

DEFENSE CONTRACT MANAGEMENT AGENCY
3901 A AVENUE, BUILDING 10500
FORT LEE, VA 23801-1809

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REVISION HISTORY

	DATE	BY	REVISION EXPLANATION
ORIGINAL	10 NOV 09	Erik Berg	Edited by Erik Berg
REV 1	20 NOV 12	Erik Berg	Revised step 8 to remove constraint on final task or milestone
REV 2	27 APR 15	Erik Berg	Corrected an error on Figure 1

Finding the Program Critical Path

Below are some steps (known as the “Constraint Method”) that may be useful in identifying the critical path. In addition, a manual trace through the network is recommended to ensure that the right sequence of tasks is selected.

To begin, the analyst isolates the tasks on the critical path from all others. To do this, the analyst identifies the longest, continuous sequence of tasks through the network between two scheduled dates with the least total float. To determine if the critical path makes sense, the analyst graphically charts the path from contract start (or the current status date) to contract completion including all critical project milestones like PDR, CDR, First Flight, etc. Precedence defines task sequencing order and how tasks are related to one another in the plan. If one task must be completed before the next task can be started, the first task has precedence over the second task. Though some tasks must precede others in the logical order of work, many tasks can be started in parallel with other tasks.

Finding the program critical path using the “Constraint Method”:

1. Filter out all completed and summary tasks.
2. Remove all hard constraints (Must Start On, Must Finish On, Start No Later Than, Finish No Later Than). Judiciously choose what makes sense on your program.
3. Remove deadlines on tasks that have not started by inserting the “Deadline” column in MS Project and deleting any dates that may exist.
4. Constrain the program completion milestone (i.e. “Contract End”) to finish no later than several months (use a minimum of six months) prior to the baseline finish date.
 - a. For example, if the “Contract End” milestone has a baseline finish date of 16 JUN 2011, apply a “Finish No Later Than” constraint date of 16 DEC 2010 (which is 6 months prior to 16 JUN 2011) to that milestone.

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- b. If no program completion milestone exists, constrain the final discrete task in the schedule as an alternative
 - c. To find the critical path to interim milestones such as PDR, CDR, etc, apply the same methodology
5. Recalculate the schedule (press the F9 key).
 6. Sort the Total Float column in ascending order.
 7. Code the tasks with the least amount of total float (should be a high negative number) as “critical” using one of the available User Defined columns (use the “Text” columns in MS Project). See Figure 1. If the constrained “Contract End” milestone is not on this path, there are multiple paths, possible logic errors, or different task / resource calendars.

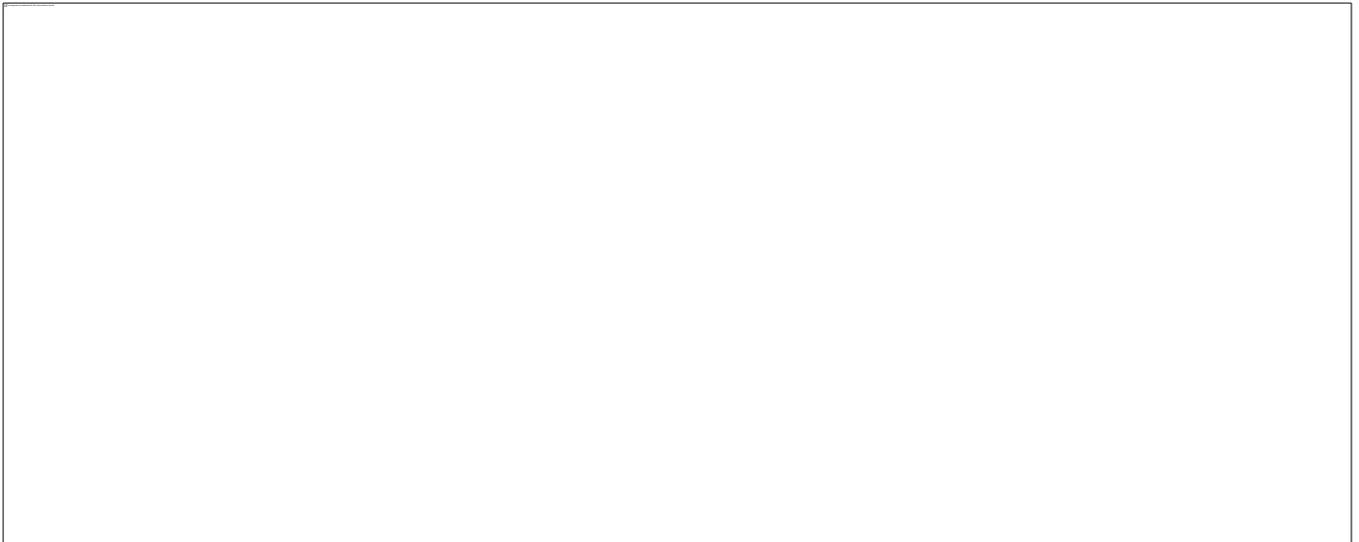


Figure 1 - Finding the Program Critical Path

8. Remove the constraint on the final milestone or discrete task and recalculate the schedule (press F9 key).
9. Filter for the critical path code that was created in the “Text” column in step 7. See Figure 2.

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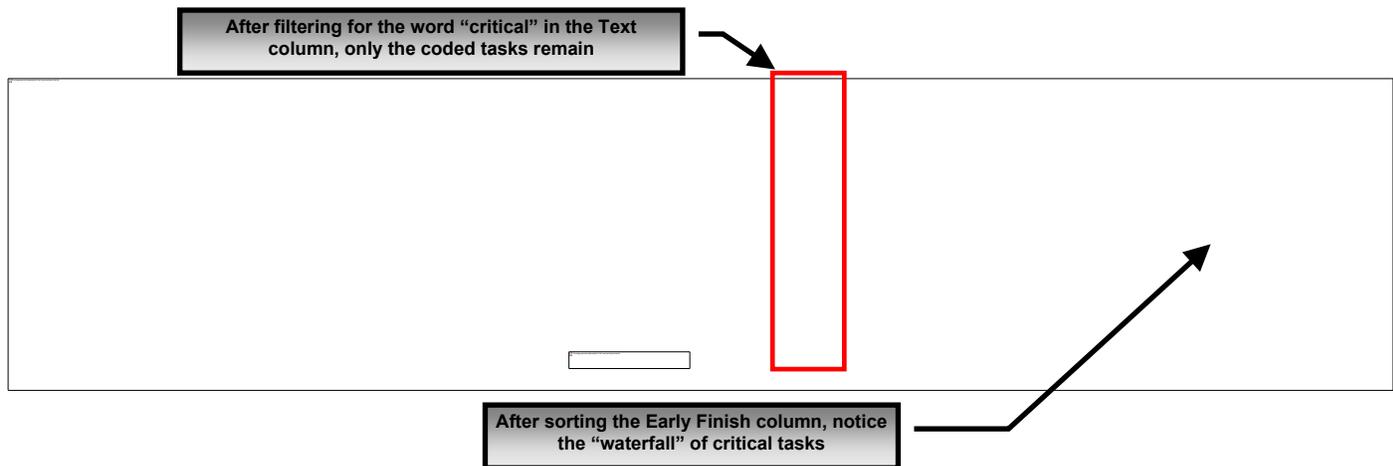


Figure 2 - Critical Tasks

NOTE: Suppliers may use different calendars on different tasks which causes float values to be inconsistent from task to task. If this is the case, the Constraint Method may not be reliable and further investigation is required.

Analyzing the Critical Path

Compare the critical path found using the "Constraint Method" with the critical path as advertised by the Supplier. If differences are found, discuss:

- How the critical path found using the "Constraint Method" is different from the Supplier's critical path?
- Why the critical paths are different from each other? Track the critical tasks over time.
- Is the total float improving or degrading?
- What is the independent forecast of completion for each of the critical tasks?

The critical path may involve one, several, or many activities that can be traced back to particular WBS elements. These critical path elements should continue to be evaluated in the earned value data base for potential problems. Since these elements are on the critical path, any indication of variances, particularly schedule variances, should immediately be analyzed in detail and discussed with the project team.

- Correlate the EV schedule performance for the WBS element with the WBS element's status activities in the integrated master schedule. Both the EVM data and the IMS should show the same status, either behind schedule or ahead of schedule. Is the element on the critical path? Is the trend likely to continue?

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Identify the non-critical activities that have become critical and critical activities changing to non-critical. This determination is made by comparing current period's schedule with the previous period's schedule relating tasks on and near the critical path with the status of these tasks as reported in the cost performance data. Also compare the summary and/or detailed schedule performance indices and/or any significant schedule variances.

Note that in order for this type of analysis to be significant, the IMS and CPR reporting requirements must have the same "as of date" and the Cost and Scheduling systems must be 100% traceable.

Contact Information:

Please contact the undersigned should you have any questions concerning the information contained in this document. The DCMA Earned Value Management group wants your feedback. In order for DCMA to better support your needs, please complete a survey form at:

<https://pubapp.dcma.mil/CustSat/main.jsp>

/S/

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