

Project AIR FORCE

**ORGANIZATIONAL
POLICY LEVERS
CAN AFFECT
ACQUISITION REFORM
IMPLEMENTATION IN
AIR FORCE REPAIR
CONTRACTS**

Mary E. Chenoweth

Sarah Hunter

Brent Keltner

David Adamson

Prepared for the
UNITED STATES AIR FORCE

RAND

Approved for public release; distribution unlimited

The research reported here was sponsored by the United States Air Force under Contract F49642-01-C-0003. Further information may be obtained from the Strategic Planning Division, Directorate of Plans, Hq USAF.

Library of Congress Cataloging-in-Publication Data

Organizational policy levers can affect acquisition reform implementation in Air Force repair contracts / Mary E. Chenoweth ... [et al.].

p. cm.

“MR-1711.”

Includes bibliographical references and index.

ISBN 0-8330-3488-X (pbk. : alk. paper)

1. Defense contracts—United States. 2. United States. Air Force—Procurement.
3. Airplanes, Military—United States—Maintenance and repair. I. Chenoweth, Mary E.

UG1123.O73 2003

359.6'212—dc22

2003021659

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.

© Copyright 2004 RAND Corporation

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2004 by the RAND Corporation

1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

1200 South Hayes Street, Arlington, VA 22202-5050

201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516

RAND URL: <http://www.rand.org/>

To order RAND documents or to obtain additional information, contact

Distribution Services: Telephone: (310) 451-7002;

Fax: (310) 451-6915; Email: order@rand.org

In 1996, the Air Force adopted the Contract Repair Enhancement Program (CREP), today known as the Contract Repair Process (CRP), which consisted of a series of contracting reform measures intended to respond directly to customer demands at the same time as reducing inventory, process steps, lead time, and total system operating costs. Further, the Air Force aimed to accomplish these reform measures while maintaining or improving readiness. These new practices were modeled on earlier Air Force changes in acquisition practices that led to cost improvements and accelerated program schedules for acquiring major weapon systems. Concerned by what appeared to be the initially slow pace at which depot personnel were carrying out the CREP reforms, the Air Force asked RAND to assess what might be hindering their implementation.

PURPOSE AND APPROACH

In the Air Force, as in the private sector, senior leadership plays a vital role in instigating change in business practices. To do so, leaders generally use a range of tools, or *organizational levers*, designed to motivate personnel. Such levers might include setting new goals and objectives, communicating them throughout all levels of the organization, and changing performance evaluation and incentives in order to encourage their adoption. Particular to the set of reform measures that the Air Force planned to undertake was increased teaming among personnel. Similarly, success at the operating level, which is where most repair contracts are written, depends on how effectively senior leadership can move personnel toward continued use of new

practices after their initial introduction. The authors analyzed whether the Air Force's existing *organizational levers* resulted in the use of CREP's innovative reforms within depot-level repair contracts. We focused on Warner Robins Air Logistics Center (ALC) because it had aggressively pursued the incorporation of CREP tenets in its repair contracts. It appeared that Warner Robins represented the ALC most likely to have the largest sample size and most variation in the number of CREP tenets incorporated in repair contracts.

Our study used a three-step approach. Step one consisted of a *literature review* on organizational levers and innovation in the private sector, combined with *interviews* with personnel considered to have excelled at incorporating CREP tenets in the first CREP contracts. The literature review and interviews formed the basis for step two, a *survey* of key personnel participating on contract repair teams (CRTs), i.e., program managers, procurement contracting officers, production management specialists, and item management specialists. Step three involved regression analyses. The survey was used to measure organizational levers, which became the independent variables. Survey data were used in combination with reported CREP tenets—the dependent variables—in the regression analyses. CREP tenets were classified by tenet groups—simple modifications, key acquisition reform concepts, complete acquisition reform concepts, agile logistics, and all CREP tenets—which became the dependent variables. Regression analyses were carried out to determine the relationship between each organizational lever and the number of CREP tenets incorporated in the contract. Each step is discussed in more detail below.

Literature Review and Interviews

In step one, we reviewed the business and management science literature on the kinds of organizational levers senior leadership uses to motivate private-sector enterprises to adopt new business practices. The literature review helped to identify organizational levers to be measured in the personnel survey. In turn, the review helped structure our subsequent interviews with CREP contracting teams at Warner Robins ALC. Similarly, the interviews helped us understand how these levers operated within the ALC and the CREP initiative and influenced the development of the next phase, the survey. We

asked CRT personnel to talk about specific CREP contracts and asked them questions related to organizational levers within these examples of contract innovation. The interviews helped us to develop questions using language and context we believed were likely to resonate with potential survey participants, thus preparing us for step two.

Survey Development and Administration

In step two, based on inputs from the literature review and interviews conducted at Warner Robins ALC, we created a survey instrument designed to gather information on organizational levers. The survey asked questions in five categories that supplied data for eight organizational lever variables. Those categories were (1) attitude toward acquisition reform, (2) leadership support, (3) performance evaluation and rewards, (4) teaming and partnering, and (5) training and career development. We surveyed key members of contract repair teams. The survey was conducted first in 1998 and again in 1999 for only those participants who had missing data in the first round or failed to respond. Each participant provided only one set of responses.

Analyses

In step three, regression analyses showed that there was a relationship between organizational levers and reported CREP tenet use. Between December 1996 and September 1998, for each CREP contract, the ALCs considered the incorporation of 16 tenets identified by HQ Air Force Materiel Command (AFMC) as innovative and consistent with CREP goals. These reported tenets were used as the measure of contract innovation. The research process involved survey data, i.e., organizational levers that served as independent variables in the regression. The process also involved tenet data, which served as dependent variables in the regression analyses.

Step 3A. Prior to the regression analyses, *Principal Components Analysis (PCA)* was used to organize responses to organizational levers (*the independent variables*). PCA allows the analyst to examine relationships among item responses to determine whether particular questions reflect the same underlying concept. The survey con-

tained questions on organizational lever themes; thus, PCA provided a technique to group questions along these themes. The PCA technique helped identify eight organizational levers that were called:

- Attitude toward acquisition reform
- Leadership consistency
- Performance evaluation
- Performance incentives
- Effective teaming
- Contractor partnering
- Air Force partnering
- Training in acquisition reform.

Two other variables, job experience and a U-2 dummy variable for the U-2 Product Directorate, since renamed the Intelligence, Surveillance, and Reconnaissance Management Directorate, were computed directly and did not require PCA.

Step 3B. CREP Tenet Groups (the dependent variables). The study used CREP tenets as an element of the dependent variables, which were defined by AFMC as its measure of contract innovation and collected throughout the initiative. We received a record of the tenets Warner Robins ALC incorporated in their CREP contracts from HQ AFMC. Individual CREP tenets were not used as dependent variables, because they lacked policy significance by themselves. The question became one of how to group CREP tenets in ways that would have strategic policy relevance to decisionmakers, i.e., to high-level policy goals and objectives. We analyzed the tenet data using cluster analysis to discern the natural groups of tenets, but the cluster analysis showed tenet clusters that had no policy relevance. In the end, we chose to use as dependent variables groups of CREP tenets that were broadly defined by the CREP initiative itself and had strategic policy relevance, plus a fifth group that included all CREP tenets. Some tenets were included in more than one group.

The first innovation group, called *simple modifications*, included the easiest tenets to implement with still-active contracts, usually related to speeding up transportation. The second group, called *key acqui-*

sition reform concepts, consisted of reform tenets that were consistent with acquisition reform goals and could be measured more objectively. The third group, called *complete acquisition reform concepts*, measured all reform tenets included in the second group, plus other acquisition reform-related tenets that involved subjective measures. The fourth group, called *agile logistics*, included all tenets designed to reduce logistics pipelines by speeding up the repair and transportation pipeline segments, as well as improving other logistics efficiencies. The fifth group, called *all tenets*, included the complete set of CREP tenets. These five groups of tenets became the dependent variables.

Step 3C. Regression Analyses. We conducted five separate regression analyses to determine the relationship between the organizational levers used at Warner Robins and the incorporation of CREP tenets in repair contracts, designed to improve total weapon system costs and readiness. The regression analyses showed that some organizational levers help explain the incorporation of CREP tenets in repair contracts. Thus, this study demonstrated that senior leadership can influence contract innovation through organizational levers, although not always in expected ways. (See pp. 37–43.)

RESULTS: ORGANIZATIONAL LEVERS RELATED TO CONTRACT INNOVATION

Our analyses showed that organizational levers help explain the degree of tenet use that teams achieve with repair and sustainment contracts. The tenets ranged from easy-to-implement transportation improvements to more difficult acquisition reform measures, such as early contractor involvement in the contracting process. In some areas, the levers were positively related to the use of CREP tenets; in others, the levers were negative; and in a few, they had no influence at all. The findings were as follows:

- **Training in acquisition reform** had a consistent and positive statistical relationship with tenet use. The statistical analyses showed significance in all four groups of CREP tenets along with the group of all CREP tenets. CRT personnel who receive more training used more tenets in their contracts compared with personnel with less training. (See p. 38.)

- **Attitude toward acquisition reform** also had a consistent, positive statistical relationship on reported tenet use in all tenet groups, except as it related to key acquisition reform. These results suggest that contract teams that view reform more positively or agree with the goals of the initiative also implement more reform tenets in their contracts. (See p. 40.)
- **Effective teaming** had a negative statistical relationship with reported tenet use. Contract teams that reported effective teaming also implemented fewer tenets. (See p. 38.)
- **Contractor partnering** had a positive statistical relationship with simple modifications and agile logistics innovation goals. CRTs that perceived contractors to be better partners included more CREP tenets in their contracts. This result, however, did not occur with either of the two acquisition reform tenet models. (See p. 40.)
- **Leadership consistency** had a positive statistical relationship with tenet implementation. CRTs that perceived consistent messages throughout management and believed reform would be around for some time incorporated more agile logistics tenets in their contracts. (See pp. 40–41.)
- **Performance evaluation** had a surprisingly negative statistical relationship on CRT behavior with respect to agile logistics tenets and no significant relationship elsewhere. (See p. 41.)
- **Job experience** had a slight negative statistical relationship with the simple modifications and the complete acquisition reform innovation groups, but the magnitude was so minimal as to have little practical consequence.

Two variables—**performance incentives** and **Air Force partnering**—had no explanatory power in our analyses. Perhaps the types of incentives we included in the survey were not sufficiently representative of rewards offered or perhaps personnel do not perceive these rewards as effective. The lack of a relationship between Air Force partnering and the incorporation of CREP tenets, however, raises questions about the Air Force’s view of itself as a customer and its effect on innovation.

Finally, we also tested a dummy variable that took into account different contracting processes and contracts that occurred in the **U-2 Product Directorate** (now the Intelligence, Surveillance, and Reconnaissance, or ISR Management Directorate). Specifically, the U-2 Product Directorate produced sustainment contracts that included repair services rather than solely repair contracts. Our analysis found that the fact that a contract was written at the U-2 Product Directorate was positively associated with the reported incorporation of complete acquisition reform concepts and agile logistics tenets in CREP contracts. At the time of this study, the U-2 Product Directorate reported a high rate of tenet use, which has been substantiated with follow up discussions at Warner Robins ALC.

LESSONS FOR THE AIR FORCE

In general, the results suggest that the Air Force should continue to make effective use of those levers associated with positive results (especially training and fostering positive attitudes toward acquisition reform), while revisiting others associated with negative results (especially performance evaluation and teaming). Specifically, the Air Force could do more to:

- Let personnel know that senior leadership wants to see progress in achieving well-specified contracting goals
- Learn how to create effective teams. This process will require training in group problem-solving and working with others from different functional backgrounds, in addition to educating teams on legal and policy changes
- Align personal evaluation criteria with reform goals.

EXTENDING THESE RESULTS TO OTHER ALCS AND INITIATIVES

To the degree that the CREP initiative is representative of contract reform efforts in general, the Air Force should consider reinforcing the organizational levers that influence innovation and looking more closely at those that seem to have no relationship or have a negative relationship with innovation. (See pp. 42–43.)

Are the lessons from this study applicable to new contract-related initiatives or to other Air Logistics Centers? We hypothesize that it is reasonable to think the dynamics between organizational levers and contract innovation at Warner Robins ALC are similar to the dynamics of these variables at both Oklahoma City and Ogden ALCs. However, it is also possible that, because this study analyzed contracts at a center viewed by HQ AFMC as particularly innovative, these results would not apply to the other two centers. Also, senior leadership at the other ALCs may have had a different impact on personnel behavior at their particular center. One would have to conduct a similar analysis at the other ALCs to know whether Warner Robins represents a unique case.

Could the same relationship between levers and innovation that we find under the CREP initiative occur with other contract initiatives? After all, the Air Force has taken on many other contracting-related initiatives since CREP. Many of those attempt more significant change in behaviors and even organizational structure, such as the purchasing and supply chain management (PSCM) initiative.¹ If senior leadership does not address those levers identified as having no relationship or having a negative relationship with innovation, then leadership may have to work as diligently—or more, depending on the initiative—to implement other innovative practices, much as it did for CREP. (See pp. 43–44.)

As senior leadership considers the behavioral implications of contracting initiatives such as CREP in the future, this study should provide suggestions as to what leadership needs to strengthen or understand better if it wants personnel to implement contract innova-

¹The PSCM initiative, demonstrated on the F100 engine at Oklahoma City ALC in FY2002, has as its objective a strategic means of selecting and managing suppliers to provide more effective and efficient support to the warfighter. While consistent with CREP outcome goals, PSCM tries to do much more than CREP. PSCM would work with purchasing and supply chain activities from an enterprise- to operating-level perspective. It is strategic in scope and implies new processes, practices, and organizational structure. Behavioral implications for PSCM are more significant than CREP. See *Talking Paper on Adopting Improved Purchasing and Supply Chain Management*, Headquarters U.S. Air Force, Installations and Logistics, Supply Chain Integration and Logistics Transformation (HAF/IL-1), November 25, 2002. Also, see Nancy Y. Moore et al., *Implementing Purchasing and Supply Management Practices: Lessons from Innovative Commercial Firms*, RAND, DB-334-AF, 2002. Available at <http://www.rand.org/publications/DB/DB334/>.

tion. This study also provides an analytical approach to updating the relationship between organizational levers and new forms of contract innovation. Since this study began, the Air Force has added contract-related initiatives that are more complicated than CREP in their approach and expected outcomes—for example, PSCM, corporate contracting, and performance-based contracting. This study thus offers a methodology that can analyze the relationship between individual organizational levers and contract innovation. Organizational levers and their relationship with behavior and innovation continue to be of great interest to the Air Force, especially as it transforms to the changing threat environment and takes on ever more aggressive contract innovation and PSCM implementation efforts.