

comments on the current documentation justifying the continued operation of nuclear power plants pending the completion of the environmental qualification program. This Statement of Policy is intended to explain the Commission's response to the D.C. Circuit's remand and to describe other related actions the NRC will take until the conclusion of the rulemaking proceeding which the Commission intends to initiate by an accompanying Notice of Proposed Rulemaking.

SUPPLEMENTARY INFORMATION:

I. Background

To provide adequate protection of public health and safety, nuclear power reactors rely in part on engineered safety systems. The Commission has stated that "fundamental to NRC regulation of nuclear power reactors is the principle that safety systems must perform their intended function in spite of the environment which may result from postulated accidents. Confirmation that these systems will remain functional under postulated accident conditions, constitutes environmental qualification." CLI-80-21, 11 NRC 707, 710 (1980). This principle is incorporated in the Commission's existing General Design Criteria One and Four. 10 CFR Part 59, Appendix A.

A June 30, 1982 deadline relating to environmental qualification of safety-related electrical equipment in operating nuclear power reactors, and the Commission's lifting of that deadline, came about as follows. In 1977 the Union of Concerned Scientists ("UCS") filed a petition with the Commission, asking among other things for a shutdown of those operating reactors containing electrical connectors that had been discovered by Sandia Laboratories not to be environmentally qualified. The Commission denied that shutdown request. However, a few plants were shut down for specific qualification deficiencies. *Petition for Emergency and Remedial Action*, CLI-78-8, 7 NRC 400, 410-415 (1978). In addition, the Commission directed the staff to review and evaluate the environmental qualification of all Class IE electrical equipment. CLI-78-8, 7 NRC 400 at 415 (1978). The NRC staff initiated that review by requesting licensees to determine the adequacy of existing documentation on equipment qualification. Circular 78-08. Many licensees failed to devote the level of attention the staff believed was necessary to this issue and requests for licensee action requiring written responses became necessary. IE Bulletins 79-01 and 79-01B were issued to request the necessary information.

Staff's reviews of licensees' submittals in response to 79-01 and 79-01B led to the discovery of more equipment for which qualification had not been established. Licensees either

did not have the required documentation to demonstrate qualification or did not include the documentation requested in the bulletins. The documentation that was submitted by the licensees and reviewed by the staff consisted of summary data extracted from qualification test reports and analyses. These licensee submittals prompted UCS to petition the Commission to reconsider its previous denial of UCS's request for reactor shutdowns.

The Commission once again denied UCS's petition, finding that "current Commission requirements . . . and those actions we order today provide reasonable assurance that the public health and safety is being adequately protected during the time necessary for corrective action." *Petition for Emergency and Remedial Action*, CLI-80-21, 11 NRC 707, 709 (1980). Among the actions ordered by the Commission were: (1) The establishment of more specific environmental qualification criteria; and (2) the establishment of a June 30, 1982 deadline for completion by the licensees of the environmental qualification program. The deadline was incorporated into the individual licenses for operating plants by separate orders.

The experience outlined above had shown a generic deadline was necessary to assure a sustained licensee effort to complete the qualification program. The order establishing the deadline did not specify the enforcement action which would be taken in the event of non-compliance. 11 NRC at 712. In particular, the Commission made no finding that failure to meet the deadline would result in unsafe conditions requiring a plant shutdown.

Technical judgments regarding the sufficiency of licensee efforts and safety of continued operation were to be made by the staff on a case-by-case basis as the licensees provided further documentation on environmental qualification. Moreover, the public retained the opportunity pursuant to 10 CFR 2.206 to request NRC enforcement action at any particular plant. Cf. 11 NRC at 715. (If an interested person reviews the staff's written judgment on qualification and desires Commission review on that issue, that person may file a petition with the NRC staff pursuant to 10 CFR 2.202 and 10 CFR 2.206).

In response to Memorandum and Order CLI-80-21, and I&E Bulletin 79-01B, licensees continued to submit information on electrical equipment environmental qualification. In early 1981, the staff issued an Equipment Evaluation Report (EER) to each licensee of 71 operating nuclear power plants. The EER identified equipment for which the qualification information submitted in response to IE Bulletin 79-01B did not, in the staff's opinion, provide sufficient assurance of

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Environmental Qualification of Electric Equipment

AGENCY: Nuclear Regulatory Commission.

ACTION: Statement of Policy on Environmental Qualification.

SUMMARY: The United States Court of Appeals for the District of Columbia Circuit has vacated and remanded a Commission rule which removed from nuclear power plant operating licenses a June 30, 1982 deadline for the completion of the environmental qualification of certain safety-related electrical equipment.¹ *Union of Concerned Scientists v. Nuclear Regulatory Commission, et al.*, 711 F.2d 370 (D.C. Cir. 1983) (hereinafter "*UCS v. NRC*"). The Court remanded to the Commission with direction to obtain public

¹ 49 FR 2889 (June 30, 1982). The deadline had originally been set by Commission Order, CLI-80-21, 11 NRC 707 (1980).

capability to perform required design functions in harsh environments. Under the provisions of 10 CFR 50.54(f), the staff requested each licensee to review the deficiencies enumerated and the ramifications thereof to determine whether safe operation of the plant would be affected. Each licensee responded that continued operation would not be unsafe.

In mid-1981, the staff sent a safety evaluation report (SER) to each licensee. The SER included the EER previously sent to the licensee, an evaluation of the environmental conditions specified by the licensee for environmental qualification purposes, an evaluation of the completeness of the list of safety-related equipment included in the qualification program, and the staff's conclusions with regard to compliance with Commission Memorandum and Order CLI-80-21. The SER also directed each licensee either to provide, within 90 days, documentation of the missing qualification information needed to demonstrate that the equipment with identified deficiencies was qualified or to commit to a corrective action such as requalification, replacement or relocation. If the latter option was chosen, the licensee was directed to provide a justification for continued operation (JCO) until such corrective action could be completed. All licensees provided responses to the mid-1981 SERs within the 90 days specified. These responses included additional technical information; justifications for continued operation or statements that such justifications were not required because in the licensee's opinion the equipment was qualified.

In late 1981, the NRC staff and Franklin Research Center (FRC) began in-depth reviews of all licensee responses to the issues raised in the SERs. This included looking at all of the background documentation provided by licensees in response to previous Commission Orders and SERs. This review was conducted in parallel with the staff's summary reviews for completeness of submittals and was not completed until the spring of 1983.

Evaluation of the information supporting licensee's JCOs was reviewed by the staff with the assistance of a consultant, FRC, in January 1982. The review was conducted over a very short period of time and consisted of checking the licensee's submittals to determine whether the justification for continued operation addressed all safety-related equipment which was listed in the plant SER as being of uncertain qualification. Where items of equipment were reported as qualified based on the licensee's reevaluation, no further justification was required at that time.

The FRC reviewed the JCOs using NRC-provided criteria.³ The NRC project

³ The criteria are (either):

1. Redundant equipment is available to substitute for the unqualified equipment; or

manager for each facility then reviewed the FRC's assessments of these JCOs. As a result of these reviews, FRC placed all responses in one of three categories. Category 1 plants (38) were those which at least asserted that either everything was qualified or provided justification for continued operation in light of the identified deficiencies. Category 2 plants (15) submitted responses which on their faces were not adequate for some reason. For example, they may not have addressed one or more pieces of equipment or deficiency identified in the SER. Category 3 plants (18) were those for which the submittal was completely inadequate. Staff required all Category 2 and 3 plants to submit further information to respond to the SERs and to provide justifications for continued operation. The level of detail contained in those JCO's ranged from summary assessments in some cases to extensive analyses in others. The staff reviewed these additional justifications and found them adequate. By the end of March 1982, then, all plants were in Category 1, pending an in-depth review of the supporting documentation. All licensees had asserted bases for qualification or justification for continued operation. The staff relied primarily on the licensees' assurances contained in these submittals in determining not to take immediate further action affecting the operation of the plant.

The volume of the submittals by the licensees showed that the extent of the effort necessary either to establish the qualification of equipment or to replace unqualified equipment had been underestimated and that the June 30, 1982 deadline would not be met. Indeed, a group of NRC licensees petitioned the Commission to extend the June 30, 1982 deadline. The Commission proposed to extend the deadline in the NRC's proposed rule on environmental qualification published for comment on January 20, 1982. In the rule the Commission proposed to codify the environmental qualification requirements set out in the existing order CLI-80-21. In addition, the proposed rule: (1) Requested licensees to submit analyses justifying continued operation pending completion of the environmental qualification program, and (2) established new compliance deadlines for completion of environmental qualification. 47 FR 2876, 2877-2878, January 20, 1982. The Commission expected the rulemaking, licensees' analyses, and staff's evaluations to be completed well in advance of the June 30, 1982 deadline which was then still in effect.

In late May of 1982 it became clear to the Commission that despite efforts by the staff, the final rule would not be

2. Another system is capable of providing the required function of the system with unqualified equipment; or

The unqualified equipment will have performed its safety function prior to failure; and

4. The plant can be safely shutdown in the absence of the unqualified equipment.

promulgated before the June 30, 1982 deadline. Accordingly, on June 30, 1982, the Commission issued, without notice and opportunity for comment, an immediately effective rule suspending the June 30, 1982 compliance deadline incorporated in each operating license (OL) then in force. The Commission stated that licensees were expected to continue their efforts to meet the environmental qualification criteria standards established in CLI-80-21.

In making the rule immediately effective the Commission relied on the "good cause" exception to the rulemaking requirements of section 4 of the Administrative Procedure Act (APA). In the statement of consideration accompanying that rule, the Commission explained that "licensees should not be placed in jeopardy of enforcement action pending promulgation of a revised schedule for implementation of equipment qualification requirements." 47 FR 28363 (June 30, 1982). The Commission also stated that the staff had received and evaluated each operating plant licensee's justification for continued operation. The statement of considerations added that, from these analyses,⁴ the Commission had determined that continued operation of these plants pending completion of the equipment qualification program would not present undue risk to the public health and safety. *Id.*

Subsequently, the General Counsel interpreted this statement on safety of continued operation in a binding formal interpretation of the rule.⁴ He found that the Commission's statement was an "explanation that before suspending the compliance deadline the Commission had reviewed the status of environmental qualification at each plant to determine that there were no widespread substantial qualification deficiencies which might indicate a need for industry-wide enforcement action." He noted that the rule did not preclude any interested person from filing a petition under 10 CFR 2.206 by citing specific qualification deficiencies as a basis for challenging the continued operation of a particular plant.

As a result of the Commission's lifting of the June 30, 1982 deadline, the staff conducted another brief review in late 1982, of the evaluations of the licensees' JCOs for the 33 plants for which additional information had previously been supplied to support the JCO review performed in early 1982. These reviews were performed to determine whether the JCOs remained adequate, given the anticipated adoption of the new deadline for qualifying electrical equipment. Staff reaffirmed that the JCOs remained adequate.

By April 1983, the staff and FRC

⁴ The analyses accepted by the staff included licensee's assertions that the equipment was qualified, in their opinion. The review of the documentary supporting these assertions was in the process of being reviewed by FRC at the time the interim rule was promulgated.

completed their in-depth reviews begun in late 1981 on the licensees' responses to issues raised in the mid-1981 staff SERs for 71 operating reactors. These reviews consisted of an audit of equipment qualification data that the licensees had submitted throughout the course of these reviews. Based on NRC's analyses, the staff issued a second round of safety evaluation reports for each of the 71 operating plants. These SERs adopted the FRC's conclusions.

The SERs identified some deficiencies in licensees' submittals. As a result, staff issued transmittal and clarification letters which set forth deadlines for the licensees to provide the requested equipment environmental qualification information. For items found unqualified, the staff requested JCOs within 10 days of receipt of the SER. The additional information submitted by the affected licensees was reviewed by the staff and the issues resolved on the bases of the licensees': (1) Replacement of equipment, (2) provision of more information showing the equipment was qualified, or (3) provision of a JCO which satisfied the previously established criteria.

None of the items addressed in this round of review had been identified during the January 1982 assessment of the JCOs submitted by the licensees, because the initial reviews were based on summary data, extracted from test reports and analyses, submitted in response to IE Bulletin 79-01B, and on assertions made by the licensees that equipment was qualified. The major difference between the staff's previous findings and the current findings is that the technical bases for the staff's conclusions that certain qualification deficiencies exist have been specified in more detail as a result of FRC's completion of its review of the documentation submitted by licensees to support qualification of the equipment.

An initial examination of the licensees' responses to the second round staff SERs indicates that in a number of instances licensees maintain the position taken in response to the mid-1981 staff SER, i.e., that much of the equipment challenged by the 1982-1983 second round SERs is in fact adequate to perform all required design functions and therefore justification for continued operation is not needed. In some instances there are new or additional test data, and some previously challenged equipment has been shown to be qualified. Finally, staff has found that some aspects of the licensees' responses raise technical issues requiring further analysis for their resolution, such as similarity, qualified life, and test sequences.

On January 6, 1983 the Commission promulgated a Final Rule on Environmental Qualification of Electrical Equipment Important to Safety. 10 CFR 50.49. That rule established general qualification criteria

and new deadlines for compliance by 1985 for most plants.

II. The D.C. Circuit Decision

On June 30, 1983 the D.C. Circuit vacated the Commission's decision in promulgating the June 30, 1982 interim rule for failure to provide an opportunity to comment on "the sufficiency of current documentation purporting to justify continued operation pending completion of environmental qualification of safety-related equipment."⁵ The Court also stated that the final rule appears to be partially predicated on the Commission's conclusion that the safety of continued operation had been demonstrated by this documentation.⁶ The Court did not criticize the substance of the Commission's determination, noting that "the NRC maintains constant vigilance over the safety of nuclear power plants and monitors compliance with safety requirements at each nuclear reactor on a day-to-day basis."⁷

III. The Current Situation

a. Staff Actions

The staff is currently implementing a program to complete the review of licensees' electrical equipment environmental qualification programs. This effort includes a one day meeting with each licensee of the 71 plants reviewed previously by the staff with the assistance of FRC. Discussion during each meeting includes the licensee's proposed/implemented method of resolution of the environmental qualification deficiencies identified in the 1982-1983 SER, compliance with the requirements set forth in 10 CFR 50.49 (EQ Rule), and justification for continued operation given those equipment items for which environmental qualification is not yet complete. Each licensee is required to document the results of the meeting in a subsequent submittal to the staff. Based on this submittal the staff will prepare and issue a final SER for each of the 71 plants that addresses the environmental qualification of electric equipment important to safety. This effort is scheduled to be completed during 1984.

b. Concerns Raised by Sandia National Laboratories

Sandia National Laboratories (Sandia), an NRC contractor, has recently expressed some concerns to the Commission regarding environmental qualification of electrical equipment. At a Commission meeting on January 6, 1984 Sandia representatives identified what they perceived as shortcomings in qualification methodologies and design bases (acceptance criteria), and the presence of inadequate equipment in plants.⁸ The staff prepared responses to the Sandia presentation and

subsequently met with Sandia to assure that the concerns had been interpreted and are being adequately addressed. Subsequent to this meeting, Sandia informed the staff that all concerns raised by Sandia regarding environmental qualification of electrical equipment, as defined by 10 CFR 50.49, "have been addressed" in the staff responses. Examples of staff's responses are discussed below.

Shortcomings in qualification methodologies are the subject of continuing research, and Sandia research tests have not demonstrated that nuclear plant safety equipment, properly qualified to existing qualification standards and NRC regulatory requirements, would not perform its safety functions. With regard to shortcomings in design bases (acceptance criteria), the staff is aware of the concerns expressed by Sandia and is addressing them in its reviews of licensee's equipment environmental qualifications programs. For example, Sandia believes that there may be shortcomings in the insulation resistance and leakage current values used as acceptance criteria for terminal blocks. Staff reviews these values when evaluating the environmental qualification of terminal blocks and requires that licensees either justify the values chosen for each particular use or provide justifications for continued operation with current values or change the values by using different terminal blocks.

The staff is also aware of Sandia's concern that some unqualified equipment remains in nuclear plants. These concerns are also being addressed by the staff in its review process, and are being resolved on a case-by-case basis. For example, Sandia reported that pressure switches failed when exposed to a high-pressure and steam-flash spray environment. Staff noted that no claims have been made that these switches are qualified for such an environment. These switches are not to be used in applications where they would experience such conditions. Staff takes into account such considerations when evaluating licensees' and applicants' qualification programs. In addition, an I&E information notice has been issued to licensees describing the results of the Sandia test of these switches, and stating the staff's position that such switches are not to be used where they would experience such environmental conditions.

A number of IE Information Notices have identified specific concerns with qualification of some components. All equipment which has not been shown to be qualified must either be demonstrated to be qualified, be replaced or relocated, or a justification for continued operation provided. Therefore, while Sandia identified potential generic issues with some equipment components, the staff has

⁵ Slip op. at 27-28.

⁶ Id. at 37n.

⁷ Id. at 38n.

concluded that none of the issues identified would warrant generic safety-related enforcement action at this time.

c. Sandia Annual Report

Sandia recently issued its Fiscal Year 1983 annual report on the Environmental Qualification Inspection Program of organizations involved in equipment qualification efforts. The report provides examples of qualification problems to highlight issues raised during those inspections for which Sandia provided technical consultant support to the staff. The Sandia concerns discussed during the Commission Meeting of January 6, 1984 were derived in part from the inspection results described in this annual report. The report illustrates some industry practices that could be improved and identifies areas where additional NRC guidance may be useful. The staff discussed the contents of this report with Sandia, and has concluded, that the report does not suggest that generic safety related enforcement action is necessary as a result of Sandia's concerns. Where inspections or reports received by the staff have indicated reasons to question qualification of equipment, the staff has required licensees to take actions including the replacement of equipment or provision of justifications for continued operation.

d. UCS Petition

On February 7, 1984, the Union of Concerned Scientists (UCS) petitioned the Commission to take certain actions regarding some recent developments in the environmental qualification of electrical equipment. These developments were: (1) Recent notices from the Commission's Office of Inspection and Enforcement to utility licensees and Atomic Safety and Licensing Boards reporting deficiencies in the environmental qualification of a few components commonly used in licensed facilities; (2) a report by the Sandia National Laboratory (Sandia) questioning the validity of certain environmental qualification tests; and (3) recent comments by Sandia to the Commission regarding Sandia's coordination with the NRC staff on research on environmental qualification. In UCS's view, these developments indicate that the NRC staff has failed to handle properly the Commission's environmental qualification program.

Accordingly, UCS has requested the Commission to review the staff's conduct of the environmental qualification program and to direct the staff to address the matters identified by the UCS. Specifically, UCS has requested that the Commission, among other things, direct staff to: (1) Obtain and evaluate justifications for continued operation for plants using the deficient components reported by the Office of Inspection and Enforcement; (2) review the generic implications of Sandia's concerns about tests of environmental qualification; and (3) direct the staff to

require utilities to justify continued operation promptly after receiving notices of environmental deficiencies. UCS has also requested Commission to direct holders of construction permits to cease construction involving deficient components until these components are qualified and to direct Atomic Safety and Licensing Boards not to authorize issuance of operating licenses until deficient components have been qualified or replaced.

"The Commission is currently considering UCS's Petition in light of this Policy Statement and accompanying Notice of Proposed Rulemaking."

IV. Current Commission Policy

As indicated above, over the past several years power reactor licensees environmental qualification has improved with time.

The environmental qualification problem at individual plants is too varied to warrant generic safety-related enforcement action. Instead it has been and continues to be the Commission's policy to monitor closely each licensee's progress on environmental qualification and to take enforcement action for safety reasons on a case-by-case basis. To this end, the staff intends to follow the guidelines described below in conducting its individual reviews.

(1) Evidence of environmental qualification deficiencies which would prevent a plant from going to and maintaining a safe shut down condition in the event of a design basis accident will be the basis for enforcement action. Enforcement action will generally not be taken where a licensee has asserted that operation will not involve undue risk, unless the staff has determined that continued operation cannot be justified. The Commission recognizes that this policy will permit power plants to continue to operate where licensees' assertions of qualification are still undergoing staff review. The Commission believes that this course of action is required unless the staff concludes that the justification for continued operation (JCO) reveals a deficiency requiring shutdown.

There are persuasive technical and policy reasons why licensees' assertions have devoted extensive efforts to comply with the Commission's environmental qualification requirements. Progress on licensee compliance has been monitored by the NRC, and NRC's own review efforts have been extensive. There have been two rounds of progressively more detailed safety evaluations for all operating reactors and additional reviews of the various rounds of JCOs

The environmental qualification of electrical equipment throughout a nuclear power plant to standards higher than those existing at the time the plant was licensed has proved to be a complex and difficult task. Thousands of individual pieces of equipment must be

identified; qualification data for this equipment must be examined and compared to applicable standards; test programs must be carried out where data is lacking; and equipment must be replaced if necessary. In many cases equipment can be replaced only when the plant is shut down. During such downtime licensees have many tasks to accomplish in addition to equipment qualification efforts. Delays may also result from the unavailability of qualified equipment and difficulties in testing existing equipment. The performance of industry in the area of and analyses may be relied on pending independent NRC staff review. The Commission notes that licensees received their operating licenses after extensive staff reviews including, in many cases, adjudicatory hearings. These proceedings include a determination that the licensee is technically capable of operating the plant safely. The mere existence of a safety uncertainty that needs to be evaluated does not, in the Commission's view, provide a basis for shutdown or similar enforcement action. It is the purpose of the case specific NRC staff reviews to determine whether, in any given case, sufficient evidence exists that would support enforcement action. In addition to confirmation of significant safety deficiencies, a persistent refusal by a licensee to cooperate adequately with the Commission's environmental qualification program would be a basis for enforcement action. But the Commission's experience with the ongoing review of licensee progress on environmental qualification, as described above, has not suggested any general refusal on the part of licensees to make reasonable efforts. Thus the June 30, 1982 deadline has served its intended purpose to assure reasonable licensee efforts and therefore need not be enforced. The June 30, 1982 deadline was not a generic cut-off date for operation. Rather, the June 30, 1982 deadline was established to force licensee completion of the environmental qualification program in a reasonable time. Since the deadline itself has proved unrealistic, and since licensees are making reasonable efforts to achieve environmental qualification, the Commission has concluded that retention of the June 30, 1982 deadline is neither necessary nor desirable as a general matter. The safety of operation of plants continues to be reviewed on an individual basis. The Commission's authority to take individual enforcement action for safety reasons, including shutdowns, is not dependent on the presence in individual licenses of a requirement for environmental qualification by a certain date.

(2) In the interim, if any person believes that there is information indicating that specific qualification deficiencies or other reasons related to environmental qualification require

enforcement action at a particular plant, such information should be presented to the Director, NRR pursuant to 10 CFR 2.206. Within 45 days of the close of the comment period in the rulemaking initiated today by companion notice, the Director, NRR will report to the Commission on any generic issues raised by any comments on plant specific qualification issues.

The Commission's final rule is still in effect. That rule established new compliance deadlines which have not yet passed. It was the Commission's intention that the compliance schedule in the final rule should supersede previous deadlines. Because the Court's decision in *UCS v. NRC* may have created uncertainty regarding the current status of the June 30, 1982 compliance deadline in each facility operating license, the Commission will conduct a notice and comment rulemaking proceeding to delete formally that deadline from all licenses.

Dated at Washington, DC, this 1st day of March, 1984.

Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.