

[7590-01-M]

NUCLEAR REGULATORY
COMMISSION

[10 CFR Part 50]

DOMESTIC LICENSING OF PRODUCTION AND
UTILIZATION FACILITIES

Acceptance Criteria for Emergency Core Cooling
Systems for Light-Water-Cooled Nuclear
Power Plants

AGENCY: U.S. Nuclear Regulatory
Commission.

ACTION: Advance notice of proposed
rulemaking.

SUMMARY: The U.S. Nuclear Regula-
tory Commission is considering
amending its regulations to change
certain technical as well as nontechni-
cal requirements within the existing
emergency core cooling system rule.
Modifications under consideration
would take into account (1) experience
gained in the licensing process, (2) new
research information, and (3) operat-
ing experience. This notice is to invite
advice and recommendations on several
questions concerning the acceptance
criteria for emergency core cooling
systems in light-water-cooled nuclear
power plants. There will be a later op-
portunity for public comment in con-
nection with any proposed rules that
may be developed by the Commission.

DATES: Comment period expires Feb-
ruary 5, 1979.

ADDRESSES: Interested persons are
invited to submit written comments
and suggestions to the Secretary of
the Commission, U.S. Nuclear Regula-
tory Commission, Washington, D.C.
20555, Attention: Docketing and Ser-
vice Branch. Copies of comments re-
ceived by the Commission may be ex-
amined in the Commission's Public
Document Room at 1717 H Street,
N.W., Washington, D.C.

FOR FURTHER INFORMATION
CONTACT:

Mr. James A. Norberg, Office of
Standards Development, U.S. Nucle-
ar Regulatory Commission, Wash-
ington, D.C. 20555, phone 301-443-
5921.

SUPPLEMENTARY INFORMATION:

HISTORICAL BACKGROUND

Emergency core cooling systems
(ECCS) were recognized in 1966 as im-
portant engineered safety features for
mitigating the consequences of a
postulated loss-of-coolant-accident
(LOCA) in light-water-cooled nuclear
power plants. During the period 1966
to 1971 extensive research programs
were initiated to better understand
the LOCA and several comprehensive
reviews were made to evaluate the ad-
equacy of ECCS. ECCS designs submit-

ted for licensing safety evaluation
were reviewed on a case-by-case basis.

By 1971, much significant research
information on the LOCA/ECCS had
been obtained, and the Regulatory
staff had acquired extensive experi-
ence in its licensing review of over 50
ECCS designs. Included in this experi-
ence was the large amount of staff
time spent in individual ECCS-related
licensing reviews. In some cases new
evaluation models, assumptions, and
parameters were proposed for each
successive plant.

To alleviate this situation, an Inter-
im Policy Statement (IPS) providing
specific guidance on ECCS evaluations
and based on the then current state of
knowledge of LOCA/ECCS was devel-
oped. The IPS was issued by the Com-
mission immediately effective on June
29, 1971. However, following public
comment, the Commission announced
its decision on November 30, 1971, to
hold a rulemaking hearing to deter-
mine whether the IPS should be re-
tained as issued or whether different
criteria should be adopted.

A rulemaking hearing, convened in
January 1972, generated an extensive
record of discussion and evaluation of
the available evidence (i.e., experimen-
tal results and analytical models) per-
tinent to LOCA/ECCS. The complete
hearing record was certified to the
Commission for the Commission's use
in making its determination of policy
on ECCS. Based on this record, the
Commission Opinion of December 28,
1973 (CLI-73-39, 6 AEC 1085) was
issued, providing the basis for the
ECCS rule 10 CFR § 50.46, "Accept-
ance Criteria for Emergency Core
Cooling Systems for Light Water Nu-
clear Power Reactors," and Appendix
K, "ECCS Evaluation Models," to 10
CFR Part 50 (published in the FEDER-
AL REGISTER January 4, 1974).

In its Opinion, the Commission care-
fully considered the different views
produced by the record and decided on
the criteria and the required and ac-
ceptable features of the ECCS evalua-
tion models. The Commission stated
its belief that the margin provided by
these criteria and their inherent con-
servative features would be adequate
to assure core cooling should a design
basis LOCA ever occur.

The Commission in its Opinion also
stated its intent to provide latitude for
change when new research informa-
tion became available.

For many years, the Commission
(and its predecessor agency, the
Atomic Energy Commission) have had
programs of experimental and theo-
retical research related to ECCS per-
formance. The rulemaking Opinion
noted the ongoing research programs
of the Commission and the nuclear in-
dustry, and their potential for im-
proved knowledge (6 AEC 1085, 1088,

8. On page 54647 in the middle
column, the 4th paragraph, the 2nd
and 3rd sentences should read, "The
witness stated that Kraft plans to
divert milk from its pool supply plant
at Springfield, Mo., to its nonpool
plants at Bentonville, Berryville and
Springfield beginning in the fall
months of 1978. Under the present
order provisions, milk diverted to Ben-
tonville and Berryville from Spring-
field would be priced at Springfield be-
cause these two locations are within
120 miles of Springfield."

9. On page 54648 in the 1st column,
the 4th paragraph should read, "One
of proponent's concerns was that milk
which is diverted to its plants at Ben-
tonville and Berryville be priced at the
same level. The present provisions pro-
vide that milk diverted to nonpool
plants within 120 miles of Springfield
or St. Louis shall be priced at the
plant from which diverted. Since the
Bentonville and Berryville plants are
within 120 miles of Springfield, any
milk diverted by Kraft from the
Springfield plant to such locations will
receive the same price."

10. In the middle column, the 1st
paragraph, the 15th and 21st lines, the
words, "producers" and "previous"
should replace, "procedures" and "pro-
vious", respectively.

11. The middle column, the 2nd sen-
tence should read, "The money is de-
ducted by the market administrator in
the computation of the blend price
and is turned over to an agency com-
posed of pro-ducer representatives."

12. In the 3rd column, the 2nd para-
graph, the 1st sentence should read,
"At the request of the cooperative, a
representative of the United Dairy In-
dustry Association presented data in
support of the cooperative's position
that additional funds are needed by
the agency."

13. Also, in the 3rd column, the 4th
paragraph, the 2nd sentence should
read, "He stressed that while he was
not opposed to advertising and promo-
tion he felt that the higher assess-
ment to producers would be passed on
to Kroger through the price that pro-
ducers charge Kroger for milk."

14. On page 54649 in the 1st column,
the 1st full paragraph, the last sen-
tence should read, "The funding rate
adopted herein is in line with these
costs increases for newspaper and radio
advertising."

15. Also, in the 3rd full paragraph,
the 8th line should read, "equal to .72
percent of the weighted . . ."

16. On page 54650 in the middle
column, § 1062.7(d)(3), the word,
"plan" should read, "plant".

17. Also, the last sentence in that
column should read, "2. Section
1062.13 is revised to read as follows:"

1094, 1103, 1120, 1124, 1129). The government and industry ECCS research programs have produced significant new information in the years since the rulemaking. Furthermore, the Commission has acquired significant experience in using the ECCS rule, through its review of many ECCS evaluation models and licensing of ECCS designs.

In order to utilize new technical information and experience in the licensing process, the Commission is considering modifying the ECCS rule with both procedural changes and technical changes. The procedural changes provide improvements to the rule which would eliminate difficulties previously encountered in applying the rule. The technical changes would be in the direction of improving the realism of ECCS licensing evaluation in the light of present knowledge, while preserving a level of conservatism consistent with that knowledge.

SUMMARY OF PROPOSED RULE CHANGES

The Commission is considering the initiation of rulemaking in two phases, as follows:

PHASE 1 (SHORT TERM)

Initiate rulemaking for procedure-oriented and certain specific technical changes in the ECCS rule. These rule changes are expected to have little impact on the overall conservatism of the rule, and such changes are anticipated to require a minimum of time and effort to implement.

PHASE 2 (LONG TERM)

In parallel with Phase 1, initiate development of the bases for a more comprehensive rulemaking action to incorporate new knowledge and operating experience into the ECCS rule. This effort would include assessing the impact of proposed changes on the overall conservatism of the rule. As part of the overall assessment of conservatism, a systematic review of all relevant information will be performed to ensure that it is appropriately considered. No information on decay heat and zirconium-water reaction would be considered together with all other new information, including any adverse results (for example, discrepancies in the pretest prediction of significant research test results, uncertainties associated with the prediction of counter-current flow phenomena and core spray distribution, and the possibility of steam generator tube failures). If, during this review, it is determined that any information requires more specific treatment than is presently provided in Appendix K or in present licensing practices, appropriate rulemaking action will be taken.

The Commission staff is presently assessing the impact on the overall

conservatism of the rule of the proposed Phase 1 changes. Concurrently, the staff is developing the methodology for assessing the technically complex Phase 2 changes. It is expected that the Phase 1 assessment will be completed within six months. A completion time for the Phase 2 assessment has not been established, but this assessment is expected to take several years to complete. In each case, the drafting of the proposed rule could begin with the end of the assessment.

SPECIFIC CONSIDERATIONS

The following specific areas are under consideration by the Commission for proposed rulemaking:

PHASE 1 (SHORT TERM) PROCEDURE-ORIENTED AND CERTAIN SPECIFIC TECHNICAL RULE CHANGES

1. *Reanalysis Requirements.* a. *Reanalysis Requirements for Construction Permit Applications.* Changes to 10 CFR § 50.34 would allow for certain corrections to be made to vendor ECCS computer analysis codes during the construction permit review or during construction of the plant without a complete reanalysis of ECCS performance in compliance with 10 CFR § 50.34 until the operating license review. Criteria would be provided to define the bounds within which the corrections could be accepted without plant specific reanalysis.

b. *Reanalysis Requirements for Operating License Applications and Licensed Plants.* The changes to 10 CFR § 50.34 would dispense with ECCS performance recalculations in the event of corrections to vendor ECCS computer analysis codes if it is demonstrated, on a generic basis, that the model changes reduce the peak cladding temperature and if no change in plant technical specifications is involved.

2. *Return to Nucleate Boiling.* The changes would allow an assumption of a return to nucleate boiling during the blowdown phase of the LOCA when supported by applicable data. This change would involve modifications to 10 CFR Part 50, Appendix K, paragraph I.C.4.e. The objective of this change is to allow use of recent data on rewetting.

3. *Steam Cooling Requirements for Flooding Rates Below One Inch Per Second.* The changes would delete the requirement (Appendix K, paragraph I.D.5) that heat transfer calculations be based on the assumption that cooling is only by steam for flooding rates below one inch per second and replace it with a requirement that heat transfer calculations be based on applicable experimental data appropriately accounting for flow blockage if it is predicted to occur.

4. *Transition Boiling Correlation Reference.* This change would replace the reference to the transition boiling correlation in Appendix K, paragraph I.C.5, with an improved reference in a later publication by the same authors.

Items 2 and 3 above constitute certain specific technical changes to the present rule. However, recent assessments strongly indicate that these changes do not significantly affect the overall conservatism of the rule. Therefore, these changes will be considered along with the procedural changes of items

1 and 4 above. The results of the assessment which show that these changes have a negligible impact on the overall conservatism of the rule will be made available as part of the rule making process.

PHASE 2 (LONG TERM) RULE CHANGES BASED ON NEW INFORMATION FROM RESEARCH AND OPERATING EXPERIENCE

The following changes to the ECCS rule based on new information from research and operating experience are being considered by the Commission:

1. *Research Information.* a. *Fission Product Decay Heat Rate.* The changes would involve revising paragraph I.A.4 of Appendix K which assumes a heat generation rate from radioactive decay of 1.2 times the October 1971 ANS Proposed Standard¹ to another specified decay heat rate consistent with present knowledge. Consideration will be given to the combination of uncertainties in decay heat with uncertainties in initial heat rate.

b. *Zircaloy Oxidation Rate.* The changes would involve revising paragraph I.A.5. of Appendix K from the Baker-Just equation² of May 1962 to a calculation method based on present knowledge and needed conservatism. In addition, the basic performance requirement set forth in § 50.46(b)(2) that "the calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation" would also be reexamined to ensure consistency with the new data on strength and ductility of partially oxidized zircaloy.

c. *Additional Data.* The changes will include any changes to the ECCS rule needed to take into account new information that indicates the present rule is less conservative than previously believed, such as (1) the delay of emergency coolant injection caused by heat transfer to the coolant from hot walls and (2) less favorable distribution of BWR ECCS core spray.

2. *Operating Experience.* The changes will include any revisions to the ECCS rule needed to account for phenomena not specifically identified at the time the rule was promulgated but that have since been identified through operating experience as having a significant effect on ECCS performance. Such revisions will be identified during the development of the proposed rule.

During the development of the proposed rule changes, an assessment will be made of the impact of the proposed changes on the overall conservatism of the ECCS rule. The impact assessment will include a reassessment of the requirements presently specified in Appendix K in light of current information (e.g., statistical combination of heat sources) as well as consideration of other phenomena of importance to ECCS performance that have been

¹Proposed American Nuclear Society Standards—"Decay Release Rates Following Shutdown of Uranium-Fueled Thermal Reactors," approved by Subcommittee ANS-5, ANS Standards Committee, October 1971.

²Baker, L. C., "Studies of Metal Water Reactions at High Temperatures, III. Experimental and Theoretical Studies of the Zirconium-Water Reactor," ANL-6548, page 7, May 1962.

identified since the promulgation of Appendix K (e.g., new semiscale and LOFT test results, steam generator tube ruptures, countercurrent flow phenomena, BWR core spray distribution, subcooled break flow). A methodology will be developed for assessing the impact of proposed technical changes on the overall conservatism of the rule.

Advice and recommendations on the proposed areas of revision to the acceptance criteria for emergency core cooling systems in light-water-cooled nuclear power plants are invited from all interested persons. Specifically, comments are requested on the following questions:

1. Under what circumstances should corrections to ECCS models be used during licensing review without necessitating complete reanalysis of a given plant or an entire group of plants?
2. What would be the impact of the proposed procedure-oriented and certain specific technical rule changes?
3. How should safety margins be quantified and how can acceptable safety margins best be specified?
4. What phenomena have been identified since promulgation of the ECCS rule that are significant to ECCS performance and that are not adequately considered in the existing ECCS rule, in light of current knowledge and experience, or in current licensing practices?
5. How should the ECCS rule provide for the inclusion of new research information and operating experience? Can or should this be done on a continuing basis? How should provision of acceptable margins be handled in such a process?

The Commission has concluded preliminarily that the procedure-oriented and certain technical changes (Phase 1) to the emergency core cooling system rule would not constitute a major Federal action significantly affecting the quality of the human environment and as such will not require the preparation of an environmental impact statement pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA).

In view of the uncertainty regarding the possible technical changes to the ECCS rule based on new information from research and operating experience (Phase 2), the Commission cannot make a determination at this time concerning the possible need for an environmental impact statement. Any proposal for rulemaking action along these lines will include a Commission determination whether or not an environmental impact statement should be prepared for that action.

(5 U.S.C. 552; Sec. 161, Pub. L. 93-703, 68 Stat. 948; Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 2201, 5841).)

Dated at Washington, D.C., this 30th day of November 1978.

For the Nuclear Regulatory Commission.

SAMUEL J. CHILK,
Secretary of the Commission.
(FR Doc. 78-33943 Filed 12-5-78; 8:45 am)

[4710-08-M]

DEPARTMENT OF STATE

[22 CFR PART 151]

[Docket No. SD-140]

COMPULSORY LIABILITY INSURANCE FOR DIPLOMATIC MISSIONS AND PERSONNEL

Notice of Proposed Rulemaking

AGENCY: Department of State.

ACTION: Proposed rule.

SUMMARY: The Department of State proposes to add new regulations to 22 CFR as Subchapter P—Diplomatic Privileges and Immunities. These regulations specify the insurance required of all diplomatic missions, members of missions and their families, and officials of the United Nations entitled to diplomatic immunity, including the limits of liability, and describe the evidence of insurance necessary before the Department of State endorses applications for diplomatic automobile license plates or exemptions from registration fees.

DATES: Written comments must be received by February 2, 1979. In addition, interested persons may offer comments orally at a public meeting to be held at 10 a.m., February 5, 1979, at Room 1912, Department of State, 2201 C Street NW., Washington, D.C. 20520. Written notification of intent to offer oral comments at this public meeting must be received by February 2, 1979.

ADDRESS: Written comments and written intention to attend the meeting and offer oral comments should be sent to David P. Stewart, Special Assistant, Office of the Legal Adviser, Room 6423, 2201 C Street NW., Washington, D.C. 20520.

FOR FURTHER INFORMATION CONTACT:

David P. Stewart, Department of State, Washington, D.C., telephone 202-632-2149.

SUPPLEMENTARY INFORMATION: The Diplomatic Relations Act, Pub. L. 95-393, September 30, 1978 (22 U.S.C. 254a et seq., 28 U.S.C. 1364) will become effective December 29, 1978. As of that date, previous statutes on diplomatic immunity dating from the eighteenth century will be repealed and the privileges and immunities provisions of the 1961 Vienna Convention on Diplomatic Relations (23 UST 3227, 500 UNTS 95), will be established as

the United States law on diplomatic immunity.

Section 6 of the Act requires diplomatic missions, members of missions, their families, and senior officials of the United Nations who are entitled to diplomatic immunity to have and maintain liability insurance against risks arising from their operation of motor vehicles, vessels, or aircraft. The President is directed to establish the requirements for this liability insurance by regulation. Executive Order 12101 (43 FR 54195) delegates to the Secretary of State the authority to prescribe these regulations.

In consideration of the foregoing, it is proposed to amend Chapter I of 22 CFR, by adding a new Subchapter P, to read as follows:

SUBCHAPTER P—DIPLOMATIC PRIVILEGES AND IMMUNITIES

PART 151—COMPULSORY LIABILITY INSURANCE FOR DIPLOMATIC MISSIONS AND PERSONNEL

Sec.

- 151.1 Purpose.
- 151.2 Definitions.
- 151.3 Types of insurance coverage required.
- 151.4 Minimum limits for motor vehicle insurance.
- 151.5 Recommended limits for motor vehicle insurance.
- 151.6 Authorized insurer.
- 151.7 Policy terms consistent with the Act.
- 151.8 Evidence of insurance for motor vehicles.
- 151.9 Evidence of insurance required for diplomatic license plates and waiver of fees.
- 151.10 Minimum limits of insurance for aircraft and/or vessels.
- 151.11 Notification of ownership, maintenance, or use of vessel and/or aircraft; evidence of insurance.

AUTHORITY: Sec. 4, 53 Stat. 111 (22 U.S.C. 2658); Sec. 6 Pub. L. 95-393 (92 Stat. 809, 22 U.S.C. 254c); E.O. 12101 (43 FR 54195).

§ 151.1 Purpose.

This part establishes regulations required under section 6 of the Diplomatic Relations Act (Pub. L. 95-393; 22 U.S.C. 254c). These regulations require all missions, members of missions and their families, and those officials of the United Nations who are entitled to diplomatic immunity to have and maintain liability insurance against the risks of bodily injury, including death, and property damage, including loss of use, arising from the ownership, maintenance, or use in the United States of any motor vehicle, vessel, or aircraft.

§ 151.2 Definitions.

(a) "Act" means the Diplomatic Relations Act, Pub. L. 95-393 (22 U.S.C. 254a et seq., 28 U.S.C. 1364).

(b) "Persons subject to the Act" means the members of missions who