



Centralised Command, Distributed Control and Decentralised Execution



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Introduction

Air power, using military aircraft, unmanned aerial systems (UAS), and missiles to achieve strategic and tactical goals, is a complex and dynamic field requiring effective coordination and control. In air power, there are three main concepts related to the control and execution of operations: centralised command, distributed control, and decentralised execution (CCDCDE). Each of these concepts has advantages and disadvantages depending on the situation and objectives of the operation.

Although these notions have far-reaching implications for the successful execution of operations, few practitioners disregard them as mere terminology. Hence, field commanders in the Tactical Battle Area (TBA) responsible for a defined and much smaller geographical area may need to be made aware of the larger context of the ongoing operation. Thus, they most often advocate total control of assets under their command. Therefore, it is essential to repeatedly revisit these concepts to keep them current. Furthermore, in today's connected battlespace, a robust Network-Centric Capability (NtCC) is essential as the overarching element to exercising the concept of CCDCDE. In fact, the Indian Air Force (IAF) has also underlined these concepts again in its newly released doctrine, 'IAP 2000-22.'¹

1 | <https://capsindia.org/>

The Need for Robust Network Centric Capability

The concept of network-centric warfare has gained widespread acceptance in military warfighting, especially in the air power domain, due to its potential to provide a decisive advantage in modern warfare. Air operations require seamless communication and coordination across multiple platforms and locations in today's complex operational environment. This capability enables field commanders to take autonomous action within the framework of the overall mission objectives while still adhering to the commander's intent. A robust NtCC allows for decentralised execution by providing aircrew and ground combat crew with the information and resources they need to make real-time informed decisions. It also enables the combatant to communicate with other service elements and receive guidance and support from higher headquarters as required.

Centralised Command

It refers to a command and control (C2) system where a single authority makes all decisions. This type of control is often used in large-scale operations or campaigns where a high level of coordination is necessary to achieve the objectives. The centralised command system is usually characterised by a strict chain of command, with decisions being made at the highest levels and then passed down to lower levels for effective execution. The advantage of centralised command is that it allows for a clear and coherent strategy to be developed and implemented across the entire operation. It also enables the efficient allocation of resources, mission planning, and the deployment of aircraft, as decisions are made based on a comprehensive view of the situation. It also enables clear communication and coordination, improving decision-making and reducing the risk of confusion or miscommunication. However, centralised control can also be slow to respond to rapidly changing situations. It can lead to a lack of flexibility in the execution of operations, leading to missed opportunities or failed missions if not planned and visualised correctly.

A robust NtCC can facilitate centralised command with real-time situational awareness for rapid decision-making and ensure all forces align with the commander's intent. For example, in an air campaign, the commander at the operational command headquarter, who fights and orchestrates the battle, can use a networked environment to adapt rapidly to changing circumstances and ensure that all assets are employed effectively. The operational commander can orchestrate the battlespace by delegating control to various war fighters through Integrated Command and Control System (IACCS) nodes, central assets that retain total command.

Distributed Control

It refers to a C2 system where decision-making authority is spread across multiple individuals, units, or C2 centres. This type of control is often used in a command-sized area of responsibility (AoR) where a high degree of flexibility and adaptability is envisaged. In a distributed control system, decisions can be made at multiple levels, with each unit having some degree of autonomy. However, it can also lead to a lack of coherence in the overall strategy. Each command-sized AoR may have its own objectives and priorities, requiring a high level of trust and coordination with adjacent AoR. Without clear communication and coordination, distributed control can quickly become chaotic and ineffective. Such situations are more foreseeable in joint operations with other services, as they would require a deeper understanding of the challenging battlespace with integrated planning and execution.

A robust NtCC can facilitate distributed control by providing subordinates with real-time situational awareness and the ability to communicate and collaborate with other units. For example, IACCS node operators communicate with aircraft, missiles, unmanned aerial vehicles (UAV), and communication squadrons in an air campaign and coordinate their actions. This can enable the Node commander to take advantage of the expertise, initiative, and tactical innovations and delegate tasks to subordinate units for coordinated operations. Similarly, a common communication network such as NFS, which is in the offing, would prove to be a strong foundation of joint network centrality for effective distributed control.

Decentralised Execution

It refers to a system where individual squadrons or units have a high degree of autonomy in the execution of their missions. This type of control is often used in highly dynamic and rapidly changing environments at the field and tactical level, where units must respond quickly to changing circumstances. The advantage of decentralised execution is that it allows for highly agile decision-making, with units innovating their own tactics and execution as they can respond immediately to evolving circumstances. However, it can also lead to a lack of coordination between other units in the same area of responsibility, especially in the TBA, making it challenging to achieve a comprehensive objective.

The NtCC can facilitate decentralised execution by providing lower echelons with the information and resources they need to execute missions effectively. For example, in an air

campaign, a pilot can use a network-centric capability to receive real-time updates on enemy movements and communicate with other pilots in the same airspace. This can enable the pilot to make decisions and take action based on the most up-to-date information available without requiring direct oversight from higher headquarters. Similarly, a tactical commander in TBA can exercise control over its guided weapons, keeping himself updated with the battle progress through a joint operational procedure controlled by the IACCS.

Therefore, each of these concepts has advantages and disadvantages, and it is essential for commanders to carefully consider the trade-offs between them when planning and executing operations. This involves a central command that sets overall objectives and provides guidance but also allows for flexibility and autonomy at the unit level. This would allow for effective coordination and execution of air operations and the agility and flexibility needed to adapt to changing tactical situations to make the right decisions quickly and effectively. In addition, it enables commanders to adjust their operational plans and tactics as the need of the operation dictates.

Conclusion

In addition to the C2 structure, technological advancement plays a crucial role in this equation. Advanced technologies such as UAS, sensor networks, and data analytics can provide real-time situational awareness and decision support for effective decentralised execution. Towards this end, a robust network-centric capability is essential for the conduct of contemporary and futuristic air operations. Together, these concepts are critical to effectively managing air battlespace operations, enabling efficient use of resources and rapid decision-making. It is also essential for air battlespace because it provides a framework for effective coordination, flexibility, quick response, reduced risk, scalability, and efficiency. This is particularly important in air operations, where split-second decisions and effective communication can mean the difference between success and failure. By adopting this approach, air forces can achieve their objectives while minimising the risk to their personnel and equipment.

Note:

¹ Doctrine of the Indian Air Force, pp v, pp 44