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# DEVELOPING SAFETY INTELLIGENCE



## **MENA ARCM- Workshop**

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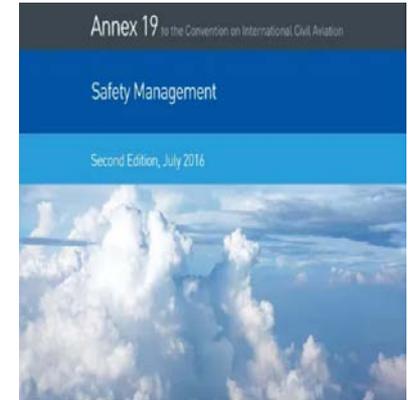
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## DEVELOPING SAFETY INTELLIGENCE

- Safety Data Collection and Processing Systems
- Safety Analysis
- Safety Information Protection
- Safety Information Sharing and Exchange
- Safety culture





## SAFETY DATA COLLECTION AND PROCESSING SYSTEMS

- **Annex 19 requires States** to establish safety data collection and processing systems (SDCPS) to capture, store, aggregate, and enable the analysis of safety data and safety information
- **Similarly, Chapter 8 of Annex 13** — Aircraft Accident and Incident Investigation requires States to establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies, and to determine any preventive actions required.





## USOAP-CMA. AIG-PQs

**6.501 (CE 8):** Has the State established and implemented (through the necessary legislation, procedures and guidance to the industry) a mandatory incident reporting system to facilitate the collection of information on actual or potential safety deficiencies?

**6.507 (CE 8):** Has the State established an accident and incident database, in a standardized format, to facilitate the effective analysis of information on actual or potential safety deficiencies and to determine any preventive actions required?

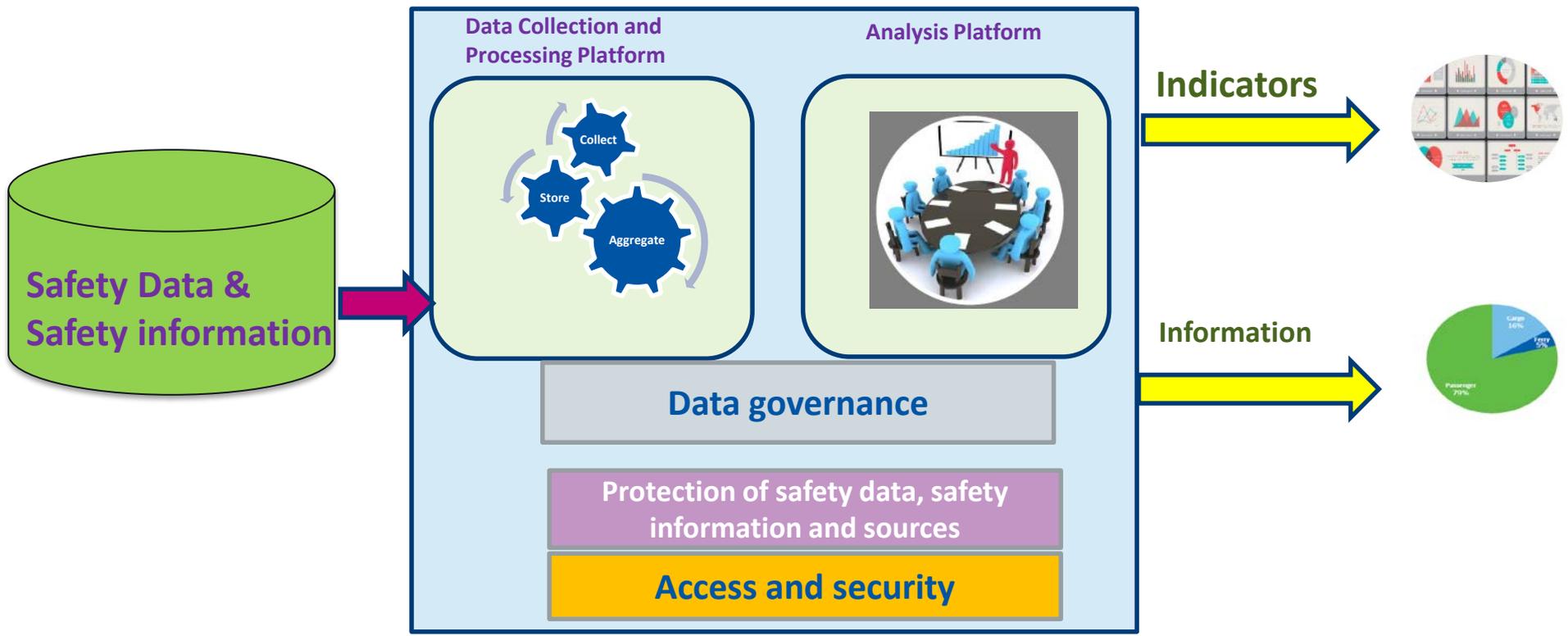
**6.511 (CE 8):** Does the State analyze the information contained in its accident/incident reports and database to determine any required preventive action?



## SSPIA. PQs

PQ No.	Protocol Question	References in ICAO Guidance Material	SSP Component	Maturity Levels			
				Not Present and Not Planned	Not Present but Being Worked On	Present	Present and Effective
SSP.SDA.01	What safety data collection and processing systems has the State established to support safety data analysis at the State level?	SMM Ch. 5	State Safety Risk Management	Based on current situation in State	Based on State's work in progress	<p>1. There is a mechanism in place to ensure the collection, processing and analysis of safety data at the State level.</p> <p>2. The sources for safety data and safety information include data and information derived from accident and incident investigations, mandatory occurrence reporting systems and other sources, including voluntary reporting.</p> <p>3. There is a mechanism in place at the State level to ensure the categorization of safety data and an agreed upon taxonomy at the State level, with supporting definitions.</p>	<p>1. The safety data that are collected, processed and analyzed contain all relevant data that might be collected.</p> <p>2. The safety data at the State level are categorized using an agreed upon taxonomy and supporting definitions, in a way that supports analysis of the safety data.</p>

# SDCPS OVERVIEW





## MANDATORY & VOLUNTARY REPORTING SYSTEMS

Annex 19 requires States to establish:

- **Mandatory safety reporting** system that includes the reporting of incidents.
- **Voluntary safety reporting** system to collect safety data and safety information not captured by mandatory safety reporting systems.
  - Confidential program
  - Non-punitive program





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## WHY DO WE NEED SAFETY DATA COLLECTION AND PROCESSING SYSTEMS (SDCPS)?

Who sees the risks out there?

- Regulators in the office?



People working on the front line?





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## BOTH SEE RISKS! WE NEED BOTH!

### Regulators see:

- The big picture
- Results of audits and visits
- Global trends



### The front line sees:

- Details and specifics
- Threats and hazards
- Practices of the rules in operations





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## WHY DOES REPORTING HELP?

Reporting helps us learn from mistakes so we can fix the issues

- Reporting helps us learn about the safety risks that could become a part of an accident chain one day
- This way we can fix them before they occur as a part of a the chain
- It gives us higher levels of safety and continuous improvement

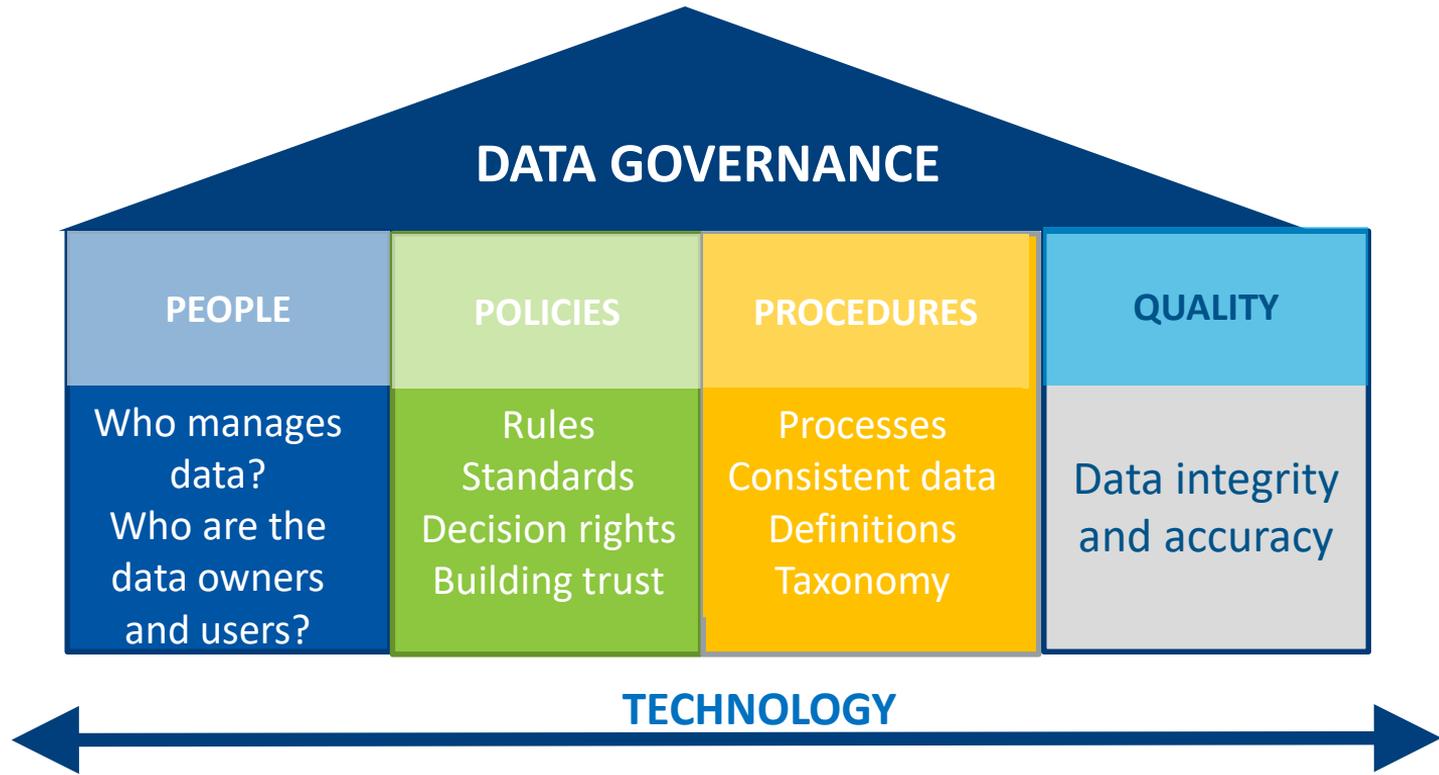




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## DATA GOVERNANCE





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## DO WE HAVE THE RIGHT DATA?



- The collection and analysis of that data over the wider aviation system will help deliver an even better risk picture.
- An effective SSP should provide a better safety risk picture.
- Having reports from multiple sources allows cross checking.

Do we have all the data needed to create a clear picture of our safety risks?



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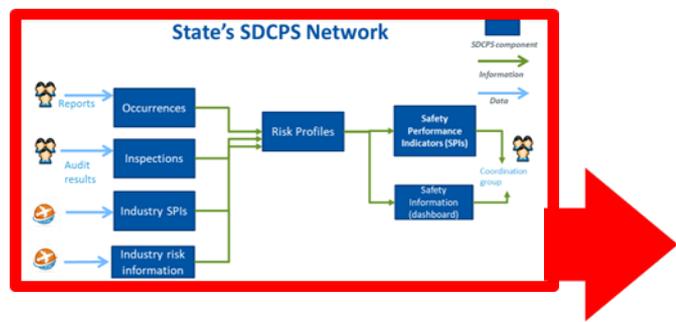


## TAXONOMY

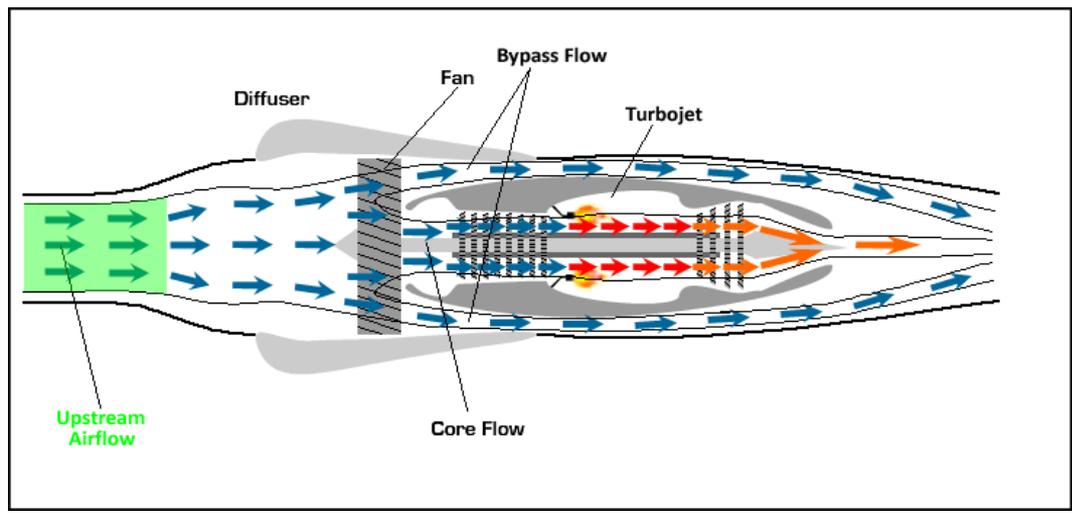
- Where every piece of data or information needs to have a definition and a predefined set of possible values.
- Improves safety analysis
- Global taxonomies/references exist for flight phases, occurrence categories, airports, etc.
- Enables compatibility between different organizations and States



## ENCOURAGING REPORTING



The success of a reporting system depends upon on the continuous flow of information from the front-line personnel.





## DATA INTEGRATION

- It is necessary to build integration facilities within SDCPS to address existing databases from different sources.
- Quality is equally important as quantity. Data needs to be normalized.





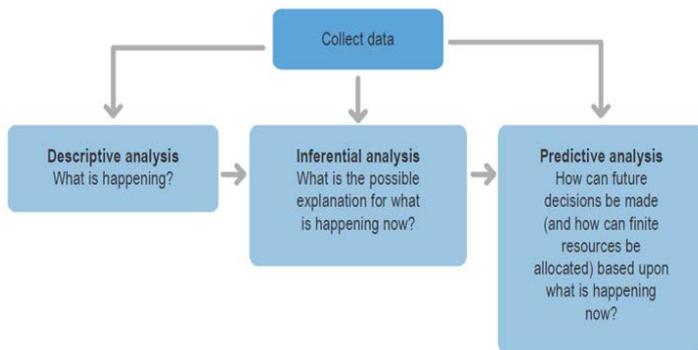
## ACCESS AND SECURITY

- The governance scheme of an SDCPS should include an appropriate level of security through user identification and management of access rights.
- Access through user-specific ID (login and password).
- Determining who can access what data.





## SAFETY ANALYSIS



- Safety analysis may be a new function the State or service provider may need to establish
- The process to **check, examine, describe, transform, condense, evaluate and visualize** safety data and safety information

### Safety Analysis:

- Discovers useful information, suggest conclusions and support data-driven decision-making
- Helps organizations to generate actionable safety
- Relies on the simultaneous application of statistics, computing and operations research
- Presents the safety situation in ways that enable decision makers to make data-driven safety decisions.





## SAFETY DATA AND SAFETY INFORMATION PROTECTION

- States shall accord protection to safety data captured by, and safety information derived from, **voluntary safety reporting systems** and related sources in accordance with Appendix 3.

Note.— Sources include individuals and organizations.

- **Recommendation:** States should extend the protection to safety data captured by, and safety information derived from, **mandatory safety reporting system** and related sources.





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## SAFETY INFORMATION PROTECTION (SIP)

- Principles for the legal protection of safety data and safety information found in **Annex 19, Appendix 3.**

*Annex 19 – Safety Management*

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## SAFETY INFORMATION SHARING AND EXCHANGE



Safety can be further improved when information is shared or exchanged:

- Sharing within the State
- Sharing between States

States shall promote the establishment of safety information sharing or exchange networks among users of the aviation system, and facilitate the sharing and exchange of safety information, unless national law provides otherwise.



## SAFETY CULTURE

- Safety Culture is *“how people behave in relation to safety and risk when no one is watching”*.

Individuals may be **influenced** by more than one culture:

- National
- Organizational (workplace / corporate)
- Professional (pilots / ATCOs / engineers)

If you are convinced your organization has a good safety culture, you are almost certainly mistaken. Like a state of grace, a safety culture is something that is striven for but rarely attained. As in religion, the journey is more important than the product. The virtue – and the reward – lies in the struggle rather than the outcome.”

(James Reason, 1997)





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## WHY POOR SAFETY REPORTING?

They won't believe me

I don't have time to complete the report

I don't want to get my colleague into trouble

It's not worth it

It's not that important

Why bother, nothing will change

It will be held against me for future promotions

Everybody is too busy, I don't want to waste anybody's time



## Example: Composite Materials?



**External damage detected – but not considered worth further investigation**

**aircraft returned to service.....**



**Internal damage found during next base check**



## WHAT TO REPORT?

- Accidents, serious incidents, and incidents
- Errors (yours or other's)
- Hazards or anything that could effect aviation safety
- Near misses (mistakes or errors that don't result in an occurrence)
- Procedures that are not clear or can't be followed
- Organizational failures (system, equipment or tooling failure or not available)
- Human Factors such as fatigue, workload, time pressures





## EVALUATING THE SAFETY CULTURE

- Safety Culture is **difficult to measure**  
However, it can be **assessed**.
  
- Safety culture matures  
However Safety culture can :
  - vary within the same organization
  - change both positively and negatively

Below is a list of statements regarding safety issues that are relevant to your role in the organisation. Please indicate the extent to which you agree/disagree with each one by circling one number on each line. We want your opinion about how your organisation currently works.

	Strongly disagree	Disagree	Neither	Agree	Strongly agree	Comment
1. Even if some equipment is unavailable, we are still required to meet our capacity targets	1	2	3	4	5	
2. The equipment that is available is suitable for my job	1	2	3	4	5	
3. In ATC everyone knows there is an accident 'just waiting to happen'	1	2	3	4	5	
4. Maintenance staff understand how equipment failures affect our ability to provide safe air traffic services	1	2	3	4	5	
5. I trust the ATC procedures that I use in my job	1	2	3	4	5	
6. Maintenance staff perform sufficient system checks	1	2	3	4	5	
7. The future plans are adequate for the development of the ATC service	1	2	3	4	5	
8. I trust the ATC equipment that I use in my job	1	2	3	4	5	
9. We openly discuss incidents in an attempt to learn from them	1	2	3	4	5	
10. Controllers would never compromise their responsibility for safety	1	2	3	4	5	
11. We are expected to be able to handle safety problems without reducing throughput	1	2	3	4	5	
12. We are consulted about changes to the technical/engineering system that impacts on the way we do our work	1	2	3	4	5	
13. There is pressure to use smaller safety margins than I feel comfortable with	1	2	3	4	5	
14. It is possible for operational and technical/engineering systems teams to meet together and discuss potential solutions for past problems	1	2	3	4	5	





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Thank you!

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