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encompassing than a DBT and it can be bounded by policy decisions. Consequently, the use of CARVER methodology may be more appropriate for lower risk assets (e.g., those assets that do not require force-on-force level of security performance evaluation).

CARVER Analysis Methodology

The regulatory structure proposed in Option 3 of Policy Issue 3 (see Enclosure 3)² would nominally be in the form of a CARVER analysis. Figure 5-1 depicts a CARVER analysis model that could be applied to ISFSI security issues.

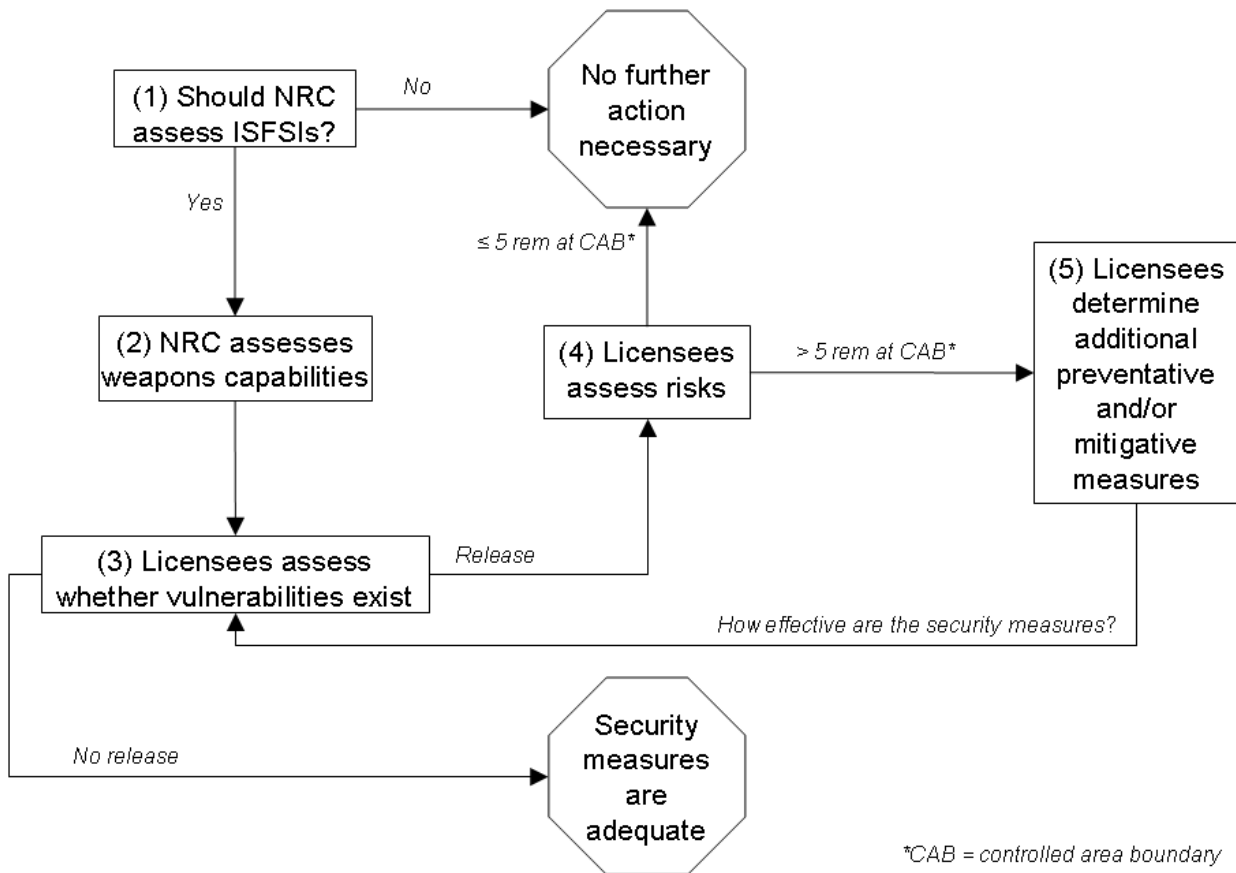


Figure 5-1. CARVER Analysis as Applied to ISFSI Security Issues

A CARVER analysis is an analytical methodology that is used to evaluate the risk (or vulnerability) to critical assets. This methodology has been successfully used by security

² Enclosure 3, “Should the Design-Basis Threat for Radiological Sabotage Be Applied Consistently to All Independent Spent Fuel Storage Installations (Not Just to General Licensees)? (Policy Issue 3).”

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professionals in various industries (e.g., oil and petrochemical) and the U.S. government (e.g., the Departments of Defense, State, and Homeland Security) since 1970 to assess vulnerabilities and risks, and to evaluate mitigative or compensatory measures. Because the CARVER analysis methodology has been in use by security professionals in various industries and the U.S. government for this length of time, a significant body of expertise in these analyses would exist for ISFSI licensees to draw upon [in accomplishing such an analysis].

As indicated in Figure 5-1 above, completion of a CARVER analysis for an ISFSI would require actions by both the NRC and the licensee. The NRC and licensee would be responsible for different portions of a CARVER analysis. These activities are described below and are indicated in Figure 5-1 above. (Note: As an aid to the reader, the staff has added identification numbers to the boxes in Figure 5-1 which correspond to the text below.)

The NRC would:

- (1) Develop regulations identifying that ISFSIs are an asset that requires protection to ensure that public health and safety and common defense and security are adequately protected, and requiring licensees to complete an analysis to provide high assurance that the ISFSIs physical protection system provides this adequate protection; and
- (2) Develop regulatory guidance to characterize the weapons capabilities or weapons effects (i.e., the phenomena created by certain weaponry—either manufactured or improvised) for which ISFSI vulnerabilities may exist and which would be used by a licensee in their analysis.

The licensee would:

- (3) Evaluate whether the weapons effects specified in the regulatory guidance would create a vulnerability for their facility (i.e., a possible breach of a storage cask's confinement boundary); and
- (4) If so, evaluate whether the release of radioactive material from a storage cask in their facility could result in a potential dose to a maximally exposed individual at the controlled area boundary exceeding the 0.05-Sv (5-rem) dose limit;^{3 4} and

³ The dose criteria in Title 10 of the *Code of Federal Regulations* 72.106, "Controlled area of an ISFSI or MRS," (0.05 Sievert (Sv) [5 rem] total effective dose equivalent; 0.15 Sv [15 rem] to the lens of the eye; 0.5 Sv [50 rem] as either the sum of the deep dose equivalent and any organ dose, or the shallow dose equivalent to the skin or any extremity) are hereinafter referred to as the 0.05-Sv (5-rem) dose limit.

⁴ As discussed in Policy Issue 2, the staff would recommend a 0.05-Sv (5-rem) dose limit at the controlled area boundary and an additional verification of a 0.01-Sv (1-rem) dose limit at the site area boundary; hereinafter, called the 0.05-Sv (5-rem) dose limit.

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(5) If so, identify changes to the design or operation of the ISFSI, changes to the protective strategy, or the employment of natural or engineered security features that would either prevent the vulnerability or allow the licensee to mitigate the effects of a release to achieve a potential dose to an individual at the controlled area boundary less than the 0.05-Sv (5-rem) dose limit.

The licensee would repeat steps (3), (4), and (5), as required, to verify that it can meet the 0.05-Sv (5-rem) regulatory dose limit. The licensee would then revise and update their physical security plans to reflect any necessary changes to their physical protection system or protective strategy to accomplish this objective.