Right Sizing Navy Fire & Emergency Services: How to Measure Risk of Loss Given Resources

OR 680/SYST 798 Project Proposal September 22, 2011



Agenda

- Background
- Problem Description
- Preliminary Requirements
- Expected Results
- Technical Approach
- Project Plan



Sponsor: Fred Woodaman, *Principal Analyst*, Innovative Decisions

Sponsor already has a detailed *descriptive* model

- What each base currently has that needs protected
- What resources required to protect it – Including personnel
- How much these resources cost

Model describes current reality



Problem Description

Sponsor Needs

- Risk model so study can become *prescriptive* to budget adjustments
- Model needs to explain possible effects of change (methodology for losing/increasing investment on resources in future)

Events & Response => Effectiveness





Preliminary Requirements

Develop a mathematical model of expected loss at an installation given an application of F&ES resources

What We Will Do (In Scope)

• Given a budgetary hit, the F&ES Program would be able to report the change in expected loss

How This Will Help (Out of Scope)

- With this model, expected risk could be aggregated across the Navy to obtain total expected loss
- Given a budget level, the optimal mix of assets could be determined that minimize loss



Problem Description – Risk Terminology

- Events: What Can Happen?
 - \$ value (e.g. investment)
 - Lives
 - Likelihood
- Response: What Can We Do?
 - Equipment/Resources
 - Numbers and types of equipment
 - Personnel cross manning equipment
- Effectiveness: What Have We Saved?
 - The difference between "currently capability" vs. "future scenario" is the Risk.



Expected Results – Final Product

Risk = Utility _{Baseline} – Utility _{Budgeted}



Risk is defined by the diminished capabilities due to lack of funds.



Technical Approach – The Event



Technical Approach – The Response



Expected Results - Effectiveness



Determining the Factors

Notional Factors

- Events: # of Alarms, Cost of the Event, Lives lost due to the Event
- Response: # of Trucks Needed, Personnel Needed, Base Locations
- Utility: Risk Tolerance

Questions

- Are all of them necessary?
- Are all of them included?
 - Are we missing something critical/useful?
- Are all of them quantifiable and calculable?
- Are they real?
 - Does the data exist?
- Can we do this all within scope?



- 9/22 Proposal Presentation
- 10/13 Status Report
- 10/20 Status Presentation
- 11/03 Status Presentation, draft of Final Presentation
- 12/01 Final Report
- 12/08 Final Presentation, Website



Back Up Slides



Factors



Proposal - What Next?

(determine the red correlations)

