Regulatory Developments in Systems Thinking

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02 February 2021

Regulatory Developments

- ICAO Human Performance Manual for Regulators
- CAA Systems Approach
- Future major human factors destinations

ICAO Assembly Resolution

- **From ICAO *Assembly Resolutions in Force (as of 4 October 2019)* (Doc 10041), A40-4:**
- **Appendix O: Human performance**

- Member States ensure the **integration** of human performance considerations in the planning, design, and implementation of new technologies, systems and processes as part of a safety management approach;

ICAO Human Performance (Doc.10151)

- It supports regulators to **make it easy for people in the aviation system to do the right thing**




ICAO HPM - Part 1

- Understanding Human Performance
- HCD
- Systems Thinking
- HP principles

Human Performance / Human Factors

- ***human performance (HP)*** refers to how people perform their tasks. HP represents the human contribution to system performance.

- ***human factors (HF)*** is concerned with the application of what we know about human beings, their abilities, characteristics and limitations, to the design of equipment they use, environments in which they function and jobs they perform. (Human Factors and Ergonomics Society, 2008)

Systems:

A system is a collection of separate, but interrelated parts that work together to achieve a common purpose.

Simple

Complicated

Complex

Aviation is a complex socio-technical system

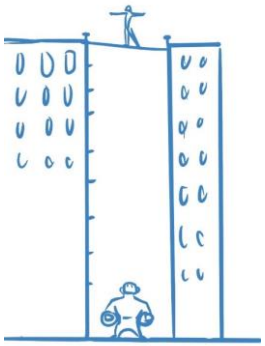
System Thinking

Systems thinking allows regulators to recognise that the **performance of the system as a whole**, not just the safety performance of its individual parts.

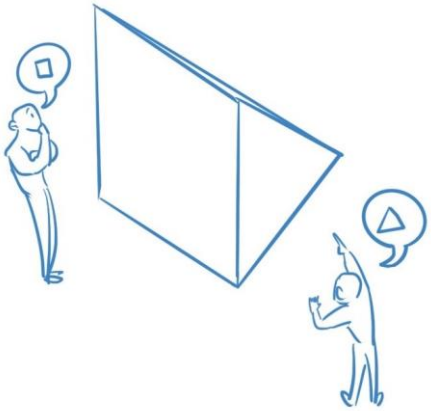
Picture curtesy of ICAO

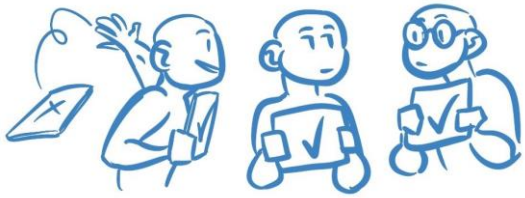
Where to start: ICAO Human Performance Principles

I: People's performance is shaped by their capabilities and limitations



II: People interpret situations differently and perform in ways that make sense to them





What do people need to perform at their best?

V: People's performance is influenced by interactions with other people, technology and the environment,

IV: People assess risk and make trade-offs

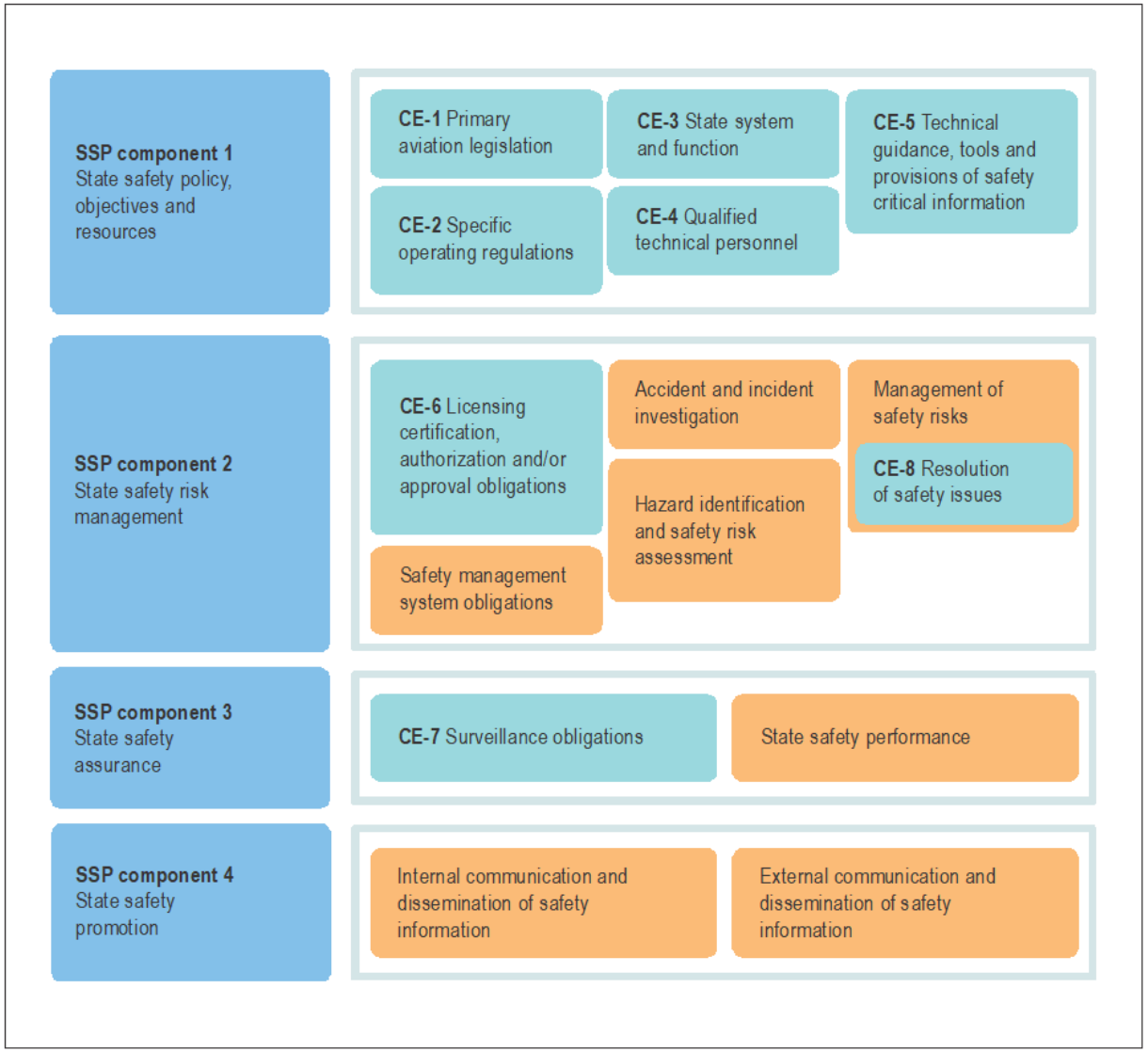
III: People adapt to the demands of a complex and dynamic work environment

Picture curtesy of ICAO

Why is systems thinking important for regulators?

- ICAO SARPS create global **interoperability**
- Every **change** to any part of the system is likely to impact other parts of it
- Enables the application and understanding of **context**
- **Understanding** of direct and indirect affects
- Change may shift the **risk / consequences**
- Enables **multiple perspectives** to be taken on problems and opportunities

ICAO HPM Part II: The State Safety Programme



Deciding to Regulate

- **Examining** the risk;
- **Deciding** on the approach;
- Process for **assessing proposals** (e.g., systems and equipment, procedures, personnel);

Ongoing surveillance and safety promotion

Key Areas for oversight:

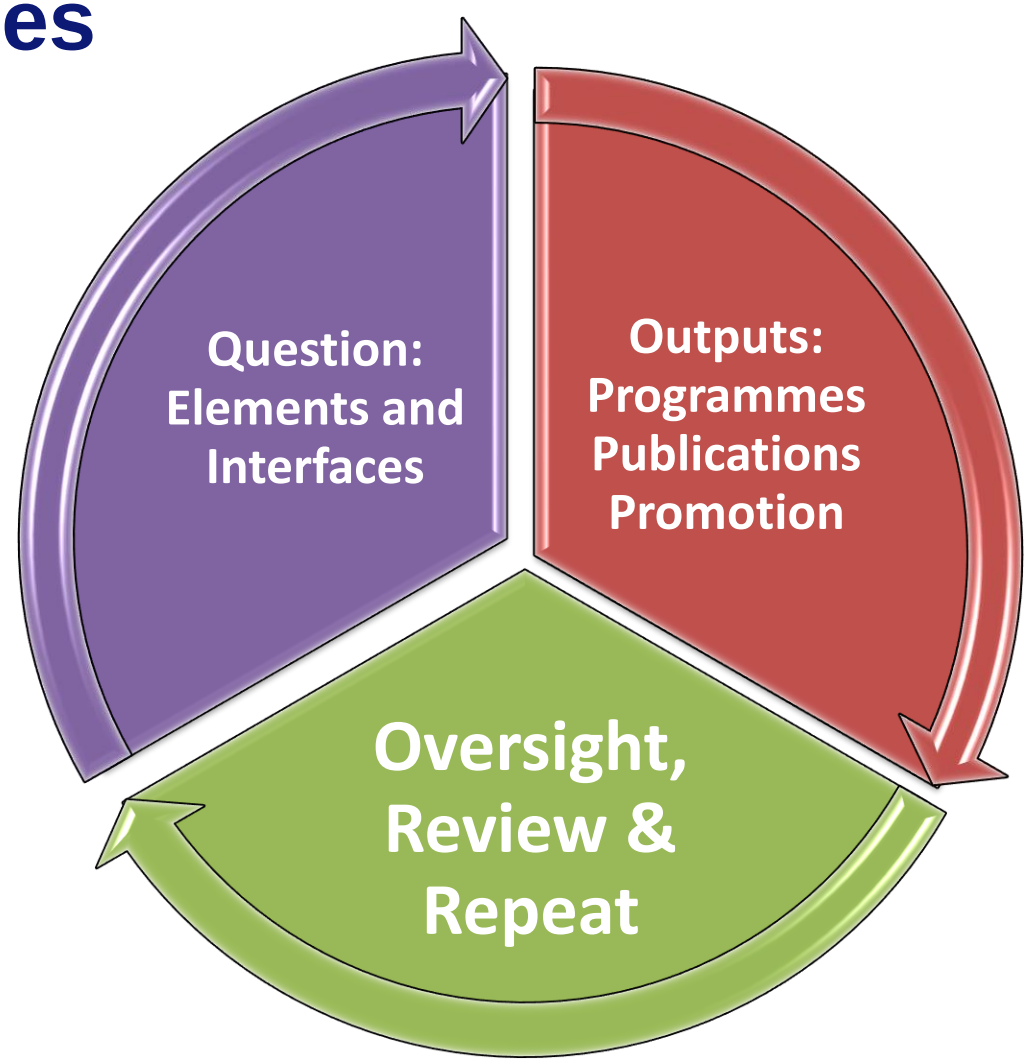
- how the service provider and its workforce **identifies** HP issues;
- how the effectiveness of any mitigations to support HP is **monitored**; and
- how lessons learned and user feedback are used to **maintain and improve** “how things get done”.

CAA's HF Vision

Everyone involved in civil aviation systematically applies Human Factors knowledge and Human Performance principles to improve aviation safety.

https://www.caa.co.uk/Safety-initiatives-and-resources/Working-with-industry/Human-factors/Human-factors/

Key Considerations within our Safety Activities



Collaborative Safety Approaches now and in the future

The 5 major HF destinations and the Regulator from CIEHF White Paper

I. Urban air mobility

II. Intelligent interfaces

III. Future flight crew

IV. Future workforce

V. Future governance

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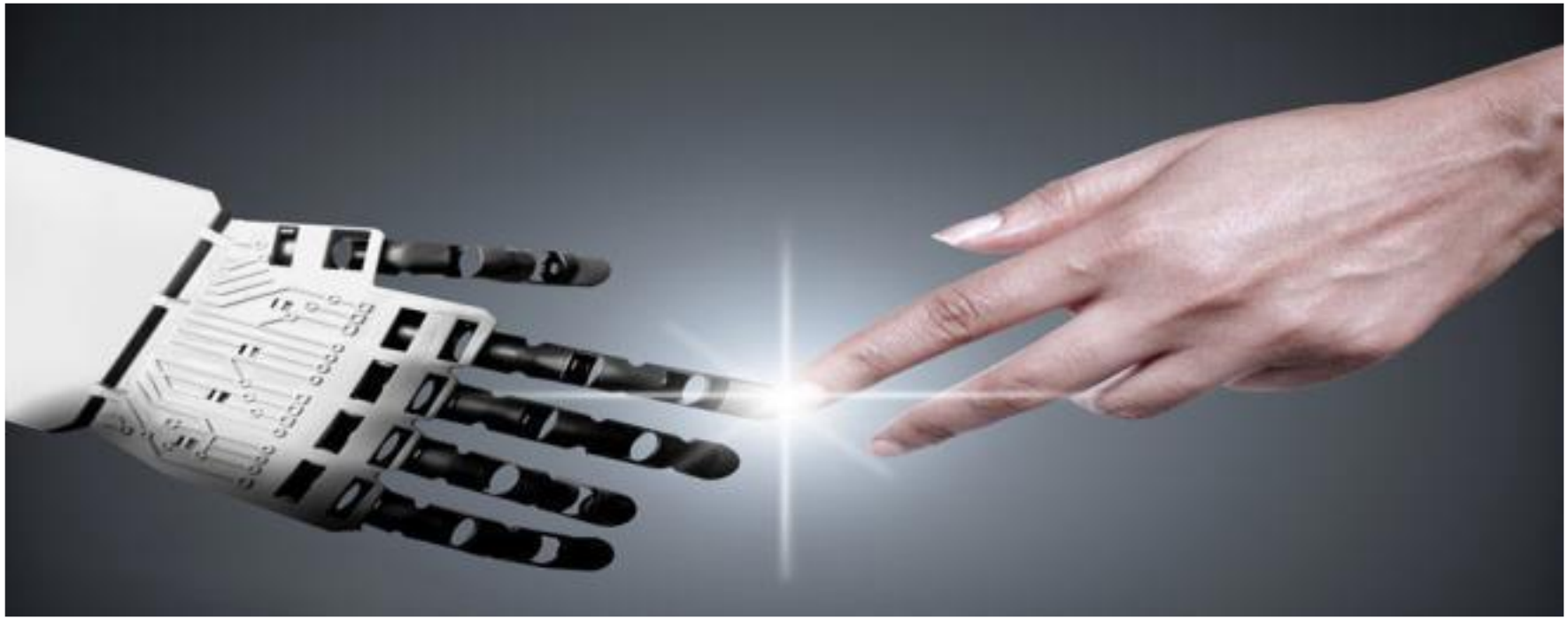
We have a sixth – as the newly appointed commercial space regulator.

Challenge Five
Future Governance



Aviation Systems will always involve people

One way to start any project is to ask some simple questions:

- Does it imply a **change** in task by a user or affected others?
- Does it imply processing of **new information** by the user?
- Does it imply the use of **new equipment?**
- Does it imply a change to **levels of automation?**

One way to start any project is to ask some simple questions:

Systems thinking is for all of us

- Collaboration
- Curiosity
- Consideration

Thank you