REGULATORY DOCKET FILE COPY

OCTOBER 24 1979

Docket Nos. 50-280
and 50-281

Mr. James E. Dougherty, Esquire
3917 11th Street, N.E.
Washington, D. C. 20002

Dear Mr. Dougherty:

This is in response to your petition dated April 18, 1979 on behalf of the four citizen's groups: Potomac Alliance, Citizens Energy Forum, Inc., the Virginia Sunshine Alliance, and Truth in Power, Inc., requesting:

1. that Operating License No. DPR-37 be suspended and the steam generator repair program be halted,

2. that a show cause hearing be held,

3. that an environmental impact statement for the Surry program be prepared,

4. that a programmatic environmental impact statement be prepared,

5. that Operating License No. DPR-37 not be reinstated or the repair program be permitted to continue until the NRC Staff "has fully reviewed and satisfied its obligations" under regulations dealing with nuclear waste disposal, nuclear plant dismantling approval, and as low as reasonably achievable occupational radiation exposures,

6. that VEPCO be prohibited from making any modification resulting in discharges into the James River without a new or amended NPDES permit from the State of Virginia,

7. that VEPCO be prohibited from making any modification resulting in discharge into the James River without Federal Water Pollution Control Act §401 certification from the State of Virginia,

8. that "all Atomic Safety and Licensing Boards, as appropriate," be notified of the above actions and that any permit, license or amendment allowing replacement or repair of steam generators be prohibited pending completion of environmental impact statements and other studies.

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OFFICE ➤					
SURNAME ➤					
DATE ➤					

For the reasons set forth in the enclosed response to your letter, your requests are hereby denied.

A copy of this determination will be placed in the Commission's Public Document Room at 1717 H Street, N.W., Washington, D. C. 20555 and at the Swem Library, College of William and Mary, Williamsburg, Virginia 23185. A copy will also be filed with the Office of the Secretary of the Commission for its review in accordance with 10 CFR §2.206(c) of the Commission's regulations.

Sincerely,

Original Signed By

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
Director's Decision Under
10 CFR §2.206

cc: Mr. W. L. Proffitt
Senior Vice President - Power
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

OFFICE ➤						
SURNAME ➤						
DATE ➤						

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*M. Groff to blue bag - DENIAL

NOTE: This response is related to EDO-06352 for which a letter was sent to Mr. Dougherty dated 6/8/79 acknowledging receipt of his letter and stating that appropriate action would be taken in a reasonable amount of time.

NOTE: See 50-280 for enclosures

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OFFICE	DOR:ORB1	DOR:ORB	DOR:ORB 1	DOR:AD:ORP	DOR	OELD
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 2 1 1979

Docket Nos. 50-280
and 50-281

Mr. James B. Dougherty, Esquire
307 11th Street, N.E.
Washington, D. C. 20002

Dear Mr. Dougherty:

This is in response to your petition dated April 18, 1979 on behalf of the four citizen's groups: Potomac Alliance, Citizens Energy Forum, Inc., the Virginia Sunshine Alliance, and Truth in Power, Inc., requesting:

1. that Operating License No. DPR-37 be suspended and the steam generator repair program be halted,

2. that a show cause hearing be held,

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4. that a programmatic environmental impact statement be prepared,

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8. that "all Atomic Safety and Licensing Boards, as appropriate," be notified of the above actions and that any permit, license or amendment allowing replacement or repair of steam generators be prohibited pending completion of environmental impact statements and other studies.

For the reasons set forth in the enclosed response to your letter, your requests are hereby denied.

A copy of this determination will be placed in the Commission's Public Document Room at 1717 H Street, N.W., Washington, D. C. 20555 and at the Swem Library, College of William and Mary, Williamsburg, Virginia 23185. A copy will also be filed with the Office of the Secretary of the Commission for its review in accordance with 10 CFR §2.206(c) of the Commission's regulations.

Sincerely,

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
Director's Decision Under
10 CFR §2.206

cc: Mr. W. L. Proffitt
Senior Vice President - Power
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

50-280/281
Ltr 10-24-79
7911050486

Ltr attachment
Addressee: J.B. Dougherty

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
HAROLD R. DENTON, DIRECTOR

In the Matter of	
	Docket Nos. 50-280
Virginia Electric and Power Company	and 50-281 (10 CFR 2.206)
(Surry Power Station, Units 1 and 2)	

DIRECTOR'S DECISION UNDER 10 CFR §2.206

By petition dated April 21, 1979, Mr. James B. Dougherty on behalf of four citizen's groups: Potomac Alliance, Citizen's Energy Forum, Inc., the Virginia Sunshine Alliance, and Truth in Power, Inc. (Citzen's Groups), requested that:

1. The Commission shall suspend VEPCO's Operating License No. DPR-37 and order that the Surry steam generator replacement project be brought to an immediate halt.

2. The Commission shall direct the Director of Nuclear Reactor Regulation to serve upon VEPCO an Order to Show Cause at a public hearing why Operating License No. DPR-37 should not be suspended pending performance of the environmental studies and other relief described below.

3. The Commission shall direct the NRC staff to prepare an environmental impact statement addressing the Surry project.

4. The Commission shall direct the NRC staff to prepare a programmatic environmental impact statement addressing the cumulative environmental impacts and the long-range policy implications of current and future steam generator replacement and repair projects.

5. The Commission shall prohibit the NRC staff from reinstating Operating License No. DPR-37 or permitting further progress on the Surry steam generator replacement program until it has fully reviewed and satisfied its obligation under the following sections of the regulations, including the making available an opportunity for a public hearing:

(a) 10 CFR §20.302, requiring NRC approval of proposals to dispose of nuclear waste;

(b) 10 CFR §50.82, requiring NRC approval of proposals to dismantle nuclear power plants, and

(c) 10 CFR §20.1(c), requiring occupational radiation exposures to be maintained as low as is reasonably achievable.

6. The Commission shall prohibit VEPCO from making any modification to the Surry facility resulting in discharges into navigable waters until it has obtained from the Commonwealth of Virginia an NPDES permit or an amendment to its current NPDES permit for the Surry plant, as required under, e.g., §§301 and 402 of the Federal Water Pollution Control Act, 42 U.S.C. §§1311 and 1342.

7. The Commission shall prohibit the staff from approving any modification of the Surry facility resulting in discharges into navigable waters until

it has received from the Commonwealth of Virginia the certification required under §401 of the Federal Water Pollution Control Act, 42 U.S.C. §1341.

8. The Commission shall notify all Atomic Safety and Licensing Boards, as appropriate, of the above actions and shall prohibit the issuance of any permit, license, or amendment thereto allowing the replacement or repair of steam generators pending the completion of the environmental impact statements and other studies described above.

The Secretary of the Commission directed the staff on May 22, 1979, to treat this petition under 10 CFR §2.206 of the Commission's regulations. Notice that the petition was being treated under 10 CFR 2.206 was published in the Federal Register. 44 Fed. Reg. 36522 (June 22, 1979). The Citizen's Group's petition is similar to petitions filed earlier by the North Anna Environmental Coalition and by the Environmental Policy Institute, both of which were denied by the Director of Nuclear Reactor Regulation. See Virginia Electric and Power Company (Surry Power Station, Units 1 and 2), DD-79-1, 9 NRC 199 (Feb. 1, 1979) and DD-79-3, 9 NRC ____ (Apr. 4, 1979).

The asserted bases for the request by the Citizens' Groups are as entitled by the petitioner.

1. The NRC Staff Violated the National Environmental Policy Act in Issuing Amendment Nos. 46 and 47 to VEPCO's Operating Licenses for the Surry Station;

2. The Staff Violated the Federal Water Pollution Control Act in Issuing Amendment Nos. 46 and 47 to VEPCO's Operating Licenses for the Surry Station;

3. The Issuance of the Operating License Amendments was Arbitrary and Capricious and Violated the Administrative Procedures Act and the Atomic Energy Act; and

4. The License Amendments were Issued Contrary to NRC Regulations.

BACKGROUND

In accordance with 10 CFR §50.59 of the Commission's regulations, a licensee seeking to make a change in the Technical Specifications or a change in the facility involving an unreviewed safety question must submit an application for an amendment to the license. On August 17, 1977, VEPCO submitted a request for NRC review and approval required in order to repair the steam generators at the Surry Power Station, Units 1 and 2. It was determined in accordance with 10 CFR §50.59 that such a program would involve an unreviewed safety question and, therefore, would require an amendment of VEPCO's Facility Operating License Nos. DPR-32 and DPR-37 for the Surry plant. In accordance with 10 CFR §2.105, a Notice of the Proposed Issuance of Amendments to the licensees at issue was published in the Federal Register on October 27, 1977 (42 FR 56652). The Notice was also available for public inspection in the Commission's Public Document Room and at the local public document room at the Swem Library, College of William and Mary, Williamsburg, Virginia. This Notice provided an opportunity for interested persons to request a hearing by November 28, 1977. No requests for a hearing were received in response to that Federal Register notice.[1] The Citizen's Groups request does not purport

1 The Atomic Safety and Licensing Board constituted to review requests for a hearing under the October 27, 1977 Federal Register Notice provided the Commonwealth of Virginia the opportunity to file a request for a hearing up to 10 days after issuance of the Staff's Safety Evaluation Report which was issued on December 15, 1978. On December 20, 1978, the Commonwealth stated it would not request a hearing.

to be filed pursuant to the October 27, 1977 notice of opportunity to request a hearing.

Prior to issuing the amendment to allow the repairs to be made to the steam generators, the Office of Nuclear Reactor Regulation (NRR or the staff) prepared the staff Safety Evaluation Report (SER) dated December 15, 1978. That evaluation, which expressly addressed the matter of radiation exposure to workers, concluded that there is reasonable assurance that the health and safety of the public (including the workers) will not be endangered by the proposed steam generator repair program and that the changes would be conducted in compliance with the Commission's regulations.

Similarly, it was determined after preparation of an environmental impact appraisal that a negative declaration rather than an environmental impact statement was appropriate. The declaration was issued on January 20, 1979.

I have reviewed the four asserted bases listed above which were given by the Citizen's Groups as bases for the requests made of the Commission and have evaluated them in the following pages.

1. The NRC Staff Abided by the National Environmental Policy Act in Issuing Amendment Nos. 46 and 47 to VEPCO's Operating License for the Surry Station.

   A. The Issuance of the Operating License Amendments Did Not Constitute a Major Federal Action Significantly Affecting The Environment and Thus Did Not Require the Preparation of an Environmental Impact Statement.

Section 102(2)(c) of NEPA requires that an environmental impact statement (EIS) accompany "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. §4332(2)(c) (1970). Pursuant to Part 51 of the NRC regulations, the Staff evaluated the environmental effects of the issuance of Amendments Nos. 46 and 47 to VEPCO's operating license for the Surry station. 10 CFR § 51.5(c)(1). The Staff has determined that the issuance of the amendments is not an action which significantly affects the environment. Therefore, the Staff did not prepare an environmental impact statement but rather the Staff prepared an environmental impact appraisal (EIA) and a negative declaration in accordance with the NRC regulations. 10 CFR § 51.5(c)(1).

All human actions, including major Federal actions, impact on the environment. In recognition of this fact, Congress has instructed that environmental impact statements be prepared in conjunction only with those major Federal actions which significantly affect the environment. NEPA Section 102(2)(c) (1970), 42 U.S.C. § 4332 (1970). The Surry steam generator repair project is not one of these actions. The steam generator repair effort involves insignificant health risks to individuals both on and off the site. Furthermore, the

costs of the project have been spread so as to insure that no individual bears a significant portion of the financial burden. Finally, whether viewed in the long or short run, the project will not have a detrimental effect upon the energy-producing capability of our natural resources. It is on the basis of these facts that the Staff decided that the Surry steam generator repair project does not significantly affect the environment. Hence, an environmental impact statement was not required.

In assessing the Staff's decision, it must be recognized that the agency in charge of a proposed Federal action (in this case the NRC) is the party authorized to make the threshold determination whether an action is one which "significantly affects the human environment." S. Rep. 91-216, 91st Cong. 1st Sess. at 20. For purposes of this evaluation, the agencies have been instructed to review the proposed action in the light of two key factors:

> "(1) The extent to which the action will cause adverse environmental effects in excess of those created by existing uses in the area affected by it and (2) the absolute quantitative adverse environmental effects of the action itself, including the cumulative harm that results from its contribution to existing adverse conditions or uses in the affected area."

Hanly v. Kleindienst, 471 F.2d 823, 830-31 (2d Cir. 1972), cert denied 412 U.S. 908; see also First National Bank of Chicago v. Richardson, 484 F.2d 1369, 1373 (7th Cir. 1973).

With respect to the first of these criteria, courts have stressed that the significance of an environmental effect is largely determined by the milieu in which it is projected to occur. Thus, "where conduct conforms to existing

uses its adverse consequences will usually be less significant than when it represents a radical change." Sierra Club v. Cavanaugh, 447 F. Supp. 427, 431 (D.S.D. 1978). Moreover, this principle is applied to situations in which existing environmental conditions are below an ideal standard. Hanly v. Kleindienst, supra at 831; Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402 (1971).

a. The Action Did Not Create Any Increase In Adverse Environmental Effects Over Those Caused By Existing Uses.

The first test in Hanly v. Kleindienst, supra, in seeing whether an environmental impact statement is needed, is to examine the extent to which the proposed action causes adverse environmental impacts in excess of those created by existing uses in the area. The teaching of Aberdeen & Rockfish R. Co. v. SCRAP, 422 U.S. 289, (1975), is that in determining whether a proposed Federal approval will significantly affect the environment one looks to the environmental effects of the authority sought in contrast to the environmental effects of the present authorization, and not to some hypothetical condition.

In SCRAP it was held that the environmental effects of an across-the-board rate increase need not be compared to the effect of rates that would encourage the recycling of material, but only need be compared to the environmental effect of rates presently authorized. Thus one examines the environmental effects of what is proposed, against the environmental effects that could be incurred under present authorizations. See also Kleppe v. Sierra Club, 427 U.S. 390 (1976).

Here the environmental effects of what is authorized would exceed those that will be caused by the amendment allowing repair of the facility. Radiological exposure will be substantially reduced. Within three to four years of completion of the repair, even counting the radiological doses stemming from the repair, a saving will be incurred in the total radiological doses over that which would be incurred over operation without this repair and only the plugging of defective tubes.

Although NRC authorization would have been needed to allow operation after further reductions in the number of operating steam generator tubes if the amendments authorizing the repair of the facility had not been granted, the facility is authorized to operate for 30 years. In the SCRAP case the fact that the railroads needed the across the board rate increase to continue to operate did not change the rules of requiring only an examination of what is proposed against what is authorized so as to require consideration of the environmental effects of restructuring the rate system. Here the fact that some change in operation had to be approved for VEPCO to exercise its license does not alter the rule that one compares the environmental effects of the approval sought against the environmental effects of what is presently authorized. Not to replace the steam generators and just continue to remove deteriorated steam generator tubes from service by locating and plugging them, as has been done in the past, cause far larger radiological doses than will be incurred under the subject amendments which allow repair of the facility to avoid these conditions.

Solid waste to be caused by the repair is subsequently dealt with, as is the commitment of resources necessary for the repair.

There is no significant increase in the commitment of resources. The waste generated, as subsequently shown, is insignificant compared with that which will be caused by the ultimate dismantling of the plant as a whole. That the resources to be used in the repair are very small is also demonstrated.

The petitioners seek to premise a major portion of their argument on the economic costs of the repair and the purchase of substitute power during the repair. Leaving aside the question of whether such economic effects require the preparation of an environmental impact statement, the repair will save money in the long run. The costs that would be incurred by society at large, and by the customers of VEPCO, by not doing the repair and operating the plant in a degraded condition would be greater than the costs of the repair, including the purchase of substitute power during the repair.

As will be shown below, the Staff has responded to this court-imposed test by devoting much of its analysis to the relationship between existing environmental conditions at and around the Surry plant and the projected changes thereto resulting from the steam generator renovation. The petitioners have characterized this portion of the analysis as a "highly transparent statistical sleight of hand." Petition at 23. This criticism is in direct conflict with the view adopted by the Federal courts, that data relating to a comparison between environmental conditions before and after the undertaking of a

proposed project is highly pertinent to the discussion of whether a Federal action significantly affects the quality of the human environment.

In sum, the activities authorized by decreasing long-term radiological exposure over what would be incurred if the facilities were to operate without the projected repairs and by being more economical than not repairing the steam generators will not cause adverse environmental effects in excess of those created by existing uses in the area affected. Under the first test of Hanly v. Kleindienst, supra, there was no need for an impact statement.

b. The Absolute Adverse Environmental Effects Are Not So Great As To Require An Environmental Impact Statement.

The Staff, in its environmental impact assessment (EIA) concluded that the environmental consequences of the Surry renovation are "insignificant" as the term has been defined by the courts. Based on the following, I believe that the Staff's assessment was correct.

1. Occupational Radiation Exposure

First, the increase in health risk to the workers attributable to radiation exposure experienced during the repair operation is insignificant in relation to the spontaneous health risk confronting the workers prior to their participation in the repair operation.[2] The Staff calculates that the repair

2 The Staff has focused on the health risk effects associated with radiation exposure in conformance with the basic NEPA objective of assessing government actions for their tangible effect on the human environment. S. Rep. 91-216, 91st Cong., 1st Sess. at 20.

effort will produce an increase in premature fatalities among the workers of approximately 0.6 event and an increase in genetic effects among the worker population of approximately 1 event.[3]

To put these figures into perspective, it should first be noted that according to present cancer mortality rates it can be projected that approximately 20% of the workers employed at Surry during the total repair operation will eventually die of cancer from causes other than the radiation exposure

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3 The increment in premature cancer mortality is calculated using the following formula: (Final Generic Environmental Statement on the Use of Recycle Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors, NUREG 002, Volume 3, Chaper IV, Section J, Appendix B, August 1976).

1.35×10^{-4} cancer deaths X total body man-rem dose = premature cancer fatality

The increment in genetic effects is calculated using the formula: (Final Generic Environmental Statement on the Use of Recycle Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors, NUREG 002, Volume 3, Chaper IV, Section J, Appendix B, August 1976).

2.58×10^{-4} genetic effects X total body man-rem dose = genetic effects

The Staff has accepted VEPCO's estimate of 4140 man-rem for the repair operation. See EIA, p. 6. Thus:

(1) Premature Cancer Fatalities for the repair operation = 1.35×10^{-4} (4140) = 0.56% deaths
(2) Genetic Effects for the repair operation = 2.58×10^{-4} (4140) = 1.07 genetic effects

The Staff's focus on premature cancer fatality and genetic effects is justified by the fact that these two health effects stand as the two key indices for the measurement of health effects attributable to exposure to low-levels of radiation. (The Effects on Populations of Exposure to Low Levels of Ionizing Radiation, Advisory Committee on the Biological Effects of Ionizing Radiation, National Academy of Science, Nov. 1972).

experienced at Surry during the repair operation.[4] Thus, the 0.6 cancer-caused death estimate for the repair operation represents 0.15% of the estimate for the total incidence of cancer-caused deaths for the worker population.

Second with respect to genetic effects, it can be estimated that the worker population at Surry will experience 600 births with genetic effects over the next five generations from causes other than the exposure experienced at Surry.[5] Hence, the 1 event projection for the repair program represents 0.3% of the prediction for the total incidence of genetic effects over the next five generations for the worker population.

These small percentage changes in health risk demonstrate that, in relation to pre-existing levels, the increments in health risk attributable to the repair operation are insignificant.

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4 This estimate is calculated by multiplying the number of workers by the cancer mortality rate as measured in 1976. (See Vital Statistics of the United States, 1976). As of July 31, 1979, 1,850 workers had been employed on the Unit 2 repair effort. Assume that 2,000 workers will be employed for the total Unit 1 and Unit 2 effort. Thus:

$$2{,}000 \times \frac{19.8 \text{ cancer-caused deaths}}{100 \text{ total deaths}} = 396 \text{ cancer-caused deaths}$$

5 This estimate is calculated by (1) applying the statistical model adopted in BEIR I and substantially retained in BEIR III according to which 6% of all children are born with some genetic effect and (2) that the workers at the plant will each produce 2 children during their life-time, thus maintaining the population at a stable level. Thus:

$$1{,}000 \text{ workers} \times \frac{2 \text{ children}}{\text{worker}} \times \frac{.06 \text{ risk}}{\text{child}} = 120 \text{ genetic effects of}$$

spontaneous origin X 5 generations = 600 genetic effects over 5 generations.

The occupational exposure resulting from the project is also insignificant when considered by itself. It must be emphasized that the "absolute component" of the Hanly test was not exclusively meant to analyze incremental changes in the abstract. Such analysis would eventually devolve into intuitive normative judgments, impervious to rational discussion. Rather, the courts have been mainly concerned with the cumulative effect of this increment on existing conditions:

> Although the existing environment of the area which is the site of a major federal action constitutes one criterion to be considered, it must be recognized that even a slight increase in adverse conditions that form an existing environment milieu may sometimes threaten harm that is significant. One more factory polluting air and water in an area zoned for industrial use may represent the straw that breaks the back of the environmental camel. Hence, the absolute, as well as comparative, effects of a major federal action must be considered. Hanly v. Kleindienst, supra at 831.

Applying this principle to the Surry program, the crucial fact to be recognized is that the incremental changes in the health risk to the workers produced by radiation exposure are quite small. Supra p. 12, et seq. Furthermore, considering these changes in health risk purely in the abstract, the Staff reasonably concluded that the 0.6 event increase in cancer fatalities and the 1 event increase in genetic effects projected for the Surry operation are insignificant. EIA at 9.

In addition, the occupational exposure produced by the repair operations has an insignificant environmental impact in the long run. This conclusion is based on a comparison between the predicted dose-savings that will be produced by the generator repair and the dose-increases discussed above. (The dose saving is calculated by subtracting the estimated annual dose after repair from the observed dose before repair. The Staff estimates the dose saving at between 1200 to 1300 man-rems per year.) The Staff estimates that the dose-reductions resulting from the installment of "clean" generators will offset the 4140 man-rems cost of repair within three or four years after the completion of the project. Thus, both from the long-run and short-run perspectives, the occupational exposure produced by the Surry steam generator repair project will have an insignificant impact on the on-site environment.[6]

2. Public Radiation Exposure

The public radiation exposure attributable to the repair effort also will produce insignificant increases in the health risk to the approximately 2 million people who live within 50 miles of the Surry plant. First, it is estimated that the public radiation exposure attributable to the repair effort

6 As of July 31, 1979, the repair program on Unit 2 was 80% complete. Since the high exposure work was largely in the early phase of the program, the exposure is more than 50% of the final total. As of July 31, 1979, this was 1515 man-rem.

will produce .0009 premature cancer fatalities to the surrounding population.[7] Applying the same cancer-caused mortality rate employed in the discussion of occupational exposure, it can be projected that roughly 400,000 of the 2 million people living within 50 miles of the Surry plant will eventually die of cancer. Supra p. 13. Thus the increment in cancer fatalities projected for the surrounding population is 2×10^{-7}% of the expected spontaneous cancer-caused death rate.

Second, it is projected that the repair effort will produce approximately .0018 genetic effects over the ensuing five generations among the surrounding population. This same population would ordinarily be expected to experience 100,000 genetic effects over the ensuing five generations according to the model employed in the discussion of occupational exposure. Thus, the increment in genetic effects to the surrounding population produced by the repair operation will be less than 2×10^{-6}% of the expected spontaneous rate of genetic effects for the surrounding population.

The Staff maintains that, measured in both relative and absolute terms, the increase in health risk effects to the surrounding population produced by the public exposure resulting from the steam generator repair is insignificant.

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7 This figure is calculated thusly:

1.35×10^{-4} (7 man-rems) = .0009 premature cancer deaths

For a discussion of the public radiation dose, see EIA at 12.

3. Solid Waste

The petitioners also cite the Staff's exclusion of an analysis of the waste products attributable to the steam generator lower assemblies in its general discussion of solid waste as a defect in the EIA. The Staff did not include this analysis for the reason that the replaced lower assemblies are not, at this time, being disposed of. Rather, these generator lower assemblies are being stored[8] until the Surry units are decommissioned at which time (approximately 30 years from now) they will be disposed of along with the other components of the plant. Moreover, the failure to consider the ultimate disposition of the generators in the EIA is insignificant. EIA at 13. The generators are expected to produce approximately 20,000 cubic meters of waste when they are removed from the storage facility. This quantity is a small fraction of the millions of cubic meters of waste that will have to be disposed of when the plant is decommissioned.

More importantly, the Staff's omission of the six stored steam generator lower assemblies from the consideration of solid waste does not affect the Staff's conclusion with respect to radiation exposure. First, the on-site exposure resulting from the movement of these assemblies from the plant to the storage facility was included in the total occupational exposure estimates. The total occupational exposure limits were demonstrated above to be

8 One steam generator lower assembly may be shipped to Hanford for examination and research. The environmental effects of the shipment of that assembly, upon which the repair effort is not dependent, are to be separately assessed by DOE/PNL.

insignificant. Supra p. 14 et seq. Thus the aforementioned omission was reasonable in this context.

Second, the Staff did discuss the onsite and offsite exposure attributable to the assemblies while in storage. The Staff found that an individual spending an entire year at the site would receive less than 1 milli-rem of radiation exposure from the stored assemblies. EIA at 13. This dose equals one percent of the natural background dose to such an individual and thus is highly insignificant. EIA at 13.

4. Economic Cost

The petitioners also cite the financial costs of the repair project, which they assume will ultimately be reflected as rate increases to VEPCO's customers, as a significant environmental effect. First, it must be recognized that NEPA was not primarily intended to serve as a statutory device for regulating the economic costs of government actions.

The notion that economic costs alone could trigger the EIS requirement has been frequently rejected by the courts. See, e.g., Image of Greater San Antonio v. Brown, 570 F.2d 517 (5th Cir. 1978), Breckinridge v. Rumsfeld, 537 F.2d 864 (6th Cir. 1976), cert. denied 429 U.S. 1061, (1977), National Association of Government Employees v. Brown, 556 F.2d 76 (D.C. Cir. 1977). Each of these courts recognized that Congress intended that the NEPA EIS requirement serve primarily as a device to protect the natural, physical

environment. The Breckinridge court found the remarks of Senator Henry Jackson to be quite instructive in this context: "The basic principle of the [environmental] policy is that we must strive in all that we do, to achieve a standard of excellence in man's relationship to his physical surroundings." Breckinridge v. Rumsfeld, supra at 866, quoting from 115 Cong. Rec. 40416 (1969). In light of the strong evidence of Congress' focus on the natural environment in its enactment of NEPA, courts have relegated socio-economic effects to a secondary status in the NEPA analysis. Image of Greater San Antonio v. Brown, supra at 527.

This hierarchy of concerns has in fact been recognized by the NRC. With respect to the question of whether the NRC must compare the costs of nuclear plants with the costs of alternative source facilities, the Appeal Board stated:

> [N]EPA requires us to look for environmentally preferable alternatives, not cheaper ones. Put another way, once it has been shown that the power to be produced by a plant is needed and that no environmentally preferable way exists of obtaining it, the acceptability of the 'cost' of the plant in dollars is a question for the utility and the State regulatory agencies, the true experts in this area." Consumers Power Company (Midland Plant, Units 1 and 2), ALAB-458 7 NRC 155, 168 (1978).

Nonetheless, even if these costs are considered in the NEPA analysis, they cannot be said to constitute an adverse economic effect, as the petitioner's theory is both lacking in support and is in direct conflict with the facts of this case.

Specifically, the petitioners assert that the public is adversely affected by the project because it is receiving no "tangible benefit to offset its pecuniary injury." Petition at 15, n. 1. On the contrary, the public will be benefited as a result of the repair project. As against the option of derating the reactor (maintaining it without major structural repair with operational restrictions), the Staff estimates that the repair project will produce a net saving in terms of power replacement costs. This calculation conservatively neglects costs which are ancillary to the derating option such as costs of (1) the inspection and plugging service, (2) the future modifications to control corrosion and (3) the costs resulting from frequent shutdowns during a derating program. EIA at 14. This cost-avoidance certainly constitutes a "tangible benefit" to the public. Moreover, these benefits would not accrue to the public if it were not for VEPCO's decision to undertake a repair program.

It must be emphasized that this discussion of the economic effect of the repair effort has focused upon the impact on the public. It has not dealt with the effect of the project upon the rate-payer. This orientation reflects the fact that the NRC is not involved in determining rates since concerns about rates are not within the scope of interests sought to be protected by the Atomic Energy Act. Portland General Electric Co. (Pebble Springs, Units 1 and 2), CLI-76-27, 4 NRC 610, 614 (1976). Thus while the Staff analyzed the economic costs of the repair project in aggregate terms, the Staff avoided a discussion of the distribution of the costs between shareholders and rate-payers and the distribution within the universe of rate-payers.

Nevertheless, even if the petitioners' assumption that the residential rate-payers will bear the brunt of the project costs is conservatively adopted, the economic impact on these rate-payers is insignificant. This can be demonstrated by comparing the estimated per residence utility rate increase resulting from the repair operation with the per capita income in the Commonwealth of Virginia. Such a comparison yields the result that the rate increase equals .0037% of the Virginia median per family disposable income. This figure is derived from data supplied by the Tayloe-Murphy Institute, University of Virginia. This figure is quite conservative as it results from the acceptance of the petitioner's cost increase estimates of $52 per residence as opposed to VEPCO's $38 estimate. Thus, in relation to existing economic conditions the cost increase is not significant.

5. Commitments of Resources

The petitioners cite various factor inputs as constituing "irreversible and irretrievable commitment of resources" which entail significant environmental costs. 42 USC Sec. 4332(2)(c)v. Each of these inputs, when gauged against

aggregate supply figures, is insignificant. First, the petitioners cite the use of 1350 tons of carbon steel and 48 tons of stainless steel for the project as having a significant effect on the environment. Potomac Alliance Petition at 18. To place these figures into perspective, it is useful to note that in 1977 the United States produced 108.1 million tons of carbon steel and 17.2 million tons of stainless. U.S. Statistical Abstract 1978. Measured against these aggregates, the steel inputs for the replacement project are infinitesimal. Moreover, these inputs taken by themselves are highly unlikely to produce any significant effect upon steel supply.

Second, the petitioners claim that the use of 3,000 cubic yards of concrete for the containment structure constitutes a significant environmental effect. In light of the fact that over 276 million cubic yards of concrete were used in construction in the United States in 1978, this small input cannot be termed significant. Portland Cement Association, Cement Industry Facts, 1978.

Third, the petitioners claim that the use of coal and oil for the replacement power that is needed while the Surry units are off-line constitutes a significant environmental effect. The petitioners neglect to consider the fact that the result of the repair effort will be a reduction in VEPCO's need for oil and coal to generate power. If VEPCO had chosen to allow the corrosion process in the generators to continue unabated, further derating would have occurred and thus VEPCO would have been required to use coal and

oil to generate the replacement power.[9] EIA at 14. Thus, the environmental effects attributable to the use of oil and coal for replacement power during the repair effort are considerably mitigated by the effect that the repair project will have in reducing requirements in the future.

In addition, the effect of using coal and oil for replacement power is also counterbalanced in the short-run by the conservation of uranium during this period. Thus, the energy-producing capability of our resources will not be reduced during the repair project.

6. NRC Regulations Do Not Require An EIS Here

Finally, the petitioners cite two provisions in the NRC regulations which they claim demonstrate that the Staff should have submitted an EIS for the Surry steam generator repair effort. At the outset it must be emphasized that these provisions do not require that an EIS be submitted but state that the decision as to whether an EIS should be written must be based on the facts of the individual case. 10 CFR § 51.5(b) (1979). Nevertheless, assuming arguendo that these regulations could theoretically mandate the submission of an EIA,

9 While the Staff could not calculate the specific quantities of coal and oil that would be required for replacement power, the Staff was able to formulate a rough estimate that the cost of replacement power would be $360 million over ten years. This estimate is based upon the assumptions that (1) derating would continue over this period at an annual rate of 3% and (2) coal and oil would be utilized in roughly equal quantities. This latter assumption is quite crude given the many variables which will ultimately determine the input mix for replacement power.

they would not require an EIS to be written in this particular case. First, petitioners' claim as to the force of 10 CFR § 51.5(b)(2) is largely based on the erroneous assumption that the effluents produced by the demineralizer will be significant.[10] As is shown below, the effluents produced by the demineralizer are insignificant in relation to the effluents produced at Surry during normal operations and insignificant when considered by themselves in absolute terms. Similarly, the petitioners' reliance on 10 CFR § 51.5(b)(7) is based on a mistaken view of the facts.[11] As is demonstrated below, the generator repair effort does not involve a dismantling or decommissioning of Surry Units 1 and 2. Hence, Section 51.5(b)(7) does not apply to the steam generator repair operation.

B. The Cumulative Effects of the NRC Approvals of Steam Generator Repair Projects Do Not Require Preparation of a Programmatic Environmental Impact Statement

The petitioners assert that NRC breached its duties under NEPA by failing to analyze the proposed license amendments for the Surry plant in a programmatic environmental impact statement. This claim is without merit.

10 Section 51.5(b)(2) states that the preparation of an EIS may be required for: "[The] [i]ssuance of an amendment to a construction permit or full power or design capacity operating license for a nuclear power reactor... that would authorize a significant change in the types or a significant increase in the amounts of effluents or a significant increase in the authorized power level."

11 Section 51.5(b)(7) states that the preparation of an EIS may be required for "[l]icense amendments or orders authorizing the dismantling or decommissioning of nuclear power reactors...."

First, the language of Section 102(2)(c) requires an impact statement only in response to a proposed action. Kleppe v. Sierra Club, supra. For example, in the context of this question, such an action would take the form of a proposal for a program involving generator repairs at various plants with the individual components of the program having a combined purpose. No such program has been proposed or contemplated by the Staff. This results from the fact that repair operation proposals are initiated by the individual plant operators and thus NRC has no direct role in determining if and/or when such a proposal would be made.

It is conceded, however, that there are exceptions to this basic construction of Section 102(2)(c). First, courts have expressed concern over the cumulative impact of disparate federal actions. Thus, in a recent decision, the Supreme Court stated that when separate proposals for similar actions will have a cumulative or synergistic environmental impact upon a region, their environmental consequences must be considered together. Kleppe v. Sierra Club, supra at 410.

It should be noted that the Court restricted this principle to pending federal actions. Federal actions which are merely possible are to be considered only when they, in fact, become proposals at which time their effect upon existing environmental conditions (which presumably have been shaped by the previous federal projects) can be accurately measured. Kleppe v. Sierra Club, supra at 410, n. 20.

At the time the Staff prepared the EIA for the Surry repair operation, the only other proposed repair projects were for the Turkey Point plant in Florida and the Palisades plant in Michigan, both several hundred miles away from Surry. In view of the extremely limited off-site effects to be produced by either of these operations, the Staff does not believe that the projects would have produced the radioactive synergy contemplated by the Court.[12]

There is also authority for the proposition that programmatic impact statements are required for actions whose completion will tend to compel the proposal of other similar actions. Scientists' Institute for Public Information, Inc. (SIPI) v. AEC, 481 F.2d 1979 at 1989 (1973), but cf. Kleppe v. Sierra Club, supra. This "bandwagon

12 While the petitioner's discussion of cumulative impact is quite vague, the Staff has adopted the interpretation that "cumulative impact" refers to a supposed synergistic effect between the off-site environmental effect produced by the individual steam generator repair efforts. This was the definition employed by the Supreme Court in Kleppe. The Staff acknowledges, however, that there are other interpretations of "cumulative impact" which are arguably applicable to the environmental evaluation of the Surry steam generator repair effort. For example, it is possible to make the argument that the radiation exposure experienced at Surry during 1976 and 1977 when the generators were being inspected and plugged with the approval of the NRC should be included in a cumulative environmental evaluation of the repair project. Such an approach would be inappropriate, however, as the inspection and plugging decisions are past actions which are unrelated to the federal action being presently analyzed, the steam generator repair. Second, if one accepts the assumption that some of the workers participating at Surry will also be employed in other steam generator repair efforts, then it is possible to argue that individual NRC decisions on steam generator repair would produce a significant cumulative effect in relation to these workers. In response to such an argument, it should be noted that this assumption as to the future employment of these workers has not been verified. Moreover, even if this assumption turned out to be valid, it would be improper to term the cumulative impact on these workers significant as the changes in health risk would have to be measured against a much greater, nationwide background of health risk. Hanly v. Kleindeinst, supra at 831.

effect" was found to exist in the case of a project involving the development of a breeder reactor by the Atomic Energy Commission as it was felt that the commitment of resources to the development of a technology would tend to foreclose options as to that technology in the future. SIPI v. AEC, supra at 490. The Surry project, on the other hand, does not involve a decision with such wide ramifications. Rather, it results from an agency determination made on the basis of the facts of the particular case.[13]

The petitioners cite the Council on Environmental Quality's regulations as requiring a programmatic impact statement for the Surry operation. Such an interpretation as noted above neglects the facts that: (1) the guidelines promulgated prior to 1979 are merely recommendations and thus 40 CFR § 1500

13 While the NRC is not engaging in a steam generator repair program, it has been involved in research on the problem of steam generator deterioration. The Staff is compiling task action reports on the problem of steam generator denting. These reports deal with various facets of the steam generator problem including water chemistry control, corrosion and in-service testing. The discussion of steam generator repair is limited to a mention of the operations currently proceeding at Surry and Turkey Point. In compiling these reports, the Staff will include inputs supplied by the Electric Power Research Institute. This organization, funded by utility companies throughout the United States, has been conducting meetings on the steam generator problem. Two NRC staff members are participating on the Institute's Corrosion Committee. Neither of them has been involved in any way with the development of a steam generator repair program. In addition, neither of them is aware of any such program being considered by the Institute. Neither the Staff's compilation of Task Action reports nor the Staff's participation at the EPRI conferences involve an NRC effort to develop a steam generator repair technology that would effectively commit the NRC to a program of steam generator repair operations similar to those occurring or proposed for Surry and Turkey Point. Thus, these activities did not require the compilation of a programmatic environmental impact statement. The NRC is attempting to arrange through DOE for one steam generator lower assembly to be shipped to Hanford for examination and research. (Sec. n. 8, supra.)

6(d) (1978) is not binding on the NRC; and (2) notwithstanding the dispute as to the binding effect on the NRC of the 1979 CEQ regulations, these regulations did not become effective until July 30, 1979, and thus do not apply retrospectively to the preparation of the EIA. 40 CFR § 1506.12 (1979).

Nevertheless, even if the 1979 CEQ regulations were binding on the Staff at the time it prepared the Surry EIA, its decision not to prepare a programmatic environmental impact statement was not in violation of these regulations. First, as stated above, the Staff's decision to approve the Surry steam generator repair effort was a decision that was independent of all prior and future decisions with respect to generator repairs at other plants. Second, as emphasized above, the Surry plant is sufficiently distant from other plants for which steam generator repair projects have been proposed to guarantee that the limited environmental effects produced by such projects will not interact to create a significant cumulative environmental impact. Last, each steam generator repair operation is a distinct entity involving environmental effects varying greatly from site to site. For example, the occupational exposure estimates for the Surry and Turkey Point repair efforts differ by more than 700 man-rems per unit. This difference represents more than 50 percent of total occupational exposure at Turkey Point. EIA for Turkey Point Steam Generator Repair, Units 3 and 4, at 4-2; EIA for Surry Steam Generator Repair, Units 1 and 2, at 6. Individual, rather than programmatic, environmental evaluations are more appropriate for government actions with such distinguishable environmental effects. Thus, with respect to the 1979 CEQ regulations, the Staff correctly limited the scope of its evaluation of the environmental effects produced by the Surry steam generator repair effort.

The programmatic EIS requirement is not triggered simply by a belief that at some time in the future, in some place, federal actions similar to one under consideration may occur. Rather, the programmatic EIS requirement is limited by consideration of the facts concerning (1) the relationship between the environmental impacts of individual projects and (2) the probability that a single action will force the agency to undertake similar actions in the future. See Kleppe v. Sierra Club, supra. In this way, the programmatic statement serves to keep an agency aware of the environmental impacts produced by actions it is proposing to take or is committing itself to take.

The petitioners also raised the issue of the scope of the Staff's analysis with respect to the question of whether an EIS or an EIA should have been prepared for the Surry steam generator repair effort. The petitioners asserted that the significance of the environmental impact produced by the repair effort at Surry should be assessed by considering the cumulative impacts produced by all steam generator repair efforts. The petitioners cited 40 CFR § 1508.27(b)(7) in support of this position.

In response to this argument, it should first be noted that the supportive regulation cited by the petitioners is another of the 1979 CEQ regulations which was not binding on the Staff at the time it prepared the EIA. 40 CFR § 1506.12 (1979). Nonetheless, the Staff acted consistently with section 1508.27(b)(7) in limiting its analysis to the environmental impacts produced by the repair effort at Surry. As is the case with the analysis of the need for the preparation of a programmatic environmental impact statement,

the key factor in determining the scope of the environmental analysis for the Surry repair effort is the existence of a significant cumulative (emphasis supplied) environmental effect resulting from separate federal actions. Such a significant cumulative impact does not exist, supra at 27. Thus, the Staff acted properly in restricting its analysis, as to the significance of the environmental effect of the Surry steam generator repair efforts, to the effects produced at Surry alone.

C. The Environmental Impact Appraisal Prepared by the Staff is Legally Adequate

The petitioners claim that the environmental impact appraisal (EIA) prepared by the NRC Staff is legally inadequate. They base their claim on various alleged shortcomings in the Staff's analysis. Each of their objections is either based on a misunderstanding of the principles of NEPA or is at variance with what is actually contained in the EIA.

1. The Failure To Discuss the Demineralizer System is Immaterial

First, the absence of a discussion of the effluents produced by the demineralizer system is not a material flaw in the EIA. Although approval of the steam generator repair could be interpreted to include approval of the demineralizer system, the environmental effects of that system are so small as to be insignificant. Thus the failure to discuss these effects is of no legal importance. See NRDC v. Morton, 458 F. 2d 827, (D.C. Cir. 1972).

The principal contaminants in waste streams resulting from the periodic regeneration of resins in the demineralizers will be sodium sulfate and ammonium sulfate with other ions present in trace amounts (see Table 1). The total waste volume will be approximately 25,600 gallons per regeneration, with an estimated average of one regeneration per day for the station.[14] Waste water treatment systems will control the pH and total suspended solids (TSS) so that releases to the station discharge canal will have a pH within the range of 6.0 to 9.0 and TSS concentrations of 30 ppm average and 100 ppm max. (These are the values recommended by EPA in their Effluent Guidelines.)[15] The maximum anticipated flow rate during discharge from this source is 400 gpm.

The waste will be discharged to the discharge canal which has 1,680,000 gpm of circulating water flow. The circulating water flow will provide for an approximately 4,650-fold dilution prior to the entry of the discharge into the river. At the river, due to the high velocity discharge and river water flow, additional mixing will take place. Using the highest concentration expected during either normal polisher operation or during condenser inleakage operation and the dilution factor of 4,650, the maximum incremental increase to the James River (prior to further dilution in the river) due to operation of the demineralizer system is:

14 Steam Generator Repair Program, Surry Power Station, Unit Nos. 1 and 2, VEPCO.

15 Effluent Guidelines and Standards for Steam Electric Power Generating Point Source Category, 40 CFR 423.

TABLE 1[16]

DEMINERALIZER EFFLUENTS

The following waste products can be expected to be discharged per regeneration of a vessel. Each unit can be expected to have 125-200 regenerations per year depending on the pH that the condensate system is run at and the amount of condenser inleakage. (Total of 250-400 regenerations for the station per year.)

Total waste volume is approximately 25,600 gallons per regeneration.

(1) During normal Polisher Operation (H-OH operation, to the ammonia break); the waste volume consists of:

pH = 6.0 to 9.0
$(NH_4)_2SO_4$ = 1800 ppm
Na_2SO_4 = 2540 ppm
30 ppm average 100 ppm max of
Total Suspended Solids (TSS)

(2) During condenser inleakage operation, the waste volume consists of:

pH = 6.0 to 9.0
$(NH_4)_2SO_4$ = 900 ppm
Na_2SO_4 = 2530 ppm
NaCl = 800 ppm
30 ppm avg - 100 ppm max of TSS

(3) In addition to items 1 and 2, the following chemicals may be evident:

10 ppm HCO_3^-
75 ppm SO_4^-
<1 ppm NO_3^-
2 ppm Br^-
<1 ppm F^-
<10 ppm Ca^+
40 ppm Mg^+
15 ppm K^+

16 See n. 14, supra.

$$(NH_4)_2SO_4 = \frac{1800}{4650} = .39 \text{ ppm}$$

$$Na_2SO_4 = \frac{2540}{4650} = .55 \text{ ppm}$$

$$NaCl = \frac{100}{4650} = .17 \text{ ppm}$$

$$TSS = \frac{100}{4650} = .02 \text{ ppm}$$

Comparison of the above values with reported values of toxicity concentration for those compounds demonstrates the insignificance of the discharge concentrations. For a number of fish species, the acute toxicity concentrations of $(NH_4)_2\ SO_4$ ranges from 260 to 500 ppm and, for various aquatic organisms (fish, worms and crustaceans), the acute toxicity concentrations range from 1900 to 16,000 ppm.[17,18,19] According to the FES, organisms in the vicinity of the plant are exposed to NaCl concentrations in excess of 6900 ppm. Also, according to the FES, the TSS range from 15 to 20 Jackson Candle Units (JCU) which roughly correlates to 700 to 1200 ppm.

Thus, it is seen that the discharge concentrations are insignificant even prior to dilution in the James River.

17 McKee, J. E. and H. W. Wolf. 1963. Water Quality Criteria, 2nd Ed. Publication No. 3-A, The Resources Agency of California, State Water Resources Control Board, p. 548.

18 Quality Criteria for Water. EPA-440/9-76-073. U.S. Environmental Protection Agency, Washington, D.C.

19 Toxicity of Power Plant Chemicals to Aquatic Life, WASH-1249, June 1973, USAEC.

The incremental increase in concentration of other ions present in the waste water in trace amounts will be undetectable after mixing with the circulating water in the discharge canal. Since the pH will be maintained within the 6.0 to 9.0 range (which is the river ambient pH) before release to the discharge canal, operation of the new demineralizer system will have no effect on the pH of the river. Because of the turbidity in the James River estuary near Surry, addition of an incremental .02 ppm TSS will likewise have no effect.

Although the Virginia State Water Pollution Control Board has not issued an amendment to the NPDES permit, it is my understanding that, based on the Staff's discussion with the Board, the Board will require the licensee to monitor and limit pH to the 6.0 to 9.0 range and TSS to 30 ppm, average, 100 ppm, maximum, prior to release to the discharge canal.

Ambient river concentrations of ionic species discharged in the demineralizer wastes are not near threshold levels of toxicity for aquatic biota. Examination of the Final Environmental Statement (FES) issued for the Surry Station in June 1972 and the most recent monitoring data from surveys conducted in the vicinity of the plant do not indicate the presence of water quality related stresses. The concentrations discussed above are not significantly different from those described in the FES and would not be expected to result in any adverse impacts to receiving water biota.

On the basis of the above finding I conclude that omission of the analysis is not a material flaw in the EIA.

The petitioners' claim that no discussion of the economic impact of the project is contained in the EIA is also puzzling as section 4.2 of the report is devoted specifically to that issue. EIA at 14, 15. Moreover, the Staff paid particular attention to the question of economic cost in its discussion of the alternatives to the proposed repair operation. In fact, this analysis demonstrated that the proposed program was the least costly of the options available to VEPCO. EIA at 16, 17.

2. The Staff Considered and Discussed Alternatives

It is difficult to understand the petitioners' claim that the Staff has failed to consider the environmental impacts of the various alternatives to the replacement operation. The Staff presented considerable discussion on the question of the relative environmental impacts of the various options in its EIA. EIA at 17, 18. First, it compared the environmental effects of the basic options of inspection and plugging, whole unit replacement, and repair through partial generator replacement. Second, within the chosen option of repair, the Staff analyzed the environmental effects of such suboptions as decontamination and replacement of the entire generator and shutdown and replacement. Finally, the Staff also considered the relative environmental impacts of the various alternatives for storage or disposal of the steam generator assemblies that are to be replaced. EIA at 19. In light of the extensive discussion of the relative environmental impacts of the alternatives to the repair operation, it cannot be maintained that the Staff neglected this issue.

The petitioners claim that the Staff should have specified which energy sources VEPCO would draw upon to generate the replacement power required during the shutdown of the Surry units but this is not required by NEPA. See: Carolina Environmental Study Group v. U.S., 510 F. 2d 796 (D.C. Cir. 1975). First, as was shown above, the net environmental effects resulting from the use of auxiliary power sources are insignificant and thus consideration of them was not crucial. Supra p. 22, et seq. Further, such an analysis is impossible. The information required for a discussion was neither available to NRC at the time the EIA was compiled nor could it have been. The specific energy sources and the quantities required from each for the replacement power were and are still contingent upon several variables including the status of the auxiliary power plants and the availability and cost of sources themselves. Any projection as to these specifics would have been a mere guess. It must be recalled that the NEPA was not designed to require agencies to indulge in crystal ball inquiries. NRDC v. Morton, supra at 837. Such exercises are hardly conducive to informed decisionmaking, but rather leave the agency wallowing in a sea of uncertainty. Such a result was not contemplated by NEPA.

3. The Staff Considered Non-Radiological Impacts

Finally, the petitioners assert that the Staff's discussion of non-radiological impacts was too brief. Courts have established the principle that brevity, in and of itself, is not a fatal defect when evaluating an EIA. Life of the Land v. Brinegar, 485 F.2d 460 (9th Cir. 1973). An agency may make findings in

conclusionary terms so long as there exists documentation to support its judgment. Trout Unlimited v. Morton, 509 F.2d 1276 (9th Cir. 1974). Such a justificatory document is found in the form of the original FES prepared for the construction of the Surry plant. It was from the data and findings made in the FES that the Staff was able to extrapolate and evaluate the dimensions of the non-radiological effects of the repair project. More importantly, this document provides a means by which the Staff's judgment may be evaluated. This is all that is required under NEPA.

The petitioners correctly state that in reviewing the adequacy of an EIA, the Court's main concern has been that the agency has taken a "hard look" at the situation while identifying all relevant environmental concerns. Hiatt Grain and Feed v. Bergland, 446 F. Supp. 457 (1978). Moreover, the examination of an EIA is subject to a "rule of reason." NRDC v. Morton, supra at 834. The EIA prepared by the Staff on the Surry steam generator repair project meets these standards. It contains a discussion of all of the reasonably foreseeable environmental effects produced by the project. Moreover, the appraisal contains a detailed analysis of the key environmental concerns linked to the project, the on and off-site radiation exposure. In addition, it includes references to the more detailed literature on which the Staff based its position. Most importantly, the EIA clearly complies with the NRC regulation relating to environmental impact appraisals, as it contains a description of the proposed action, a summary description of probable impacts on the environment, and the Staff's basis for concluding that an EIS is not necessary. 10 CFR § 51.7(b) (1979).

In reality, the EIA prepared by the Staff is neither the latticework which the petitioners claim it to be nor the great stone edifice which they wish it to be. Rather, it is a highly functional document which clearly identifies numerous environmental ramifications of the repair project and which presents, in reasonable detail, the Staff's argument for determining that an impact statement was not required for the project. In addition, the EIA contained a consideration of alternatives as required by NEPA. Such a report is clearly adequate as an environmental impact appraisal.

D. The Staff Approved the Surry Steam Generator Repair With the Full Consideration of Alternatives Required by NEPA.

The Staff takes issue with the petitioners' position that sections 102(2)(E) and 102(2)(C) of NEPA are to be regarded as equivalent in their respective dictates with respect to the consideration of alternatives. Section 102(2)(E) in calling for a consideration of alternatives for all Federal actions calls for a less intensive and less thorough consideration of alternatives than must be performed under section 102(2)(C) for "major Federal actions significantly affecting the human environment." See Trinity Episcopal School Corp. v. Harris, 445 F. Supp. 204 (S.D.N.Y. 1978); reversed on other grounds, 590 F.2d 204 (2nd Cir. 1970). [It should be noted that this case was decided before section 102(2)(D) was changed to 102(2)(E).]

Petitioners' seem to say that the same analysis is required for proposed Federal actions which are minor or which have insignificant environmental effect as for major actions with significant effect. Thus, the distinction between actions in the 102(2)(C) category and other actions, for all practical

purposes, leaves clause (C) as an appendage rather than, as it is more commonly regarded, the most crucial element of section 102(2). This reading is contrary to the plain structure and intent of section 102 and it should be rejected. Trinity Episcopal School Corp. v. Harris. supra at 218. Rather, as indicated in NRDC v. Morton, supra, there exists a direct relationship between the magnitude of the environmental effects produced by an action and the intensiveness with which an agency must examine alternatives to that act under section 102(2).[20]

This is not to say that the Staff does not have a statutory duty to consider alternatives to the proposed repair project. NEPA, section 102(2)(E), 42 U.S.C. §4332(2)(E) (1978). The Staff, in fact, devoted a section of the report to a discussion of alternatives to the repair operation and their respective environmental and economic costs. The Staff's discussion does contain a reasonably detailed, quantified comparison of the costs and benefits of the relevant options confronting VEPCO and the Staff. When considered against the backdrop of an agency decision of limited environmental significance the EIA's consideration of alternatives is more than adequate

20 It should be noted that the Appeal Board has at least implicitly given section 102(2)(E) a far more literal reading in a recent decision. Portland General Electric Co. (Trojan Nuclear Plant), ALAB-531 (March 21, 1979). It appears that the Appeal Board interprets section 102(2)(E) to refer, exclusively, to conflicts over available resources as inputs for government projects. The Second Circuit has adopted a broader interpretation according to which a "conflict over available resources" exists when there are planning options available to an agency which involve different impacts upon the environment. Trinity Episcopal School Corp. v. Rommey, 523 F.2d 88 (2d. Cir. 1975).

as it evidences that the Staff has considered alternatives to the repair project and informed outsiders as to how it chose among them. Calvert Cliffs Coordinating Council v. AEC. Supra at 1123. Indeed, the NRC Staff's discussion of alternatives, under this test, would have been sufficient even if an EIS had been required.

The petitioners, in fact, do not dispute the fact that the Staff included serious discussion of alternatives in its EIA. Rather, the petitioners claim that the Staff's failure to consider two particular alternatives, "retubing" and "shortterm delay," render the EIA inadequate. The Staff acted in accordance with the principles of NEPA in not considering these alternatives. An EIA is evaluated with reference to the situation at the time the report is submitted. The requirements of NEPA are not applied retroactively. EDF v. Corps of Engineers, 492 F.2d 1123, 1129 (5th Cir. 1974). At the time the EIA was submitted (January 1979) retubing was not a serious alternative. The Westinghouse report on new retubing technology had not been published. The Staff could not make a real assessment of the costs and benefits of retubing and in fact expressly refrained from attempting one. It consciously neither adopted nor rejected the assessment of retubing promulgated by VEPCO. Due to the dearth of information on the retubing technique, it was not at the time of decision a meaningful alternative. To have considered this unestablished technique at the time would have been to indulge in the crystal ball predictions so inimical to the orderly decision making envisioned in NEPA. See NRDC v. Morton, supra at 837.

Thus, realistically speaking, the only option available to the NRC in relation to retubing was to refrain from any action and continue to have the facility operate in a degraded condition until Westinghouse released its report on the new retubing technique. As discussed below, the Staff was justified in omitting the option of this delay from the EIA as it offered no advantages to the immediate undertaking of the repair operation. Alternatives which would result in similar or greater harm need not be discussed. Sierra Club. v. Morton, 510 F.2d 813, 825 (5th Cir., 1978).

Applying this principle of looking at realistic alternatives to the option of short-term delay, the Staff had to take note of two possible contingencies. First, it was possible that after waiting for the issuance of the report and making its evaluation, the Staff would reject the new retubing technique and allow the proposed operation to proceed. Since it is projected that the Staff will not complete its review of the Westinghouse report until sometime next year, it can be estimated that this contingency would have involved, at a minimum, a one-year delay in the repair operation-measuring from the time at which the EIA was issued. During this period workers at the plant would have experienced approximately 1000 to 1500 man-rems of radiation exposure from the inspection and plugging operations alone.[21] In addition, VEPCO would have had to spend $11 million for replacement power, assuming derating at an annual rate of 3% plus an added about $25 million for replacement power, assuming

21 This estimate is based on recorded exposures at Surry which were attributed to inspection and plugging. See EIA at 7.

1 month downtime per plant per year. These costs would be additional to the calculated costs related to the repair operation which would proceed after the rejection of the Westinghouse plan. Thus, the option of a short-term delay followed by the repair operation would be at least as, if not more harmful than, the option of going ahead with the repair operation straightaway.

The second possible contingency consists of a scenario in which the Staff would approve the retubing technique. In such a situation, the new technology would not be instantly implemented. Rather, VEPCO would have to formulate a plan which adapted the new technique to the Surry plant and the Staff, in turn, would have to approve the VEPCO plan. It has been estimated that this process would be completed in a minimum of two years. EIA for Turkey Point Plant, Units 3 and 4 (1979), at 5-3. During this time period, workers at the plant would experience a radiation dose of between 2000 and 3000 man-rems while working in the inspection and plugging operation. The costs of replacement power during this period would be about $30 million, assuming an annual derating rate of 3%, and about an additional $50 million for replacement power assuming a 1-month downtime per plant per year. Moreover, as retubing remains an untried technology, there were and still are doubts as to how successful its implementation will be. [This uncertainty is very important to an appraisal of this option, as VEPCO would have to respond to a problem during the retubing process with a manual operation involving high occupational exposure.] This cost, discounted by a probability ratio, had to be considered in evaluating this option. Finally, the advantages posed by retubing are uncertain. First, the retubing operation and the steam generator repair

contemplated for Surry would involve basically the same procedures and, hence, approximately the same radiation exposure for post-shutdown preparation and post-installation start-up. (These two phases entail approximately 800 to 1000 man-rems exposure per unit or roughly one half the exposure projected for the total repair effort.) The major operational differences between the two techniques are found in the generator disassembly and generator reassembly phases of the operation. It is difficult to predict, however, how these differences affect net occupational exposure as the contrasting elements of these techniques involve both relative increases and decreases in exposure. For example, while the reactor coolant piping to the steam generator would not be cut and thus would result in less exposure to the workers in this aspect of the retubing operation than in the repair effort, the retubing operation would entail exposures due to cutting of all tubes prior to their removal operation. That exposure would not be experienced in the repair effort. In light of the certain economic and environmental costs attributable to delay, and the uncertainties involved in assessing the costs and benefits, in radiological terms, of the retubing technique, the Staff reasonably concluded that "short-term delay" was a sub-optimal, if not impractical, alternative and thus deemed it inappropriate to consider the delay option in detail.

The third flaw cited by the petitioners in the consideration of alternatives is the discrepancy between the estimates of the cost of on-site storage as estimated by VEPCO and the Staff. The discrepancy arises from the Staff's failure to include in its estimate the cost of removing the generator lower assemblies (approximately $9,000,000). This error, however, was made in the

estimate for each disposal method. Thus, the Staff's conclusion that on-site storage is the least costly disposal alternative is not affected--the error is harmless.

Section 102(2)(E) of NEPA requires that agencies consider numerous options to insure that they choose the most socially beneficial. The Staff followed this dictate by considering those options which were competitive with the proposed plan and comparing them with respect to the environmental and economic costs they were expected to produce. In this exercise, it properly excluded options which were likely to be at least as harmful as the proposed plan. Thus, its decision not to consider retubing was motivated by a concern that the delays and uncertainties related to retubing rendered that option unacceptable in the context of the deteriorating situation at Surry and not by a desire to rush the project through. This good faith decision is in accord with the basic objectives of NEPA. Calvert Cliffs Coordinating Council v. AEC, supra at 1123.

2. The Staff Acted Consistently With the Federal Water Pollution Control Act In Issuing Amendment Nos. 46 and 47 to VEPCO's Operating Licenses for the Surry Station

The petitioners assert that the Staff violated section 401 of the Federal Water Pollution Control Act, 33 U.S.C. §1341 (1978), by issuing license amendments nos. 46 and 47 to VEPCO's operating licenses for the Surry station without first obtaining certification from the Commonwealth of Virginia that effluent discharges from the new demineralizer system will not exceed applicable state limitations. The Staff contends that this allegation is groundless.

First, section 401[22] does not require the Staff to obtain certification from the Commonwealth of Virginia for an amendment to an operating license. Section 401 is construed by the staff to refer exclusively to operating licenses and construction permits. The Staff believes that this interpretation of section 401 should be accepted as it is the agency's operational interpretation of a statue. Such interpretations have been afforded great weight by reviewing bodies. See PRDC v. Electrical Workers, 367 U.S. 396, 408 (1961).

The effluent discharges from the new demineralizer system have been evaluated by the Staff and determined to be insignificant. Supra at 33.

22 Section 401 (A)(1) provides that:
"[a]ny applicant for a federal license or permit to conduct any activity, including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates. ... No license or permit shall be granted until the certification required by this subsection has been obtained."

Moreover, although not required to do so under the Staff's interpretation of section 401,[23] the Staff did notify the Commonwealth of Virginia of the Staff's consideration of license amendments for Surry. The Commonwealth has not registered any objection with the Staff to the effect that the effluents produced by the demineralizer system are a violation of water pollution laws. Thus, I believe that the staff acted consistently with the Federal Water Pollution Control Act in its issuance of the license amendments authorizing the Surry steam generator repair.

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23 Section 401(A)(3) states:
"The certification obtained pursuant to paragraph (1) of this subsection with respect to the construction of any facility shall fulfill the requirements of this subsection with respect to certification in connection with any other Federal license or permit required for the operation of such facility unless, after notice to the certifying State, agency, or Administrator, as the case may be, which shall be given by the Federal agency to whom application is made for such operating license or permit, the State, or if appropriate, the interstate agency or the Administrator, notifies such agency within sixty days after receipt of such notice that there is no longer reasonable assurance that there will be compliance with the applicable provisions of sections 301, 302, 303, 306 and 307 of this Act [33 USCS §§1311, 1312, 1313, 1316, 1317] because of changes since the construction license or permit certification was issued in (A) the construction or operation of the facility, (B) the characteristics of the waters into which such discharge is made, (C) the water quality criteria applicable to such waters or (D) applicable effluent limitations or other requirements. ..."

3. The Issuance of the Operating License Amendments Was Not Arbitrary and Capricious and Did Not Violate the Administrative Procedure Act Nor the Atomic Energy Act

A. The Statutory Standards

The petitioners imply that by rejecting or failing to investigate alternatives to steam generator repair and by failing to collect facts needed to support its decision the Commission has violated statutory standards for exercising its discretion. I believe that such a claim is groundless. The Staff's consideration of alternatives has been discussed above. Supra at 34-35 and 37-43. Moreover, the Staff did not merely accept VEPCO's representations. Where necessary the Staff made independent evaluations. For example, the Staff evaluated and compared estimates of worker doses made by both VEPCO and Battelle Pacific Northwest Laboratories and made an independent judgment. See discussion infra at 51. The Staff also made an independent estimate of the cost of on-site storage of the generator lower assemblies. See discussion supra at 42.

B. The Decision to Approve the Surry Project and the Choice of the Repair Alternative Over the Retubing Alternative Was Not Based on Invalid Analysis of Occupational Radiation Exposures.

The petitioners claim that the Staff's reliance on the licensee's prediction of 4140 man-rems of total occupational exposure is extremely unconservative, and that the Battelle[24] study which examined steam generator repair "generically," was rejected. These claims are not true.

24 Battelle Pacific Northwest Laboratories, Radiological Assessment of Steam Generator Removal and Replacement, (September 1978).

The Battelle study was a basis used by the Staff to reach an independent conclusion regarding occupational radiation exposure. The work done by Battelle was not rejected but was considered to be an upper bound estimate. Both the SER and EIA contain an explanation of why the Battelle doses are considered "upper bound estimates." Exposure rates were based on information from several sources including data from measurements made at several operating PWRs including the Surry Units. Battelle usually selected exposure rate values on the high end of the range of values measured at the several plants. The estimates of occupational exposures were intended to be conservative and represent upper bound values. The estimates were presented as a range of values. The upper value was estimated assuming no credit for dose saving techniques. The lower value was estimated assuming credit for shielding by raising the steam-generator water level, remote tooling and distance where applicable. It is the lower value which is used to compare with the licensee's estimates. The licensee's estimates are generally lower than Battelle's because VEPCO used actual plant data and took credit for temporary shielding (such as lead blankets) and local decontamination in addition to the measures taken by Battelle. SER at 10 and EIA at 5, 6, and 7.

The Battelle doses were not summarily rejected. These doses provided a basis for the Staff judgment that VEPCO was in conformance with ALARA objectives. In addition, experience at Surry as reported in its Progress Reports (May 8, 1979, July 2, 1979 and August 31, 1979) support the Staff's position. Dose reduction techniques have provided significant dose savings over what would be expected without them.

The temporary shielding used by Battelle was that provided by the steam generator water level. Battelle did not take credit for additional shielding as did VEPCO. Local decontamination has been used by VEPCO and consists of washing areas of the containment to remove loose contamination. Both the EIA at 6 and SER at 10 state that steam generator water level control and remote tooling is considered in the Battelle lower estimate. The Staff considered all factors considered by Battelle and VEPCO and based its conclusion on these factors. The experience (radiation exposure 9% below estimate) at Surry has further supported the Staff's conclusions that VEPCO provided a more reasonable estimate based on its specific plant data and the dose reduction techniques it would use (VEPCO Progress Report dated August 31, 1979).

The dose rates used by Battelle were based on measurements provided in NUREG-0395 "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station": (Draft Working Paper) and presented in Table 2 of NUREG/CR-0199. Table 2 of NUREG/CR-0199 shows the exposure rates varying by as much as a factor of 20 at some points. Thus, the use of lower dose rates as measured at Surry provides a good estimate of the actual man-rem expected.

The reasons for disparities in the four "sub-activities" questioned by the petitioners have been elaborated in the SER at 11, 12, 13, 14 and 15 and are: (1) the use of local decontamination and temporary shielding by VEPCO greatly reduces dose rates in the area in question, (2) the use of remote tooling, (3) the steam generator wrapper cut from outside the steam generator, not

inside as was assumed by Battelle and (4) reactor coolant pipe will be decontaminated prior to reinstallation. All of these serve to reduce the dose rates to the workers and, thus, the total exposure.

The estimates presented in the repair program by VEPCO assumed an average field reduction of a factor of 5 compared to only a factor of 2 used by Battelle. However, the dose rates assumed for the activity vary by a factor of 25. This is due to (1) the lower initial dose levels, (2) the effect of temporary shielding and (3) the assumed effectiveness of the decontamination. The actual decontamination of reactor coolant pipe has resulted in a significant reduction in dose rates from the removed coolant pipes. VEPCO (Progress Report 2, July 2, 1979) has found that an average dose reduction on contact of 1000 has been achieved by the decontamination process.

The Staff did consider the Battelle estimates and compared them to VEPCO's. Battelle provided a generic estimate as an upper bound value. It was recognized by the Staff that VEPCO is more knowledgable of its own plant than would be an independent contractor. The SER and EIA were prepared after careful scrutiny of both VEPCO's and Battelle's estimates. The decision to use the licensee's estimate was made after careful consideration was given to all aspects. The experience to date at Surry has proven the Staff correct in its decision.

The retubing option was not reviewed in detail for Surry and was not considered as an alternative. Supra at 39.

Based on the reasons discussed on page 39, it was determined that retubing was not a clearly acceptable alternative at the time of the EIA. Even if the retubing option was an alternative it is not clear that it would be a preferable alternative. Therefore, the staff's approval of a clearly acceptable solution (repair) to the tube degradation problem is justified.

c. The Staff's Calculation of the Economic Cost of the Project Was Not Misleading and Invalid

The petitioners cite a discrepancy between the estimates of the cost of on-site storage as estimated by VEPCO and the Staff. As discussed previously, supra at 42, the discrepancy between $1 million and $10 million arises from the Staff's failure to include in its estimate the cost of removing the lower assemblies. However, this error does not change the Staff's conclusions in the EIA.

The petitioners question the Staff's omission of the costs estimates for the construction of the two new demineralizer systems which were projected to cost $27 million. This $27 million, however, includes $10 million for the condenser tubes.

It is true that the cost of the demineralizer systems was not included in the Staff's estimates because the Staff did not consider them to be part of the steam generator repair project. The licensee could have installed the demineralizers without the Staff's review by performing a safety review in accordance with 10 CFR 50.59 and finding that the installation involved neither a change in the Technical Specifications for the facility nor an unreview safety question. (See discussion infra at 54). The Staff believes that the installation involved neither.

VEPCO had estimated a net savings of $125 million and, if the cost of the demineralizer systems were included, a savings of $100 million would remain. The Staff estimated, over 10 years, a cost of $360 million in differential fuel costs if the repair were not made. The additional cost of the demineralizer systems would not have changed the Staff's conclusions.

The Petitioners also assert that the Staff's calculations were based on a cost-benefit analysis over a 10-year period. This is true. The 10-year period was selected as an example only to show the reasonableness of VEPCO's estimated net savings over the life of the plant. Based on this example, the Staff showed that VEPCO's estimate was conservative.

Based on the above, I conclude that the issuance of the amendments was not arbitrary and capricious nor did it violate the Administrative Procedure Act nor the Atomic Energy Act.

4. The Issuance of the Amendment Was Consistent With NRC Regulations

A. The Issuance of a Construction Permit Was Not Required Under NRC Regulations

The petitioners assert that according to 10 CFR §50.91, the Staff was required to issue construction permits prior to the issuance of the operating license amendments for the Surry repair project. This allegation is based on an erroneous conception of the function of a construction permit in situations involving plant modifications.

Any proper analysis of section 50.91 requires that the regulation be considered within the set of laws and regulations governing NRC response to changes to existing facilities. Under Commission regulations there are many changes which the licensee may undertake without seeking approval of the Commission. These are modifications which involve neither a change in technical specifications nor an unreviewed safety question. 10 CFR § 50.59(a)(1) (1979).[25] Second there are changes to a licensed facility which require that the licensee obtain prior Commission approval and an amendment to the operating license. At the very least, these modifications involve changes of technical specifications or the introduction of unresolved safety questions. 10 CFR § 50.59(a)(1) (1979). This second category of modification is further subdivided into two groups: those license amendments which involve a significant hazards consideration and those which do not. The importance of this distinction lies in the requirement that the NRC must give notice of its proposed action thirty days before issuing such an amendment. This "pre-notice" requirement insures that those individuals affected by the amendment have an opportunity to be heard, if they so desire. The "pre-notice" requirement is dispensed with for those amendments which do not involve

25 Section 50.59(a)(1) reads:
"The holder of a license authorizing operation of a production facility may (i) make changes in the facility as described in the safety analysis report, (ii) make changes in the procedures as described in the safety analysis report and (iii) conduct tests or experiments not described in the safety analysis report without prior Commission approval, unless the proposed change, test or experiment involves a change in the technical specifications incorporated in the license or an unreviewed safety question."

significant hazards considerations. Atomic Energy Act of 1954, section 189, 42 U.S.C. § 2239.[26]

Finally, there are those modifications to a license which require issuance of a construction permit prior to the issuance of the amendment to the operating license. Under section 50.23 of the Commission's regulations whether a construction permit is required for the alteration of a facility is governed by section 50.91.[27] Section 50.91 states that a construction permit must be

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26 "Sec. 189. Hearings and Judicial Review --
a. In any proceeding under this Act, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance of modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award, or royalties under sections 153, 157, 186 c., or 188, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. The Commission shall hold a hearing after thirty days' notice and publication once in the Federal Register, on each application under section 103 or 104 b. for a construction permit for a facility, and on any application under section 104 c. for a construction permit for a testing facility. In cases where such a construction permit has been issued following the holding of such a hearing, the Commission may, in the absence of a request therefor by any person whose interest may be affected, issue an operating license or an amendment to a construction permit or an amendment to an operating license without a hearing, but upon thirty days' notice and publication once in the Federal Register of its intent to do so. The Commission may dispense with such thirty days' notice and publication with respect to any application for an amendment to a construction permit or an amendment to an operating license upon a determination by the Commission that the amendment involves no significant hazards consideration."

27 Section 50.23 reads in part:
"A construction permit for the alteration of a production or utilization facility will be issued prior to the issuance of an amendment of a license, if the application for amendment is otherwise acceptable as provided in section 50.91."

issued for those changes which involve a material alteration of a licensed facility.[28] (emphasis supplied). The Atomic Energy Act requires that a hearing be held for all issuances of construction permits whether or not it has been requested. Atomic Energy Act of 1954, Section 189, 42 U.S.C. 2239.

The above description sets out a continuum of changes to licensed facilities with the agency responses required for each. The motivating principle underlying this structure is that agency and, more importantly, public participation in the regulatory process should increase in direct relation to the degree to which the contemplated facility alteration involves a change in the nature and function of the facility. These regulations and laws protect the public's due process rights by the strengthening of the hearing requirement according to the extent to which the proposed agency action involves issues within the agency's jurisdiction which were not considered when the public was last afforded an opportunity to be heard on the construction of the facility or its operation. These laws and regulations do not, as the petitioners contend, require public participation according to the size of a proposed repair operation.

In order to meaningfully apply this analytic framework to the Surry steam generator repair effort, it is necessary to refer back to past Commission

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28 Section 50.91 reads in part:
"If the application involves a material alteration of a licensed facility, a construction permit will be issued prior to the issuance of the amendment to the license."

practice in implementing these regulations. This analysis is essential to the definition of otherwise empty terms such as material alteration. Such a discussion is in accord with the principle that great weight should be given to a practical administrative construction of a disputed provision. PRDC v. Electrical Workers, supra at 408.

First, there has been only one instance in which a construction permit was issued prior to an amendment of an operating license. This action related to an amendment issued on March 2, 1971 to the University of Maryland research reactor license (Docket No. 50-106). The facility alteration involved the complete removal of existing control rods, rod drive mechanisms, core instrumentation and control room equipment supplied by the Allis-Chalmers Corporation and replacement of these components with new components of the Triga design. The change rendered major portions of the original safety analysis for the facility inapplicable to the modified facility.

The only other instance involving a Staff decision to require a construction permit for an alteration of a licensed facility occurred when Nuclear Fuel Services applied for an amendment to its provisional operating license for the West Valley fuel reprocessing facility in New York. The proposed changes involved the construction of a new gas building, a new cask unloading pool, a new water treatment facility, the extension to the plutonium extraction facility and the crane room and other changes that would make the facility substantially different after the modifications from that initially licensed. Most important was the fact that these modifications would have increased the

facility's production capacity by a factor of three. In view of these facts, the Staff advised the licensee that the proposed changes appeared to be material alterations within the meaning of 10 CFR § 50.91 and that a construction permit would be required prior to the issuance of the license amendment. No permit was ever issued since Nuclear Fuel Services advised the agency, in September 1976, that it was withdrawing from the fuel reprocessing business and the proceeding has been inactive since that time.

The characteristic shared by these cases is that the changes proposed by the licensees involved substantial changes in the type of major components of existing facilities to a different type of equipment. Thus, the changes introduced new significant issues relating to the nature and function of the facilities and to the public's health and safety. The public participation on the original license was rendered meaningless as a drastically different set of facts and questions had to be considered by the NRC in relation to the different equipment. Hence, these changes required that construction permits be issued prior to the issuance of a license amendment under section 50.91.

No material alterations are being contemplated for the Surry plant. The steam generator repair effort includes three changes to the facility, but none materially departs from the design of the plant originally approved. First, and most prominently, is the actual repair of the generators. This facet of the project consists of several elements including:[29]

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29 Safety Evaluation for Surry Power Plant, Units 1 and 2, (December 15, 1978) at 4-6.

1. The installation of new lower steam generator assemblies consisting of the tube sheet, tube bundle assembly, reactor coolant inlet and outlet channel head with nozzles, and the outer shell.

2. The new lower assemblies will have a flow distribution baffle plate designed to assist and direct the lateral flow across the tubesheet surface, thus minimizing the number of tubes exposed to sludge and causing the sludge to deposit near the center of the tube bundle at the blowdown intake.

3. The incorporation of an improved blowdown system having a blowdown intake location coordinated with the baffle plate design so that the maximum flow is located where the greatest amount of sludge is expected to deposit.

4. The tubes in the new lower assemblies will be expanded to the full depth of the tubesheet to eliminate the potential for contaminant concentration at these interfaces on the steam side. Recessing the tubes into tube sheet holes and welding them to the tubesheet cladding is expected to reduce entry pressure losses and eliminate crud buildup on the reactor coolant side.

5. The change of the tube support plate material from carbon steel to SA-240 Type 405 ferritic stainless steel in the new lower assemblies--a material that is expected to be much more corrosion resistant than the carbon steel now in use.

6. The placement of "quatrefoil" design holes in the new tube support plates to provide higher average flow velocities along the tube surfaces passing through the support plates, thus preventing most sludge depositions and eliminating the denting.

7. Modifications to the existing moisture separator equipment which will serve to minimize moisture and soluble corrodent species carryover into the turbines.

8. The installation of a 2-inch nozzle to the existing upper shell to facilitate wet lay-up of the steam generators during periods of inactivity. This nozzle can be used for addition of chemicals to maintain water quality.

9. The inclusion of a 3/8 inch primary shell drain in the new channel head to improve drainage of the channel head.

10. The welding of closure rings inside the new channel head at the base of each reactor coolant nozzle so that closure plates can be bolted in place during reactor coolant side maintenance.

11. The thermal treatment of the new Inconel-600 tubing used in the repaired steam generators. This treatment will produce a microstructure with improved resistance to stress corrosion cracking by reactor coolant. In addition, the tubes in the innermost eight rows of the bundle will be stress relieved after bending to minimize residual stresses.

The second modification of the Surry plant included in the generator repair effort is the installation of a full-flow condensate polishing demineralizer system for each unit. Each unit will have an independent chemical regenerator system consisting of a cation regeneration tank, a resin mix and storage tank and an acid and caustic recovery system. A building to house the condensate polishing systems, auxiliary systems, motor control centers and controls panel will be constructed adjacent to the east end of the Unit No. 2 turbine building. This system is being installed to aid in controlling water chemistry in the secondary system in order to reduce the corrosion to be experienced in the generators in the future. "Steam Generator Repair Program, Surry Power Station, Unit Nos. 1 and 2", pp. 5.3-3 and 5.3-4.

Last, a concrete storage facility will be constructed on the site to house the replaced generator parts. It will be an above ground concrete structure on a poured structural slab. Its internal space will be divided into two cells (each capable of storing three assemblies)[29] with a 2-foot thick separation wall between the cells. The exterior walls will be approximately 3 feet thick. A sealing system will be used to prevent water intrusion and to promote runoff, and an internal sump will be provided to collect any water inside the building. Steam Generator Repair Program at 5.3-1.

29 One of the six Surry steam generator lower assemblies is now being considered for research work at Hanford. Therefore, the facility may contain only five of the six assemblies during the remaining life of the station. Also see notes 8 and 13, supra.

The facility modifications described above do not constitute a material alteration of the Surry plant. On the contrary, the steam generator repair is in reality a major maintenance operation consisting of plant modifications which are being implemented so that the plant may function as was originally intended. More specifically, the steam generator repair will restore the heat transfer capacities of the units to their original design levels. Safety Evaluation Report for Surry Units 1 and 2 (Docket Nos. 50-280 and 50-281), p. 4. In addition, the storage structure will not in any way affect the nature or function of the plant. The structure will merely serve as a temporary repository for the replaced generator parts. Moreover, it is projected that the radioactivity levels outside the building will be low enough to designate the structure as an unrestricted area. Infra p. 66.

The Staff did find it necessary to issue license amendments for the steam generator repair effort to have the plant function as it was originally intended to function. The decision, however, did not stem from the structural changes that will be made to the facility, but rather is attributable to the safety questions inherent in the repair process itself. The repair operation involves extensive work with radioactive components including the cutting, welding and transporting of portions of the steam generators and related water and steam lines. In view of the potential exposure hazards of such work, the licensee and its subcontractors have had to develop elaborate procedures to protect the workers from radiation exposure. The Staff properly determined that such procedures and operations contained unreviewed safety questions and pursuant to section 50.59, the Staff required the licensee to apply for a

license amendment for the repair effort. Supra,p. 4. Furthermore, the repair operation raised safety questions serious enough to prompt the staff to designate the license amendments as involving significant hazards considerations. Atomic Energy Act of 1954, Section 189 42 U.S.C. 2239. These safety issues, however, relate to the process of steam generator repair and not to material alterations in the nature and function of the Surry plant. In fact there are no such alterations being contemplated for the Surry plant. Thus, under section 50.91, the Surry steam generator repair effort did not require a construction permit prior to the issuance of the licensing amendments.

The petitioners also cite section 50.54(n) in support of their claim that the Staff was required to issue a construction permit prior to the issuance of the operating license amendments for the Surry steam generator repair effort. The Staff concedes that if section 50.54(n) were to be read literally without regard to other related regulations or the Atomic Energy Act of 1954, it would appear to require that a construction permit be issued for every modification of a licensed facility which involves the change of a technical specification.[30] Such a reading has to be rejected as it wreaks havoc with both the procedural framework created by section 189 of the Atomic Energy Act and the regulations

30 Section 50.54(n) reads:

> (n) The licensee shall not, except as authorized pursuant to a construction permit, make any alteration in the facility constituting a change from the technical specifications previously incorporated in a license or construction permit pursuant to § 50.36.

promulgated by the NRC in accordance with that section. See Train v. Colorado Public Interest Research Group, Inc. 420 U.S. 1(1976).

As was noted above, the regulatory scheme promulgated under the Atomic Energy Act sets out a continuum of modifications to existing facilities and varying agency responses to each of these changes. The most significant of these modifications, a material alteration, requires a construction permit. A construction permit can only be granted after a mandatory public hearing. The literalist interpretation of section 50.54(n) offered by the petitioners would impose the same procedural requirements on a modification involving a change in technical specifications even if the actual change in the facility represented a minor, immaterial modification of the facility. This interpretation would thus create the absurd situation in which a minor change in the facility that happened to involve a change in technical specifications but, simultaneously, no significant hazards consideration, would require a mandatory hearing. A facility modification involving a license amendment with a significant hazards consideration but no change in technical specifications would only require a hearing if it were requested after the appropriate "pre-noticing" procedures were followed. Supra, p. 61.

Furthermore, this literal interpretation of 50.54(n) would add considerable confusion to the meaning of several NRC regulations. It will be recalled that, together, sections 50.23 and 50.91 require construction permits only for modifications which entail a material alteration to the facility. Such material alterations involve changes much more substantial than a modification

involving the change in a technical specification. Supra et seq p. 55. In addition, this literal reading of section 50.54(n) would cloud the meaning of section 50.59. Section 50.59 states that one criterion for determining whether a license amendment is required for a facility modification is whether the alteration entails a change in technical specifications. The literal interpretation of section 50.54(n) would thus leave the Staff in a position of using the same criterion, a change in technical specifications, for making two very different decisions: (1) whether a construction permit and license amendment or merely a license amendment should be required for a facility modification, and (2) whether a license amendment or no agency action at all is appropriate for a facility modification.

The better reading of section 50.54(n) is that it requires a construction permit for those facility modifications which require changes in technical specifications which also entail material alterations of the facility as stated by section 50.91. This was in fact the interpretation adopted by the Atomic Safety and Licensing Board:

> However when sections 50.23, 50.45, 50.55, 50.56, 50.90, 50.54(n) [emphasis supplied] and 50.91 are read as a whole, it is clear that only if an application for an operating license involves a material alteration of a licensed facility must a construction permit be issued prior to the issuance of the amendment.

In the Matter of Portland General Electric Company, et al. (Trojan Nuclear Plant), LBP-77-69, 6 NRC 1179, 1182 (1977). As was demonstrated above, the modifications contemplated for the Surry plant are not material under

section 50.91.[31] Thus, neither section 50.91 nor section 50.54(n) requires that a construction permit be issued prior to the issuance of license amendments authorizing repair of the steam generators at Surry.

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31 In addition to the facility modifications described in the discussion of section 50.91, the steam generator repair effort involves the following license conditions which functionally operate as changes in technical specifications:

a. All fuel shall be removed from the reactor pressure vessel and stored in the spent fuel pool.

b. The temporary containment and ventilation systems shall be operating for all cutting and grinding operations involving components with removable radioactive contamination greater than 2200 DPM per 100 cm^2.

c. The health physics program and procedures which have been established for the steam generator repair program shall be implemented.

d. Progress reports shall be provided at 60-day intervals from the start of the repair program and due 30 days after close of the interval with a final report provided within 60 days after completion of the repair. These reports will include:

i. A summary of the occupational exposure expended to date using the format and detail of Table 5.3-1 of the report entitled "Steam Generator Repair Program."

ii. An evaluation of the effectiveness of dose reduction techniques as specified in Chapter 6 of the report entitled "Steam Generator Repair Programs" in reducing occupational exposures.

iii. An estimate of radioactivity released in both liquid and gaseous effluents.

iv. An estimate of the solid radioactive waste generated during the repair effort including volume and radioactive content.

(3) Sixty days prior to fuel loading, the program for preoperational testing and startup shall be submitted for NRC review.

In addition, the steam generator repair will allow for the deletion of technical specifications relating to the inspection and plugging of the formerly deteriorating steam generators.

B. The Steam Generator Repair Effort Does Not Involve A Disposal of Nuclear Waste and Thus Did Not Require Commission Approval Under Section 20.301

The petitioners assert that VEPCO was required to procure the Staff's approval for the disposal of the steam generators. This contention is entirely based on the invalid assumption that the steam generators are being disposed of. Portions of the steam generators are being stored at the site until a suitable plan is developed for their disposal and most probably will not be disposed of until the plant is decommissioned. EIA at 2. In this respect, the removed portions of the steam generators are not unlike other radioactive components at some facilities which have been removed from service during maintenance and repair and which will remain at the sites until they are disposed of upon decommissioning.

Furthermore, until the removed portions of the steam generators are disposed of, the licensee will store them in accordance with the relevant portions of Part 20. The Staff believes that the radiation levels outside the concrete storage facility walls will be low enough to treat the storage facility as an unrestricted area under 10 CFR 20.105 and 10 CFR 20.207. If, however, upon completion of the transfer of the sealed steam generator lower assemblies to the storage facility, the licensee finds radiation levels in excess of the threshold levels described in section 20.105, the licensee will be required to provide adequate control and posting pursuant to 10 CFR 20.203. Safety

Evaluation Report for Surry Units 1 and 2 (Docket Nos. 50-280 and 50-281), p. 25.

C. The Steam Generator Repair Project Is Being Performed Consistent With NRC Regulations Requiring Occupational Radiation Exposures To Be Kept As Low As Reasonably Achievable

The petitioners assert that VEPCO and the NRC are ignoring the ALARA principle[32] in their planning and regulating of the steam generator repair project. The petitioners offer no evidence to substantiate this claim save for a remark made by a VEPCO spokesperson, which the Staff believes that the petitioners misinterpret. An examination of the facts, on the other hand, reveals that the petitioners' accusation is groundless. The Staff has, in fact, reviewed the licensee's submittal regarding occupational exposures and has concluded that efforts being made to maintain occupational exposures ALARA are acceptable because the licensee is doing everything reasonable to reduce occupational exposure. Safety Evaluation Report at 17.

First, the petitioners cite a statement regarding the applicability of Regulatory Guide 8.8[33] made by a VEPCO spokesperson as evidence of the utlitity's disregard for the ALARA principle. Petition at 55. (The spokesperson asserted that much of Regulatory Guide 8.8 did not apply to the replacement operation.) The petitioners' allegation fails to take into

32 See 10 CFR 20.1(C)

33 Regulatory Guide 8.8 Information Relevant to Maintaining Occupational Radiation Exposure as Low as Reasonably Achievable. (Nuclear Power Reactors)

account the broad scope of Regulatory Guide 8.8. The guide discusses the application of ALARA to all stages of a plant's existence from planning through decommissioning. Regulatory Guide 8.8, Revision 3 (June 1978) at 4. Obviously, portions of Regulatory Guide 8.8 will not be applicable to the steam generator repair operation.

The Staff's interpretation of the spokesperson's statement is supported by VEPCO's implementation of a multi-faceted program to reduce occupational radiation exposure at the site during the replacement operation. The salient features of this plan include:

1. The placement of temporary shielding on piping and components located in the lower steam generator cubicles. It has been estimated that this measure has produced a dose reduction factor of 7 or 240 man-rem. Progress Report No. 2 at 9.

2. The maintenance of water levels in the steam generators above the tube bundle until just prior to removing the lower assemblies. This procedure has resulted in an estimated dose reduction factor of 10 which translates to 576 man-rem. Progress Report No. 2 at 10.

3. The decontamination of the removed reactor coolant pipes through the use of an electropolishing process. Although the calculations for the dose-savings attributable to this measure are quite rough, it has been estimated that the electropolishing process has produced a dose reduction of approximately 400 to 1,000 man-rem.

4. The utilization of other, more general procedures:

   a. general work area clean-up and debris removal,

   b. decontamination of tools, equipment and components,

   c. the use of tools and gloves for special cutting and grinding operations,

   d. the establishment of low exposure rest areas inside the containment to accommodate workers during idle periods, and

   e. various miscellaneous measures including health physics and training programs, the "work package" concept for task preplanning and review, special tool and equipment design for exposure reduction, and the project photographic documentation. Progress Report No. 2 at 12, 13, and 14.

Section 20.1(c) of the Commission's Regulations defines the term ALARA to mean "as low as reasonably achievable taking into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest." 10 CFR § 20.1 (1979). In other words, under ALARA licensees must employ cost-effective methods which reduce radiation exposure. The program described

above has been judged by the Staff to satisfy this requirement. Safety Evaluation Report at 17.

D. The Surry Steam Generator Repair Project Does Not Constitute A Dismantling Operation and Thus Does Not Require The Commission's Approval Under 10 CFR § 50.82

The petitioners claim that the steam generator repair project constitutes a partial dismantling of Units 1 and 2 and thus requires Commission approval under 10 CFR § 50.82.

First, the very language of section 50.82 belies petitioners claims. The first sentence of section 50.82 reads:

> "Any licensee may apply to the Commission for authority to surrender a license voluntarily and to dismantle the facility and dispose of its component parts." [emphasis supplied]

10 CFR § 50.82 (1979). This language clearly indicates that the term "dismantling" as used in section 50.82 refers to an act which occurs once the licensee has decided to relinquish its operating license.

Second, petitioners can reach this conclusion only after taking section 50.82 out of its regulatory context. See Train v. Colorado PIRG, supra. An analysis which places section 50.82 in its proper place within the regulatory framework discloses that section 50.82 simply does not apply to operations such as the steam generator repair project at Surry. Each license to operate a production and utilization facility is issued for a certain duration. 10 CFR § 50.51. Once that period has expired, the licensee

can either apply for (1) a renewal of its operating license, (2) an amendment to the license which would restrict the licensee to possess but not operate the facility, or (3) NRC approval to decommission the plant. Regulatory Guide 1.86 (1974), p. 1. If the licensee chooses one of the two latter options, it may, in addition, opt to dismantle all or part of the equipment at the plant. It is at this juncture that the licensee must receive the Commission's approval under section 50.82. Regulatory Guide 1.86 (1974), p. 1.

Further support for the Staff's interpretation of section 50.82 is provided by the agency's past practice in implementing the regulation.[34] It is instructive to note that the most prominent dismantling approved under section 50.82 to date occurred at the Elk River reactor. The reactor was decommissioned and dismantled and the facility was transformed into a coal-fired power plant. All the nuclear-related structures and equipment were disassembled and disposed of. Most significantly, the dismantling of the facility was one element in a plan to cease operations at a nuclear power facility.[35] It is this essential characteristic which has marked the approximately 30 total and partial dismantlings to date.

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34 As was noted in the analysis of section 50.91, reference to an agency's practical interpretation of a regulation is a valid method of establishing its meaning, infra p. 45 et seq.

35 The following summary of the dismantling operation at Elk River demonstrates that further operation of the nuclear facility after the dismantling was completed was out of the question.

The work required to achieve the end product of the dismantling program will consist of:

a. Removal of the reactor pressure vessel and internals, reactor pressure vessel biological shielding, reactor building and

(CONTINUED)

Moreover, viewing the issue in practical terms, the Staff has in fact examined the same questions in granting the license amendment authorizing repair of the Surry steam generators, that they would have analyzed in determining whether

(CONTINUED)

all equipment, concrete, materials and structures located within the space enclosed by the reactor building.

b. Removal of the superheater, superheater building, and the superheater building foundation down to approximately one foot below existing ground level and all material, piping, equipment and structures from within the superheater's building.

c. Removal of all piping, conduits, cables, conductors and equipment located in the passageway between the reactor building and the superheater building, the metal super-structure of the passageway and the concrete walls of the structure to approximately one foot below existing ground level.

d. Removal of all valves, piping, cables, switches, air lines, wiring or components within the turbo-generator facility if they contain reactor-originated radioactivity, or if the AEC wishes to remove them for programmatic or economic reasons.

e. The east wall of the RCPA steam electric generation building, which is the west wall of the superheater building, will be returned to weather-proof condition by sealing and finishing in an appropriate manner all openings, except the rear entrance door at grade level.

f. All cavities remaining after the removal of the structures and equipment will be filled with clean rubble and/or earth to approximately grade level.

All items which contain reactor-originated radioactivity will be packaged and transported to an approved burial ground. All non-radioactive material will be used as land fill at the reactor site or disposed of at a local land fill area.

After completion of all dismantling operations and prior to backfill, a thorough radiation survey of the plant site will be performed to verify that all reactor-originated radioactivity has been removed from the site. AEC Elk River Reactor Dismantling Plan (Docket No. 115-47) (1971), p. 47.

to approve a dismantling 50.82. Most prominently, the actual operation procedures, the storage plan and the security measures for the repair effort have all been analyzed in detail by the Staff. Thus, in reality, the decision to analyze the repair effort as a maintenance measure calling for a license amendment rather than as a dismantling has not affected the Staff's review of VEPCO's action.

Based on the foregoing discussion and the provisions of 10 CFR §2.206, I have determined that there exists no adequate basis for taking the action proposed by the Citizen's Groups. The request of the Citizen's Groups is hereby denied.

A copy of this decision will be placed in the Commission's Public Document Room at 1717 H Street, N.W., Washington, D.C. 20555 and the local public document room for the Surry Nuclear Power Station located at the Swem Library, College of William and Mary, Williamsburg, Virginia 23185. A copy of this decision will also be filed with the Office of the Secretary of the Commission for its review in accordance with 10 CFR §2.206(c) of the Commission's regulations.

In accordance with 10 CFR §2.206(c) of the Commission's Rules of Practice, this decision will constitute the final action of the Commission 20 days after the date of issuance, unless the Commission on its own motion institutes the review of this decision within that time.

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 24th day of October , 1979.

7590-01

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	Docket Nos. 50-280
VIRGINIA ELECTRIC AND POWER COMPANY	)	and 50-281
(Surry Power Station, Units 1 and 2)	)	

NOTICE OF ISSUANCE OF DIRECTOR'S DECISION
UNDER 10 CFR 2.206

On April 18, 1979, the Potomac Alliance, et al., requested that an order be issued to the Virginia Electric and Power Company to suspend further action on the steam generator repair program at the Surry Power Station, Units 1 and 2, pending preparation of an Environmental Impact Statement and completion of other requested relief. The Alliance's petition has been treated as a request for action under 10 CFR 2.206 of the Commission's regulations. Upon review of the petition, the Director of Nuclear Reactor Regulation has determined not to grant the Alliance's requested relief. Accordingly, the Alliance's petition is denied.

Copies of the Director's Decision are available for inspection in the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. 20555, and in the local public document room at the Swem Library, College of William and Mary, Williamsburg, Virginia 23185. A copy of this decision will also be filed with the Secretary of the Commission for the Commission's review in accordance with 10 CFR 2.206(c) of the Commission's regulations.

As provided in 10 CFR 2.206(c), this decision will constitute the final action of the Commission twenty (20) days after the date of issuance,

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unless the Commission on its own motion institutes a review of this decision within that time.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 24th day of October, 1979.

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FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 24th day of October, 1979.