

DIGITALIZATION AND ATC IN AVIATION'S INFO- CENTRIC FUTURE

**DATS WORKSHOP ON DIGITAL AIR TRAFFIC SERVICES: WORKLOAD AND SAFETY
ASSESSMENT, LINKÖPING UNIVERSITY**

MAY 8-9, 2025

DR. RUTH STILWELL



Aerospace Policy Solutions, LLC



Photo credit http://imansolas.freesevers.com/ATC/short_history_of_the_air_traffic.html



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Photo credit FAA.gov



Source : Information Services Department

圖片來源：政府新聞處

Air Traffic Control Centre in 1960's showing air traffic control enroute sector positions. Aircraft position reports received from pilots were regularly updated onto paper-stripboards.

六十年代航空交通管制中心的航路扇區管制席 - 管制員得悉航機位置資料，並寫在紀錄飛行進程的紙條上。



Photo credit avstop.com



Photo credit Patrick Doyle/Bloomberg



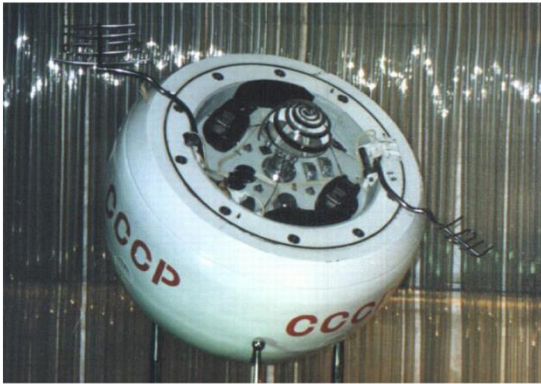
Photo credit NATS

WHAT IS OUR VISION FOR THE FUTURE?

SPEAKING OF THE FUTURE...



WE ARE NOT ALONE...



**A VENUS PROBE WILL FALL
TO EARTH THIS WEEK —
HERE'S HOW AEROSPACE
IS TRACKING IT**

May 06, 2025

WHAT HAPPENED LAST NIGHT?

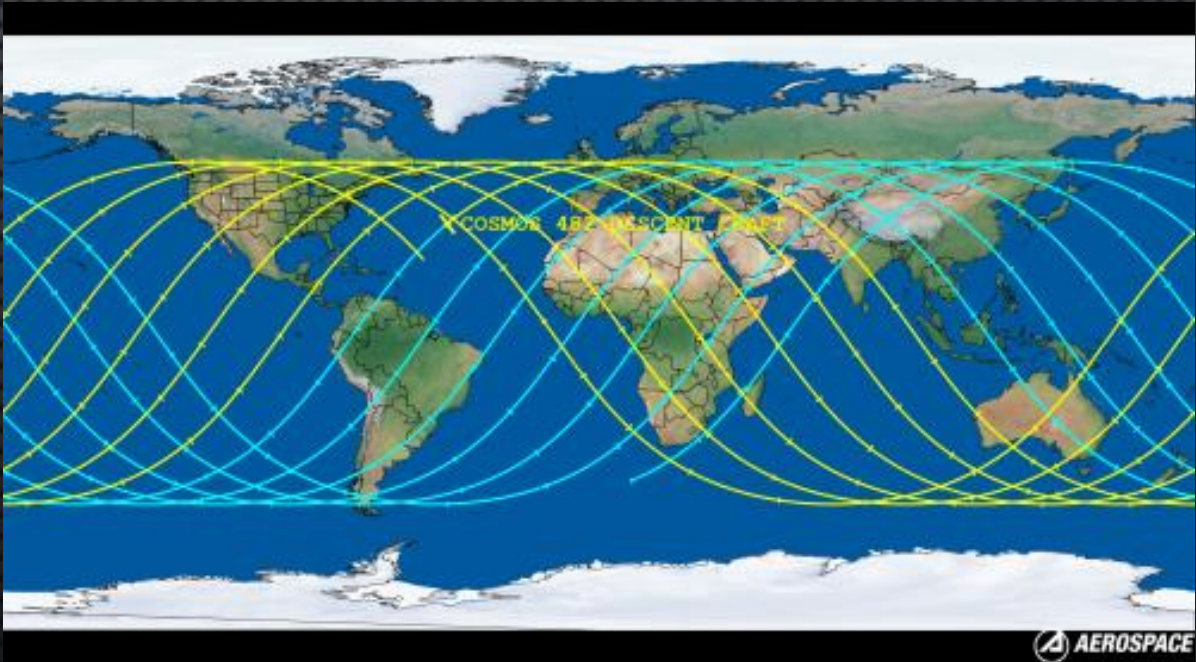


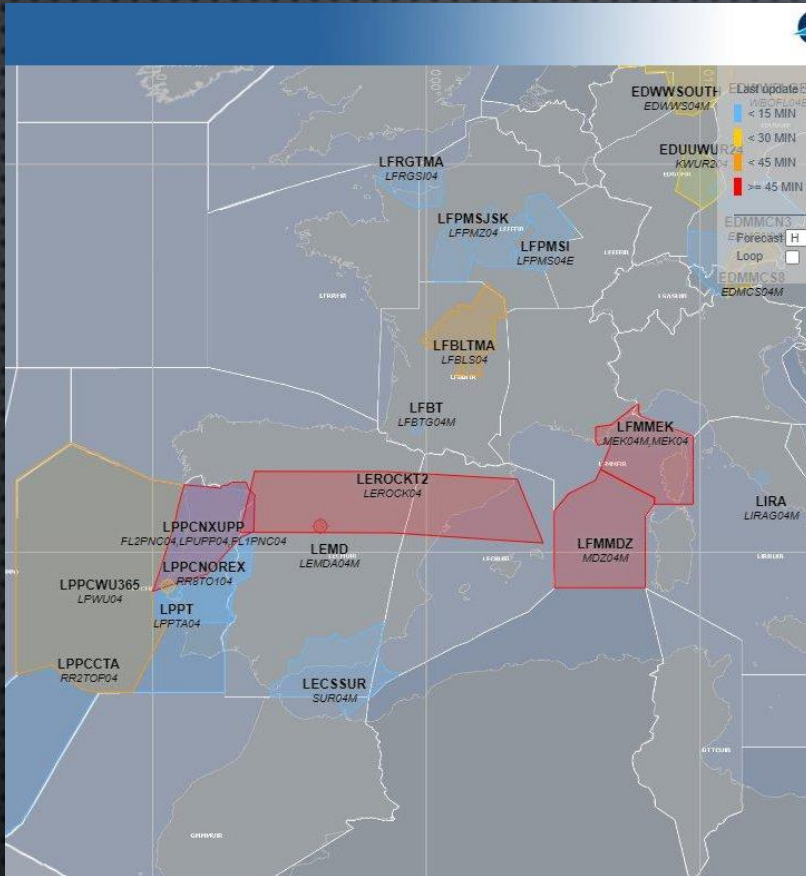
Image Credit: Aerospace Corp.

WHY DOES IT MATTER?

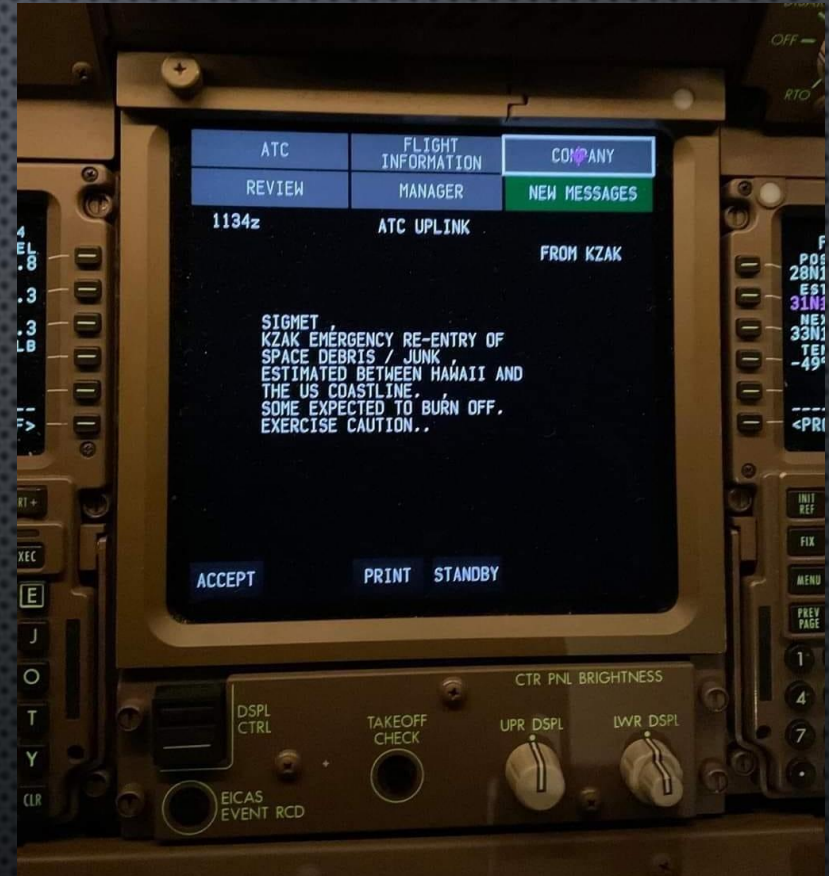
- Debris larger than a square of 10cm x 10cm carries sufficient energy to perforate the structure of the aircraft
- Recent tests sponsored by the FAA demonstrated that a commercial transport fuselage could be penetrated by 9-gm steel cubes
- A fragment of at least 300 grams should be assumed to produce a catastrophe for any impact on an aircraft
- One of the worst objects an engine can ingest is a piece of cloth, e.g., a shop rag,” and “thin plastic sheets and quilted pads sometimes used on missile and space vehicles for thermal protection could become part of the falling debris and act somewhat like a rag if ingested [1]”.

[1] Federal Aviation Administration, "Report to Congress: Risk Associated with Reentry Disposal of Satellites from Proposed Large Constellations in Low Earth Orbit," Washington, DC, 2023.

CURRENT STATE



(image credit: French Civil Aviation Authority (DGCA) via Twitter)



(image credit: personal correspondence)

LAUNCH ANOMALY RESPONSE (USA)

Risk Assessment

New Procedures – Debris Response Areas (DRAs):

- **Real-time ATO response** to a debris generating event:
 - Appropriate DRA will be **activated based on time of the vehicle malfunction**
 - DRA will be **evacuated and remain sterile** until all debris has fallen to earth
 - **DRA durations are pre-calculated** and known prior to launch
 - Applied in **radar-controlled airspace only**



TIMING MATTERS

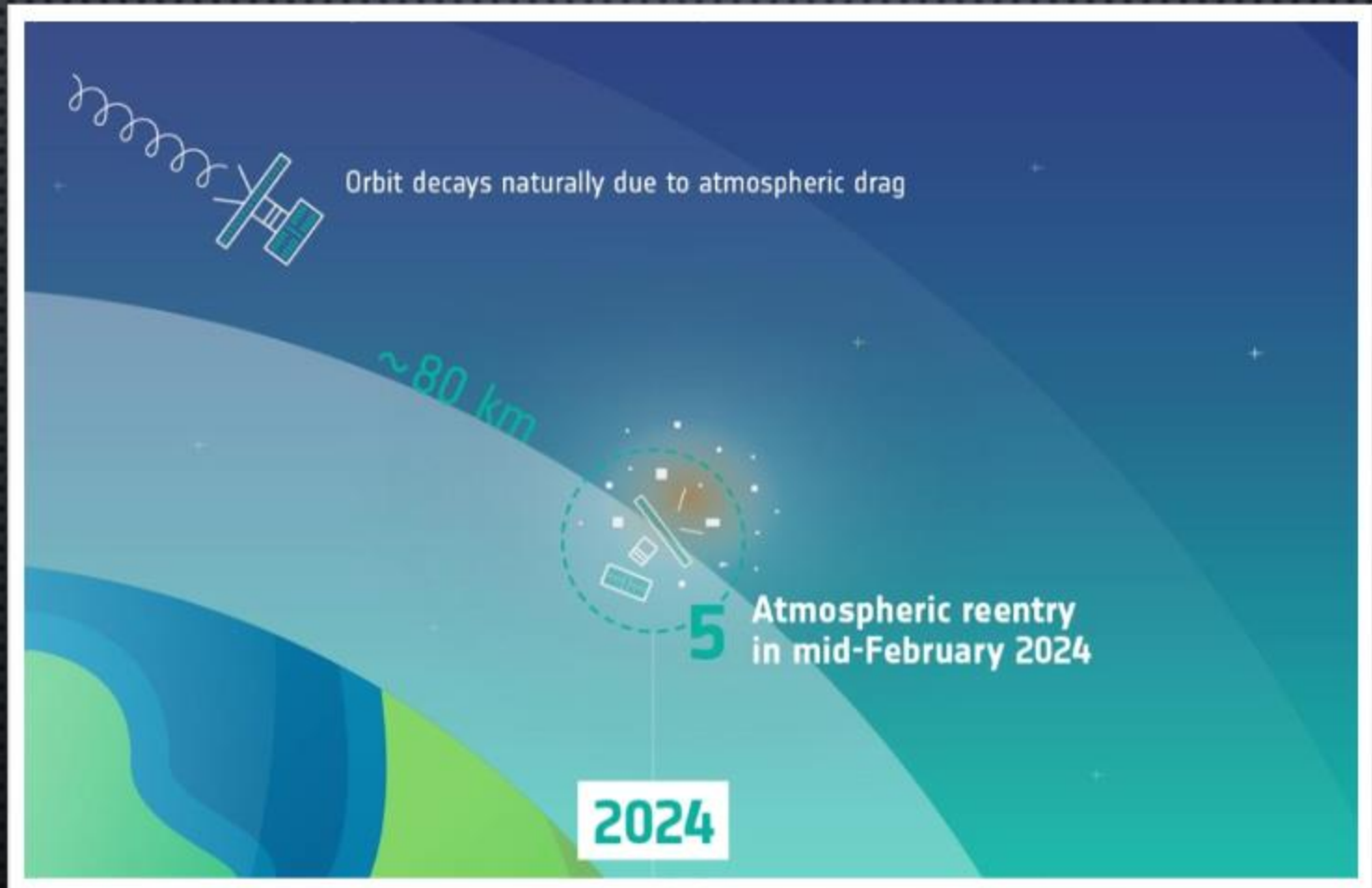


Image Credit: ESA ERS-2 reentry

THANK YOU



Aerospace Policy Solutions, LLC

DR. RUTH STILWELL
OFFICE@AEROSPACEPOLICYSOLUTIONS.COM