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Contingency Contractor Optimization Phase 3 Sustainment, Requirements Document Contingency Contractor Optimization Tool - Prototype

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Abstract

This requirements document serves as an addendum to the Contingency Contractor Optimization Phase 2, Requirements Document [1] and Phase 3 Requirements Document [2]. The Phase 2 Requirements document focused on the high-level requirements for the tool. The Phase 3 Requirements document provided more detailed requirements to which the engineering prototype was built in Phase 3. This document will provide detailed requirements for features and enhancements being added to the production pilot in the Phase 3 Sustainment.

Contents

1. SCOPE AND PROCESS

This document serves as an addendum to the Contingency Contractor Optimization Phase 2, Requirements Document [1] and Phase 3 Requirements Document [2]. The Phase 2 Requirements document focused on the high-level requirements for the tool. The Phase 3 Requirements document provided more detailed requirements to which the engineering prototype was built in Phase 3. This document will provide detailed requirements for features and enhancements being added to the production pilot in the Phase 3 Sustainment.

The focus of this document is on feature enhancment requirements and required inputs/outputs. Software and platform requirements are addressed in a separate document, entitled Contingency Contractor Optimization Phase 3 Platform Requirements Document [3].

This addendum to the Phase 2 Requirements Document and Phase 3 Requirements Document is based on feedback from subject matter experts, decision makers, users of the production pilot and potential end users.

2. PHASE 3 SUSTAINMENT MODIFICATIONS TO MODEL REQUIREMENTS

As outlined in the Phase 2 Tool Requirements Document, the Contingency Contractor Optimization Tool Prototype (CCOT-P) is intended to optimize the match of personnel types (military, DoD civilian, and contractors) and capabilities to meet the mission requirements as effectively as possible, based on risk, cost, and other requirements. The tool must be designed to recommend an optimal workforce mix (dependent on the input settings entered by the analyst) and to provide estimates on the optimal number of contractors to employ for each capability type.

Appendix B of the Phase 2 Tool Requirements Document summarizes the Department of Defense (DoD) requirements (DoD Directives, DoD Instructions, and other documents) and the associated tool requirements traced to those DoD requirements. The overarching requirements shown in Appendix B have not changed in Phase 3. The tool still needs to be able to address strategic-level (long term) planning questions, minimize cost, consider all available personnel groups, observe applicable treaties, observe existing manpower mix criteria, and plan across multiple scenarios. The results provided by the tool must include the number and type of contractors, as was stated in the Phase 2 document.

The Phase 3 Sustainment requirements enhance existing features in CCOT-P: modifying the user authentication method, updating Annex W output, addition of a feedback form, displaying manpower requirements by phase and removal of the overuse penalty from the Administrator screens.

2.1 Modifications to User Authentication Method

The CCOT-P currently resides on the production pilot servers managed by OUSD (AT&L) eBusiness Center. It uses the Single Sign On (SSO) service provided by the server for user authentication. The eBusiness Center is in the process of updating its authentication service to EDS/SAML authentication. This requires a change to how CCOT-P handles user authentication. Since the goal is eventually migrate CCOT-P to a different network, CCOT-P can use an authentication method other than EDS/SAML.

With agreement from the eBusiness Center, CCOT-P will be updated to use Tomcat authentication to manage user authentication. The eBusiness Center will be required to manage user access by modifying the tomcat-users.xml file as needed.

2.2 New Requirements for Annex W Output

As mentioned in the Phase 2 Tool Requirements Document, Annex W requires estimates of the numbers and types of contractors to be used to support that operation. These estimates can be difficult to create, depending on the level of the operation plan and on the business rules affecting allowable use of contractors. In Phase 3, the ability to download Annex W results was added to CCOT-P.

Annex W data requirements have since been updated, and CCOT-P's Annex W output must be updated to meet the new requirements. Two changes must be made to the Annex W output.

1. A CAAF totals (U.S. Contractors + Third-Country National Contractors) column for each phase will be added to all tables.
2. New tables will be added to display contractor estimates for each location of a mission scenario. The current output only displays contractor estimates at the mission scenario level.

2.3 Addition of a Feedback Form

In order to gather CCOT-P feedback in a consistent manner, a feedback form will be added to CCOT-P. The feedback form will allow users to report bugs experienced in the tool and to request additional features or tool enhancements. The feedback form will be available via a link in the tool. The form can be filled out in the web browser and will then be emailed to the appropriate team members.

2.4 Display of Manpower Requirements by Phase

CCOT-P currently displays total manpower requirements for a mission scenario and for each of its bases. The prototype also ignores negative FTE values Feedback from subject matter experts state that since manpower requirements by phase are not displayed, it is difficult to understand the manpower population at any specific phase of the operation. The prototype should also allow for the use of negative FTE values to show when manpower is no longer needed at a base.

The prototype will be updated to allow for negative FTE values. A new table will be added to display manpower requirements by phase. The user can view these requirements for a mission scenario or one of its bases. The addition of this table will make for a rather long page with four tables. To address this issue, Manpower Substitutions & Requirements will be split into two pages. The Manpower Substitution tab will have one table which displays the manpower substitution rules. The Manpower Requirements tab will have three tables: Summary Overview, View Requirements by Phase, and Additional Support Needs.

2.5 Removal of Overuse Penalty

The Overuse Penalty variable is used to enforce large penalties when more resources are assigned to missions than are available. When determining the optimal manpower mix, the CCOT model will attempt to honor the size limits associated with each personnel group. In certain cases, more resources may be required from a personnel group than are available. In this event, the model will assign more personnel than are available in order to obtain a solution, though it will identify these overages to the user. These overages are given large penalties, via the Overuse Penalty variable, in order to ensure that they only occur when absolutely necessary.

The Administrator role is able to modify the Overuse Penalty through the Administrator screens in CCOT-P. The default value of this term should be sufficiently large to prevent unnecessary overages. However, should unexplainable overages occur, the value of this term can be increased until these overages are eliminated.

While the ability to modify the Overuse Penalty variable could be useful at some point in the future, it will be removed from the current Administrator screens. The variable will remain in the model, it will just not be modifiable through the CCOT-P user interface. Feedback from stakeholders and potential users indicated that while this was a potentially useful concept for the future, there is currently no need to be able to modify this model parameter since the default value is sufficient for the majority of use cases.

3. SUMMARY

The Phase 1 Functional Requirement Document and Roadmap Report [4], created by ICF International during Phase 1, took a broad view of the overall problem of contingency contractor planning and catalogued existing tools related to contractor and manpower planning. Phase 2 focused on developing an electronic storyboard prototype of a tool for use in the strategic planning framework of the SSA that could be used for communication with senior decision makers and other strategic contract support stakeholders, and the Phase 2 Tool Requirements Document described the requirements for that storyboard prototype. Phase 3 created an engineering prototype tool based on the Phase 2 Tool Requirements Document as well as feedback from the prototype developed during phase 2. Phase 3 Sustainment will add new features and enhancements based on feedback on the current production pilot.

This document describes the new features and enhancements that will be added to the current production pilot. Due to upcoming changes in the OUSD (AT&L) eBusiness Center's user authentication method, CCOT-P's user authentication must be changed. The Annex W output must be updated to meet new Annex W requirements. To standardize feedback, a bug report/feature request form is being built in to the production pilot. To improve awareness of the manpower population at any specific phase of the operation, a new table to display manpower requirements by phase will be added. Finally, the overuse penalty variable will be removed from the Administrator screens.

REFERENCES

1. K. A. Jones, K. L. Adair, A. Bandlow, J. L. Gearhart, D. A. Jones, N. Martin, N. E. Miner, A. S. Nanco and L. K. Nozick, "Contingency Contractor Optimization Phase 2, Requirements Document," Sandia National Laboratories, Albuquerque, 2012.
2. K. A. Jones, K. L. Adair, A. Bandlow, Tom R. Brounstein, Justin D. Durfee, Jared L. Gearhart, Nathaniel Martin, "Contingency Contractor Optimization Phase 3, Requirements Document - Contingency Contractor Optimization Tool – Prototype," Sandia National Laboratories, Albuquerque, October 2013.
3. J. D. Durfee, C. R. Frazier, A. Bandlow, J. L. Gearhart, K. A. Jones, "Contingency Contractor Optimization Phase 3 Sustainment, Platform Requirements – Contingency Contractor Optimization Tool – Prototype," Sandia National Laboratories, Albuquerque, May 2016.
4. ICF International, "Contingency Contractor Optimization Project, Functional Requirement Document and Roadmap Report," ICF International, 2011.

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