



System Analysis of Counter Unmanned Aerial Systems' Kill Chain in an Operational Environment

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Objective:

The rapid growth in unmanned aerial system (UAS) capabilities and adoption rates across industry and hobbyist community have pose significant security and safety concerns to facilities such as airports, critical infrastructure, and military camps and bases. Hence, to keep counter unmanned aerial system (CUAS) in pace with the UAS's technological growth there is a need to have an efficient evaluation and analysis method.

Research Ideas:

- To develop a step-by-step systems engineering approach for facility designers to conduct evaluation and analysis
- The methodology must be iterative and allow designers to compare performance parameters across the sub-systems and at different technology readiness levels (TRLs)

Benefits of Research:

The methodology's principle focuses on detection and interception which are the key functions of CUAS. The proposed methodology will be resource-optimized and provides rapid assessment of the CUAS effectiveness. This will benefit the security facility that needs to deal with UAS threats and potential technological gap.

Follow-up of Research Activities:

- Improve the methodology by adding steps that can generate data sets from live tests
- Increase uses of autonomy in CUAS operations
- Improve the CUAS's cyber resilience

Proposed Methodology:

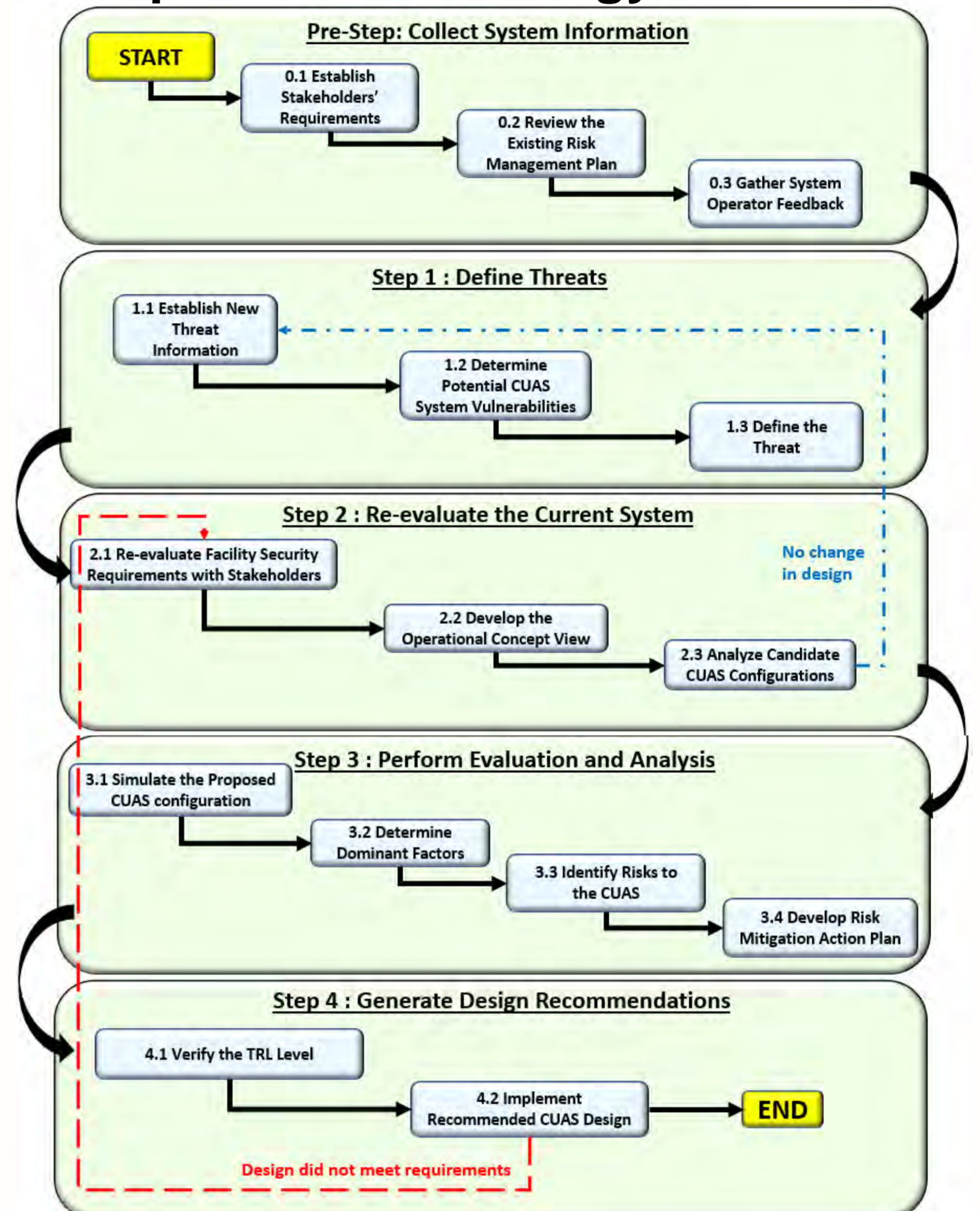


Figure 1. Overview of the Proposed Methodology. The methodology is intended for use by facility commanders to analyze existing CUAS effectiveness, identify CUAS capabilities gaps, produce CUAS upgrade recommendations, and provide CUAS system design reviews.

[1] G. Lykou, D. Moustakas, and D. Gritzalis, "Defending airports from UAS: A survey on cyber-attacks and counter-drone sensing technologies," *Sensors*, vol. 20, no. 12, May 2020. [Online]. Available: <https://doi.org/10.3390/s20123537>

[2] J. Shevchenko. "An introduction to Model-Based Systems Engineering (MBSE)," Accessed May 30, 2021. [Online]. Available: <https://insights.sei.cmu.edu/blog/introduction-model-based-systems-engineering-mbse/>