



BEA
Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

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**Conducting investigations on
similar incidents that occurred
in different countries**

A complex organization

Investigating on similar incidents

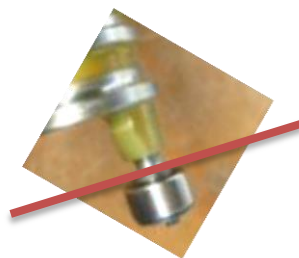
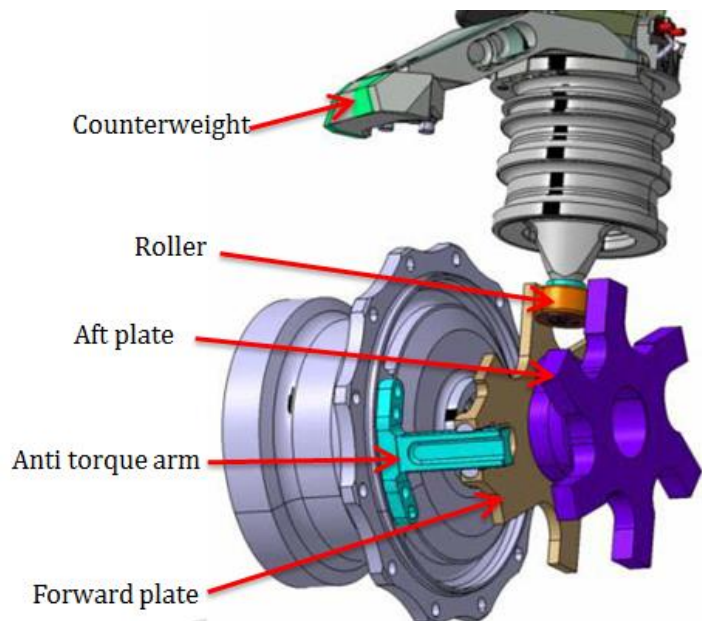
- A practical case : the investigation on several incidents involving propeller severe vibrations during flight
- Organization of investigations according to ICAO Annex 13
- Highlighted Solutions
- Possible ways of improvement

Practical case : propeller severe vibrations

- On 18th September 2013, in Indonesia, ATR 72-212A equipped with Hamilton Sundstrand Propellers 568F-1
 - ➔ Severe vibrations on engine #2 propeller during descent
 - ➔ Engine #2 was shut down after landing
 - ➔ Different blade angles observed on ground

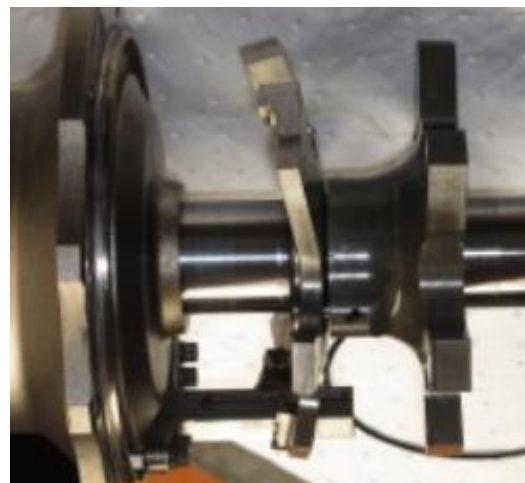


Practical case : propeller severe vibrations



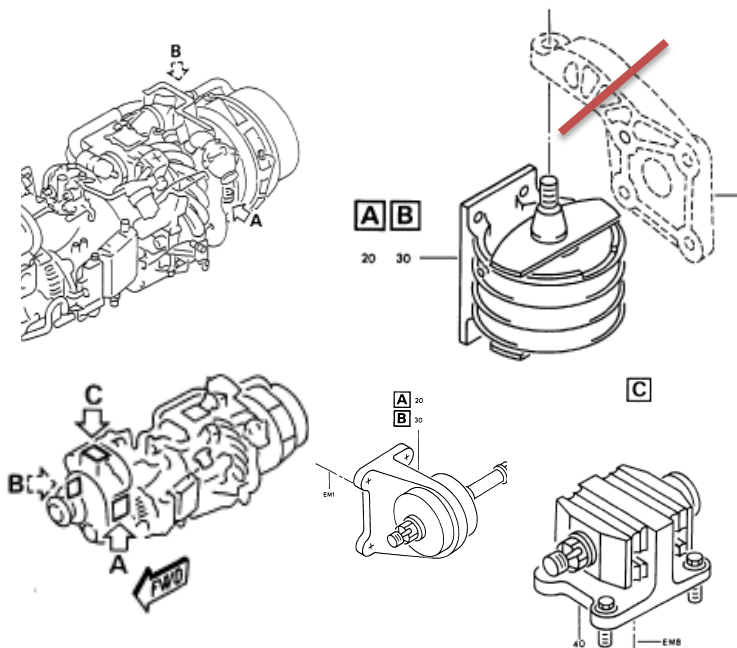
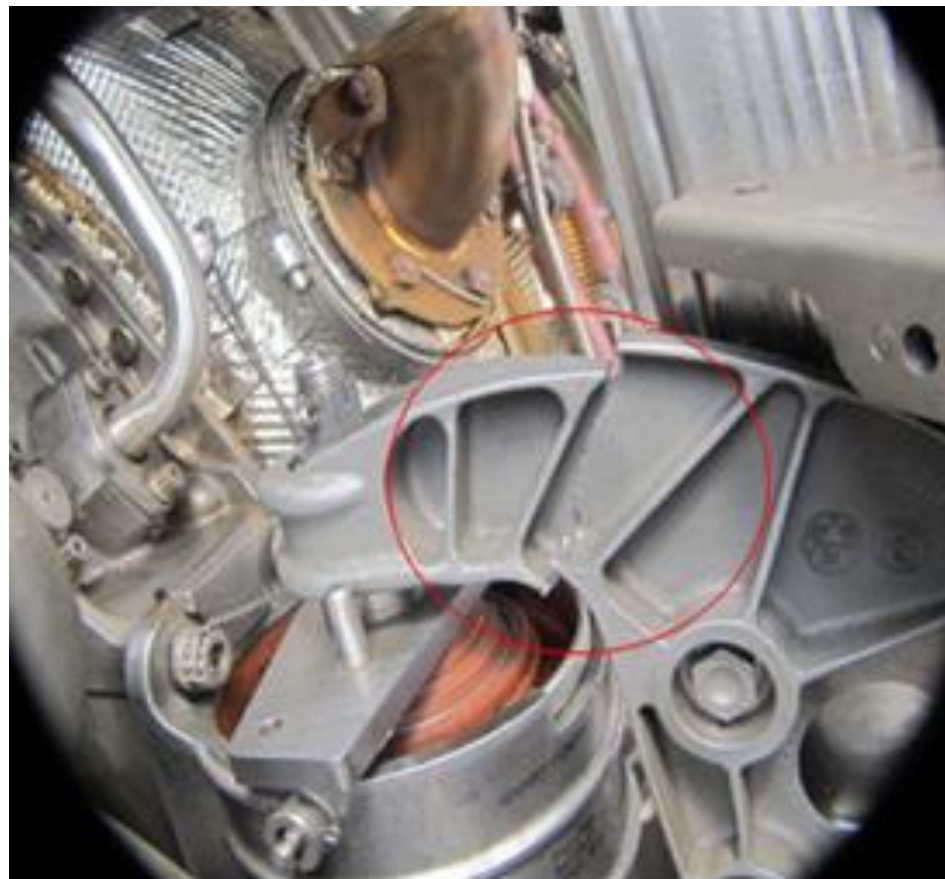
■ Damages :

- ➔ One blade was turning freely (blade trunnion pin broken)
- ➔ Blade angle actuator forward plate found bent



Practical case : propeller severe vibrations

- Damages :
 - ➔ Two engine fittings found broken



Serious Incident – full investigation

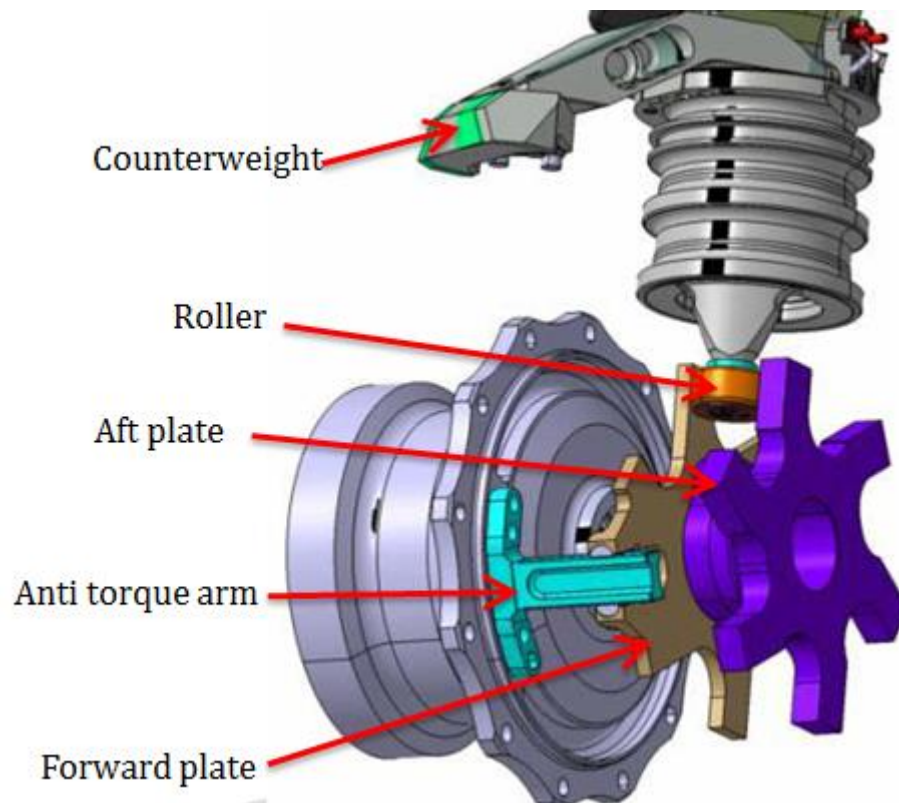
- According to the Attachment C of the ICAO Annex 13, this occurrence was classified as serious incident.
- NTSC conducted full investigation and sent notification to direct involve parties including France BEA as State of Manufacture.
- Significant supports received from the BEA.
- 30 days after the occurrence NTSC issued safety recommendation to the aircraft operator.

Practical case : propeller severe vibrations

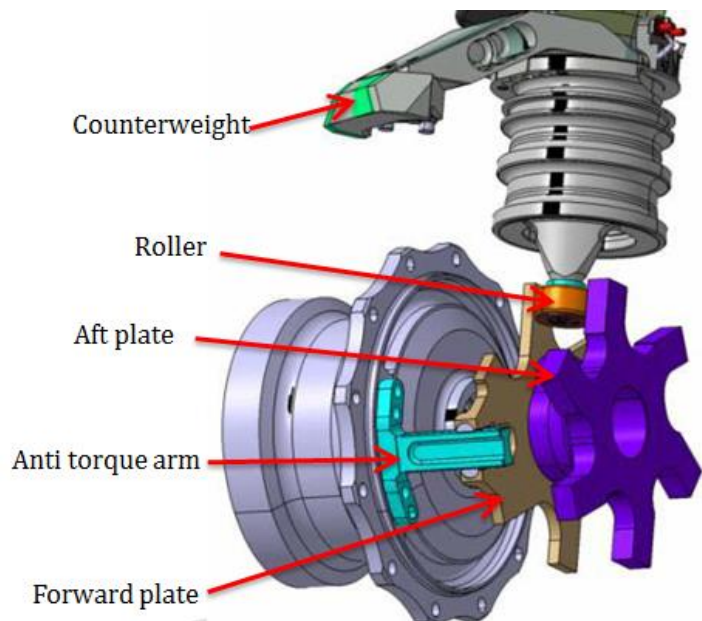
- On 4th May 2014, in Trinidad and Tobago, ATR 72-212A equipped with Hamilton Sundstrand Propellers 568F-1
 - ➔ Severe vibrations on engine #2 propeller during descent
 - ➔ No findings from maintenance
 - ➔ On 5th May 2015, vibrations after landing
 - ➔ Test runs leading to damages

Practical case : propeller severe vibrations

Propeller governing system description



Practical case : propeller severe vibrations



■ Damages :

- ➔ One blade was turning freely (blade trunnion pin broken)
- ➔ Blade angle actuator forward plate found bent



Practical case : propeller severe vibrations

NOT A SERIOUS INCIDENT but SIMILAR INCIDENT



INVESTIGATION proposed by BEA

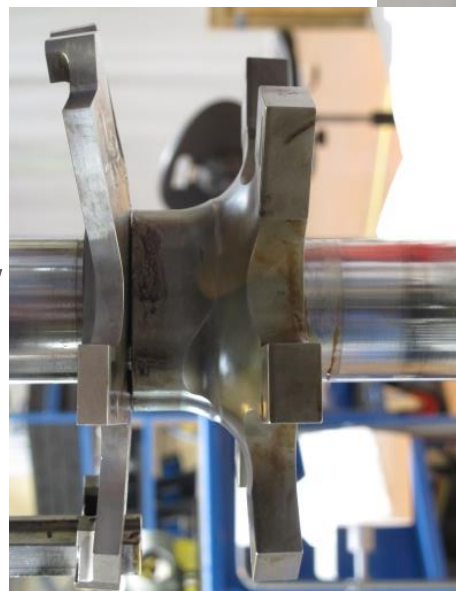
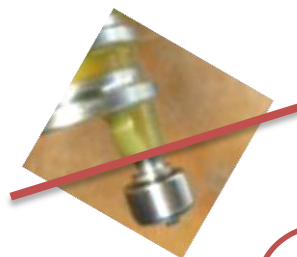
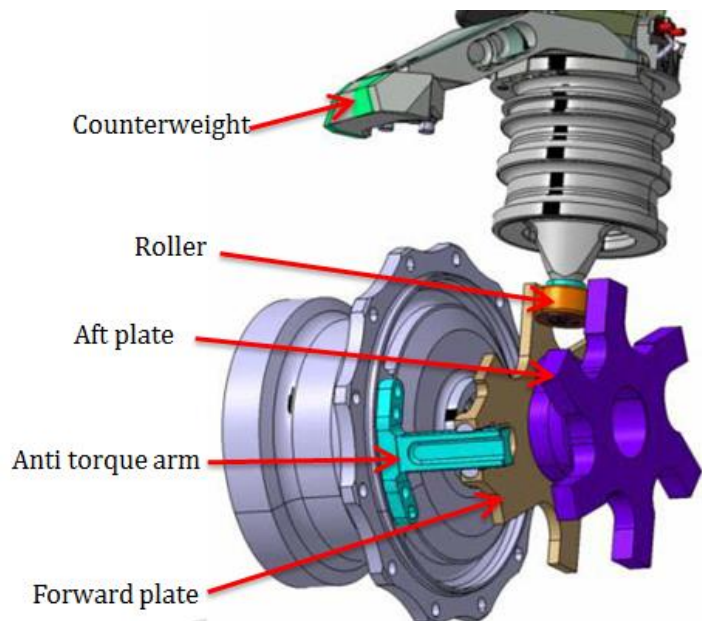


INVESTIGATION delegated to BEA

Practical case : propeller severe vibrations

- On 30th November 2014, in Sweden, ATR 72-212A equipped with Hamilton Sundstrand Propellers 568F-1
 - ➔ Severe vibrations on engine #2 propeller during descent
 - ➔ Impossible to read instruments and to walk in cabin
 - ➔ Engine #1 fatheared then engine #2

Practical case : propeller severe vibrations

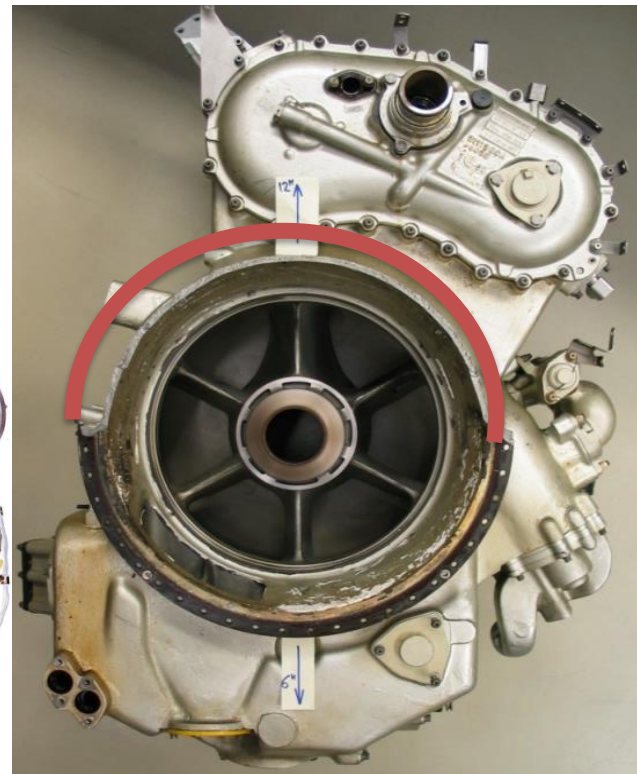
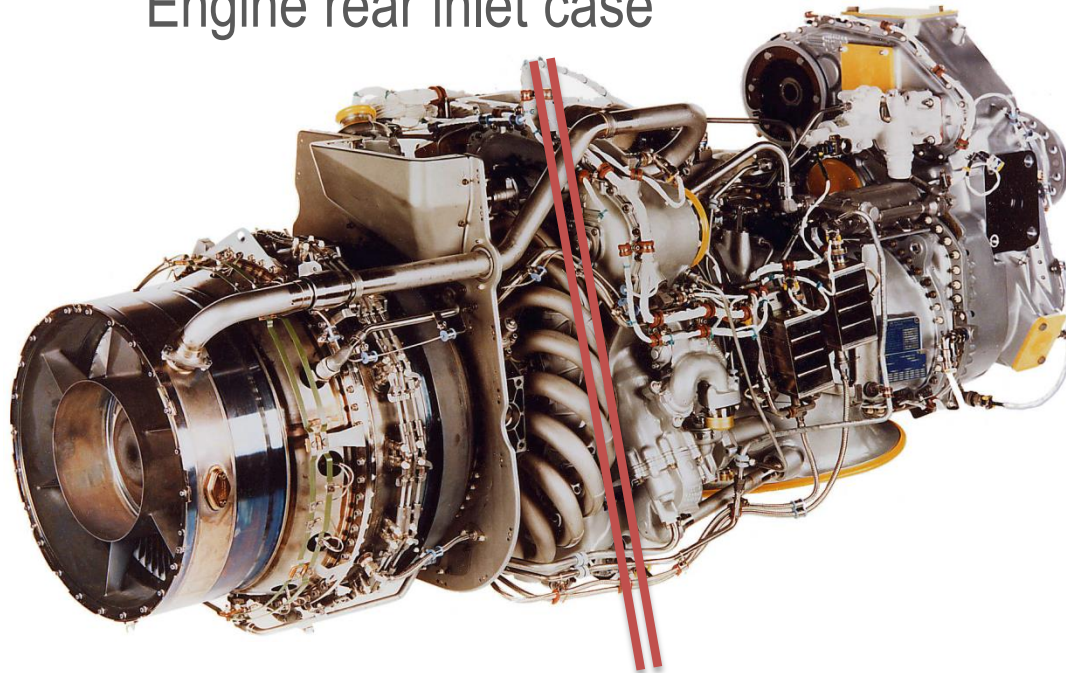


■ Damages :

- ➔ One blade was turning freely (blade trunnion pin broken)
- ➔ Blade angle actuator forward plate found bent

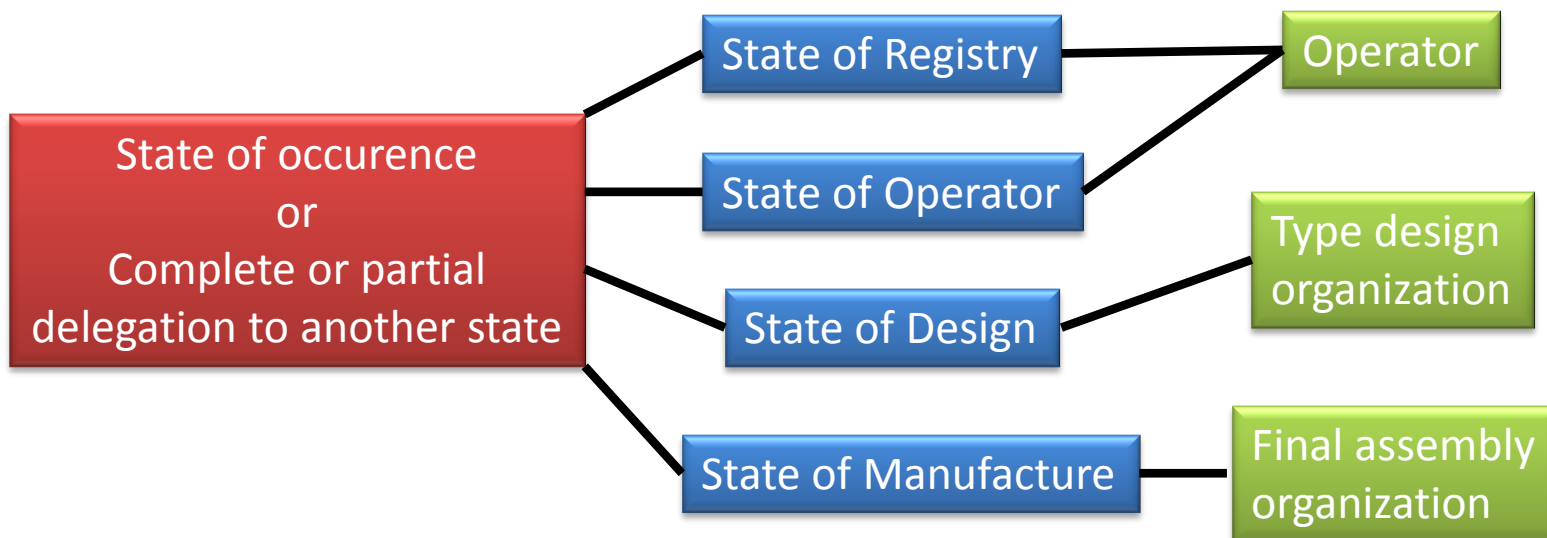
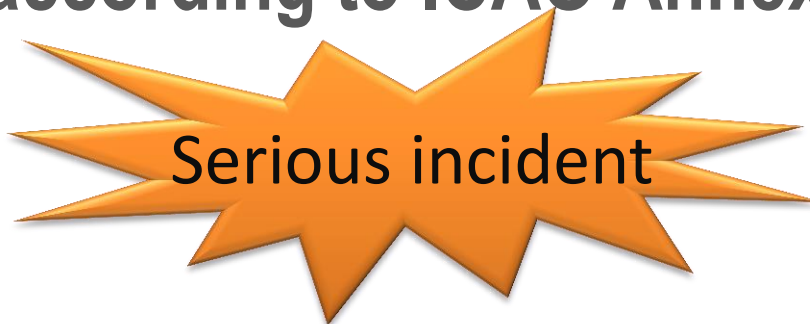
Practical case : propeller severe vibrations

- Damages :
 - A 180° crack
- Engine rear inlet case



INCIDENT but SIMILAR INCIDENT → INVESTIGATION by SHK

Organization of investigations according to ICAO Annex 13



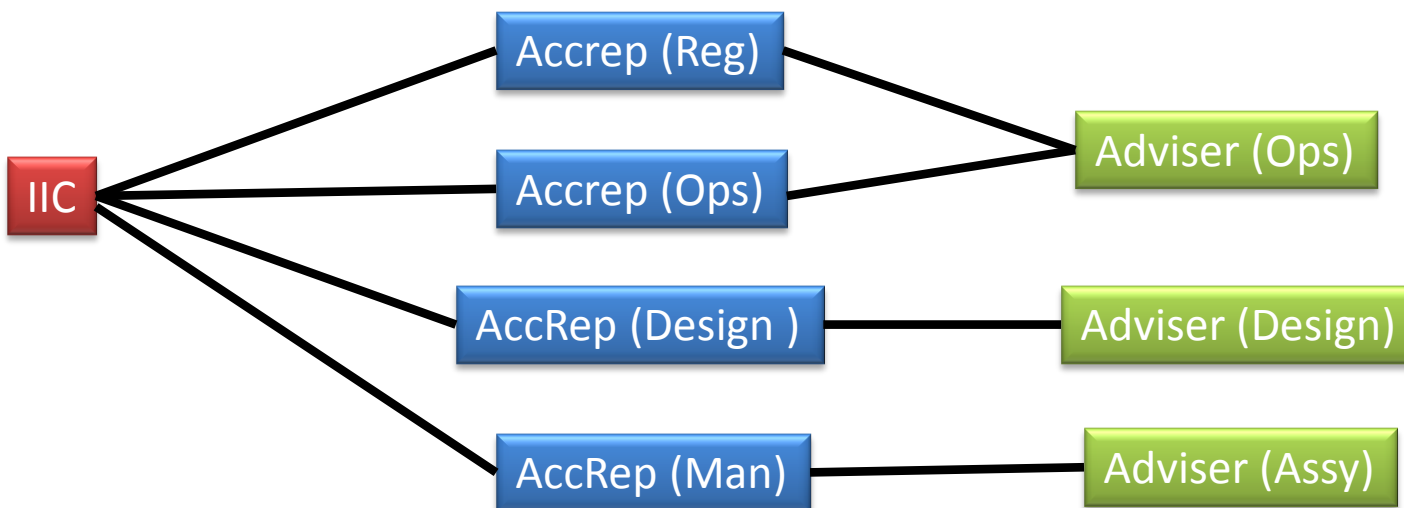
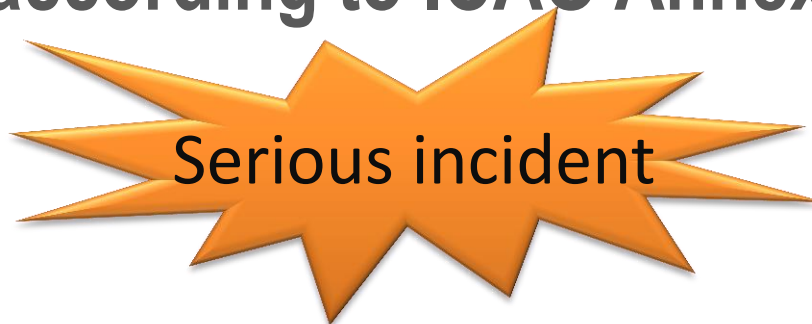
IIC

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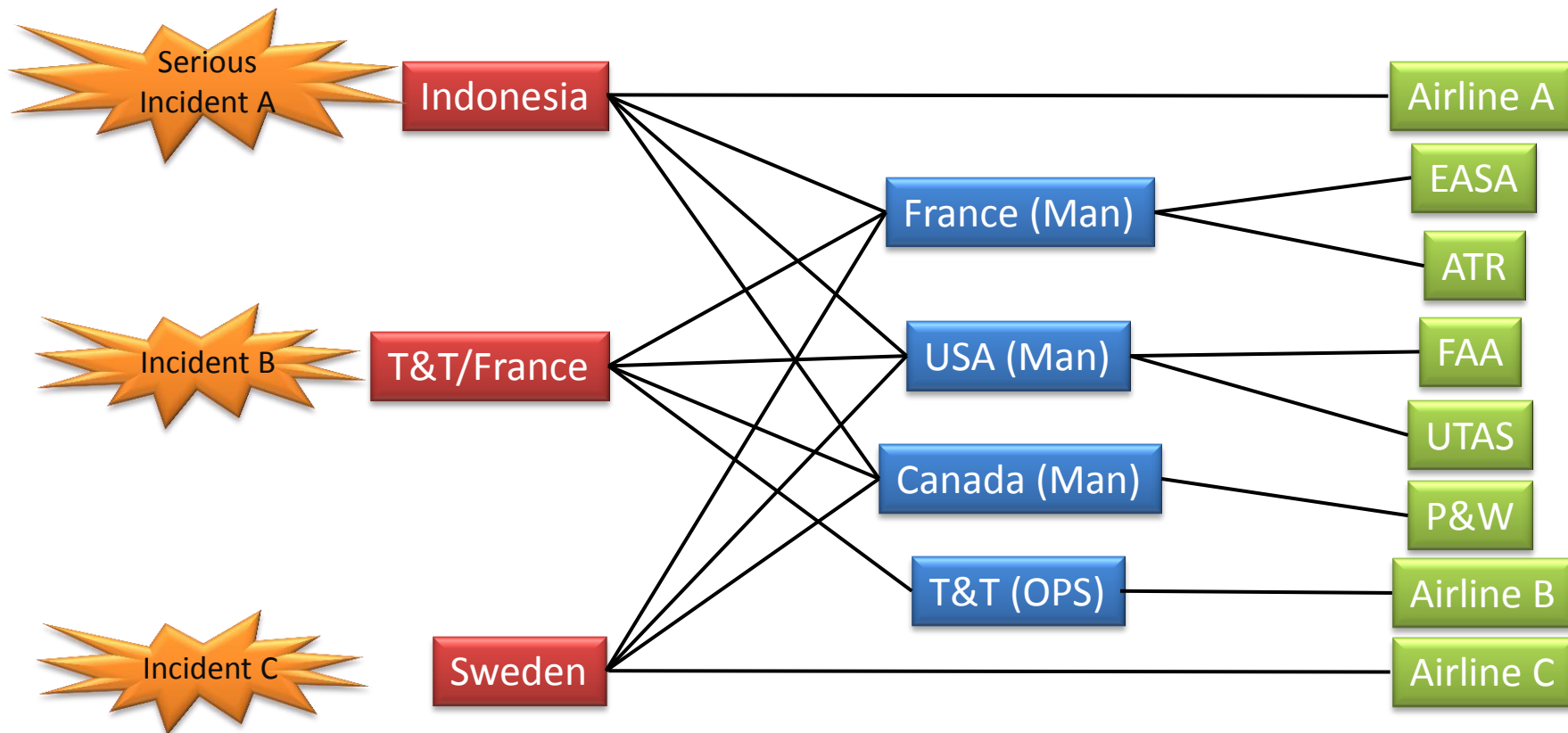
Advisers



Organization of investigations according to ICAO Annex 13

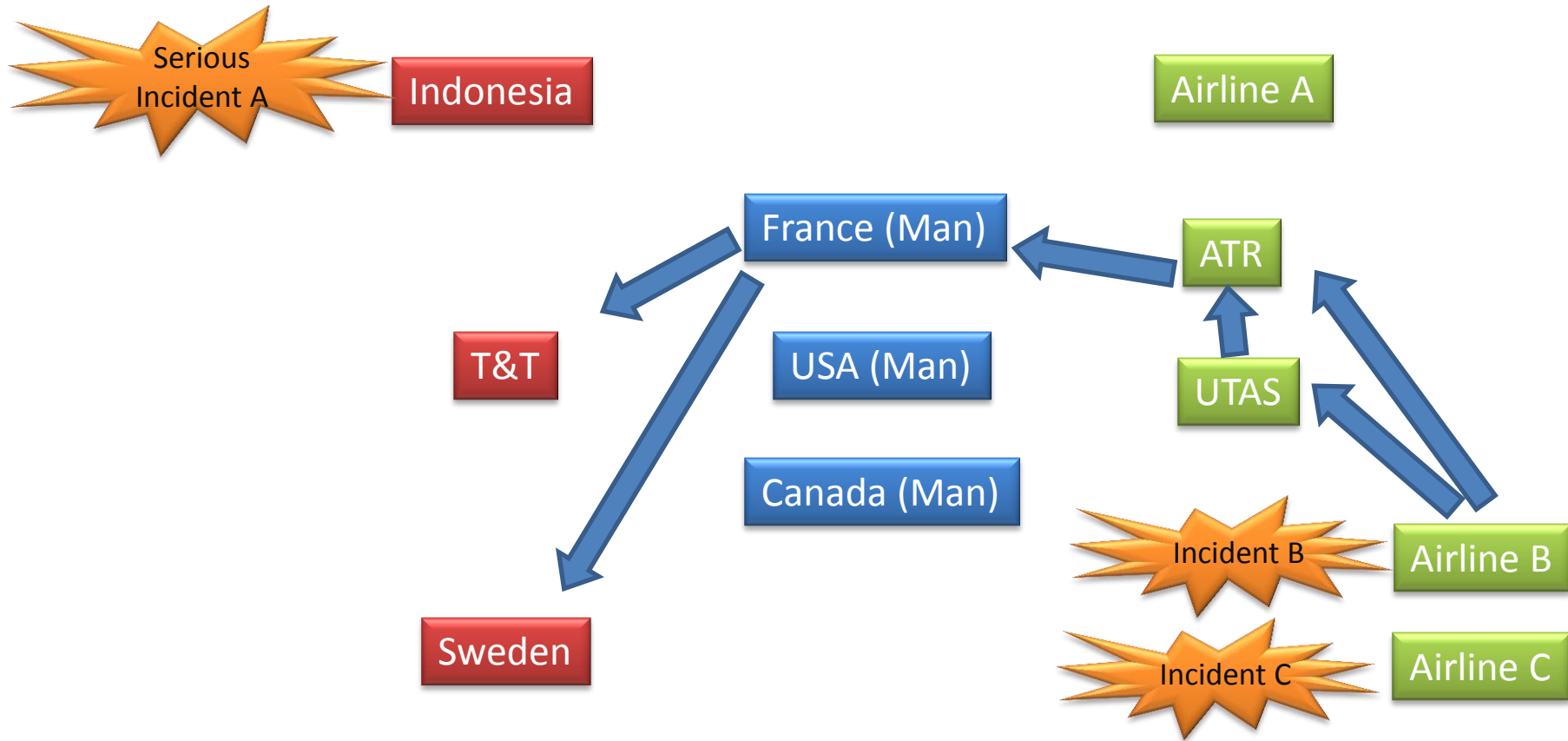


Organization of investigations according to ICAO Annex 13



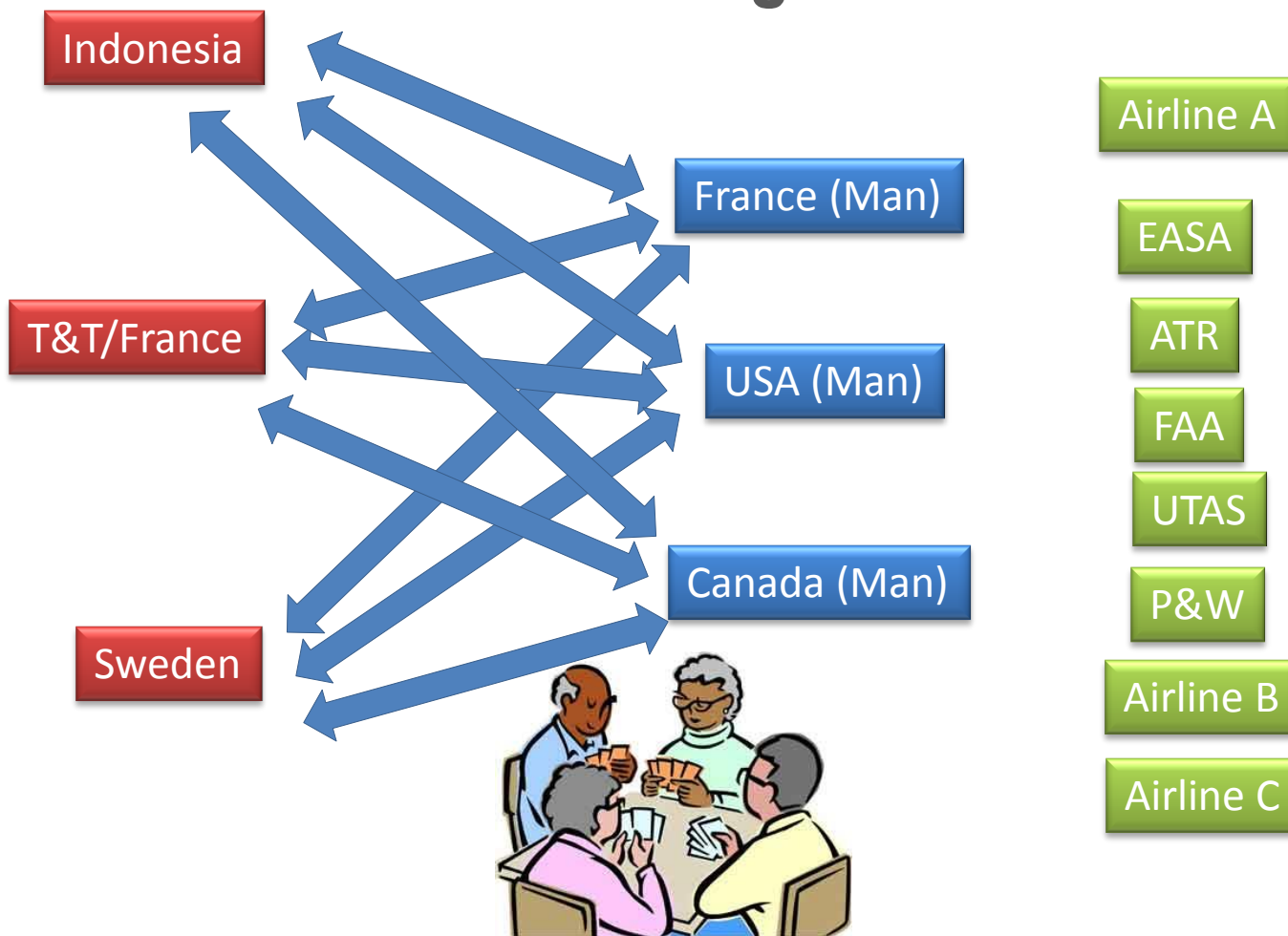
Highlighted Solutions

Incident Notification

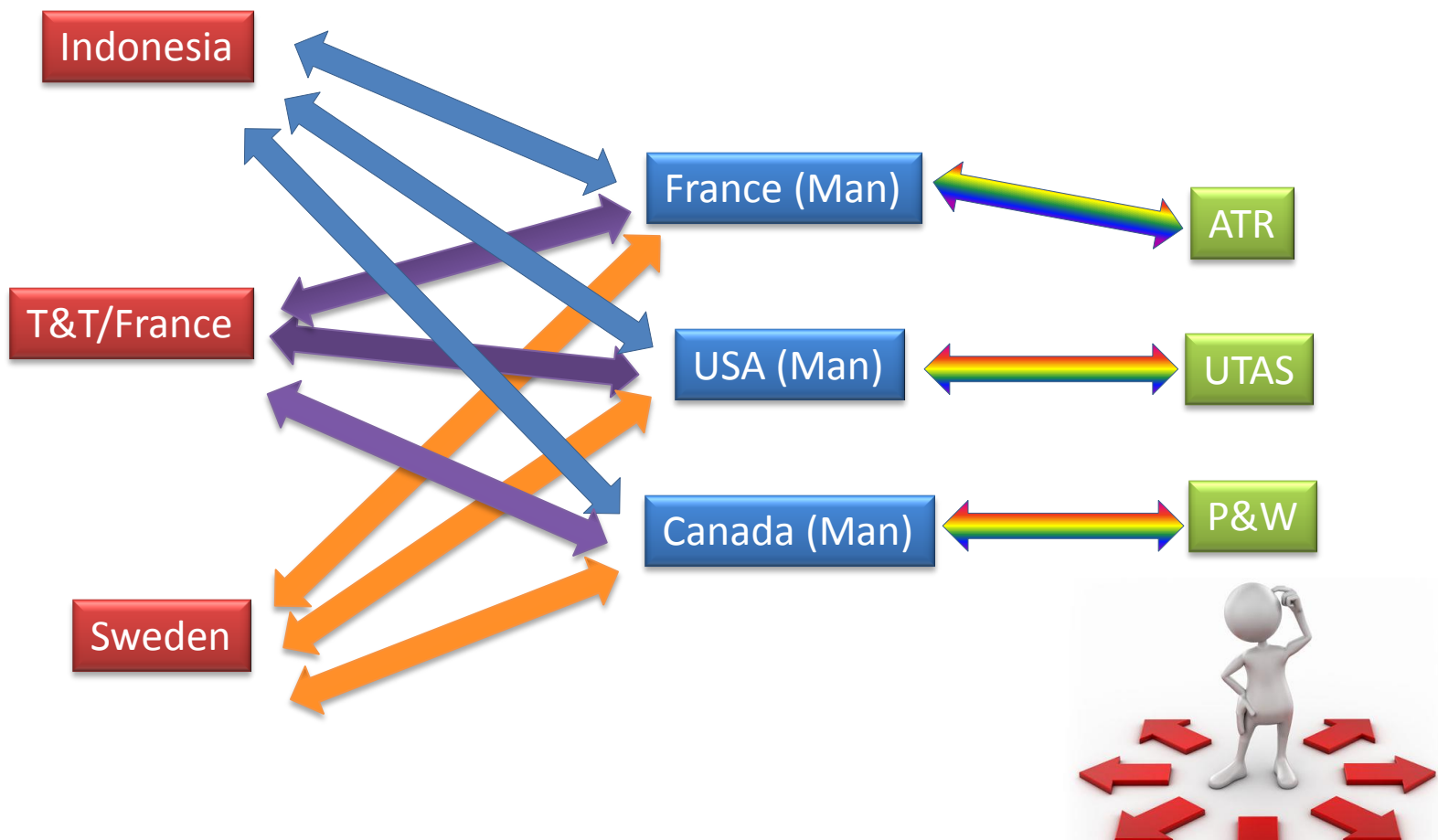


Highlighted Solutions

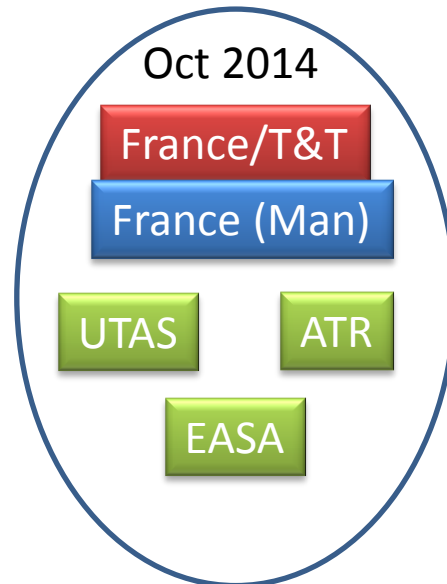
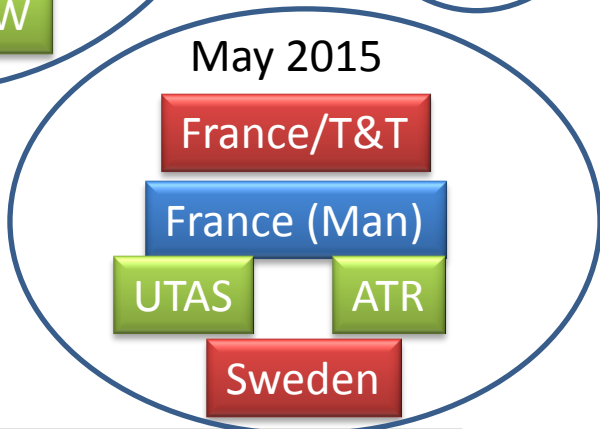
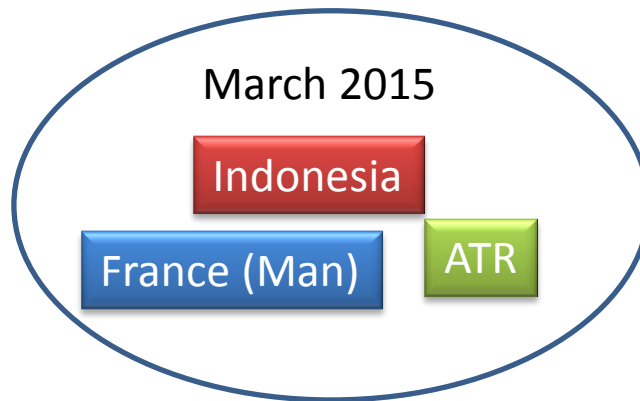
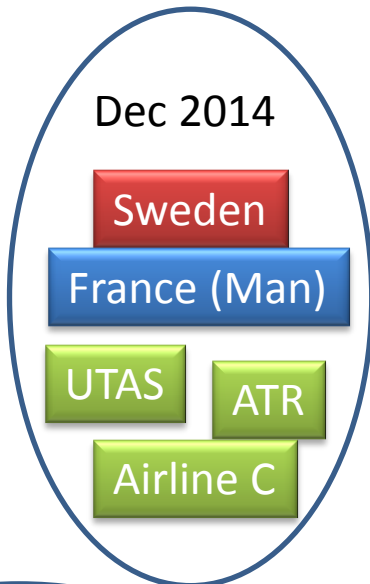
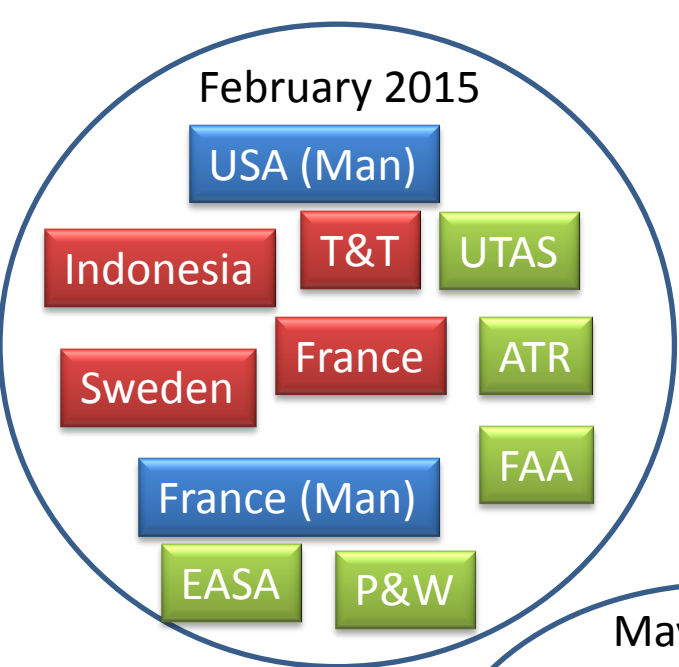
Information sharing between SIA



Examination requests and “to do list”

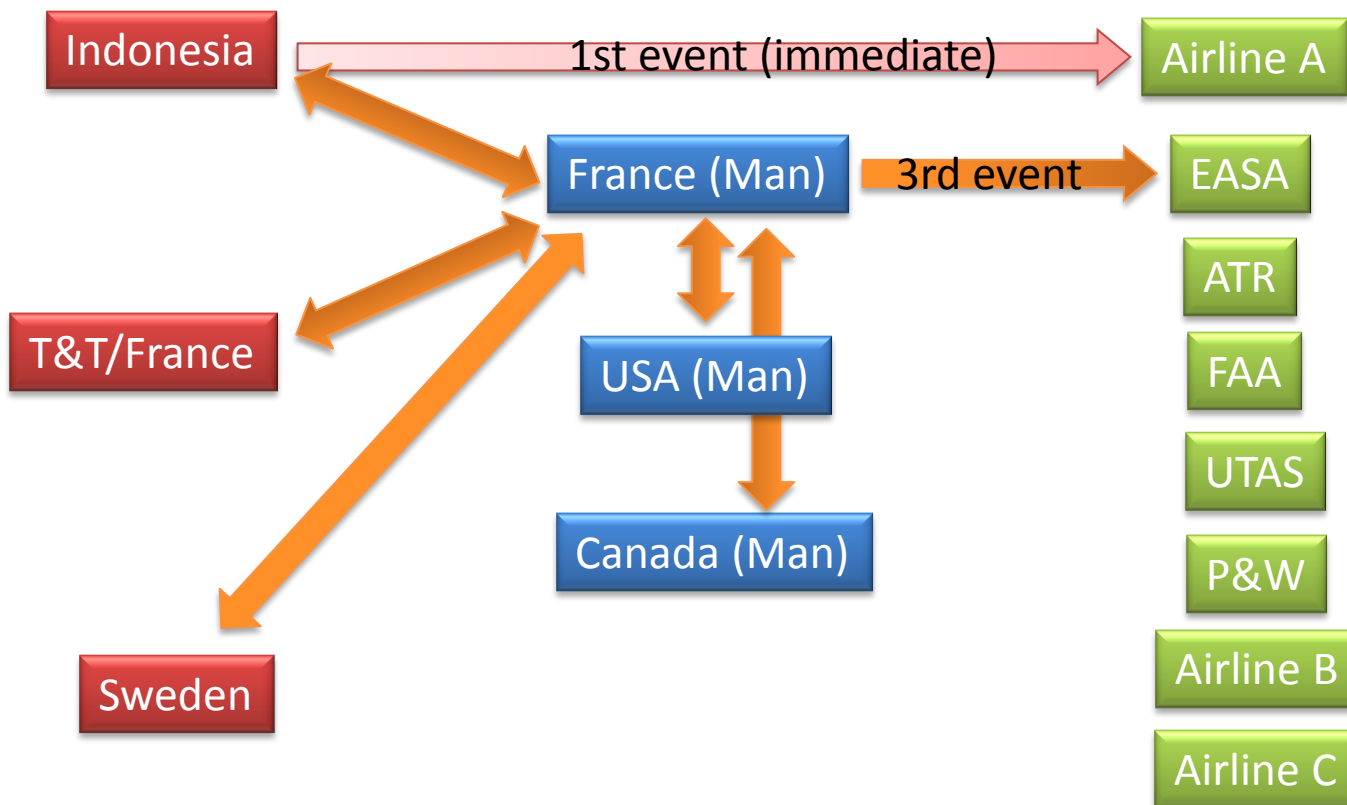


Highlighted Solutions Update meetings



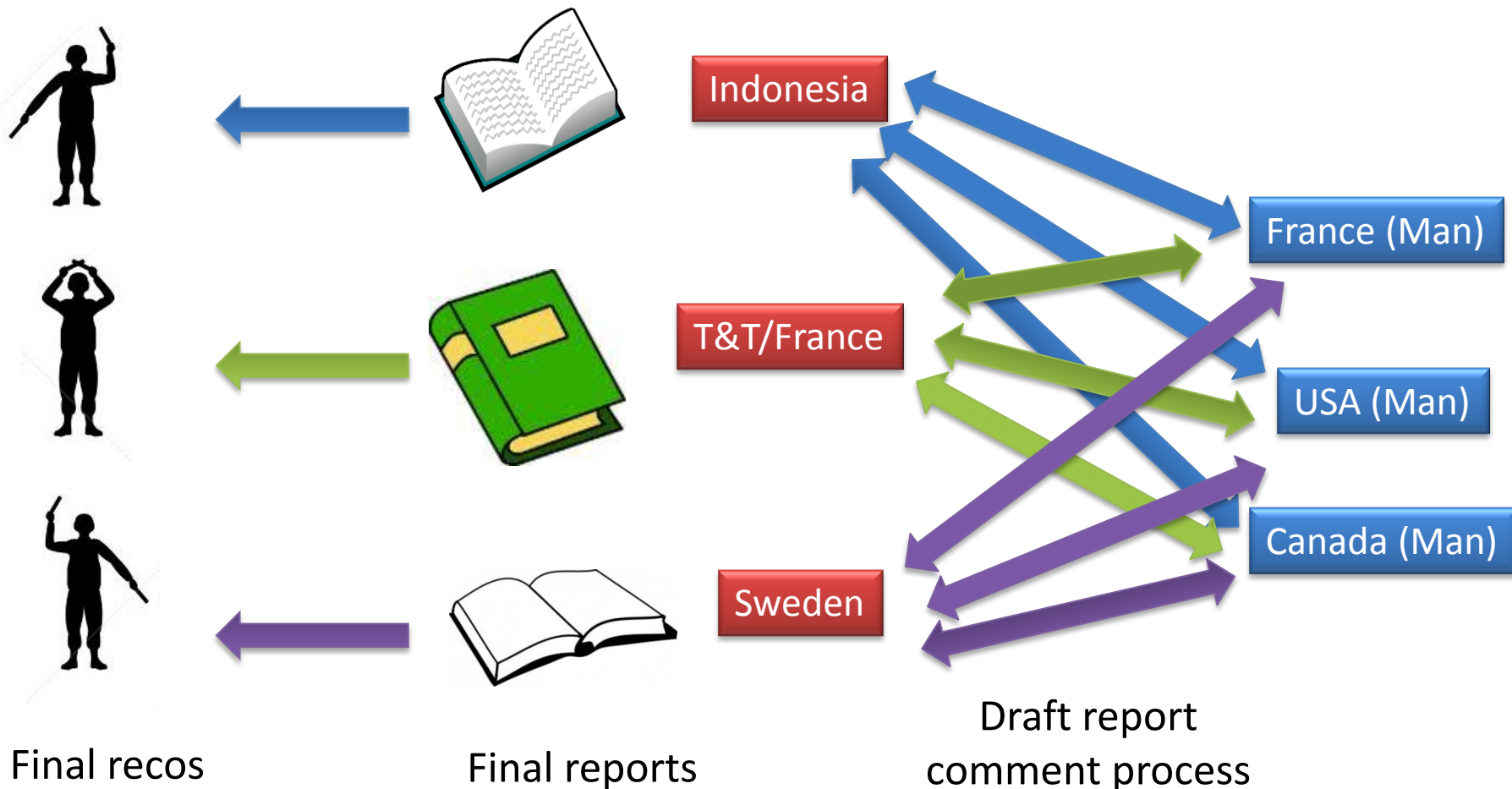
Highlighted Solutions

Safety recommendations



Highlighted Solutions

What about the reports and final recos?



Possible ways of improvement

- Improve SIA awareness of an on going investigation



- Focal point (SIA or safety organization)



- Improve confidentiality principles for information sharing

- Harmonization of reports and recommendations

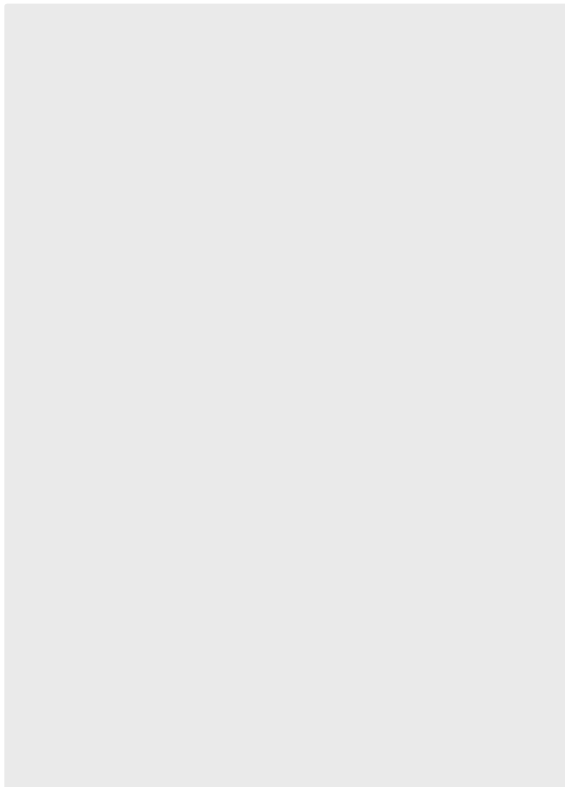


Similar investigations to be considered as a unique big one ?



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Thank you for your attention

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