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Introduction to cyber security for ANSPs

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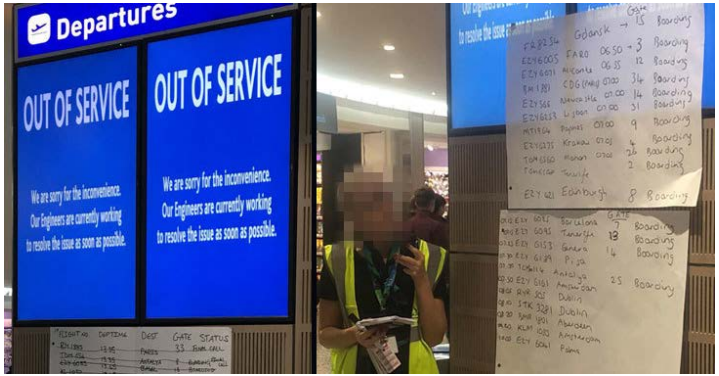
Aviation industry is a target: Airport

- **Bristol Airport** hit by ransomware attack for causing a blackout of flight information screens for two days.
- However, no flight delays were reportedly caused due to the cyber attack.
- https://thehackernews.com/2018/09/cyberattack-bristol-airport.html



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Aviation industry is a target: Airlines

- **British Airways**: (2018) hackers stole the personal and financial details of 380,000 people who booked direct with the airline during 15-days.

- **Vietnam Airlines and airports**: (2017), two major international airports, hacked and offensive messages were displayed on flight information screens.

  At the same time Vietnam Airlines, website was hacked, and its 400,000 customers VIP membership database was stolen.

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Aviation industry is a target: Aircraft

- **BlackHat 2018:** Researcher **Hacked In-Flight Airplanes Satcom**

  He accessed on-board passengers' WiFi network …

  … reached the planes' satcom equipment, **from the ground**…

  … spotted hundreds of "exposed" aircraft **from multiple airlines**,…

  … Same Satcom equipment used in the maritime industry and military are also affected by the vulnerability.

https://www.blackhat.com/docs/us-14/materials/us-14-Santamarta-SATCOM-Terminals-Hacking-By-Air-Sea-And-Land-WP.pdf

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Aviation industry is a target: ANSP

- **Air Traffic Control System Failure** (2014)
  - The ATM failed from West Coast to Arizona and from Nevada to the Mexico border.
  - No accidents or injuries but thousands of passengers had flights delayed or cancelled.

- System failure, based on automation system design issue, also exposed a cybersecurity vulnerability

- https://thehackernews.com/2014/05/air-traffic-control-system-failure.html

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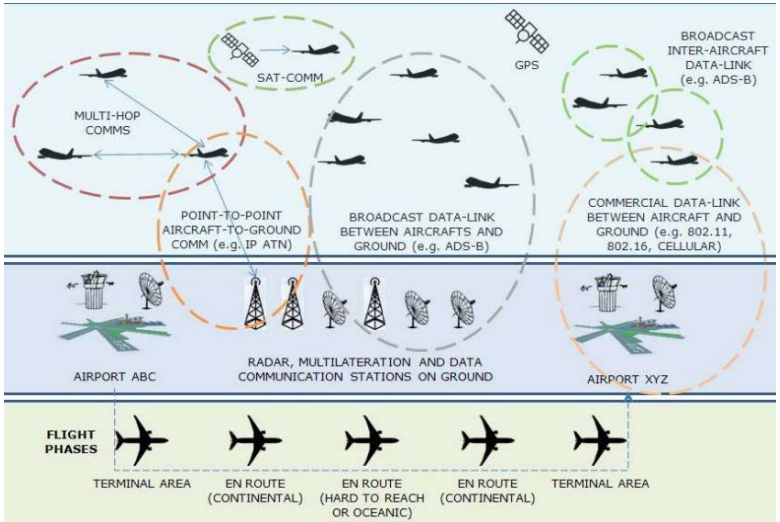
Aviation industry is a target: ANSP

- ADS-B protocol is exposed to Deny of service and injection and replay attacks because of RF based communication (ghost aircraft)
  - No encryption
  - No authentication, …
- Potential solutions exist but require an industry wide effort



https://www.researchgate.net/publication/267557712_Ghost_in_the_AirTraffic_On_insecurity_of_ADS-B_protocol_and_practical_attacks_on_ADS-B_devices

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Industrial Supply Chain: ASCO & VT SAA

- Aircraft parts manufacturer ASCO hit by Ransomware attack: (2019) having impact on production and shipment to its customers

asco

- VT SAA Aircraft Maintainer, part of ST Engineering: (2020) hit by Ransomware attack, and data extraction

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Aviation industry is a target: ANSP

- **Remote Comms site monitoring infrastructure compromised:**
  - Remote facility monitoring links slow & intermittently failed
  - ISP investigated, no fault. Huge effort spent troubleshooting
  - A junior engineer asked, “what if the cause is cyber?”
  - … it was!
- **Attackers were interested in using infrastructure for Denial-of-Service attacks on others**
  - Remote access password was brute forced

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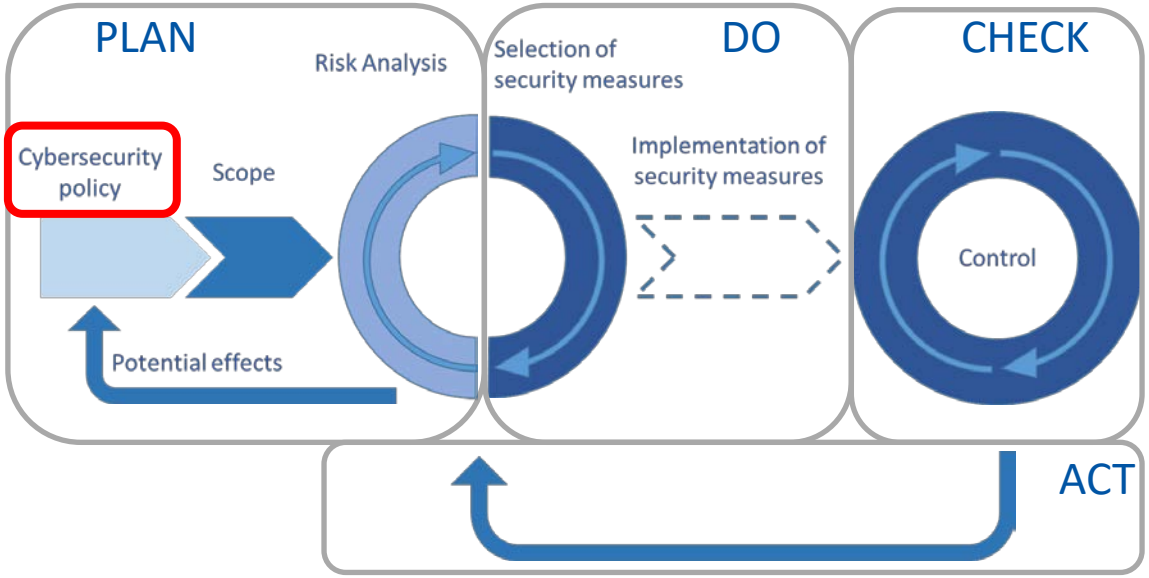
ISMS approach

- **To comply with safety and certification constraints**
- **To avoid too many changes (of design)**



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Cybersecurity policy objectives

- Focused on 2 key objectives
  - Safety
  - Business continuity
- Based on ISO27001 and IEC62443 (industrial systems) key principles
- Benefits from Airbus Aircraft Security Management System principles

➔ To provide consistent end-to-end security: “security by design from ground to air”

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Assessment about States Aviation System and Infrastructure

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THANK YOU!