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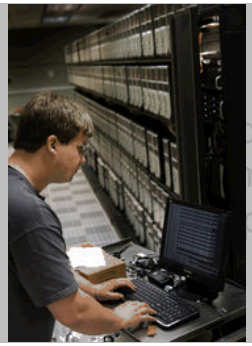
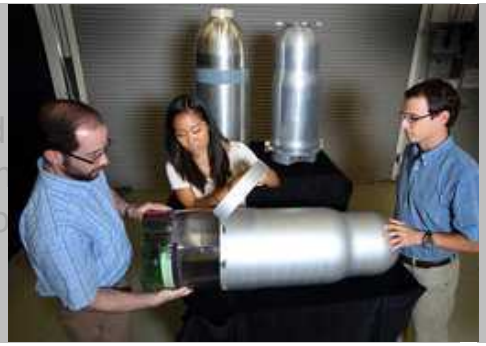

Challenges of Risk Management in National Security

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U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

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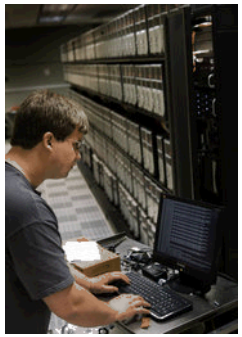
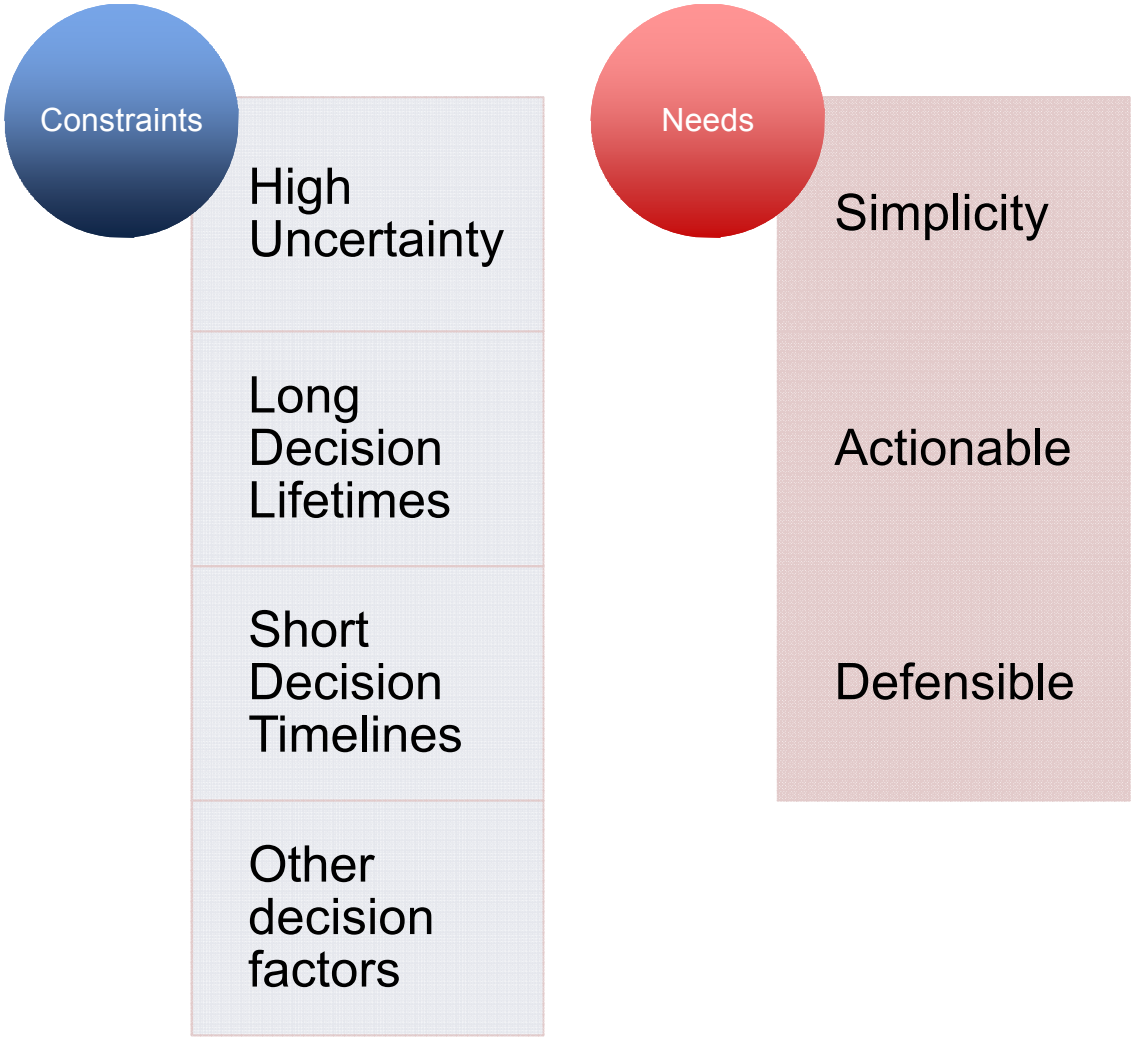
National Security Context




- National security is energy security, infrastructure security, chemical/biological security, radiological/nuclear security, cyber security (not addressing economic security in this talk)
- The following elements do not all apply to all problems, but they are representative of repeated themes we see in national security work

- Goal: risk management. We enable decision-makers to manage risk by providing insights from risk analyses.
- Risk is not a number!

National security risk management is challenging



National security can be an uncertain space

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Constraints

- High Uncertainty
- Long Decision Lifetimes
- Short Decision Timelines
- Other decision factors

There is often high uncertainty around the adversary

- Current adversary motives, behavior uncertain
- Future adversary more uncertain

There are not large amounts of historical data to draw upon (and we don't want a lot of data points!)

Makes probabilities hard to quantify, with large uncertainties

Strategic decision lifetimes can be much longer than data lifetimes

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Constraints

- High Uncertainty
- **Long Decision Lifetimes**
- Short Decision Timelines
- Other decision factors

National security investments can have lifetimes of decades

We don't have reasonable methods for knowing quantitative threat probabilities for decades in the future

Technology advancements can introduce future vulnerabilities that we cannot quantify nor predict

Risk analyses for strategic decisions must be careful to not be dependent upon transient data

National Security decisions can have short timelines

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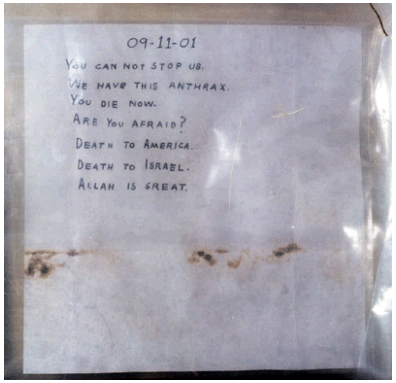
Constraints

- High Uncertainty
- Long Decision Lifetimes
- **Short Decision Timelines**
- Other decision factors

Some risk mitigation decisions are made:

- In times of crisis
- When political wills align
- When budgets allow (can be fleeting)

Some decisions will not allow for long, detailed, time-consuming risk analyses



Risk is only one of many factors in most national security decisions

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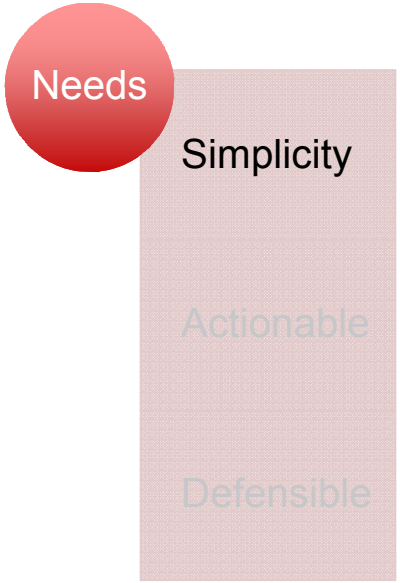
National security is a complex space, with many stakeholders and many factors. Potential other factors include

- Cost
- Political will (federal, state, local)
- Safety risk vs. security risk

Algorithms that optimize solutions for one of many decision factors may not tell the relevant story

Decision makers often ask for simple analyses



Simple analyses:

- Allow decision maker to *understand and communicate* the key components and key insights of risk analysis
- Enable *transparency* in assumptions (assumptions aren't buried under tens of layers of complex calculations)
- Enable *decision maker* to modify risk model and quickly see impact

Decision makers need to take risk-informed action

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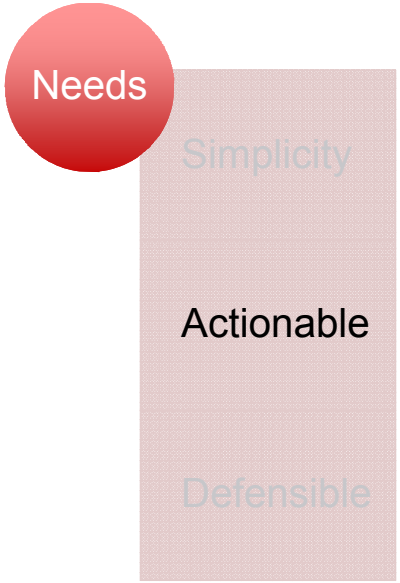

Actionable analyses:

- Provide insight into the decision and options at hand

Decision makers need analyses that are defensible

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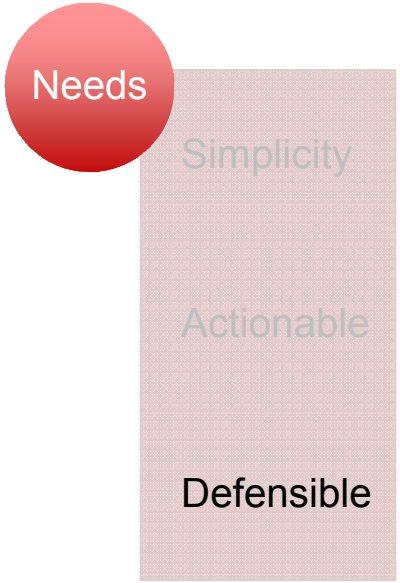

Defensible analyses:

- Provide confidence that reasonable methods were used in informing risk management decisions

Do traditional risk analysis tools work in the National Security space?

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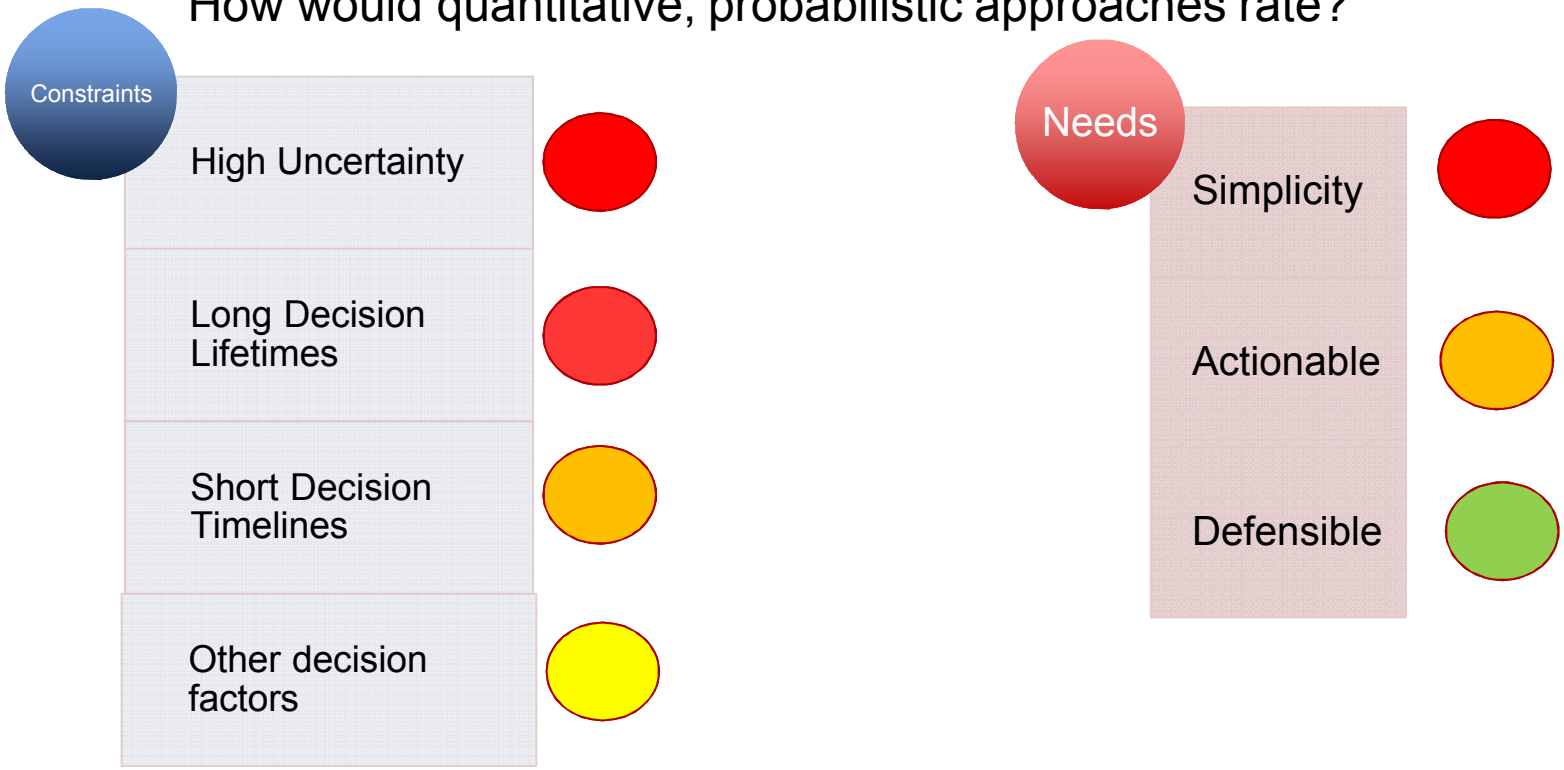
How would quantitative, probabilistic approaches rate?



Do traditional risk analysis tools work in the National Security space?

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We have had some successes (maybe not so traditional approaches)…

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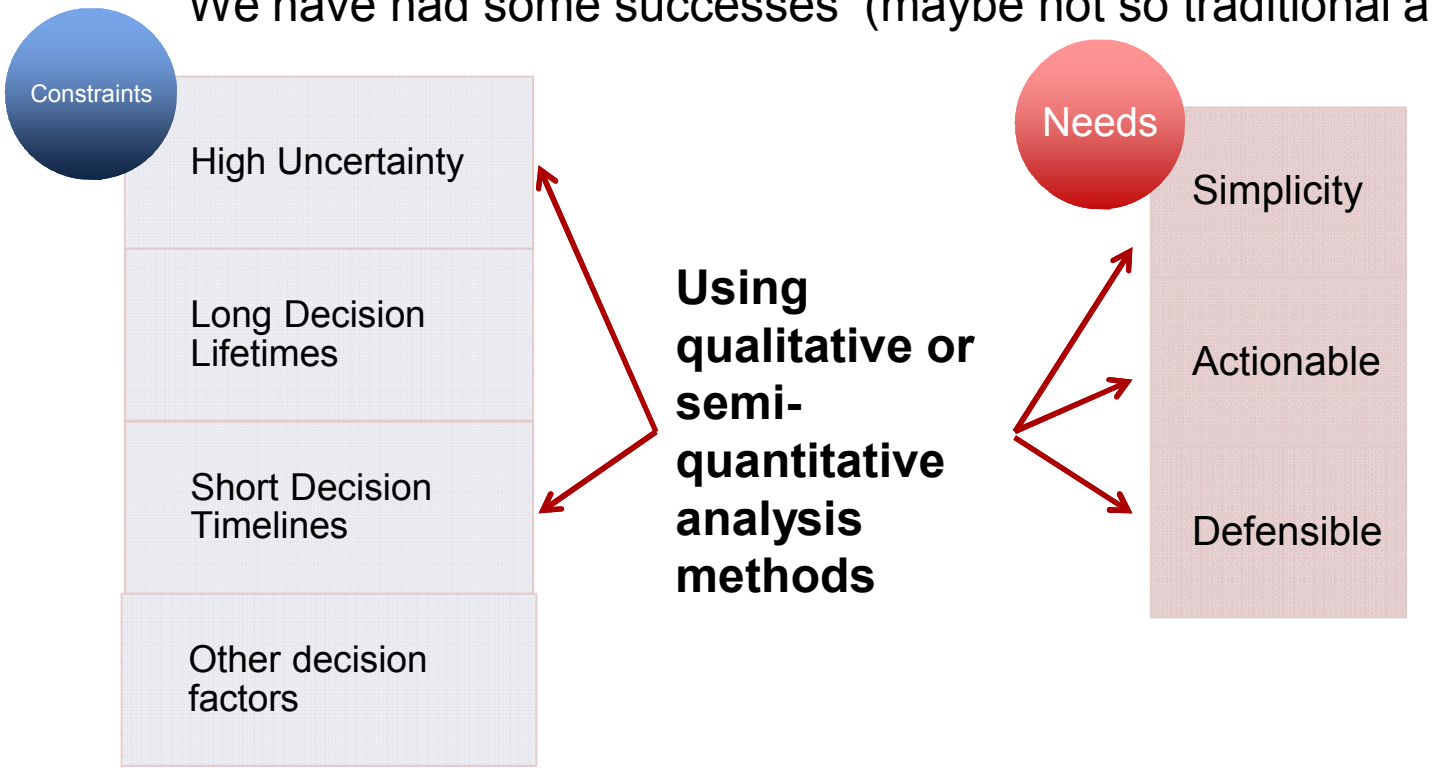

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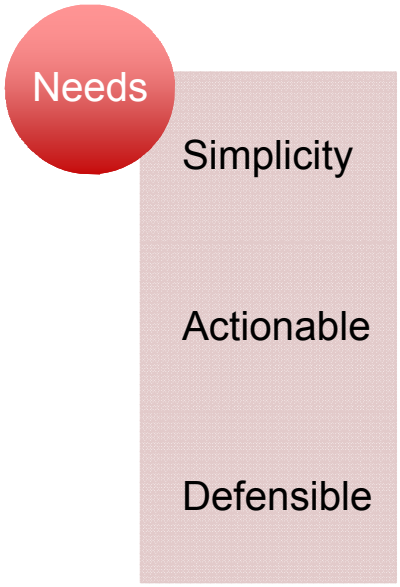

Further research/development of risk analysis tools are needed that work well across multiple constraints/needs of the National security space

Session:

- **Risk Metrics for Chemical Facility Security – Scott Paap**
- **Useful Approaches to Evaluating Adversary Behavior in National Security Risk Assessment—Steve Streetman**
- **Increasing the Use of Risk-Relevant Information for Security at the Nuclear Regulatory Commission—Joe Rivers**