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Development of a Robust Framework for Security Assessment of Safety-Informed Siting Decisions under Uncertainty

Development of a Robust Framework for Security Assessment of Safety-Informed Siting Decisions under Uncertainty

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ABSTRACT

The assessment of security vulnerabilities during the initial phase of locating a nuclear reactor facility involves a process aimed at recognizing specific site attributes that could expose the site to potential security risks. Early identification of such features is crucial as they might increase the site's susceptibility to malicious attacks. Any security incident or event could harm life, the environment, or property. Additionally, certain site characteristics such as its location and the shortest route from the responders can impact response to emergencies at the site. Features such as slope and extreme weather events could influence the efficacy of implemented measures in reducing security risks at the selected site.

If an issue with a site's potential risk factor is identified early, a more cost-efficient plan can be incorporated into the overall site design. However, once a site is chosen and construction commences, any discovery of natural or artificial features that render the site vulnerable to security threats could lead to construction delays and additional expenses in designing and implementing necessary security measures.

This paper aims to emphasize the deficiencies in the evaluation framework used to assess security risks at potential nuclear reactor sites during the site selection phase. Our research underscores the necessity for establishing a robust framework to assess security vulnerabilities in nuclear facility siting, aiming to address these gaps effectively.

Keywords: site security, vulnerability assessment, siting, nuclear threat, nuclear security, threat mitigation, OR-SAGE

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