



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

November 9, 1990

Mr. William H. Rasin
Director, Technical Division
Nuclear Management and Resources Council
Suite 300
1776 Eye Street N.W.
Washington, DC 20006-2496

Dear Mr. Rasin:

We have reviewed the "Design Basis Program Guidelines" developed by the Nuclear Management and Resources Council (NUMARC) forwarded to us by NUMARC's letters of May 16, July 2, and October 17, 1990. We appreciated the opportunity to interface with your staff during the development of the guidelines. We note that your staff was responsive to the comments and concerns that the U.S. Nuclear Regulatory Commission (NRC) staff expressed during the development of the guidelines.

We believe that NUMARC's approach will provide a useful framework and worthwhile insights to those utilities undertaking design basis programs of various scopes. We share your view that no single best approach exists for a design basis program. We understand that utilities must often address unique situations. Therefore, a variety of approaches can satisfy the basic need to develop a centralized location for design bases information that emphasizes the design intent and provides an index to important design documentation. It is important to stress that a facility should not be modified unless sufficient information is available to demonstrate that adequate design margins will be maintained.

We believe that Section VI of the guidelines regarding validation of the facility against current design information is of particular importance. The goal of any design reconstitution program should be to establish confidence that the existing facility is in accordance with the current design documents and that any deviations are reconciled.

The Enclosure summarizes our thoughts on several areas that the NUMARC guidelines do not address extensively. You may want to consider issuing further NUMARC guidance in these areas as you receive responses from utilities on use of the guidelines.

In the near future, the NRC will issue a NUREG document containing perspectives on utility design control programs and design document reconstitution programs gained from a survey of the programs of six licensees and one nuclear steam supply system vendor. The NUREG document will contain factual information regarding programs as they were being implemented at that time and will describe program strengths and weaknesses and problems encountered by utilities.

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Mr. William H. Rasin

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We view your development of the "Design Basis Program Guidelines" to be a positive step in an area that will continue to be of great importance.

Sincerely,

Original signed by:

William T. Russell, Associate Director
for Inspection and Technical Assessment
Office of Nuclear Reactor Regulation

Enclosure:
NRC Observations of Design Document
Reconstitution Programs

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*See previous concurrence
RSIB:DRIS SC:RSIB:DRIS
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10/15/90 10/15/90

C:RSIB:DRIS
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** Reviewed by Tech Ed on 10/17/90

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NRC Comments on
Design Document Reconstitution Programs

(1) Template Approach

The design document reconstitution (DDR) process should result in confidence that sufficient design documentation is available (a) to verify the implementation of the design bases, (b) to provide justification that key design parameters, such as the pump net positive suction head, are adequately accounted for in the design, and (c) to ensure that a structure, system, or component (SSC) will perform its intended safety function. One approach to developing a system or topical design bases document is to first identify a template of design parameters. Such a template would (a) establish and define the functionality and operability requirements of SSCs, (b) demonstrate the conformance of SSCs to the design bases, and (c) demonstrate that SSCs will perform their intended safety functions.

A review could then be performed to establish the degree to which the available design documents support the parameters defined in the template. This process would identify areas that require additional design documentation.

(2) Design Document Technical Review

The design document reconstitution program should include a technical review of the supporting design parameters, design calculations, and analyses. This technical review would verify that the design documents are technically sound and consistent with the as-built facility. The available design documents should be reviewed to identify areas where design information is technically inadequate or not consistent with the as-built facility.

(3) Concept of Essential Design Documents

In performing a design document reconstitution program, certain design documents will probably be unretrievable or will contain inconsistencies. While the NRC does not advocate the regeneration of the complete set of design documents, it is important that certain design documents are available to support plant operation. The design documents in this set will be referred to as the "essential design documents" and are further defined as Category I herein. All Category I design documents must be accurate, and those that are unretrievable need to be regenerated. Category I design documents are those documents that are necessary to support or demonstrate the conservatism of technical specification values, such as pump flow calculations or setpoint calculations. Additional design documents included in Category I would be those necessary for (a) engineering organizations to use in supporting plant operations and (b) the operators to use in quickly responding to events. Examples of Category I documents include, but are not limited to, electrical load

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lists, setpoint lists, valve lists, instrument lists, fuse lists, breaker lists, Q-lists, diesel generator load sequencing, piping and instrumentation diagrams, flow diagrams, electrical single-line diagrams and schematics, and breaker and fuse coordination studies.

(4) Prioritization of Missing or Inadequate Documents

Use of a prioritization methodology in considering whether to regenerate missing or deficient documents can ensure that the licensee focuses resources on the more safety-significant items in a timely manner. An initial screening process would enable the licensee to determine the significance, effect on plant operability, and reportability requirements related to the missing or inadequate documentation.

One way to rank the importance of design documents according to safety significance is as follows:

Category I - Design documentation that supports or defines technical specification safety limits, limiting conditions for operation, limiting safety system setpoints or surveillance requirements. These documents demonstrate that the SSCs addressed by technical specifications will perform their active safety functions.

Category II - Design documentation that defines controlling parameters or demonstrates the active functionality of safety-related SSCs that are not explicitly addressed by the technical specifications, but that support the SSCs addressed by technical specifications such as heating, ventilating, and air conditioning systems.

Category III - Design documentation that defines controlling parameters or demonstrates active functionality of safety-related SSCs not included in Categories I or II.

Category IV - Design documentation that defines controlling parameters or demonstrates the functionality of safety-related SSCs with regard to passive considerations (e.g., seismic considerations).

Category V - Design documentation that demonstrates the design of non-safety SSCs is such that its failure would not impair the functionality of safety-related SSCs (e.g., seismic II/I considerations).

(5) Design Bases vs. Design Document Reconstitution

Reestablishment of the design bases without reconstitution of the supporting essential design documents may not provide a sufficient amount of information to support future modifications and current plant operation. The objective of a DDR program is to establish a continuity among the various levels of design information (e.g., design calculations and design bases documents) and with the physical plant characteristics of the facility. The DDR program should ensure that the design bases documents accurately reflect the source design documents, the design output documents accurately reflect the design bases, and the plant configuration is in accordance with the design output documents.

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This information requiring document reconstitution can be evaluated in relation to the document categories, as defined herein. The MRC considers that all Category I essential documents that are inaccurate, unretrievable, or not yet produced should be regenerated in an expeditious manner. However, a licensee may be able to generate test data or use other means to establish a high level of confidence that the system can fulfill its safety functions. If so, then the licensee may be able to schedule the regeneration of the Category I document in a period of time commensurate with its evaluated safety significance.

A licensee may not need to regenerate design documents for Categories II through V if other supporting information or test data is available to demonstrate that an SSC can perform its intended safety function. For example, it may not be necessary to regenerate all missing pipe support calculations if, based on reanalysis of a sufficient sample, it can be demonstrated that adequate design margins exist. However, if a modification is proposed that would affect a pipe support, it would have to be reanalyzed if a valid analysis did not exist.

It is important to stress that a facility should not be modified unless sufficient information is available to demonstrate that adequate design margins will be maintained. Therefore, all missing calculations or design documents necessary to support a modification must be regenerated to establish a point of departure for the proposed modification and to quantify the design margin available following the proposed installation of the modification.

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