RESEARCH SUMMARY

Air Force Operational Test and Training Infrastructure

Barriers to Full Implementation

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ISSUE

Senior leaders on the Joint Staff are becoming increasingly concerned that the readiness assessment system is unable to provide credible answers to whether U.S. air forces can meet the demands of high-end conflict and whether individuals and aircrews have developed the right skills to complete their missions in stressful, complex environments. The sense is that the emphasis has not been on possible future scenarios and that readiness metrics do not provide accurate signals of force deficiencies. This ultimately results in decision priorities that do not align with national strategy.

APPROACH

This report examines the Air Force's operational test and training infrastructure (OTTI), which is responsible for achieving aircrew readiness, and on the processes for assessing skill development and maintenance. The focus is on OTTI for the combat air forces. The authors describe the technical and other supporting components that constitute OTTI and assess the development frontier for each component. The objective is to offer diverse stakeholders a framework they can use to discern the implications of different training infrastructure investments for assessing skills and monitoring readiness from the individual through joint levels. The authors describe interdependencies across different components of OTTI and implications for coordinating and prioritizing investments in those components.

CONCLUSIONS

- The frontier of OTTI development generally falls short of providing a capability to assess skills beyond the individual level.
- Progress in certain areas of OTTI—competency models and data analysis—is limited by a lack of foundational knowledge and a lack of consensus; others are held back by organizational, policy, and technical challenges.
- Beyond fundamental research challenges, the lack of incentives to develop interoperable and standardized training systems and the parochial focus of training investments within the DAF and across DoD hinder progress along multiple dimensions of OTTI.

continued

- Progress along different dimensions of OTTI is highly interdependent; for example, the development of data storage and analytic capabilities for assessing readiness in highly complex environments depends on identification of competency models and associated performance criteria.
- More-authentic training at the individual level alone is unlikely to provide an accurate capability to assess collective and joint readiness; more research is required to identify competencies, metrics, and data analytic capabilities to assess performance and readiness at higher levels of aggregation.

BARRIERS TOWARD ADVANCING THE HORIZONS OF OPERATIONAL TEST AND TRAINING INFRASTRUCTURE TECHNOLOGIES

Category	Initial Skills	Individual Skills	Collective Skills	Joint Skills
Competency model	Perceptual and motor skills	Task behaviors	Team behaviors	Interteam behaviors
Infrastructure	Trainer	Simulator	Networked simulators	Distributed joint mission training
Simulation capabilities	Low environment complexity	High environment complexity	Red air models	Diverse Blue and Red system models
Data capture and storage	Few performance variables	Many performance variables	Scenario and Red air	Non–Air Force systems
Data analysis	Performance relative to standard	TTP selection	Team behavior (communication)	Interteam behaviors

NOTES: Green shading indicates that the limitations are related to technical, organization, or policy issues. Blue shading indicates that the limitations are more fundamental (lack of consensus, foundational knowledge). The black line indicates current horizon boundaries.

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