

“Sense and Respond” Capabilities Can Make the Air Force Combat Support System More Agile

Combat support (CS) forces face the considerable challenge of distributing materials related to transportation, maintenance, munitions, and other essential services required to support a fighting force in the field. Working with limited financial resources, the CS system must be able to predict requirements and to respond rapidly when requirements change. Traditionally, CS forces sent “mountains of supplies” to the war zone to compensate for long supply chains and an inability to accurately predict support needs. Today’s concept of rapid deployment and employment of combat forces calls for a different approach that replaces mass with speed.

Sense and respond combat support (S&RCS) is a promising approach, based on methods and technologies used in the commercial sector to closely monitor market patterns and to produce and distribute what is required rather than what planners think should be built based on internal production goals. RAND Project AIR FORCE (PAF) studied how this concept can be applied to the Air Force environment to make combat support more agile and efficient.

Combat Support Command and Control (CSC2) Upgrades Are Key

Sense and respond capability requires a robust system of information-gathering and analysis or, in military terms, a highly efficient command and control system. The Air Force has been developing an improved CSC2 system, which involves joint planning in which logistics process performance and resource levels are related to desired operational effects; tracking of control parameters to achieve desired operational objectives (the “sense” part of the system); signaling of logistics process owners when their processes lie outside control limits (the “respond” part of the system); and replanning to mitigate portions of the plan that are outside control limits. The Air Force can achieve S&RCS capabilities if it continues to upgrade the CSC2 architecture and its related information systems, organizations, and training.

New Technologies Are Needed to Create S&RCS Capabilities

Although current technology has enabled a limited set of sense and respond capabilities, a full implementation of S&RCS concepts depends on substantial future technological development. Two technologies are especially important to producing S&RCS capabilities:

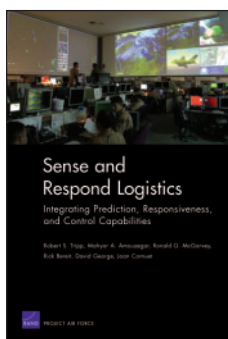
- Radio frequency identification (RFID) is an automatic identification technology that provides location and status information for items in the CS system. RFID technologies are fairly mature and have been fielded in both commercial and military arenas.
- Agent-based modeling (ABM) software allows a more robust simulation of combat support operations. These models have been used extensively in combat modeling but, until recently, there has been limited application to logistics and the technology is still in its early stages.

Next Steps for the Air Force

The Air Force has already begun to take steps to implement some of these concepts and technologies with varying degrees of success. Further steps include making doctrinal changes to recognize the importance of CSC2 as part of S&RCS capabilities and identifying improvements in training and information systems. In addition, the Air Force should identify one organization to lead the development of CSC2 and associated S&RCS capabilities. ■

RAND Research Areas

The Arts • Child Policy • Civil Justice • Education • Energy and Environment • Health and Health Care • International Affairs • National Security • Population and Aging • Public Safety • Science and Technology • Substance Abuse • Terrorism and Homeland Security • Transportation and Infrastructure • Workforce and Workplace



This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of individual published, peer-reviewed documents or of a body of published work. This research brief describes work done for RAND Project AIR FORCE and documented in *Sense and Respond Logistics: Integrating Prediction, Responsiveness, and Control Capabilities*, by Robert S. Tripp, Mahyar A. Amouzegar, Ronald G. McGarvey, Rick Bereit, David George, and Joan Cornuet, MG-488-AF (available at <http://www.rand.org/pubs/monographs/MG488/>), 2006, 130 pp., ISBN: 978-0-8330-3978-1. The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. **RAND**[®] is a registered trademark.

RAND Offices

Santa Monica, CA • Washington, DC • Pittsburgh, PA • Jackson, MS • Doha, QA • Cambridge, UK • Leiden, NL

www.rand.org



PROJECT AIR FORCE

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND
HOMELAND SECURITY
TRANSPORTATION AND
INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of individual published, peer-reviewed documents or of a body of published work.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Project AIR FORCE](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use.