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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

AUG 20 1993

MEMORANDUM FOR: Phillip F. McKee  
Safeguards Branch  
Office of Nuclear Reactor Regulation

FROM: Michael T. Lesar, Chief  
Rules Review Section  
Rules Review and Directives Branch  
Division of Freedom of Information  
and Publications Services  
Office of Administration

SUBJECT: REVIEW OF DRAFT PROPOSED RULE ENTITLED "PROTECTION AGAINST  
MALEVOLENT USE OF VEHICLES AT NUCLEAR POWER PLANTS"

The Rules Review Section has reviewed the draft proposed rule package that would modify the design basis threat for radiological sabotage to include protection against malevolent use of vehicles at nuclear power plants. We have attached a marked copy of the proposed rule package that presents editorial and format corrections. These changes are necessary to meet the publication requirements of the Office of the Federal Register (OFR).

We have provided the Information and Records Management Branch of the Office of Information Resources Management a copy of the proposed rule to review for compliance with the Paperwork Reduction Act. You should contact Brenda Shelton on 492-8132 for further information concerning this matter.

When the proposed rule is forwarded for signature and publication, please include a 3.5-inch diskette that contains a copy of the proposed rule in WordPerfect 5.0 or 5.1 as part of the transmittal package. The diskette will be forwarded to the Office of the Federal Register and the Government Printing Office for their use in typesetting the document.

If you have any question regarding our comments, please contact me on 492-7758 or Alzonja Shepard on 492-7651.

Michael T. Lesar, Chief  
Rules Review Section  
Rules Review and Directives Branch  
Division of Freedom of Information  
and Publications Services  
Office of Administration

Attachment: As stated

DRAFT - PREDECISIONAL - NOT FOR PUBLIC RELEASE

DRAFT 8/13/93

FOR: The Commissioners  
FROM: James M. Taylor  
Executive Director for Operations  
SUBJECT: PROPOSED AMENDMENTS TO 10 CFR PART 73 TO PROTECT AGAINST  
MALEVOLENT USE OF VEHICLES AT NUCLEAR POWER PLANTS

PURPOSE:

To obtain Commission approval to publish a proposed regulation in the Federal Register.

Background:

*In the*  
Under staff requirements memorandum, dated June 29, 1993, the Commission directed the staff to proceed with an expedited rulemaking to modify the current design basis threat (DBT) for radiological sabotage to include use of a land vehicle by adversaries for the transport of personnel, hand-carried equipment and/or explosives. The Commission directed the staff to modify 10 CFR 73.55 to reflect the change to the DBT and allow for alternative measures when establishing standoff distances. The Commission also directed the staff to allow for at least 30 days for public comment. Information on the proposed modification to the DBT was previously submitted to the Commission under SECY-93-102, SECY-93-166 and SECY-93-210. A public meeting was held May 10, 1993 to solicit comments from affected licensees and other interested parties on the need to modify the design basis threat for radiological sabotage. ↗

Contacts:

Phillip F. McKee, NRR  
504-2933, or  
Priscilla A. Dwyer, NMSS  
504-2478

DISCUSSION:

The proposed rule would require licensees to provide vehicle control measures to protect against the use of a design basis land vehicle (DBV) as a means for transportation to gain rapid access to vital areas. It would also require licensees to compare their vehicle control measures with design goals and criteria for protection against a land vehicle bomb specified by the Commission.

The proposed modifications to §73.1, <sup>text ✓</sup> 73.55(c)(7), and 73.55(c)(8) were presented to the Commission in SECY-93-166. <sup>text of the proposed ✓</sup> The ~~rule language for these~~ modifications has not been changed from that presented in SECY-93-166 except <sup>(that was ✓)</sup> for the change to 10 CFR 73.55(c)(8) directed by the Commission in the June 29, 1993 SRM. The enclosed proposed rule package includes a new provision, §73.55(c)(9), that <sup>would ✓</sup> provides implementation schedules for applicants for an operating license and licensees who currently hold an operating license. Licensees who are either in the process of decommissioning or plan to decommission in the near future will be handled on a case-by-case basis by NRC licensing staff to determine if full or partial exemption from the new rule is appropriate.

Implementation of the rule as proposed would require applicable licensees to design and install a vehicular barrier system to protect vital areas and equipment from access by unauthorized forced entry by land vehicles. Licensees would also be required to evaluate the effectiveness of these measures to protect against a vehicle bomb. Documentation of facility modifications resulting from implementation of the rule would be made through §50.54(p) changes (no decrease in security effectiveness), §50.59 changes (no change in the technical specifications incorporated in the license or an unreviewed safety issue), or both. Details of barrier design engineering and analysis associated with evaluation of the effectiveness of the barriers to meet the design goals and criteria for protection against a land vehicle bomb would be maintained by the licensee for as long as the licensee holds an operating license.

As contained in the implementation schedule for the proposed rule, licensees would be required to submit to the Commission a letter providing the completion of the design of the barrier system and the results of their evaluation comparing the measures to protect against forced vehicle entry with the design goals and criteria for protection against a land vehicle bomb. NRC has provided licensees with the design goals and criteria for protection against a land vehicle bomb through a letter to each affected licensee.

Licensees whose evaluation shows that measures to be taken to meet §73.55(c)(7) do not fully meet the design goals and criteria have two options. They may implement additional measures that would fully meet the design goals and criteria, or they may propose to the Commission additional measures other than ones needed to fully meet the design goals and criteria, <sup>must</sup> ~~provided this~~ <sup>must</sup> ~~approach provides~~ substantial protection against a vehicle bomb and ~~that it~~ <sup>can be demonstrated</sup> that the costs of measures to fully meet the design goals and criteria are not justified by the added protection that would be provided. These licensees would be required to provide their proposal and supporting bases to the Commission.

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This rulemaking activity must also be coordinated with OIG.

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The documentation and record keeping burden associated with §§50.54(p) and 50.59 changes applies to repetitive recordkeeping requirements. OMB has previously approved recordkeeping requirement for §§50.54(p) and 50.59 under OMB approval number 3105-0011. Since the proposed rule would require submittal of information outside the scope of either §§50.54(p) and 50.90 and documentation of results of evaluations onsite, Office of Management and Budget (OMB) review of the proposed rule will be needed.

is necessary ✓

Information collection requirements contained ✓

With respect to regulatory guidance, staff plans to make available a draft regulatory guide at the time of proposed rule publication. NUREG/CR 5246, "A Methodology to Assist in Contingency Planning for Protection of Nuclear Power Plants Against Land Vehicle Bombs" is currently available. A technical information NUREG, which is planned to be developed in time for final rule publication, is also being developed by the United States Army Corps of Engineers.

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COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

RECOMMENDATION:

That the Commission:

1. Approve a notice of proposed rulemaking (Enclosure 1).
2. Certify that this rule change, if promulgated, will not have a significant economic impact on a substantial number of small entities in order to satisfy the requirements of the Regulatory Flexibility Act [5 U.S.C. 605(b)].
3. Note:
  - a. The proposed rule would be published in the Federal Register for a 30 day public comment period.
  - b. An environmental assessment (Enclosure 2) has been prepared, pursuant to the National Environmental Policy Act of 1969, as amended, (42 U.S.C. 4321 et. seq.) and the Commission's regulations in Subpart A of 10 CFR Part 51, and has resulted in a finding of no significant environmental impact.
  - c. The Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification regarding economic impact on small entities and the reasons for it as required by the Regulatory Flexibility Act.
  - d. This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule is being submitted to the Office of Management and Budget for review



and approval of paperwork requirements.

- e. A public announcement will be issued (Enclosure 3). ✓
- f. A Regulatory Analysis (Enclosure 4) has been prepared and will be placed in the NRC Public Document Room.
- g. As required by 10 CFR 50.109, the staff has completed a backfit analysis for the proposed rule (Enclosure 5). The staff has determined, based on this analysis, that backfitting to comply with the requirements of this proposed rule will provide a substantial increase in protection to public health and safety or the common defense and security at a cost which is justified by the substantial increase. The analysis will be placed in the NRC Public Document Room.
- h. Appropriate Congressional committees will be notified of the proposed rule change (Enclosure 6).
- i. A proposed regulatory guide (Enclosure 7) will be published with this proposed rule and will be placed in the NRC Public Document Room.

*J. That a copy of the proposed rule will be distributed to the appropriate Congressional committees and the interested public.*

James M. Taylor  
 Executive Director  
 for Operations

Enclosures:

- 1. Federal Register Notice
- 2. Environmental Assessment
- 3. Public Announcement
- 4. Regulatory Analysis
- 5. Backfit Analysis
- 6. Congressional Letters
- 7. Regulatory Guide

ENCLOSURE 1

*Have a double-check  
for next time  
this rule.*

[7590-01] -P

NUCLEAR REGULATORY COMMISSION  
10 CFR Part 73  
RIN 3150- AE 81

Protection Against Malevolent Use of Vehicles at Nuclear Power Plants

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend its physical protection regulations for operating nuclear power reactors. The proposed amendment would modify the design basis threat for radiological sabotage to include use of a land/vehicle by adversaries for transporting personnel, hand-carried equipment, and/or explosives. The Commission believes this action is prudent based on evaluation of an intrusion incident at the Three Mile Island nuclear power station and the bombing at the World Trade Center.

DATE: Comment period expires <sup>Insert</sup> (enter) 30 days after publication in the Federal Register). Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Mail written comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch.

Deliver comments to: 11555 Rockville Pike, Rockville Maryland, between 7:45 am and 4:15 pm Federal workdays.

A proposed environmental assessment and finding of no significant impact on which the determination is based, a proposed regulatory analysis, a proposed backfit analysis, and a proposed regulatory guide are available for inspection at the NRC Public Document Room, 2120 L Street NW (Lower Level), Washington, DC. Single copies of the environmental assessment and finding of no significant impact are available from Carrie Brown, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 504-2382. Single copies of the regulatory and backfit analyses and the regulatory guide are available from Robert J. Dube, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 504-2912.

FOR FURTHER INFORMATION CONTACT: Priscilla A. Dwyer, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC, telephone (301) 504-2478.

SUPPLEMENTARY INFORMATION:

Background

In the development of its physical protection programs, NRC uses the concept of a design basis threat to assure adequate protection. The design basis threat is a hypothetical threat that is not intended to represent a real threat. Notwithstanding, it serves three purposes: (1) It provides a standard with which to measure changes in the real threat environment; (2) It is used to develop regulatory requirements; and (3) It provides a standard for evaluation of implemented safeguards programs. The intent of the design basis threat for power reactors is to provide a physical protection system that protects against radiological sabotage.

To assure adequacy of the design basis threat, NRC continually monitors and evaluates the threat environment, worldwide. The Commission is also briefed periodically by agencies such as the Central Intelligence Agency and the Federal Bureau of Investigation to keep abreast of domestic and foreign intelligence concerning threat. Although, based on current information, there is no significant change in the threat environment, the bombing at the World Trade Center demonstrated that a large explosive device could be assembled, delivered to a public area and detonated in the United States without advanced intelligence.

In addition, the unauthorized intrusion at the Three Mile Island nuclear power station demonstrated that a vehicle could be used to gain quick access to the protected area at a nuclear power plant. In light of these incidents, NRC held a public meeting on May 10, 1993, to obtain additional information from the public, affected licensees, and other interested parties concerning the need for any changes to the design basis threat for radiological sabotage.

Discussion

Findings. NRC has concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry. However, based on recent events, NRC believes that a vehicle intrusion or bomb threat to a nuclear power plant could develop without warning in the future. To maintain a prudent margin between what is the current threat estimate (low) and the design basis threat (postulated as higher for conservatism), NRC is proposing to amend 10 CFR Part 73 to modify the design basis threat for radiological sabotage to include protection against malevolent use of vehicles at nuclear power plants.

Description of Proposed Amendments. NRC proposes to amend §73.1 to explicitly include use of a four-wheel drive land vehicle by adversaries for the transport of personnel, hand-carried equipment, and/or explosives. In addition, §73.55 would be amended by adding three provisions. The first provision, §73.55(c)(7), would reflect addition of regulatory requirements to establish measures to protect the facility from use of a land vehicle to gain forced, rapid access to vital areas. The second provision, §73.55(c)(8), would propose a process for licensees to assess whether the protective measures established in accordance with §73.55 (c)(7) provide protection

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against a vehicle bomb consistent with design goals and criteria specified in the proposed regulatory guide. Licensees whose protective measures meet this criteria would certify this to the Commission. Licensees that did not satisfy the criteria would have the option to provide additional measures to meet the criteria or propose other additional measures that provide substantial protection against a land vehicle bomb. The third provision, §73.55(c)(9), describes proposed implementation schedules and information required to be submitted to the Commission.

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Regulatory Approach. The regulatory approach that NRC proposes would establish measures that protect vital equipment within vital areas from rapid, forced access by persons transported by a land vehicle and damage from the detonation of a vehicle bomb. The approach emphasizes protection of vital equipment by requiring licensees to establish measures to protect against the use of a land vehicle to gain rapid, forced access to vital areas of a facility. The approach would require licensees to establish a barrier system to prevent land vehicular access to vital areas of the plant. The approach would allow for use of natural features such as cliffs and natural waterways or man-made features such as buildings and canals to be included as part of the barrier system. Protection against rapid, forced access of a land vehicle to vital areas provides inherent protection for the facility against a vehicle transporting a bomb.

Licensees would be required to determine if measures established to protect against vehicular intrusion to vital areas of the facility provide protection against design goals and criteria set by the Commission regarding the threat of a land vehicle bomb. Essential, vital, or alternative equipment needed to shutdown the reactor and maintain the reactor in a shutdown condition would need to be protected. Determination of the protection of vital equipment could take into consideration protection provided by structures where the equipment was located, alternative equipment not damaged by the assumed explosion, and damage control measures. A design basis vehicle threat has been developed that describes vehicle characteristics and amount of explosives to be protected against. This information is protected as Safeguards Information and has been previously provided affected licensees.

PARTLY \*

It is estimated that most sites would meet the Commission design goals and criteria for protection against a vehicular bomb by providing protective measures against vehicle intrusion. Licensees whose evaluation shows that measures to be taken to meet the vehicle intrusion requirements do not fully meet the design goals and criteria for protection against a land vehicle bomb have two options. They may implement additional measures that would fully meet the design goals and criteria or they may propose to the Commission additional measures other than ones needed to fully meet the design goals and criteria, provided this approach provides substantial protection against a vehicle bomb and it can be demonstrated that the costs of measures to fully meet the design goals and criteria are not justified by the added protection that would be provided.

*If a licensee proposes alternative measures, they must demonstrate that*

Licensees would be required to submit to the Commission a letter providing the design of the barrier system and the results of their evaluation comparing the measures to protect against forced vehicle entry with the design goals and

↳ that ✓



criteria for protection against a land vehicle bomb. Licenses whose evaluation shows that measures to be taken to meet §73.55(c)(7) fully meet the design goals and criteria for protection against a land vehicle bomb and licensees who take additional measures to meet design goals and criteria for protection against a vehicle bomb would only have to submit this conclusion to the Commission. Licensees who choose not to take additional measures to fully meet the Commission design goals and criteria may propose alternative measures provided these measures provide substantial protection against a vehicle bomb and that it can be demonstrated that the costs of measures to fully meet the design goals and criteria are not justified by the added protection that would be provided. These licensees would be required to provide their proposal and supporting bases to the Commission.

GUIDANCE. ✓ A proposed regulatory guide has been prepared in response to this effort. The guide contains preliminary information that will assist licensees in initial assessments of protective measures against vehicle intrusions and approaches to assess whether the Commission design goals and criteria are met by measures taken to protect against vehicular intrusion. Additional guidance is currently available in NUREG/CR 5246, "A Methodology to Assist in Contingency Planning for Protection of Nuclear Power Plants Against Land Vehicle Bombs." NRC is also making arrangements with the U.S. Army Corps of Engineers to develop a NUREG that would be available by the effective date of the final rule. This NUREG would provide simplified methods for licensees to select barriers and perform an analysis of existing structures and equipment to demonstrate their ability to withstand the effects of an explosive blast.

Public Comment. ✓ The Commission notes ✓ The Commission notes ✓ The Commission is issuing this proposed rule with a 30-day public comment period, noting that some of the issues associated with a design basis threat modification have been previously discussed in a public meeting. Interested parties who previously submitted comments at the time of the public meeting need not resubmit their comments. Previously submitted comments will be addressed as part of the rulemaking comment review process.

In addition to comments on the need to revise the design basis threat, the Commission is interested in receiving comments on the proposed implementation schedule for the rule, particularly with respect to availability of vehicle denial systems for purchase. It is estimated that there are 67 possible sites needing protection with an estimated 4 denial systems needed per site.

Implementation. ✓ It is the Commission's intention that licensees will have completed their evaluations within 90 days and implementation within 360 days from the effective date of the final rule. Applicants for an operating license are required to complete their evaluation by within 90 days and implementation within 360 days from the effective date of the rule or the date of receipt of the operating license, whichever is later.

Safeguards Information. ✓ The Commission cautions licensees not to submit any data that is protected as Safeguards Information as part of their comments on the proposed rule.

*Amendments*

Enforcement. ✓ Violation of these proposed rules, if promulgated, may subject a person to the criminal penalties in section 223 of the Atomic Energy Act, of 1954, as amended.

Decommissioning Reactors. ✓ Licensees who are either in the process of decommissioning or plan to decommission in the near future will be handled on a case-by-case basis by NRC licensing staff to determine if full or partial exemption from the new requirements is appropriate.

#### Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that this rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment and therefore an environmental impact statement is not required. The proposed rule involves installation of vehicle barriers at the protected area of operating power reactor sites and an evaluation of these barriers by the licensee to determine whether they provide adequate protection against a land vehicle bomb under design goals and criteria established by the Commission. Implementation of these amendments would not involve release of or exposure to radioactivity from the site. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the environmental assessment and the finding of no significant impact are available from Carrie Brown, U.S. Nuclear Regulatory Commission, Washington, DC, telephone (301) 504-2382. *CPI*

#### Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule is being submitted to the Office of Management and Budget for review and approval of paperwork requirements.

Public reporting burden for this collection of information is estimated to average 371 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch (P-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the Paperwork Reduction Project (3150- ), Office of Management and Budget, Washington, DC 20503.

#### Regulatory Analysis

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the cost and benefits of the alternatives considered by the Commission. The draft analysis is available for inspection in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the draft analysis may be obtained from Robert J. Dube,

Do not fall within the scope of the definition of "small entities" as given in the Regulatory Flexibility Act or the Small Business Size Standards promulgated in Regulations issued by the Small Business Administration (13 CFR 121).  
U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 504-2912.

The Commission requests public comment on the draft regulatory analysis. Comments on the draft analysis may be submitted to the NRC as indicated under the ADDRESSES heading.

### Regulatory Flexibility Certification

Based on the information available at this stage of the rulemaking proceeding and in accordance with the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Commission certifies that, if promulgated, this rule will not have a significant economic impact upon a substantial number of small entities. The proposed rule affects only operating power reactors. The utilities that operate these nuclear power reactors are not considered small entities.

### Backfit Analysis

As required by 10 CFR 50.109, the Commission has completed a backfit analysis for the proposed rule. The Commission has determined, based on this analysis, that backfitting to comply with the requirements of this proposed rule will provide a substantial increase in protection to public health and safety or the common defense and security at a cost which is justified by the substantial increase. The backfit analysis on which this determination is based is available for inspection at the Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the backfit analysis are available from Robert J. Dube, U.S. Nuclear Regulatory Commission, Washington, DC, telephone (301) 504-2912. It should be noted that the conclusions reached are based on best available data. The proposed rule contains a provision for affected licensees to conduct site specific analyses if they so choose.

~~10 CFR Part 73~~

~~Last of Subjects in 10 CFR Part 73~~

Criminal penalties, Hazardous materials + transportation, Incorporation by reference, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements, Security measures.

~~Part 73 PHYSICAL PROTECTION OF PLANTS AND MATERIALS~~  
1. The authority citation for Part 73 continues to read as follows:

AUTHORITY: Secs. 53, 161, 68 Stat. 930, 948, as amended, sec. 147, 94 Stat. 2232, 2241, (42 U.S.C. 10155, 10161). Section 73.37(f) also issues under sec. 301, Pub. L. 96-295, 94 Stat. 789 (42 U.S.C. 5841 note). Section 73.57 is issues under sec. 606, Pub. L. 99-399, 100 Stat. 876 (42 U.S.C. 2169).

2. In §73.1, paragraph (a) is amended to read as follows:

§73.1 Purpose and scope.

(a) Purpose. This part prescribes requirements for the establishment and maintenance of a physical protection system which will have capabilities for the protection of special nuclear material at fixed sites and in transit and in plants in which special nuclear material is used. The following design

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954 and 5 U.S.C. 552 and 553, the NRC is proposing to adopt the following amendments to Part 73.

INSERT A

INSERT A

PART 73 - PHYSICAL PROTECTION OF PLANTS AND MATERIALS

AUTHORITY: Secs. 53, 161, 68 Stat. 930, 948, as amended, sec. 147, 94 Stat. 780 (42 U.S.C. 2073, 2167, 2201); sec. 201, as amended, 204, 88 Stat. 1242, as amended, 1245 (42 U.S.C. 5841, 5844).

Section 73.1 also issued under secs. 135, 141, Pub. L. 97-425, 96 Stat. 2232, 2241 (42 U.S.C. 10155, 10161). Section 73.37(f) also issued under sec. 301, Pub. L. 96-295, 94 Stat. 789 (42 U.S.C. 5841 note). Section 73.57 is issued under sec. 606, Pub. L. 99-399, 100 Stat. 876 (42 U.S.C. 2169).

FEDERAL REGISTER CITATION: November 24, 1992; 57 FR 55072.  
DESIRED AUTHORITY CITATION: Yes.



basis threats, where referenced in ensuing sections of this part, shall be used to design safeguards systems to protect against acts of radiological sabotage and to prevent the theft of special nuclear material. Licensees subject to the provisions of §73.20 or §73.50 are exempt from §73.1(a)(1)(i)(E).

3. In §73.1(a)(1)(i), a new paragraph (E) is added to read as follows:

~~§73.1 Purpose and Scope~~

(a) Purpose \*\*\*

(1) Radiological sabotage \*\*\*

(i) \*\*\*

(E) a four-wheel drive land vehicle used for the transport of personnel, hand-carried equipment, and/or explosives, and

\* \* \* \* \*

3. In §73.55, new paragraphs (c)(7), (c)(8), and (c)(9) are added to read as follows:

§73.55 Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage.

\* \* \* \* \*

(c) \*\*\*

(7) Vehicle control measures should be established to protect against use of a land vehicle, as specified by the Commission, as a means of transportation to gain rapid access to vital areas.

*"Should" means "must" for licensees to take this measure. If this is to be an enforcement requirement, use "must".*

(8) Each licensee shall compare the vehicle control measures established in accordance with 10 CFR 73.55(c)(7) with the design goals and criteria for protection against a land vehicle bomb specified by the Commission. Each licensee shall either (i) certify to the Commission, through 10 CFR 50.54(p) amendments to their security plans that the vehicle control measures meet the criteria specified, or (ii) propose alternative measures, in addition to the measures established in accordance with 10 CFR 73.55(c)(7), describe the level of protection that these measures would provide against a land-vehicle bomb, and compare the costs of the alternative measures with the costs of measures necessary to fully meet the criteria through §50.54(p) amendments to security plans or §50.59 changes in the facility as described in the safety analysis report or procedures described in the safety analysis report. The Commission will accept the proposed alternative measures if they provide substantial protection against a land vehicle bomb, and it is determined by an analysis, using the essential elements of the criteria in 10 CFR 50.109, that the costs

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of fully meeting the design goals and criteria are not justified by the added protection that would be provided.

(9) Each licensee who holds an operating license shall:

(i) <sup>2.25.93</sup> By 90 days from final rule effective date <sup>submit</sup> to the Commission a letter providing the design of the proposed land vehicle barrier system and the results of the land vehicle bomb comparative analysis.

(ii) <sup>If a licensee</sup> For licensees <sup>who</sup> choose to use 10 CFR 50.109 to propose alternative measures, those measures must be submitted with the letter required by §73.55(c)(9)(i) along with a justification as required by §73.55(c)(8).

(iii) Protect the letter as Safeguards Information.

(iv) <sup>from</sup> By (insert 360 days of the effective date of the rule), <sup>fully</sup> implement the required vehicle control measures or the site specific alternative measures as approved by the Commission and certify this by letter to the Commission.

(v) For each applicant for a license to operate a nuclear power reactor pursuant to §§50.21(b) or 50.22 of this chapter, whose application was submitted prior to (insert effective date of rule), incorporate the required vehicle control program into the site Physical Security Plan and implement it either by (insert 360 days from the effective date of the rule) or the date of receipt of the operating license, whichever is later.

(vi) ~~M~~aintain as a record the evaluation and certification letter required by this section for as long as the licensee holds an operating license.

Dated at Rockville, MD this \_\_\_\_\_ day of \_\_\_\_\_ 1993.

For the Commission.

Samuel J. Chilk,  
Secretary of the Commission.

ENCLOSURE 2

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT  
FOR AMENDMENTS TO 10 CFR 73

Protection Against Malevolent Use of Vehicles at Nuclear Power Plants

The Commission has determined, under the National Environmental Policy Act (NEPA) of 1969 as amended, and the Commission's regulations in 10 CFR Part 51, that promulgation of the amendments to 10 CFR Part 73 will not have a significant effect on the quality of the human environment and that, therefore, an environmental impact statement is not required.

This determination is based on an environmental assessment and finding of no significant impact performed in accordance with the procedures and criteria in Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," as published in the Federal Register, March 12, 1984.

Part 51 is NRC's regulation for assuring appropriate environmental consideration of licensing and regulatory actions. Generally, under Part 51 any licensing or regulatory action will fall within one of three classes.

The first class of actions consists of those which require an environmental impact statement. The criteria for and identification of this class of actions are given in §51.20. This class of actions includes matters such as issuance of a construction permit or operating license for a nuclear power plant.

The second class of licensing and regulatory actions consists of those requiring an environmental assessment. The criteria for and identification of this class of licensing and regulatory actions are given in §51.21. This class of actions, for purposes of environmental considerations, consists of those actions which are neither identified in §51.20 as requiring an environmental impact statement nor identified in §51.22 as qualifying for categorical exclusion from preparation of an environmental impact statement or assessment.

The third class of actions consists of those eligible for categorical exclusion following a Commission declaration that the category of actions does not individually or cumulatively have a significant effect on the human environment. The criteria for and identification of licensing and regulatory actions eligible for categorical exclusion are given in §51.22. Amendments to Commission regulations which are corrective, or of a minor or nonpolicy nature and do not substantially modify existing regulations, fall within this class of actions.

The proposed amendments to 10 CFR Part 73 regarding protection against malevolent use of vehicles at nuclear power reactors are subject to the requirements of §51.21 (the second class of actions) and, accordingly, the assessment ~~below~~ <sup>below</sup> has been prepared. *Letter 05*

The required contents of an environmental assessment, set out in §51.30, are as follows:

§51.30 Environmental assessment.

- (a) An environmental assessment shall identify the proposed action and include:
- (1) A brief discussion of:
    - (i) The need for the proposed action;
    - (ii) Alternatives as required by section 102(2)(E) of NEPA;
    - (iii) The environmental impacts of the proposed action and alternatives as appropriate; and
  - (2) A list of agencies and persons consulted, and identification of sources used.

The following comments respond to the specific requirements of § 51.30.

Need for Action

The Nuclear Regulatory Commission (NRC) is proposing to amend its physical protection regulations for operating nuclear power reactors. The proposed amendments would modify the design basis threat for radiological sabotage to include use of a four-wheel drive land vehicle by adversaries for transporting personnel, hand-carried equipment and/or explosives. Implementation of the rule as proposed would require applicable licensees to design and install a vehicular barrier system to protect vital areas and equipment from access by unauthorized forced entry by land vehicles. Licensees would also be required to evaluate the effectiveness of these measures to protect against a vehicle bomb.

The Commission believes this action is necessary based on an evaluation of an unauthorized intrusion at the Three Mile Island nuclear power station which demonstrated that a vehicle could be used to gain quick access to the protected area at a nuclear power plant. In addition, the bombing at the World Trade Center demonstrated that a large explosive device could be assembled, delivered to a public area and detonated in the United States without advance warning. Although, the Commission has concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry, the Commission believes that a vehicle intrusion or bomb threat to a nuclear power reactor could develop without advance warning in the future. The proposed amendments would directly affect 67 nuclear power reactor sites.

Alternatives

Section 102(2)(E) of NEPA provides that agencies of the Federal Government shall "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." The objectives of these amendments are to protect vital areas and equipment from sabotage (1) by adversaries transported by land vehicles and (2) by detonation of large bulk explosives at a distance that would damage vital equipment. These objectives

would be accomplished through use of a vehicle barrier system and a licensee evaluation of the effectiveness of the barrier system to protect against a vehicle bomb.

It is estimated that most sites would meet the Commission design goals and criteria for protection against a vehicular bomb by providing protective measures against vehicle intrusion. Licensees that find that measures to be taken to meet the vehicle intrusion requirements do not fully meet the design goals and criteria for protection against a land vehicle bomb have two options. They may implement additional measures that would fully meet the design goals and criteria, or they may propose to the Commission additional measures other than ones needed to fully meet the design goals and criteria, provided this approach provides substantial protection against a vehicle bomb and that it can be demonstrated that the costs of measures to fully meet the design goals and criteria are not justified by the added protection that would be provided. The proposed amendments explicitly include provisions for licensees to propose, if determined necessary, alternative measures to protect against a vehicle bomb. For example, in a hypothetical situation, a power reactor site may not be able to install vehicle barriers at a distance sufficient to provide protection against an explosion due to site configuration in relation to roadways or the owner-controlled boundary. Without flexibility built into the proposed amendments, a licensee might be compelled to reroute roadways or purchase additional land to provide for sufficient distance to protect against an explosion.

However, the proposed amendments would allow a licensee to take additional measures such as expansion of the barrier boundary or reconfigure vital equipment or areas to assure maintenance of vital equipment to enhance protection against a vehicle bomb. One alternative measure that was considered and immediately rejected was the deployment of security measures at the owner-controlled boundary. This alternative proved to be extremely cumbersome from an operational perspective and man-power intensive. No appropriate alternatives were identified beyond placement of vehicle barriers to prevent intrusion to vital areas of the plant.

#### Environmental Impacts

Implementation of the proposed amendments involves two components, installation of physical barriers and a process for licensees to assess whether the protective measures established to protect against vehicle intrusion provide protection against a vehicle bomb. The later activity may require, for some licensees, measures in addition to those needed to protect against vehicle intrusion. Neither of these activities would involve release of or exposure to radioactivity at affected sites.

The installation of barriers to prevent vehicle intrusions to vital areas of the facility involves placement of "active" vehicle barriers, most often hydraulically operated vehicle gates, at entry/exit points and static or "passive" vehicle barriers, such as concrete bollards or secured airplane cable, about the remaining protected area perimeter. Active vehicle barriers require a power source to operate and generally some site excavation at the point of placement, although surface mounted active vehicle barrier systems

TRUCK BOMBS  
DUMP TRUCKS CIRCLED,



are commercially available. <sup>Because</sup> Since most active vehicle barrier systems are hydraulically operated, there may on occasion be leakage of this fluid to the environment. This leakage would be of the order of 20 gallons or less per active barrier over the life of the system. Additionally, a non-toxic biodegradable oil is currently being used successfully at some Federal facilities.

The strategy for protection against vehicle intrusion would also involve placement of passive vehicle barriers around vital areas, most likely close or adjacent to the protected area boundary. In addition, some licensees may need to take additional measures, such as expanding the barrier perimeter or installation of backup equipment, to provide a specified level of protection against a vehicle bomb.

Construction activities associated with passive vehicle barriers would involve some earth movement, either for excavation or development of berms, and possible destruction of trees and shrubbery. Installation of backup equipment would take place entirely within a facility's protected area and, as previously stated, would not involve release of or exposure to radioactivity from the site.

In summary, these activities are expected to be minor in nature with respect to environmental impact and, accordingly, support a finding that the amendments proposed involve no significant environmental impact.

#### Agencies and Persons Consulted

In the development of this environmental assessment, staff consulted with several Federal agencies and personnel involved with development and construction of vehicle barrier systems. The U.S. Army Corps of Engineers provided strong support for the entire project of developing measures to counter a revised design basis threat and possible environmental impacts were discussed with representatives of this group. Counsel was also received from the Treasury Department where practical experience was gained in the installation of active vehicle barrier systems. Additional practical experience on the installation of active and passive vehicle barrier systems was obtained from random consultation with one class of licensees currently required to install vehicle barriers. Staff discussed environmental impacts from construction and installation of active vehicle barrier systems with commercial vendors of this equipment. Finally, the Nuclear Regulatory Commission sponsored a public forum on May 10, 1993, to obtain comment on all aspects of a revised design basis threat from public interest groups, affected licensees, and other interested parties.

#### Determination of Need for Environmental Impact Statement

Section 51.31 provides that upon completion of an environmental assessment, the appropriate NRC staff director will determine whether to prepare an environmental impact statement and finding of no significant impact on the proposed action. The Executive Director for Operations has determined that the environmental assessment adequately supports a finding that the amendments will have no significant environmental impact. Accordingly, the Commission

has determined not to prepare an environmental impact statement for this rulemaking. The amendments will not significantly affect safe operation of the affected facilities nor the routine release of or exposure to radioactivity from the facilities.

ENCLOSURE 3

NRC PROPOSES AMENDMENTS TO PHYSICAL SECURITY REQUIREMENTS  
FOR NUCLEAR POWER PLANTS

The Nuclear Regulatory Commission is proposing to amend its physical protection regulations for operating nuclear power plants. The amendments would modify the design basis threat for radiological sabotage to include the use of land vehicles by adversaries for transporting personnel, hand-carried equipment, and explosives.

Nuclear power plant licensees are required to implement a system that protects against acts of radiological sabotage, and specifically against the design basis threat for radiological sabotage as set out in the Commission's regulations.

Based on current information derived by continually monitoring and evaluating the worldwide threat environment and briefings by various government intelligence agencies, the NRC has concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry. However, based on the recent bombing of the World Trade Center and the unauthorized intrusion at the Three Mile Island nuclear power plant, the NRC believes that a vehicle intrusion or sabotage threat to a nuclear power plant could develop without warning in the future.

To maintain a prudent margin between the current threat estimate (low) and the design basis threat (postulated as higher

for conservatism), the NRC is proposing to amend its regulations to modify the design basis threat for radiological sabotage to include protection against malevolent use of vehicles at nuclear power plants.

The proposed amendments, which are to Part 73 of the Commission's regulations, would include--within the design basis threat that licensees are required to protect against--the use of a four-wheel-drive land vehicle for the transport of personnel, hand-carried equipment or explosives. The amendments would provide a process to allow for alternative measures to protect against sabotage.

Licensees would be required to establish measures to protect the facility from use of a land vehicle to gain forced, rapid access to vital areas. They would also be required to assess whether the measures taken to protect against vehicle intrusion provide protection against a vehicle bomb consistent with design goals and criteria specified by the Commission. Licensees who could not demonstrate that they fully meet the Commission's design goal for protection against a vehicle bomb would have the option of proposing alternative measures for protection against this threat.

Programs of licensees who are in the process of decommissioning or are contemplating decommissioning in the near future would be evaluated on a case-by-case basis by the NRC to determine if full or partial exemption from the new rule is appropriate.



*Waste Regulation*

The rule ~~calls for~~ operating nuclear power plant licensees (1) to submit within 90 days of the effective date of the final rule documentation containing the design of the barrier system and the results of their evaluation and (2) to fully implement the required vehicle control measures or the site-specific alternative measures as approved by the Commission within 360 days of the effective date of the final rule.

The NRC currently plans to complete this rulemaking within three and one-half months from publication of the proposed rule in the Federal Register on

\_\_\_\_\_. Interested persons are invited to submit written comments on the proposal to the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch. The comments should be submitted by \_\_\_\_\_ (30 days following publication of the Federal Register notice).

ENCLOSURE 4

REGULATORY ANALYSIS  
Malevolent Use of Vehicles at Nuclear Power Plants

1.0 STATEMENT OF THE ISSUE

1.1 Background

The Commission began its deliberations on the vehicle issue in 1985 and a series of Commission meetings and papers followed. These meetings and papers focused on a range of options to respond to the potential threat posed by vehicles, Nuclear Regulatory Commission and other agency assessments of the threat, and the continuing validity of the design basis threat (DBT) for radiological sabotage. Staff provided options to the Commission in SECY-86-101 and SECY-88-127. Options were included for both short-range and long-range contingency planning by licensees and NRC, and for various physical security requirements. The physical security options addressed were: (1) a vehicle denial system on existing access roads to power reactor sites, (2) vehicle denial system for land portion of protected area (PA) perimeter, and (3) surface vehicle bomb protection.

The Commission also solicited the views of other agencies. A number of Commission meetings between 1985 and 1987 included threat briefings by the Central Intelligence Agency (CIA), the Federal Bureau of Investigation (FBI), and the Department of Energy. Further, guidance was sought from the National Security Council (NSC). The NSC and the FBI documented their assessments in classified correspondence to the NRC.

Although staff recommended that the Commission approve contingency plans for use by the NRC staff in the event that a vehicle bomb threat were to arise, the Commission directed in a Staff Requirements Memorandum (SRM), dated June 16, 1988, that short-range contingency planning by licensees be required that would assure that plans were in place for installation of temporary emergency measures for response to a surface vehicle bomb threat. In choosing short-range contingency planning, the Commission also chose not to modify the DBT. Contingency planning for surface vehicle bombs was addressed in Generic Letter 89-07 and developed by licensees in 1989.

1.2 Recent Events

On February 7, 1993, there was a forced vehicle entry into the PA at Three Mile Island (TMI) Unit 1. An NRC Incident Investigation Team report on the event highlighted the fact that PA barriers could be penetrated by vehicles and that assessment and response to such a penetration was difficult. On February 25, 1993, a van bomb, containing between 500 and 1500 pounds of TNT equivalent, was detonated in a public underground parking garage at the World Trade Center in New York City. In a memorandum from Samuel J. Chilk, Secretary of the Commission, to James M. Taylor, Executive Director for Operations, dated March 1, 1993, the Commissioners directed staff to reevaluate and, if necessary, update the design basis threat for vehicle intrusion and the use of vehicle bombs.

In SECY-93-102, "Review and Update of Options To Protect Against Malevolent Use of Vehicles and Related Threat Information," dated April 16, 1993, staff provided information regarding the 1985-1988 Commission deliberations on the need to require nuclear power reactors to protect against malevolent use of vehicles and provided an updated range of protection options along with current cost information. Staff and the Nuclear Control Institute, a public

interest group, briefed the Commission on April 22. Staff solicited comments on the issues at a public meeting on May 10, 1993. *JHC*

*JHC* Staff forwarded SECY-93-166, "Staff Recommendation for Protection Against Malevolent Use of Vehicles at Nuclear Power Plants," to the Commission on June 14, 1993. Enclosure 6 to SECY-93-166 was a regulatory analysis that included the four options discussed in SECY-92-102. To provide flexibility in implementing DBV protection at some distance from vital equipment at a reasonable cost, staff also developed and analyzed a fifth option. In a memorandum from Samuel J. Chilk, Secretary of the Commission, to James M. Taylor, Executive Director for Operations, dated June 29, 1993, the Commission directed staff to initiate expedited rulemaking to implement option 5. This regulatory analysis updates the analysis provided in Enclosure 6 of SECY-93-166. *JHC*

## 2.0 OBJECTIVES OF THE RULEMAKING

The objective of this proposed rulemaking is to maintain a prudent margin between what is the current threat estimate (low) and the design basis threat for radiological sabotage specified in 10 CFR 73.1(a) (higher).

## 3.0 ORIGINAL OPTIONS

### 3.1 Option 1

No change in current position.

### 3.2 Option 2

Roadway Protection - Require a vehicular protection system on existing roadways and some distance on either side of the vehicle control points into PAs.

This option would protect against forced vehicle entry only in the immediate area of existing vehicle gates into the PA. Because the remainder of the PA perimeter would remain vulnerable to vehicle intrusions, licensee contingency planning for land vehicle bombs would be retained.

Barriers that could be used to protect gates include permanent active barriers that can be lowered to permit passage of authorized vehicles and temporary barriers that can be moved. Adjacent areas could be protected by passive barriers such as concrete blocks, bollards (i.e., heavy posts), or planters, all which must be properly anchored into the ground.

### 3.3 Option 3

PA Perimeter Protection - Instead of existing contingency procedures, require protection against vehicular intrusions into PAs.

This option would extend vehicle protection to the entire PA. In addition to the type of barriers discussed in Option 2, licensees could use other techniques such as trenching or reinforcing the existing perimeter with anchored cabling systems.

This option would also provide varying degrees of protection against a vehicle bomb. At facilities with an average sized PA and typical concrete structures,

a vehicle bomb similar to that reportedly used at the World Trade Center may cause moderate damage to some concrete walls. However, the safety equipment located behind typical concrete walls, but not contiguous to outside walls, would likely be protected. Some facilities also have intervening structures which might absorb some of the energy from an explosive blast.

However, some PAs are smaller and have portions of the PA perimeter that are close to a vital area barrier and would likely be severely damaged. In addition, not all safety equipment is protected by reinforced concrete walls. At a few sites, significant portions of safety systems are not behind concrete walls.

### 3.4 Option 4

Protection at Standoff Distance for a DBV and Explosive Device - Instead of existing contingency procedures, require protection against a vehicle bomb of a specified size. Existing vehicle bomb contingency procedures would remain in effect until permanent measures are implemented.

*the* At some sites, protection against vehicular intrusions into PAs may be sufficient to protect against the DBV bomb. At other sites, licensees would have to provide additional measures to protect against unauthorized vehicles approaching close enough to vital equipment to cause a significant safety risk. Staff believes that this could be done at most sites without reconfiguring existing PA perimeters, intrusion detection systems, and closed-circuit television (CCTV) or increasing the size of security forces. The extent of additional measures required for some sites would vary depending on the size of the design basis explosive used in determining appropriate stand-off distances. Implementation options would include installing permanent or moveable barriers to protect against vehicle access to portions of the PA perimeter or installing blast shields or deflectors to protect vital equipment.

## 4.0 CONSEQUENCES

### 4.1 Analytical Approach

*the* Staff conducted a preliminary analysis of the benefits and costs of the four options in support of SECY-93-102. Because of the short time available, this preliminary analysis was limited in scope. To assess the benefit from protection against use of a vehicle for forced entry into the PA (absent a bomb threat), staff reviewed NUREG-1485, "Unauthorized Forced Entry into the Protected Area at Three Mile Island Unit 1 on February 7, 1993." For the purposes of this analysis, staff also reviewed prior assessments of the vehicle intrusion issue. It also examined details of the times it would have taken an adversary to reach vital areas from the PA at TMI, both using a vehicle and on foot, which was outside the scope of NUREG-1485.

In analyzing the benefits of protecting against a vehicle bomb for SECY-93-102, staff reviewed drawings of all 67 power reactor sites that are currently operating or are in temporary outages, that showed the owner controlled area, the PA, and the location of buildings that contained vital equipment. For all sites, staff estimated the shortest distance between the outer edge of the owner controlled area and a vital area. For 26 sites, chosen at random, staff estimated the length of the PA perimeter, the shortest



distance between the PA perimeter and a vital area, and the shortest distance between a parking area and the nearest vital area. Because of the small scales involved, many of the estimates of distances were imprecise.

To estimate the impact of a truck bomb of the size described in Enclosure 8 of SECY-93-166, staff assumed a building with concrete walls 18 inches thick and an effective density of rebar of 0.2 percent. Most vital area barriers equal or exceed this assumption, although several sites have a few pieces of vital equipment that are not within structures. Staff assumed that the ceilings or roofs of vital area structures would provide protection at least equivalent to the wall. For distances at which the closest vital area structure would provide a low level of protection, staff assumed that vital equipment within the structure would be disabled. Staff estimated the impact of an explosive blast on building structures using the United States (U.S.) Corps of Engineers Blast Analysis Manual, PDC-TR-91-6, July 1991. Staff did not assess the significance of the actual equipment in the nearest vital area structures nor did it assess whether redundant or diverse equipment would continue to function.

Since preparing SECY-93-102, staff has expanded the scope of its analysis of vehicle bomb protection. It has expanded its review of site drawings to all 67 sites. It then identified the 30 sites that its initial analysis indicated had a specified distance between the PA and the nearest vital area. (At a distance greater than the specified distance, most vital area barriers should provide at least a medium level of protection. The Corps of Engineers uses medium level of protection to describe a structure that would be damaged, but repairable. Occupants or other assets within the structure may sustain minor injuries or damage.) For these 30 sites, it determined, through information obtained by the resident inspectors, more precise estimates of the distance from the PA to all vital areas that were within 125. For these vital areas, it obtained available details on the wall structures. For vital area structures that appeared to provide less than medium protection, it assumed that the vital equipment within the structure would be disabled and then determined whether redundant or diverse equipment would be available to perform the same function.

Staff has been unable to obtain data on the direct effect of an explosive blast on unprotected equipment. Its initial assessment on equipment not in buildings focused on the availability of diverse systems, substantial intervening buildings, and stand-off distances sufficient to reduce blast overpressures to the same range as static pressures used in design to protect against natural phenomena.

#### 4.2 Benefits

Traditionally, the staff has not attempted a quantitative evaluation of the benefits associated with safeguards requirements. In 1983, the NRC reviewed past efforts to quantify risk due to sabotage of nuclear power plants in an attempt to include consideration of that risk in the Commission's safety goal. The review led the staff to conclude that sabotage should not be included in the safety goal because no technical basis was available for quantifying the contribution of sabotage to the overall risk from nuclear power plant operations.

For the purpose of this analysis, a quantitative evaluation would require, among other things, quantification of the likelihood that someone would use a

70) vehicle bomb in an attempt to damage a nuclear power plant, the probability that the bomb would be set off from a stationary location or that forced entry into the PA would be attempted, the probability that a bomb of a particular size would be used, and the probability that the bomb would be in a particular location. Staff is unable to quantify any of these factors.

40) In analyzing Options 2 and 3, staff first qualitatively considered the benefits that would be gained from avoiding a TMI-type intrusion, assuming that the intruders had malevolent intent and the characteristics of the DBT specified in 10 CFR 73.1(a). Option 2 would provide little incremental benefit, since portions of the PA perimeter at most sites would still be protected by only a chain link fence. A typical unenhanced chain link fence provides little protection against a moving vehicle. For any sites where Option 2 would be effective because natural terrain or other site features prevent access to the PA perimeter away from vehicle access points, the site would effectively meet Option 3 at no additional costs beyond those to meet Option 2.

40) With respect to Option 3, staff identified several lessons learned from the vehicle intrusion at TMI. Although the intrusion detection system generated an alarm, the alarm station operators were not able to confirm the intrusion promptly by CCTV. A foot patrol was sent to evaluate the cause of the alarm. There was confusion and misinformation given to operations and security staff until a positive assessment of the intrusion could be made. Out of the confusion and concern for personal safety, operations staff made decisions that could have negatively affected the public health and safety. Even when an initial assessment was made, licensee staff did not know how many unauthorized individuals were inside the PA, where they were, and whether they possessed weapons or explosives. The vehicle also could have provided some protection from responder weapons fire, could have been used as a breaching device, or could have been used as a weapon against on-site personnel.

70) Although at many sites, vital area doors can be reached on foot within similar periods of time as with a vehicle, the incident demonstrated that a person in a vehicle could penetrate a PA barrier and quickly approach a vital area barrier. Staff estimates that at TMI an adversary in a vehicle could have reached vital areas about 50 seconds faster than on foot. At some sites, this difference could significantly affect the licensee's ability to interdict an adversary before critical safety equipment was reached.

By providing protection against vehicular intrusion into the PA, Option 3 also provides varying degrees of protection against a vehicle bomb. If a barrier stopped a vehicle at the PA perimeter with little or no further penetration, about 90 percent of the sites would provide significant protection against a vehicle bomb of the type specified in Enclosure 8 of SECY-93-166. Barriers that result in no vehicle penetration for vehicle impacts at specified kinetic energies are typically more expensive than those that allow some penetration. For less expensive barriers, a vehicle of the type specified in Enclosure 8 may penetrate as much as 30 feet into the PA. For these types of barriers, about 80 percent of the sites would provide significant protection. Staff's analysis also indicates that there is a high likelihood that all sites would be capable of achieving and maintaining safe shutdown if a vehicle bomb of the size specified in Enclosure 8 were detonated at any land accessible location of a nuclear power plant outside of the owner controlled area. The

Option 4 would provide an additional benefit by assuring that the remaining 10 to 20 percent of the sites would provide significant protection against a vehicle bomb of the type specified in Enclosure 8. Enclosure 7 of SECY-91-166 provided information (Safeguards Information provided under separate cover) regarding the potential impact at certain sites that might not provide significant protection against a large vehicle bomb that was stopped at the PA perimeter.

#### 4.3 Assumptions used in Predicting Backfit Costs

##### General Assumptions

1. Based on analysis of all power reactor sites, site perimeters range between about 2,000 and 9,000 feet. Site PA perimeters that have potential for land vehicular access range from 2,000 to 7,000 feet. This range assumes some protection by natural terrain features which would preclude the need for protection of portions of the PA.

2. Site has four vehicle access points. Some sites may have up to 15 vehicle access points to protect.

##### Costs of Specific Intrusion Protection Devices Active Vehicle Access Barriers

Active barriers - Active vehicle access barriers include reinforced sliding gates and pop-up barriers. Vendor prices for materials and installation of active barriers of these types with a width of 10 - 12 feet range between \$15 - 35K. Price is dependent on several factors, most important of which is the design characteristics (size and speed) of the vehicle to be stopped. To account for licensee overhead costs (engineering, interface connections, procurement, and training) the vendor costs have been doubled. Therefore, the prices used in the cost estimates are as follows:

- a. \$30K for an active barrier to stop a passenger vehicle
- b. \$40K for an active barrier to stop a pickup truck
- c. \$70K for an active barrier to stop a large truck

Passive Barriers - Commonly used passive barriers are concrete barriers (Jersey Bounces) or cabling that can be placed at the PA fence and anchored at periodic intervals. Passive barriers to stop larger size vehicles include concrete planters and reinforced concrete walls. Price is dependent on a number of factors, most important being the size and speed of the vehicle (kinetic energy). Licensees may also choose combinations of options, such as a means to slow down a vehicle, which would justify less substantial barriers. Vendor prices for concrete barriers and cabling that can stop passenger size vehicles are estimated to be between \$16 and \$25 per foot. Vendor prices for passive barriers that can stop pickup trucks are estimated to be between \$36 and \$60 per foot, although staff did not find specific barrier test data for barriers that stop this size vehicle. Vendor prices for passive barriers that can stop large trucks are estimated to be between \$110 and \$136 per foot. To account for licensee overhead costs (engineering and procurement) the vendor costs have been tripled. Therefore, the prices used in the cost estimates are as follows:

- a. \$60/ft for a passive barrier to stop a passenger size vehicle with some penetration
- \$90/ft for a passive barrier to stop a passenger size vehicle with no penetration
- b. \$150/ft for a passive barrier to stop a pickup truck with some penetration
- \$225/ft for a passive barrier to stop a pickup truck with no penetration
- c. \$375/ft for a passive barrier to stop a large truck with some penetration
- \$550/ft for a passive barrier to stop a large truck with no penetration

Standoff Distance Analysis - If required to do a site-specific analysis, it is assumed that a licensee would need to do one similar to that described in NUREG/CR-5246, "A Methodology to Assist in Contingency Planning for Protection of Nuclear Power Plants Against Land Vehicle Bombs." This analysis would consist primarily of two major elements.

1. Blast Effect Analysis - The blast analysis would require assessment of what vital structures would be damaged and what vital equipment in that structure was damaged (assuming an explosive size). At many sites, where equipment was located inside reinforced concrete walls at sufficient standoff distances from the PA, this analysis would not need to be extensive. At other sites, with shorter distances between the PA boundary and vital area structures, this analysis could be significantly more complex. Vital equipment needed to be protected and not located in a building would also add to the complexity of the analysis.

2. Systems Analysis - Once it was determined what equipment was damaged, analysis would need to be done to determine if there was backup equipment, not damaged, that would allow the plant to maintain a safe shutdown condition.

#### 4.4 Results of Costs Analysis

Option 1 - No change in current position.

Cost Summary:

No additional costs



Option 2 - Roadway vehicle intrusion protection at PA perimeter.

Cost Summary:

Items	Passenger Vehicle	Pickup Truck	Large Truck
1. 4 Active Vehicle Access Barriers	120	160	280
2. 800' Passive Barrier	48	120	300
Total	----- \$168K	----- \$280K	----- \$580K

Option 3 - Vehicle intrusion protection at PA perimeter.

Cost Summary:

Items	Passenger Vehicle	Pickup Truck	Large Truck
1. 4 Active Vehicle Access Barriers	120/120	160/ 160	280/ 280
2. 2,000/7,000' Passive Barrier	120/420	300/1,050	750/2,625
Total	----- \$240/540K	----- \$460/1,210K	----- \$1,030/2,905K

Option 4 - Protection at safe standoff distance for DBV and explosive device.

Cost Summary Case 1:

(Assumes analysis demonstrates safe standoff distances are within present PA - About 80 percent of sites)

Items	Passenger Vehicle	Pickup Truck	Large Truck
1. 4 Active Vehicle Access Barriers	120/120	160/ 160	280/ 280
2. 2,000/7,000' Passive Barrier	120/420	300/1,050	750/2,625
3. Standoff Analysis	115/115	115/ 115	115/ 115
Total	----- \$355/655K	----- \$575/1,325K	----- \$1,145/3,020K



Cost Summary Case 2: (Assumes analysis demonstrates safe standoff distances go beyond PA boundary for about 1/3 of boundary and further hardening of portions of PA barrier to penetration needed)

Items	Passenger Vehicle	Pickup Truck	Large Truck
1. 4 Active Vehicle Access Barriers	120/120	160/ 160	280/ 280
2. 2000/7000' Passive Barrier	120/420	300/1,050	750/2,625
1000/2000' Passive Barrier - hardened	90/100	225/ 450	550/1,100
3. Standoff Analysis	300/300	300/ 300	300/ 300
Total	\$630/940K	\$985/1,960K	\$1,880/4,305K

Discussion of Factors Impacting Cost of Option 4:

Ranges in cost estimates for the three vehicle types illustrates the influence of site-specific characteristics on costs, including the need at some sites to extend the vehicle exclusion area beyond portions of the current PA boundary or providing a more substantial passive barrier to prevent vehicle penetration. At a few sites, extension of the vehicle exclusion area beyond the current PA boundary may result in costs that exceed the upper range of the cost estimate.

The need for a licensee to provide additional measures beyond those needed to protect against vehicle penetration into the PA (Option 3) is a factor of the structural details of buildings containing vital equipment and the distance of the buildings from the PA. In SECY-93-102, staff indicated that at facilities with an average sized PA and typical concrete structures, a vehicle bomb similar to that reportedly used at the World Trade Center may cause moderate damage to some concrete walls. However, the safety equipment located behind typical concrete walls, but not contiguous to outside walls, would likely be protected.

5.0 DECISION RATIONALE

The staff continually monitors and evaluates the threat environment worldwide. In addition, the Commission was briefed by the CIA and the FBI on March 5, 1993. Neither agency provided information regarding an actual vehicle threat to domestic commercial nuclear power reactors that could serve as the basis for modifying the DBT. Further, staff reported on its analysis of more than 500 vehicle bomb attacks worldwide. Although, based on current information, there is no significant change in the threat environment, the bombing at the World Trade Center demonstrated that a large explosive device could be assembled, delivered to a public area, and detonated in the U.S. without advanced intelligence knowledge. In addition, the unauthorized intrusion at TMI demonstrated that a vehicle could be used to gain quick access to PAs of the plant. Consequently, the staff has concluded that a modification to the DBT is warranted.

The DBT is not intended to represent a real threat. It serves three purposes. It provides a standard with which to measure changes in the real threat environment. It is used to develop regulatory requirements. And it provides a standard for evaluation of implemented safeguards systems.

*the* In assessing the impact on the DBT of the events at TMI and the World Trade Center, staff has considered the following two issues: first, whether these events establish the need for NRC to revise its regulations to redefine adequate protection of the health and safety of the public, in the sense that adequate protection is used by section 182 of the Atomic Energy Act; and second, whether these events demonstrate that amending NRC's regulations to protect against malevolent use of a vehicle at nuclear power plants would result in a substantial increase in the overall protection of the public health and safety. With respect to the first issue, the NRC cannot consider cost. With respect to the second issue, the NRC must determine that the direct and indirect costs of implementation are justified in view of the increased protection.

The staff's assessment as to whether to redefine adequate protection is as follows:

The vehicle intrusion at TMI demonstrated that a person in a vehicle could penetrate a PA barrier and quickly approach a vital area barrier. However, for the public health and safety to be actually affected (absent a vehicle bomb threat, which will be discussed with respect to World Trade Center event), the following would also have to be true. The person or persons in the vehicle would have to possess the intent, knowledge of the plant skills, and equipment necessary to create radiological sabotage. They would have to leave the vehicle and reach one or more vital areas barriers. They would have to penetrate the vital area barriers, which are typically reinforced concrete walls and locked and alarmed steel doors. They would have to create a significant loss-of-coolant accident or create a reactor transient. They would have to disable sufficient safety systems to prevent the reactor from reaching a safe condition. They would have to cause a breach of containment. And they would have to accomplish all of this without intervention by the licensee's armed responding security officers.

The NRC interpretation of the DBT for radiological sabotage does not preclude adversaries' use of vehicles, other than vehicle bombs, for transportation and for breaching PA barriers. The vehicle should be detected by an intrusion detection system as it enters the PA. The nature of the threat should be assessed using CCTV or other means. Responding security officers should be able to neutralize the threat before sufficient damage can be done to create radiological sabotage. At many sites, vital area doors can be reached on foot within similar periods of time as with a vehicle. Therefore, staff has concluded that the TMI event has not demonstrated a need to redefine adequate protection.

In denying a 1991 petition for rulemaking to upgrade the DBT for radiological sabotage to include protection against a vehicle bomb, one factor identified by the staff was that a terrorist

group would have to construct a large truck bomb undetected. The World Trade Center event demonstrated that this can happen. However, to conclude that protection of the public health and safety is not adequate, the NRC would have to conclude that the use of a vehicle bomb to create radiological sabotage is reasonably to be expected and that there would not be sufficient time to implement contingency procedures for protecting against a vehicle bomb. Based on its analysis of the current threat environment, staff has concluded that the use of a vehicle bomb to create radiological sabotage at a nuclear power plant is not currently a reasonable expectation. If a significant change in the general threat environment caused staff to change this conclusion in the future, current contingency planning, which is designed to be implemented in a timely manner, would provide staff with a rapid regulatory mechanism to implement temporary protection measures and maintain an adequate level of protection while its regulations are amended to require permanent protection. Therefore, the staff concludes that the World Trade Center event has not established a need to redefine adequate protection.

The staff assessment as to whether to amend its regulations to protect against malevolent use of a vehicle bomb against a nuclear power plant so as to provide a substantial increase in overall protection of the public health and safety is as follows:

The Staff has identified several lessons learned from the vehicle intrusion at TMI. Although the intrusion detection system generated an alarm, the alarm station operators were not able to confirm the intrusion promptly by CCTV. A foot patrol was sent to evaluate the cause of the alarm. There was confusion and misinformation given to operations and security staff until a positive assessment of the intrusion could be made. Out of the confusion and concern for personal safety, operations staff made decisions that could have negatively affected the public health and safety. Even when an initial assessment was made, licensee staff did not know how many unauthorized individuals were inside the PA, where they were, and whether they possessed weapons or explosives.

The TMI event demonstrates some aspects regarding use of a vehicle by a potential adversary that could provide advantages not previously considered. Therefore, staff considers that providing vehicular intrusion protection would provide a significant enhancement against such a threat. Enhancements to protect against the vehicular intrusion threat also provide, to varying degrees dependent on site characteristics, enhancement for protection against vehicle bombs.

The World Trade Center event has demonstrated a capability within the U.S. to construct a truck bomb undetected. This recently demonstrated capability indicates that although a vehicle bomb attack at a nuclear power plant is not reasonably to be expected, it is somewhat more likely to develop without advance indications than staff previously believed. Staff therefore considers that providing vehicle bomb protection would provide significant enhancement against such a threat.

Based on the analysis of the four options discussed in Sections 4 and 5, staff concluded that a fifth option should be proposed that would offer a more realistic and practical approach. *the*

## 6.0 OPTION 5

This new Option 5 incorporates the protection measures of Option 3 - hardened protected area perimeter against intrusion. However, for Option 5, staff would develop criteria that could be used by licensees to determine, through simplified site-specific analyses, that protecting against vehicle intrusion into the protected area would also provide high assurance of protection against a vehicle bomb with characteristics of the type specified in Enclosure 8 of SECY-93-166. These criteria would specify safe stand-off distances for various types of building constructions typical of those at power reactors. All licensees would be required to review their sites against these criteria, and those sites meeting these criteria would certify this to the NRC. Staff estimates that this certification process would demonstrate that about 80 to 90 percent of the sites could meet these criteria without further analysis or consideration of additional measures. *the*

Sites not meeting these criteria would have choices that would include using more substantial (and expensive) barriers for a portion of their protected area to reduce vehicle penetration, extending vehicle barriers beyond the protected area perimeter, performing a more detailed analysis of existing structures and equipment to demonstrate their ability to protect against a vehicle bomb using barriers at the protected area, or evaluating other alternatives. Some licensees may be able to demonstrate that atypical building structures would provide adequate protection, that building damage would not disable vital equipment, or, if vital equipment were damaged, that redundant or diverse equipment could provide a backup function. If this capability could not be demonstrated, a licensee may have to establish additional security measures to assure protection from a vehicle explosive for vital equipment. Examples of these measures are extending the hardened barrier outward from the current protected area boundary, placement of blast shielding, or providing backup systems for those assumed to be damaged. *the*

For most sites (80 to 90 percent), the costs for Option 5 would be about \$50,000 more than Option 3. This amount assumes a confirmation analysis that vital area structures meet staff specified criteria for safe stand-off distances. Many of the remaining sites would have choices available to provide equivalent protection with additional cost. For the few sites where analysis indicated that stand-off distances may be less than those specified in staff guidance, Option 5 permits evaluation of alternative approaches.

In those cases where licensees determine additional security measures may be needed to protect safe shutdown capability, Option 5 would permit licensees to either implement the additional security measures or develop alternate protection strategies. Staff would review licensee's alternative proposals and make an acceptability determination. The staff will accept the proposed alternative measures if they provide substantial protection against a land vehicle bomb and the costs of fully meeting the design goals and criteria are not justified by the added protection which would be provided. The Commission would be notified of such staff action. *the*



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 Staff has concluded that Option 5 would significantly increase protection of the public health and safety. Staff has also determined that the direct and indirect costs of implementation of Option 5 are justified in view of the increased protection. Staff also notes that the determination on costs of implementation of Option 5 is based on the premise that the only definitive requirement for all licensees is that they provide measures to protect against the use of a land vehicle as a means of transportation to gain rapid access to vital areas and that they assess any incremental measures, if necessary to meet the design goal for a land vehicle bomb. A determination of whether incremental costs were not justified by incremental benefit would be made on a site-specific basis.

A summary of cost estimates follows for two cases, one where analysis demonstrates that safe standoff distances are within the present PA and one where the standoff distances go beyond the PA boundary.

Cost Summary Case 1: (Assumes analysis demonstrates safe standoff distances are within present PA - About 80 to 90 percent of sites)

Items	Passenger Vehicle	Pickup Truck	Large Truck
1. 4 Active Vehicle Access Barriers	120/120	160/ 160	280/ 280
2. 2,000/7,000' Passive Barrier	120/420	300/1,050	750/2,625
3. Standoff Analysis	50/ 50	50 / 50	50/ 50
Total	\$290/590K	\$510/1,260K	\$1,080/2,955K

Cost Summary Case 2: (Assumes analysis demonstrates standoff distances go beyond PA boundary for about 1/3 of boundary and further hardening of portions of PA barrier to penetration needed)

Items	Passenger Vehicle	Pickup Truck	Large Truck
1. 4 Active Vehicle Access Barriers	120/120	160/ 160	280/ 280
2. 2,000/7,000' Passive Barrier	120/420	300/1,050	750/2,625
3. Standoff Analysis	100/100	300/ 300	500/ 500
4. Additional Measures	100/100	150/ 150	250/ 250
Total	\$440/740K	\$910/1,660K	\$1,780/3,655K

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 Conclusion: Staff has concluded that Option 5 would significantly increase protection of the public health and safety. Staff has also determined that the direct and indirect costs of implementation of Option 5 are justified in view of the increased protection. Staff also notes that the determination on



costs of implementation of Option 5 is based on the premise that the only definitive requirement for all licensees is that they provide measures to protect against the use of a land vehicle as a means of transportation to gain rapid access to vital areas and that they assess any incremental measures, if necessary to meet the design goal for a land vehicle bomb. A determination of whether incremental costs were not justified by incremental benefit would be made on a site-specific basis.

## 7.0 IMPLEMENTATION

### 7.1 Rulemaking Options

On June 29, 1993, the Commission directed staff to implement Option 5 by expedited rulemaking to implement option 5.

### 7.2 Guidance for Licensees

As indicated above, staff intends to develop criteria that could be used by licensees to determine, through simplified site-specific analyses, that protecting against vehicle intrusion into the PA would also provide substantial protection against a vehicle bomb with characteristics of the type specified in Enclosure 8 of SECY-93-166. These criteria would specify safe stand-off distances for various types of building constructions typical of those at power reactors. The safe standoff guidance would consider such variables as wall and ceiling construction material; wall height, width, and thickness; the size, spacing and depth of rebar, and boundary conditions.

Staff anticipates that most licensees could certify the adequacy of their standoff distances using staff's guidance, without the need for more detailed analysis. For those licensees that choose to perform more direct analyses, staff could make available a four volume security engineering manual prepared by the U.S. Army Corps of Engineers. These manuals include information on vehicle barrier design and penetration tests. Additional barrier testing results are available from the Naval Civil Engineering Laboratory and Sandia National Laboratories. Staff also plans, with the help of the Army Corps of Engineers, to provide guidance on extrapolating data on penetration tests to barriers with different details of construction and for various soil conditions.

Sites not meeting the criteria would have choices that would include using more substantial and expensive barriers for a portion of their PA (to reduce vehicle penetration), extending vehicle barriers beyond the PA perimeter, performing a more detailed analysis of existing structures and equipment to demonstrate their ability to protect against a vehicle bomb using barriers at the PA, or performing a qualitative analyses of alternatives. The qualitative analysis would address the enhanced protection that would be achieved by protective measures that exceed protecting against vehicle intrusion into the PA. Some of these licensees may be able to demonstrate that atypical building structures would provide adequate protection, that building damage would not disable vital equipment, or, if vital equipment were damaged, that redundant or diverse equipment could provide a backup function. If this capability could not be demonstrated, a licensee may have to establish additional security measures to assure an acceptable level of protection from a vehicle explosive for vital equipment. Examples of these measures are extending the

hardened barrier outward from the current PA boundary, placement of blast shielding, or providing backup systems for those assumed to be damaged.

In those cases where the licensee determines additional security measures are needed to protect a safe shutdown capability, this option would permit licensees to either implement the additional security measures, develop alternate protection strategies, or propose not implementing measures beyond the PA boundary, along with a complete cost analysis. ~~Staff would have to review the licensee's alternative solution against developed criteria and make a determination on its acceptability. For those licensees proposing not to implement additional security measures (beyond hardened PA perimeter), staff would need to make a determination of whether the costs were not justified by the incremental benefit. The Commission will be informed of the staff decision.~~ (The

ENCLOSURE 5

BACKFIT ANALYSIS  
Malevolent Use of Vehicles at Nuclear Power Plants

- I. Statement of the specific objectives that the proposed action is designated to achieve.

To publish a proposed rule in response to direction from the Commissioners in a staff requirements memorandum dated June 29, 1993. The Commissioners' decision to proceed with expedited rulemaking was the result of two recent events. On February 7, 1993, there was a forced vehicle entry into the protected area (PA) at Three Mile Island (TMI) Unit 1. On February 25, 1993, a van bomb, containing between 500 and 1,500 pounds of TNT equivalent, was detonated at the World Trade Center in New York City.

In its subsequent review of the threat environment, <sup>the</sup> staff concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry. Nonetheless, in light of the vehicle intrusion at TMI and the World Trade Center vehicle bombing, ~~staff~~ <sup>the</sup> concluded that a vehicle intrusion or bomb threat to a nuclear power plant could develop without warning in the future. The objective of the proposed rulemaking is to maintain a prudent margin between what is the current threat estimate (low) and the design basis threat for radiological sabotage specified in 10 CFR 73.1(a) (higher).

- II. General description of the activity that would be required by the licensee or applicant in order to complete the action.

The proposed rule would require licensees to provide vehicle control measures to protect against the use of a design basis land vehicle (DBV) as a means of transportation to gain rapid access to vital areas. It would also require licensees to compare their vehicle control measures with design goals and criteria for protection against a land vehicle bomb specified by the Commission. Each licensee would (i) certify to the Commission that the vehicle control measures to protect against use of the DBV as a means of transportation to gain rapid access to vital areas meet the criteria specified, and either (ii) certify that the vehicle control measures meet the design goals and criteria for protection against a land vehicle bomb, or (iii) propose additional alternative measures, describe the level of protection that these measures would provide against a land vehicle bomb, and compare the costs of the alternative measures with the costs of measures necessary to fully meet the criteria. The NRC will accept alternative measures if the measures provide substantial protection against a land vehicle bomb and if the licensee demonstrates by an analysis, using the essential elements of the criteria in 10 CFR 50.109, that the costs of fully meeting measures needed to protect against a vehicle bomb are not justified by the added protection that would be provided.

- III. Potential change in the risk to the public from the accidental offsite release of radioactive material.

The potential change in the risk to the public from the accidental offsite release of radioactive material is discussed in detail in pages 3 through 8 of SECY-93-166 and in pages 4 through 6 and 10 through 15 of the regulatory analysis included as enclosure 6 to SECY-93-166. Failure to protect against attempted radiological sabotage could result in reactor core damage and large radiological releases. Based on its assessment, the staff concludes that amending NRC's regulations to protect against malevolent use of a vehicle bomb against a nuclear power plant would provide a substantial increase in overall protection of the public health and safety.

In summary, the TMI event demonstrated some aspects regarding use of a vehicle by a potential adversary that could present some challenges not previously considered by staff and licensees. Staff considers that providing vehicular intrusion protection would provide a significant enhancement against such a threat. Enhancements to protect against the vehicular intrusion threat also provide, to varying degrees dependent on site characteristics, enhancement for protection against vehicle bombs.

The World Trade Center event demonstrated a capability within the U.S. to construct a truck bomb undetected. This recently demonstrated capability indicates that although a vehicle bomb attack at a nuclear power plant is not reasonably to be expected, it is somewhat more likely to develop without advance indications than staff previously believed. Staff therefore considers that providing permanently installed vehicle bomb protection would provide significant enhancement against such a threat.

IV. Potential impact on radiological exposure of facility employees and other onsite workers.

By enhancing protection against malevolent use of a vehicle, the proposed rule decreases the potential for radiological exposure of facility employees and other onsite workers. Although the threat of a determined, violent attack at a nuclear power plant is considered to be low, the proposed rules also decrease the risk that onsite workers could be injured by weapons fire or an explosion.

V. Installation and continuing costs associated with the action, including the cost of facility downtime or the cost of construction delay.

Estimates of installation costs are discussed in detail in pages 6 through 10 and 13 through 15 of the regulatory analysis. Ranges in cost estimates for three vehicle types illustrate the strong influence of vehicle characteristics. In addition, site-specific characteristics influence costs, including the need at some sites to extend the vehicle exclusion area beyond portions of the current PA boundary or providing a more substantial passive barrier to prevent vehicle penetration.

Staff estimates that about 80 to 90 percent of the sites could provide safe standoff distances against a vehicle bomb by providing a vehicular barrier in proximity to the present PA boundary. For these sites, costs



estimates range from \$290K for protecting the smallest protected area against a passenger vehicle to \$2,955K for protecting the largest protected area against a large truck. (The characteristics of the design basis vehicle used to establish protection goals are described in a Safeguards Information document to be provided separately.) For the remaining 10 to 20 percent of the sites, costs estimates range from \$440K to \$3,655K.

An important consideration in assessing costs for the 10 to 20 percent of the sites that may have to protect beyond the existing protected areas is that the only definitive requirement for all licensees is that they provide measures to protect against the use of a land vehicle as a means of transportation to gain rapid access to vital areas and that they assess any incremental measures, if necessary, to meet the design goal for a land vehicle bomb. The NRC will accept alternative measures if the measures provide substantial protection against a land vehicle bomb and if the licensee demonstrates by an analysis, using the essential elements of the criteria in 10 CFR 50.109, that the costs of fully meeting measures needed to protect against a vehicle bomb are not justified by the added protection that would be provided.

Continuing costs to maintain barriers should be small. Implementation of the proposed rule would not require facility downtime or construction delay.

- VI. The potential safety impact of changes in plant or operational complexity, including the relationship to proposed and existing regulatory requirements and staff positions.

There should be no safety impact from the proposed rule. Construction of barriers would be near or beyond existing protected area perimeters and should not delay authorized access to the protected area.

- VII. The estimated resource burden on the NRC associated with the proposed action and the availability of such resources.

There should be no new resource burden on the NRC. There will be no staff licensing review of licensees' vehicle control measures prior to implementation. Licensees will be required to retain their analyses on site for staff review during routine inspections. Inspection of the approximately 90% of the sites that would fully meet goals for explosive protection would be about 1 FTE. Reviewing licensee proposals for alternative measures and 50.109-type analyses would require approximately 1 FTE and 40K of technical assistance from the U.S. Army Corps of Engineers.

- VIII. The potential impact of differences in facility type, design or age on the relevancy and practicality of the proposed action.

The proposed action is relevant for all nuclear power reactors. The proposed action should also be practical at most sites. If a barrier stopped a vehicle at the PA perimeter with little or no further

penetration, about 90 percent of the sites would provide significant protection against the proposed design basis vehicle bomb. Enclosure 3 provides information (Safeguards Information provided under separate cover) regarding the potential impact at certain sites that might not provide significant protection against a large vehicle bomb that was stopped at the PA perimeter.

In those cases where licensees determine additional security measures may be needed to protect safe shutdown capability, the proposed rule would permit licensees to either implement the additional security measures or develop alternate protection strategies. The licensee may propose alternative measures if the measures provide substantial protection against a land vehicle bomb and if they demonstrate by an analysis, using the essential elements of the criteria in 50.109, that the costs of fully meeting measures needed to protect against a vehicle bomb are not justified by the added protection that would be provided. Staff would review licensee's alternative proposals and make an acceptability determination. The Commission would be notified of such staff action.

Barriers that result in no vehicle penetration for vehicle impacts at specified kinetic energies are typically more expensive than those that allow some penetration. For less expensive barriers, the proposed DBV may penetrate as much as 30 feet into the PA. For these types of barriers, about 80 percent of the sites would provide significant protection. Staff's analysis also indicates that there is a high likelihood that all sites would be capable of achieving and maintaining safe shutdown if a DBV were detonated at any land accessible location of a nuclear power plant outside of the owner controlled area.

IX. Whether the proposed action is interim or final, and if interim, the justification for imposing the proposed action on an interim basis.

The proposed action is final.

ENCLOSURE 6



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

The Honorable Richard H. Lehman, Chairman  
Subcommittee on Energy and Mineral Resources  
Committee on Natural Resources  
United States House of Representatives  
Washington, DC 20515

Dear Mr. Chairman: *the*

*the* The Nuclear Regulatory Commission (NRC) is sending the enclosed proposed amendments to 10 CFR Part 73 to the Office of the Federal Register for publication. NRC has concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry. However, based on recent events, NRC believes that a vehicle intrusion or bomb threat to a nuclear power plant could develop without warning in the future. To maintain a prudent margin between what is the current threat estimate (low) and the design basis threat (postulated as higher for conservatism), NRC is proposing to amend 10 CFR Part 73 to modify the design basis threat for radiological sabotage to include protection against malevolent use of vehicles at nuclear power plants. *the*

The proposed amendments would explicitly require measures to deny the access of a four-wheel drive land vehicle by an adversary for the transport of personnel, hand-carried equipment, and/or explosives. Specifically, the rule would require applicable licensees to design and install a vehicular barrier system to protect vital areas and equipment from access by unauthorized forced entry by land vehicles. Licensees would also be required to evaluate the effectiveness of these measures to protect against a vehicle bomb.

Current plans are to complete this rulemaking within 3 1/2 months from proposed rule publication. The proposed amendments will be published in the Federal Register with a 30-day public comment period.

Sincerely,

Dennis K. Rathbun, Director  
Office of Congressional Affairs

Enclosure: As stated

cc: Representative Barbara Vucanovich



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

The Honorable Joseph Lieberman, Chairman  
Subcommittee on Clean Air and Nuclear Regulation  
Committee on Environment and Public Works  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

The Nuclear Regulatory Commission (NRC) is sending the enclosed proposed amendments to 10 CFR Part 73 to the Office of the Federal Register for publication. NRC has concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry. However, based on recent events, NRC believes that a vehicle intrusion or bomb threat to a nuclear power plant could develop without warning in the future. To maintain a prudent margin between what is the current threat estimate (low) and the design basis threat (postulated as higher for conservatism), NRC is proposing to amend 10 CFR Part 73 to modify the design basis threat for radiological sabotage to include protection against malevolent use of vehicles at nuclear power plants.

The proposed amendments would explicitly require measures to deny the access of a four-wheel drive land vehicle by an adversary for the transport of personnel, hand-carried equipment, and/or explosives. Specifically, the rule would require applicable licensees to design and install a vehicular barrier system to protect vital areas and equipment from access by unauthorized forced entry by land vehicles. Licensees would also be required to evaluate the effectiveness of these measures to protect against a vehicle bomb.

Current plans are to complete this rulemaking within 3 1/2 months from proposed rule publication. The proposed amendments will be published in the Federal Register with a 30-day public comment period.

Sincerely,

Dennis K. Rathbun, Director  
Office of Congressional Affairs

Enclosure: As stated

cc: Senator Alan K. Simpson





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

The Honorable Philip R. Sharp, Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

The Nuclear Regulatory Commission (NRC) is sending the enclosed proposed amendments to 10 CFR Part 73 to the Office of the Federal Register for publication. NRC has concluded that there is no indication of an actual vehicle threat against the domestic commercial nuclear industry. However, based on recent events, NRC believes that a vehicle intrusion or bomb threat to a nuclear power plant could develop without warning in the future. To maintain a prudent margin between what is the current threat estimate (low) and the design basis threat (postulated as higher for conservatism), NRC is proposing to amend 10 CFR Part 73 to modify the design basis threat for radiological sabotage to include protection against malevolent use of vehicles at nuclear power plants.

The proposed amendments would explicitly require measures to deny the access of a four-wheel drive land vehicle by an adversary for the transport of personnel, hand-carried equipment, and/or explosives. Specifically, the rule would require applicable licensees to design and install a vehicular barrier system to protect vital areas and equipment from access by unauthorized forced entry by land vehicles. Licensees would also be required to evaluate the effectiveness of these measures to protect against a vehicle bomb.

Current plans are to complete this rulemaking within 3 1/2 months from proposed rule publication. The proposed amendments will be published in the Federal Register with a 30-day public comment period.

Sincerely,

Dennis K. Rathbun, Director  
Office of Congressional Affairs

Enclosure: As stated

cc: Representative Michael Bilirakis



ENCLOSURE 7

## REGULATORY GUIDE 5.XX

### PROTECTION AGAINST MALEVOLENT USE OF VEHICLES AT NUCLEAR POWER PLANTS

#### A. INTRODUCTION

(a)(1)

In 10 CFR Part 73, "Physical Protection of Plants and Materials," Section 73.1(i)(E) requires a licensee to protect against a determined violent external assault, attack by stealth, or deceptive actions, of several persons using a four-wheel drive land vehicle used for the transport of personnel, hand-carried equipment described in 10 CFR 73.1 (a)(1)(i)(C), and/or explosives. In 10 CFR Part 73.55, "Requirement for physical protection of licensed activities in nuclear power reactors against radiological sabotage," Section 73.55(c)(7) requires a licensee to establish vehicle control measures to protect against the use of a land vehicle, as specified by the Commission, as a means of transportation to gain rapid access to or introduce explosives near vital areas. Section 73.55(c)(8) requires a licensee to compare the vehicle control measures established in accordance with 10 CFR 73.55(c)(7) with the design goals and criteria for protection against a land vehicle bomb specified by the Commission. Section 73.55(c)(8) also provides for those licensees with particularly difficult site configuration, a process for a licensee to use alternative measures for protection against a land vehicle bomb. These alternative measures must provide substantial protection against a land vehicle bomb, and it is determined by an analysis, using the essential elements of the criteria in 10 CFR 50.109, that the costs of fully meeting the design goals and criteria are not justified by the added protection that would be provided.

Section 73.55(c)(9) requires a licensee to submit to the Commission a letter providing: (1) the design of the barrier system, and (2) the results of their vehicle bomb comparative analysis. Those licensees whose evaluation finds that the design does not fully meet the design goals and criteria for protection against a vehicle bomb and choose not to take additional measures to fully meet the criteria are required by Section 73.55(c)(9) to include in their submittal proposed alternative measures and justification that these measures provide substantial protection. Following the completion of all vehicle control measures and bomb blast barriers, licensees are required to certify to the Commission that all the requirements have been implemented and are in place.

This regulatory guide provides an approach acceptable to the NRC staff by which the licensee can meet the requirements of 10 CFR 73.1(i)(E), 73.55(c)(7), 73.55(c)(8), and 73.55(c)(9).

## B. DISCUSSION

### 1. Measures to protect against use of a vehicle as a means of personnel transport

Protection against use of a land vehicle as a means to gain rapid access to vital areas can be accomplished by establishment of a continuous barrier system that encompasses vital areas of the facility. The features and structures that form the barrier system would need to be sufficient to stop the forward motion of a land vehicle with the design characteristics established by the Commission. Since the protected area perimeter serves as an outer barrier to vital areas, one approach would be to establish the vehicle barrier contiguous with or in close proximity to the protected area perimeter. At many facilities, natural terrain features such as water barriers, steep cliffs, and large rocks and existing structures such as buildings or cooling towers located adjacent to the protected area would be well suited and maybe linked with barriers to serve as part of the continuous barrier. As a matter of economy and convenience, the barrier system would likely include the present vehicle access points to the protected area. At these locations, active barriers, that would allow the vehicle entry, would need to be installed.

Passive vehicle barriers are appropriate for those portions of the barrier system that are not needed for vehicular access. The passive barriers may make use of natural topographic features and structures, provided that these features, along with other segments of the barrier, provide for a continuous vehicle barrier for land access to the facility's vital areas. For those segments of the barrier system that may be located outside the protected area, consideration needs to be given to the susceptibility of the barrier to tampering. In considering a barrier, natural features or devices that limit vehicle direction and speed also may be appropriate to simplify or reduce the performance required of the vehicle barrier system. The Technical Manual - Security Engineering Concept Design (Army TM5-853-2/Air Force AFM88-56) provides design guidance on the performance capabilities of barriers and specifications for measures that reduce vehicular speed.

Active vehicle barriers are appropriate for those portions of the barrier system that need to provide for vehicular access. Active vehicle barriers have two positions. In one position the barrier denies passage of a vehicle; while in the other position it allows passage. Barriers remain in the denial position to prevent entry and are moved to allow entry only after authorization for the vehicle has been confirmed. Army TM5-853-2/Air Force AFM88-56 provides design guidance on the performance capabilities of active barriers.

Access control measures for vehicles entering within the boundary of the established vehicle barrier system need to be sufficient to provide assurance that the vehicle is appropriately authorized and not transporting an explosive device. It would be expected that at most facilities, active vehicle barriers would be established at the present protected area vehicle access points. Searches of vehicles for explosives and personnel access control measures for



protected areas, which remain the same, are rigorous and provide assurance against any unauthorized vehicle entries. For barrier system layouts where vehicle denial barriers are located outside the protected area boundary, vehicle access control measures, including explosive searching would need to be provided for vehicles permitted access inside the barrier, even if the vehicle did not enter the protected area.

## 2. Measures to protect against use of a vehicle as a means of transport of an explosive device

The design goal for protection against explosive devices transported by a vehicle is to design protect equipment, systems, devices, or material, or the failure or destruction of which could directly or indirectly endanger the public health and safety by exposure to radiation. Such equipment, systems, devices or material are designated by licensees as vital equipment and are required to be located within vital areas. Vital areas in turn are required to be located inside protected areas. At many facilities the vital area barrier, which separates vital equipment from the protected area, is located at a considerable distance from the protected area barrier. Further, vital area barriers generally are quite substantial. These features, assuming the vehicle barrier system is located along or adjacent to the protected area barrier, provide substantial protection for vital equipment from an explosive blast. Many of the issues discussed in the previous section related to active and passive barriers apply to the protection against explosives.

The effects of an explosive device diminish rapidly with distance. The distance of the structure or equipment from the explosive blast is referred to as "stand-off distance." If the vehicle is transporting an explosive device and the device is detonated at the vehicle barrier, the stand-off distance would be that distance from the blast detonation to the vital area barrier. Penetration of a barrier by the vehicle before it comes to rest also needs to be considered in determining stand-off distances. The distance the vehicle penetrates beyond the barrier would result in the stand-off distance between the explosive blast and the vital area barrier being shortened by that distance. Considering typical plant layouts and the placement of vehicle barriers at or adjacent to the protected area, vital area barriers at many facilities would be afforded sufficient protection against a relatively large explosive device.

In addition to the protection afforded by distance from the blast, vital equipment at most sites is provided substantial protection by structures containing the equipment. Vital equipment is frequently located within seismic structures (often reinforced concrete walls).

"Safe stand-off" distance is a distance (from the blast to the structure) where the structure would provide high assurance that equipment within the structure would be protected. Safe stand-off distances can be determined by blast effect analysis that take into account the size of the explosive, distance between the explosive and the effected structure, and characteristics of the structure. These analysis techniques are available in the United

States Army Corps of Engineers Blast Analysis Manual, PDC-TR-91-6, July 1991. Army TM5-853-2/Air Force AFM88-56, Vol. 2, describes design approaches for determining safe stand-off distances.

For those cases where blast analysis shows that a vital area barrier structure is significantly damaged, further analysis may be able to demonstrate that vital equipment within the structure is not damaged. For example, the vital equipment may be located in a separate cubical within the main structure that is unaffected by the analyzed blast damage to an outer wall.

If the blast effect analysis indicates that the explosion could damage vital equipment, the ability to shutdown and maintain the facility in a safe shutdown condition may be demonstrated by identification of alternate plant equipment that could serve the same safety function as the equipment analyzed as being damaged by the explosion. Also, it may be demonstrated that damage control measures can be taken that could support plant shutdown and maintenance of the plant in a shutdown condition.

If the blast effects analysis demonstrates that vital equipment is damaged, that alternate equipment is not available, and that damage control measures can not adequately support plant shutdown and maintenance of shutdown, other measures (in addition to those required to protect against the use of a land vehicle as a means of transportation to gain rapid access to vital areas) may be needed. To fully meet the Commission's design goals and criteria for protection against a land vehicle bomb, additional measures that can be taken include: (1) extending the vehicle barrier location out from those positions where analysis show that the barrier does not provide sufficient safe standoff distance for vital area structures from the explosive, (2) construction of structures that shield the vital area barrier from blast effects, or (3) construction of equipment to backup that equipment assumed to be damaged.

The Commission recognizes that Part 73 requires certain security-related power supplies and the Central Alarm Station to be protected within vital areas; however, in the absence of safety-related equipment necessary for plant shutdown, these vital areas need not be considered in the licensee's analysis.

As provided in 10 CFR Section 73.55(c)(8), under certain circumstances a licensee may propose measures other than those needed to fully meet the design goals and criteria for protection against a land vehicle bomb specified by the Commission. This does not relieve the licensee of their requirement to protect against use of a vehicle to gain rapid access to vital areas. Alternative measures developed by a licensee will be acceptable to the Commission if they provide substantial protection against a land vehicle bomb and if the licensee determines by an analysis, using the essential elements of the criteria in 10 CFR 50.109, that the costs of fully meeting the design goals and criteria are not justified by the added protection by these additional measures.

### 3. Documentation and Certification

Design of the VBS will be site dependent and documentation of the details of the design will be maintained by the licensee. Similarly, the details of the analysis of the effects of an explosive device on vital equipment will be site dependent and documentation of the analysis will be maintained by the licensee. In some cases, there may be a multi-step process between design of the VBS and analysis considerations for protection against a vehicle explosive device. Licensees that determine that protection against a vehicle intrusion does not fully meet the design goals for protection against a vehicle bomb and that choose to propose alternative measures to protect against the vehicle bomb threat will need to do evaluations comparing costs and levels of protection. The results of these evaluations will need to be made available to the Commission for review prior to implementation.

Changes to the licensee's security programs to implement protection against malevolent use of vehicles should not result in any decrease in program effectiveness. Therefore, pursuant to 10 CFR 50.54(p)(2), actions taken to implement vehicular protection measures would not require NRC approval prior to implementation. Resultant changes to licensee's Physical Security Plans, if required, should be submitted to the NRC in accordance with 10 CFR 50.54(p)(2).

### 4. Definitions

For the purpose of this guide, the following definitions are provided.

- 1) Stand-off Distance: The distance between vital equipment or structure housing vital equipment and the point of detonation of the design basis threat bomb.
- 2) Level of Protection: The degree of protection from a bomb blast a structure provides equipment housed inside the structure. Three levels of protection (low, medium, and high) are defined in U.S. Army Corps of Engineers' Blast Analysis Manual PDC-TR-91-6.
- 3) Safe Stand-off Distance: The distance between vital equipment or structure housing vital equipment and the point of detonation of the design basis threat bomb that would protect the equipment within the structure to a medium level of protection.
- 4) Vehicle Barrier System (VBS): A continuous barrier, which may include buildings, natural barriers, commercially available barriers and any combination of these items, utilized to stop a land vehicle used as transportation to gain access to vital areas and/or used to transport a bomb.
- 5) Design Basis Threat Land Vehicle: A vehicle with design characteristics as stated in Enclosure 1 to this document.
- 6) Design Basis Threat Bomb: An explosive device with the TNT equivalent force as stated in Enclosure 1 to this document.

7) Design Goals and Criteria for Protection Against a Land Vehicle Bomb: The design goal is to protect equipment systems, devices, or material, the failure or destruction of which could directly or indirectly endanger the public health and safety by exposure to radiation. The criteria is that protection needed to protect against the design basis land vehicle bomb threat, as stated in Enclosure 1 to this document.

### C. REGULATORY POSITION

1. Measures to Protect Vital Areas Against Forced, Rapid Access. A vehicle barrier system (VBS) that is capable of preventing forced access of a land vehicle to vital areas should be established at each nuclear power reactor site. The VBS should provide a perimeter around vital areas of the facility such that no location along the perimeter would permit forced land vehicle entry. The VBS, regardless of type of barriers used, should be of a design capable of stopping the forward motion of the design basis land vehicle (DBV). The VBS may be incorporated as part of the protected area perimeter system but should not diminish or remove any requirements established for the protected area. As currently required in Part 73, compensatory measures necessitated by failed barriers should include alternate barriers and equipment, additional security personnel, and specific contingency procedures to ensure that the effectiveness of the vehicle barrier is not reduced. These measures should be initiated upon discovery of the failed barrier and fully implemented within 72 hours.

a. **Passive Barriers.** The passive barrier portion of the VBS may include natural terrain features such as steep cliffs and large rocks alone or in combination with man-made structures or barriers provided that the overall effectiveness of the barrier at any point is capable of stopping the forward motion of the DBV. Man made or natural features that limit the direction and speed of the DBV may be used in conjunction with a barrier design. Measures should be established to periodically verify the integrity of these portions of the barrier that are located outside the protected area. The U.S. Corps of Engineers Security Engineering Concept Design Technical Manual (Army TM5-853-2/Air Force AFM88-56) provides design guidance acceptable to the NRC on the performance capabilities of barriers and specifications for measures that reduce vehicular speed.

b. **Active Barriers.** Access by vehicles to locations inside the VBS should be through active vehicle denial barriers which, in the denial position, are capable of stopping the forward motion of the DBV. Operational design features of the active barrier or barrier system should be capable of allowing access for authorized vehicles while preventing access of unauthorized vehicles.

c. **Vehicle and Personnel Access Authorization Measures.** Vehicles and their operators should be authorized for entry prior to being permitted access inside the VBS. Vehicle authorization should include a vehicular search for explosives of a quantity equivalent to the design basis threat bomb. Vehicle authorization should also include confirmation



that the vehicle has a legitimate purpose for entering the VBS. Authorization for the vehicle operator should include confirmation that the individual has a legitimate purpose for operating the vehicle inside the VBS. For VBS designs that are adjacent to the protected area boundary and whose active vehicle barrier access points are the same as the protected area vehicle access points, vehicle and personnel authorization measures for entering the protected area provide adequate authorization controls.

d. **VBS Description.** The security plan should contain an attachment with a description of the VBS. The description should include site drawings that identify the VBS, the various components and combination of components that compose the VBS, and access authorization measures for vehicle and personnel within the VBS.

2. **Measures to Protect Vital Areas Against a Land Vehicle Bomb.** 10 CFR 73.55(c)(8) requires a licensee to compare the vehicle control measures established in accordance with 10 CFR 73.55(c)(7) with the design goals and criteria for protection against a land vehicle bomb specified by the Commission. The design basis bomb size is specified in Enclosure 1 to this Regulatory Guide.

a. **Blast Effect Analysis.** The comparison of vehicle control measures with the design goals and criteria for protection against a land vehicle bomb should consist of an analysis which establishes that the operational capability (that capability needed to shutdown the facility and maintain shutdown) of vital equipment is not lost as a result of the detonation of a design basis bomb at the VBS boundary. Depending on the VBS design and site specific considerations, this comparison could result in a determination that the design goals and criteria for protection against a land vehicle bomb are satisfied at the conclusion of any one of the following four steps.

#### STEP 1.

This step involves a screening process to determine if further, more detailed analysis of the effects of an explosive blast of the size of the design basis bomb are required.

For each location along the VBS perimeter the standoff distance (distance between vital equipment or structure housing vital equipment and the point of detonation of the design basis bomb) should be determined. Standoff distance should take into account the distance of barrier penetration by the DBV.

Licensees should determine if the standoff distances for each location along the VBS provide a safe stand-off distance. This determination should be made by an analysis that takes into account the size of the explosive, both reflective and side-on blast loads, distance between the explosive and the effected structure, and characteristics of the structure. Vital equipment can be assumed to remain operational if the structure containing the equipment provides at least a medium level of



protection. Analysis techniques to make this determination are available in the United States Army Corps of Engineers Blast Analysis Manual, PDC-TR-91-6, July 1991. Army TM5-853-2/Air Force AFM88-56, Vol. 2, describes design approaches for determining safe stand-off distances. The Blast Analysis Manual was developed for thirteen typical industrial and military style buildings. The curves contained in this manual may be used to determine the level of protection provided by structures at nuclear facilities that are similar in construction to the listed structures (i.e., that the dimension of the building structure at the nuclear facility are within 25 percent of those described in the manual). The manual should not be used for structures that are not within the envelope of this engineering calculation. Enclosure 2 (A letter or piece of paper from Doug Wehring, Corps of Engineers, defining the limitation of the manual) defines the limitation of this manual. Alternative engineering analysis may be used by a licensee if necessary where the U.S. Army Corps of Engineers Blast Analysis Manual does not address the plant design.

If all vital area structures and equipment are found to be located at distances equal to or greater than the safe standoff distance, the design goals and criteria for protection against a land vehicle bomb are considered met and no further analysis is necessary.

#### STEP 2.

If the analysis in step 1 determines that a vital area structure would be damaged by detonation of the design basis bomb at a location along the VBS boundary, the analysis should then consider if any obstructions in the blast path would effect the level of protection provided to vital equipment. The analysis may incorporate the effects of natural topography that diminish the effects of the bomb blast effect. The analysis may also include assessment of interior building designs (e.g., interior walls, supports, etc.) that may protect vital equipment even if the outer wall or structure is significantly damaged. The analysis should show whether or not the blast damage impacts the functional operability of the vital equipment.

Due to the complexity of a particular site arrangement, the licensee may elect not to incorporate the effects of natural topography or other structures. The licensee should assume the level of protection determine in step 1 and perform step 3 for the specific arrangement.

If the analysis in this step determines that vital equipment remains functional, the design goals and criteria for protection against a land vehicle bomb are considered met and no further analysis is necessary.

#### STEP 3.

If the analysis in step 2 determines that vital equipment would be damaged by detonation of the design basis bomb at a location along the VBS boundary, the analysis should then consider whether the plant can be shutdown and maintained shutdown with equipment not damaged by the

explosion. The evaluation may allow for damage control actions to mitigate the consequence of the explosion. These damage control actions should be included in the safeguard's contingency procedures and/or applicable station emergency procedures. An acceptable approach to conducting this evaluation is through the identification of a set of "survival envelopes." Use of survival envelopes is described in NUREG/CR 5246 entitled, "A Methodology to Assist in Contingency Planning for the Protection of Nuclear Power Plants Against Land Vehicle Bombs."

If the analysis in this step determines that the ability to shutdown the facility and maintain shutdown can be provided with the assumed loss of certain vital equipment, the design goals and criteria for protection against a land vehicle bomb are met and no further analysis is necessary.

#### STEP 4.

If the analysis in steps 1 through 3 determines that the design goals and criteria for protection against a land vehicle bomb cannot be met, the licensee should develop and implement a plan to achieve the design goals. This course of action may include installation of blast shields, moving current security barriers, strengthening current structures, or installation or relocation of plant equipment or systems.

If actions taken as a result of this step result in a determination that the design goals and criteria for protection against a land vehicle bomb are met, no further analysis is necessary. As provided in 10 CFR Section 73.55(c)(8), the licensee may elect not to take the additional measures specified by this step and propose alternative protection measures against detonation of a land vehicle bomb. If so, the actions in Regulatory Position C.3 should be taken.

b. Blast Effects Analysis Documentation. The blast effect analysis made in accordance with the above steps should be maintained on site. The security plan should be modified under the provisions of 10 CFR 50.54(p)(2) to include a summary of the Blast Effects Analysis. The summary of the Blast Effect Analysis should be included in the same security plan revision as the VBS description. The summary should include a description of the basis for determination that the design goals and criteria for protection against a land vehicle bomb are met. When applicable, the summary should include damage control actions that must be taken and additional security measures taken to protect against the design basis bomb.

3. Alternative Protection Against Explosive. As provided in 10 CFR Section 73.55(c)(8), a licensee may propose, under certain conditions, measures other than those needed to fully meet the design goals and criteria for protection against a land vehicle bomb specified by the Commission. 10 CFR Section 73.55(c)(9) requires licensees that choose to propose measures other than those needed to fully meet design goals and criteria to submit these proposed

alternative measures and justification that these measures provide substantial protection. This submittal should include:

- (1) The findings regarding the extent of the protection against a vehicle bomb provided by the vehicle control measures designed to meet the requirements of Section 73.55(c)7. These findings should be expressed in explicit terms such the size of explosive for which the measures provide protection and locations along the barrier system perimeter where the design goals for protection against a vehicle bomb cannot be fully met.
- (2) A description and analysis of additional measures needed to fully meet the design goals and criteria for protection against a vehicle bomb. The description should include an estimation of the cost of the measures, both initial and variable.
- (3) A description and analysis of additional measures, alternative to those needed to fully meet the design goals and criteria, that are proposed to be taken and would provide enhanced protection against a vehicle bomb. The analysis should address the degree of enhanced protection provided by the additional measures. The description should include an estimation of the costs for the measures, both initial and variable.
- (4) A comparison of the costs of measures described in (2) and (3) above and an assessment supporting a finding that the measures needed to fully meet the design goals and criteria are not justified by the added protection (when compared with alternatives proposed) that would be provided.

### 3. Certification

In accordance with Section 73.55(c)(9), licensees certifying their VBS design and their land vehicle bomb comparative evaluation should submit a Safeguards Information letter to the Commission. The submittal should include an adequate description of the active/passive components of the VBS and any natural terrain features or man-made obstructions that complete the VBS. Appropriate site drawings or diagrams should also accompany the safeguards submittal.

Those licensees proposing alternative measures should also submit a safeguards correspondence which details the VBS, exceptions to the design goals and criteria, justification for these measures, and a demonstration that these measures provide for substantial protection.

In all cases, the certifications should explain what compensatory measures for failed or inoperable barriers will be taken.

Following completion of all the measures and barriers required by 10 CFR Part 73.55(c)(7) and (c)(8), licensees are required to submit a certification to that effect. This certification may be the same letter providing appropriate

changes to the Physical Security Plan regarding the VSB description and the vehicle bomb analysis.

The submittals should be sufficiently informative to allow the staff to conclude that the design goals and criteria for protection against a vehicle bomb have been successfully achieved as certified by the licensee.

#### REGULATORY ANALYSIS

A separate regulatory analysis has not been provided for this regulatory guide. The regulatory analysis that was prepared for the rule provides the basis for this regularly guide and examines the costs and benefits of the rule as implemented by this guide. A copy of the "Regulatory Analysis for Malevolent Use of Vehicles at Nuclear Power Plants" is available for inspection and copying for a fee at the Commission's Public Document Room, 2120 L Street NW, Washington, DC, under Regulatory Guide 5.xx.

*(Lower Level)*

Design Basis Vehicle (DBV) for the  
Design Basis Threat for Radiological Sabotage

1. Four wheel drive land vehicle:

Vehicle weight:	lbs.
Explosive charge size:	lbs. (TNT equivalent)
Gross vehicle charge weight with explosives:	lbs.
Vehicle speed:	m.p.h.

Vehicle denial systems must protect against a gross vehicle weight with explosives of            pounds.



CRGR BRIEFING - 8-22-93

CRGR 10v-20g  
8/24/93

AE81-1  
PDR

## BACKGROUND

### PAST ACTIONS AND CONSIDERATIONS RELATED TO VEHICLE

- o GENERIC LETTER 89-07, Power Reactor Contingency Plans for Surface Vehicle Bombs

### TMI INTRUSION EVENT ON FEBRUARY 7, 1993

### WORLD TRADE CENTER BOMBING ON FEBRUARY 27, 1993

### OPTIONS PRESENTED TO COMMISSION AT APRIL 22, 1993 MEETING

- o OPTION 1, Take No Action
- o OPTION 2, Vehicular intrusion protection at existing vehicle access points
- o OPTION 3, Vehicular intrusion protection around the entire protected area perimeter
- o OPTION 4, Protection against specified DBV and explosive charge

## REGULATORY ANALYSIS (Cont.)

### VEHICLE BOMB ANALYSIS

- o Examined drawings for all sites
- o Identified 30 sites with 125 ft or less between PA and VA
- o Confirmed distances with resident inspectors
- o Obtained details on wall structures
- o Calculated explosive effects on walls
- o Determined whether redundant or diverse safety equipment survives blast

### DEVELOPMENT OF FIFTH OPTION

- o Incorporates protective measures of Option 3
- o Provides for process for comparing protection provided by measures to protect against intrusion with specified design goals and criteria for protection against a design basis vehicle bomb
- o For sites not fully meeting criteria for vehicle bomb protection, provides process for licensees to take additional measures to fully meet criteria or propose alternative additional measures

## DRAFT RULE CHANGES

### ADD PROVISION TO 73.1

"73.1(i)(E) four-wheel drive land vehicle used for the transport of personnel, hand-carried equipment, and/or explosives

### ADD NEW PARAGRAPHS (7) AND (8) TO 10 CFR 73.55(c):

"(7) Vehicle control measures shall be established to protect against the use of a land vehicle, as specified by the Commission, as a means of transportation to gain rapid access to vital areas.

"(8) Each licensee shall compare the vehicle control measures established in accordance with 73.55(c)(7) with the design goals and criteria for protection against a land vehicle bomb specified by the Commission. Each licensee shall either (i) confirm to the Commission that the vehicle control measures meet the criteria specified, or (ii) propose alternative measures in addition to the measures established in accordance with 73.55(c)(7), describe the level of protection that these measures would provide against a land vehicle bomb, compare the costs of the alternative measures with the costs of measures necessary to fully meet the criteria. The Commission will approve the proposed alternative measures if they provide substantial protection against a land vehicle bomb, and it is determined by an analysis, using the essential elements of the criteria in 50.109, that the costs of fully meeting the design goals and criteria are not justified by the added protection that would be provided."

DRAFT RULE CHANGES (Cont.)

ADD A NEW PARAGRAPH (9) TO 10 CFR 73.55(c)(9)

"(9) Each licensee who holds an operating license shall:

(i) By (90 days from final rule effective date), submit to the Commission either:

(a) a letter providing a summary description of the proposed vehicle control measures and confirmation that they meet the goals and criteria for protection against a land vehicle bomb, or

(b) for licensees who choose to use 10 CFR 50.109 to propose alternative measures, a description of those measures along with a justification as required by 73.55(c)(8).

(ii) Protect the letter as Safeguards Information.

(iii) By (360 days from final rule effective date), fully implement the required vehicle control measures or the site specific alternative measures as approved by the Commission and confirm this by letter to the Commission.

(v) For each applicant for a license to operate a nuclear power reactor pursuant to 50.21(b) or 50.22 of this chapter, whose application was submitted prior to (insert effective date of rule), incorporate the required vehicle control program into the site Physical Security Plan and implement it either by (insert 360 days from the effective date of the rule) or the date of receipt of the operating license, whichever is later.

(vi) maintain as a record the evaluation and letter required by this section for as long as the licensee holds an operating license."

## REGULATORY GUIDE

### GUIDANCE ON HOW TO MEET 73.55(c)(7), VEHICULAR INTRUSION

- o Land Vehicle Barrier System Design
  - Passive Barriers
  - Active Barriers
  - Vehicle Access Controls

### GUIDANCE ON HOW TO MEET 73.55(c)(8), VEHICLE BOMB

- o Blast Effects Analysis (Four Steps)
  - Step 1 (simplified analysis)
  - Step 2 (more detailed analysis)
  - Step 3 (alternative equipment determination)
  - Step 4 (additional measures)



DRAFT RULE CHANGES (Cont.)

ADD A NEW PARAGRAPH (9) TO 10 CFR 73.55(c)(9)

"(9) Each licensee who holds an operating license shall:

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(a) a letter providing a summary description of the proposed vehicle control measures and confirmation that they meet the goals and criteria for protection against a land vehicle bomb, or

(b) for licensees who choose to use 10 CFR 50.109 to propose alternative measures, a description of those measures along with a justification as required by 73.55(c)(8).

(ii) Protect the letter as Safeguards Information.

(iii) By (360 days from final rule effective date), fully implement the required vehicle control measures or the site specific alternative measures as approved by the Commission and confirm this by letter to the Commission.

(v) For each applicant for a license to operate a nuclear power reactor pursuant to 50.21(b) or 50.22 of this chapter, whose application was submitted prior to (insert effective date of rule), incorporate the required vehicle control program into the site Physical Security Plan and implement it either by (insert 360 days from the effective date of the rule) or the date of receipt of the operating license, whichever is later.

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