

# Strategies for adapting Aviation & Defence industries to disrupt Supply Chains

Disruptions in the supply chain caused by global events, particularly the COVID-19 pandemic and geopolitical tensions, in the aerospace and defence industries' have caused delays, scrapped deliveries, and difficulties for OEMs in managing investments in production scale-ups amidst supply chain unpredictability. This article elaborates on the industry's trials and tribulations, pondering the potential for resolution amidst ongoing chaos.



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In the wake of a global pandemic, the once-stable supply chains of the aerospace and defence industries are now besieged by unprecedented disruptions. The post-Covid era has ushered in a new reality where managing delays and shortages has become the norm for Original Equipment Manufacturers (OEMs). But what are the catalysts of this persistent turmoil, and is there an end in sight?

The stability that defined aerospace and defence supply chains post-World War II has been upended. A confluence of rising global trade tensions and conflicts in Ukraine and Gaza has fragmented these critical networks, posing significant hurdles across sectors. The Red Sea crisis exemplifies the latest challenge, with US-Iran tensions prompting a massive rerouting of shipping lines—a detour adding 3,500 miles to reach European shores.

Manufacturers face the brunt of this instability, grappling with soaring commodity prices and erratic costs. The scarcity of skilled workers post-pandemic, coupled with a titanium shortage—stemming largely from Russian suppliers—has placed immense strain on supply chains. The repercussions are palpable: manufacturers delay timelines and scrap deliveries, while OEMs struggle to reconcile hefty investments in production scale-ups with the erratic nature of supply continuity.

### The soaring demand keeps challenging the Aviation and Defence Supply Chain

The aviation sector is currently experiencing remarkable growth in demand, driven by projections of increased air passenger traffic in 2024. The International Air Transport Association (IATA) anticipates a surge to over 4.7 billion passengers, surpassing pre-pandemic levels of 4.5 billion. India, specifically, foresees domestic air traffic exceeding 150 million passengers, reflecting its status as one of the world's fastest-growing civil aviation markets.

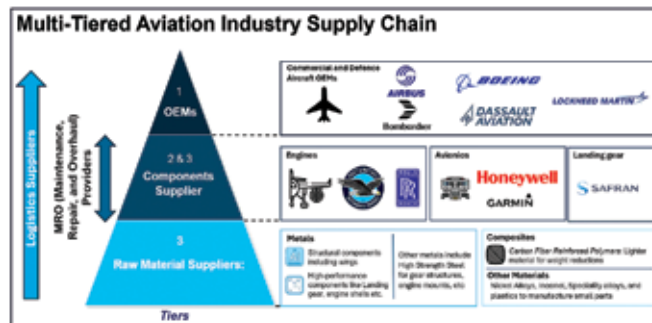
The defence sector has witnessed a surge in demand, largely driven by Russia's invasion of Ukraine and escalating tensions in the Middle East. Initiatives like the Global Combat Air Program (GCAP) and the AUKUS agreement highlight a growing emphasis on military capabilities worldwide.

India, aiming for self-reliance and bolstering its global geopolitical standing, has prioritised expanding its defence arsenal.

### Challenges for Aviation and Defence Industries

Both the aviation and defence industry supply chains have a multi-tiered structure, with various players contributing to the final product as suppliers or contractors (figure 1 and figure 3)

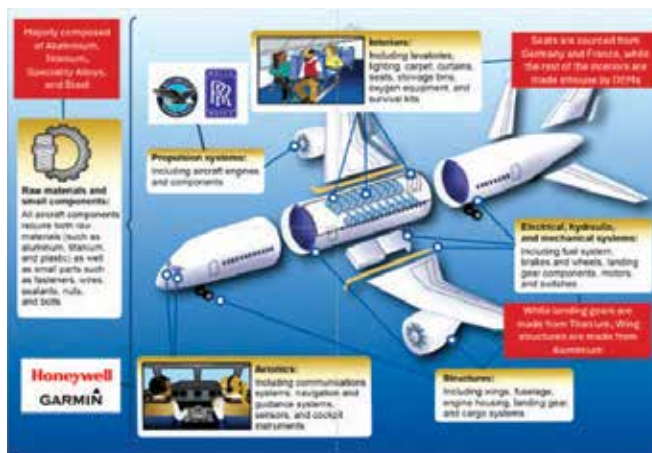
Figure 1: Multi-Tiered Aviation Industry Supply Chain (Avalon Consulting Research)



Considering the parts are sourced globally by T1 Suppliers (refer to above figure), they have been subject to delays from Tier 2 and 3 suppliers, and other key supply chain members face the following challenges,

- 1. Shortage of Skilled Workforce:** Post-pandemic, the industry faces a skilled labour shortage. Resuming operations has spiked labour demand and costs, intensified worker competition, and the need for hazardous condition work further complicates resource attraction. The industry also faces competition from other specialized industries for skilled workforce.

Figure 2: Breakdown of components of an Aircraft (Source: Avalon Consulting and Research)



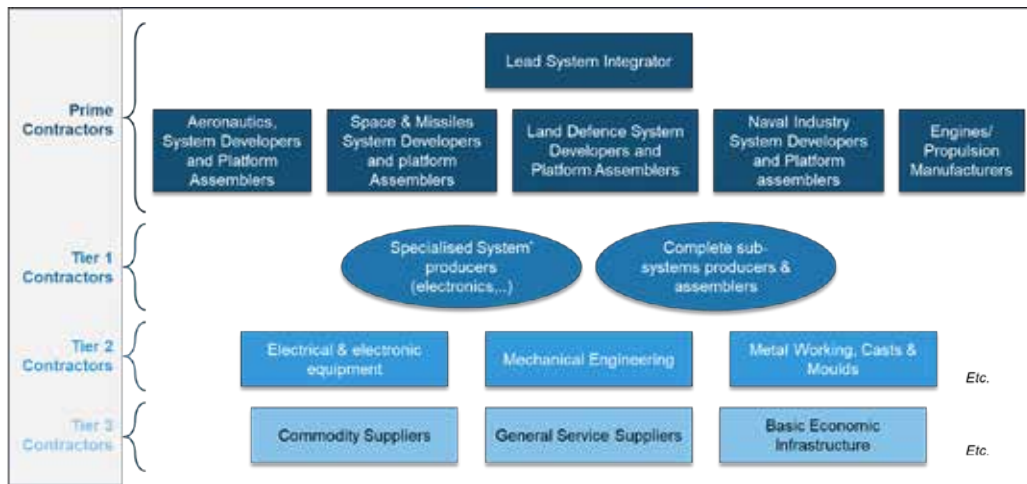
- 2. Long Delays in lead times:** Global supplier networks sustain aviation; however, geopolitical strife, particularly the Russia-Ukraine conflict, has hindered titanium and aluminium supplies, leading to critical part shortages and significant assembly line disruptions.
- 3. Semi-conductor shortages:** Semiconductor shortages, driven by consumer demand, pandemic impacts, and political issues, persistently disrupt Aviation and Defence industries.

- 4. **Rising cost of raw materials continue to affect defence contracts and Aircraft orders:** Supply chain issues have escalated costs for key materials like aluminum and titanium, with a significant reliance on China and Russia’s prioritization of domestic needs over international markets, highlighting a stark imbalance in global supply.
- 5. **Components shortage for MRO (figure 1) of Existing Fleet of Aviation Companies:** Due to the disrupted supply chains, the management of fleets has become difficult, as many suppliers at tier 2 and 3 of the supply chain have been facing delays. Amid Sanctions, the MRO supplies are blocked for Russia, making it even more difficult for Russian Carriers to operate.

Escalating global instability has propelled commodity prices to record highs, leading to significant cost fluctuations for manufacturers. Post-pandemic skills shortages and a global titanium scarcity, predominantly sourced from Russia, further burden aerospace and defence supply chains. Safety concerns surrounding Boeing aircraft exacerbate uncertainties, contributing to demand fluctuations and price hikes.

This extensive supply chain fragmentation is rooted in globalisation trends predating 2020, where manufacturers prioritised low-cost country sourcing. Now, amidst ongoing disruptions, companies are pivoting towards localised or regionalized production to enhance resilience against supply chain vulnerabilities.

Figure 3: Supply Chain of Defence Industry (Source: BIPE)



### Seizing opportunities in Aerospace and Defence Supply Chains

Amidst geopolitical uncertainty and cost volatility, aerospace and defence manufacturers face both risks and growth prospects. To capitalise on rapid defence sector expansion:

- 1. **Embrace Innovation and Collaboration:** Original Equipment Manufacturers (OEMs) and sub-tier supply chains should foster innovation and remain open to fresh ideas. Industry collaboration, especially in supply chain inventory management and new product design, is crucial.
- Leverage digital technologies like AI systems and digital twins for faster innovation and seamless integration.
- **Effective Product Lifecycle Management (PLM):** PLM streamlines innovation from design to production, distribution, and end-of-life planning. Agile design methods, akin to software industry

practices, allow for in-life upgrades and mitigate technology obsolescence risks.

- **Position as Innovation Leaders:** OEMs serving the global defence industry can establish collaborations and develop innovative products. These innovations may also benefit civil aircraft designers, creating a unique opportunity.
- **Boost Resilience and Efficiency:** Strengthen supply chain resilience and operational efficiency. Leverage AI, automation, and digital tools to gain a competitive edge.
- **Strategic Investment Decisions:** When evaluating tech transfer opportunities, challenge customer demands and prioritise long-term benefits. Facilitate end-to-end supply chain integration and positive industry collaborations for commercial success.

In this dynamic landscape, forward-thinking decisions can yield substantial rewards for aerospace and defence manufacturers. □