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Bento Box Modular/Recoverable Stratospheric Balloon Capabilities to Support Distributed Maritime Operations

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Monterey, California: Naval Postgraduate School

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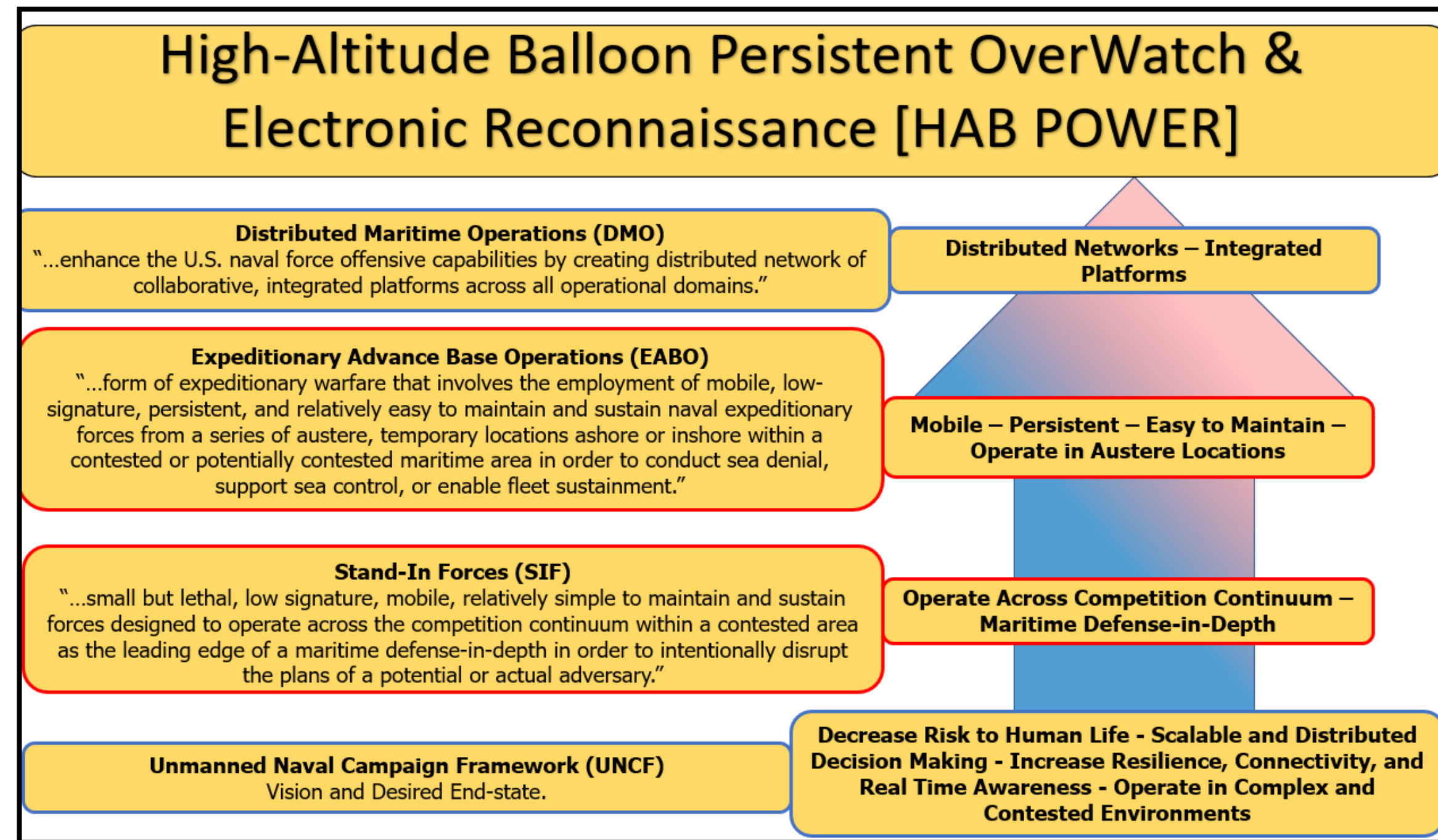
HAB POWER: The Space Domain's First Line of Defense



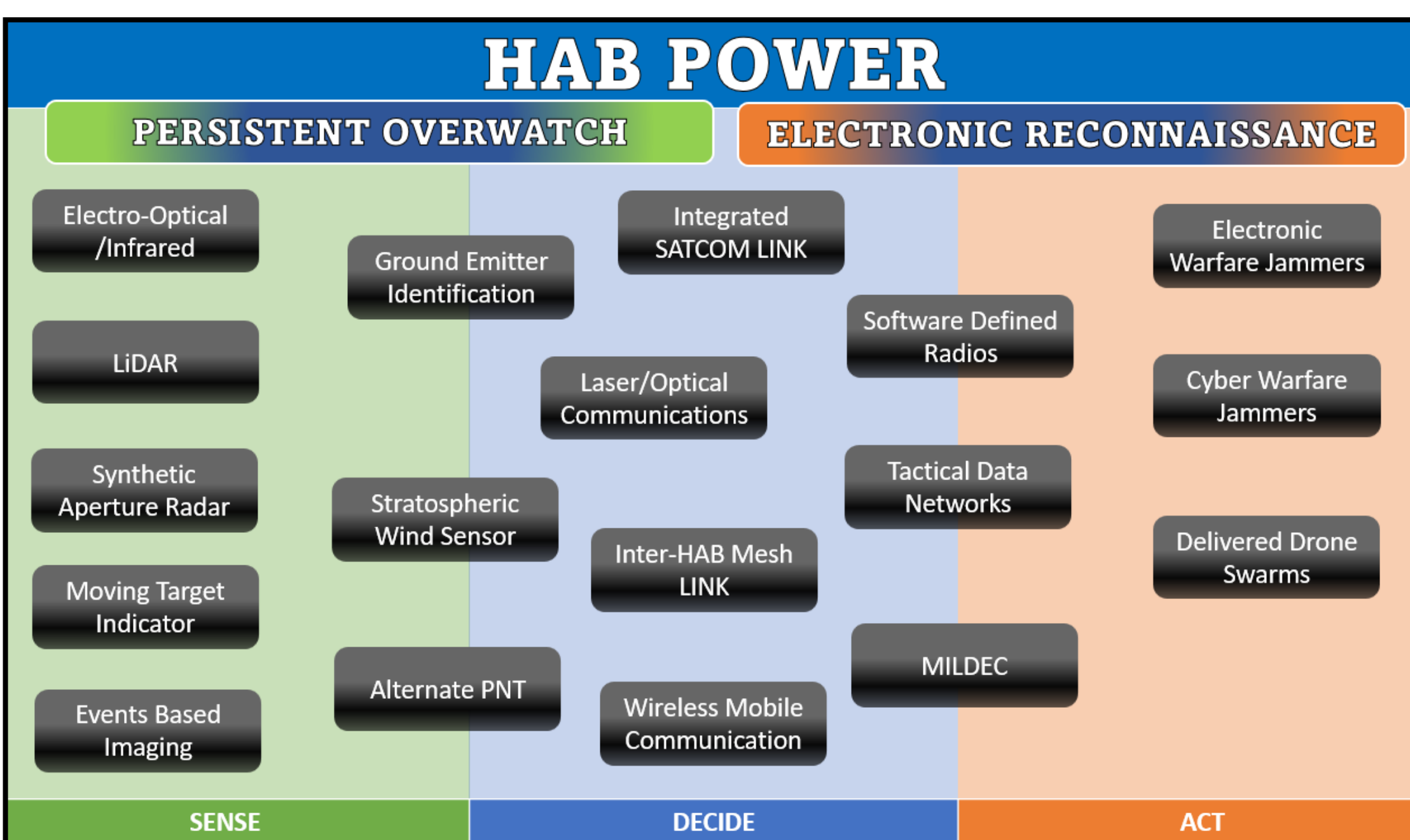
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Defining HAB POWER

To counter the increase of our rivals' maritime platforms, naval routes, and overstepping of rules-based international systems at sea, the U.S. military is adapting to a distributed force that operates from a networked architecture that can connect hundreds of sensors from manned and unmanned platforms to deliver synchronized effects across all domains. To be expeditionary and distributed requires dependence on many space-based beyond line-of-sight (BLOS) capabilities which are being contested by improved adversary counter-space capabilities. This drives the question, "Can the space domain be optimized by integrating high-altitude balloons (HABs) to support Distributed Maritime Operations and associated concepts?"



Doctrine and Concepts to Build Upon

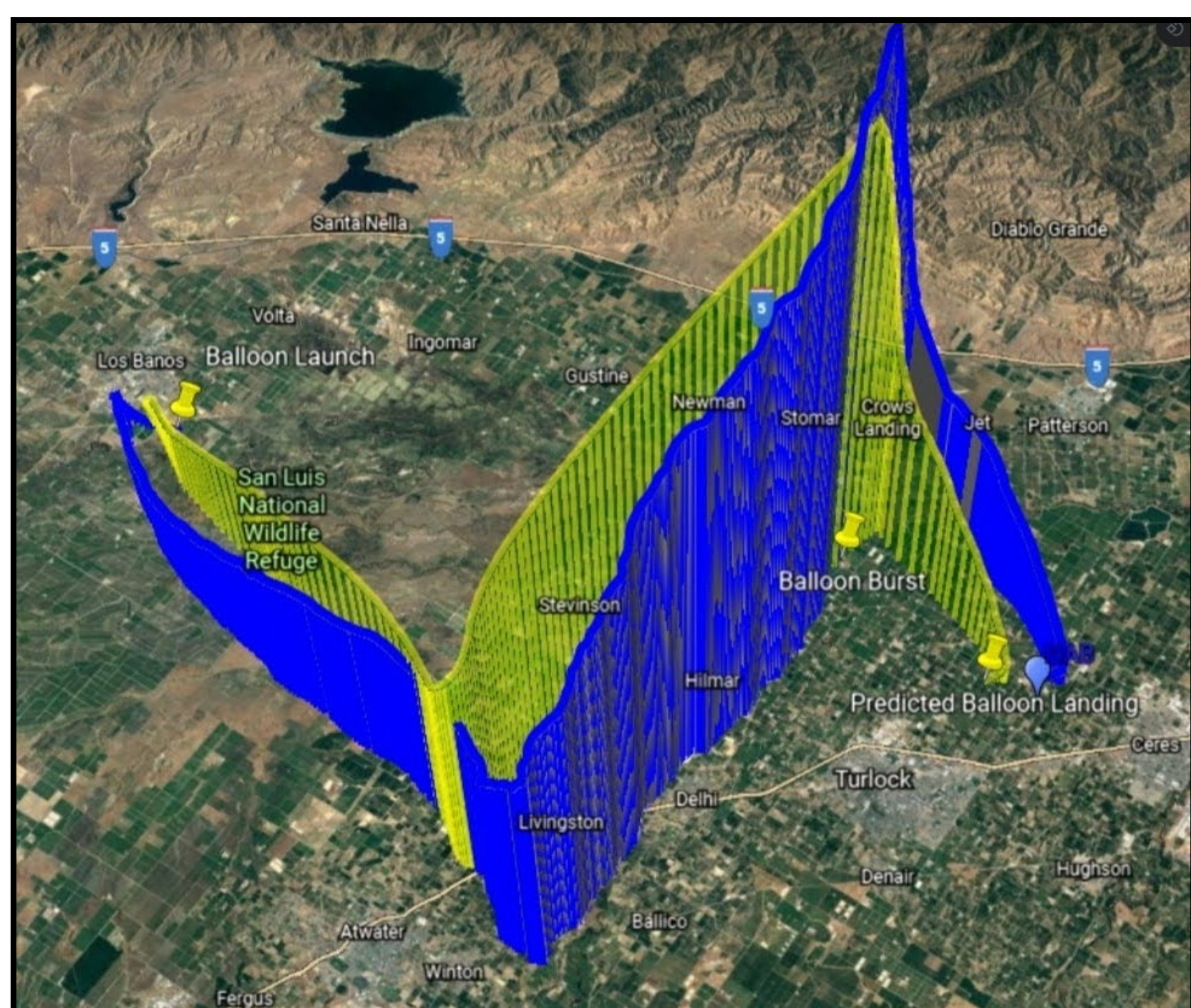


HAB POWER Mosaic Warfare Payload Lexicon

HAB POWER Architecture

- Leverage the commercial stratospheric industry due to their advanced station seeking wind navigation algorithms and persistent platform ready systems
- Military provides reliable, scalable, and modular - payloads that can be hosted on commercial platforms.
- Maritime and Expeditionary Advance Base Task Force Commanders can task HABs.
- HAB concept of operations that follow a decision-centric mindset derived from Mosaic Warfare.

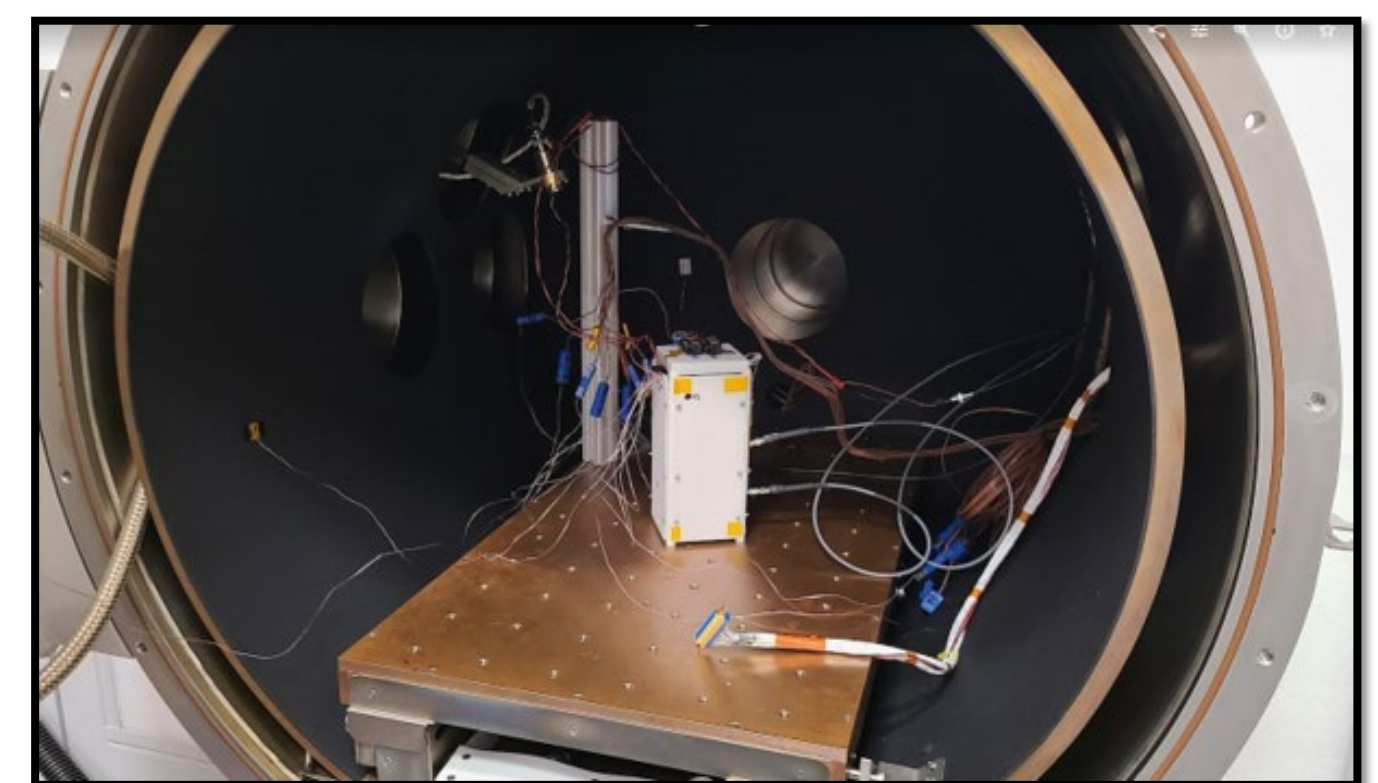
Testing and Demonstrating HAB POWER



HAB Flight Path Predicted vs Actual



HAB Launch



HAB Bus Thermal Testing in TVAC Chamber

Note: The stratosphere is a harsh climate – thermal testing is a requirement!

NPS HAB ALTITUDE RECORD: 37 km

HAB POWER ENDSTATE: An additional layer of capability added to the existing multi-domain framework possessing another variable for the adversary but providing additional satellite-like capacity, redundancy, and reliability to the tactical and operational warfighter within the Joint and Naval Operational Architecture.



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