

DOCKET NUMBER  
PROPOSED RULE

*PR - Misc. Notice  
Regulatory Guides*

July 22, 1976



Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Service Section

Gentlemen:



In response to your request for comment on Regulatory Guide 1.117 entitled "Tornado Design Classification", we suggest adding the following statement (underlined) to the end of section B. Discussion:

"The physical separation of redundant or ..., including tornado-generated missiles, unless it can be demonstrated to be at an acceptable risk level."

We appreciate this opportunity to comment on your regulatory guide.

Yours truly,

*W. B. Loewenstein*

W. B. Loewenstein, Director  
Nuclear Safety & Analysis Department

WBL/rt

cc: M. Levenson

Acknowledged by card *7/27/76*

*IFW  
Comments*



Allied-General Nuclear Services

August 20, 1976

DOCKET NUMBER  
PROPOSED RULE *PR-Misc Notice*  
*Regulatory Guide*



Secretary of the Commission  
Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Docketing and Service Section

Subject: Regulatory Guide 1.117, June 1976

Gentlemen:

We have reviewed the subject Regulatory Guide and suggest that Item 5 of the Appendix be modified to read: "The spent fuel storage facility to the extent necessary to preclude significant loss of watertight integrity of the storage and to prevent missiles from significantly damaging fuel within the pool."

The potential consequence of tornado-generated missiles should be analyzed on a case-by-case basis -- for instance, with the fuel pool at the Barnwell Nuclear Fuel Plant an analysis has shown that tornado-generated missiles would not have any significant consequence if they enter the pool.

The Appendix to the Regulatory Guide also includes as systems to be protected against tornados, "(3) cooling the spent fuel storage pool." Again, on a case-by-case basis, it should be determined whether, in order to maintain the safety of the pool, the cooling system is required to be able to be functional at all times and after any consequence. With the four hundred ton capacity pool at Barnwell, such safety can be assured even after long duration loss of cooling capacity, simply by permitting the pool to boil and adding makeup water to maintain the necessary water level for shielding. Actually, in the early days of pool operation, it is anticipated that the fuel will be sufficiently cooled and the burnup so low that, regardless of the length of loss of cooling capability, the pool would not even boil. Accordingly, it seems quite appropriate that this not be a firm requirement, but one required where applicable on a case-by-case analysis.

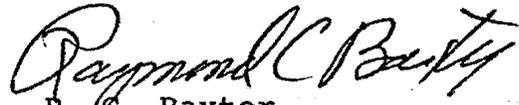
Acknowledged by card *8/31/76 JF*

*IFP-11*  
*Comments*

Secretary of the Commission  
Page 2  
August 20, 1976

Should you not concur with the above comments, we would be pleased to hear your reason for nonconcurrence and to have the opportunity to discuss the matter with you if our differences persist.

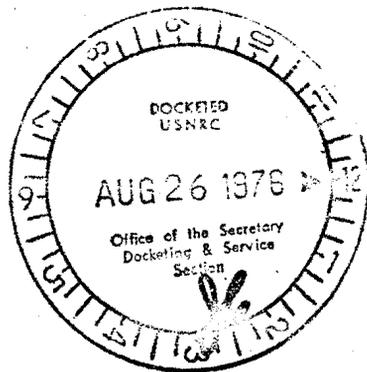
Sincerely yours,

A handwritten signature in cursive script, appearing to read "Raymond C. Baxter".

R. C. Baxter  
Acting President

RCB:cw

EXXON NUCLEAR COMPANY, Inc.  
RESEARCH AND TECHNOLOGY CENTER  
955 George Washington Way, Richland, Washington 99352  
PHONE: (509) 943-0661



DOCKET NUMBER  
PROPOSED RULE

*PR-Price Notice  
Regulatory Guide*

August 20, 1976

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Attention: Docketing & Service Section

Reference: Regulatory Guide 1.117, "Tornado Design Classification,"  
dated June 1976.

Gentlemen:

The referenced Regulatory Guide 1.117 was reviewed by the Exxon Nuclear staff and it is recommended that Section 5 of the Appendix should be reworded as follows:

5. The spent fuel storage facility to the extent necessary to preclude the significant loss of watertight integrity of the storage pool, and to prevent a release of radioactive material which would result in an offsite dose that is a significant fraction of the guideline exposure of 10 CFR Part 100.

It is our opinion that a tornado-generated missile may be allowed to penetrate or cause spalling of a confinement barrier and that these spalled pieces or even the missile itself may contact the fuel or parts of the fuel pool provided the damage incurred does not cause a significant loss of watertight integrity, or does not give an offsite dose to the public which is a significant fraction of the guideline exposures of 10 CFR Part 100. The large depth of water covering the fuel (approximately 15 feet) tends to absorb the impact from low velocity missiles and thus prevents severe damage to the fuel. The difference between the cost of missile protection that prevents contacting the fuel and that which allows same damage to the fuel can be considerable; yet, the protection afforded both the public and the equipment with the latter case is well within the desired limits.

Reviewed by and

*8/26/76*

*IR-11  
Comments*

Secretary of the Commission  
August 20, 1976  
Page 2

In view of the above, it is recommended that the wording in item 5 of the Appendix to Regulatory Guide 1.117 be reworded as given above to allow the fuel to be contacted by the primary missile or by secondary missiles generated by the primary missile.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Nilson', written in a cursive style.

R. Nilson, Manager  
Quality Assurance and Licensing



UNITED STATES  
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION  
WASHINGTON, D.C. 20545

AUG 30 1976

DOCKET NUMBER  
PROPOSED RULE PR-Misc. Notice  
Regulatory Guide



Secretary of the Commission  
ATTN: Docketing and Service Section  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Sir:

REGULATORY GUIDE 1.117 - TORNADO DESIGN CLASSIFICATION

The subject guide was reviewed by ERDA and ERDA contractors safety staff. The following comments resulted from these reviews and are offered for consideration in the finalization of this guide.

1. "NUREG 75/087, section 3.5.1.4 - Missiles Generated by Natural Phenomena," should be added as a reference in the second paragraph of Section A.

The reference could be cited as follows in the text, "... including tornado missiles [as defined in NUREG 75/087, section 3.5.1.4, "Missiles Generated by Natural Phenomena,"] and remain functional."

2. The phrases "a significant fraction" and "an unacceptable safety level" should be further clarified quantitatively and qualitatively. These phrases appear as follows:

Section B. Discussion (item 3) - "The capability to prevent accidents that could result in potential offsite exposures that are a significant fraction..."

Section C. Regulatory Position (second paragraph) - "Those portions of structures, systems, or components whose continued function is not required but whose failure could reduce to an unacceptable safety level...."

Acknowledged by card 9/8/76 JLP



ESP-11  
Comm

3. Section B, last paragraph. The inference in this paragraph is that physical separation is not an acceptable method for protecting against the effects of missiles. While the redundant or alternate structures or components required for safe shutdown should by themselves be designed to withstand the effects of a Design Basis Tornado, their physical separation would reduce the possibility of tornado-generated missiles from impacting redundant structures, systems, or components. To remove the inference, it is suggested that the paragraph be revised as follows: "The physical separation of redundant or alternate structures or components required for the safe shutdown of the plant is generally not considered acceptable by itself for protecting against tornado effects, including tornado-generated missiles."
4. Appendix, item 6. The specific parts associated with the control rod drives that need to be hardened against tornados should be specified.
5. Appendix, item 10. This item only requires electric and mechanical devices and circuitry up to the input terminals of the actuator systems to be protected against tornados. It excludes the actuation devices (e.g., circuit breakers, relays, valve operators, etc.) and actuated equipment (e.g., control rod release mechanisms, prime movers and pumps, valves, etc.). Since operation of the actuation devices and actuated equipment is necessary to complete protective action, item 10 should be revised to include this equipment.

Sincerely,



Martin B. Biles, Director  
Division of Safety, Standards,  
and Compliance

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, 175 CURTNER AVENUE, SAN JOSE, CALIFORNIA 95125  
Phone (408) 297-3000 TWX No. 910-338-0116

NUCLEAR ENERGY  
SYSTEMS DIVISION  
BWR PROJECTS DEPARTMENT

Mail Code 685

DOCKET NUMBER

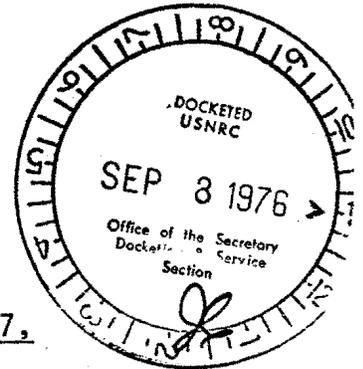
August 30, 1976

PROPOSED RULE

*PR-Misc. Notice  
Regulatory Guide*

Letter No. 780-321-76

Secretary of the Commission  
ATTN: Chief, Docketing and Service Section  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555



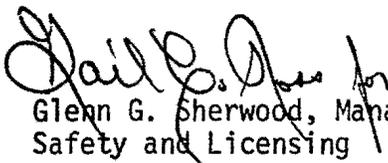
SUBJECT: GENERAL ELECTRIC COMMENTS ON REGULATORY GUIDE 1.117,  
"TORNADO DESIGN CLASSIFICATION"

Gentlemen:

The General Electric Company has reviewed the subject guide. As a result of this review, the General Electric Company has developed the comments documented in Attachment A. The changes recommended in Attachment A are intended to improve the meaningfulness and technical accuracy of the guide.

Please consider these comments in further revisions of the guide. If you have questions regarding this letter, please contact me or W.H. D'Ardenne, (408) 297-3000, Ext. 2441.

Sincerely,

  
Glenn G. Sherwood, Manager  
Safety and Licensing

GGG:RJM:csc

Attachment A

cc: A. Briggs  
N. Shirley  
L.S. Gifford  
M. Kehemuyi (NRC)

*Acknowledged by [unclear] 9/8/76*

*I + P-11  
Comments*

ATTACHMENT A

GENERAL ELECTRIC COMMENTS ON REGULATORY GUIDE 1.117,  
"TORNADO DESIGN CLASSIFICATION"

1. Recommended Change

- a. Change the third line of the fourth paragraph in section B to read as follows:

"...of, or be protected by barriers designed to preclude missile strikes from a Design Basis Tornado are those necessary to ensure..."

- b. Change the third line of the first paragraph in section C to read as follows:

"...and supports, that should be designed to withstand or be protected from the...."

- c. Change the sixth line of the second paragraph in section C to read as follows:

"...constructed or housed within protective barriers which preclude missile strikes so that the effects of the Design Basis..."

Reason

The regulatory guide as presently written literally specifies that individual components and systems of piping, components, and instruments be designed to withstand tornadoes and tornado missiles. Such a provision cannot be practically implemented. For example, there is no way to design a pressure gage or a thermometer to withstand a missile strike. However, it is possible to house such devices within a barrier which will preclude strikes from tornado born missiles. The suggested word changes are consistent with the second sentence of the first paragraph in section B. The aforementioned sentence specifies that Design Basis Tornado protection of structures, systems, and components can be achieved by incorporating in the design protective barriers which preclude missile strikes.

2. Recommended Change

Change paragraph seven of the Appendix to read as follows:

"The control room structures and essential equipment whose failure could result in incapacitating injury to authorized individuals occupying the control room. Essential equipment includes all equipment which is needed to maintain the control room within safe operating limits for personnel and equipment."

Reason

The terms "life support systems", as presently incorporated in paragraph seven, could be misinterpreted to include those "life support systems" which are not essential to maintain the control room within safe operating limits for personnel and equipment. Paragraph seven should be re-written with the main theme of paragraph seven, "...the maintenance of the control room within safe operating limits...", emphasized. The change recommended accomplishes the foregoing objective.

3. Recommended Change

The term "required" in paragraph nine of the Appendix should be correlated to a specific criterion.

Reason

As presently written the intent of paragraph nine is not clear. The term "required" can be misinterpreted unless it is clarified by a reference establishing the basis of the requirement, such as a general design criterion, a IEEE standard, or another regulatory guide.

William J. Cahill, Jr.  
Vice President

DOCKET NUMBER  
PROPOSED RULE

PR-Misc. Notice  
Regulatory Guide

Consolidated Edison Company of New York, Inc.  
4 Irving Place, New York, N Y 10003  
Telephone (212) 460-3819

August 31, 1976

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20545

Attention: Docketing and Service Section

Dear Mr. Secretary:

We have reviewed NRC Regulatory Guide 1.117 entitled,  
"Tornado Design Classification", and offer the following  
comments for your consideration:

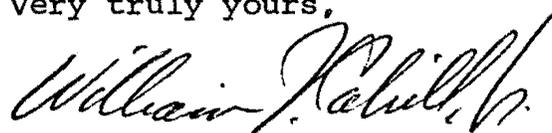
Section B, Paragraph 2

This paragraph states that "It is not necessary to maintain the functional capability of all Seismic Category I structures..." Those structures, systems and components required to be designed to withstand a Design Basis Tornado as delineated in Paragraph 4, however, are essentially the same as those required to be designed to Seismic Category I. These two paragraphs appear to be in direct contradiction.

Section B, Paragraph 4

The term "significant fraction of the guideline exposures of 10CFR Part 100" is extremely nebulous and requires quantification.

Very truly yours,

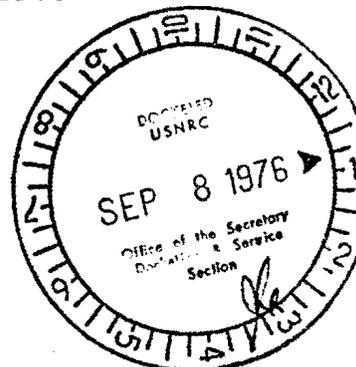


William J. Cahill, Jr.  
Vice President

mp

Acknowledged by card

*Stetson*



ITP-11  
Comments

DOCKET NUMBER  
PROPOSED RULE

PR-*Final Notice*  
*Regulatory Guide*

Telephone 617 366-9011

TWX  
710-390-0739

# YANKEE ATOMIC ELECTRIC COMPANY



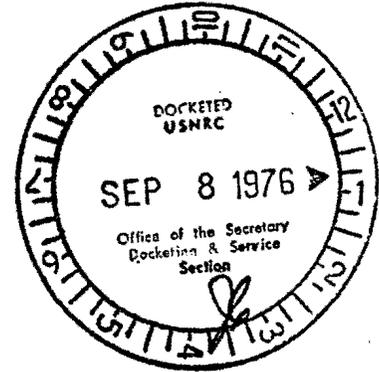
20 Turnpike Road Westborough, Massachusetts 01581

August 31, 1976

Secretary of the Commission  
United States Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Docketing and Service Section

Subject: USNRC Regulatory Guide 1.117 "Tornado Design  
Classification (For Comment)"



Dear Sir:

Submitted herewith are comments developed as a result of review of the subject Regulatory Guide.

The subject Regulatory Guide, paragraph A. Introduction states:

"This guide describes a method acceptable to the NRC staff for identifying those structures, systems, and components of light-water-cooled reactors that should be designed to withstand the effects of the Design Basis Tornado..."

However, the above intent differs significantly from the title wording of the Regulatory Guide appendix, which reads: "Minimum Structures, Systems, and Components to be Protected Against Tornadoes". To design a component to "withstand the effects" of a tornado significantly differs from those required to "protect against" the effects of a tornado.

We believe the denotations expressed in the text of the subject Regulatory Guide and its Appendix should be modified to resolve the apparent ambiguity.

We trust that this information is of value to you.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

W. P. Johnson  
Vice President

*ITP-11  
Comments*

RHG/kg

Acknowledged by card *9/8/76*

C-E Power Systems  
Combustion Engineering, Inc.  
1000 Prospect Hill Road  
Windsor, Connecticut 06095

Tel. 203/688-1911  
Telex: 9-9297

DOCKET NUMBER

PROPOSED RULE

*PR - Tma Notice  
Regulatory Guide*

September 8, 1976  
LD-76-097



**POWER  
SYSTEMS**

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Docketing and Service Section

Gentlemen:

Regulatory Guide 1.117 "Tornado Design Classification" was received in July, 1976 for comments to be used in evaluating the need for a revision to the guide. We have reviewed the guide and provide the following comments for your use.

Section B of the guide, in paragraph 1, discusses the need to design structures such as the primary containment, reactor building, auxiliary building, and control structures against collapse, and that the structures should provide an adequate barrier against missiles. The paragraph then goes on to state that "If protective barriers are not installed, the structures and components themselves should be designed to withstand the effects of the tornado, including tornado missile strikes." This guidance in the Discussion section of the guide seems appropriate, however, it is in conflict with the Regulatory Position section of the guide.

Section C, the Regulatory Position section of the guide states "The appendix to this guide lists those structures, systems, and components, including their foundations and supports, that should be designed to withstand the effects of ... tornado missiles, without loss of capability to perform their safety function." In turn, the appendix lists minimum items which should conform to the guidance of Section C. The appendix includes items such as the reactor core, control rod drives, devices involved in generating signals that initiate protective action, and the structures that can provide protective barriers for these items. Thus, it appears that Section C of the guide and the Appendix would require, for example, that the reactor core be designed to withstand the impact of the tornado generated missiles. We feel that the dichotomy with Section B which allows use of a barrier, such as the containment, to protect safety related structures and components must be eliminated.

Acknowledged by card

*9/15/76*

We recommend that the first paragraph of Section C of the guide be revised to state "The appendix to this guide lists those structures ... that should be designed, or protected by barriers which are designed, to withstand the effects ...." Incorporation of this recommendation will more accurately reflect the Discussion section of the guide.

Very truly yours,

COMBUSTION ENGINEERING, INC.

A handwritten signature in cursive script, appearing to read "A. E. Scherer".

A. E. Scherer  
Licensing Manager

AES:RRM:g1