
Computer Supported Network Analysis (CSNAS): Applications for Foreign Military Sales Program Management

By

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INTRODUCTION TO CSNAS

The Air Force Computer Supported Network Analysis System (CSNAS), developed at the Acquisition Logistics Division (ALD) at Wright Patterson AFB, Ohio, can be used for planning, scheduling, and controlling acquisition activities and virtually every other element of a program management plan. The CSNAS software allows for the development of automated milestone charts and flowcharts which are vital tools in the decision making process during the management of a project or program. The software also includes a series of model USAF acquisition program network analysis diagrams that can be tailored to become a program planning, tracking, and briefing system. The objective of CSNAS is to provide a government owned network analysis capability to Program Managers, Deputy Program Managers for Logistics (DPMLs), Integrated Logistics System Managers (ILSMs), and System Program Managers that satisfies the requirements of Department of Defense Directive 5000.39, *Acquisition and Management of Integrated Logistics Support for Systems and Equipment*. Similarly, CSNAS has important applications for the management of a foreign military sales case, as will be discussed below.

The purpose of a network analysis system is to develop a logical schedule, determine the critical path for completion of that schedule, identify which jobs have slack time, and then integrate all the separate schedules and portions of a project. Using network analysis, the manager of a project or a program can perceive the interrelationships of all the tasks required for successful and timely completion of the program, the amount of time required for each project, and to what degree a slip in one area may impact the overall schedule. A network analysis will graphically show all the participants in a program/project just where each individual task fits into the total effort, and the impact of changes that may occur.

CSNAS uses a form of the program evaluation review technique (PERT) and the critical path method to assist managers in planning, scheduling, tracking, and controlling their projects. The manager simply develops a list of the specific tasks required, their sequence, and the time estimates for the duration of each one. When this information is entered into the computer, the computer will calculate the slack time and the critical path, and then produce flowcharts and milestone charts on either common printers or on multicolor plotters. The manager can then make "what if" changes and recompute schedules to respond to changes in the program. Network diagrams add an important dimension to management communications and decision making by graphically illustrating the relationships between tasks. Although CSNAS was developed specifically for use with Air Force acquisition projects, its design and software can be used for project management of any major program, including foreign military sales programs.

The network analysis plan is easily developed through a series of seven steps:

1. Establish the purpose of the plan and the level of detail required. In other words, determine who is going to use the plan and to what end.
2. Develop the time frame of the plan. If you are going to include the plan as part of a program management plan or Integrated Logistics Support Plan, the dates may be all inclusive, cradle to grave.
3. List all the jobs/tasks to be done. This step requires input from all the key players in the program. The level of detail of the tasks will depend on the purpose defined in step 1. Smaller sub-networks may be tied into the plan for a greater level of detail. As new jobs are identified, they can be incorporated into the plan at any time.
4. Determine the sequence and dependencies of the tasks—which task has to be completed before another can begin. For this step it is usually easier to start with the final task, i.e., deliver an end item to a country by a specific date, and then work back to the initial task.
5. Establish the amount of time required to complete each task. This is the duration of each job on the network. If the actual time is unknown, an educated guess will be adequate. Adjustments can be easily made once the network is automated.
6. Load the data into the computer. A CSNAS worksheet is available to list the data to be loaded. The *CSNAS User Guide* provides detailed instructions on how to load the information.
7. Update the information and make changes to the time frames. CSNAS will automatically re-evaluate the dates and display the current status of the program. This is particularly useful in evaluating potential changes in the project and determining the impact of the changes on the critical elements.

Once the above information has been loaded in the computer, milestone charts and network analyses will be generated. The computerized charts will identify actual dates for each task, along with the critical path to meet final milestone, and any slack time that may be present. Each task is represented by a box (figure 1) which contains the following information:

OPR - Who is responsible for the task?

TASK DESCRIPTION - Job or function to be performed.

TASK TIME - Duration in weeks/days.

EARLY START DATE - The earliest possible date to start the task.

EARLY FINISH DATE - The earliest possible date to finish the task. The computer will calculate this date based on the duration of the task.

LATE START DATE - Latest possible date to start the task without affecting the critical path time.

LATE FINISH DATE - Latest possible date to finish the task without affecting the critical path time.

SLACK TIME - The amount of time that the task can be delayed without affecting the project completion date.

RECOVERY RATIO - Slack time divided by the task duration time. The smaller the recovery ratio, the more critical the task.

FIGURE 1

DATA DISPLAY

EARLY START DATE	EARLY FINISH DATE
Task Number	Wk/Day Task
Task Description OPR	
Slack Time	Recovery Ratio
LATE START DATE	LATE FINISH DATE

Careful review of the time elements will allow a manager to evaluate the impact of changes and make appropriate adjustments to the program.

FMS APPLICATIONS OF CSNAS

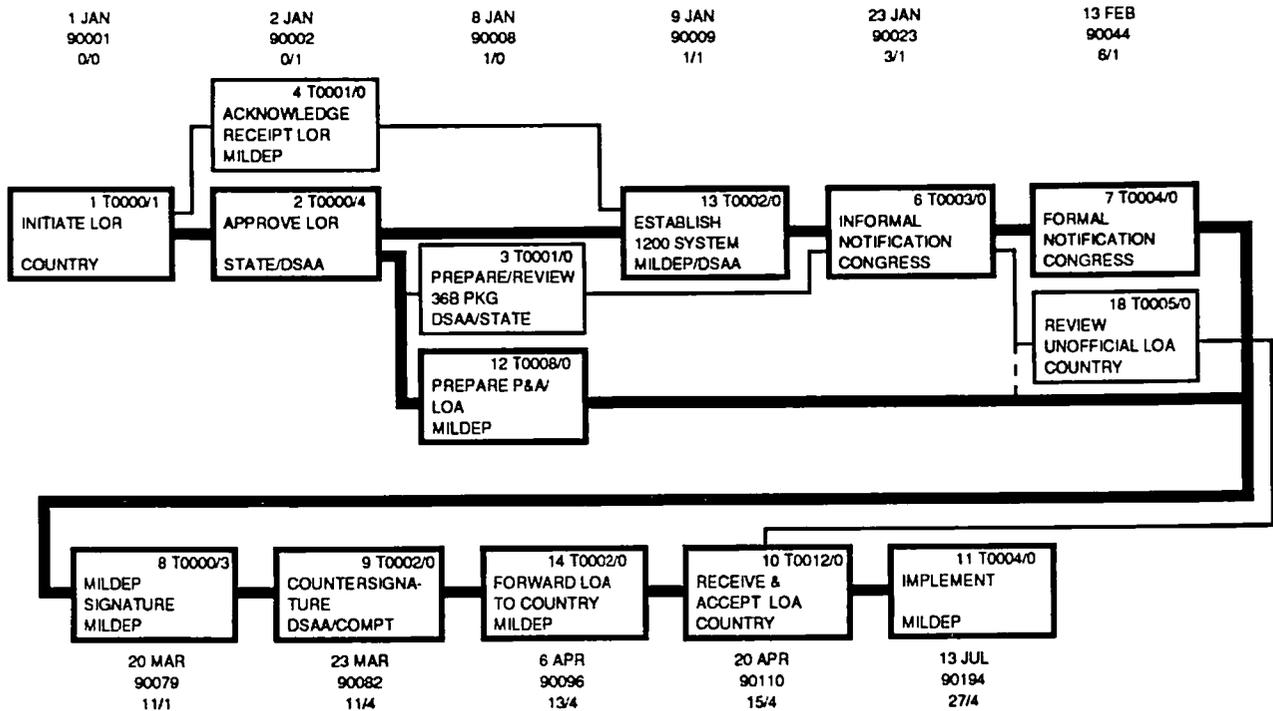
Using CSNAS for a Foreign Military Sales (FMS) Program, especially a major system sale, can be a benefit for both the U.S. service representatives and the foreign purchasers. Not only does it provide a tracking mechanism for monitoring the progress of the DD Form 1513, Letter of Offer and Acceptance (LOA), during the preliminary stages of a program; it can also be used to oversee and track all of the elements of the Total Package Concept during the execution of a program. Section 704 of the *Security Assistance Management Manual (SAMM)* directs that a case or program manager be assigned each active FMS case. This manager is to be responsible for:

. . . integrating functional and inter- and intra-organizational efforts directed toward the successful performance of an FMS case. . . Case Management begins during P&A [Price and Availability] and LOA preparation and should include total package concept/total package approach. . . The case manager should have the authority to take actions and task inter- and intra-organizational areas relating to financial, logistics, procurement, and administration matters in the day-to-day operation of a case.

The CSNAS comprehensive milestone and flowchart mapping of the entire program will provide the case manager the ability to have visibility over all these areas of responsibility.

A model network during the initial stages of a program (i.e., from Letter of Request (LOR) through customer acceptance of the LOA and implementation by the military department) would help keep all the various players, including the purchasing country, informed as to the status of the request. Since the time frames for many of the initial actions are defined in the SAMM, it is easy to devise a model flowchart (see Figure 2).

FIGURE 2



The position of the boxes in Figure 2 demonstrate how some of the actions during the initial process stage can take place concurrently. The critical path is highlighted with a heavier line. This network flowchart has been accomplished on a plotter; the printed version would have different symbols to show the critical path. The model generic flowcharts can be individualized by adding relevant program data and actual dates.

When the country and the specific name of the program are inserted, the appropriate header will appear on the milestone charts. Figure 3 is a sample milestone chart of a request for an LOA for significant military equipment which requires Congressional review. The milestone chart has been updated to reflect the current status of the LOA—in this case it is currently in the formal congressional notification period. With only a few minor adjustments, the status can be updated to show the next step in the process as soon as the Congressional review period is concluded.

A TPA system sale LOA may have multiple lines for ordering all the materiel and services necessary to support a new weapon system activation. It is not uncommon to see an LOA for initial activation of an F-16 sale with over 50 individual lines. The actual number of line items would be based on an evaluation of a country's individual requirements. A checklist for determining the requirements of a USAF aircraft system sale is available in Air Force Regulation 130-1, Attachment 19. For other services, the appropriate information can be obtained from Army Regulation 12-8 and Navy Supply Publication 526. Each one of the lines on the LOA requires several interconnected actions to fulfill the requirements of the program, and can be established as a separate network in itself in CSNAS.

A sampling of the principal line items on a major system sale LOA would always include a line item for delivery of the major end item, a line item for related support equipment, a line item for publications, and a line item for training. For example, on the support equipment line, some of the applicable tasks would be:

1. definitize requirements
2. submit requisitions
3. submit request for proposals (RFPs)
4. process and evaluate RFPs
5. award contracts
6. identify spares for support equipment
7. determine required availability date based on aircraft schedule
8. determine delivery period
9. plan for follow-on support

Each one of these tasks has a specific OPR and period of time in which it is to be accomplished. In turn, the requirement for this line item must be completed prior to aircraft delivery. With CSNAS, it is possible to create a network for the support equipment line requirements and then tie in those requirements to the critical path for aircraft delivery/activation for the total program. The training line can also be linked to the support equipment line, since some of the training may not be able to be done until the support equipment is in place. By the same token, the correct publications cannot be ordered until the definitized list of support equipment is available. The flowcharts showing the interrelationships can be produced for one small segment of the program or expanded to include that segment in relationship to the total project.

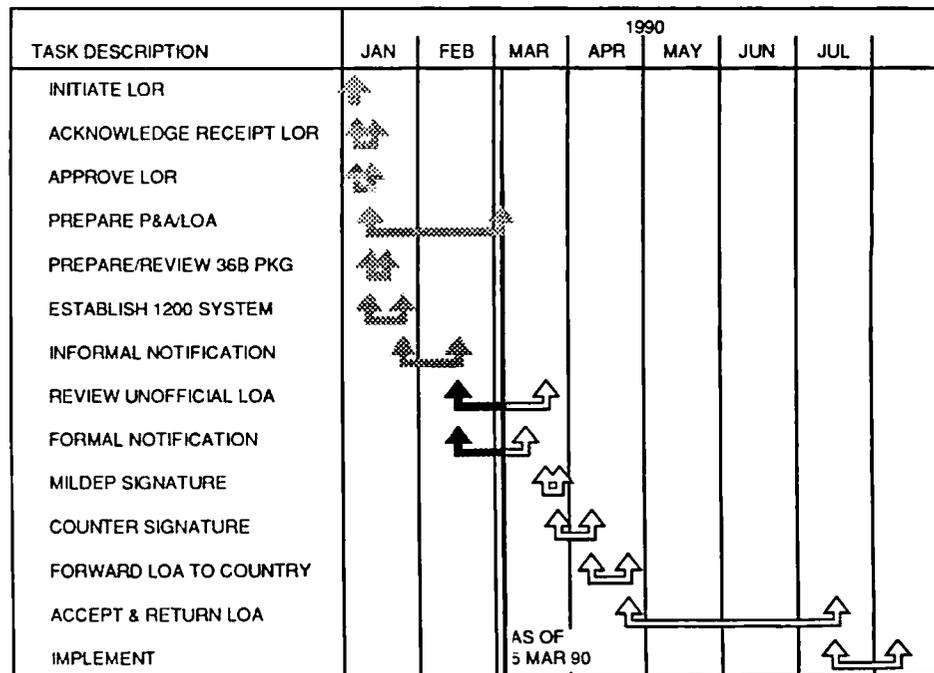
As an example, if the negotiations for the contract were delayed due to failure of first article testing on a piece of support equipment, the impact on the specific line, and also on the total program, can be graphically illustrated. The program manager can evaluate the options available to keep the program on schedule by looking at the recovery ratio to determine how critical the time frame is, or by looking at the slack time to see if there is any room for delays. He might consider shortening the duration of the task or other connected tasks by requesting overtime, etc. The automated features of CSNAS give the program manager the capability of graphically portraying several proposed options before making a final decision on how to cope with the delay.

Changes in program requirements or delays in meeting deadlines may require extraordinary management actions. The network flowcharts are valuable instruments in the decision making process and in the identification of potential problems. If a country requests an accelerated delivery of an aircraft, the program manager can load the new timetables in the pre-established CSNAS program and evaluate the impact on the support equipment schedule (and the other lines on the LOA) and determine what management actions would be required. The automated network not

only allows the program manager to look at several different alternatives and take a pro-active approach to program integration; it also provides the manager with the information necessary to react efficiently to program changes.

The program management plan for a major FMS sale delineates the key milestones for the effective implementation of the program. AFR 130-1, Attachment 17, provides a summary of 10 recommended milestones to use as a guide for developing specific country plans. Once these milestones have been loaded as part of a network in CSNAS, the milestone chart (figure 3) can be updated and used as a status briefing chart at the security assistance management reviews (SAMRs). Additional milestones can be added, or some of the milestones may be deleted to adapt to a specific program.

FIGURE 4
LOA PROCESS MILESTONES



The logistics elements of the total package sale along with the tasks required for each line on the LOA, added to the key milestones for the program management plan, can all be incorporated into one major network using the CSNAS software. This will provide current information to the case/program manager, who will then keep the purchasing country, the SAO and all the other participants apprised of the status of the program.

CONCLUSION

Network analysis and milestone management applications in Foreign Military Sales programs are valuable aids to efficient program management. The availability of an automated system makes it possible to respond to the ever-changing requirements of a program in an effective and timely way. Since the CSNAS software is government owned, it is available to all DOD employees free of cost. Although it was specifically developed by the USAF, CSNAS is equally beneficial for use in FMS Management by the other services as well.

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The generic design concept of CSNAS allows it to be used on computers, printers and plotters that Department of Defense users may already have in their offices, as well as be upward compatible with future equipment. Most DOD program managers can use the network analysis capability at a low cost because CSNAS does not require unique graphics terminals or printers. CSNAS works on any PC using MS-DOS with at least 400K of main memory. Standard ASCII printers will provide draft output products. Plotted output can be processed on the HP-7475 or HP-7580 compatible plotters.

For instructions on how to obtain CSNAS software and any additional information concerning its applications, contact Mr. James Roe, ALD/LSL, Wright Patterson AFB, Ohio 45433, AUTOVON 785-3161 or commercial (513) 255-3161.

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