SAND2015-6027

SAND
Unlimited Release
Printed July 2015

# Contingency Contractor Optimization
## Phase 3, Quick Start Guide
## Contingency Contractor Optimization Tool
## Engineering Prototype – Release 2.3

Alisa Bandlow, Kristin L. Adair, Justin D. Durfee, Christopher R. Frazier,
Jared L. Gearhart, Linda K. Nozick

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.




U.S. DEPARTMENT OF
ENERGY

Sandia National Laboratories

Issued by Sandia National Laboratories, operated for the United States Department of Energy by Sandia Corporation.



Available to DOE and DOE contractors from
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

Telephone: (865) 576-8401
Facsimile: (865) 576-5728
E-Mail: reports@osti.gov
Online ordering: http://www.osti.gov/scitech

Available to the public from
U.S. Department of Commerce
National Technical Information Service
5301 Shawnee Rd
Alexandria, VA 22312

Telephone: (800) 553-6847
Facsimile: (703) 605-6900
E-Mail: orders@ntis.gov
Online order: http://www.ntis.gov/search

SAND
Unlimited Release
Printed July 2015

# Quick Start Guide
# Contingency Contractor Optimization Tool
# Engineering Prototype – Release 2.3

Alisa Bandlow, Kristin L. Adair, Justin D. Durfee, Christopher R. Frazier,
Jared L. Gearhart
Operations Research and Knowledge Systems
Sandia National Laboratories
P.O. Box 5800
Albuquerque, New Mexico 87185-MS1138

Linda K. Nozick
Cornell University

**Abstract**

This Quick Start Guide is an abbreviated version of the Contingency Contractor Optimization Phase 3, User Manual for the Contingency Contractor Optimization Tool engineering prototype. It focuses on providing quick access instructions to the core activities of the two main user roles: Planning Manager and Analyst.

Based on an electronic storyboard prototype developed in Phase 2, the Contingency Contractor Optimization Tool engineering prototype was refined in Phase 3 of the OSD ATL Contingency Contractor Optimization to support strategic planning for contingency contractors. The tool uses a model to optimize the total workforce mix by minimizing the combined total costs for the selected mission scenarios. The model will 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.

# CONTENTS



# FIGURES



# TABLES



# NOMENCLATURE

| | |
|---|---|
| ATL | Acquisitions, Technology and Logistics |
| CCOT-P | Contingency Contractor Optimization Tool Prototype |
| COCOM | Combatant Command |
| DOD | Department of Defense |
| DoDI | Department of Defense Instructions |
| DOE | Department of Energy |
| FTE | Full Time Equivalent |
| OCS | Operational Contract Support |
| OSD | Office of the Secretary of Defense |
| SSA | Support for Strategic Analysis |
| TPFDD | Time-Phased Force & Deployment Data |
| U.S. | United States |

# 1. INTRODUCTION

This Quick Start Guide focuses on providing an overview of the project, the tool, and the activities can be performed by the three user roles. Detailed instructions can be found in the Contingency Contractor Optimization Phase 3, User Manual for the Contingency Contractor Optimization Tool (CCOT-P) engineering prototype [1].

## 1.1. Project Overview

The Contingency Contractor Optimization project is intended to address former Secretary Gates' mandate in a January 2011 memo [2] and DoDI 3020.41 [3] by delivering a centralized strategic planning tool that allows senior decision makers to quickly and accurately assess the impacts, risks, and mitigation strategies associated with utilizing contract support.

The Contingency Contractor Optimization Tool prototype was developed in Phase 2 and refined in Phase 3 of the OSD ATL Contingency Contractor Optimization to support strategic planning for contingency contractors. The tool uses a model to optimize the total workforce mix by minimizing the combined total costs for the selected mission scenarios. The model will 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.

## 1.2. Tool Requirements

**Operating System:** Windows XP or Windows 7

**Internet Browser:** Firefox and Internet Explorer 10 or later

## 1.3. Logging In

These login instructions are for the CCOT-P engineering prototype available on the DoD network as a production pilot. You must have access to the DoD network in order to access the tool.

First, the administrator must grant you access to the tool. Please contact Anna L. Carter (anna.l.carter10.civ@mail.mil) for access. The administrator will provide you with a username and password for the tool.

1. Go to the CCOT-P website.
2. Enter your CCOT-P username and password.
3. Select a role (defined in section 2.2. User Roles).
4. Click "Continue".

## 1.4. Accessing Help

This Quick Start Guide and the longer user manual are accessible through the CCOT-P interface. The links for these help guides are available at the top of every page, above the CCOT-P banner image (Figure 1).

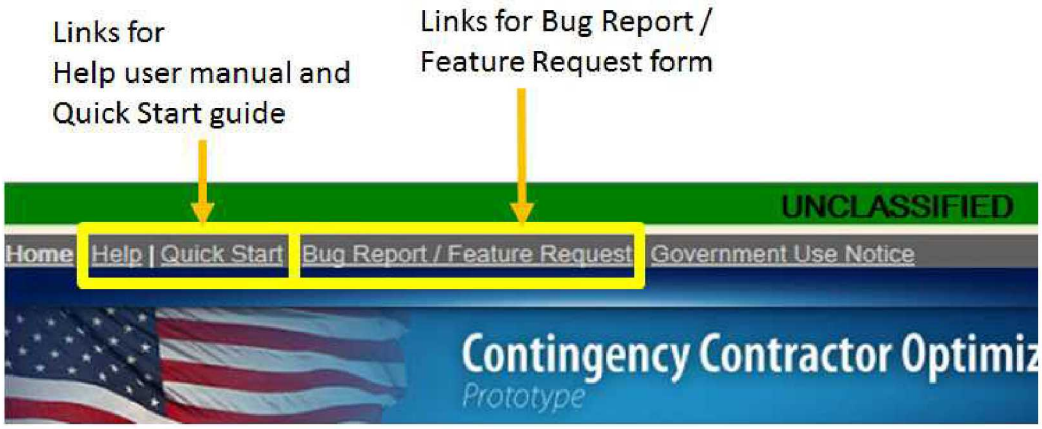


**Figure 1. Links for help and the bug report/feature request form.**

## 1.5. Reporting a Bug or Requesting a Feature

To report a bug or request a feature, click on the "Bug Report/ Feature Request" link available at the top of every page, above the CCOT-P banner image (Figure 1). A new browser window will open with a form to fill out. When the form is complete, click the "Send" button at the bottom of the form. The form will be translated into text that must be pasted into an email.

Please send the email to

abandlo@sandia.gov;crfrazi@sandia.gov;jdurfee@sandia.gov;
anna.l.carter10.civ@mail.mil

Please note that Sandia National Laboratories does not have access to the version of CCOT-P residing on the DoD network. If reporting a bug, please provide sufficient details so that we may attempt to recreate your issue. Attach any data, screen shots, or supporting documents to the email.

# 2. DEFINITIONS

## 2.1. Mission Scenarios and Planning Baselines

The Contingency Contractor Optimization Tool determines the optimal workforce mix (military, DoD civilians, contractors) that minimizes total cost for selected mission scenarios. Before analysis can begin, a planning baseline must be created, and mission scenarios must be added to this planning baseline.

**Mission Scenarios** - A mission scenario represents a single mission, ranging from disaster relief and humanitarian assistance to a major combat operation. The mission scenario in the tool is focused on the manpower requirements by phase needed to implement the mission. Using the manpower requirements, policies, and risk settings, the tool will calculate an optimized workforce mix to support the mission.

**Planning Baseline** - A planning baseline is a group of mission scenarios that analysts (defined below in section 2.2. User Roles) must consider in their planning.

## 2.2. User Roles

**Administrator** - The administrator sets high-level parameters that are constant across all analyses. These are high-level, static parameters that should not change with every new planning baseline. The administrator also helps to maintain the tool and to manage user access to the tool. See the User Manual [1] for administrator activities and instructions. Table 1 provides an overview of all activities and input values that can be modified by the administrator.

**Planning Manager** - The planning manager is in charge of creating new planning baselines and adding the relevant mission scenarios. The planning manager is expected to have enough knowledge about the mission scenarios to be able to set reasonable default values. Planners at the combatant command (COCOM) or service level, who are very familiar with the mission scenarios, are good candidates for planning manager. More than one person can be planning manager.

**Analyst** - The analyst is a planner who will be using the tool to perform "what-if" analyses. Through these analyses, the analyst will be able to provide estimates on the number of contractors needed, what capabilities they will need to have, and when they will be needed.

There are two types of planning that can be performed. First, the analyst can perform planning limited to scenarios within a COCOM or service. Second, the analyst can perform an integrated, centralized analysis using scenarios across all COCOMs and all services.

## 2.3. Permissions Overview

Table 1 provides a summary of which activities can be performed and which input values can be modified by each user role.

**Table 1. Overview of user role permissions.**

| Page | Activities & Input Values | Admin | Planning Manager | Analyst |
|---|---|---|---|---|
| | Modify **preset baseline values** | X | | |
| | Create/modify **planning baselines** (modify title, add/remove mission scenarios, modify notes/comments/guidance) | | X | |
| | Create/modify **mission scenarios** | | X | |
| | Start a **new analysis** | | | X |
| **Budgets & Costs** | Modify **budgets** | | X | X |
| | Modify **annual cost**: all personnel groups | X | | |
| | Modify **annual cost**: 3rd Country and Local Nation Contractors | X | X | X |
| **Manpower Substitutions** | Modify **manpower substitution rules**: all personnel groups | X | | |
| | Modify **manpower substitution rules**: 3rd Country and Local Nation Contractors | X | X | X |
| **Manpower Requirements** | **Modify manpower requirements (import TPFDD or TPFDD-like data during mission scenario creation)** | | X | |
| | Modify **additional support needs** | | X | X |
| **Manpower Availability & Phase Durations** | Modify **manpower availability** | | X | X |
| | Modify **phase durations** | | X | X |
| **Policies & Guidance** | Modify **policies** assigned to missions (*Analysts cannot remove policies added by the planning manager*) | | X | X |
| | Modify **manpower business rules** | X | | |
| **Risk in Using Non-Military Personnel** | Modify **risk in using non-military personnel** | | X | X |

# 3. PLANNING MANAGER ACTIVITIES

The planning manager is in charge of creating new planning baselines and adding the relevant mission scenarios. The planning manager is expected to have enough knowledge about the mission scenarios to be able to set reasonable default values. Planners at the COCOM or service level, who are very familiar with the mission scenarios, are good candidates for planning manager. More than one person can be planning manager.

Major activities include:

- Creating a new planning baseline
- Modifying/updating existing planning baselines
- Creating new mission scenarios
- Modifying/updating existing mission scenarios for a planning baseline

Table 1 provides an overview of all activities and input values that can be modified by the planning manager. This table can also be used as a guide for which tasks can be accomplished on which pages for planning baselines and mission scenarios.

The planning manager has three main pages.

- **Planning Baselines** - This page lists all of the existing planning baselines, their status (draft or public mode), included mission scenarios, and creation date. This is the main page for managing planning baselines. From here, the planning manager can create, view and modify baselines, and hide public baselines from analysts. Mission scenarios can be created from within a planning baseline.
- **Preset Baseline Values** - The preset baseline values are values that should remain constant across all planning baselines and mission scenarios. It is important to review these values before creating a new planning baseline. They can only be modified by the administrator. If any values need to be updated, contact the administrator BEFORE creating a new planning baseline.
- **Mission Scenarios** - This page lists all of the existing mission scenarios, their status (draft or public mode), and operation type. Mission Scenarios may be created from this page.

# 4. ANALYST ACTIVITIES

The analyst is a planner who will be using the tool to perform "what-if" analyses. Through these analyses, the analyst will be able to provide estimates on the number of contractors needed, what capabilities they will need to have, and when they will be needed.

There are two types of analyses that can be performed. First, the analyst can perform planning limited to scenarios within a COCOM or service. Second, the analyst can perform an integrated, centralized analysis using scenarios across all COCOMs and services.

Major activities include:

- Create a new analysis
- Branch a new analysis from an existing analysis
- View results of a solved analysis

Table 1 provides an overview of all activities and input values that can be modified by the analyst. This table can also be used as a guide for which tasks can be accomplished on which pages for the analysis input pages.

The **analyses manager** is the home page for the analyst. Here you can create new analyses and view results from old analyses. The analyses manager is designed like a file browser. Planning baselines are the top level directories, and analyses are organized beneath them.

Analyses have two status modes:

- *Initial* means that the analysis has not been run. It is a work in progress.
- *Solved* means that the analysis has been run. It has results. Its input values can no longer be modified.

There are two types of analyses that can be created.

- **Normal** – Deterministic analysis that includes no uncertainty. Most of your analyses will probably be normal.
- **Uncertainty of Phases 3-5 Durations** – The optimization model is also capable of assessing how uncertainty impacts contingency contractor decisions. This is important because most analysis uses predetermined profiles and start dates for each mission scenario. In reality, the exact requirements for executing mission scenarios are uncertain. In this version of CCOT-P, the user is able specify a range of possible durations for phases 3, 4 and 5 of each mission scenario.

Table 2 provides a summary of normal (deterministic) analysis results pages.

Table 3 provides a summary of uncertainty analysis results pages. Results for uncertainty analyses display the 25th, 50th, and 75th percentile values rather than a single value.

**Table 2. Summary of normal (deterministic) analysis results pages.**

| Normal Analysis Result Page | Description |
|---|---|
| **1) Manpower Mix** | Displays the optimized workforce mix aggregated over all time periods |
| **2) Budget Summary** | Displays the total cost (sum of all mission scenarios) by fiscal year. |
| **3) Assignments** | Displays the number of FTEs assigned for a single capability and single personnel group versus the availability over time. Overages (shortfalls) are only shown for Military – Active |
| **4) Assignments by Personnel Group** | Displays how a single capability has been assigned across the personnel groups over all time periods. |
| **5) Assignments by Capability** | Displays how a single personnel group has been assigned across the capabilities over all time periods. |
| **6) Assignments by Scenario** | Displays the number of FTEs from a single personnel group for a single capability assigned to each mission scenario over all time periods. |
| **7) Analyses Comparison** | Allows for the comparison of manpower mix and cost for two analyses. |

**Table 3. Summary of uncertainty analyses results pages.**

| Uncertainty Analysis Result Page | Description |
|---|---|
| **1) Total Assignments** | Displays the total number of FTEs assigned to all mission scenarios over all time periods. |
| **2) Assignments by Personnel Group** | Displays the total number of FTEs assigned to a single personnel group over all time periods. |
| **3) Assignments by Capability** | Displays the total number of FTEs assigned to a single capability over all time periods. |
| **4) Assignments by Personnel Group and Capability** | Displays the total number of FTEs assigned to a single personnel group and a single capability over all time periods. |
| **5) Budget Summary** | Displays the total cost (sum over all mission scenarios) by fiscal year. |
| **6) Overages** | Displays the likelihood of an overage (shortfall) and the expected size of the overage over time by capability. |

# REFERENCES

[1] A. Bandlow, K. L. Adair, T. R. Brounstein, J. D. Durfee, J. L. Gearhart, K. A. Jones, N. Martin and L. K. Nozick, "Contingency Contractor Optimization Phase 3, User Manual," Sandia National Laboratories, Albuquerque, 2013.

[2] *Secretary of Defense Memorandum, Strategic and operational planning for operation contract support (OCS) and Workforce Mix,* 2011.

[3] "Department of Defense Instruction (DODI) 3020.31, "Contractors Authorized to Accompany the U.S. Armed Forces"," 2011.


Sandia National Laboratories