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Contingency Contractor Optimization Phase 3 Sustainment, Cost by JCA Implementation Guide

Justin D. Durfee, Christopher R. Frazier, Bryan Arguello, Alisa Bandlow,
Jared L. Gearhart, Katherine A. Jones

Prepared by
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1. INTRODUCTION

This document provides implementation guidance for implementing personnel group FTE costs by JCA Tier 1 or 2 categories in the Contingency Contractor Optimization Tool – Engineering Prototype (CCOT-P). CCOT-P currently only allows FTE costs by personnel group to differ by mission. Changes will need to be made to the user interface inputs pages and the database. The FTE cost changes do not impact any of the results pages, which report costs at the personnel group level.

There are nine JCA Tier 1 categories:

1. Force Support
2. Battlespace Awareness
3. Force Application
4. Logistics
5. Command & Control
6. Net-Centric
7. Protection
8. Building Partnerships
9. Corporate Management & Support

There are thirty-five JCA Tier 2 categories:

1. Force Support
 - 1.1 Force Management
 - 1.2 Force Preparation
 - 1.3 Human Capital Management
 - 1.4 Health Readiness
2. Battlespace Awareness
 - 2.1 Planning & Direction
 - 2.2 Collection
 - 2.3 Processing/Exploitation
 - 2.4 Analysis Prediction & Production
 - 2.5 BA Data Dissemination & Relay
3. Force Application
 - 3.1 Maneuver
 - 3.2 Engagement
4. Logistics
 - 4.1 Deployment & Distribution
 - 4.2 Supply
 - 4.3 Maintain
 - 4.4 Logistics Services
 - 4.5 Operational Contract Support
 - 4.6 Engineering
 - 4.7 Base & Installation
5. Command & Control
 - 5.1 Organize
 - 5.2 Understand
 - 5.3 Planning
 - 5.4 Decide
 - 5.5 Direct
 - 5.6 Monitor
6. Net-Centric
 - 6.1 Information Transport
 - 6.2 Enterprise Services
 - 6.3 Net Management
 - 6.4 Information Assurance
7. Protection
 - 7.1 Prevent
 - 7.2 Mitigate
8. Building Partnerships
 - 8.1 Communicate
 - 8.2 Shape
9. Corporate Management & Support
 - 9.1 Advisory & Compliance
 - 9.2 Strategy & Assessment
 - 9.3 Information Management
 - 9.4 Acquisition & Technology
 - 9.5 Program Budget & Finance

The following documents provide detailed information about CCOT-P:

- *Installation Instructions*
- *Developer's Guide*: This document provides background and instructions for developing and building the (CCOT-P) application.
- *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*: This document provides technical guidance on implementing JCA Tier 2 categories in CCOT-P.
- *Platform Requirements*: This document describes the platform requirements, the architecture, and the implementation details of the CCOT-P.
- *Interface Control Document*: This document describes the interfaces among the elements of the CCOT-P.
- *Software Design Document*: This document describes the final software design of the CCOT-P. Its purpose is to provide the overall architecture of the software and the logic behind this architecture. Documentation for the individual classes is provided in the application Javadoc.
- *Third-Party Software List*: The CCOT-P requires several third-party software packages. These are documented for each of the CCOT-P elements: client, web server, database server, solver, web application and polling application.
- *Model Description and Formulation*: Description and formulas used in the optimization model.
- *Database Design Document*: The CCOT-P database is used to store input and output data for the linear program model. The database allows queries to retrieve this data and updating and inserting new input data.
- *Quick Start Guide*: This document focuses on providing quick access instructions to the core activities of the two main user roles: Planning Manager and Analyst.

2. DATABASE/CODE CHANGES

2.1. Database Changes

An overview of the database design and a data dictionary are available in *Contingency Contractor Optimization Phase 3 Sustainment – Database Design Document*.

All of the database changes outlined in *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide* need to be completed.

Modify tables **AD_AnnualCosts**, **AD_AnnualCostsDefaults**, **DS_AnnualCosts**, **DS_AnnualCostsDefaults**, **MR_AnnualCosts**

- Add integer column “SkillID” which will indicate which JCA category (skill) the row cost refers to.

Modify view **MRIV_AnnualCost**

- Remove join to DS_Skills and get skill id directly from MR_AnnualCosts table.

2.2. Source Code Changes

gov.sandia.orca.ocs.web.client.domain.dto.admin.IAnnualCostDefault.java
gov.sandia.orca.ocs.web.client.domain.dto.superuser.IAnnualCost.java
gov.sandia.orca.ocs.web.client.domain.dto.superuser.IAnnualCostDefault.java
gov.sandia.orca.ocs.web.client.domain.dto.superuser.ids.IAnnualCostID.java
gov.sandia.orca.ocs.web.client.domain.dto.superuser.ids.IAnnualCostDefaultID.java
gov.sandia.orca.ocs.web.client.domain.dto.user.IAnnualCost.java
gov.sandia.orca.ocs.web.client.domain.dto.user.ids.IAnnualCostID.java

3. OPTIMIZATION MODEL CHANGES

Costs are included in the model through the variable c_{spkt} , which represents the cost of using a resource from personnel group p with capability k for mission scenario s in time period t . Since an index k was already included in the original mathematical formulation of the optimization model, it already accommodates specification of cost by capability. However, the CCOT-P user interface currently only allows FTE costs by personnel group to differ by mission. This means that the optimization model itself will not change when adding the ability to specify cost by capability, but the user interface inputs pages and the database change.

If costs are specified only at the JCA Tier 1 level and the tool does not implement JCA Tier 2 categories, then assign the desired cost to c_{spkt} for each JCA Tier 1 capability, k .

If JCA Tier 2 categories have been implemented in the tool (see *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*):

1. If costs are specified only at the JCA Tier 1 level and the tool implements JCA Tier 2 categories, then set the cost, c_{spkt} , for each Tier 2 capability equal to the cost at its Tier 1 level
2. If costs are specified at the JCA Tier 2 level, then assign the desired cost to c_{spkt} for each JCA Tier 2 capability, k .

4. USER INTERFACE: INPUT PAGES CHANGES

Of the 50 tables in the user interface, 5 display FTE cost information. Currently, tables only allow for entry of FTE costs at the personnel group level. All 5 tables will need to be updated in the user interface to allow entry of FTE costs by JCA categories.

NOTE: *Updates in addition to those listed below may be necessary. Since development was last paused, several third-party libraries have undergone major revisions and older versions may be unsupported. For example, Google Web Toolkit is currently on version 2.8.0, and Sencha GXT is currently at version 4.0. CCOT was built using GWT 2.5.1 and GXT versions 2.2.3 and 3.0.7.*

Table 1. Overview of input tables that will require updates for FTE cost by JCA.

Role	Inputs Page	Table
Administrator	Preset Baseline Values	Annual Cost of Personnel Groups
Planning Manager	Preset Baseline Values	Annual Cost of Personnel Groups
	<i>Baseline:</i> Budget & Costs	Personnel Costs
	<i>New Scenario:</i> Personnel Costs	Personnel Costs
Analyst	Budget & Costs	Personnel Costs

4.1. Administrator

Only one table requires updates for the Administrator role.

4.1.1. Annual Cost of Personnel Groups

This table allows the administrator to set the annual FTE cost for all of the personnel groups. Only the Administrator may set the cost for Military – Active, Military – Reserve, DoD Civilians and U.S. Contractors. The Administrator sets the default FTE cost for 3rd-Country Contractors and Local Nation Contractors. The planning manager and analyst can later change the FTE costs for 3rd-Country Contractors and Local Nation Contractors for each mission scenario.

The Annual Cost for Personnel Groups table will require the following changes:

1. Update the existing table to allow the administrator to enter FTE costs for the JCA Tier 1 categories (Figure 1). The checkbox and JCA menu above the table are not necessary if JCA Tier 2 categories are not implemented.

If JCA Tier 2 categories have been implemented in the tool (see *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*):

2. Add a menu above the table that will only display Tier 1 categories (Figure 2).
3. This menu will filter the table to the selected Tier 1 category by displaying the corresponding Tier 2 categories (Figure 2).
4. Add a checkbox that will allow the administrator to apply FTE costs entered at the Tier 1 to corresponding Tier 2 categories (Figure 1). This allows the administrator to skip entering FTE costs for all Tier 2 categories.

CCOT-P

Annual Cost (in thousands) of Personnel Groups

Set the annual cost in thousands (\$10 = \$10K) for all personnel groups. The Planning Manager will be able to modify the cost for 3rd-Country and Local Nation Contractors.

To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories.

To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select JCA:

Apply JCA Tier 1 values to Tier 2 Force Support ▾

JCA	Military - Active	Military - Reserve	DOD Civilians	US Contractors	Local Nation Contractors	3rd-Country Contractors
Force Support	\$120	\$140	\$150	\$232	\$68	\$36
Battlespace Awareness	\$120	\$140	\$150	\$232	\$68	\$36
Force Application	\$120	\$140	\$150	\$232	\$68	\$36
Logistics	\$120	\$140	\$150	\$232	\$68	\$36
Command and Control	\$120	\$140	\$150	\$232	\$68	\$36
Net-Centric	\$120	\$140	\$150	\$232	\$68	\$36
Protection	\$120	\$140	\$150	\$232	\$68	\$36
Building Partnerships	\$120	\$140	\$150	\$232	\$68	\$36
Corporate Mgmt & Spt	\$120	\$140	\$150	\$232	\$68	\$36

Save Changes

Figure 1. Mockup of changes required for the Administrator Manpower Business Rules Annual Cost of Personnel Groups table.

CCOT-P

Annual Cost (in thousands) of Personnel Groups

Set the annual cost in thousands (\$10 = \$10K) for all personnel groups. The Planning Manager will be able to modify the cost for 3rd-Country and Local Nation Contractors.

To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories.

To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select JCA:

Apply JCA Tier 1 values to Tier 2 Force Support ▾

JCA	Military - Active	Military - Reserve	DOD Civilians	US Contractors	Local Nation Contractors	3rd-Country Contractors
1.1 Force Management	\$120	\$140	\$150	\$232	\$68	\$36
1.2 Force Preparation	\$120	\$140	\$150	\$232	\$68	\$36
1.3 Human Capital Mgmt	\$120	\$140	\$150	\$232	\$68	\$36
1.4 Health Readiness	\$120	\$140	\$150	\$232	\$68	\$36

Save Changes

Figure 2. Administrator Annual Cost of Personnel Groups table filtered to display Force Support.

4.1.1.1. Source Code Changes

gov.sandia.orca.ocs.web.client.view.admin.grids.AnnualCostGrid.java
gov.sandia.orca.ocs.web.client.view.admin.panels.BaselinePresetsPanel.java

4.2. Planning Manager

4.2.1. Preset Baseline Values: Annual Cost of Personnel Groups

This table allows the planning manager to view the annual FTE cost for all of the personnel groups. This is a view-only version of the table described in the Administrator section (see 4.1.1. Annual Cost of Personnel Groups).

The Annual Cost for Personnel Groups table will require the following changes:

1. Update the existing table to allow the planning manager to view FTE costs for the JCA Tier 1 categories (Figure 3). The JCA menu above the table is not necessary if JCA Tier 2 categories are not implemented.

If JCA Tier 2 categories have been implemented in the tool (see *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*).

2. Add a menu above the table that will only display Tier 1 categories (Figure 3).
3. This menu will filter the table to the selected Tier 1 category by displaying the corresponding Tier 2 categories (Figure 4).

CCOT-P

Annual Cost (in thousands) of Personnel Groups																																																																													
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Figure 3. Mockup of changes required for the Planning Manager (Preset Baseline Values) Personnel Costs table.

CCOT-P

Annual Cost (in thousands) of Personnel Groups																																										
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Figure 4. Planning Manager (Preset Baseline Values) Personnel Costs table mockup of table filtered to display Force Support.

4.2.1.1. Source Code Changes

gov.sandia.orca.ocs.web.client.view.superuser.grids.PresetAnnualCostGrid.java
gov.sandia.orca.ocs.web.client.view.superuser.panels.PresetPanel.java

4.2.2. Baseline: Personnel Costs

The Personnel Costs table on the Budget & Costs page displays the annual FTE costs for each personnel group by mission scenario. The planning manager can modify the default values for 3rd-Country Contractors and Local Nation Contractors. The other values can only be modified by the administrator.

The Personnel Costs table will require the following changes:

1. Update the existing table to display all of the JCA Tier 1 categories (Figure 5).
2. Add a menu above the table that will display all mission scenarios included in the baseline. The checkbox and JCA menu above the table are not necessary if JCA Tier 2 categories are not implemented.
3. This menu will filter the table to allow the planning manager to enter FTE costs for 3rd-Country Contractors and Local Nation Contractors for the selected mission scenario.

If JCA Tier 2 categories have been implemented in the tool (see *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*):

4. Add a menu above the table that will only display Tier 1 categories (Figure 5).
5. This menu will filter the table to the selected Tier 1 category by displaying the corresponding Tier 2 categories (Figure 6).
6. Add a checkbox that will allow the planning manager to apply FTE costs entered at the Tier 1 to corresponding Tier 2 categories (Figure 5). This allows the planning manager to skip entering FTE costs for all Tier 2 categories.

CCOT-P

Personnel Costs

(2) Set the annual FTE costs in thousands (\$10 = \$10K) for 3rd-Country and Local Nation Contractors. FTE costs are entered by mission scenario. To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories. To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select a mission scenario: Select JCA:

Apply JCA Tier 1 values to Tier 2

JCA	Military - Active	Military - Reserve	DOD Civilians	US Contractors	Local Nation Contractors	3rd-Country Contractors
Force Support	\$120	\$140	\$150	\$232	\$68	\$36
Battlespace Awareness	\$120	\$140	\$150	\$232	\$68	\$36
Force Application	\$120	\$140	\$150	\$232	\$68	\$36
Logistics	\$120	\$140	\$150	\$232	\$68	\$36
Command and Control	\$120	\$140	\$150	\$232	\$68	\$36
Net-Centric	\$120	\$140	\$150	\$232	\$68	\$36
Protection	\$120	\$140	\$150	\$232	\$68	\$36
Building Partnerships	\$120	\$140	\$150	\$232	\$68	\$36
Corporate Mgmt & Spt	\$120	\$140	\$150	\$232	\$68	\$36

Figure 5. Mockup of changes required for the Planning Manager (Baseline) Personnel Costs table.

CCOT-P

Personnel Costs

(2) Set the annual FTE costs in thousands (\$10 = \$10K) for 3rd-Country and Local Nation Contractors. FTE costs are entered by mission scenario. To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories. To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select a mission scenario: Select JCA:

Apply JCA Tier 1 values to Tier 2

JCA	Military - Active	Military - Reserve	DOD Civilians	US Contractors	Local Nation Contractors	3rd-Country Contractors
1.1 Force Management	\$120	\$140	\$150	\$232	\$68	\$50
1.2 Force Preparation	\$120	\$140	\$150	\$232	\$65	\$48
1.3 Human Capital Mgmt	\$120	\$140	\$150	\$232	\$55	\$50
1.4 Health Readiness	\$120	\$140	\$150	\$232	\$55	\$45

Figure 6. Planning Manager (Baseline) Personnel Costs table filtered to display Force Support.

4.2.2.1. Source Code Changes

gov.sandia.orca.ocs.web.client.view.superuser.grids.AnnualCostGrid.java
gov.sandia.orca.ocs.web.client.view.superuser.panels.BudgetCostPanel.java

4.2.3. New Scenario: Personnel Costs

The Personnel Costs table on the Budget & Costs page displays the annual FTE costs for each personnel group for the new mission scenario. The planning manager can modify the default values for 3rd-Country Contractors and Local Nation Contractors. The other values can only be modified by the administrator.

The Personnel Costs table will require the following changes:

1. Update the existing table to display all of the JCA Tier 1 categories (Figure 7).
2. The checkbox and JCA menu above the table are not necessary if JCA Tier 2 categories are not implemented.
3. This menu will filter the table to allow the planning manager to enter FTE costs for 3rd-Country Contractors and Local Nation Contractors for the selected mission scenario.

If JCA Tier 2 categories have been implemented in the tool (see *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*):

4. Add a menu above the table that will only display Tier 1 categories (Figure 8).
5. This menu will filter the table to the selected Tier 1 category by displaying the corresponding Tier 2 categories (Figure 8).
6. Add a checkbox that will allow the planning manager to apply FTE costs entered at the Tier 1 to corresponding Tier 2 categories (Figure 7). This allows the planning manager to skip entering FTE costs for all Tier 2 categories.

CCOT-P

Personnel Costs

(2) Set the annual FTE costs in thousands (\$10 = \$10K) for 3rd-Country and Local Nation Contractors. FTE costs are entered by mission scenario. To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories. To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select JCA:

Apply JCA Tier 1 values to Tier 2 Force Support ▼

JCA	Military - Active	Military - Reserve	DOD Civilians	U.S. Contractors	Local Nation Contractors	3rd-Country Contractors
Force Support	\$120	\$140	\$150	\$232	\$68	\$36
Battlespace Awareness	\$120	\$140	\$150	\$232	\$68	\$36
Force Application	\$120	\$140	\$150	\$232	\$68	\$36
Logistics	\$120	\$140	\$150	\$232	\$68	\$36
Command and Control	\$120	\$140	\$150	\$232	\$68	\$36
Net-Centric	\$120	\$140	\$150	\$232	\$68	\$36
Protection	\$120	\$140	\$150	\$232	\$68	\$36
Building Partnerships	\$120	\$140	\$150	\$232	\$68	\$36
Corporate Mgmt & Spt	\$120	\$140	\$150	\$232	\$68	\$36

Figure 7. Mockup of changes required for the Planning Manager (New Scenario) Personnel Costs table.

CCOT-P

Personnel Costs

(2) Set the annual FTE costs in thousands (\$10 = \$10K) for 3rd-Country and Local Nation Contractors. FTE costs are entered by mission scenario. To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories. To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select JCA:

Apply JCA Tier 1 values to Tier 2 Force Support ▼

JCA	Military - Active	Military - Reserve	DOD Civilians	U.S. Contractors	Local Nation Contractors	3rd-Country Contractors
1.1 Force Management	\$120	\$140	\$150	\$232	\$68	\$50
1.2 Force Preparation	\$120	\$140	\$150	\$232	\$65	\$48
1.3 Human Capital Mgmt	\$120	\$140	\$150	\$232	\$55	\$50
1.4 Health Readiness	\$120	\$140	\$150	\$232	\$55	\$45

Figure 8. Planning Manager (New Scenario) Personnel Costs table filtered to display Force Support.

4.2.3.1. Source Code Changes

gov.sandia.orca.ocs.web.client.view.superuser.grids.AnnualCostGrid.java
gov.sandia.orca.ocs.web.client.view.superuser.panels.ScenarioAnnualCostPanel.java

4.3. Analyst

4.3.1. Personnel Costs

The Personnel Costs table on the Budget & Costs page displays the annual FTE costs for each personnel group by mission scenario. The analyst can modify the default values for 3rd-Country Contractors and Local Nation Contractors. The other values can only be modified by the administrator.

The Personnel Costs table will require the following changes:

1. Update the existing table to display all of the JCA Tier 1 categories (Figure 9).
2. Add a menu above the table that will display all mission scenarios included in the analysis. The checkbox and JCA menu above the table are not necessary if JCA Tier 2 categories are not implemented.
3. This menu will filter the table to allow the analyst to enter FTE costs for 3rd-Country Contractors and Local Nation Contractors for the selected mission scenario.

If JCA Tier 2 categories have been implemented in the tool (see *Contingency Contractor Optimization Phase 3 Sustainment, JCA Tier 2 Implementation Guide*):

4. Add a menu above the table that will only display Tier 1 categories (Figure 10).
5. This menu will filter the table to the selected Tier 1 category by displaying the corresponding Tier 2 categories (Figure 10).
6. Add a checkbox that will allow the analyst to apply FTE costs entered at the Tier 1 to corresponding Tier 2 categories (Figure 9). This allows the analyst to skip entering FTE costs for all Tier 2 categories.

CCOT-P

Personnel Costs

(2) Set the annual FTE costs in thousands (\$10 = \$10K) for 3rd-Country and Local Nation Contractors. FTE costs are entered by mission scenario. To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories. To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select a mission scenario: Select JCA:

Apply JCA Tier 1 values to Tier 2

JCA	Military - Active	Military - Reserve	DOD Civilians	US Contractors	Local Nation Contractors	3rd-Country Contractors
Force Support	\$120	\$140	\$150	\$232	\$68	\$36
Battlespace Awareness	\$120	\$140	\$150	\$232	\$68	\$36
Force Application	\$120	\$140	\$150	\$232	\$68	\$36
Logistics	\$120	\$140	\$150	\$232	\$68	\$36
Command and Control	\$120	\$140	\$150	\$232	\$68	\$36
Net-Centric	\$120	\$140	\$150	\$232	\$68	\$36
Protection	\$120	\$140	\$150	\$232	\$68	\$36
Building Partnerships	\$120	\$140	\$150	\$232	\$68	\$36
Corporate Mgmt & Spt	\$120	\$140	\$150	\$232	\$68	\$36

Figure 9. Mockup of changes required for the Analyst Personnel Costs table.

CCOT-P

Personnel Costs

(2) Set the annual FTE costs in thousands (\$10 = \$10K) for 3rd-Country and Local Nation Contractors. FTE costs are entered by mission scenario. To enter FTE costs at the JCA Tier 1 level, check the checkbox below. These values will be propagated to the Tier 2 categories. To enter FTE costs at the JCA Tier 2 level, leave the checkbox empty.

Select a mission scenario: Select JCA:

Apply JCA Tier 1 values to Tier 2

JCA	Military - Active	Military - Reserve	DOD Civilians	US Contractors	Local Nation Contractors	3rd-Country Contractors
1.1 Force Management	\$120	\$140	\$150	\$232	\$68	\$50
1.2 Force Preparation	\$120	\$140	\$150	\$232	\$65	\$48
1.3 Human Capital Mgmt	\$120	\$140	\$150	\$232	\$55	\$50
1.4 Health Readiness	\$120	\$140	\$150	\$232	\$55	\$45

Figure 10. Analyst Personnel Costs table filtered to display Force Support.

4.3.1.1. Source Code Changes

gov.sandia.orca.ocs.web.client.view.user.grids.AnnualCostGrid.java
gov.sandia.orca.ocs.web.client.view.user.BudgetCostPanel.java

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