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PETITION RULE PRM 50-68  
(65FR1829)

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NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

[Docket No. PRM-50-68]

Bob Christie; Receipt of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; Notice of receipt.

SUMMARY: The Nuclear Regulatory Commission has received and requests public comment on a petition for rulemaking filed by Mr. Bob Christie, Performance Technology, Knoxville, Tennessee. The petition was docketed on November 15, 1999, and has been assigned Docket No. PRM-50-68. The petitioner requests that the NRC amend its regulations concerning hydrogen control systems at nuclear power plants. The petitioner believes that the current regulations on hydrogen control systems at some nuclear power plants are detrimental and present a health risk to the public. The petitioner believes that similar detrimental situations may apply to other systems as well (such as the requirement for a 10-second diesel start time). The petitioner believes the proposed amendments would eliminate those situations that present adverse conditions at nuclear power plants.

DATE: Submit comments by (75 days after publication in the Federal Register). Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Mail comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemakings and Adjudications Staff.

Deliver comments to: 11555 Rockville Pike, Rockville, Maryland, between 7:30 a.m. and 4:15 p.m. on Federal workdays.

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Pub. on 1/12/00

For a copy of the petition, write to David L. Meyer, Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

You may also provide comments via the NRC's interactive rulemaking website at <http://ruleforum.llnl.gov>. This site provides the capability to upload comments as files (any format), if your web browser supports that function. For information about the interactive rulemaking website, contact Ms. Carol Gallagher, (301) 415-5905 (e-mail: [cag@nrc.gov](mailto:cag@nrc.gov)).

The petition and copies of comments are also available electronically at the NRC's Public Electronic Reading Room on the Internet at <http://www.nrc.gov/NRC/ADAMS/index.html>. From this site, the public can gain entry into the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents.

The petition and copies of comments received may be inspected and copied for a fee at the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: David L. Meyer, Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Telephone: 301-415-7162 or Toll Free: 1-800-368-5642 or email: [DLM1@nrc.gov](mailto:DLM1@nrc.gov).

#### SUPPLEMENTARY INFORMATION:

##### Grounds for Petition

The petitioner performed a detailed review of the San Onofre Task Zero Safety Evaluation Report (Pilot Program for Risk-Informed Performance-Based Regulation) conducted by the NRC staff and dated September 3, 1998, concerning that plant's hydrogen control system. The petitioner is convinced that action by the Commission is necessary to remedy possible adverse conditions at nuclear power plants.

##### Background

The petitioner includes three topics of discussion in support of the proposed amendments:

#### A. Public Health Risk from Nuclear Electric Power Units

The petitioner states that since the publication of the Reactor Safety Study (WASH-1400) in 1975, there has been a growing agreement between the practitioners of probabilistic risk assessment and licensing personnel (both at the NRC and within the industry) that there is a greater risk to public health from the release of fission products from the reactor core during a severe accident at a nuclear power plant, than from a design-basis accident. The petitioner asserts that the NRC staff has formally recognized this position. The petitioner sets out the following excerpts from the San Onofre Task Zero Safety Evaluation Report in support of his assertion.

1. "Subsequent risk studies have shown that the majority of risk to the public is from accident sequences that lead to containment failure or bypass, and that the contribution to risk from accident sequences involving hydrogen combustion is quite small."
2. "As mentioned in the previous section, the risk associated with hydrogen combustion is not from design-basis accidents but from severe accidents."
3. "The overall public risk and radiological consequences from reactor accidents is dominated by the more severe core damage accidents that involved containment failure or bypass."

#### B. Consideration of Design-Basis Accidents

The petitioner also states that since the publication of the Reactor Safety Study (WASH-1400) in 1975, there has been growing agreement between practitioners of probabilistic risk assessment and licensing personnel that compliance with some design-basis accident requirements can be detrimental to public health. The petitioner asserts that the NRC staff has formally recognized this position. The petitioner sets out the following excerpts from the San Onofre Task Zero Safety Evaluation Report in support of his assertion.

1. "Although the recombiners are effective in maintaining the Regulatory Guide 1.7 hydrogen concentration below the lower flammability limit of 4 volume percent, they are

overwhelmed by the larger quantities of hydrogen associated with severe accidents which are typically released over a much shorter time period (e.g., 2 hours)."

2. "From this information, the NRC staff concludes that the quantity of hydrogen, prescribed by 10 CFR 50.44(d) and Regulatory Guide 1.7, which necessitates the need for hydrogen recombiners and its backup, the hydrogen purge system is bounded by the hydrogen generated during a severe accident. The NRC staff finds that the relative importance of hydrogen combustion for large, dry containments with respect to containment failure to be quite low. This finding supports the argument that the hydrogen recombiners are insignificant from a containment integrity perspective."
3. "In a postulated Loss of Coolant Accident, the San Onofre Nuclear Generating Station Units 2 and 3 Emergency Operating Instructions direct the control room operators to monitor and control the hydrogen concentration inside the containment after they have carried out the steps to maintain and control the higher priority critical safety functions. The key operator actions in controlling the hydrogen concentration are to place the hydrogen recombiners or hydrogen purge system in operation which involves many procedural steps. These hydrogen control activities could distract operators from more important tasks in the early phases of accident mitigation and could have a negative impact on the higher priority critical operator actions."

C. Recommended Policy Statement on "Design-Basis Accident Requirements versus Severe Accident Information"

The petitioner states that according to the San Onofre Safety Evaluation Report, the NRC granted an exemption to San Onofre from the design-basis accident requirements from the hydrogen control system on the basis of information obtained in the analysis of severe accidents. According to the petitioner, NRC staff's evaluation also indicated that adherence to the requirements of design-basis accidents could have a detrimental effect on public health. The petitioner asserts that it is likely that similar situations exist with respect to the hydrogen control systems at other nuclear units, and also for other systems at San Onofre and other nuclear units. The petitioner believes that the Commission should issue an interim policy

statement concerning requirements for design-basis accidents. The petitioner believes that the interim policy statement would clarify the role of the NRC staff to ensure that matters that present a risk to public health are given appropriate high-level attention. The petitioner recommends the following "strawman" statement.

All situations where there is an indication that adherence to design basis requirements would be detrimental to public health must be brought to the immediate attention of the Executive Director for Operations of the Nuclear Regulatory Commission. The Executive Director for Operations will make a decision on whether an exemption to the design basis requirements should be granted on an expedited basis.

The petitioner believes that the NRC would want all individuals who may be aware of a situation where adherence to design-basis requirements could be adverse to public health, to bring the situation to the attention of the NRC staff without fear of recrimination and regardless of the present licensing basis for each nuclear unit. The petitioner states that, in the present culture of licensing at nuclear electric power units, there are few individuals (at the NRC or within the industry) who would suggest that adherence to design-basis accident requirements can be detrimental to safety. The petitioner believes that this culture must change and "change with NRC blessings."

The petitioner states that he recommends an interim policy statement because the NRC, nuclear industry, and the public are in the process of changing the NRC regulations to eliminate situations where adherence to the regulations could present a risk to public health.

The petitioner believes that the current regulations concerning combustible gas control systems have serious flaws and proposes that 10 CFR 50.44 be revised to read as follows:

§ 50.44 Standards for combustible gas control system in light-water cooled power reactors

(a) An inerted reactor containment atmosphere shall be provided for each boiling light-water nuclear power reactor with a Mark I or Mark II type containment.

(b) Each licensee with a boiling light-water nuclear power reactor with a Mark III type of containment and each licensee with an ice condenser type of containment shall provide its nuclear power reactor containment with a hydrogen control system. The hydrogen control

system must be capable of handling (based on realistic calculations) the hydrogen equivalent to that generated from a metal-water reaction involving 75 percent of the fuel cladding surrounding the active fuel region (excluding the cladding surrounding the plenum volume).

(c) All light-water reactors with other types of containment than those in paragraphs (a) or (b) of this section, must demonstrate that the reactor containment (based on realistic calculations) can withstand, without any hydrogen control system, a hydrogen burn for accidents with a high probability of causing severe reactor core damage. If such an evaluation of reactor containment capability can not be demonstrated, then the licensee shall provide a hydrogen control system per the backfit process. This hydrogen control system must be capable of handling (based on realistic calculations) the hydrogen equivalent to that generated from a metal-water reaction involving 75 percent of the fuel cladding surrounding the active fuel region (excluding the cladding surrounding the plenum volume).

(d) Each light-water nuclear power reactor shall be provided with high point vents for the reactor coolant system, for the reactor vessel head, and for other systems required to maintain adequate reactor core cooling if the generation of noncondensable gases in these systems would realistically lead to severe reactor core damage during an accident. High point vents are not required, however, for the tubes in U-tube steam generators.

The petitioner proposes that 10 CFR Part 50, Appendix A - General Design Criteria 41 be revised to read as follows:

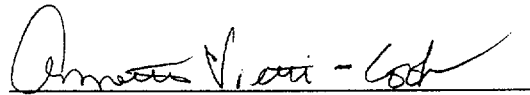
#### Appendix A - General Design Criteria 41 - Containment Atmosphere Cleanup

As necessary, systems to control fission products, hydrogen, oxygen, and other substances which may be released into the reactor containment shall be provided, consistent with the functioning of other associated systems, to assure that reactor containment integrity is

maintained for accidents where there is a high probability that fission products may be present in the reactor containment.

Dated at Rockville, Maryland, this 6 date of January , 2000.

For the Nuclear Regulatory Commission.

A handwritten signature in black ink, appearing to read "Annette L. Vietti-Cook", written over a horizontal line.

Annette L. Vietti-Cook,  
Secretary of the Commission.