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International Launch Services
FLEXIBILITY | PERFORMANCE | EXPERIENCE | DEDICATION

Press Briefing — SAT 2017 Proton Medium and 5m PLF Update

Presented by:

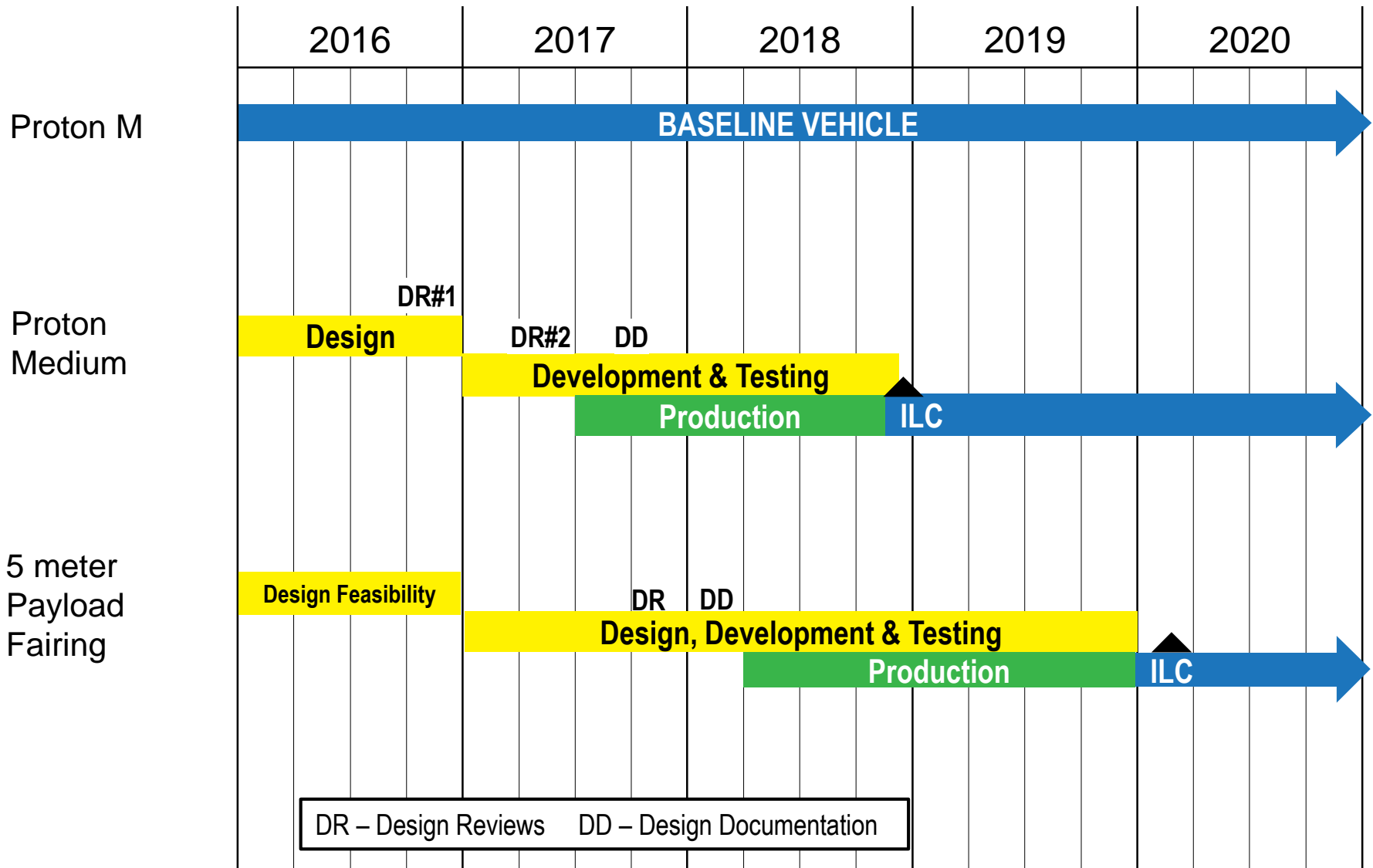
Jim Kramer

Vice President, Engineering & Mission Assurance

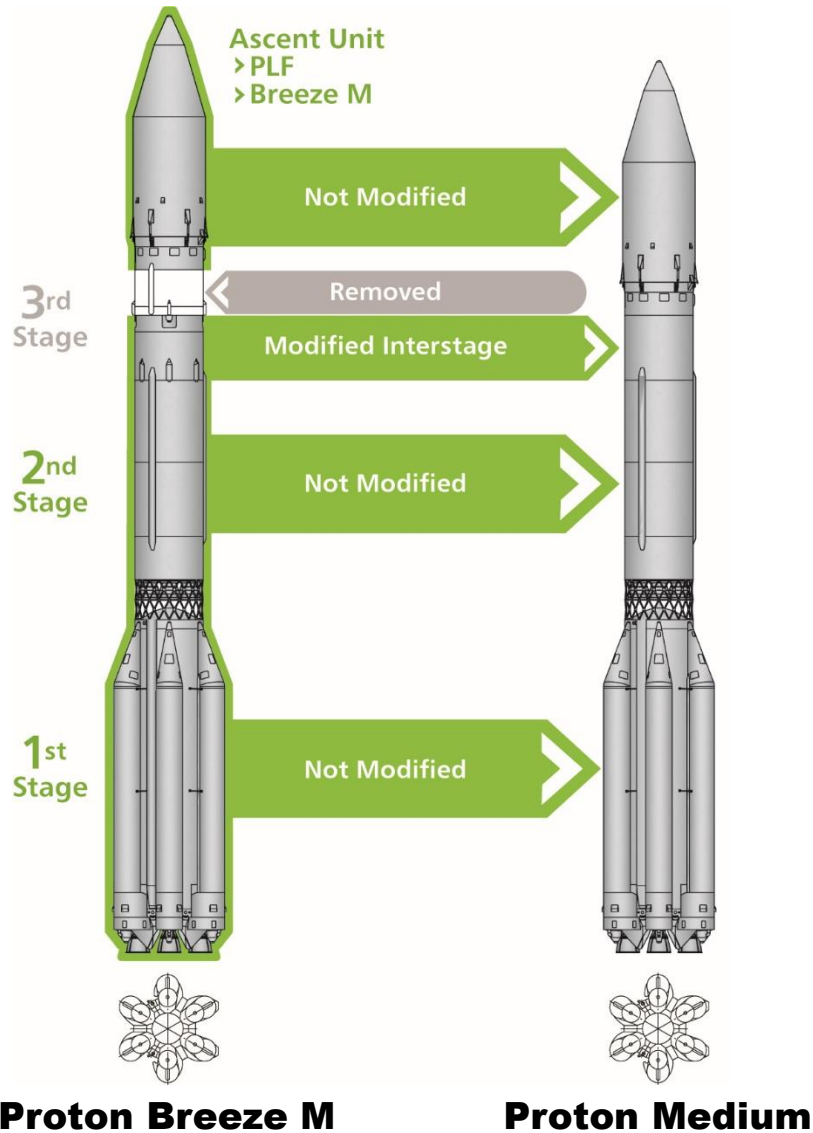
Agenda

- **Proton Development Roadmap**
- **Proton Medium Update**
- **5 meter PLF Introduction**

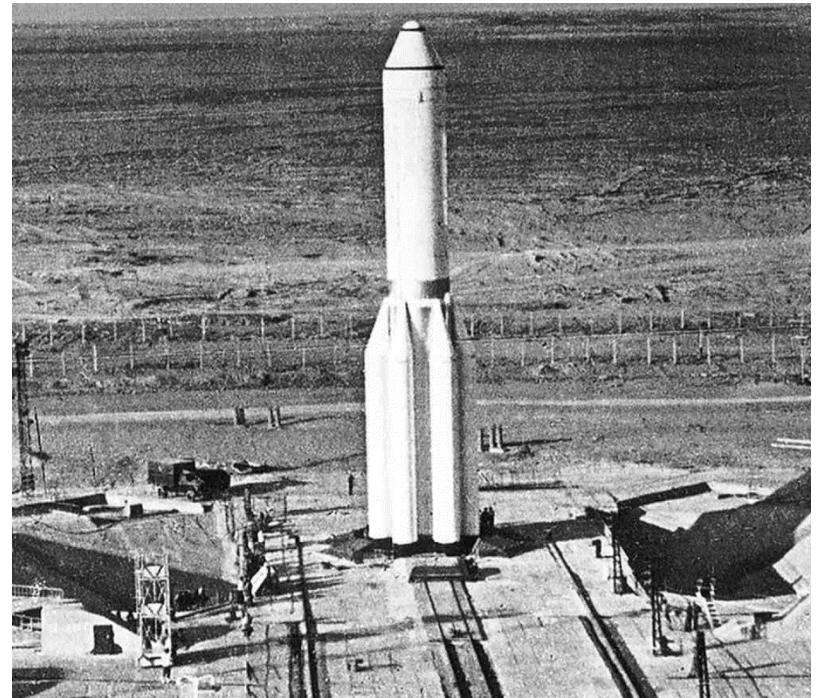
Proton Development Roadmap



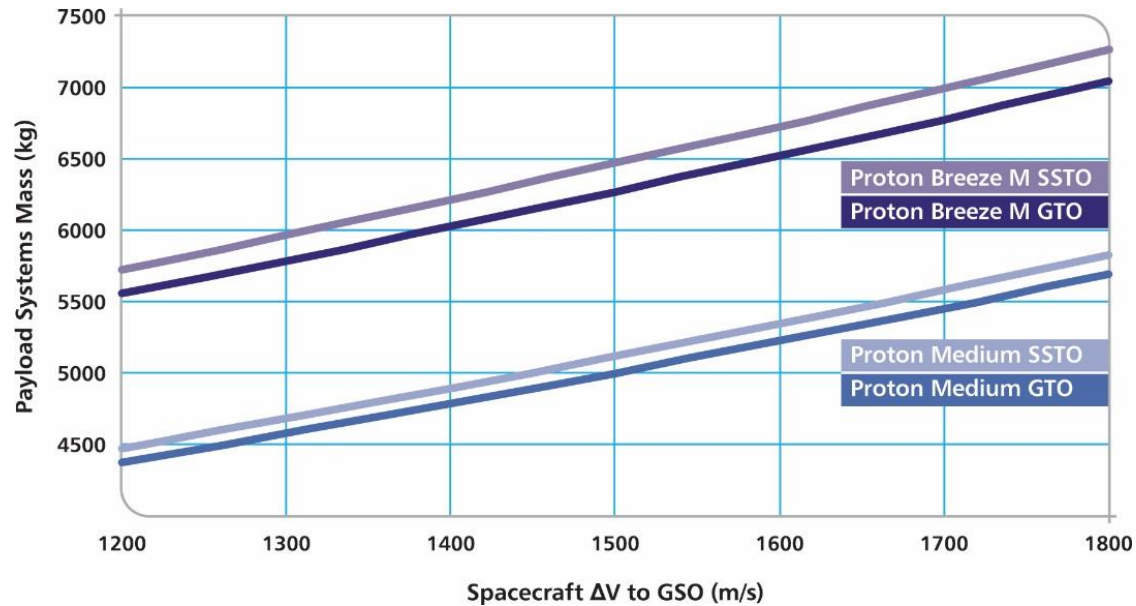
Proton Breeze M and Proton Medium Comparison



Back to the Future
Proton's first flight as the
2-stage UR-500 in 1965



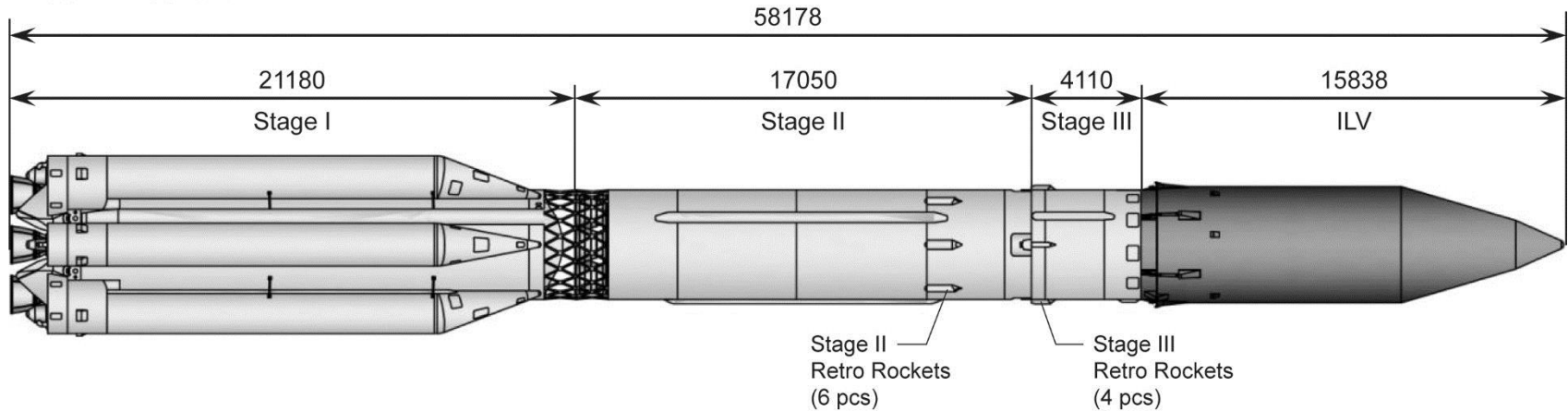
Proton Breeze M and Proton Medium Performance Comparison



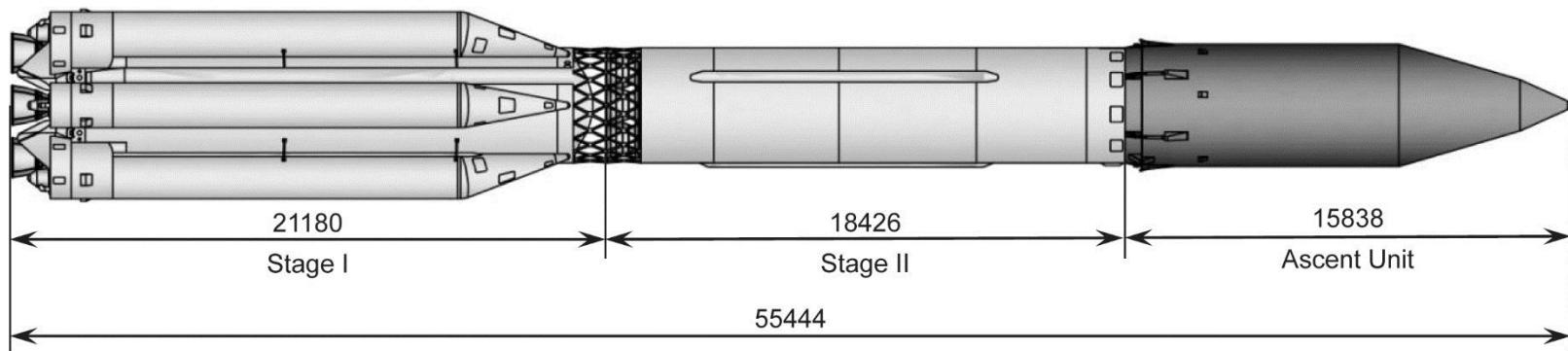
	Proton M	Proton Medium	ΔV to GSO
GSO	3.28 MT	2.4 MT	—
GTO	6.27 MT	5.0 MT	1500 m/s
	7.07 MT	5.7 MT	1800 m/s

Proton Breeze M and Proton Medium General View

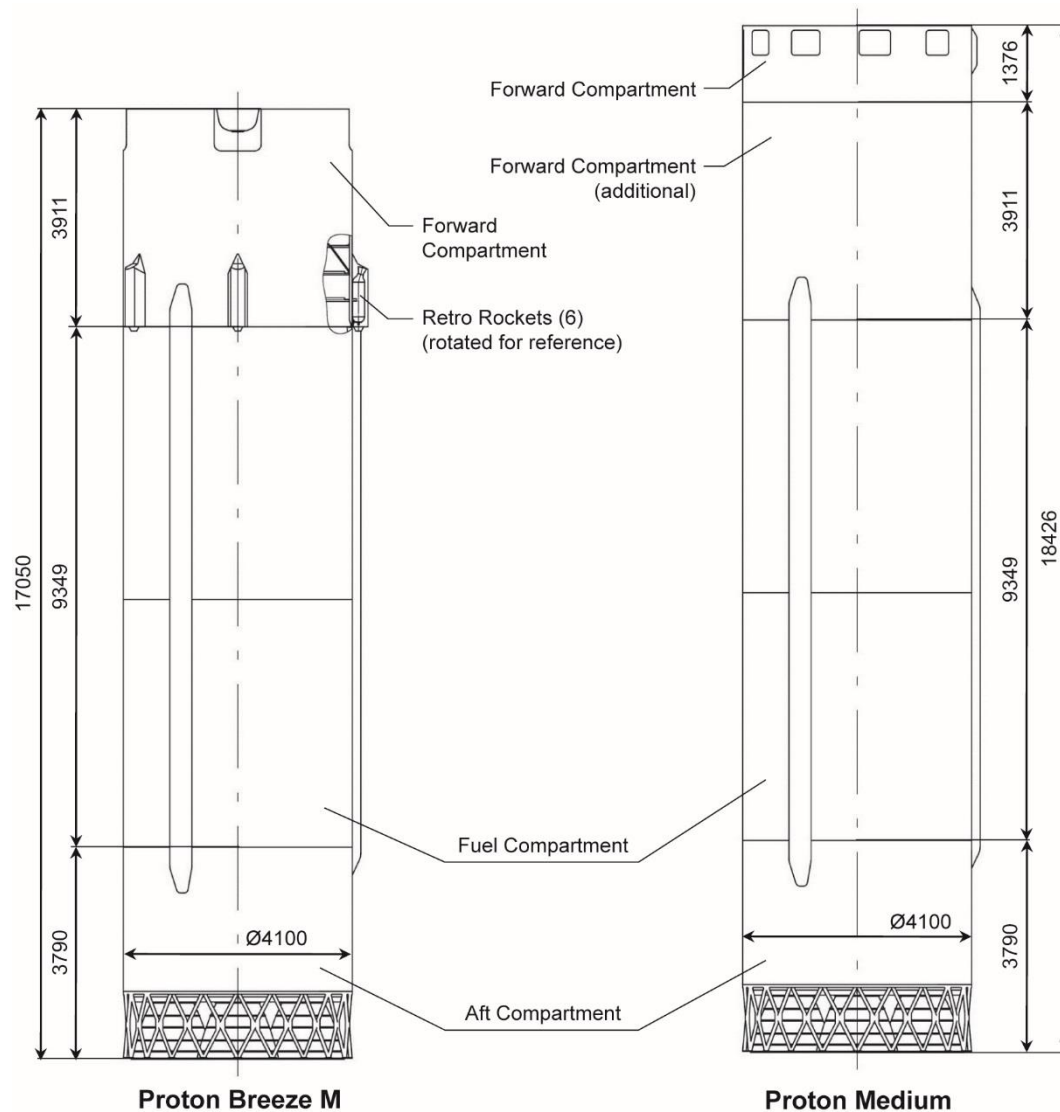
Proton Breeze M



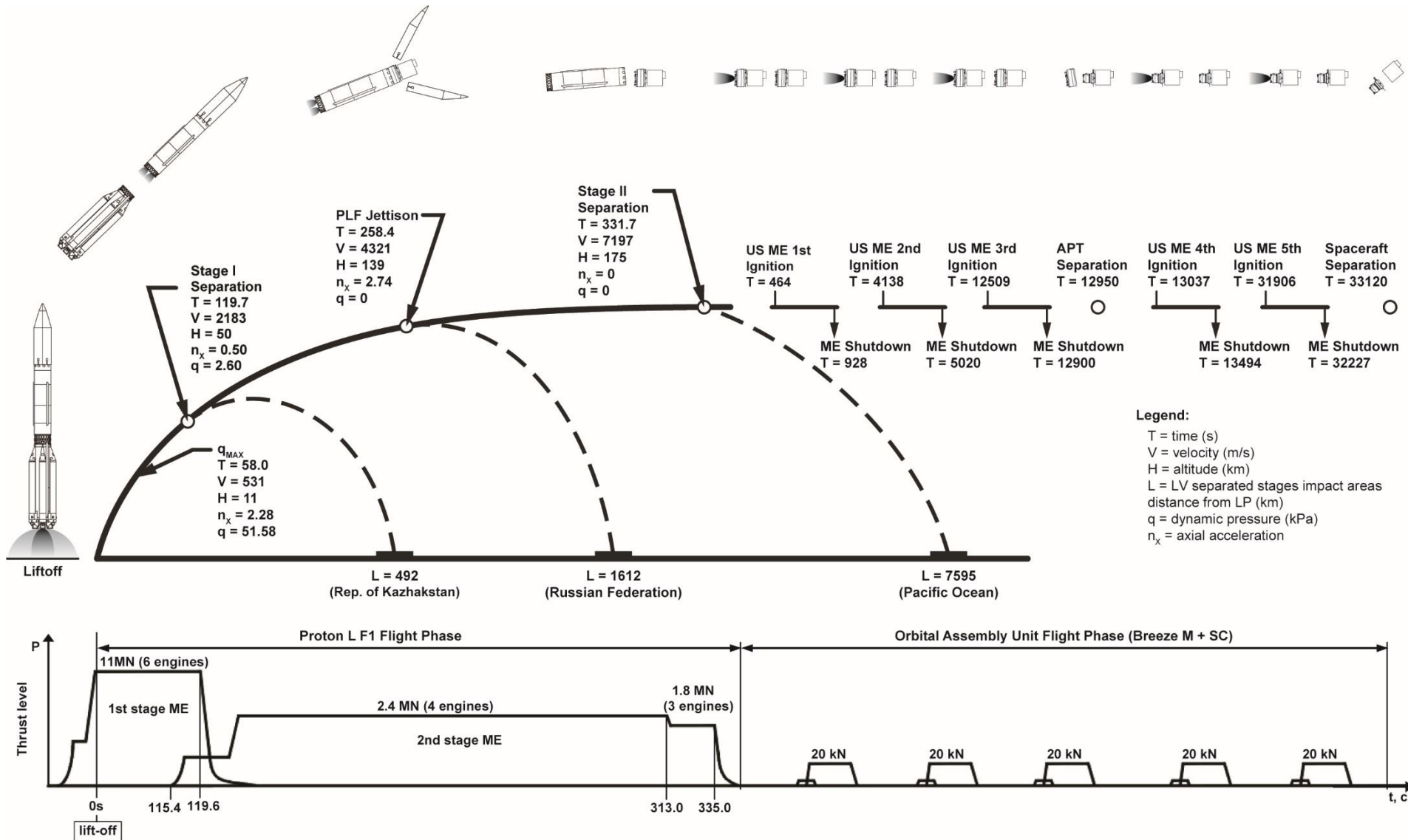
Proton Medium



Proton Launch Vehicle 2nd Stage General View

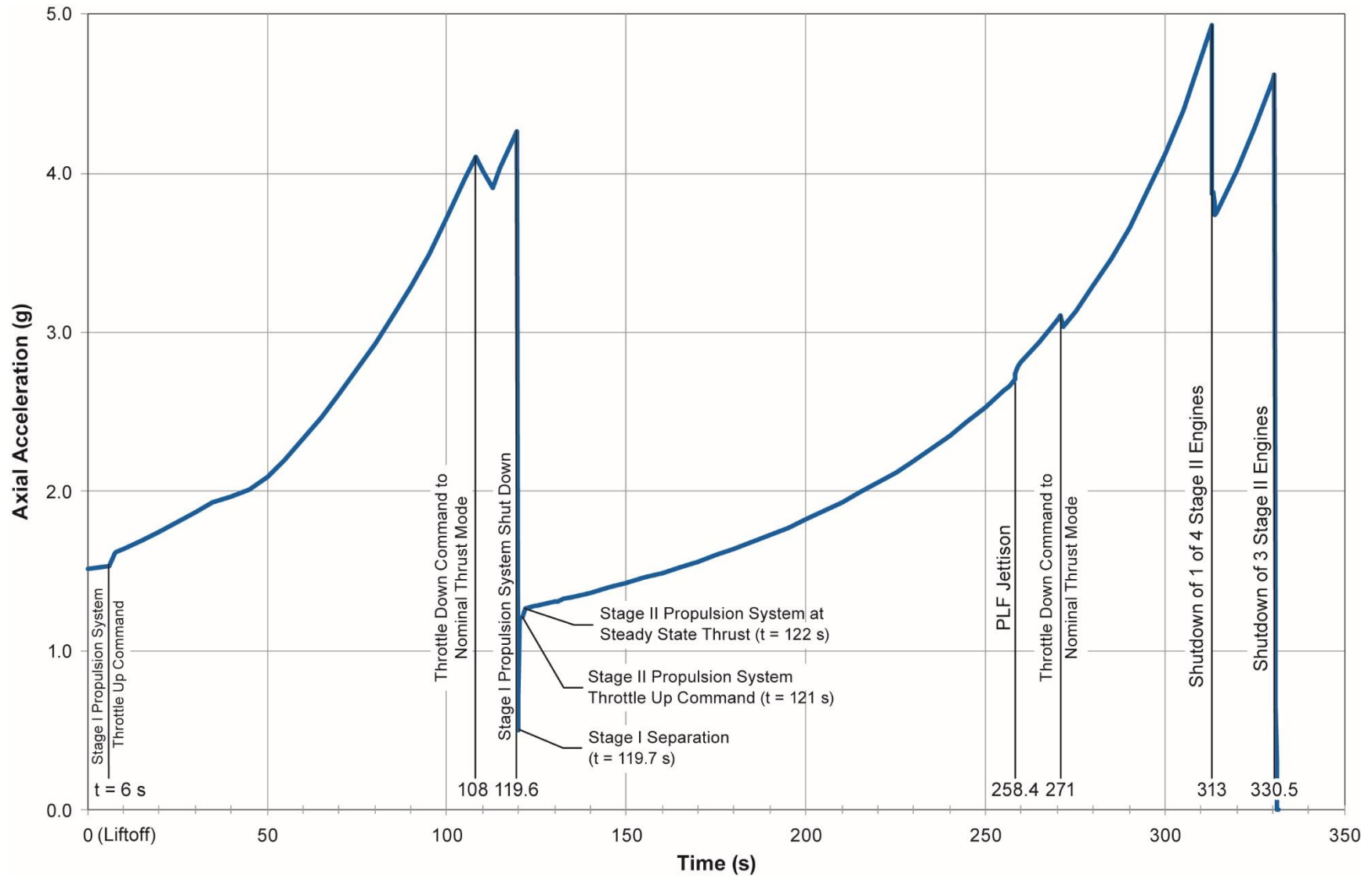


Injection Profile and Sequence of Flight Events

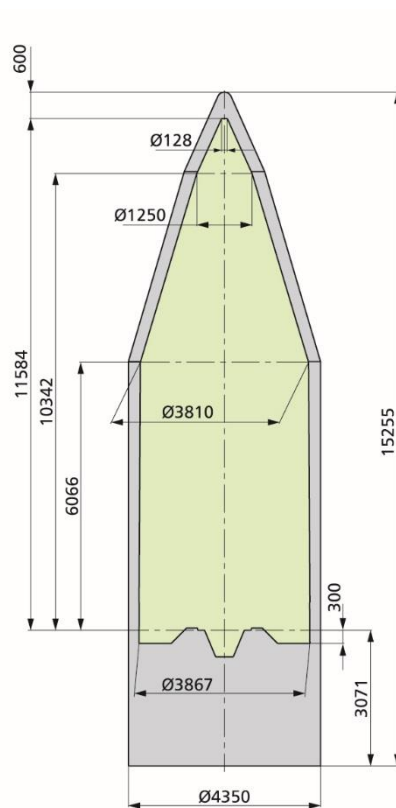


Proton Medium Typical Flight Trajectory

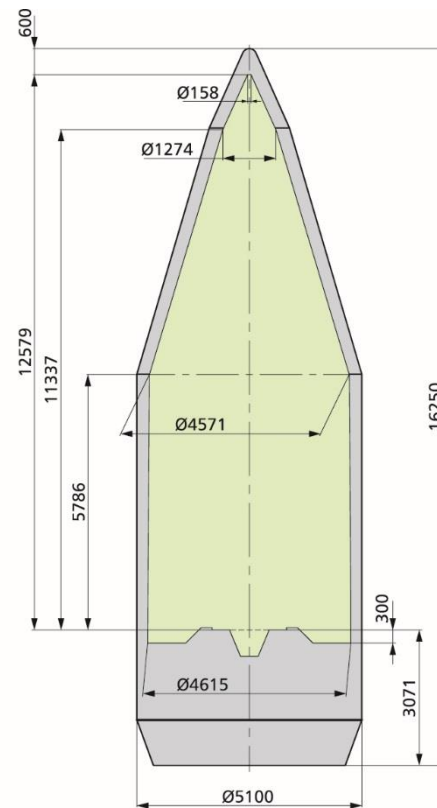
Axial Acceleration Profile



Proton 5m Payload Fairing Comparison



15.3 m Long
4 m Diameter



16.3 m Long
5 m Diameter

Now

1Q2020

Proton Breeze M

4Q2018

1Q2020

Proton Medium

Proton Breeze M with 5 Meter PLF at MST

