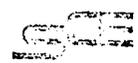


Design Criteria  
-50



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September 7, 1967

File No.  
A-5500-1

Secretary  
U. S. Atomic Energy Commission  
Washington, D.C. 20545

Re: Proposed General Design Criteria  
for Nuclear Power Plant Construction  
Permits

Dear Sir:

Enclosed are the comments of Southern California Edison Company concerning the proposed general design criteria for Nuclear Power Plant construction permits.

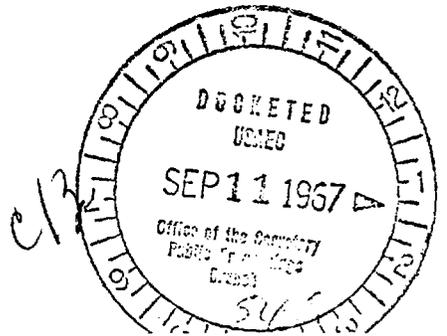
We appreciate the opportunity given to review these proposed criteria.

Thank you very much.

Very truly yours,

David N. Barry, III  
Assistant Counsel

DNB:dsd  
Enclosure  
cc: Mr. J. B. Moore



SCE COMMENTS ON NEW AEC GENERAL DESIGN CRITERIA FOR

NUCLEAR PLANT CONSTRUCTION PERMITS

September 1, 1967

On July 11, 1967, the AEC published for public comment a revised set of proposed general design criteria to assist in the preparation of applications for nuclear power plant construction permits. In general, we find that the revised criteria is a significant improvement over the earlier document issued for comment in 1965. Main improvements are evident in the areas of (1) categorization of the multiple criteria required for nuclear power plants, and (2) more straight-forward guidance within each category. Specifically, we have the following comments to offer:

Criterion 1

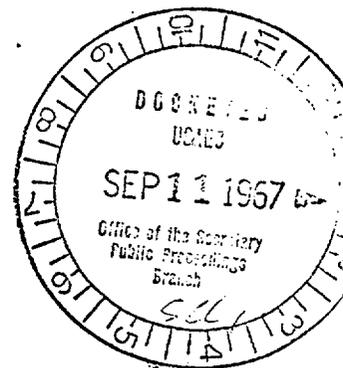
The third sentence of Criterion 1 addresses itself to codes or standards which "do not suffice." It appears necessary to define the circumstances under which an industry-approved code or standard for practice "does not suffice." It is suggested that the criterion be amplified to indicate that the question of sufficiency will be measured against the technological state of the art at that particular time. It appears that feasibility of implementation is the true measure of whether an industry-approved code or standard should or should not suffice to assure a quality product.

Criterion 2

Criterion 2 is entitled "Performance Standards." The writing refers to systems that should be designed, fabricated and erected according to "Performance Standards" that will enable the facility to withstand certain natural phenomenon. Since Criterion 2 is a Performance Standard in itself, it is suggested that the words "performance level" be used in lieu of "performance standard" in the body of the writing.

Criterion 5

Lifetime maintenance of design, fabrication, and construction records of "essential components of the plant" is required by Criterion 5. In view of the current emphasis on quality assurance programs during and after construction, retention of fabrication records on a lifetime basis appears unwarranted. On the other hand, it appears that maintenance of records which would allow verification of performance trends and reliability of quality assurance programs is most desirable.



Criterion 9

- A. The words "gross rupture or significant leakage" are used in close association in Criterion 9. Since the words "significant leakage" usually apply to leakage monitoring and/or measurements of leakage from the reactor coolant boundary, it is suggested that the words "gross rupture or unacceptable leakage from a safety viewpoint" be used instead.
- B. It is suggested that the words "and operated" be used after "shall be designed and constructed..."

Criterion 11

- A. Criterion 11 requires that radiation protection be provided for access to and control of the facility from the control room, even under accident conditions, without radiation exposure in excess of 10 CFR 20 limits. In view of conservative current practice regarding hypothesizing accident conditions and in view of the fact that under such accident conditions 10 CFR 100 allows doses to the public in low population zones of 25 rem whole body dose or 300 rem thyroid, it is believed that this criterion is unduly restrictive. It appears logical that station operating personnel, by virtue of their occupational status, should be in an exposure category at least equivalent to that of the public in low population zones under hypothetical accident conditions.
- B. It is believed that the content of the last sentence of Criterion 11, which addresses itself to fire in the control room, can more realistically be handled by a criterion which assures fire prevention or security measures which would ensure that access to the control room will not be lost.

Criterion 12

It is suggested that this criterion be expanded to indicate performance of instrumentation and control systems within their accepted design tolerances.

Criterion 13

It appears that the subordinate clause "... such as indication of position of control rods and concentration of soluble reactivity control poisons..." can be interpreted as limiting in scope. Deletion of this clause is suggested.

Criterion 14

It appears that any one of the nuclear instrumentation monitoring, control and/or safety channels can be interpreted to fall in the definition of "core protection system" as well as the engineered safety features incorporated in plant design. Therefore, it is suggested that Criterion 14 be expanded to read "... shall be designed to annunciate the approach to undesirable operating conditions that could result in exceeding acceptable fuel damage limits, and to act automatically to prevent or to suppress such conditions." This suggested wording is consistent with Criterion 15 which addresses itself to engineered safety features.

Criterion 16

It is suggested that Criterion 16 be expanded to include provisions for measuring reactor coolant pressure boundary leakage in addition to detection of leakage.

Criterion 18

It is suggested that monitoring provisions for "fuel" and "waste" be more clearly defined to apply to "spent fuel" and "radioactive waste." New fuel storage facilities are covered under Criterion 66.

Criterion 19

Since commercial reactors are utilized by public utilities in connection with production of electricity, it is suggested that the word "availability" be used in addition to "reliability" in Criterion 19. High availability is also important from a design viewpoint as it minimizes the number of start-ups (reactor cycling) that may be required by the facility.

Criterion 23

Clarification of the words "exposed in common" appears warranted as it applies to redundant channels or protection systems.

Criterion 25

It appears that Criterion 25 and Criterion 19, discussed above, are closely related to a point that they could be incorporated under one single heading.

Criterion 28

Since Criterion 29 addressed itself to "operational transients" it is not clear why the words "... including those resulting from power changes ..." are included in Criterion 28.

Criterion 29

It is suggested that the words "During reactor operation..." be added at the beginning of Criterion 29.

Criterion 35

It can be concluded that the combination of criterion 35 with criterion 21 "Single Failure Definition" will force plant operation at 120°F above NDT rather than the currently ASME and industry practice of 60°F.

Criterion 21 indicates that any combination of failures caused by a single event will be considered as one failure. A combination of hypothetical earthquake and coincident coolant boundary rupture has been assumed for recent reactor safety analyses. Since economic justification of current reactor designs provides for some plastic deformation under these hypothetical circumstances, it appears that operation at 120°F above NDT would be a requirement if Criterion 35 is to be generally met.

It is recognized that a 120°F increase above NDT is more conservative than the currently ASME accepted 60°F. Because significant research and development has been performed and is being performed to justify the adequacy of 60°F, it is recommended that this value continue to be used rather than any other until at least quantitative and experimental data are developed to support the use of a 120°F as stated in this Criterion 35.

Criterion 47

In view of the extensive requirements for inspection and functional testing of emergency core cooling systems required by Criteria 45, 46 and 48, and in view of deliverability tests conducted prior to initial criticality, periodic demonstration of delivery capability as required by Criterion 47 appears to be an undue burden on the power plant operator.

Criterion 49

Criterion 49 discusses "design leakage rate" in connection with containment integrated leak rate testing. The words "design leakage rate" can be interpreted differently depending on whether they are used by the containment designer, erector, test personnel or the reactor safety analyst. For clarification, it is suggested that the use of these words be explained as those applicable in accident analyses of the facility.

### Criterion 55

Because of the considerable experience accumulated to date and being accumulated on the subject of containment integrated leak rate testing, established correlations between partial and full design pressure tests should provide the necessary assurance of containment tightness. Criterion 55 can be interpreted as a requirement to periodically test at full design pressure regardless of whether data obtained from partial pressure tests may show satisfactory results. For these reasons, it is suggested that Criterion 55 be modified to require full pressure testing only when tests at partial pressure indicate a higher than allowable containment leakage rate.

### Criterion 60

In view of the extensive requirements for inspection and functional testing of containment spray systems required by Criteria 58, 59 and 61, and in view of deliverability tests conducted prior to initial criticality, periodic demonstration of delivery capability, as required by Criterion 47, appears to be an undue burden on the power plant operator.

### Miscellaneous

- a. Following the adoption of these general design criteria, it is recommended that the AEC publish a statement of its position regarding the applicability of these criteria retroactively to existing reactor facilities. It is recommended that for existing reactors of the small to moderate size, located in low to medium populated areas, these criteria should not apply as long as satisfactory operating experience has demonstrated the acceptability of the existing facilities.
- b. It is recommended that whenever the term "monitoring" is used, it be clarified to mean either continuous monitoring or periodic sampling, testing, or inspection.