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NUCLEAR ENERGY INSTITUTE

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65FR55064
Sept. 12 - 2000
③

SUBJECT: Public Comment on Draft Regulatory Guide DG-1098, *Safety-Related Concrete Structures for Nuclear Power Plants (Other than Reactor Vessels and Containments)* (64 Fed. Reg. 71990)
Request for Comments

PROJECT NUMBER: 689

Enclosed are the Nuclear Energy Institute's (NEI)¹ comments on draft Regulatory Guide DG-1098, which was issued for public comment on September 12.

A comment with policy implications beyond this one regulatory guide is the NRC staff activity to update regulatory guides to incorporate improved technical knowledge and to reference revised or new consensus standards. This currently includes draft guides DG-1098, -1100, -1102, and -1103, but there will be more.

In the DG-1098 Regulatory Analysis, an assumption is made that licensees would use the latest consensus standards available because they incorporate more recent technology and knowledge on the subject. While this might often be the case, there can be valid exceptions. It remains for each licensee to determine the feasibility and value of applying updated regulatory guides. An operating reactor licensee who voluntarily proposes to initiate system modifications consistent with the current licensing basis should not be placed in a position of defending to NRC staff a decision to not apply an updated regulatory guide.

¹ NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

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add - ANN BERANEK
(AFB)

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The Backfit Analysis section of the DG-1098 Regulatory Analysis states that the regulatory guide *“does not require a backfit analysis as described in 10 CFR 50.109(c) because it does not impose a new or amended provision in the Commission rules or a regulatory staff position...In addition, this regulatory guide does not require the modification or addition to systems, structures, components, or design of a facility or the procedures or organization required to design, construct, or operate a facility...This regulatory guide provides an opportunity to use industry-developed standards, if that is a licensee’s or applicant’s preferred method.”*

In contrast, the guidance contained in Section D, *Implementation*, of DG-1098 could result in an unwarranted burden on licensees. It states that *“except in those cases in which the applicant or licensee proposes an acceptable alternative method for complying with specified portions of the NRC’s regulations, the method to be described in the active guide reflecting public comments will be used in the evaluation of safety-related nuclear concrete structures, excluding concrete reactor vessels and concrete containments.”*

To address this concern, we recommend that the NRC include clear guidance in Section D, *Implementation*, of each updated regulatory guide that operating reactor licensees are not required to adopt revised regulatory guides in place of those cited as part of the current licensing basis.

Regarding DG-1098, our two most significant technical comments are:

- Eliminate Regulatory Positions 6.2 and 6.3, which modify the P_a factors from those defined in the ACI 349-97 standard. These Regulatory Positions appear to add unnecessary conservatism. Advances in current computer modeling and analytical computer codes obviate the need for building in additional margin beyond that specified by ACI 349-97.
- Revise the draft regulatory guide to permit use of other qualification methods for small batch projects. The ACI 349-97 guidance and DG-1098 Regulatory Position 5 limitation on qualification testing requirements for small batch projects is cost prohibitive and could force licensees to use means other than concrete to repair concrete structures.

Questions should be directed to Kurt Cozens (202-739-8085 or koc@nei.org).

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Sincerely,

A handwritten signature in black ink, appearing to read "David J. Modeen". The signature is fluid and cursive, with a long horizontal stroke at the end.

David J. Modeen

KOC/maa

Enclosure

c: Mr. Herman L. Graves, III, U. S. Nuclear Regulatory Commission
Mr. Peter C. Wen, U. S. Nuclear Regulatory Commission

Enclosure 1

Comments on DG-1098

CMT #	Page	Section	Paragraph	Comment	Recommended Change
1.	2	B.	1 st Para., last sentence	ACI 349-97 is based on the corresponding sections of ACI 318-89 (Revised 1992), with the exception of Chapter 12, which is based on ACI 318-95. The referenced sentence indicates that the entire ACI 349-97 document is based on the requirements of ACI 318-95, which is not true.	Revise the reference to ACI 349-97 and ACI 318-95,
2.	4	B.	Regulatory Position 3	<p>Paragraph 21.2.1.2 of ACI 349-97 appears to be a wrong reference. It is not clear what the commenter intended.</p> <p>The Position 3 statement "...where seismic resistance is shared by several buildings..." is unnecessary and could cause confusion.</p>	Delete "where seismic resistance is shared by several buildings,"
3.	6	B.	Regulatory Positions 10 & 11	<p>At the top of Page 6:</p> <p>The sentence reads, "Though there is no direct relationship between DLF and DIF, Regulatory Position 10 restricts the use of DIF when the DLF is <u>higher</u> than 1.2."</p> <p>It should read, "Though there is no direct relationship between DLF and DIF, Regulatory Position 10 restricts the use of DIF when the DLF is <u>lower</u> than 1.2."</p>	Revise the text from "higher" to "lower".
4.	6	C	3.	<p>Additional guidance should be included to determine when the structural component should be designed as a frame member. All components will have some flexure. They should be designed as a frame only when the seismic flexure is a large percentage of the flexural capacity. These requirements should not be imposed on floor slabs primarily designed for dead and live load nor for out of plane bending in a wall primarily designed for in-plane seismic shear.</p> <p>A ratio of two thirds as shown in the recommended change was selected such that seismic flexure alone would be within the design capacity even under a seismic margin earthquake equal to 150% of the SSE</p>	<p>Add:</p> <p>The response of structural components should be considered as consistent with the response of structural frames when the flexural moment due to seismic loads exceeds two-thirds of the design flexural capacity of the section in the absence of axial forces.</p>
5.	7	C.	5.	The proposed regulatory position requires a strength test at least once per shift, but shift is not defined. This could cause a conflict between a utility and an inspector.	Revise the proposed regulatory position to define the term "shift" or change the criteria to that permitted in ACI 349, strength testing at least once per day.
6.	7	C.	5.	The proposed regulatory position does not	Modify the proposed

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				address the frequency of strength testing of small batch projects as addressed by the ACI 349 Code in sections 5.6.1.2 and 3.	regulatory position to include appropriate strength testing requirements for small batch projects.
7.	7	C.	5.	Qualification testing requirements for small batch projects on safety related structures are cost prohibitive and could force utilities to use other means than concrete to repair the structure.	Modify Regulatory Position 5 or add a new position that allows provisions for using other methods in lieu of qualification testing for small batch projects. Define small batch projects as 100 cubic yards or less. For small batch projects add alternative qualification testing criteria that include acceptance of qualification testing requirements used by state highway departments (in lieu of those listed in ACI 349, 3.8) and increased field testing for slump, air content and compressive strengths.
8.	7	C.	6.	ACI 349-97 load factors are addressed in Section 9.2.1 rather than Section 9.3.1.	Revise 9.3.1 to 9.2.1.
9.	7	C.	6.2 & 6.3	Proposed regulatory position 6.2 and 6.3 increases the P_a factors for load combinations 6 and 7. This is an unnecessary addition of conservatism because advances in computer modeling and improvements in analysis computer codes permit better predictions of accident pressures. The proposed factor increase appears to assume that analysis methods are those developed in the 1970's and 1980's Sub-compartment pressurization methodology typically includes a series of conservative assumptions. The load factor of 1.5 proposed by the staff is equal to that used for design of concrete containment. The load factor of 1.25 in ACI 349-97 reflects that such structures are less critical than containment.	Revise the regulatory guide to maintain the ACI P_a factors.
10.	8	C.	10.3	The position should refer to ACI 349-97 Section C.3.5 rather than Section C.3.4.	Revise C.3.5 to C.3.4.
11.	8	C.	10.3	The intent of the position is to limit out-of-plane deformations so that the structural elements can continue to support in-plane (compression) loads. For specific cases such as a pressurized tunnel, limiting the ductility to the elastic range is overly conservative.	The regulatory guide should specify the ductility limitations when structural elements of a concrete structure support compressive (in-plane) loads in excess of those specified under Section C 3.8 b of ACI 349-97.

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12.	8	C.	10.3.1	The permissible ductility ratio defined in Section C.3.4 of ACI 349-97 is a maximum limit. Use of the less than or equal symbol is inappropriate.	Revise the equation to $\mu = 1.0$
13.	8	C.	10.5	<p>The purpose of this position is to assure that the strain rates associated with the impactive or impulsive loading are high enough to justify the use of a Dynamic Increase Factor (DIF) greater than 1.0. When the assessment of the impactive or impulsive load is made using momentum conservation and/or energy balance techniques, such as equating available strain energy to the kinetic energy of the load, a Dynamic Load Factor (DLF) is not, and needs not be, calculated.</p> <p>Revise the existing text to address this possibility and still avoid using DIFs that are not justified by the strain rates associated with the loading.</p>	<p>Revise 10.5 to read:</p> <p>"In Section C.2.1 of ACI 349-99, all materials will use a dynamic increase factor of 1.0, when the dynamic load factor associated with the impactive or impulsive loading is less than 1.2."</p>
14.	8	C.	14	<p>This position requires certain structural elements to meet both ACI 349 and ACI 359. This may create conflicts between the two codes. Either code is adequate for seismic loads. Either code is probably adequate for pressure loads since the element would be pressure resisting and not pressure retaining.</p> <p>As an example consider a containment with a basemat common with the auxiliary building. Such a mat frames into the concrete containment and will participate in resisting accident and seismic loads.</p>	<p>Revise the regulatory guide to require the designer to identify the boundaries of code applicability. These boundaries would be reviewed by NRC staff.</p> <p>Also revise Regulatory Position 14 on page 6 to be consistent with this recommendation.</p>
15.	8	D.	--	<p>Section D, Implementation, states "...the method to be described in the active guide reflecting public comments will be used in the evaluation of safety-related nuclear concrete structures, excluding concrete reactor vessels and concrete containments."</p> <p>The term "evaluation" is not defined. This could result in licensee or NRC staff confusion about when the RG is to be used. Revision 1 of RG 1.142 (Section D, Implementation, first paragraph) discusses the circumstances for use of the RG. Revision 2 of the RG does not have the same clarification. The clarification provided in Revision 1 should be retained in Revision 2.</p>	Revise DG-1098 to retain the Implementation clarification provided in Revision 1.

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16.	10	Appendix A	--	The third reference, i.e., ACI 318-95, should read "Building Code Requirements for Structural Concrete " rather than "Building Code Requirements for Reinforced Concrete. "	Correct the title.
17.	10	Appendix A	--	Comment 1 noted that the ACI 349-97 is based on ACI 318-89 (Revised 1992) with the exception of Chapter 12 which is based on ACI 318-95. The references need to identify both editions.	Revise the ACI 318 references to: ACI 318 [-89(Revised 1992) and -95], "Building Code Requirements for Reinforced Concrete."