

Risk Assessment Methodology for Energy Infrastructures (RAM-ESM)

Fact Sheet



Description of the Tool

The security and protection of our energy infrastructure is extremely important to our nation's economy and social well-being. The Risk Assessment Methodology for Energy Infrastructures, RAM-ESM, is a systematic, risk-based approach used to evaluate selected parts of the energy infrastructure with respect to potential malevolent actions (i.e. terrorists or criminals) that could cause an undesirable

Features

The core of RAM-ESM is the process by which a systematic risk analysis is accomplished. The risk analysis process is embodied in the following Risk Equation:

$$\text{(Likelihood of Attack)} * \text{(Consequence)} * \text{(1-System Effectiveness)} = \text{Risk}$$

The first objective of RAM-ESM is to set forth a procedure for completing a threat assessment that determines the likelihood that an adversary will attack a critical asset to achieve a particular consequence and succeed in defeating the security system. The second objective of RAM-ESM is to provide a procedure for completing a consequence assessment should an adversary be successful in disrupting, disabling, or destroying the missions of the energy infrastructure. The third objective of RAM-ESM is to provide a systematic process for determining the effectiveness (or ineffectiveness) of the security protection system to prevent a successful attack against an operational component of the system. The final objective of RAM-ESM is to provide the procedure for completing a risk assessment that allows the manager to evaluate the level of risk associated with the threat, consequences, and protective system and determine the needs for directing an implementation of security upgrades or plans for risk reduction, as appropriate for the characteristics of the system. The RAM-ESM is not a quantitative analysis but, rather, compares relative security risks. If the risks are deemed too high, recommendations can be developed for measures to reduce the risks.

Applicability

The structure of RAM-ESM includes consideration of possible ways to disrupt the energy mission. This could include during extraction, during distribution, during storage, during power production or during transmission. RAM-TSM has been developed to address electric power transmission. The current version of RAM-ESM focuses on the non-nuclear power production area. Fault trees have been developed for combustion turbine (liquid, natural gas fuel), natural gas fired power plants and coal fired power plants.

Availability

A prototype version of the RAM-ESM field manual has been developed. The manual is a controlled distribution Official Use Only document. Sandia controls the distribution of the RAM-ESM manual. Currently distribution is being limited until further development is completed and training classes become available.



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