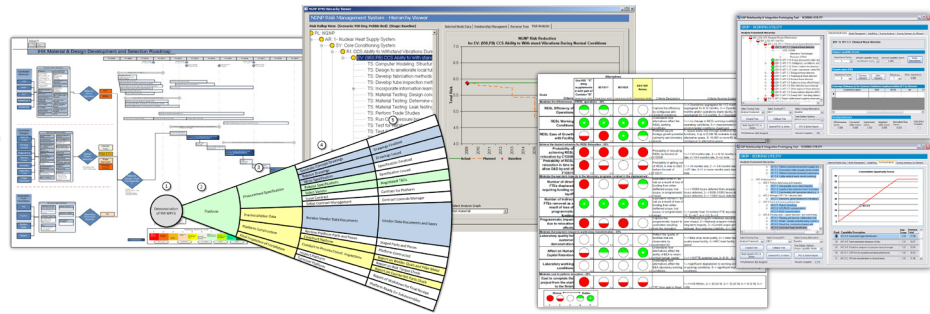


**Systems Analyses and Engineering has developed a suite of customized tools and techniques that have proven highly effective in helping programs and projects achieve mission objectives.**

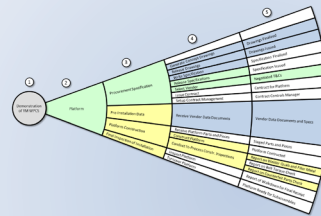


## Innovative Systems Engineering Tools

**T**ools and techniques are an important component in the successful application of any Systems Engineering effort. Systems Analyses and Engineering (SA&E) has developed a suite of customized tools and techniques that have proven highly effective in helping programs and projects achieve mission objectives. Summary descriptions of these tools and techniques are provided below.

### Zoned Analysis

In the 1960s, Dr. Milton E. Larson introduced a curriculum development model to “counteract the aimless evolvement of curriculum programs” in vocational technical education. Using the term Zoned Analysis, SA&E has adapted Dr. Larson’s model as a means of capturing and analyzing all aspects of a project to enhance the



collaboration and planning of project activities.

In practice, Zoned Analysis facilitates a gap analysis for the project and helps management quickly see the “big

picture”. Similarly, project personnel are better able to see their place and how they fit into the entire project. With this insight, functional requirements can be quickly identified and all deliverables linked back to the requirements. The results of Zoned Analysis become the source data for subsequent SA&E functions and tools.

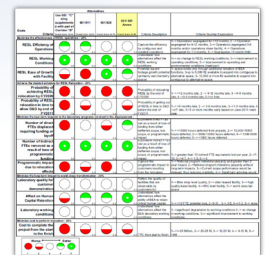
### QuickCompare

Developed in-house, *QuickCompare* is a flexible tool that can be applied to a wide range of decision making situations. It follows simple decision making processes (e.g., define the problem, goals, alternatives, criteria, and weights; score alternatives; analyze

results) and makes any decision process faster, easier, and more transparent.

QuickCompare contains the capability for performing sensitivity analysis and testing the validity of multiple “what if” scenarios. It also provides graphical outputs to facilitate better understanding of the

impact of those scenarios on the decision to be made.



### GAP Relationship and Integration Planning

The GAP Relationship and Integration Planning (GRIP) tool was developed for the

U.S. Army to support current force fleet modernization planning. GRIP provides system-of-systems qualitative gap assessment and anti-

ipated solution performance improvement using multi-attribute utility theory as a basis. For example:

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1. Size of capability gaps relative to each other based on subject matter expert input. Assessments for multiple missions can be maintained separately within the tool
2. Potential mismatches between capability focus (e.g., requirements) and the size of those gaps
3. Estimated improvement (gap closure) or degradation to capabilities resulting from the application of one or more solutions
4. Overall (system-of-systems level) contribution to capability gap closure associated with individual solutions.

GRIP is configured to provide a variety of data reports, rol-up information (e.g., Consumer Reports®-style icons),

and graphs for outputting the results of the assessment and can be customized to any business enterprise to assess capability gaps and potential solutions. Based on this functionality, several applications have been tailored to meet the specific needs of other projects.

- *Strategic Milestones and Relationships Tracking (SMART)* was developed for the U.S. Army Hit Avoidance System to manage the complex relationships of program artifacts, evidence, reviews, tasks, status, and relationships to other elements.
- *The Performance Rol-lup Tool (PRT)* captures and evaluates a number of variables affecting a system's performance across

multiple scenarios. System issues can be evaluated and prioritized for highest value to overall performance across each scenario.

- *The Portfolio Integration and Prioritization (iPIP)* tool provides an ability to easily capture and analyze the interrelationship of organizational elements (called capabilities) that play a role in the overall strategy and tactics of the enterprise. The decision model portion of the iPIP manages the relationship between the programmatic users of the enterprise architecture, the organizations developing and maintaining the architecture, and the investment decisions made to maximize mission success and minimize programmatic risks.

### For more information

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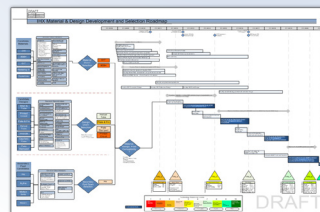
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### Planning and Technology Roadmapping

INL has developed a specialized planning and technology roadmapping capability that provides the rigor and understanding needed for decision-makers to focus on critical uncertainties and make informed decisions. This advanced roadmapping process provides the means to:

- Measure the relative merit of technologies
- Identify the key discriminators for down selecting technologies and designs
- Establish the long-term vision for maturing technologies toward deployment and operations
- Identify risks early in the process and outline the



tasks needed to resolve technical risks

- Accelerate the application of new technologies
- Minimize project costs and schedules
- Provide a defensible argument for acquisition choices.

These capabilities combine to form a technical risk reduction strategy, referred to as a focused roadmap. The tools can be applied to technical or programmatic risk, including economic, stakeholder, and political risk.

### Risk Management System

The Risk Management System (RMS) tool provides the capability to: establish a risk baseline; document and analyze a risk reduction plan; track risk reduction status; organize risks by reference configuration; and inform project level decision making. The tool provides a drilldown capability that summarizes technical risk scores. These scores can be displayed for baseline, current status, or the final projected risk by average or worse case.

The RMS provides the capability to outline and status a strategy for each identified risk. Risk reduction tasks are assigned to each item and the magnitude of risk reduction estimated for each task can be specified.