



Airship Initiatives At A Turning Point?

Lead-in

1. National Defense Authorization Act FY12 – **Flagged concerns**
2. “Sec. 902. Designation Of Department Of Defense Senior Official With Principal Responsibility For Airship Programs - Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall:”
 - a. Designate a senior official of the DoD with principal responsibility for the Department airship programs; and
 - b. Identify senior official’s responsibilities for programs
3. ASD R&E, assumes responsibility – **Possibly appropriate because of the degree of Congressional attention but incumbent’s departure Dec 2012 – breaks continuity of the office**
4. Reports:
 - a. Hybrid Airships Operational Concepts – **Limited detail**
 - b. Summary Report Of DoD Funded Lighter-than-air-vehicles – **Lists DoD LTA with limited qualification**

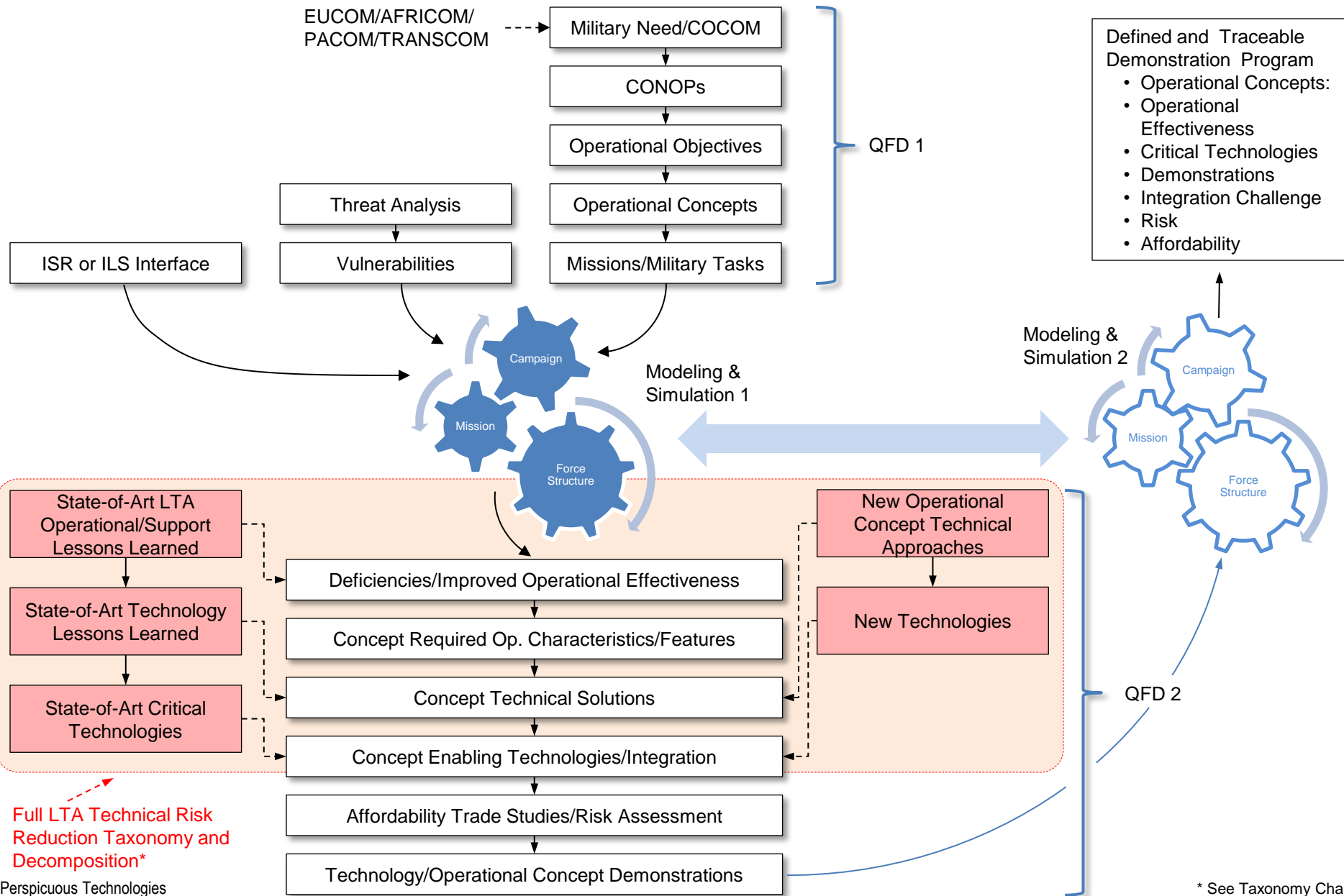
Armed Services Committees Do Not Appear To Be Very Content

A Reason To Act

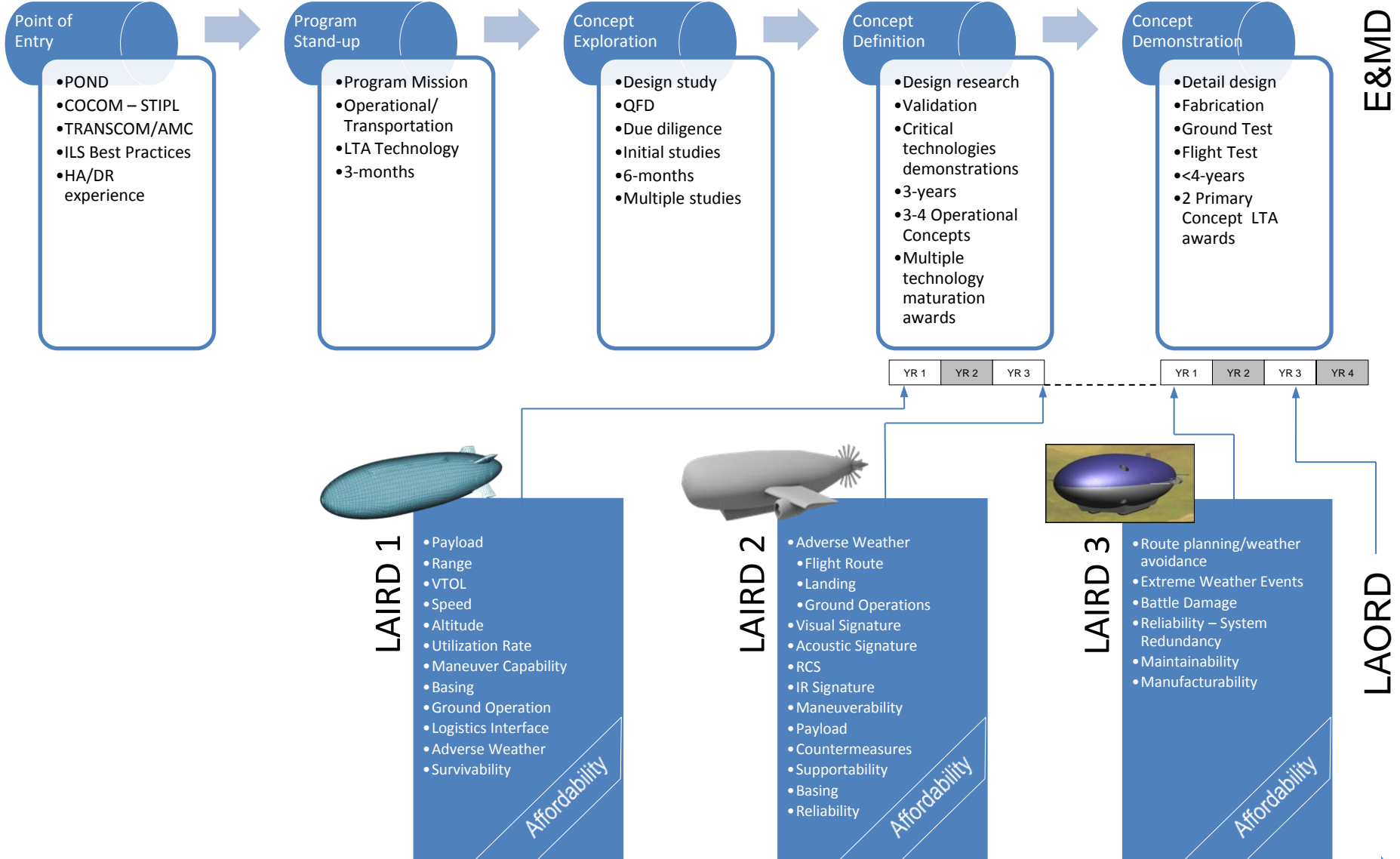
- Exist in popular familiarity – Blimps and Hindenburg
- The technical elegance - this “*gift-of-nature*” - **motor-energy free lift**, within lower atmospheric altitudes, is really not being appreciated seriously:
 - Opportunity for very low cost, heavy lift air transportation
 - Possibly high altitude ISR but very limited technical paths
- Very disappointing 20-year developmental record – aerostats are the exception
- A number of failed technical attempts – have undermined credibility/patience:
 - Disparate, multiple and incoherent
 - Poorly managed
 - Superficial lesson-learned experience – historical operations/design
 - Conceptually incomplete – little good new science incorporated
- How to try again and do it better:
 - A new DoD strategy – based on a full appreciation of the strategic value of LTA technology
 - Smart development – establish a sound foundation with effective due diligence at the start
 - Early maturation – a raft of enabling technologies – think about a 1990s type JAST effort – need to understand the building blocks to retire risk effectively – by single bite, it’s a choking episode!
 - Airship-literate vision and leadership
 - Incremental demonstration goals and metrics – build Congressional confidence
 - Technical immaturity – requires a DARPA-like lead – not OSD/NASA/TRANSCOM

Risk Losing A Technical Breakthrough Opportunity For Poor Reasons

A Path To Assuage NDAA FY12 Concerns – *Strategy-to-Task* Links Operational Capability To Concepts To Technologies

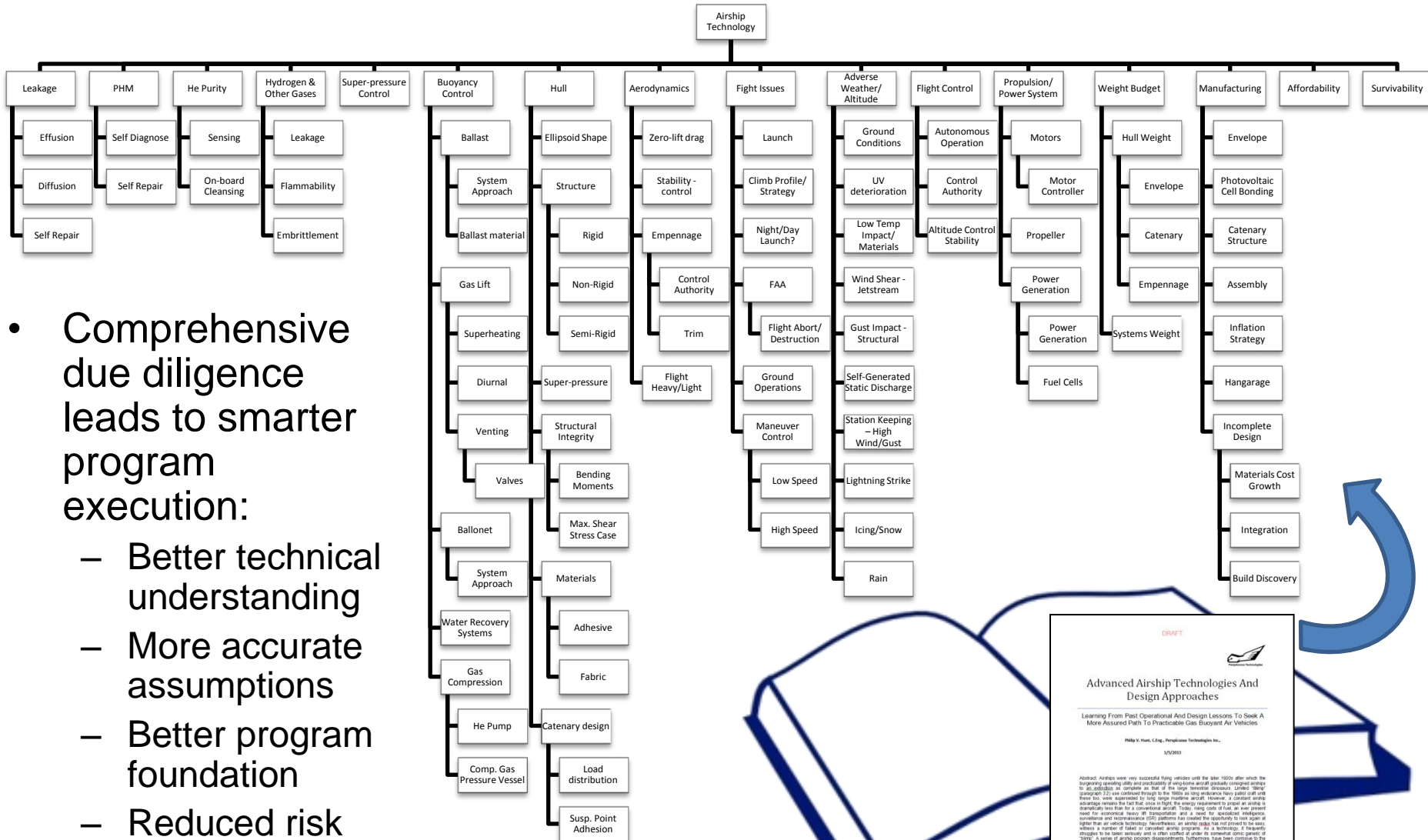


An Integrated Needs Process For A Logistics Airship Requiring Relevance, Realism, Affordability & 20/20 Vision



Logistics Airship Force Structure – Affordability – IL/Transportation Effectiveness

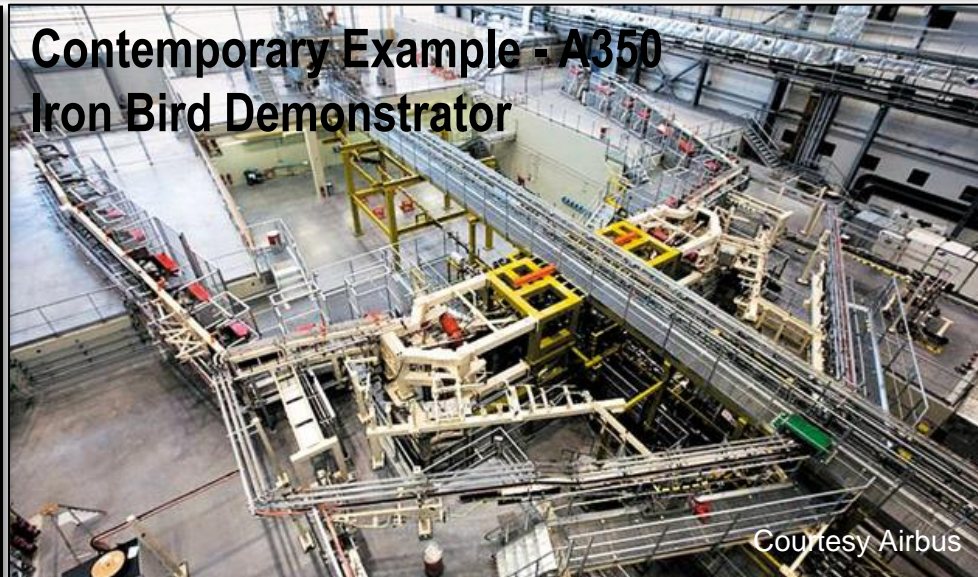
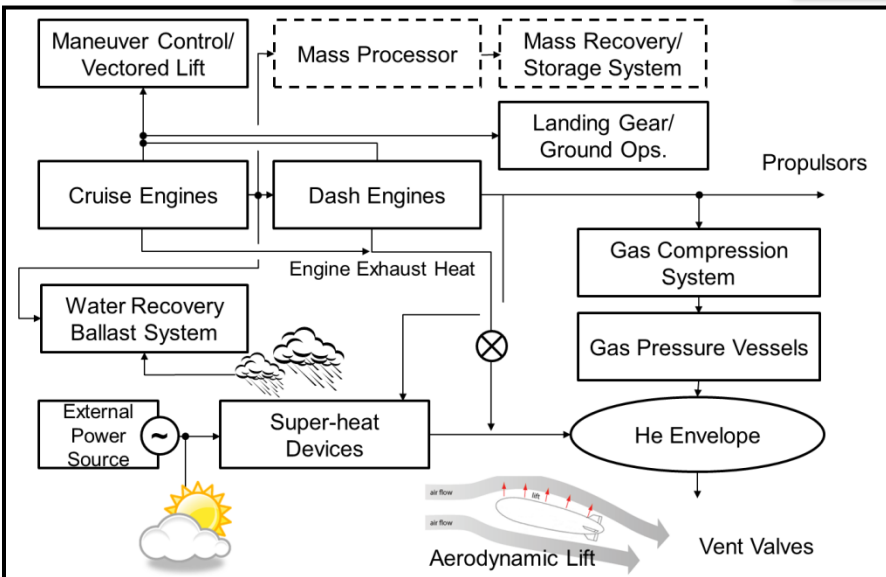
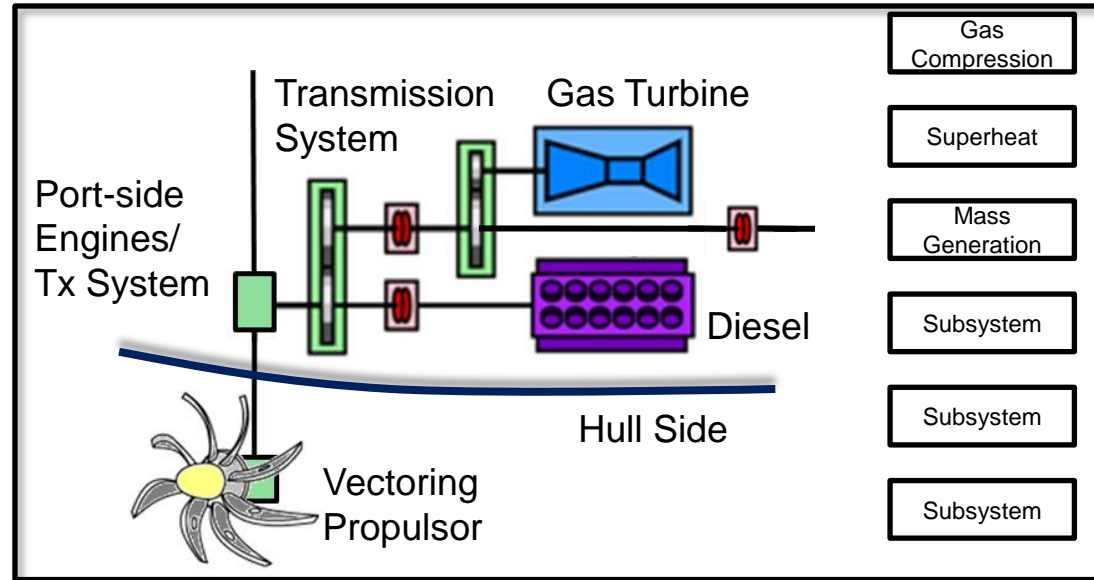
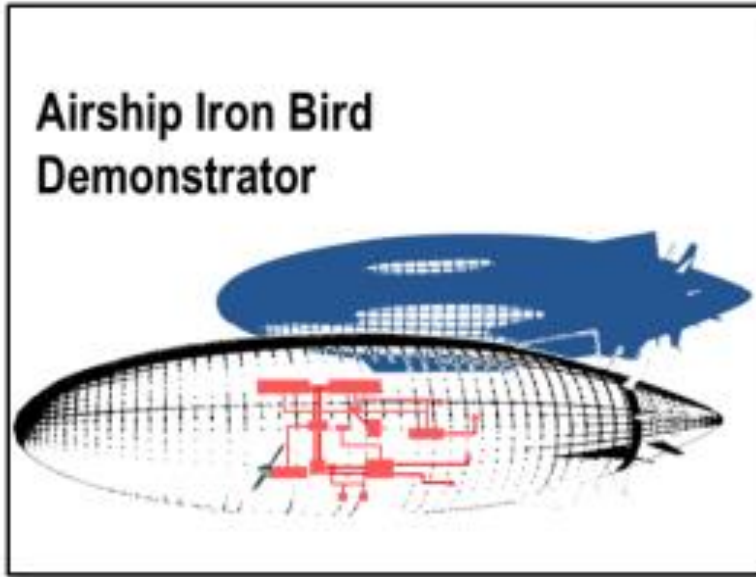
Airship Nominal Technology Taxonomy



- Comprehensive due diligence leads to smarter program execution:
 - Better technical understanding
 - More accurate assumptions
 - Better program foundation
 - Reduced risk

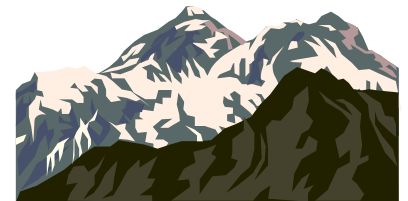


Example – *Iron Bird*, Large Scale Integrated Lift/Propulsion Demonstrator – *A Modest Step? A Leap In Risk Reduction!*



Summary

- Airship flight is underpinned by a remarkable naturally occurring quality – atmospheric buoyancy
- Offers a path to extremely low cost, heavy-lift air transportation – perhaps, high altitude ISR – likely having transformational impact
- Airship development – technologically, badly done – in crisis with lost confidence – with little operational glitter, its support constituency appears weak and weakening
- Could be saved – with program structure, good technology, due diligence to lessons learned and leadership
- *Armed Services Committees have appeared restless with overall technical approach* - it is possible to fix this and to begin a family of smart LTA technology programs



.... “Because its there”, George Mallory in 1924

NDAA FY12 Concerns

In the HASC report accompanying the National Defense Authorization Act FY-12, the committee stated its concern “...that airship technology has a history of being hampered by a variety of operational constraints that the military has not adequately dealt with since the last military airships were retired more than 50-years ago. The committee believes the Department should pursue a parallel path that demonstrates robust concepts of operation as the technology is matured and validated. Part of the process of developing concepts of operation should include planning and analysis for addressing operational and logistical constraints of using large airships, such as basing, airspace management, and environmental issues.” The committee requests development of operational concepts for how rigid-hull, variable-buoyancy hybrid air vehicle technology might be employed in future platforms.¹

SENATE COMMITTEE ON ARMED SERVICES NATIONAL DEFENSE AUTHORIZATION ACT FISCAL 2014 REPORT

Page 63, 'Hybrid Airships'

"Over the last several years, the Department of Defense (DOD) has pursued a number of airship vehicles to span a range of missions from long duration Intelligence, Surveillance, and Reconnaissance (ISR) to heavy lift. **Many of these programs have been terminated or concluded due to either budgetary issues, technical challenges, changed requirements, or declining interest.**

Nevertheless, in testimony before the committee, General William M. Fraser, III, USAF, the Commander of U.S. Transportation Command said, "hybrid airships represent a transformational capability, bridging the longstanding gap between high-speed, lower-capacity airlift, and low-speed, higher-capacity sealift. Across the range of military operations, this capability can be leveraged from strategic to tactical distances... We encourage development of commercial technologies that may lead to enhanced mobility capabilities in the future."

One class of airships—hybrid airships—has been investigated under DOD's Pelican program and the Army's Long Endurance Multi-intelligence Vehicle (LEMV).

The Pelican airship uses a system to control its buoyancy, while the LEMV is a standard hybrid airship with fixed buoyancy.

While the Pelican program recently demonstrated a limited capability of the underlying technology for controlled variable buoyancy, there are still significant advances that are needed to be made in order to develop a robust flight vehicle that would have a cargo capacity with any military utility.

The committee understands that there is some degree of interest in the commercial sector for the transportation capabilities of a heavy-lift hybrid airship. If such a capability were developed in the private sector, there is the potential opportunity for DOD to leverage this capability for its needs. The committee directs U.S. Transportation Command and the Air Force Mobility Command to monitor progress in this area and report to the congressional defense committees no later than 180 days after the enactment of this Act on the status of developments in the commercial sector regarding hybrid airships that could be used to provide the capability identified by General Fraser, and to what extent the DOD could benefit from them."

US House Of Representative NDAA FY14 Report

Page256, 'Hybrid Airship Technology'

The committee is aware that hybrid airship technology has the potential to provide much needed capability for the Department of Defense, particularly with regards to cargo lift and logistics. In the past, the committee has supported the development and demonstration of hybrid airship technology, and continues to monitor developments with interest. The committee is aware of recent developments that have demonstrated innovative capabilities in airship design and lift.

The committee is also aware, however, that airship technology still requires additional, more rigorous development and demonstration.

As noted by the Assistant Secretary of Defense for Research and Engineering, "current conventional airships are capable of accommodating payloads of only a few thousand pounds. In order to achieve the massive payloads envisioned by air-logistic theorists, significant technical advances and resource investments must be made."

The committee continues to support efforts to transition from rudimentary technology demonstrators to operational prototypes in relevant environments. The committee encourages the Air Force and Transportation Command to work with industry to more fully develop the capability requirements and mission analysis needed to pursue such an operational prototype.