



NOAA Aircraft and AR: Present and Future

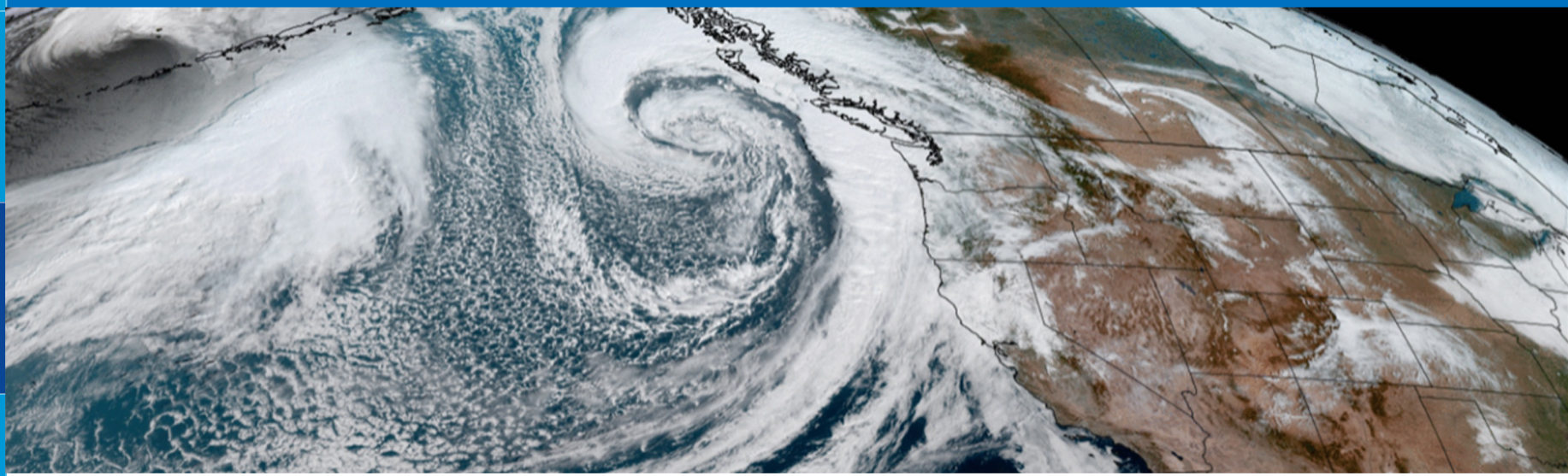
NOAA



RADM Nancy Hann



June 28, 2023



NOAA Aircraft Operations Center



NOAA Aircraft Recapitalization Plan



**Update, Status, and Implementation
of the
NOAA Aircraft Plan
Building and Sustaining the 21st Century Fleet**



August 2022

National Oceanic and Atmospheric Administration

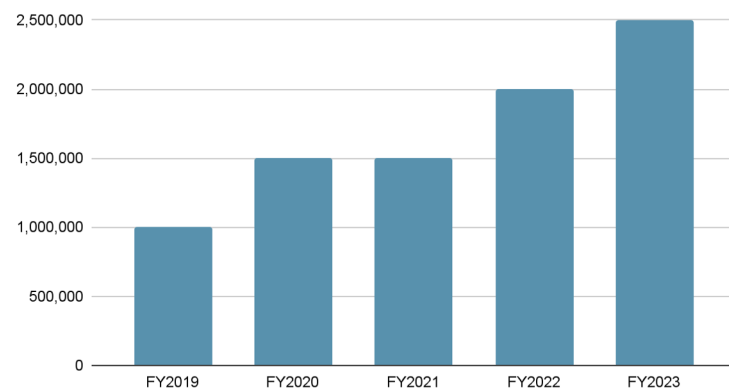




History of NOAA Aircraft Reconnaissance for Atmospheric Rivers

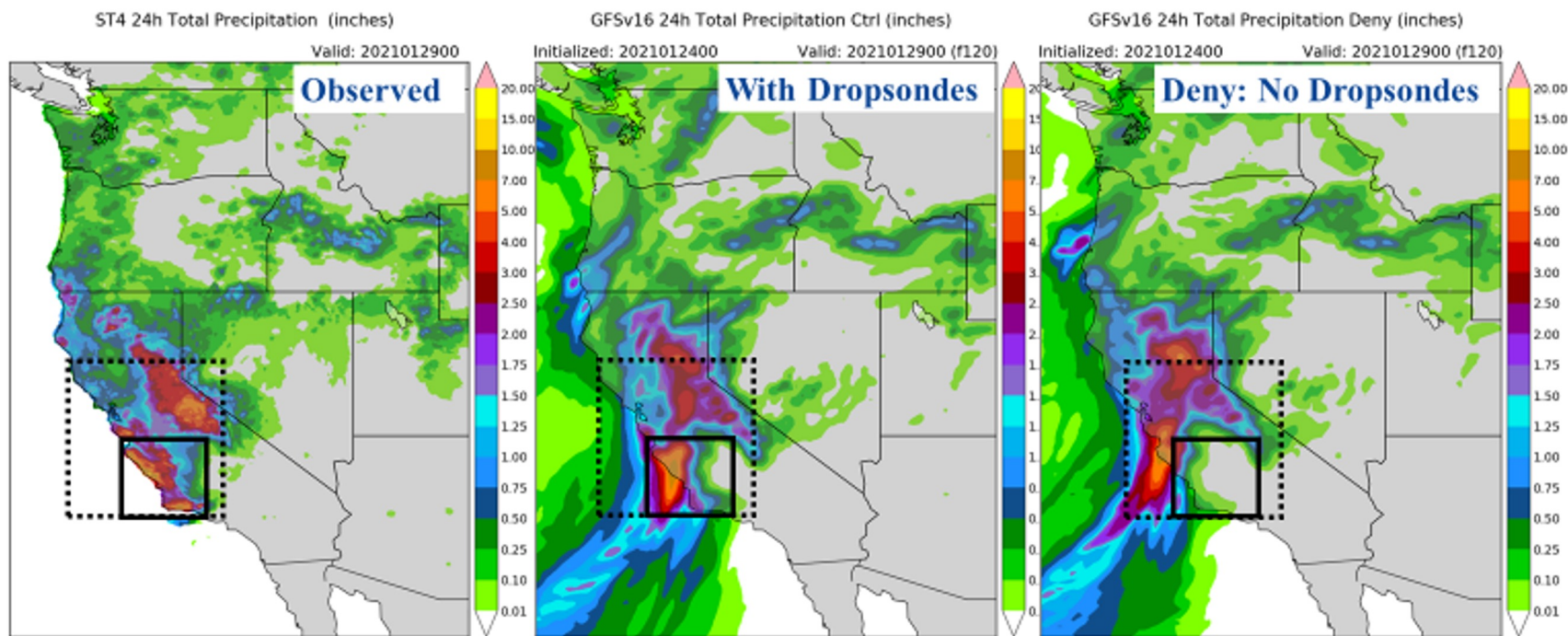
- In 2018, Congress required a report on the feasibility of and benefit of using airborne assets for Atmospheric Rivers (AR).
- Starting in 2019, Congress appropriated funding for NOAA to conduct AR reconnaissance.

Appropriated Dollars



Precipitation verification 00Z 28 Jan to 00Z 29 Jan, 2021

GFSv16 5-day forecast from 00Z 24 Jan, 2021

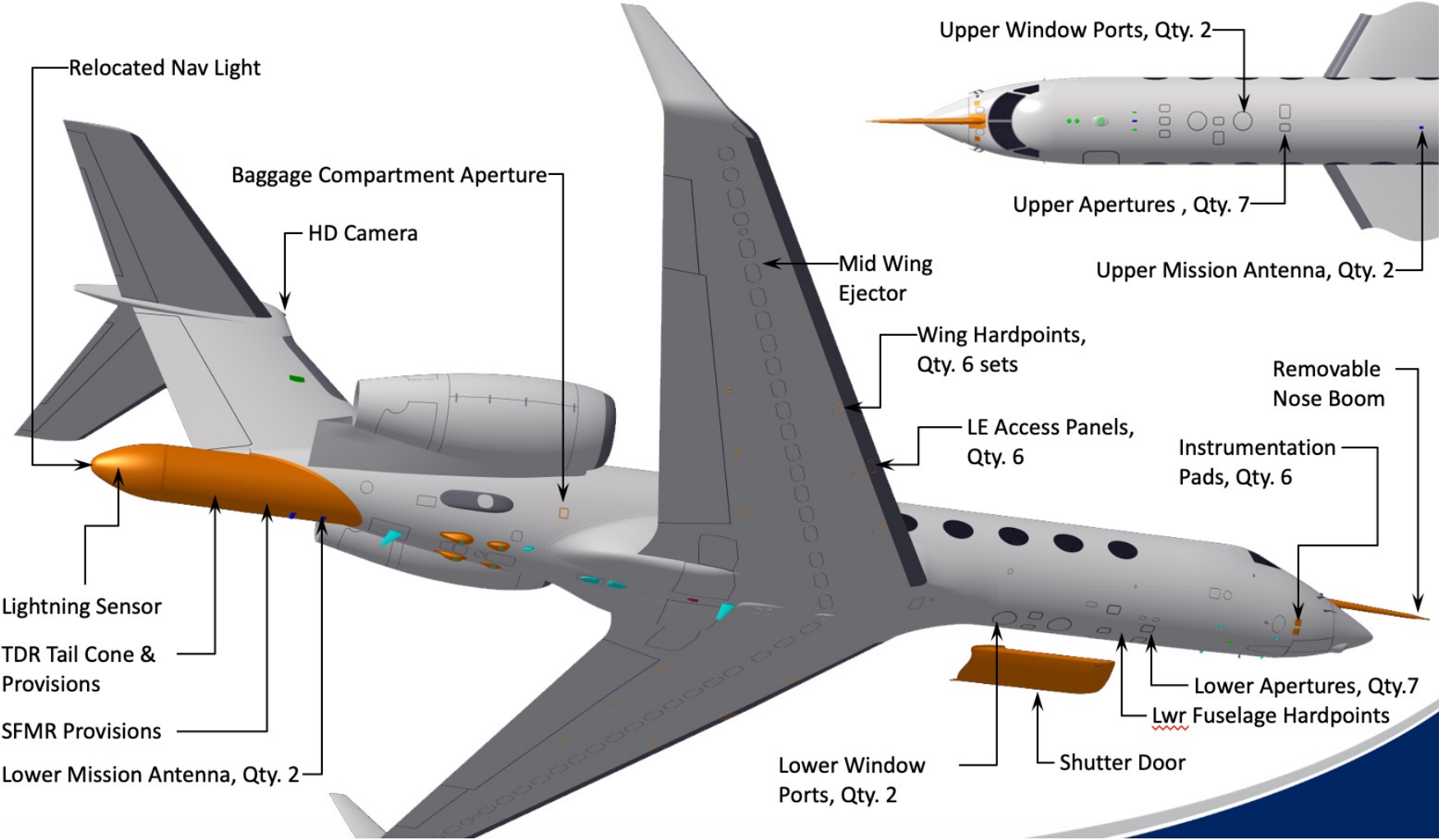


Focus on the “boxed” area” – much improved with the dropsonde data!

G550



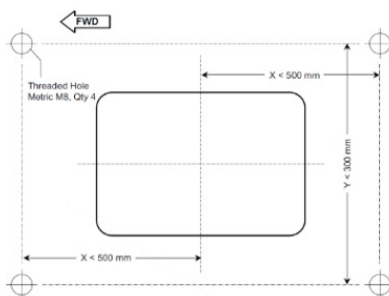
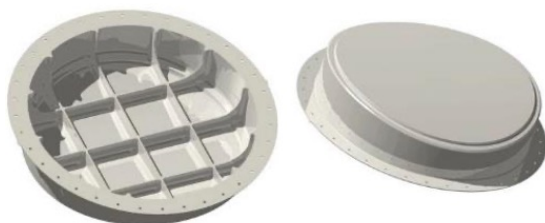
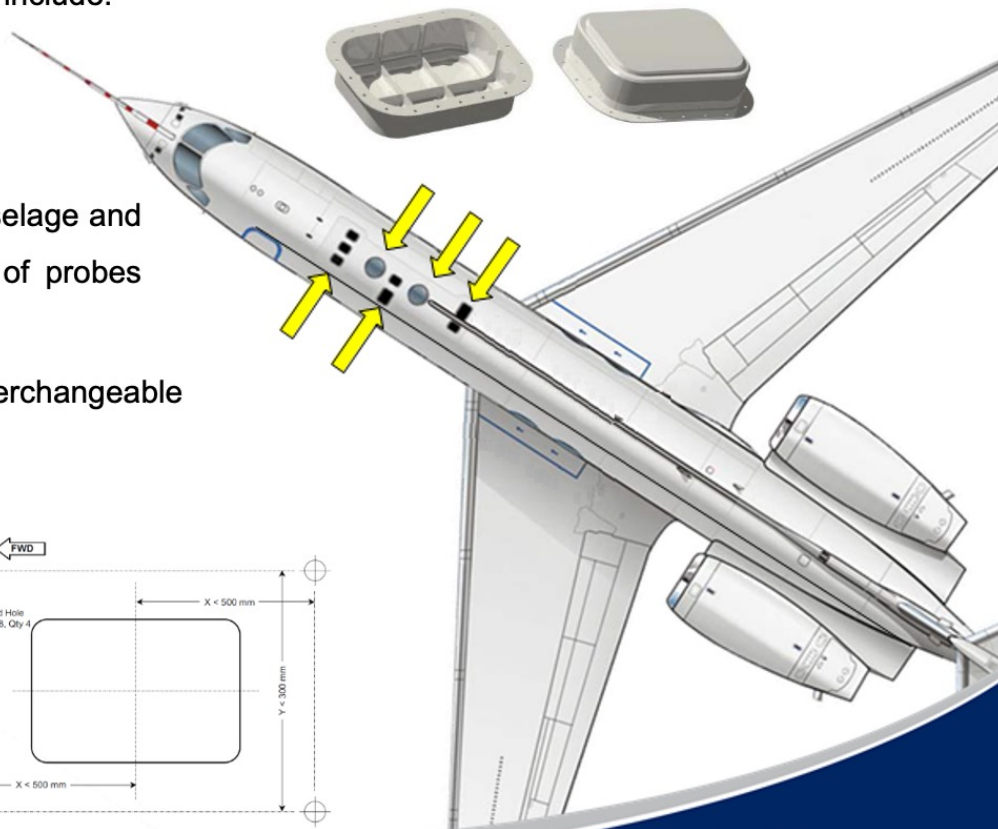
Exterior Modifications



Upper Viewports and Apertures

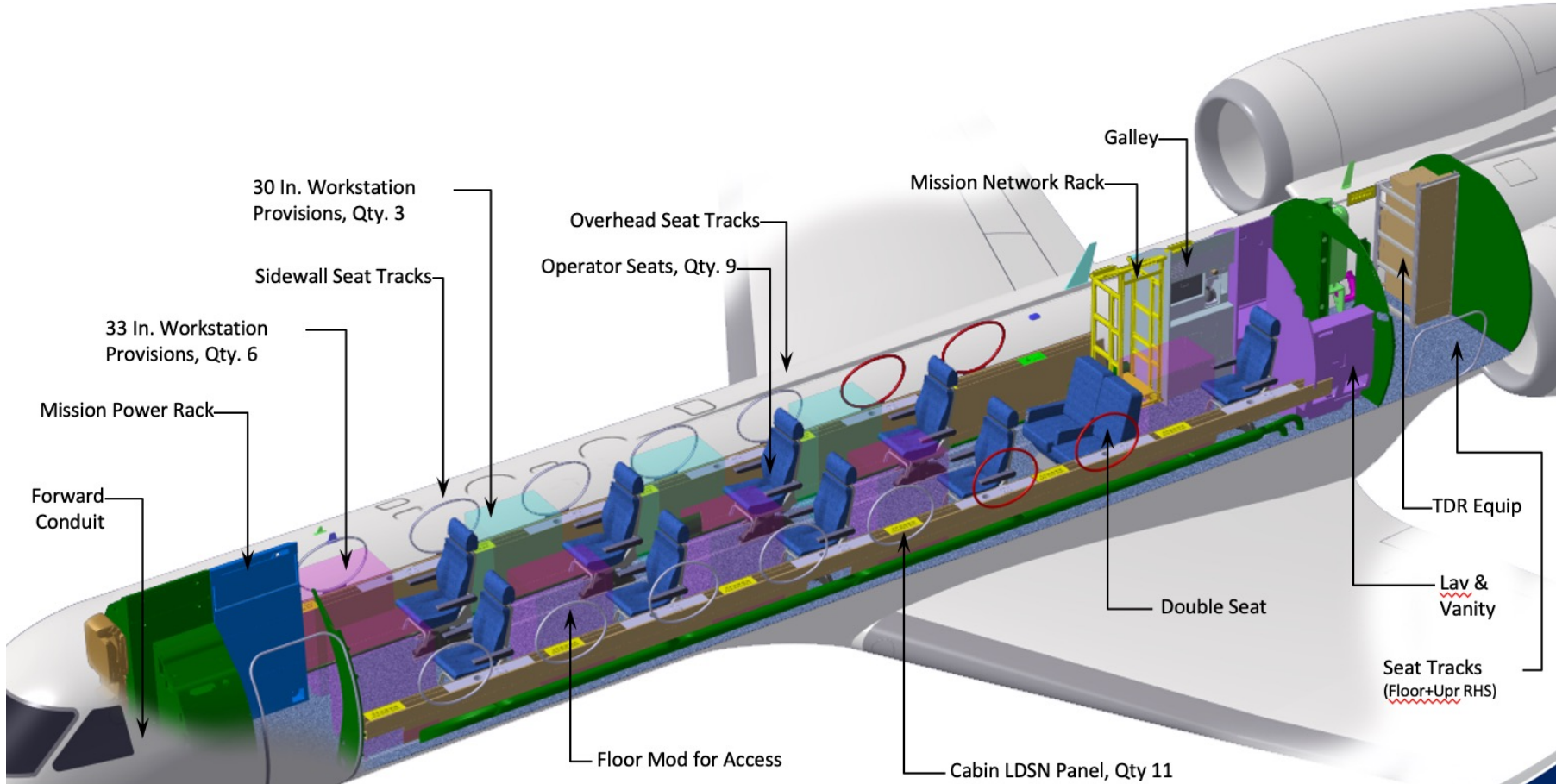


- Multi-use instrument aperture plates and view ports on the upper fuselage that allow install of optical glass or instrumentation – FAA Certification needs to be addressed for each new install
- The NOAA upper surface modifications include:
 - 2 Round view ports, 20.5"Ø opening
 - 5 Rectangular apertures, 7" x 10"
 - 2 Rectangular apertures, 14" x 10"
- Additional attachment points on the fuselage and in the cabin facilitate the installation of probes and equipment
- Aperture plates of common size are interchangeable





Interior Arrangement



- Mission Power: 400 Hz (some 3 ϕ), 60 Hz, 28 VDC, 28 VDC Weight-Off-Wheels
- Networks: 3ea Cat 6a, NTP, PTP
- Misc: 8 shielded twisted pairs, 2ea 50 ohm coax

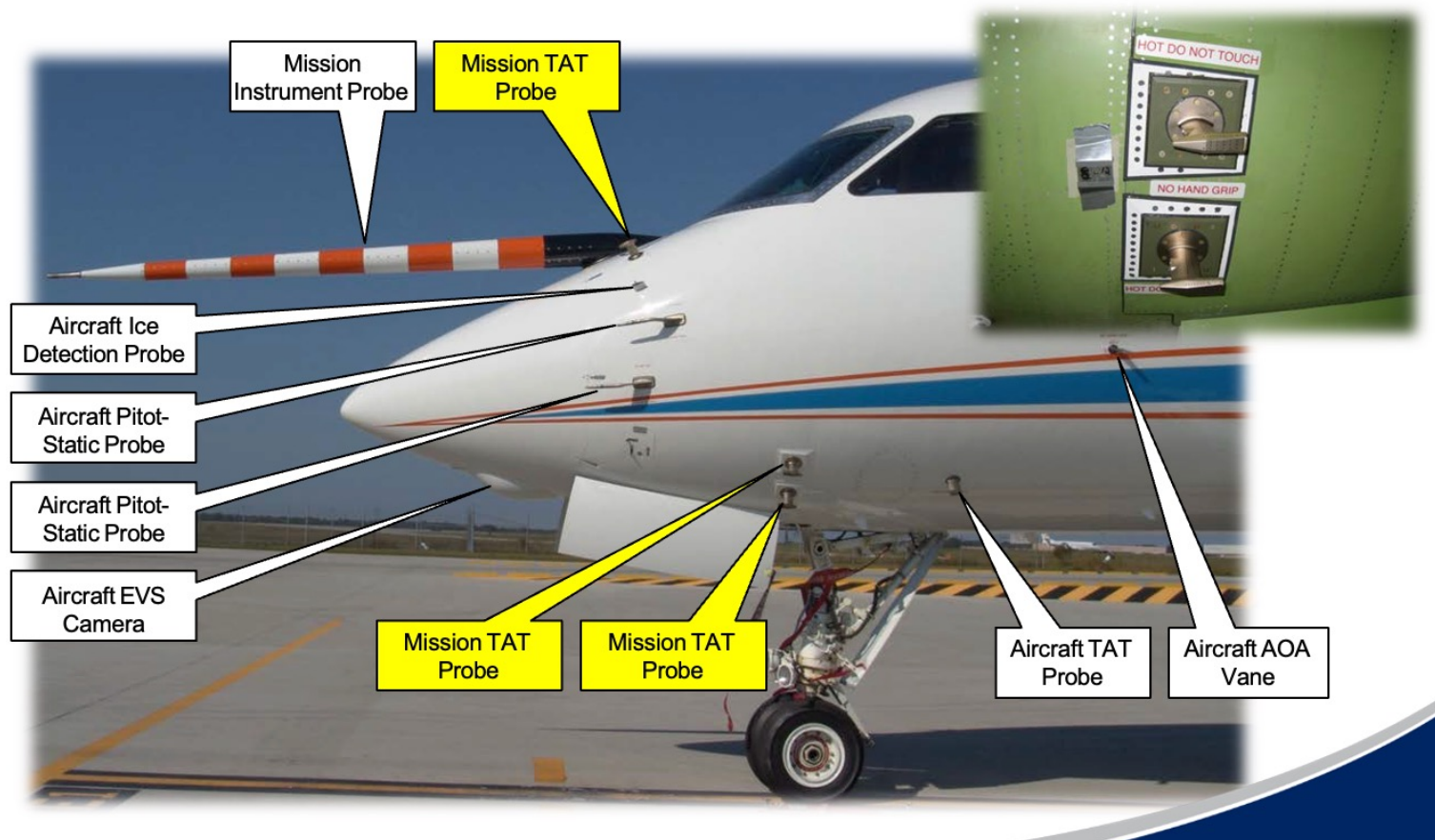


Mission Systems

- Tail Doppler Radar (TDR)
 - Vertically scanning, dual Doppler system for volumetric reflectivity and winds
 - Similar to G-IV TDR system
- Airborne Vertical Atmospheric Profiling System (AVAPS)
 - Dropsonde expendables for profiles of pressure, temperature, humidity, and winds
 - Uses NRD-41 (mini-sondes), dispensed from an automated launcher with 40+ sonde capacity (similar to NCAR system on their G-V)
- Stepped Frequency Microwave Radiometer (SFMR)
 - Provides surface wind speed measurements directly below aircraft in high wind (>20 kts) oceanic regions
- High Altitude MMIC Scanning Radiometer (HAMSR)
 - Provides swath of temperature and humidity data below the aircraft
 - Improved version of instrument developed by JPL for NASA ER-2 and GlobalHawk



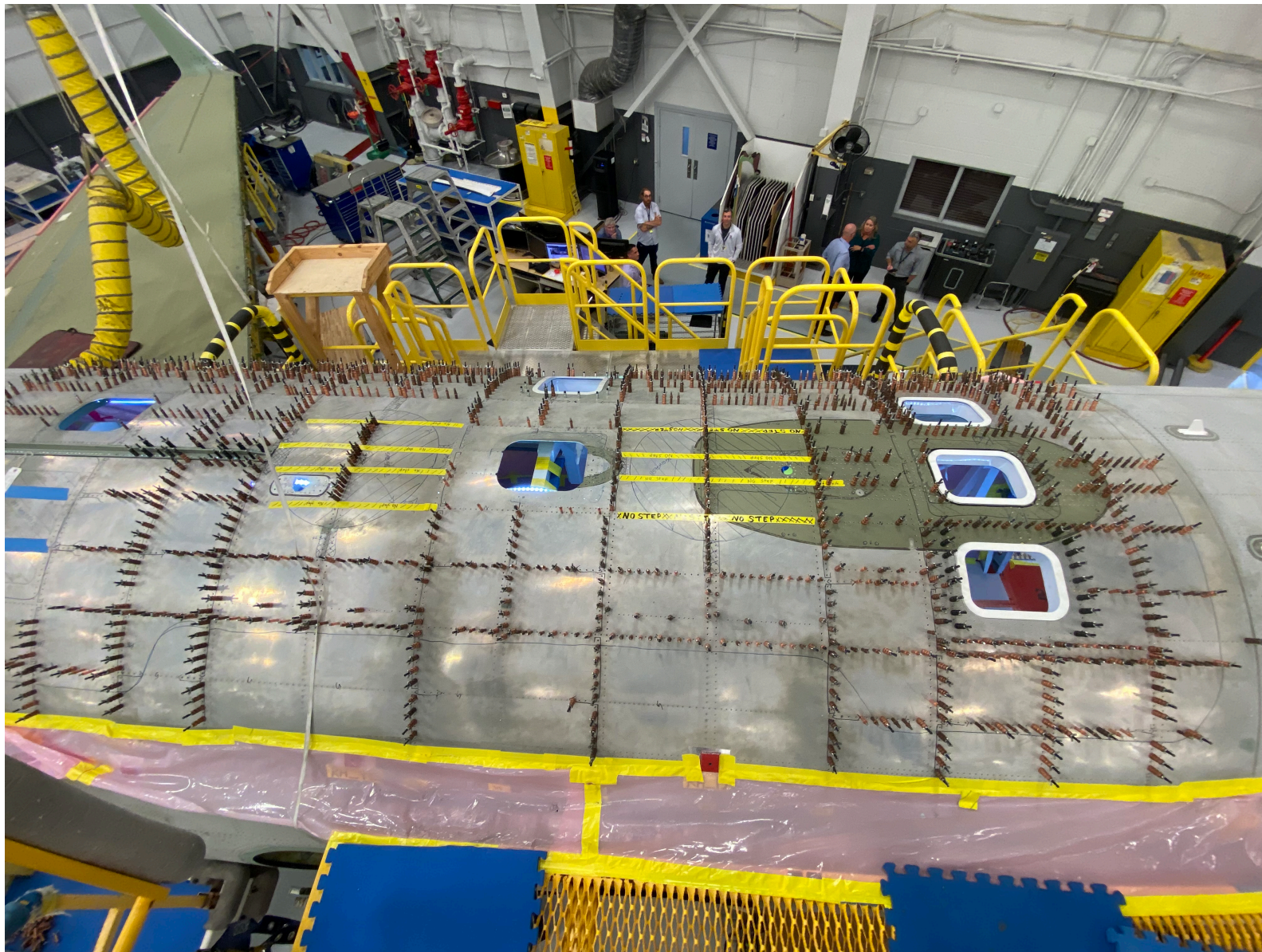
Forward Instrument Apertures & Nose Boom



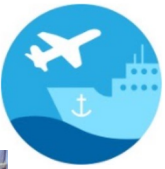


Floor Modification and Lower Aperture Ports











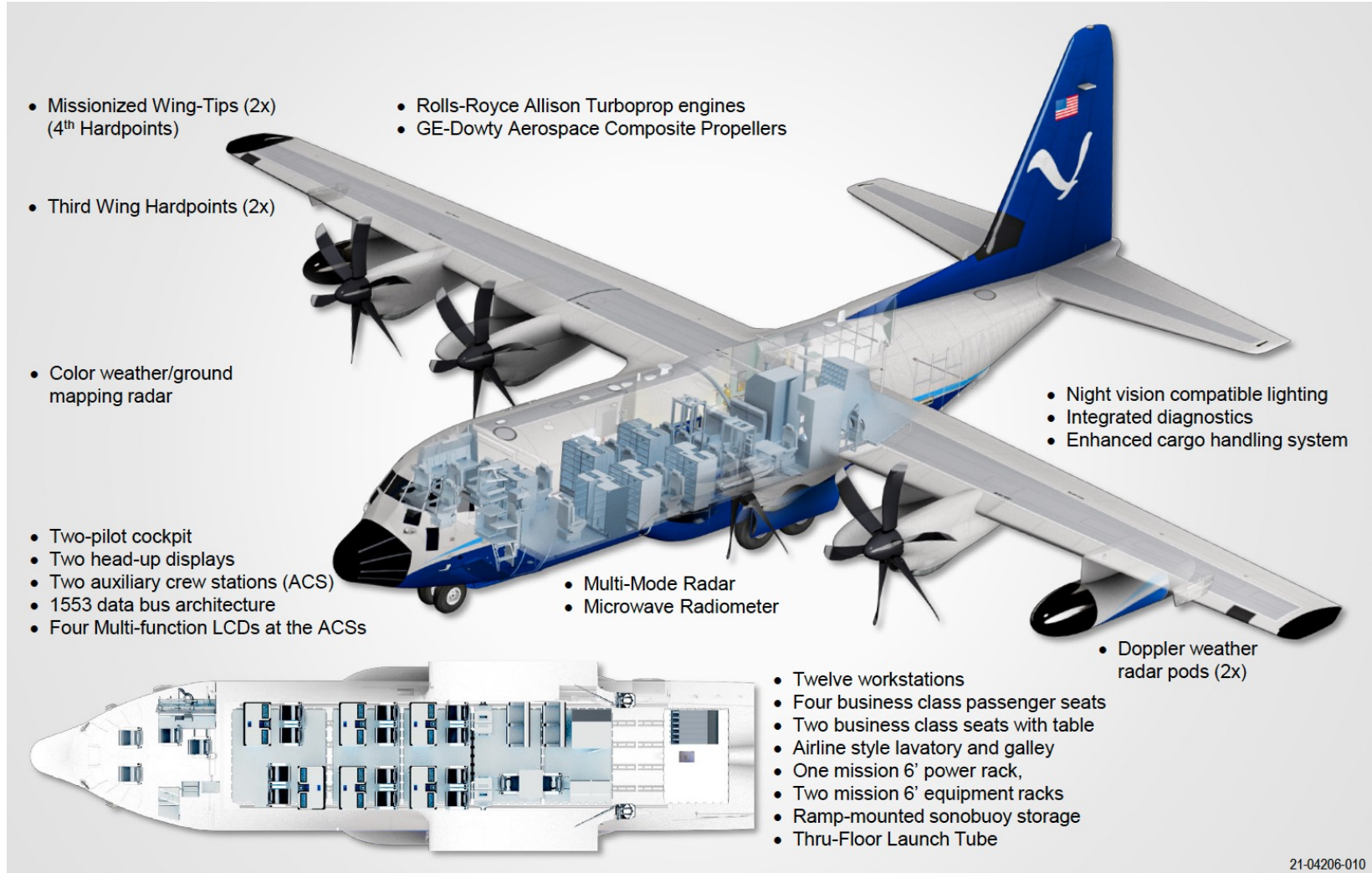
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Interior Layout



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