.pdf)



- GRÖTSCHELOVÁ, K., A. LALIŠ a N. GUSKOVA. **Performance Based Audit Checklists Using Systemic Approach To Safety**. In: *Advanced in Reliability, Safety and Security - Part 10 Cybersecurity and Functional Safety in Hazardous Systems & Research Challenges Concerning Sustainability, Safety and Security*. 34-th European Safety and Reliability Conference, Krakow, 2024-06-23/2024-06-27. Polish Safety and Reliability Association, 2024. s. 69-76. ISBN 978-83-68136-22-7. Available: <https://esrel2024.com/wp-content/uploads/articles/part10/performance-based-audit-checklists-using-systemic-approach-to-safety.pdf>

# Thank you for your attention!



## Aviation Safety and Security Laboratory

The Aviation Safety and Security Laboratory is a state-of-the-art unit for aviation safety and security research. The laboratory's research team focuses on systemic approach to safety, the latest methods and tools for data collection, processing and analysis, modeling of complex socio-technical systems and aviation safety management solutions. The lab's vision is collaborative, cross-national research that fosters innovation and creativity in safety and security.

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