



U.S. NUCLEAR REGULATORY COMMISSION
STANDARD REVIEW PLAN
OFFICE OF NUCLEAR REACTOR REGULATION

SECTION 3.5.1.5

SITE PROXIMITY MISSILES (EXCEPT AIRCRAFT)

REVIEW RESPONSIBILITIES

Primary - Accident Analysis Branch (AAB)

Secondary - Structural Engineering Branch (SEB)
Auxiliary and Power Conversion Systems Branch (APCSB)I. AREAS OF REVIEW

The staff reviews the applicant's assessment of possible hazards due to missiles generated by the design basis explosions identified in Section 2.2 of the safety analysis report (SAR). The purpose of the review is to assure that hazards due to these missiles are acceptably small so that they need not be included in the plant design basis, or that appropriate design basis missiles have been chosen and properly characterized. The APCSB determines those systems and components that should be protected against missile impacts, and the SEB assures that adequate protection is provided.

II. ACCEPTANCE CRITERIA

The plant is considered adequately designed against site proximity missiles if the resulting probability of a missile affecting the safety-related features of the plant is within the guidelines established in Section II of Standard Review Plan 2.2.3.

III. REVIEW PROCEDURES

The reviewer selects and emphasizes aspects of the areas covered by this review plan as may be appropriate for a particular case. The judgment on areas to be given attention and emphasis in the review is based on an inspection of the material presented to see whether it is similar to that recently reviewed on other plants and whether items of special safety significance are involved.

1. The identification of accidents which could possibly generate missiles is obtained from Section 2.2 of the SAR.
2. The total probability of the missiles striking a critical area of the plant is estimated. The total probability per year (P_T) may be estimated by using the following expression:

$$P_T = P_E \times P_{MR} \times P_{SC} \times P_P \times N$$

USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to Revision 2 of the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

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where:

P_E = probability per year of design basis explosion calculated in Section 2.2,

P_{MR} = probability of missiles reaching the plant,

P_{SC} = probability of missiles striking a critical area of the plant,

P_P = probability of missiles exceeding the energies required to penetrate to vital areas (e.g., based on wall thickness provided for tornado missiles), and

N = number of missiles generated by the design basis explosion.

P_{MR} , P_{SC} and P_P are assumed to be equal to 1 unless the analyses in this section demonstrate lower values.

3. If P_T is greater than about 10^{-7} per year, the reviewer should verify that the proper design basis events have been chosen and the missiles properly characterized.
4. The capability of structures to withstand the postulated missile impacts will be reviewed by the SEB, and the vital target areas will be defined by the APCSB.

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided and the review and calculations support conclusions of the following type, to be included in the staff's safety evaluation report:

1. "The staff analysis shows that the probability of an accident having serious radiological consequences is extremely remote and is within the guidelines established for low probability events of site proximity missiles. We conclude, therefore, that the probability of a missile impact causing radiological consequences of the order of 10 CFR Part 100 guidelines is so small that such an event does not present an undue risk to the health and safety of the public."

or

2. "The staff analyses verify that a design basis missile impact has been properly chosen and characterized."

V. REFERENCES

1. Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants," Revision 2.
2. Regulatory Guide 1.76, "Design Bases Tornado for Nuclear Power Plants."
3. Regulatory Guide 1.91, "Evaluation of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plant Sites."
4. Standard Review Plan 2.2.3, "Evaluation of Potential Accidents."

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