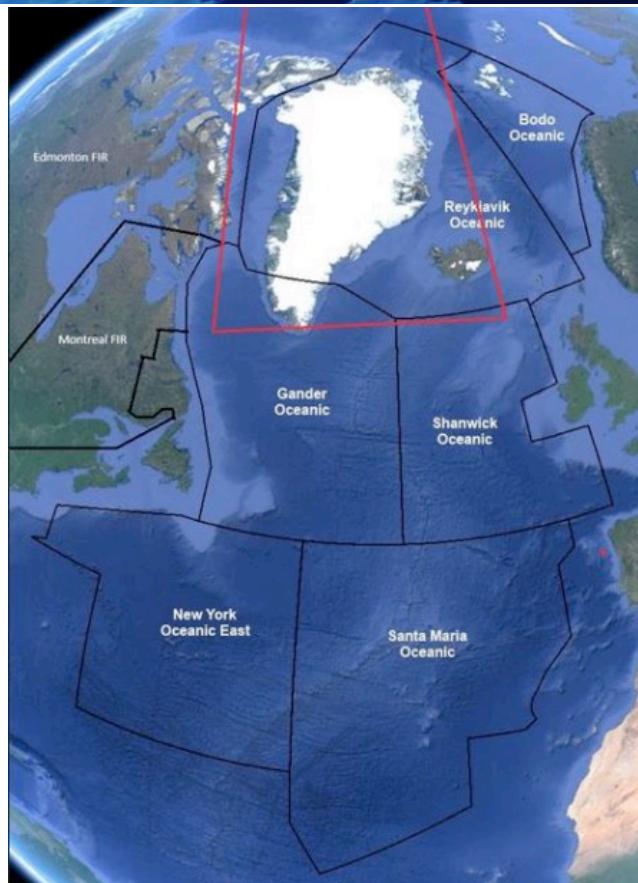


# NAT Space Weather Contingency Exercise 2025



- The tabletop exercise will be held in a hybrid meeting at the ICAO EUR/NAT Office in Paris on 10<sup>th</sup> December. The exercise will affect NAT airspace from N9000 – N6000 and from W01500 – W06000.
- A number of Space Weather Centres, Met Offices, ANSPs, Regulators as well as IATA, IFALPA and IBAC have joined the exercise, however thus far a limited number of airlines have done so.
- Some airlines and other stakeholders have comprehensive space weather mitigation procedures. This is an opportunity for us all to learn why and how to optimise our own and NAT contingency procedures.



# NAT Space Weather Contingency Exercise 2025

- The exercise is preceded by the eruption of a large X-class solar X-ray flare and coronal mass ejection (CME).
- At 06:00 UT, approximately 3 hours after the eruption of the CME, a stream of solar energetic protons arrives at the Earth. The particles flood into the high-latitude regions in both the Northern and Southern hemispheres over the 18-hour event duration.
- The flux of incoming particles quickly enhances, reaching a peak value between 10 and 11 UT, and then slowly decays to background levels by 24 UT. As a result, HF experiences moderate impacts (intermittent degradation, especially at lower frequencies)
- 06-10 UT and severe impacts (strong degradation, especially at lower frequencies, with periods of radio blackout) for 10-18 UT, followed by moderate impacts from 18-23 UT. Impacts are not experienced 23-24 UT.



# NAT Space Weather Contingency Exercise 2025

- During the event radiation at flight altitude follows a similar pattern of enhancement causing thresholds for moderate and severe activity to be crossed for the periods indicated. A stream of energetic electrons from an earlier CME arrive at approximately 10 UT causing moderate levels of geomagnetic activity, with the strongest enhancements observed on the nightside of the Earth.
- As a result, GNSS experiences periods of moderate impact (intermittent degradation) in the high-latitude region which enhances to severe impact (more widespread and longer-lasting degradation) as the NAT region progresses from day to night. Impacts suddenly end by 23 UT. Finally, the same solar active region responsible for the space weather impacts erupts at 14 UT with a long duration (~90 minute) X-class solar X-ray flare. Solar radio noise impacts CPDLC, SATVOICE and ADSC for four hours. All space weather impacts cease by 23 UT and all services return to normal operation.

# NAT Space Weather Contingency Exercise 2025

UTC	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Notification	HF & GNSS				HF & GNSS & RAD		RAD		XRAY	RRAY	HF & GNSS	RAD	HF	GNSS & RAO				HF & GNSS
HF																		
VHF																		
CPDLC (Satellite)																		
SATVOICE																		
ADSC																		
ADSB Data																		
GNSS																		
SSR																		
ILS																		
VOR																		
Radiation																		

System Available/Low Radiation	System Intermittent/Moderate Radiation	System Unavailable/Severe Radiation
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# NAT Space Weather Contingency Exercise 2025



## **SWPC Format Warning at 1200UTC:**

Space Weather Message Code: EXERCISE NAT TTX  
2025 EXERCISE

Serial Number: SWPC WWA EXERCISE 5

Issue Time: 2025 DEC 10 1200 UTC

ALERT: Proton Event 10MeV Integral Flux exceeded  
10,000pfu

Begin Time: 2025 DEC 10 1200 UTC

NOAA Scale: S4 - Severe

NOAA Space Weather Scale descriptions can be  
found at [www.swpc.noaa.gov/noaa-scales-explanation](http://www.swpc.noaa.gov/noaa-scales-explanation)

Potential Impacts: Radio - Minor impacts on polar HF  
(high frequency) radio propagation resulting in  
fades at lower frequencies.

## **ICAO SEV RAD Advisory at 1200UTC:**

SWX ADVISORY \*EXERCISE\*

DTG: 20251210/1200Z

SWXC: SWPC

ADVISORY NR: 2025/31

SWX EFFECT: RADIATION SEV

OBS SWX: 10/1200Z HNH W180 - E180 ABV FL340

FCST SWX +6 HR: 10/1800Z HNH W180 - E180

FCST SWX +12 HR: 11/0000Z NO SWX EXP

FCST SWX +18 HR: 11/0600Z NO SWX EXP

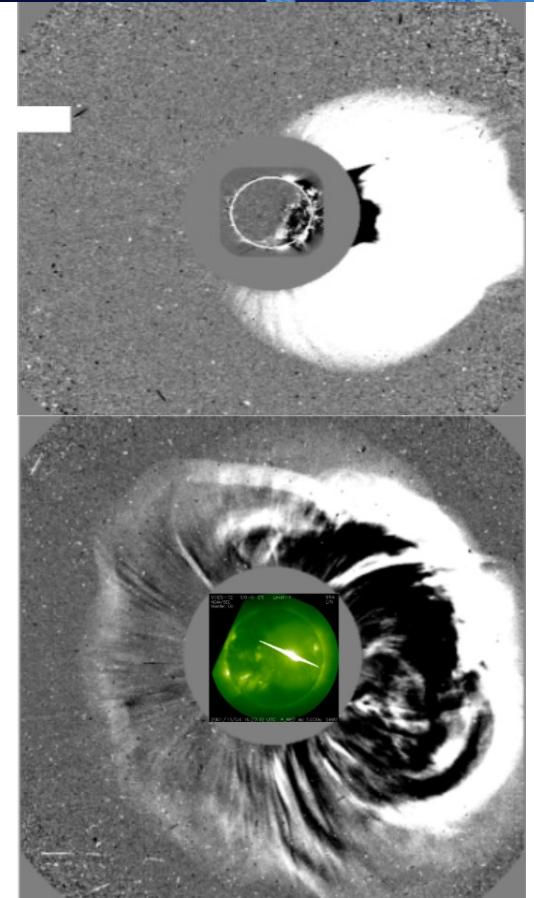
FCST SWX +24 HR: 11/1200Z NO SWX EXP

RMK: THIS ADVISORY IS IN ADDITION TO 2025/030 FOR  
MOD RADIATION ABV FL310. RADIATION EXPECTED  
TO RETURN TO NML VALUES WITHIN FCST PERIOD.

NXT ADVISORY: 2051210/1800Z

# NAT Space Weather Contingency Exercise 2025

- A questionnaire will be shared with each stakeholder in advance of the exercise to seek what they would do in response to each warning to assist participants to learn from one another.
- The US National Oceanic and Atmospheric Administration (NOAA) Space Weather Prediction Center (SWPC) will issue warnings in both their own format as well as the agreed ICAO Standard Format. <https://www.swpc.noaa.gov/>
- There will be a review/lessons learned session on the 11<sup>th</sup> December, also a hybrid meeting.
- The group will also assess whether any updates to NAT DOC 006 Air Traffic Management Operational Contingency Plan and/or DOC 007 North Atlantic Operations and Airspace Manual are required based on what we learn.



NAT Space Weather Space  
Weather Contingency  
Exercise 2025



Questions?