Appendix C

TO-BE CS EXECUTION PLANNING AND COMBAT DETAILED PROCESS FLOW MODEL

DIAGRAM AND DATABASE

Figure C.1 is a process diagram of the *TO-BE* CS execution planning and control operational architecture. Each primary activity is depicted in greater detail (tasks and information flows) in the supporting database. The activities are distinguished by operational phase and organizational node. The phases include readiness, crisis action planning, deployment, employment, and sustainment. The eight organizational nodes range from the President, Secretary of Defense (SECDEF), and associated high-level joint-service organizations to generic sources of supply (SOSs) for individual commodities. As described in Chapter Four and discussed further here, assigning tasks to nodes rather than to individual organizations allows for standardized roles and responsibilities across different theaters even if the organization occupying that node is theater dependent.

The diagram is drawn to emphasize processes and information flows. Each box represents an activity, with the arrows connecting the boxes representing products and other types of information inputs and outputs to that activity. Although the processes generally flow from left to right, the activities are not necessarily performed sequentially. For example, a node may show tasks in both the readiness and crisis action planning phases. The iterative nature of many processes is shown by feedback loops, representing progressively refined information inputs and outputs.

Note that in several places multiple activities are contained within a larger activity that may span more than one organizational node. This notation conveys the importance of cooperation between different nodes for certain activities. An example is the collaboration between the JFACC/AFFOR and OSC in the various planning stages. As discussed below, this is a major component of the *TO-BE* architecture.

An HTML version of the *TO-BE* process map can be found on the CD enclosed with this report. Individual activities and arrows on the diagram are linked to the database, allowing the user to explore the relationships among activities, tasks, phases, and nodes. Information inputs and outputs between activities can be viewed by dragging the mouse over the connecting arrows. Clicking on an activity on the diagram brings up a table of tasks associated with that activity, as well as a listing of the individual information flows into and out of it. Clicking on an organizational node heading brings up all of the activities, tasks, and information flows associated with that node throughout the different phases. Clicking on an operational phase heading will similarly bring up all of the activities, tasks, and information flows associated with that phase across the different nodes. Finally, the user may select to view only those data associated with a particular combination of phase and node.

The most important modifications to the CS execution planning and control architecture are in theater-level combat support (as conducted by the AFFOR and the OSC) and inventory management (the focus of the Inventory Control Points and Global Integration Center). Consequently, these organizational nodes are portrayed here in somewhat greater detail relative to other nodes in which few changes were made. For example, no modifications were proposed for the SECDEF/JCS/combatant command/JTF level, so this node is not included in the database. The SOS node is similarly excluded; any important decisionmaking regarding supply is made at the ICP and GIC nodes.

NEW ARCHITECTURAL COMPONENTS TO IMPLEMENT *TO-BE* CONCEPT

Chapter Three outlines several shortcomings in the *AS-IS* system identified by comparing analysis and documentation of the *AS-IS* system with the *TO-BE* concept derived from AEF goals. *AS-IS* system aspects that hinder effective implementation of the *TO-BE* concept were defined as shortcomings. Several of the changes proposed to help transform the CS system to conform with the *TO-BE* concept are reflected in Figure C.1 and the accompanying database. We next discuss these changes and how they address the shortcomings. Chapter Four describes the individual activities and organizations shown in Figure C.1.

Increased Integration of CS Input Into Operational Planning

Beginning in the readiness phase (which includes deliberate planning) and continuing through the crisis action planning phase, the theater or regional operational planning activities receive explicit input from the CS community (see activities A31, B31, and B32 in Figure C.1). In each case, the JFACC/AFFOR-level planning process is guided by both strategic input from SECDEF and the joint-services staff as well as resource and capability input from the CS community (i.e., the OSC).

This differs substantially from the *AS-IS* system, where operational plans are developed largely independently of CS input. Plans are subsequently sent to the CS community where support plans must be developed or the plan is rejected as infeasible from a CS perspective. As discussed in the main text, this serial approach can result in prolonged development of unsupportable plans that may require major restructuring when CS is factored in. An integrated planning process would contribute substantially to COA assessment, thereby focusing efforts on feasible COAs early in the planning process.

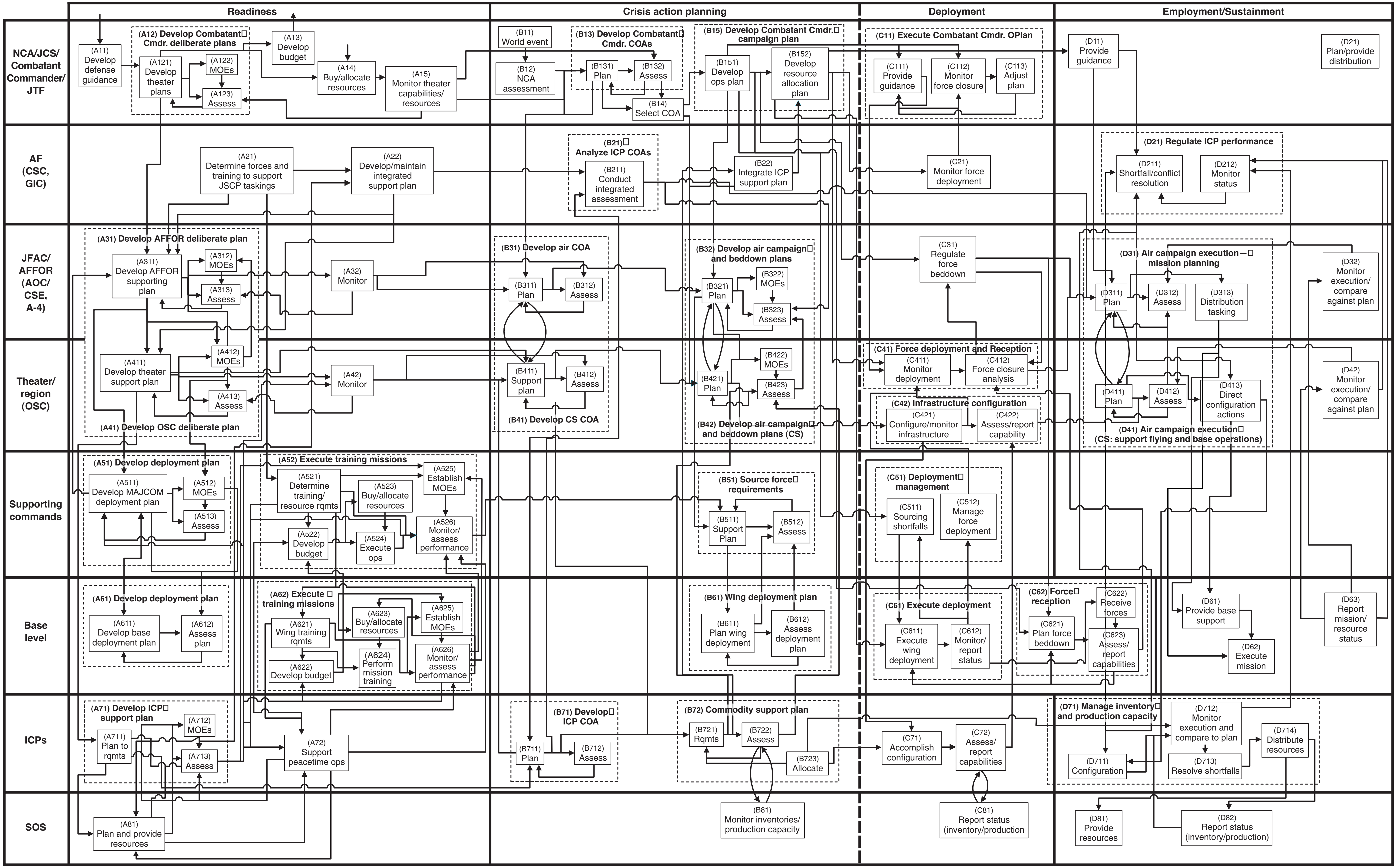

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Figure C.1—TO-BE CSC2 Process Map

Feedback Loops to Reconfigure the CS Infrastructure in Response to Changing Demands or Capabilities

Feedback loops influencing CS activities occur at several points in Figure C.1. The most important example is in the employment/sustainment phase, in the set of activities leading into and out of activity D21. This "loop" conveys regulation of CS activities relative to performance criteria and operational objectives. It includes monitoring of operational execution effectiveness (activity D42), CS performance at both an individual commodity (activity D712) and integrated level (activity D212), and operational and CS objectives (activities D3121 and D411), as well as directing and implementing reconfiguration actions (activities D413 and D711). When CS performance begins to differ from desired levels, either because of degradation of CS capability or changes in operational objectives, reconfiguration actions will be triggered.

This type of closed-loop regulating ensures that the CS infrastructure is monitored and adjusted to maximize operational effectiveness during execution. The Air Force has emphasized flexible tailoring for force deployment, but it has made less progress in the ability to react quickly to changes once deployed. The feedback loop allows the flexible tailoring concept to be extended from initial deployment to employment and sustainment.

Establishment of Standing CS Organizational Nodes

The *TO-BE* architecture designates three standing (permanent) organizational nodes dedicated primarily to combat support: the theater-level Operations Support Center (OSC), individual commodity Inventory Control Points (ICPs), and a Global Integration Center (GIC). The rationale for standing organizations is two-fold. The first is to provide operational continuity and seamless incorporation of peacetime CS activities during transition to a contingency. Having a single node, such as the OSC, responsible for CS activities across the spectrum of operations optimizes time and energy during the transition to higher-intensity operations. It eliminates the need to transfer command responsibilities, minimizes the confusion and delay accompanying augmentation of wartime organizations, eliminates the ambiguity in redirecting information flows into wartime organizations, and leverages the peacetime knowledge base regarding regional and temporal infrastructure, transportation, and host nation idiosyncrasies. A standing OSC alleviates these shortcomings by using the same staff, organization structure, and information and communication networks in peace and war.

The second motivation for standing organizations is to provide uniform roles and responsibilities for a given organizational node in different theaters. Even if the organization occupying that node is theater dependent, the node structure ensures that the organization's role is well defined and corresponds to the organization occupying the same node in other theaters. This allows for intertheater consistency in activities and objectives, relationships with other organizational nodes, performance standards and metrics, and personnel training curricula. Such global consistency is critical for assessing and comparing the state of the CS infrastructure and readiness levels, arbitrating the allocation of resources between theaters, developing plans that may involve multiple theaters or intertheater interactions, and training and assigning personnel to staff the organizations.

Establishment of Centralized Management of CS Resources and Capability

The *TO-BE* architecture includes a GIC to monitor and integrate information regarding CS resources. Support requirements generated at the JFACC/AFFOR and OSC levels feed ICP plans, which are then centrally overseen and managed by the GIC and fed back into the JFACC/AFFOR and OSC. The GIC is thus able to provide a comprehensive CS perspective to the JFACC/AFFOR and OSC to help guide plan development and regulate activities during execution. It should have the visibility and clout to suggest alternatives where appropriate. In addition, it should have authoritative power to dictate production and acquisition rules to ICPs.

One of the primary goals of the GIC is to ensure that individual commodity support activities are coordinated to address total plan supportability. An integrated supportability assessment can then provide the input and feedback to the various planning steps to be sure that weapon system, airbase, and personnel resource requirements are accounted for and can be supported.

In the readiness phase, the GIC must manage support for both deliberate planning and training. In the crisis action planning phase, the GIC must analyze total weapon system sortie generation capability based on the individual ICP plans, as well as determine supply chain capability to sustain these plans (activities B21 and B22). These and other inputs contribute to a CS feasibility assessment. The GIC may need to suggest or impose adjustments to the support or alternative mission approach strategies. These monitoring and regulatory activities continue into the employment/sustainment phase, where the GIC is responsible for monitoring CS system performance, working with the ICPs to identify causes for system performance degradation and with the ICPs, OSC, and JFACC/AFFOR to design and implement get-well plans. With a single node for managing resources and capability, planners will have a reliable source of information and will be better able to develop informed, feasible plans.

Improved Ability to Monitor and Arbitrate Resources Across Competing Theaters

Because the GIC is able to monitor and analyze CS resource requirements and capabilities from a global perspective, a key responsibility is to monitor and arbitrate resource demands across competing theaters. This responsibility extends from readiness through employment/sustainment.

In the readiness phase, the GIC must integrate individual commodity CS plans for supporting both deliberate planning and training (activity A22 in Figure C.1). It would monitor weapon system readiness, adjust individual commodity support strategies to balance global resource demands, and arbitrate resources among competing plans.

In the crisis action planning phase, commodity support developed by the ICPs to support air campaign plans being generated by the OSC and JFACC/AFFOR often require the diversion of resources from other theaters. One of the GIC's primary responsibilities in this phase is to monitor the impact of any resource diversion on individual commodity and total weapon system readiness in other theaters (activity B21). Further, when such impact is deemed unacceptable, the GIC is responsible for working with the competing combatant commanders and OSCs, together with the ICPs, to make adjustments or develop alternative plans (activity B22). Similar monitoring and arbitration must occur during the employment/sustainment phase. The ability to monitor resource levels across competing theaters and to make arbitration decisions based on the new information increases operational capability where it is needed most.

RECOMMENDED USES

The process diagram and supporting database in this appendix offer the critical components of an operational CS execution planning and control architecture. The visual presentation and underlying content make it a valuable reference as the Air Force CS community transitions from the current architecture to the *TO-BE* concept. We next suggest how this material could be used to facilitate the transition.

Enhancing Air Force Doctrine and Policy on CS Execution Planning and Control

One of the shortfalls in the current system involves Air Force CS doctrine and policy. Because the CS execution planning and control concept is not well defined in doctrine, assignment of responsibilities to organizations is not well defined in policy. Proposed solutions include rewriting Air Force Doctrine Documents 2, 2-4, and 2-8 to address basic objectives and functions for combat support. New Air Force Instructions (AFIs) and possibly Tactics, Techniques, and Procedures (TTPs) documents should include the assignment of responsibilities, processes, and information flows to C2 organizations. To that end, the Figure C.1 diagram and database assign responsibilities, processes, and information flows to existing and new organizational nodes within the *TO-BE* system and can be used as a source document for rewriting existing doctrine and policy documents or developing new ones.

Training Material

In our site visits and interviews, we learned that many warfighting staff members are not adequately trained in their management roles. Most are assigned to regional CS roles from the wing level and have little or no experience with resource management at a regional level. Little formal training is available, leaving both operations and CS personnel to learn most of their responsibilities through on-the-job training. Solutions to the training shortfall were addressed in Chapter Five. One solution is to develop a CSC2 curriculum that incorporates CS execution planning and control into formal courses such as the Joint Aerospace C2 course, Air Force Institute of

Technology's (AFIT's) Logistics 399 and 499 courses, and Chief's Logistics Review's Logistics Officer Weapons School. The structure and content of the diagram and database could be translated into training material for curriculum development. The products uniquely reflect C2 activity across each phase of operations and at each echelon, and thus could be adapted for courses from SECDEF/Joint level to base level. Its HTML format lends itself well to development of web-based applications and training aids for distance learning and OJT. It could be further translated into a graphically oriented interactive product.

Another training shortfall solution calls for enhancing wargames and exercises with a higher level of CS fidelity. Products described here could be used to develop training and evaluation criteria, script events, and exercise the C2 nodes (e.g., a Total Asset Visibility database could be developed and integrated with the Global Transportation Network database to train logisticians on the global distribution system). Operations and CS personnel would have a more realistic training environment into which CS considerations were fully integrated.

Operations Requirements Documentation

This report identifies where both the *AS-IS* and the *TO-BE* CS systems would benefit from the enhancement or development of information systems and decision support tools. Because CS resources have been managed and funded by commodity with different organizations having commodity management responsibility, corresponding information systems have been implemented independently. The result is a myriad of stovepipe systems with little ability to share data or interface with other systems. Tools are needed to relate operational plans to CS requirements, convert CS resource levels to operational capability assessments, aggregate assessments to a theater or global scale, and to conduct tradeoff analyses of operational, support, and strategy options. Comprehensive operations requirements documentation is critical to the development of these types of tools. Before systems engineers can build the infrastructure and tools needed for the *TO-BE* CS capability, users must identify their requirements—what processes the tool is to facilitate, what information is to be captured or shared, and where the information must flow. The products discussed in this report are well suited as source material for requirements documentation for system architecture, decision support tools, and information system development. For example, the products would be useful in developing and maintaining the Air Force input into the JCS CINC 57 Category One Requirements for the Global Combat Support System (GCSS). They could be used by the AEF and C2 battlelabs to filter potential battlelab CS initiatives and by the Air Force Experimentation Office to help select tools for evaluation in the Joint Expeditionary Force Experiment (JEFX) series.