

SKYRORA LIMITED 2024

SKYRORA - ICAO

TRANSFORMING

WORKSHOP ON NEW ENTRANTS INTEGRATION IN THE NAT REGION

13-14 May 2024 Paris

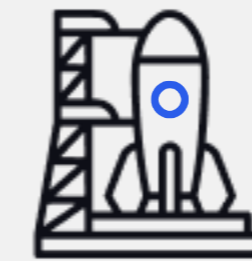
Alan Thompson
Head of Govt Affairs



OVERVIEW



Overview of Operations

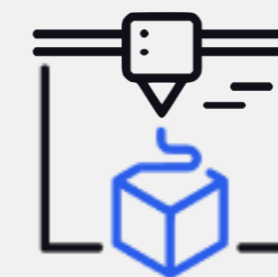


Current Status and Timeline



Required Airspace, Location,
and Flight Path

Frequency of Activity



Expected ATC Services

SKYRORA

Is a New Space enterprise that manufactures dedicated satellite launch vehicles to make space more accessible, greener and lower cost



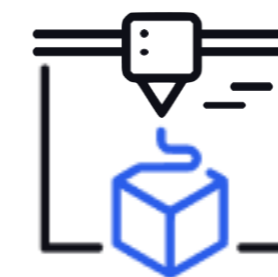
Multifunctional launch vehicle providing in-orbit services in addition to launch (life extension, de-orbiting, etc.)



Mobile and modular launch complex means Skyrora is capable of launching from almost any location



Combining our proprietary Ecosene kerosene fuel, and High Test Peroxide (HTP), means a reduction in CO2 emissions by 45% per launch



Cutting-edge 3D printing technology reduces the average unit cost of printing by 40% compared to competitors

LAUNCH & IN-ORBIT SERVICING MARKETS 2022-2031

Cumulative Fully
Addressable Global
Satellite Launch Market

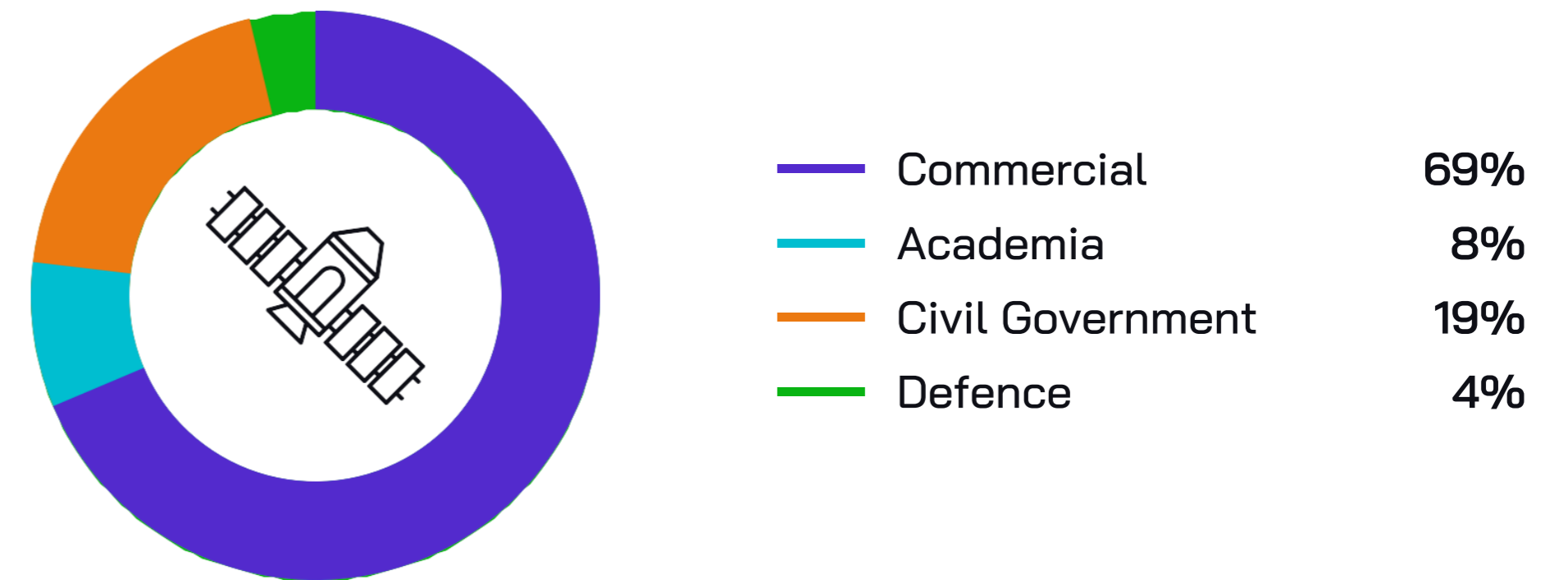
£ 6.5BN

Cumulative global
In-Orbit Servicing market

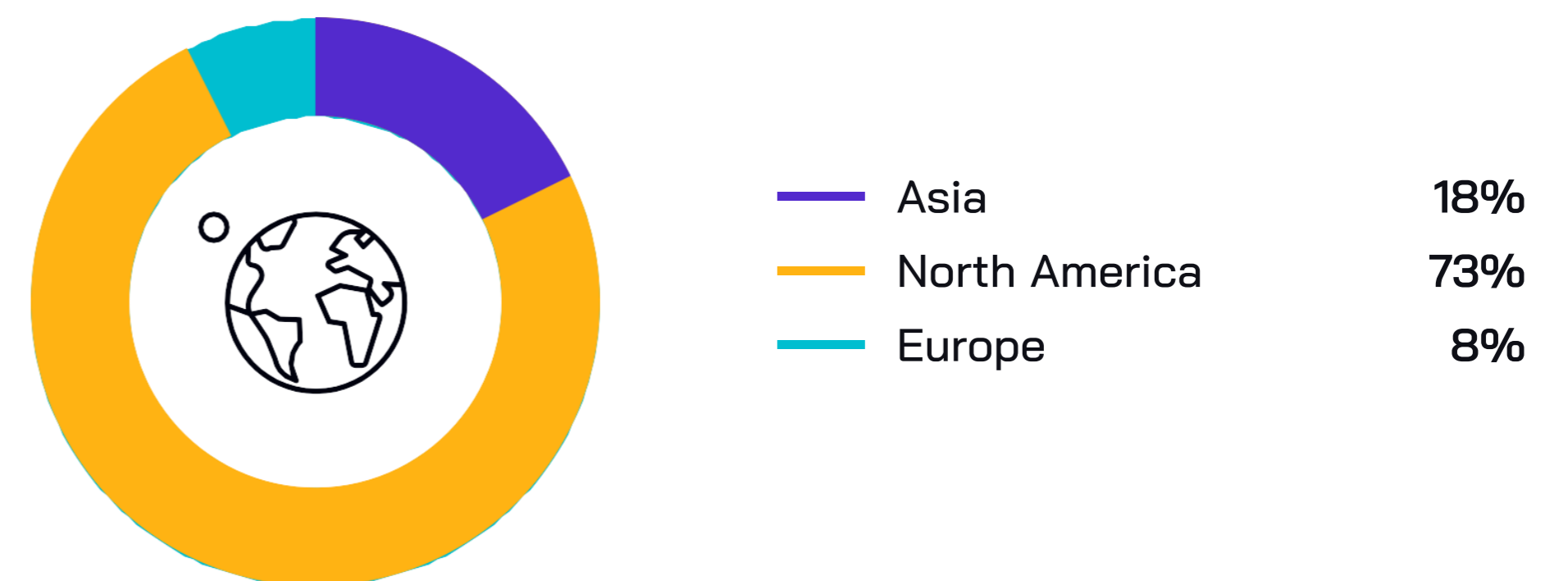
£ 3.8BN

GLOBAL SMALL SATELLITE MARKET 2022- 2031

Small Satellites by operator status



Small Satellite by operator region

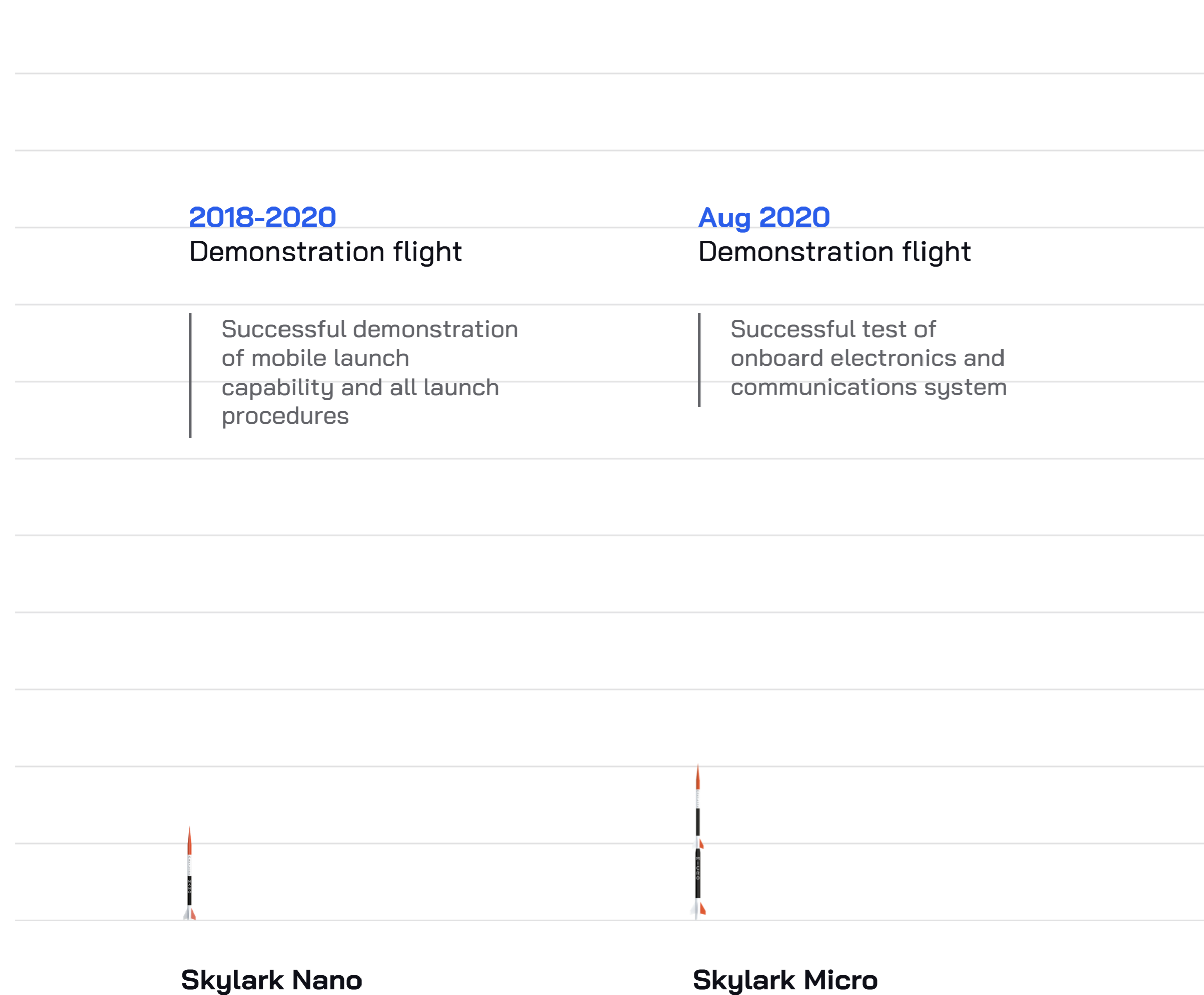


Source:

- Prospects for the Small Satellite Market, Euroconsult, 2022.
- In-Orbit Servicing Market, NSR, 2021

INCREMENTAL AND DE-RISKING APPROACH

DEVELOPMENTAL



MAIN VEHICLES



H,m
24
22
20
18
16
14
12
10
8
6
4
2
0



Skylark Nano

Skylark Micro

Skylark L

Skyrora XL

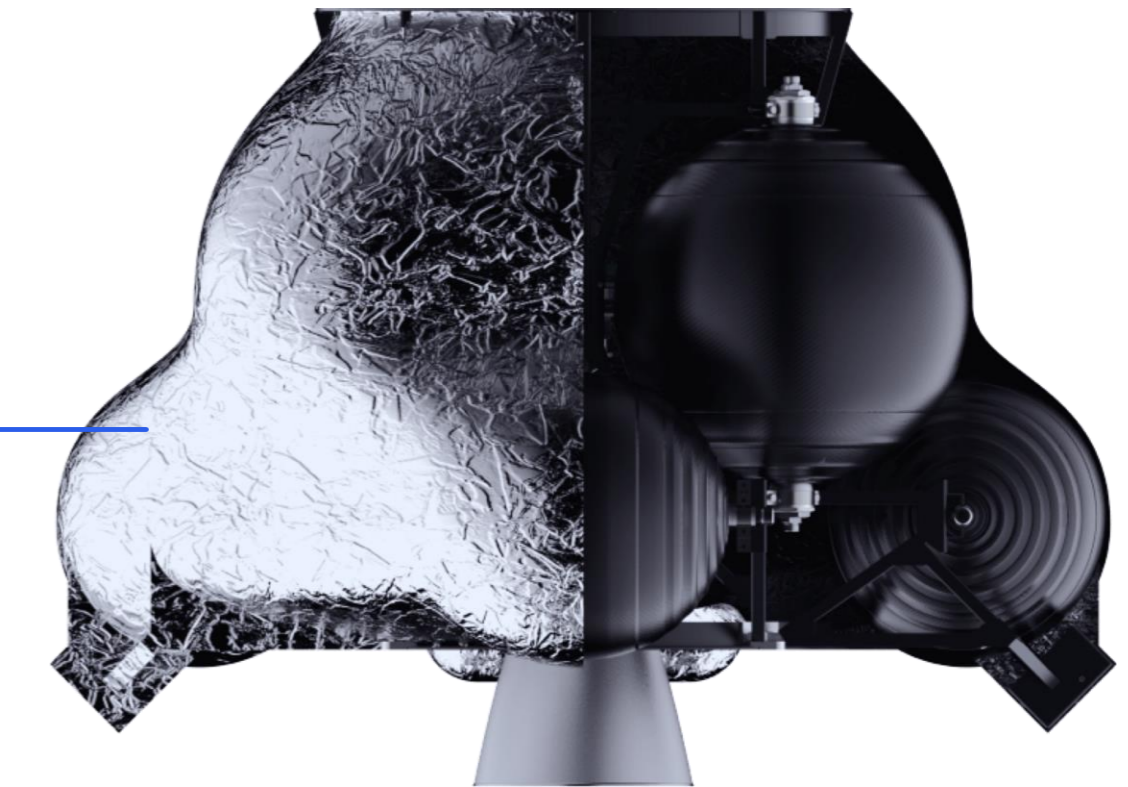
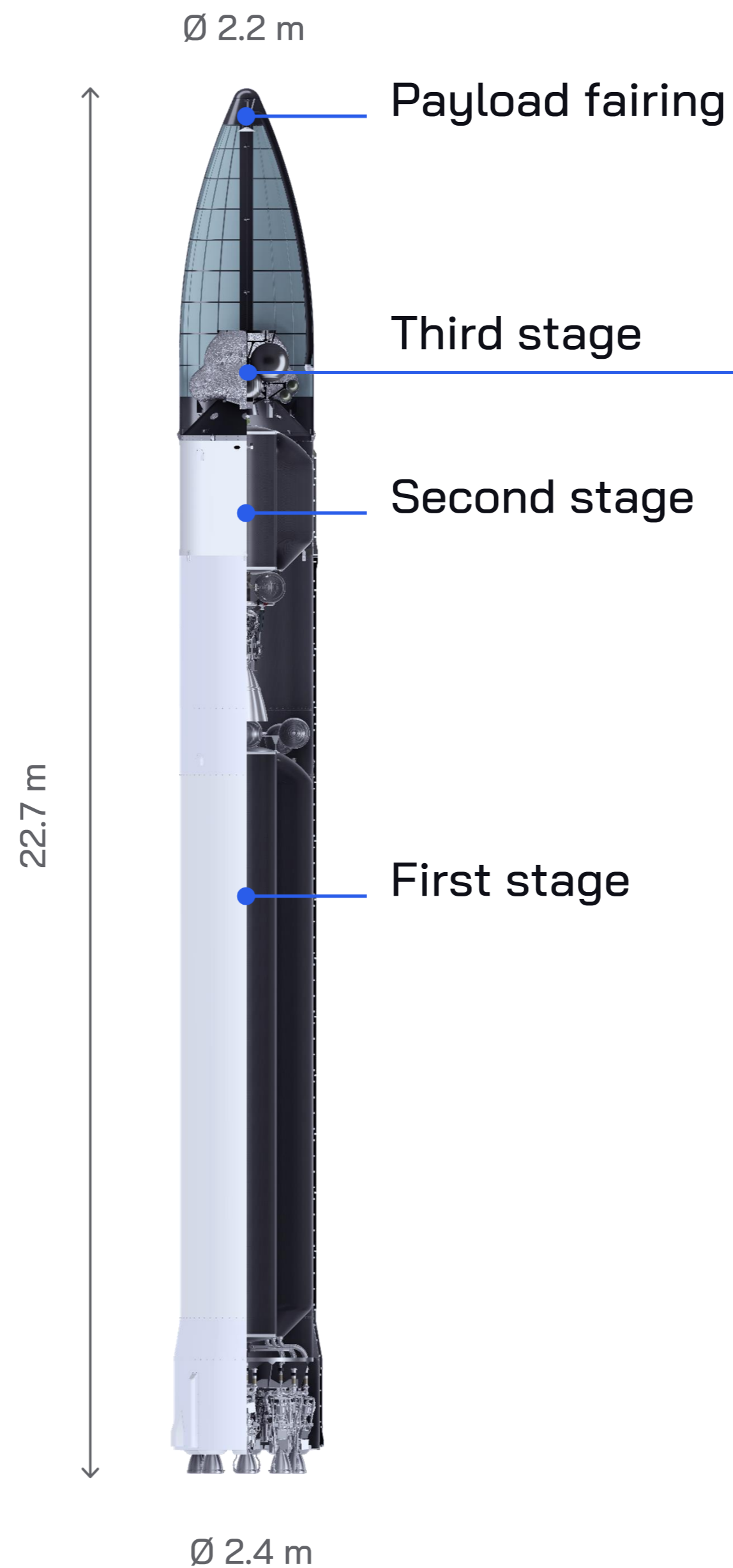
SKYRORA XL

Bespoke, flexible access to space

Eco-conscious launch

Low G-loading

In-orbit maneuvering



REIGNITABLE THIRD STAGE

Propellant components	HTP / KEROSENE
Thrust (in vacuum)	3.5 kN
Exhaust velocity (in vacuum)	3,004 m/s
Payload mass	315 KG

SPACE TUG/THIRD STAGE

DECEMBER 2020

Full mission duration static fire test (450 second burn over 3 firings) has been successfully accomplished at our engine development complex in Fife, Scotland.

The test verified propellants and compressed gas filling technology, operation of propulsion system, fuel system, pressurisation system, telemetry recordings.

PRIMARY MISSION

Delivering the payload in LEO orbit from a wide range of altitude and orbit inclination.

SECONDARY MISSIONS

- Correcting satellite or spacecraft orbit
- De-orbiting space debris
- Refueling satellites or spacecrafts
- Lunar orbits or interplanetary missions





LV AND SPACECRAFT ASSEMBLY, INTEGRATION AND TEST BUILDING

TRANSFORMING



SKYRORA TEST SITE

SKYLARK L LAUNCH

ICELAND,
8TH OCTOBER 2022

“This suborbital launch attempt of a rocket developed in Scotland is another exciting step on Skyrora’s journey towards launching from the UK. Our strong international relationships with partners such as Iceland are vital for our own launch ambitions. By harnessing the opportunities provided by commercial spaceflight, we are creating highly skilled jobs and local opportunities across the country”.

Matt Archer, Director of Commercial Spaceflight at the UK Space Agency.



SKYLARK L1 LAUNCH

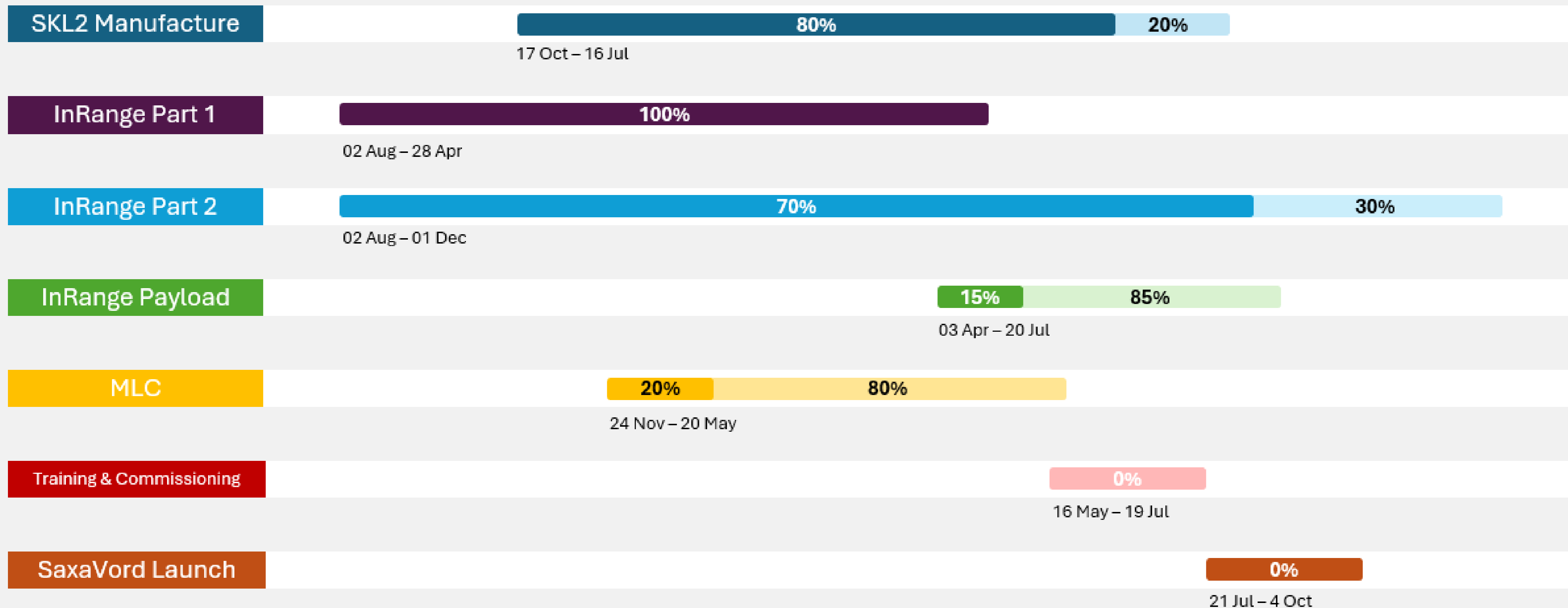


Launch windows designed in consideration with local flight activities

Skyrora worked with ICETRA and ISAVIA to issue relevant NOTAMs

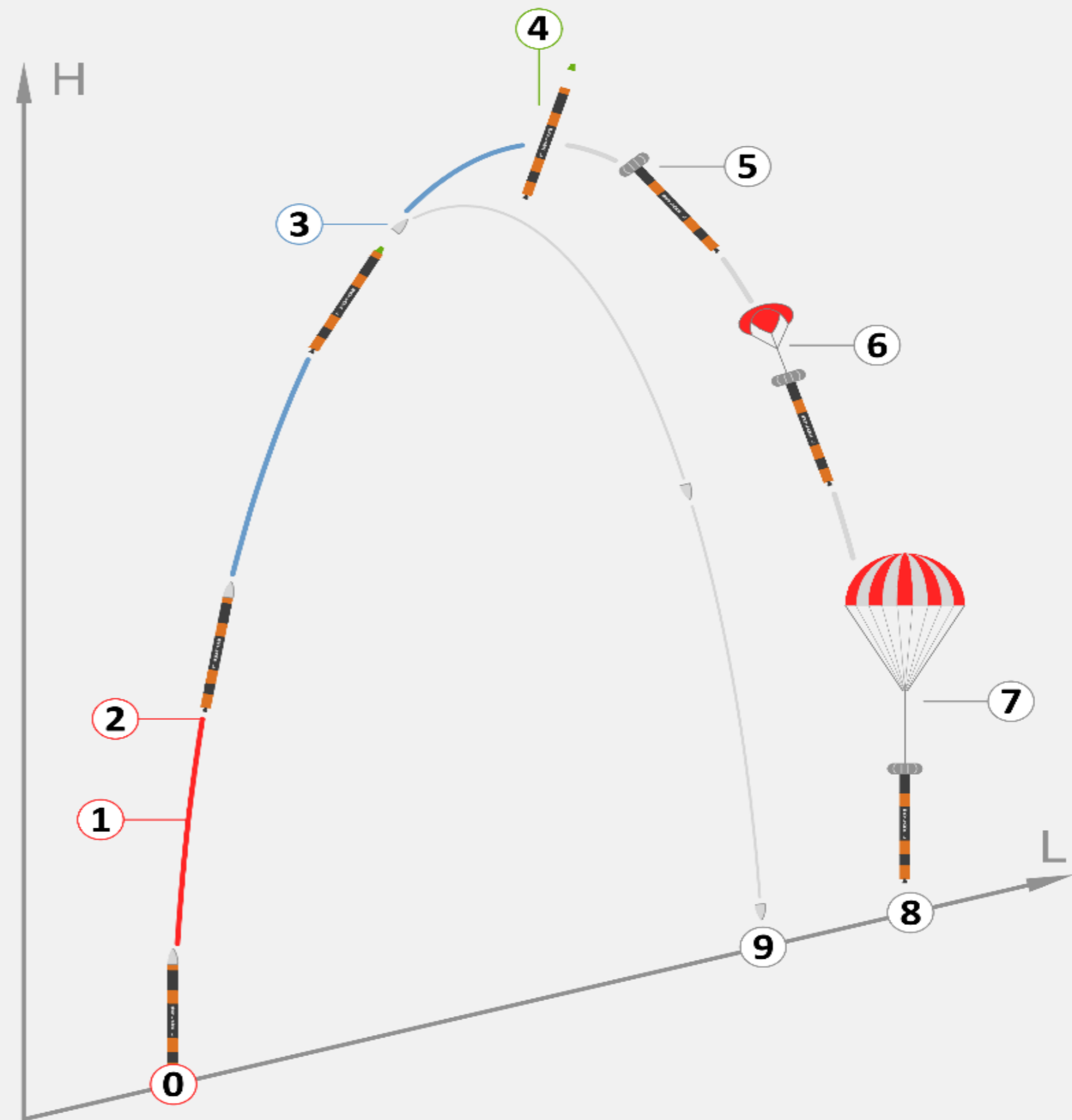
CURRENT STATUS & TIMELINE – SKYLARK L

Jul – Sep 2023 Q3	Oct – Dec 2023 Q4	Jan – Mar 2024 Q1	Apr – Jun 2024 Q2	Jul – Sep 2024 Q3	Oct – Dec 2024 Q4
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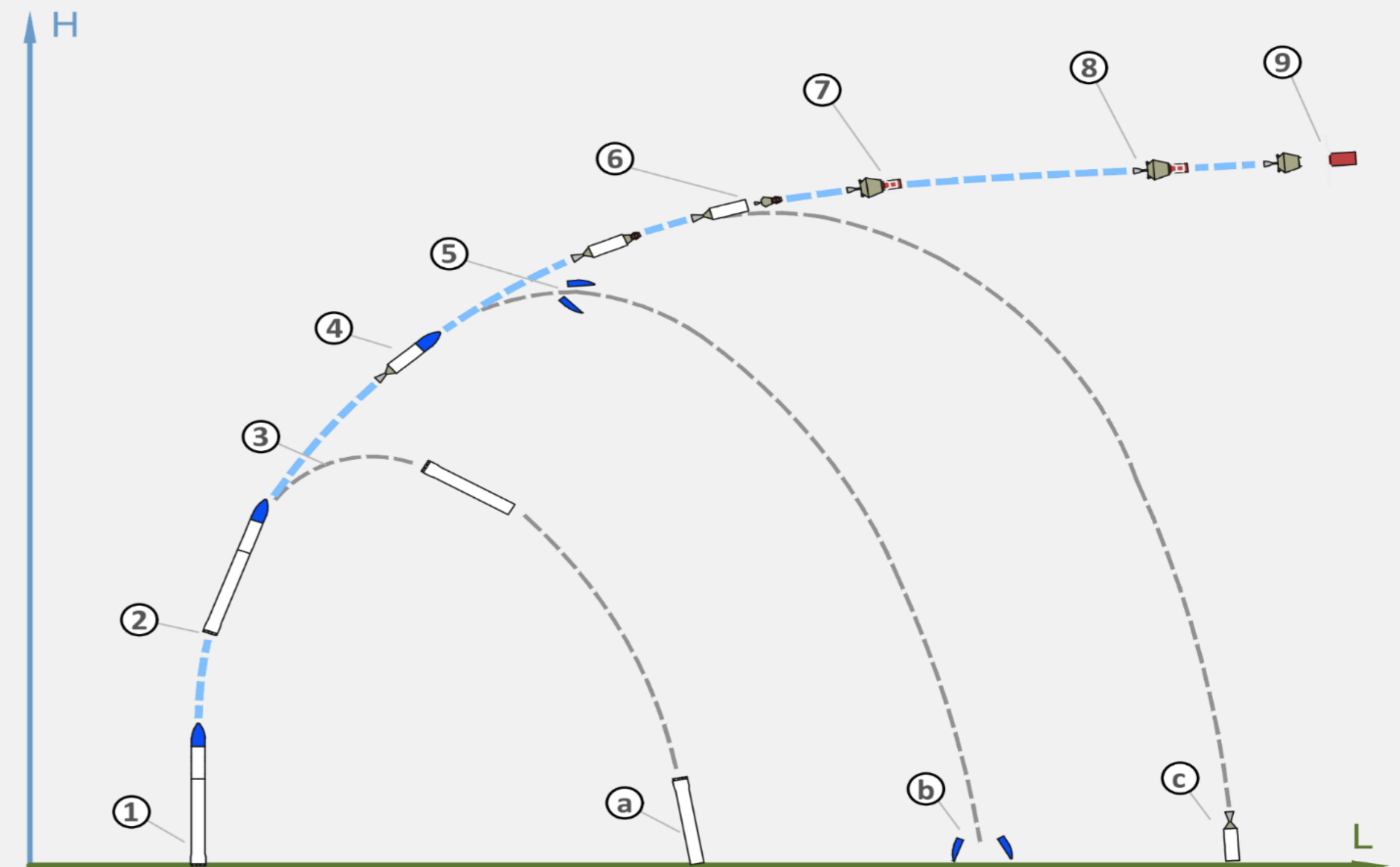
OVERVIEW OF OPERATIONS – SKYLARK L

1. Engine ignition – lift off
2. Boost phase – passing q_{max}
3. Engine shutdown
4. Payload fairing jettison
5. Apogee passing
6. LDSD deployment
7. High-altitude drogue parachute deployment
8. Main parachute deployment
9. Separated part landing
10. Payload fairing landing

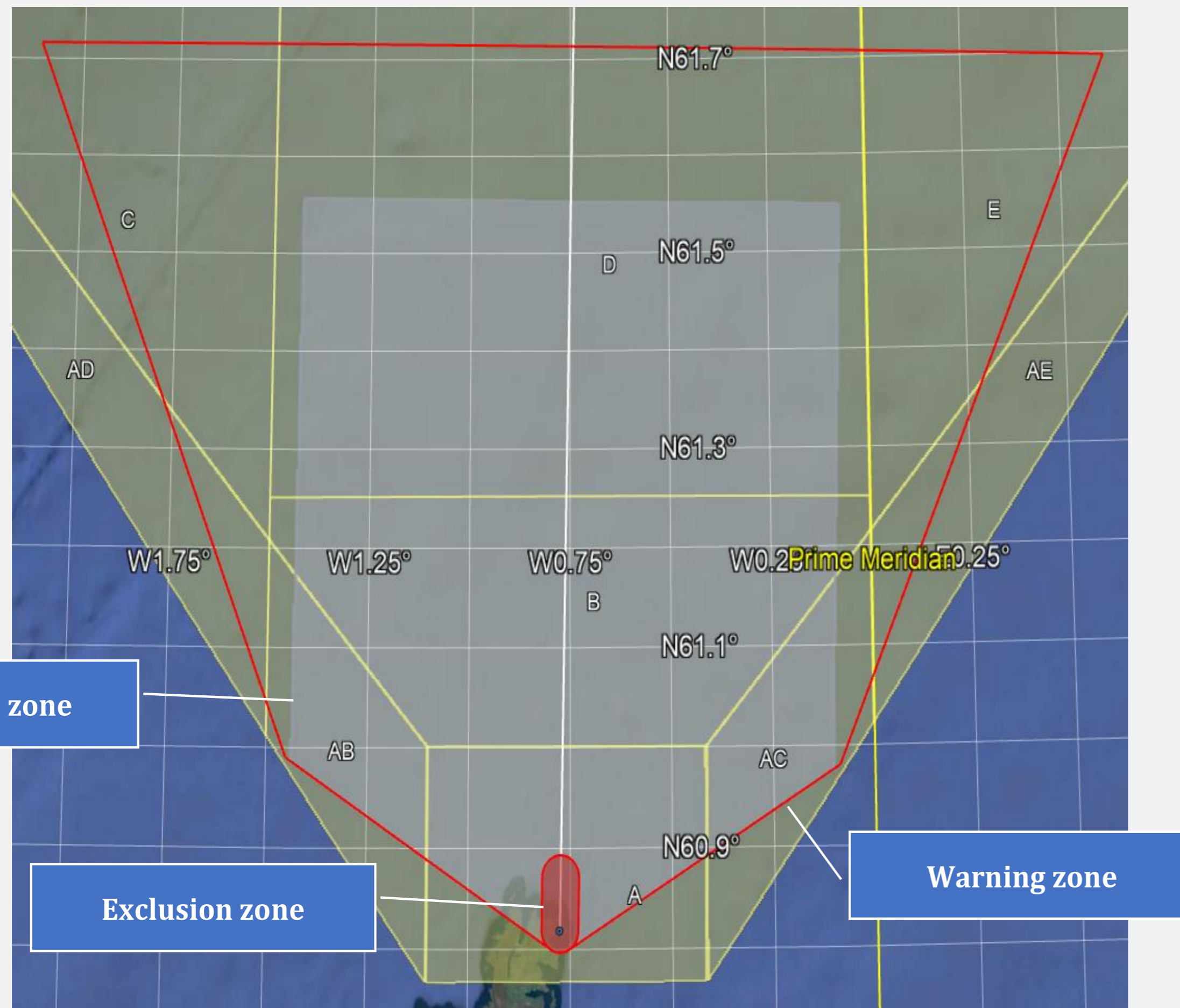


OVERVIEW OF OPERATIONS – SKYRORA XL

1. Main engine start
 - a) Separated 1st stage impact area
2. 1st stage main engine shutdown
3. 1st and 2nd stage separation
4. Fairing separation
 - b) Payload fairing impact area
5. 2nd stage main engine shutdown
6. 2nd and 3rd stage separation
 - c) Separated 2nd stage impact area
7. First ignition of 3rd stage main engine
8. Second ignition of 3rd stage main engine
9. Payload separation



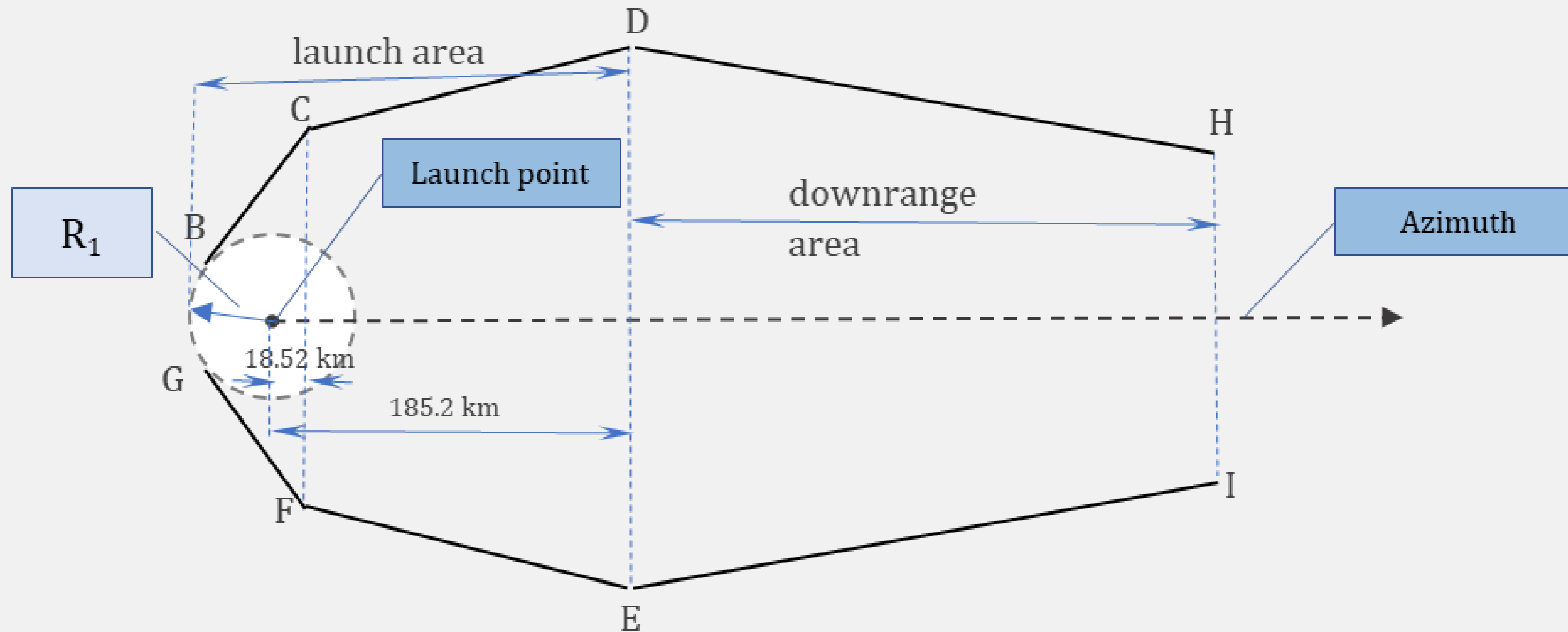
AIRSPACE & FLIGHT PATH – SKYLARK L



- Exclusion, Restricted, and Warning zones for SKL launch
- Exclusion zone presents a higher than acceptable risk to life (above 1E-6)
- Restricted zone presents a higher than background risk level (between 1E-6 and 1E-7)
- Warning zone provides a buffer at background risk levels

AIRSPACE & FLIGHT PATH – SKYRORA XL

Proposed flight corridor



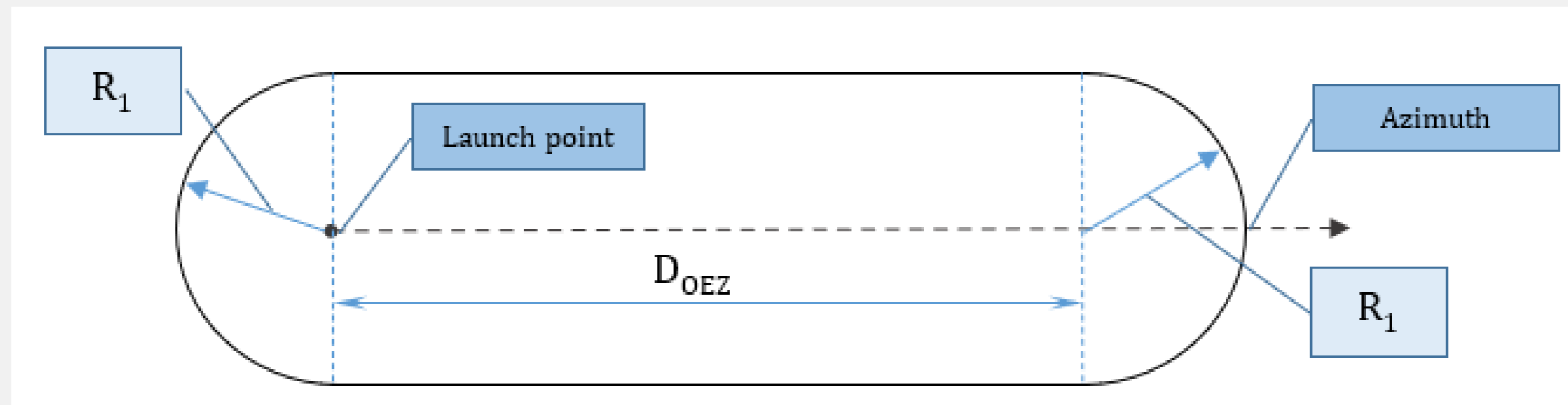
	R1	CF	DE	HI
Orbital Launch Vehicles	2.222 km (1.2 nm)	72.228 km (39.45 nm)	216.684 km (117.87 nm)	3265.076 km (1763.27 nm)

AIRSPACE & FLIGHT PATH – SKYRORA XL

Proposed flight corridor

R1 of 2.222 km (1.2 nm)

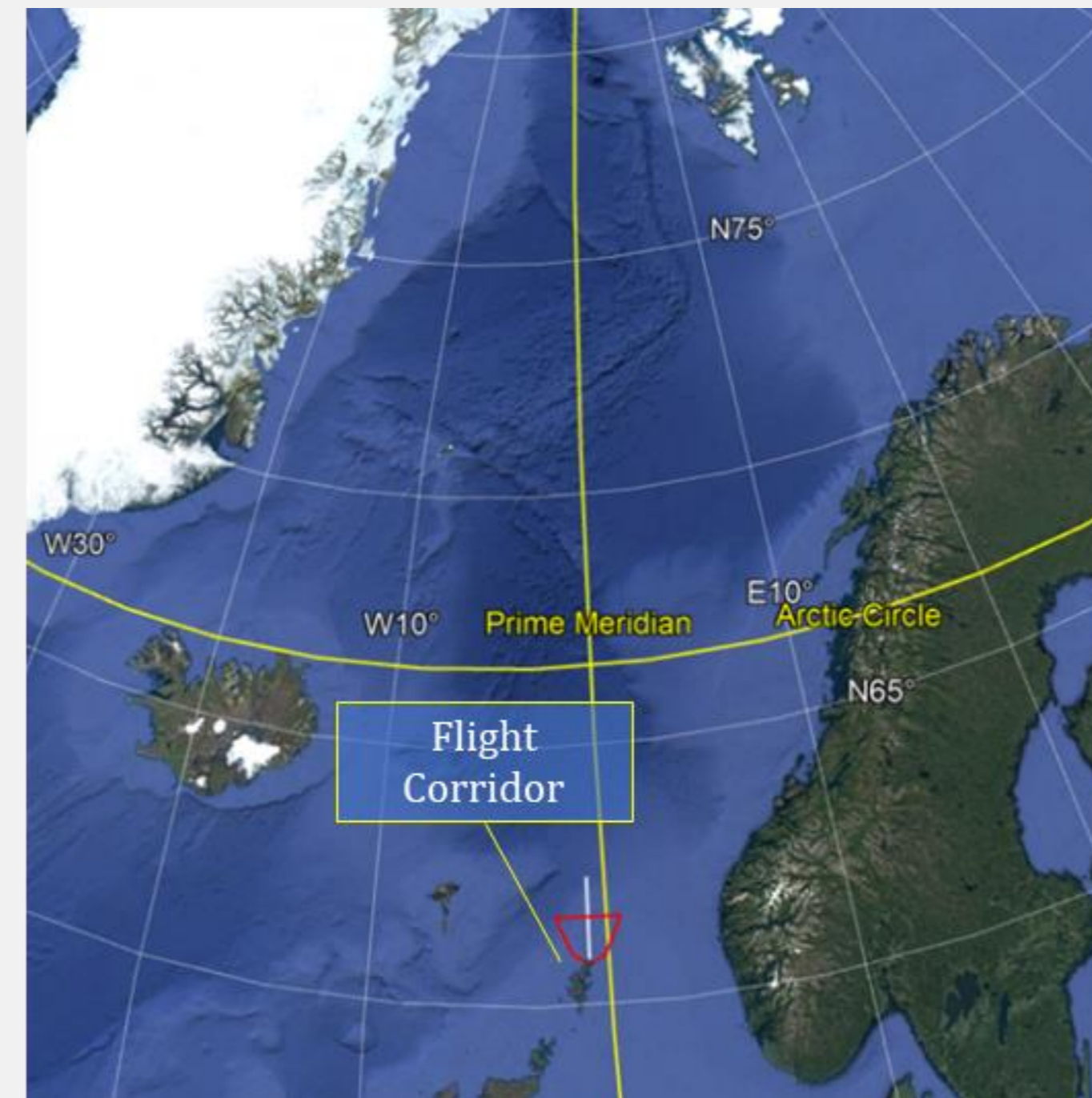
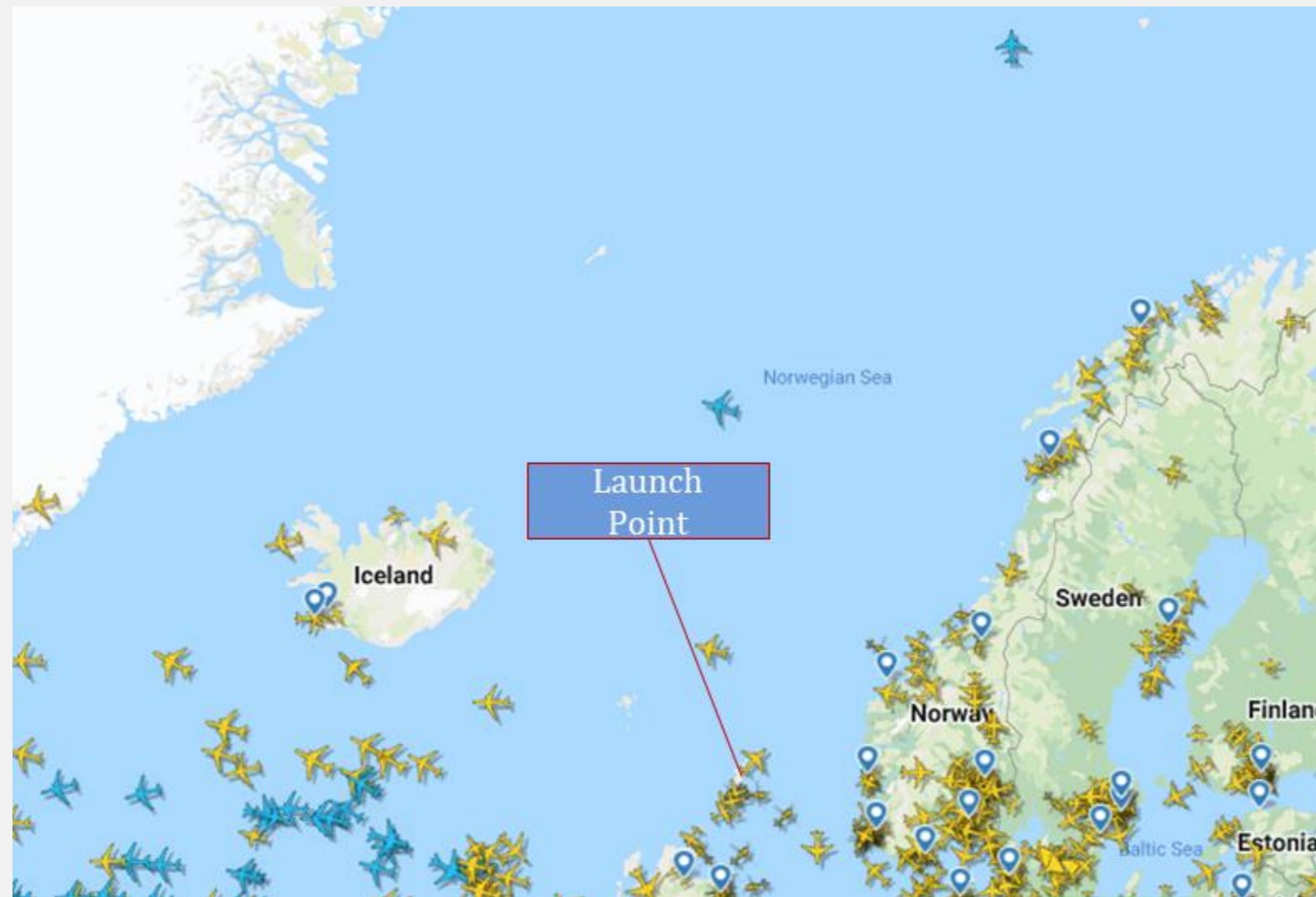
D_{OEZ} of 12.556 km (6.8 nm) – increased by 7 km based on Skyrora's risk assessments

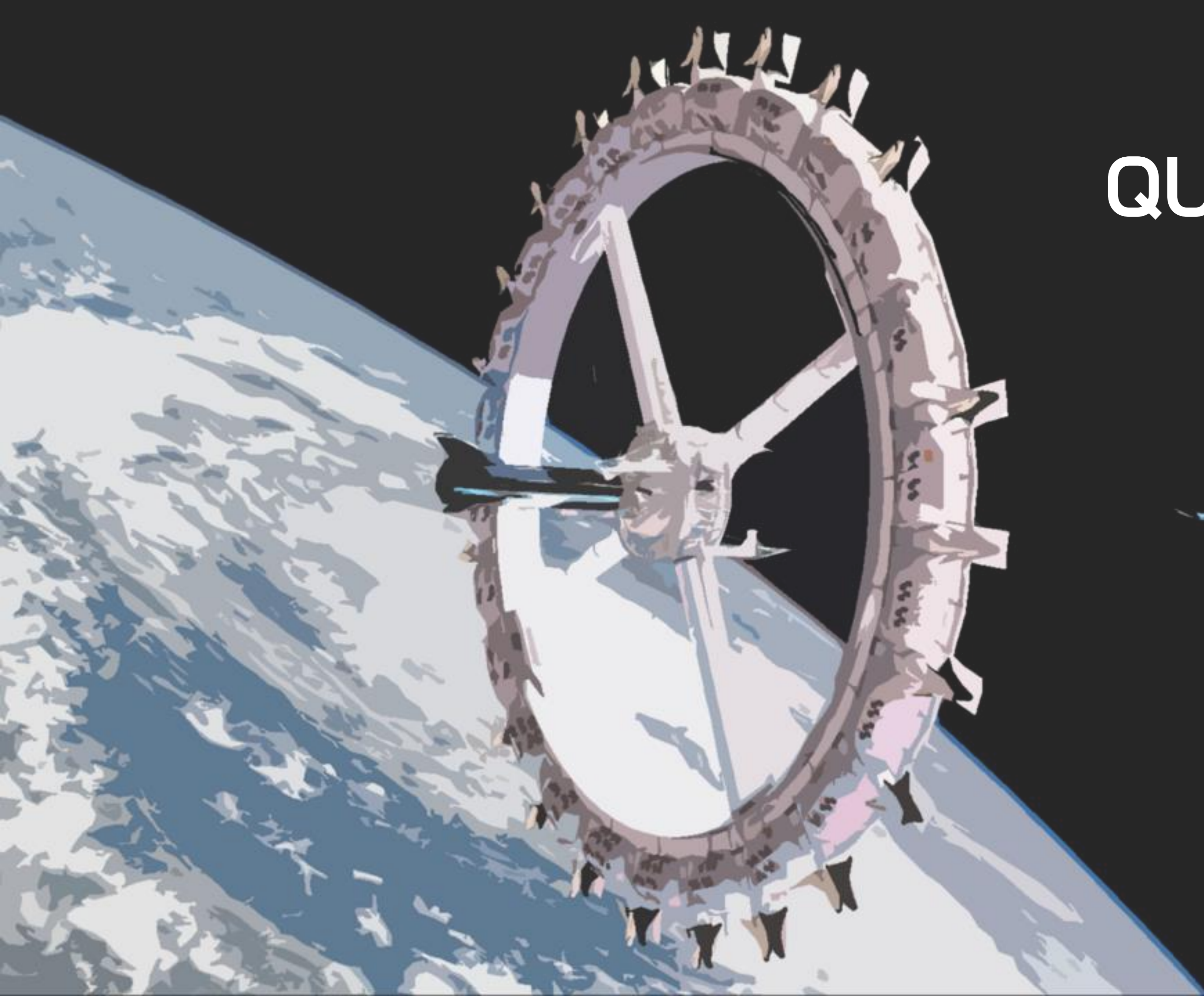


ATC SERVICES

Appropriate NOTAMs to be issued prior to launch

Skyrora to work with relevant stakeholders including spaceport, range provider, and ATCs





QUESTIONS?