Risk Assessment & Measurement

What is URAMS?

The Unified Risk Assessment and Measurement System helps bridge the gap between disparate risk assessment approaches, using a range of tools and techniques to enhance mission-relevant risk awareness and communicate portfolio-wide risk to decision makers.

The URAMS framework utilizes a four-step repeating cycle.

> 1_ analyze

Analyze involves an engineering process to determine what risk scenarios may apply to the system in its expected contested operating environment. A risk scenario in URAMS is the explanation of how a potential threat could exploit a vulnerability to impact a critical component of a system, and these scenarios can be developed using a wide range of analytics. One process often used in this step, and a powerful analytic, is called System-Theoretic Process Analysis for Security (STPA-Sec). STPA-Sec uses a top-down analysis to examine the risk that starts with a clear definition of the mission, unacceptable losses, and hazards to that mission, as well as system level security constraints.

> 2_score

Score is the second step in the URAMS cycle. This step is used to score the scenarios found in the Analyze step with respect to mission loss. For DoD related systems, this scoring is most often done in the units of Expected Mission Loss (EML), although other options are available. In the URAMS framework, scoring tools are developed from a risk model that captures the factors expected to contribute to the overall risk of a system in an organized hierarchy. **A key distinction between URAMS and many other risk scoring approaches is that URAMS has multiple ways to track the uncertainty of risk measurements.** These approaches determine the input method to the risk model and are the second factor that creates a risk tool.

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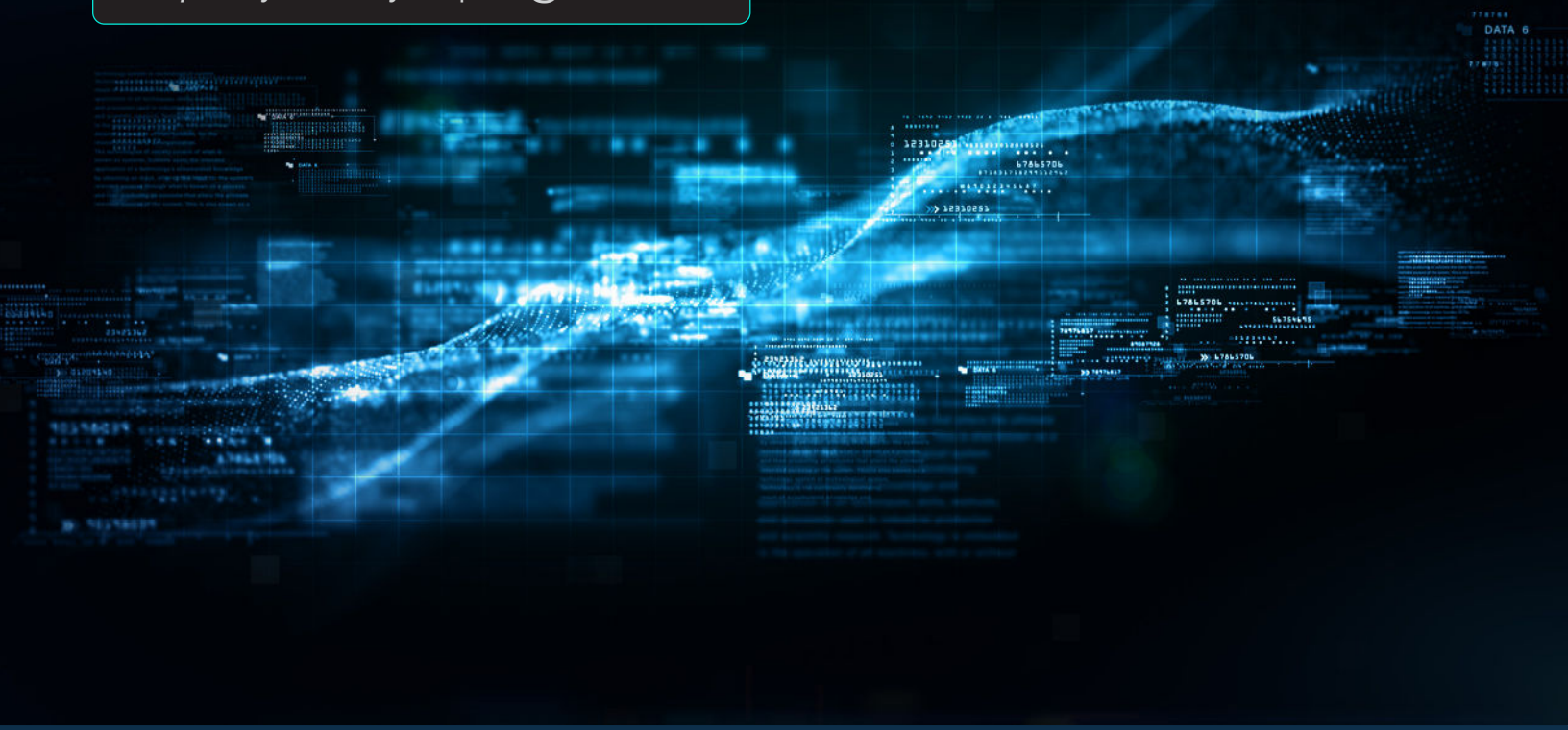

> 1_ combine

Combine, the third step in the URAMS cycle, is when the individual risks of systems can be aggregated into different levels such as groups, systems, and missions. These risks can also be compared to different programs allowing for understanding across an organization on which programs have the most risk and where to focus time and resources to create a larger reduction in overall risk. Monte Carlo simulations are used inside this step to model combined risks. The results can be displayed as risk charts, risk probability density functions, or loss exceedance curves, all of which can display the assessed uncertainty in the measurements in various ways.

> 4_decide

The final URAMS step, Decide, encompasses the activities to both assemble the outputs and data from the previous URAMS steps and support a detailed review with decision makers to gain concurrence or feedback on areas of concern. It is critical that the results from the assessment are presented in a way that is easily accessible for senior decision makers who have limited time to learn new tools and mathematical techniques.