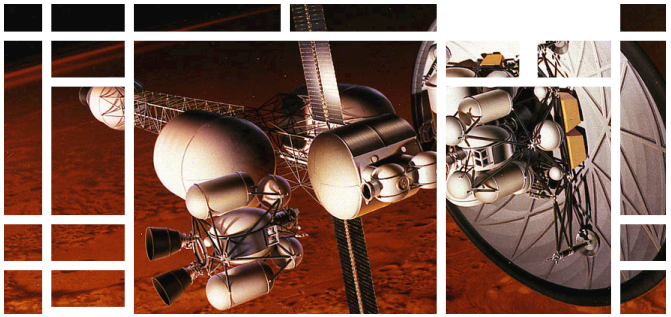


What Is JCL?

Joint Confidence Level (JCL) is an integrated uncertainty analysis of cost and schedule. The result of a JCL indicates the probability that a project's cost will be equal to or less than the targeted cost AND that the schedule will be equal to or less than the targeted finish.

Why Do a JCL?

JCL analysis provides a cohesive and holistic picture of the project's ability to achieve cost and schedule goals by systematically integrating technical, cost, schedule, and risk data.

As an integrating framework, a JCL can show the impacts of risk to a project as well as highlight the relationship between cost and schedule. This relationship can be extremely important in situations with constrained budgets.

A complete JCL analysis can also facilitate transparency with stakeholders on expectations and probabilities of meeting those expectations.

When Is a JCL Required?

NASA requires that a JCL analysis be completed and submitted at Key Decision Point (KDP)-C for all projects above $250 million. However, projects should start planning for their JCL at KDP-B when producing their probabilistic range estimates.

Facts and Myths About JCL

- **MYTH:** JCL analysis requires expensive software tools.

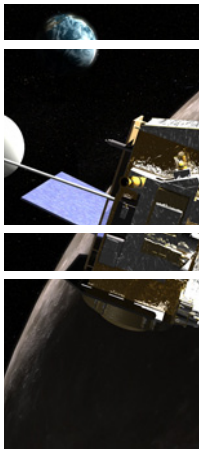
  FACT: NASA has JCL tools available at no cost to the projects.

- **MYTH:** A JCL requires a detailed resource-loaded schedule.

  FACT: Completing a JCL requires only costs, not labor categories and rates.

- **MYTH:** A JCL must be based on a detailed integrated master schedule (IMS).

  FACT: Projects do not need an IMS for a JCL. Summary and analysis schedules are preferred!



National Aeronautics and Space Administration

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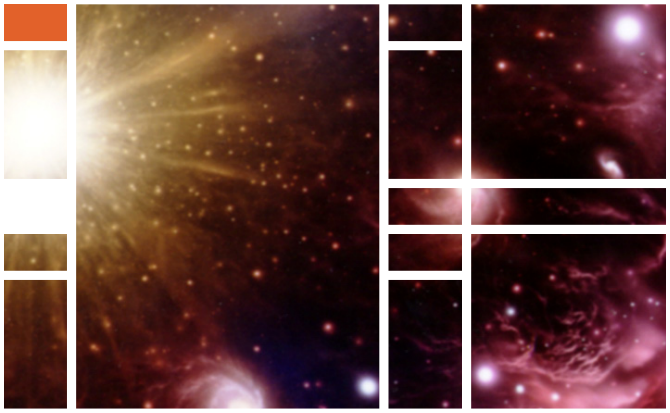
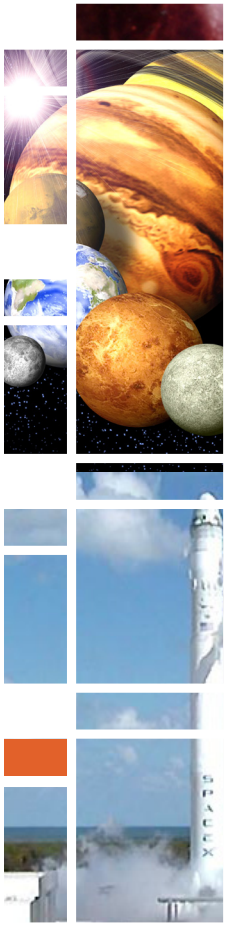
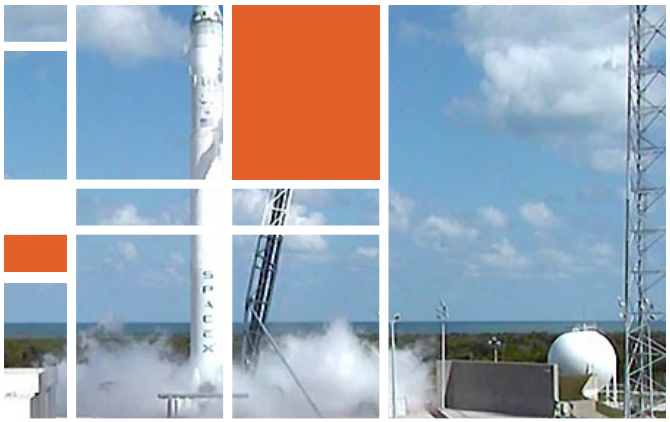


UNDERSTANDING JOINT CONFIDENCE LEVEL (JCL) AT NASA

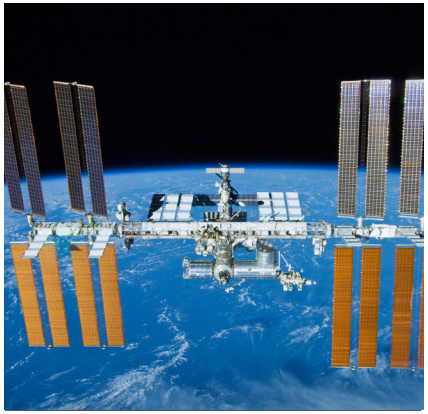
Office of Evaluation

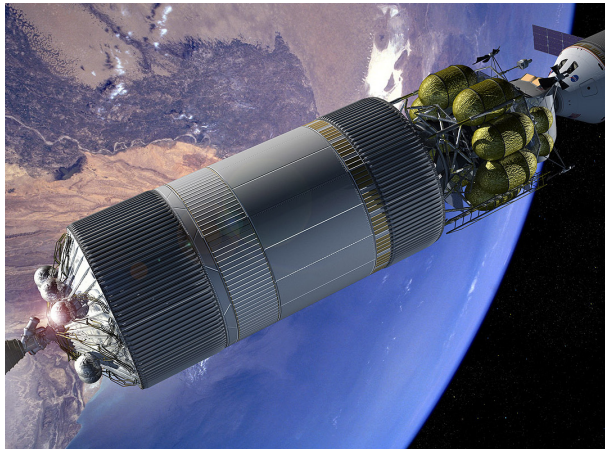
Cost Analysis Division JCL Analysis Primer

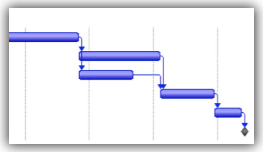




The Four Key JCL Inputs

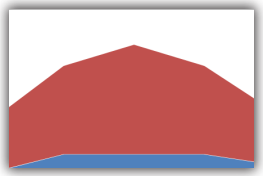






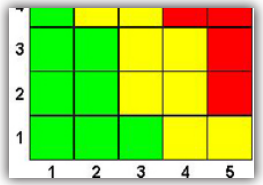
SCHEDULE

The network schedule of activities is the foundation of the JCL analysis.



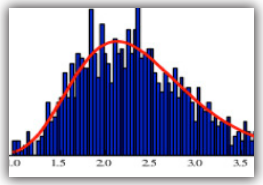
COST

Project cost data by element are linked to the schedule and mapped to activities.



RISK

An itemized list of known risks with likelihood and impact is included in the JCL.



UNCERTAINTY

Uncertainty in the cost and duration can capture additional unknown risk.

Overview of the JCL Process

1. DEVELOP A SUMMARY ANALYSIS SCHEDULE

Build a logic network of activities. Utilizing a summary analysis schedule can significantly improve the process.

2. LOAD COST ONTO THE SCHEDULE ACTIVITIES

Map cost to the schedule. Cost data can be summarized by a work breakdown structure (WBS) to aid with mapping.

3. INCORPORATE RISK LIST

Quantify likelihood of occurrence and impact. Map risks to the appropriate activities.

4. CONDUCT UNCERTAINTY ANALYSIS

Apply uncertainty to the schedule and cost.

5. CALCULATE AND VIEW RESULTS

Analyze the scatterplot, run sensitivities, and refine!

Understanding the JCL Scatterplot

The JCL scatterplot is a standard XY chart with schedule on the X-axis and cost on the Y-axis.

Each point is a result of the simulation calculation representing one cost and schedule pair.

The JCL calculation is based on the number of results in the target area for both cost and schedule and is expressed as a percentage of all simulation results displayed on the scatterplot.

Establishing a cost and schedule target (**black** dotted lines) divides the scatterplot into two areas. One area contains results that are at or beneath the target (shown in **green**). The other area contains results that exceed the target (shown in **blue**). The yellow points and frontier line represent all results from the simulation that meet a desired Joint Confidence Level. Multiple points from the simulation may meet the JCL target. Each of the yellow points would establish a new target area large enough to meet the desired JCL.