DOCKETED 51 S-3

May 17, 1982 SECY-82-197

ADJUDICATORY ISSUE

(Commission Meeting)

For: The Commission

From: Leonard Bickwit, Jr., General Counsel

Subject: DISCUSSION OF NRDC V. NRC, D.C. CIR. NO. 74-1586 AND CONSOLIDATED CASES (DECISION HOLDING INVALID NRC'S ORIGINAL, INTERIM, AND FINAL TABLE S-3 FUEL CYCLE RULES)

Summary: Our brief memorandum of April 27, 1982 informed the Commission that the D.C. Circuit in a decision announced that day had held that the Commission's Original, Interim, and Final fuel cycle rules ("Table S-3") are invalid because the rules do not allow "proper consideration" of uncertainties in fuel cycle environmental impacts. The court held that the Original and Interim rules were also invalid because of "their failure to allow for proper consideration of the health, socioeconomic, and cumulative effects of fuel cycle activities" in individual licensing proceedings. The court interpreted the rules, which did not examine these effects, as precluding

Contact:
E. Leo Slaggie, GC
X-43224

XA Copy Has been Sent to PDR

8205240606 XA

5-17-82

their consideration in licensing proceedings. 1/ The court's 69-page opinion was written by Judge David Bazelon. Judge George Edwards of the Sixth Circuit, sitting by designation, contributed a lengthy concurrence. Judge Malcolm Wilkey filed a 65-page dissent, which argued that the majority had stepped outside its authority in rejecting the S-3 rule's treatment of fuel cycle uncertainties. Judge Wilkey did not address the issue of health, socioeconomic, and cumulative effects as treated by the Original and Interim rules. Both Judge Bazelon and Judge Wilkey agreed that the Commission had adequately demonstrated that the models on which the Table S-3 numbers are based were economically feasible. Therefore the court dismissed the State of New York's challenge to the Final rule, which rested entirely on the economic feasibility issues. Judge Edwards would have remanded to the Commission for further consideration of economic feasibility.

We have now had an opportunity to study these opinions, discuss their potential impact with the NRC technical and legal staff, and we present herein some views and recommendations concerning post-decision judicial relief and actions that can be taken by the Commission to avoid disruption of past

---

1/ Unlike the Original and Interim rules, the Final rule explicitly requires that environmental statements prepared in support of power reactor licensing should take account of health effects and socioeconomic and cumulative impacts of the nuclear fuel cycle.

licenses and ongoing proceedings while post-decision relief is being pursued. We think a substantial argument can be made that the court was in error both on the uncertainties issue and in its interpretation of the Original and Interim rules. We believe the Commission should recommend that the Solicitor General seek rehearing and reconsideration en banc in the D.C. Circuit. If reconsideration is denied, the Solicitor General should be urged to petition the Supreme Court for a writ of certiorari. The Government has until June 11 to file a petition for rehearing and reconsideration. Normally the court's mandate will not issue until this period expires. Filing of such a petition automatically stays the mandate until 7 days following the court's disposition of the petition. The court may further stay its mandate pending the filing of a petition for certiorari and final Supreme Court disposition of the case. Until the mandate issues, the Commission's rules remain at least formally valid and useable in licensing proceedings. We think it likely that the Commission can obtain a lengthy stay of mandate if it pursues its post-decision remedies. Because a large number of licenses are potentially affected by the D.C. Circuit's decision, and there is considerable uncertainty and apprehension among applicants and licensees as to the Commission's reaction to the case (a brief licensing moratorium was ordered by the Commission when the S-3 rule was last struck down), we recommend that the Commission issue promptly a statement of policy indicating the status of both closed and ongoing licensing proceedings pending

final resolution of this matter in the courts.

Discussion:

1. Background

The fuel cycle rules which are the subject of these cases were promulgated by the Commission as a means of describing generally in individual power reactor licensing proceedings the environmental impacts of the off-site uranium fuel cycle operations which must be performed in support of the reactor, if it is licensed to operate. These operations include mining and milling of uranium, enrichment and fabrication of the fuel, and storage, possible reprocessing, and eventual permanent disposal of the radioactive wastes. It is reasonably well settled by now that because the operation of a power reactor involves a commitment to these fuel cycle activities, the environmental analysis required by the National Environmental Policy Act (NEPA) as part of the reactor licensing process must address the impacts of the fuel cycle. 2/ This consideration cannot be deferred, for example, until the Commission is engaged in licensing the actual waste repository that will close the fuel cycle. Accordingly, rather

---

2/ Natural Resources Defense Council v. NRC, 547 F.2d 633, 639-640 (D.C. Cir. 1976), rev'd on other grounds, 435 U.S. 519 (1978). On review the Supreme Court stated that it is "hard to argue that [nuclear wastes] do not constitute 'adverse environmental effects which cannot be avoided' . . . or that by operating nuclear power plants we are not making 'irreversible and irretrievable commitments of resources'" within the meaning of NEPA. 435 U.S. at 539.

than have individual reactor licensing boards repeatedly relitigate the generic problem of estimating fuel cycle impacts, the Atomic Energy Commission on April 22, 1974 promulgated what we now call the "Original" S-3 rule. This rule set out in "Table S-3" numerical values for, among other things, radioactive effluents from fuel cycle activities associated with annual fuel requirement (AF) for a typical light water reactor.

The Original rule was invalidated by the D.C. Circuit on July 21, 1976. Natural Resources Defense Council v. NRC, 547 F.2d 633, later reversed and remanded by the Supreme Court in Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519 (1978). The D.C. Circuit particularly criticized the lack of opportunity for direct confrontation of witnesses in the rulemaking hearing and the lack of evidentiary support for the conclusion, implicit in Table S-3, that disposal of high-level waste would have no environmental impact. While the case was working its way toward reversal, the Commission performed through a special task force a new environmental survey of fuel cycle impacts, NUREG-0116, which for the most part supported the numbers in the table, while identifying several sources of uncertainty. Relying on NUREG-0116, the Commission promulgated by notice and comment procedures an Interim rule on March 14, 1977, which did not differ significantly from the Original rule. The following May the Commission also began a final rulemaking with extensive public participation, including hearings, to determine whether the Interim rule should be made final. In July 1979 the Commission promulgated

the Final rule. 44 Fed. Reg. 45362 (August 2, 1979). See Attachment A. 3/ The Final rule adopted a revised version of Table S-3 not much different from the previous versions. The Table included some waste disposal radioactive effluents from fission product gases, which NUREG-0116 assumed would be released in their entirety during handling of waste prior to sealing of a bedded salt repository. The Table incorporated the assumption that once a repository was sealed there would be no further release of radioactive materials to the environment. The Final rule provides that the environmental impact statements for a power reactor shall evaluate the contribution of the fuel cycle "on the basis of impact values set forth in Table S-3." Thus the Final rule, like its predecessors, in effect precludes further consideration of the possibility that because of uncertainties, for example in the selection or performance of a repository, fuel cycle impacts might be significantly different from the S-3 values. Unlike the Original and Interim rules, the Final rule adds: "The impact statement shall take account of dose commitments and health effects from fuel cycle effluents set forth in Table S-3 and shall in addition take account of

---

3/ The Statement of Consideration promulgating the Final rule extensively reviews the background and rationale underlying the Commission's fuel cycle rules and should be consulted for the details which the abbreviated discussion in this memorandum has omitted. Judge Bazelon's and Judge Wilkey's opinions also describe adequately the background of the three rules. Opinion, pages 12-28; Dissent, pages 5-18.

economic, socioeconomic, and possible cumulative impacts and such other fuel cycle impacts as may reasonably appear significant."

While the final rulemaking was going on, the Supreme Court reversed the D.C. Circuit's decision, which the Supreme Court interpreted as a holding that the Commission's rulemaking procedures had been legally insufficient. 435 U.S. 519 (1978). The Court remanded to the Court of Appeals to review the Original rule on the basis of the adequacy of the evidentiary record supporting it. The D.C. Circuit consolidated this remand with challenges to the Interim and Final rules and heard argument in September 1980. The decision of April 27, 1982 is the outcome of that remand.

2. Judge Bazelon's Opinion

Judge Bazelon's opinion for the court focuses on whether the fuel cycle rules operate to exclude from the reactor licensing process the consideration of potentially significant environmental impacts. He characterizes the issues in the case as:

> largely concern[ing] the use of numerical values to depict the environmental effects of fuel-cycle activities. By describing such effects in this manner, the issue arises whether there is more to the fuel cycle's environmental impact than the bare numbers in the Table reveal, and, if so, whether licensing boards are prevented from looking beyond the Table to consider additional elements of the fuel cycle's environmental impact.

> One omission from the Table is explicit recognition of the uncertainties that underlie the projected effluent releases. This omission is particularly glaring in the Table's treatment of the long-term effects of solid high-level and transuranic wastes, which remain toxic for at least 250,000 years. The Commission expects to dispose of those wastes, perhaps by first reprocessing a portion of them, and in any event, by burying them in salt mines beneath the continental United States. The Tables indicate that the wastes will have no effect on the environment after they are sealed in salt mines. In effect, therefore, the Table S-3 Rules instruct all licensing boards, when analyzing the environmental impact of a particular plant, to conclusively assume that such wastes will emit no radiological effluents into the environment after final burial.

Op. at 10, 11. Judge Bazelon later indicates that he has at least two particular sources of uncertainty in mind:

> "[T]he Commission's final Rule, like its two predecessors, does not permit licensing boards to consider either the risk that permanent waste management facilities will not be developed or the risk that they will fail to perform as intended if developed."

Op. at 28. With regard to the Original and Interim rules, he also notes the

issue "whether the Table S-3 rule allows licensing boards to take evidence on and consider [health, socioeconomic, and cumulative effects of the projected releases] in individual licensing proceedings." Op. at 11. He concludes "that the Table S-3 Rules are invalid because they fail to allow for proper consideration of the uncertainties concerning the long-term isolation of high-level and transuranic wastes, and [in the case of the Original and Interim rules] because they fail to allow for proper consideration of the health, socioeconomic and cumulative effects of fuel-cycle activities." Op. at 11, 12.

In reaching the conclusion that the Commission's rule treats uncertainties inadequately, Judge Bazelon begins with the Supreme Court's observation in Vermont Yankee, 435 U.S. 519, 539 (1978) that in terms of NEPA "It is hard to argue that [nuclear wastes] do not constitute 'adverse environmental effects which cannot be avoided should the proposal [licensing of a nuclear power plant] be implemented. . . .'" Judge Bazelon concludes accordingly that "the Commission must fully consider and disclose the environmental impact of nuclear wastes during the course of its decision to license nuclear power plants." Op. at 30. He analyzes the S-3 rule as an attempt to implement this requirement through generic consideration of these impacts and at the same time a limitation on other ways by which impacts might be considered and disclosed, primarily by litigation in individual licensing proceedings.

The opinion then focuses on whether the zero-release assumption (no releases

from the repository after sealing) constitutes a fatal flaw in the S-3 rules. Judge Bazelon considers the zero-release assumption from two different perspectives: (1) as a factual finding by the Commission that a suitable waste repository site will be found and will operate without any environmental impact once it is sealed; and (2) as a decisionmaking device "by which the Commission retains exclusive responsibility for considering the uncertainties concerning long-term waste disposal." Op. at 35.

In reviewing the zero-release assumption as a factual finding Judge Bazelon begins by holding that environmental risks, "probabilities or possibilities of environmental damage," are themselves environmental impacts. He states in a footnote:

> When confronting a set of uncertain environmental effects, or an environmental risk that is known, an agency's goal should be to trace each reasonably foreseeable contingency and determine, first, the likelihood of its occurring, and second, the environmental damage that it would entail should it occur. Of course, precision in this context can only be the ideal, and the detail with which an agency must consider and disclose the likelihood and nature of each contingency is somewhat flexible. If a contingency is not expected to entail a serious environmental risk less detail is required.

Op. at 37, n. 101. Applying this to the zero-release assumption as a factual finding, the court viewed the assumption as equivalent to a Commission finding that there is "no significant risk" that there may be post-sealing releases from a repository, not simply a finding that such releases are unlikely. Pointing then to the Commission's many acknowledgements in the rulemaking record that there are "areas of uncertainty . . . regarding both the likelihood of finding a site and the probability that it will perform as expected," Op. at 41, Judge Bazelon held that as a finding of no significant risk of waste repository failure "the zero release assumption represents a clear error in judgment" and is "arbitrary and capricious." Op. at 42.

Considering the zero-release assumption as a decisionmaking device, which the court conceded was probably a better characterization of the Commission's intent, the court agreed that the Commission was free to consider waste disposal uncertainties generically and, further, by a generic rule to determine generic values for "costs and benefits common to a class of individual actions" and to "weigh the costs and benefits against each other to produce a generic 'net value.'" Op. at 44.

> In the abstract, such generic structuring of individual decisionmaking is acceptable as long as it is based on the agency's reasoned judgments about how the generic costs and benefits weigh against each other. In the course of such a generic rulemaking, however, the agency must consider

> and disclose the actual environmental effects it has assessed in a manner that will ensure that the overall process, including both the generic rulemaking and the individual proceedings, brings those effects to bear on decisions to take particular actions that significantly affect the environment.

Id. [footnotes omitted]. The fault Judge Bazelon found in the zero-release assumption, viewed as a decisionmaking device, is that under the S-3 rule two environmental costs, the risk that the repository won't work as expected and the risk that such a repository or its equivalent may never be built at all, are excluded from nuclear plant licensing decisions. This is because licensing boards are precluded from considering these risks, being bound by the values in Table S-3, while in Judge Bazelon's view the Commission itself acknowledged the risks but failed to integrate them generically into the decisionmaking process. The key paragraph of the decision is the following:

> The Commission argues that its consideration and disclosure of these costs prior to promulgating the Rule was sufficient under NEPA, and that the licensing boards need not reconsider them. We disagree. Although the Commission did consider these uncertainties, it did not do so in a manner that would allow licensing decisions to be affected -- either directly or indirectly -- by the risk that

> nuclear waste will not be successfully isolated from the environment indefinitely. After recognizing that there are uncertainties concerning the permanent storage of nuclear wastes, the Commission simply ruled that licensing decisions should be made on the basis of cost-benefit analyses that omitted the costs represented by those uncertainties. It did not rule that the costs were insignificant, nor did it rule that they were outweighed by generic benefits that would also be excluded from licensing boards' consideration. In effect, therefore, the Commission directly contravened NEPA's requirement that environmental costs be considered "at every stage where an overall balancing of environmental and nonenvironmental factors is appropriate." The risks entailed by the possible failure to develop a successful waste-disposal system were never part of any "balancing." They were considered alone, in a vacuum, and then excluded from the licensing boards' balancing. The process that began with the proposal of the Table S-3 Rule does not allow the uncertainties concerning permanent storage to play a role in the ultimate licensing decision. That omission, and hence, the Rule, which causes it, constitutes a blatant violation of NEPA.

Op. at 46. Thus, although Judge Bazelon recognizes that the Commission in promulgating the Final rule "has disclosed the nature of many of the

uncertainties surrounding the storage of long-lived wastes," Op. at 48, he appears to conclude that the Commission nevertheless failed to give proper consideration to the environmental costs of waste disposal because the rule does not explicitly allow for those uncertainties to be factored as an environmental cost into the cost-benefit balance for a power reactor. 4/ What, specifically, "proper consideration" might be the court does not say much about. Judge Bazelon says only that, having assessed generically the risk associated with uncertainties, the Commission "must in some manner factor its assessments into ultimate decisions to license plants. One way . . . would be to . . . assess and evaluate the uncertainties and attendant risks, and instruct licensing boards to consider and disclose them in a uniform manner." Op. at 47. Taking note of the Commission's assumption of complete release of volatile fission products

---

4/ The court briefly noted that the Commission is conducting a "waste confidence" proceeding to assess the likelihood that safe and timely waste disposal will be available, Op. at 23, note 56, but did not address the question what bearing this proceeding might have on the court's concern that the Commission had not integrated an evaluation of waste disposal uncertainties into its decisionmaking process. Judge Wilkey's dissent described the waste confidence proceeding in greater length, Diss. Op. at 25, note 36, and apparently suggests that any gaps in the S-3 treatment of uncertainties of waste disposal may be acceptable in part "because the Commission expected that long-term effects would be more fully analyzed and understood after the concurrent 'waste confidence' proceeding had concluded." Diss. Op. at 51.

Turning to the challenges specific to the Original and Interim rules, that their operation precluded consideration of health, socioeconomic, and cumulative impacts in reactor licensing proceedings, Judge Bazelon first notes that "there can be no dispute that NEPA requires the health, socioeconomic, and cumulative impacts of a proposed action to be disclosed in an EIS." Op. at 53. The Commission had argued that even though the Original and Interim rules had not specifically required that such consideration be given, they had not precluded it either. Although licensing boards had correctly interpreted the S-3 rule as precluding challenges to the effluent values in the Table, no board had ever ruled that a party could not present evidence that significant health effects, for example, might be caused by those effluents. Nevertheless, Judge Bazelon found that "[p]rior to 1977 individual licensing boards interpreted [the rule] to preclude their consideration of the environmental significance of the numerical values

listed." Op. at 55. 6/ He concluded that the Original and, prior to 1978 amendments, the interim rule "effectively eliminated the consideration and disclosure of the health, socioeconomic and cumulative impacts of fuel-cycle activities," and therefore violated NEPA. Op. at 57.

Only on the issue of economic feasibility did Judge Bazelon somewhat grudgingly support the Commission's rulemaking. The Commission had relied on estimates which projected waste-management and disposal facility costs as less than 10% of the capital costs and less than 5% of operating costs for a typical reactor. The court held:

> Because these waste-management and disposal expenses represent a comparatively small addition to the resources needed to build and operate a reactor, and because a plant need not be built if it

---

6/ Apparently Judge Bazelon based this conclusion on a statement by the Commission in the Statement of Consideration for the Final rule that the Original rule "at least initially was apparently interpreted as cutting off further discussion of fuel cycle impacts." 44 Fed. Reg. 45362, 45364. The Commission did not say that the interpretation was authoritative or that it had ever been imposed so as to cut off any contentions in licensing proceedings. To our knowledge no such cutoff ever occurred. Apparently the first offer of fuel cycle health effects material was made by the NRC staff on March 30, 1977 in the Marble Hill proceeding, 7 NRC 179 (1978), at 187, and was accepted by the Licensing Board. The Commission's brief cited this case.

> appears that those expenses will render the plant unprofitable, we cannot say that the Commission clearly erred in determining that sufficient resources would be available.

Op. at 68. Therefore the court dismissed New York's petition for review of the Final rule.

Judge Edwards' concurrence in holding the rules invalid does not add to the majority's legal analysis, but it illustrates the intense concern and distrust which the nuclear power controversy can arouse. Despite the Commission's many disclaimers about the S-3 rule's "limited purpose" and statements that the rule "is in no way intended to be a tool for choosing among alternative uranium fuel cycle technologies," 44 Fed. Reg. 45363, Judge Edwards' opinion addresses at length the potential dangers of plutonium recycle, noting that "prudence requires this court to assume that approval of Table S-3 would be read by the Commission as judicial sanction for its originally intended -- and now presidentially permitted -- employment of plutonium as reactor fuel." Conc. Op. at 4. He states his belief that "Table S-3, inasmuch as it requires licensing boards to accept that only insignificant releases will result from transporting plutonium all over the nation to 71 (potentially 190) reactors is 'otherwise not in accordance with law.'" Conc. op. at 46. During the rulemaking proceeding the Table S-3 treatment of fuel cycle transportation impacts was not seriously questioned,

and the issue was not addressed in the briefs or argument.

On the issue of economic feasibility, Judge Edwards noted his concern that "the cost of maintenance, surveillance and guarding the public from toxic waste . . . will continue from somewhere between 10,000 and 250,000 years." Conc. Op. at 46. He concluded that such an "open ended subsidy of great dimension" should not be "routinely endorsed" by a court. Therefore he would have remanded on the issue of economic feasibility for further consideration by the Commission and public discussion at licensing hearings. Conc. Op. at 47.

Neither Judge Bazelon nor Judge Wilkey gives more than a passing reference to Judge Edwards' concurrence.

3. Judge Wilkey's Dissent

The thrust of Judge Wilkey's dissent is that Judge Bazelon's opinion, though couched in terms of a straightforward judicial review of the Commission's basis for factual findings (e.g., zero release) and compliance with NEPA procedural requirements (e.g., to take account of environmental risks in agency decisionmaking), actually amounts to an impermissible substitution of the court's judgment for the agency's in what is essentially a policy decision, the NRC's determination of the effect

which waste disposal uncertainties will have on licensing decisions. 7/ Judge Wilkey would accord "the greatest deference" to the manner in which an agency structures its proceedings to comply with NEPA and stresses that "[e]ven though NEPA provides that environmental considerations must be made 'to the greatest extent possible,' [a court] may not, under the guise of close scrutiny for procedural compliance, dictate to the agencies just how this consideration is best made." Diss. Op. at 47. He sees the majority's decisions as "no more than a giant step sideways," Diss. Op. at 64, from the court's earlier efforts to impose procedural burdens on the NRC over and above those required by statute, the approach conclusively rejected by the Supreme Court in Vermont Yankee.

Judge Wilkey viewed the S-3 rule as "only one part of an ongoing and wide-ranging Commission effort to evaluate long-term nuclear waste disposal issues." Diss. Op. at 24 (emphasis in the original). He stresses that the rule must be reviewed on the basis of its "limited purpose," rather than regarded as "an exhaustively comprehensive table of precisely accurate figures as to which all uncertainty had been eliminated." Diss. Op. at 27. He notes that the Commission

---

7/ Judge Wilkey states in his introductory analysis: "[I]t is not our job to substitute our judgment for the agency's to reach what we perceive to be the best or correct result. Yet this is precisely what the majority has accomplished in this case." Diss. Op. at 5.

recognized the uncertainties but "chose as a matter of policy not only to acknowledge that uncertainty, but to accept it, and then to proceed in the face of that uncertainty." Diss. Op. at 28. He emphasizes the extent of the rulemaking record and the adequacy of the Commission's disclosure of impacts, noting that "working assumptions were expressly spelled out and uncertainties inherent in the models employed were candidly acknowledged." Diss. Op. at 30 (emphasis in the original).

Judge Wilkey evidently regards the NRC's awareness and disclosure of the uncertainties as sufficient to meet NEPA requirements that environmental consequences be "considered during the planning stage of agency actions. 8/ He notes that "the Act does not prescribe exactly how this consideration must be made" and concludes that "any NEPA-based review consistent with Vermont Yankee II must be limited to a scrutiny of compliance with only the 'outward signs' of environmental consideration clearly prescribed by the Act." Diss. Op. at 44.

Turning then to the zero-release assumption, which Judge Bazelon had

---

8/ Judge Wilkey disputes Judge Bazelon's treatment of uncertainties as equivalent to environmental costs, see Diss. Op. at 45, but it is not clear whether he is saying that risk of an environmental impact is not itself an impact that need ever be considered under NEPA, a proposition we would find questionable, or whether he is simply objecting to equating uncertainty -- "a quality inherent in all impacts" -- with the impacts themselves.

found to be "a clear error in judgment" if regarded as a factual finding, Op. at 39, Judge Wilkey states that "the relevant question with regard to the zero-release assumption is not whether the zero figure itself is precisely accurate but whether the Commission's decision to adopt it was reasoned." Diss. Op. at 48. Judge Wilkey finds that the Commission never intended to find as a fact that releases would never occur from a repository but had "only decided, in view of the staff's assumption that fission-product gases would be released prior to sealing and its finding of extremely low probability of repository failure, that 'taking post-sealing releases as zero does not significantly reduce the overall conservatism of the table.'" Diss. Op. at 49.

Considering the zero-release assumption as a "decisionmaking device" rather than a factual finding, Judge Wilkey rejects the majority's holding that for the Commission to preclude licensing boards from considering the possibility of post-sealing releases without itself having factored that possibility explicitly into its fuel cycle rule was another "clear error in judgment." Instead, Judge Wilkey finds in a pivotal section of his dissent:

> "[T]here is no question that the Commission considered relevant factors -- including the uncertainties with which Judge Bazelon is so concerned -- in deciding to promulgate the S-3 Rule. The record is replete with evidence that the Commission took fair account of these

> uncertainties. * * * We can demand no more, and the majority's holding that relevant factors were not 'properly considered' because the consideration did not take a particular form or yield a 'usable' result exceeds the limits of our judicial prerogative in a substantive review of agency decisions under the APA." Diss. Op. at 49, 50 (footnotes omitted).

Evidently accepting the arguments the Commission had offered in defense of the S-3 rule, Judge Wilkey notes that the Commission's way of dealing with uncertainties was a "quintessential" policy judgment and not an unreasonable one:

> It did not attempt to quantify the uncertainties surrounding the figures themselves because they were inherently unquantifiable. It did not require individual licensing boards to weigh repeatedly the effects of uncertainties because it was aware that individual boards were incapable of doing a better job of analysis than the Commission had already done. It did not institute a separate generic proceeding to consider uncertainties because the Commission expected that long-term effects would be more fully analyzed and understood after the concurrent "waste confidence" proceeding had concluded. In view of all of these considerations, I do not believe the Commission abused its discretion by finding "no advantage in having licensing boards repeatedly weigh" for

> themselves the unquantifiable uncertainties inherent in the rule it adopted -- a table whose values mixed both fact and prediction.

Diss. Op. at 51 (footnotes omitted).

Judge Wilkey concludes his dissent with a discussion on "Living With Uncertainty," which re-emphasizes his view that the majority is forcing on the Commission its own substantive view "that the current level of risk-assumption is unacceptable." Diss. Op. at 60. He asserts that compliance with the majority's decision, if it is possible at all, will require "an enormous commitment of agency time and resources" which will achieve nothing except "delay in the development of nuclear power." Diss. Op. at 58. 9/ The dissent agrees with Judge Bazelon's conclusion that the Commission's finding on economic feasibility was acceptable. Judge Wilkey does not address the issue of whether the Original and Interim rules did or did not unlawfully preclude consideration of health, socioeconomic, and cumulative impacts.

4. Impacts of the Decision and Prospects for Relief

The D.C. Circuit's decision is potentially extremely disruptive of the Commission's reactor licensing program.

9/ In a footnote Judge Wilkey points to studies which suggest that long-term waste disposal should "rank relatively low on the list of NRC's environmental concerns." Diss. Op. at 58, note 161, citing Yellin, 94 Harv. Law Rev. 489 (1981).

Every reactor license which the Commission has issued since NEPA took effect on January 1, 1970 has arguably relied, either directly or indirectly, on either the Original, Interim, or Final fuel cycle rulemakings for meeting the NEPA requirement that prior to licensing the agency must consider significant fuel cycle impacts associated with operating the reactor. OGC's review of the statistics discloses that at least 64 OLs and 77 CPs at 123 units are potentially affected. Many of these involve licenses issued even before the Original rule took effect. Arguably, these licenses depend on the Commission's determination as part of promulgating the Original rule on April 22, 1974 that in view of the apparent small magnitude of fuel cycle impacts there was no need to reopen closed proceedings. Such a determination would appear to be called into question by the D.C. Circuit's holding that the Commission had inadequately considered the uncertainties in those impacts. As for licenses issued directly in reliance on one of the fuel cycle rules, i.e., since April 22, 1974, there are 33 OLs and 57 CPs at 90 units that are potentially affected. So far only 6 OLs and no CPs have issued in reliance on the Final rule, but all ongoing proceedings rely on that rule for exclusion of contentions that fuel cycle releases might be different from the numbers in Table S-3. If the decision stands, the Commission would have to allow such contentions to be considered, pending promulgation of an amended rule complying with the court's holding. In effect it is imaginable that in each individual licensing proceeding boards

might have to conduct their own S-3 evidentiary hearings until a valid generic fuel cycle rule could be put in place. One might expect also a series of requests to reopen closed proceedings, meanwhile suspending construction or operation of reactors, so that the consideration the court asserts is required by NEPA could be given to fuel cycle impacts.

Given that the Commission has, as the court conceded, actually looked closely at the uncertainties and can make out a reasonable case that almost certainly no previous licensing decision would go the other way if reopened for consideration of fuel cycle impacts, it seems to us that a strong case can be made against any license suspensions, even if the decision stands. Nevertheless, a considerable amount of legal and technical resources may have to be expended to make the necessary arguments. 10/ Considerable technical resources may also be needed to comply with the decision as it applies to

---

10/ As Judge Bazelon notes, Op. at 5, note 7, there are presently five cases in the D.C. Circuit in which licenses have been challenged on the basis of asserted inadequacy in the Commission's treatment of waste disposal impacts. These include Shoreham, Midland (two cases), Callaway, and Vermont Yankee. In the First Circuit there is a challenge to the Seabrook CP which was held in abeyance pending the D.C. Circuit's decision on validity of the rules. We do not expect these cases to become active unless the D.C. Circuit's mandate issues. Efforts to seek post-decision relief will hopefully keep the mandate from issuing for an indefinite period.

ongoing proceedings. Judge Bazelon's opinion, no doubt intentionally, left unclear the lengths to which the Commission might have to go to provide what the court would regard as "proper consideration" of fuel cycle impacts. Informal discussions we have had with the technical staff indicate that the staff might have considerable difficulty evaluating and defending in each case the unquantified and possibly unquantifiable impacts of "unsafe" waste disposal, which presumably is one of the environmental risks Judge Bazelon would require the agency to incorporate into its decisionmaking process. Thus the Commission has substantial incentive to try to get this decision overturned.

A case to overturn the decision would certainly be improved if there is a clear and well-supported Commission decision (say, as part of the waste confidence proceeding) that safe waste disposal is highly likely, not just the outcome "that the probabilities favor," as stated in the Commission's Final S-3 decision. Such a finding would tend to diminish the force of Judge Bazelon's argument that the risk of unsafe waste disposal requires additional consideration. However, as Judge Wilkey's strong dissent indicates, there are powerful arguments which can be raised against Judge Bazelon's decision even on the basis of the existing record. We believe that on balance Judge Wilkey has the better of the argument. The Commission can, and we believe should, argue that Judge Bazelon's opinion has impermissibly substituted the court's judgment for the Commission's on the question of the weight which should be

given to waste disposal uncertainties in the cost-benefit balance for a power reactor. The rulemaking record shows that the Commission took the requisite "hard look" at fuel cycle impacts, including uncertainties, and we believe the Supreme Court will be receptive to an argument that in this decision once again Judge Bazelon is trying to compel the NRC to go beyond statutory requirements and regulate nuclear power the way the court, not the agency, thinks the job should be done.

We recommend that the Commission authorize OGC to ask the Solicitor General to seek rehearing and reconsideration en banc before the D.C. Circuit and, should those avenues of relief fail, petition the Supreme Court for a writ of certiorari. Normally the Court of Appeals' mandate will remain stayed during the pendency of such actions. Therefore we see no disadvantage to trying for reconsideration first rather than going directly to the Supreme Court. Moreover, our chances for Supreme Court review will probably be improved if the Court perceives that we have "exhausted" all avenues of relief before the D.C. Circuit. Given the strong dissent of Judge Wilkey and the whole court's sure awareness of the possibility of another Vermont Yankee-type reversal, the case

has some promise of winning reconsideration. 11/ In view of the severe impact which the decision could have on licensing and the Supreme Court's likely interest in assuring that its Vermont Yankee decision is followed in the continuation of the case in which it was issued, we think the chances of getting Supreme Court review are reasonably good.

5. Need for a Statement of Policy

The last time the Commission's fuel cycle rule was overturned, in 1976, the Commission promptly issued a General Statement of Policy, 41 Fed. Reg. 34707 (August 16, 1976), which among other things announced the Commission's intentions regarding ongoing licensing (it was suspended) and the possibility of show cause proceedings to reexamine existing licenses, all pending supplementation of the record and interim rulemaking to replace the invalidated Original S-3 rule. In order to provide guidance in the present situation to licensing boards and to persons contemplating the initiation of actions before the Commission based on the D.C. Circuit's decision, we recommend that the Commission issue a policy statement describing its intentions with regard to interim

---

11/ There is always the chance that the Court of Appeals might reaffirm the panel on reconsideration en banc and issue an opinion more likely to survive a Supreme Court review than the panel's opinion. We do not think the risk of this outcome is high since judges who agree with the panel are unlikely to vote for reconsideration.

measures and seeking post-decision relief. For reasons we have indicated, we do not believe there is a need for suspension of licensing or opening up of past proceedings.

Recommendations:

(1) Direct OGC to recommend to the Solicitor General that petitions for rehearing and reconsideration en banc be filed before the D.C. Circuit and that, if rehearing is denied, Supreme Court review be sought.

(2) Direct OGC to prepare a draft statement of policy indicating the Commission's intention not to alter its licensing procedures or to initiate enforcement action while the petitions for post-decision relief are pending.

Leonard Bickwit, Jr.
General Counsel

Attachment:
44 Fed. Reg. 45362

DISTRIBUTION:
Commissioners
OGC
OPE
SECY
OCA
OIA
OPA
EDO
ELD
ACRS
ASLPB
ASLAP

§ 201.77 [Amended]

In § 201.77 delete "packer, and licensee" and insert " and packer".

§ 201.94, 201.95, 201.97 [Amended]

In §§ 201.94, 201.95, 201.97, delete "dealer, and licensee" and insert "and dealer".

§ 201.96 [Amended]

In § 201.96 delete "dealers, or licensees" and insert "or dealers".

§ 201.95 [Amended]

In § 201.95 (Amended) delete "dealer, or licensee." and insert "or dealer.".

§ 201.23 [Amended]

In § 201.23 delete "or licensee.".

Due to the nature of these changes they shall become effective August 2, 1979.

Done at Washington, D.C. this 26th day of July 1979.

Chas B. Jennings,

Deputy Administrator, Packers and Stockyards, AMS.

[FR Doc. 79-23836 Filed 8-1-79; 8:45 am]

BILLING CODE 3410-02-M

NUCLEAR REGULATORY COMMISSION

10 CFR Part 51

Licensing and Regulatory Policy and Procedures for Environmental Protection; Uranium Fuel Cycle Impacts From Spent Fuel Reprocessing and Radioactive Waste Management

AGENCY: Nuclear Regulatory Commission.

ACTION: Promulgation of a final fuel cycle rule.

SUMMARY: The Commission promulgated on March 14, 1977 an interim rule identifying the environmental impact values for the uranium fuel cycle which are to be included in environmental reports and environmental impact statements for individual light water nuclear power reactors. After an extensive proceeding focused on the nuclear waste management and fuel reprocessing parts of the fuel cycle, the Commission now promulgates a final rule which sets out revised impact values. The rule also specifies fuel-cycle-related subjects that are to be considered in individual licensing proceedings as part of the environmental cost-benefit analysis for a power reactor. The Commission notes its intention to conduct a further supplementary rulemaking to adopt as part of the rule an explanatory narrative addressing the environmental significance of the impact values tabulated in the final rule. A general update of the rule with respect to all aspects of the uranium fuel cycle is also in progress.

EFFECTIVE DATE: September 4, 1979.

FOR FURTHER INFORMATION CONTACT: E. Leo Slaggie, Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC, 20555, phone 202-634-3224.

SUPPLEMENTARY INFORMATION: This notice announces the outcome of a final rulemaking by the Nuclear Regulatory Commission regarding the environmental effects of spent fuel reprocessing and radioactive waste management in the light water power reactor uranium fuel cycle. The rule adopted herein replaces an interim rule which identifies fuel cycle environmental impact values to be included in environmental reports and environmental impact statements for individual light water power reactors. The interim rule, 10 CFR 51.20(e) ("Table S-3", as revised), was published on March 14, 1977 (42 FR 13803) to be effective for 18 months and was extended several times, the final extension being to the effective date of this rule.

This final rulemaking concludes a proceeding which began on May 26, 1977 with a notice that a rulemaking hearing would be held to consider whether the interim rule should be made permanent or, if it should be altered, in what respects. 42 FR 26987. The Hearing Board took extensive written and oral testimony from more than twenty participants. On August 31, 1978 the Board submitted to the Commission a detailed summary of the evidentiary record, followed on October 26, 1978 by its Conclusions and Recommendations.

After studying the Hearing Board's recommendation and receiving written and oral presentations by rulemaking participants, the Commission has adopted as a final rule the modified Table S-3 recommended by the Hearing Board. The impact values in this table differ only slightly from the values in the interim rule. With two exceptions, these values will be taken as the basis for evaluating in individual light water power reactor licensing proceedings, pursuant to requirements of the National Environmental Policy Act (NEPA), the contribution of uranium fuel cycle activities[1] to the environmental costs of licensing the reactor in question. The exceptions are radon releases, presently omitted from the interim rule (43 FR 15613, April 14, 1978), and technetium-99 releases from reprocessing and waste management activities, as discussed later in this notice. Appropriate values for these releases are open for consideration in individual proceedings.

Promulgation of the revised table is not the sole outcome of this rulemaking. The rulemaking record makes clear that effluent release values, standing alone, do not meaningfully convey the environmental significance of uranium fuel cycle activities. The focus of interest and the ultimate measure of impact for radioactive releases are the resulting radiological dose commitments and associated health effects. To convey in understandable terms the significance of releases in the Table, the Hearing Board recommended that the modified Table be accompanied by an explanatory narrative promulgated as part of the rule. The recommended narrative would also address important fuel cycle impacts now outside the scope of the Table, including socioeconomic and cumulative impacts, where these are appropriate for generic treatment. The Commission has directed the NRC staff to prepare by October 1 such a narrative, as described in more detail later in this notice. The narrative will be submitted for public comment in a further rulemaking.

Pending adoption of an explanatory narrative as part of the fuel cycle rule, the use of Table S-3 in individual proceedings must be accompanied by supplementary presentations. Accordingly, the Commission has directed the NRC staff to continue presenting in individual proceedings an evaluation of dose commitments and health effects from fuel cycle releases. In addition, the staff will address economic, socioeconomic, and possible cumulative impacts of fuel cycle activities and such other impacts of the fuel cycle as may reasonably appear to have a significance for inidividual reactor licensing sufficient to warrant attention for NEPA purposes. These matters remain open for litigation in individual proceedings. The present rulemaking settles only the question of fuel cycle release values, with the

[1] The fuel cycle activities addressed by the rule include uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, spent fuel storage and disposal, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes. The rulemaking proceeding concluded here dealt only with impacts of reprocessing and waste management and associated transportation, the so-called "back-end" of the fuel cycle. The impacts of transportation of cold fuel to the reactor and irradiated fuel and solid radioactive wastes lie outside the scope of the rule and are treated separately in the Commission's regulations. See 10 CFR 51.20(g).

exceptions noted above, and such other numerical data that appear explicitly in the Table.

In response to a recent decision by the United States Court of Appeals for the District of Columbia Circuit, *State of Minnesota* v. *NRC*, Nos. 78–1269 and 78–2032 (May 23, 1979), the Commission intends to conduct a generic proceeding which will consider the most recent evidence regarding the likelihood that nuclear waste can be safely disposed of and when that, or some other off-site storage solution, can be accomplished. That new generic waste disposal proceeding will be separate and different in scope and purpose from further fuel cycle rulemakings dealing with an S–3 narrative and general update of S–3, but will in part review and update the conclusions regarding waste disposal which have been reached in the present rulemaking. If available, the record compiled in the new generic waste disposal proceeding can be considered in, and made a part of the record in, the general update of S–3.

The background of this proceeding and the reasons underlying the Commission's decision are explained in the material which follows.

I. Need For a Fuel Cycle Rule in Power Reactor Licensing

The National Environmental Policy Act of 1969 (NEPA) requires that the Commission look closely at the environmental impact of a proposed nuclear power reactor before it may license the construction or operation of the facility. To comply with NEPA the Commission has adopted licensing and regulatory procedures presently set out in 10 CFR Part 51. Under these rules the environmental analysis in a power reactor licensing proceeding must include a cost-benefit analysis which, among other things, considers and balances the adverse environmental impacts of the nuclear plant against the expected environmental, economic, technical, and other benefits.

The environmental impact of operating a nuclear power reactor is not limited to effects specific to the plant itself, such as site alterations due to plant construction or the release of reactor effluents. The environment will also be affected by the fuel cycle activities necessary to support plant operation. Since operation of a nuclear plant involves a commitment to prepare fuel and dispose of spent fuel and waste, the environmental impacts considered in the NEPA analysis for a power reactor should include contributions from uranium fuel cycle activities.[2]

Evaluating these contributions necessarily involves a wide-ranging inquiry and a certain amount of speculation. Fuel cycle facilities serve many reactors, and there is no way to ascertain with certainty which facility now in existence or to be operated in the future will contribute fuel to a given nuclear power reactor or will receive its irradiated fuel or wastes. Thus the fuel for a particular reactor cannot be identified at the start of the fuel cycle and traced through the various steps to final disposal. Instead, the fuel cycle impacts for a particular reactor must be estimated hypothetically, for example by apportioning the impacts of representative fuel cycle facilities to the number of reactors served. Determining these facility impacts also involves uncertainties, particularly for the back end of the cycle. For example, reprocessing of spent fuel, if it is done, would take place at newly designed facilities, not yet operational. Thus impacts based on previous reprocessing experience using outdated technology are not in the Commission's judgment representative of future impacts. For waste disposal many proposals have been put forth, but the method or methods which will finally be used are as yet unselected. A reasonable approach for determining waste disposal impacts is to focus on a system which seems likely to be deployed and to estimate its impacts conservatively, based on the best available information and analysis.

A study of fuel cycle impact thus involves difficult generic analysis and prediction well outside the normal scope of facility-specific subjects dealt with by a reactor licensing board. This does not mean that the subject can be ignored or deferred until the fuel cycle facilities themselves come up for licensing.[3] It does mean that in reactor licensing fuel cycle impacts should be treated where possible by generic rulemaking rather than case-by case adjudication.

The Commission's interim fuel cycle rule, 10 CFR 51.20(e), requires that the environmental costs to be considered in a power reactor licensing proceeding shall include contributions from uranium fuel cycle activities as set forth in a table ("Table S–3. Summary of environmental considerations for uranium fuel cycle"). The adequacy of this interim rule, insofar as waste management and reprocessing impacts are concerned, was the original focus of the present rulemaking, as the background discussion in the section to follow indicates. As the rulemaking progressed, however, participants submitted a substantial amount of public comment and testimony addressing matters not dealt with by the interim rule, including economic and socioeconomic impacts, numerical uncertainties in the estimates, and long-term dose commitments and health effects. This implicit broadening of the rulemaking's scope called attention to problems which must be addressed in a further rulemaking, but also indicated there may be confusion regarding the proper objective of a fuel cycle rule.

The rule aimed at in this proceeding has a limited purpose. It applies only to environmental cost-benefit balances for power reactors and is in no way intended to be a tool for choosing among alternative uranium fuel cycle technologies. Although the rule should reflect as accurate an assessment as reasonably possible of uranium fuel cycle impacts, the rule clearly does not need the detail or the precision of an environmental analysis for licensing fuel cycle facilities themselves. A reasonable degree of uncertainty is unavoidable and is acceptable, given that basic decisions have not yet been made regarding reprocessing and the technology of waste disposal.

The rule need not be comprehensive in scope to be a useful and valid exercise of rulemaking authority. A record is not yet available to support a comprehensive rule dealing with all generic aspects of fuel cycle impacts relevant to reactor licensing, but the Commission is free to adopt a narrower rule that for the present leaves some of these matters for consideration in individual proceedings. The table of impacts adopted as a final rule in this proceeding serves as an important first step in this consideration, relieving adjudicatory boards from the need to determine those numerical impacts of the uranium fuel cycle which have been extensively considered in generic rulemaking. Ultimately, however, the impacts of the releases and not the releases themselves dictate the standards the Commission must set. Therefore, use of the table in individual licensing will not foreclose discussion of the significance of those impacts or other important aspects of the fuel cycle not addressed by the table. This point

---

[2] Activities comprising the nuclear fuel cycle are listed in note 1, above.

[3] The court of appeals for the D.C. Circuit has specifically rejected such an approach and held that "absent effective generic proceedings to consider these issues, they must be dealt with in individual licensing proceedings." *NRDC* v. *NRC*, 547 F. 2d 663, 641 (1976), *rev'd on other grounds sub nom. Vermont Yankee Nuclear Power Corp.* v. *NRDC*, 435 U.S. 519 (1978).

an effective rule or in the adjudicatory proceeding, the court found the rulemaking record insufficient to support the waste management and reprocessing parts of the rule because the procedures afforded during the hearing were inadequate, at least as applied by the hearing board.[8] The court saw the significance of Table S–3 as an expression "in numerical terms [of] the conclusion that the environmental effects of the fuel cycle, including waste disposal, are insubstantial." *Id.* at 646. With regard to reprocessing and waste disposal, "the focal points for this appeal," the court found that the Environmental Survey failed to provide "detailed explanation and support" for this conclusion and that testimony presented at the hearing did not fill the gap. The court noted that "[t]he only discussion of high level waste disposal techniques was supplied by a 20-page statement by [AEC witness] Dr. Frank K. Pittman," which the court criticized for its "conclusory quality." *Id.* at 645, 651. The court found that the procedures employed at the hearing failed to expose this statement to any "probing of its underlying analysis," *id.*, and concluded that the Commission had been arbitrary and capricious to adopt a rule "cutting off consideration of waste disposal issues and reprocessing issues in licensing proceedings based on the cursory development of the facts . . . in this [rulemaking] proceeding." The court vacated those portions of the rule and remanded to the Commission.

In important respects, however, the court of appeals approved the Commission's overall approach to the fuel cycle rulemaking. The court rejected the argument that a fuel cycle rule is itself a major Federal action requiring an impact statement. The court found it sufficient that a NEPA impact statement is prepared when Table S–3 is incorporated into a proposal to license an individual reactor. The court also saw no necessity for a "plenary consideration of alternatives" in evaluating waste disposal impacts for the purposes of the rule, "provided a sufficiently conservative and credible assessment of a particular waste disposal method is used." *Id.* at 653, note 57.

3. *Promulgation of the Interim Rule*

In response to the *NRDC* v. *NRC* decision and a related decision, *Aeschliman* v. *NRC*, 547 F. 2d 622 (D.C. Cir. 1976), the Commission on August 16, 1976 issued a General Statement of Policy (GSP) (41 FR 34707) announcing an intention to reopen the fuel cycle rulemaking proceeding to supplement the existing record on waste management and reprocessing impacts and to determine whether or not the rule should be amended. The Commission directed the NRC staff to prepare on an expedited basis a revised and well-documented environmental survey as the basis for an interim rule on waste management and reprocessing impacts. The General Statement of Policy also directed that no new full-power operating licenses, construction permits, or limited work authorizations should issue, pending the conclusion of a notice-and-comment interim rulemaking. With regard to licenses already issued, the Commisson indicated that, if requests for a show cause order based on fuel cycle grounds were received, licensing boards would be assigned to determine whether the licenses in question should be continued, modified, or suspended pending adoption of an interim rule.

The revised enironmental survey, NUREG–0116—Supplement 1 to WASH–1248, was completed in early October, 1976, and on October 18 the Commission published a notice soliciting public comment on the survey and a proposed interim rule. (41 FR 45849). Comments received in response to that notice and the Commission's responses to those comments were later published in March 1977 as NUREG–0216, Supplement 2 to WASH–1248.

On November 11, 1976 the Commission announced that licensing could resume on a conditional basis (41 FR 49898). As factors in this decision the Commission noted that (1) the court of appeals had stayed its mandate, leaving the S–3 rule formally in effect but conditioning new licenses on the outcome of petitions by licenses for Supreme Court review of the court's decision,[9] and (2) NUREG–0116 provided significant support for the conclusion that waste management and reprocessing impacts are slight, so that the interim rule, when promulgated, would not be likely to produce results in reactor licensing different from the original rule. The Commission also suspended show cause proceedings on fuel cycle grounds against light water reactor licensees. The Commission directed that new licenses could be issued only if a separate analysis determined that use of the impacts in the proposed interim rule would not tilt the cost-benefit balance against the reactor.

On March 19, 1977 the Commission promulgated the interim rule (42 FR 13803) to be effective for eighteen months, subject to extension for good cause. 10 CFR 51.20(e). In support of the interim rule the Commission noted that the two environmental supplements, NUREG–0116 and NUREG–0216, provided a "sufficient informational basis for the interim rule . . ." The Commission acknowledged that "there are gaps in the information needed for a detailed assessment of waste management and disposal technology" but found that "the costs of not proceeding outweigh the risks of proceeding by interim rule," given that within a relatively short period the issues would be more thoroughly discussed in the final rulemaking proceeding. The Commission terminated show cause proceedings initiated pursuant to the General Statement of Policy, noting that "the values in the interim rule are not sufficiently different from the values in the original Table S–3 to warrant revocation or suspension on cost-benefit grounds [of previously issued licenses]."[10] 43 FR 43806.

Footnotes continued from last page
Vermont Yankee Nuclear Power Corp., 4 AEC 930 (June 6, 1972). The court of appeals rejected the Appeal Board's decision and held that reprocessing and waste disposal issues must be dealt with either by an effective rule or in individual licensing proceedings. The Supreme Court did not disturb this holding when it later reversed the court of appeals. The Supreme Court noted that the Commission "acted well within its statutory authority" in requiring that fuel cycle impacts be considered in reactor licensing proceedings. *Vermont Yankee Nuclear Power Corp.* v. *NRDC*, 435 U.S. 519, 539 (1978). The Commission in promulgating the fuel cycle rule had stated that the Appeal Board's Vermont Yankee decisions had no further precedential significance insofar as they differed from the rule. 39 *Fed. Reg.* 14188.

[8] Interpreters of the opinion have differed over the relative weight which the court of appeals in reaching its decision attached to procedural inadequacies and to insufficiency of the record. The Supreme Court was persuaded that the "ineluctable mandate of the court's decision is that the procedures afforded during the hearings were inadequate." 435 U.S. 519, 542. The Supreme Court reversed the court of appeals on this procedural question and remanded for consideration whether the evidentiary record supported the rule. The court of appeals has held in abeyance its decision on the remand, pending completion of the Commission's final rulemaking.

[9] The Supreme Court's subsequent grant of certiorari automatically continued the stay of mandate pending completion of Supreme Court Action. The Supreme Court's remand and subsequent action by the court of appeals have left unresolved for the present the question whether the waste management and reprocessing portions of the original S–3 rule were legally sufficient. See note 8.

[10] Subsequently the Commission directed the Appeal Board to consider for the ten facilities affected by the terminated show cause proceedings "the particularized factual data essential to making a determination of the incremental effect, if any, that the use of the values in the interim rule would have on the NEPA cost-benefit balances for the particular facilities involved." 5 NRC 717, 7173 (1977). The Appeal Board found that fuel cycle impacts did not tilt the cost-benefit balance against any of the facilities in question. 6 NRC 25, 28–30, 6 NRC 33, 102–104, 6 NRC 206, 209 (1977), and concluded: "The effects assigned by the interim rule

Footnotes continued on next page

accompany the use of Table S–3 in such proceedings and recommended that this practice continue.

On January 19, 1979 the Commission heard oral presentations from the commenters. These presentations provided a valuable elaboration of the parties' views but did not change the basic positions stated in the written comments. The Commission accepted brief supplemental written submissions following the oral presentations and then closed the record of this proceeding as of January 23, 1979.

III. Final Rulemaking

1. Adoption of the modified Table S–3

The Commission has found that except for technetium-99 releases the record supports adoption of the modified Table S–3 as a final rule, as recommended by the Hearing Board. The participants' comments and the Board's recommendations have made clear that the Table is not free of flaws, but for the reasons discussed below the Commission believes that these will not significantly impair the Table's usefulness as the starting point for considering fuel cycle impacts in individual reactor licensing proceedings.

To begin with, there can be little doubt that this rulemaking has been adequate from a procedural standpoint. The Supreme Court's *Vermont Yankee* decision confirmed that informal agency rulemaking is procedurally sufficient when the notice-and-comment requirements of the Administrative Procedure Act, 5 U.S.C. 553, are met. 435 U.S. 419 (1978). The fuel cycle rulemaking not only afforded these basic notice-and-comment procedures but also provided extensive additional written and oral procedures, including several not offered by the hearing board in the original S–3 rulemaking. A few participants expressed the view that the record might have been improved, had the Board exercised its discretion to permit cross-examination, but no one has argued that the record is legally deficient from a procedural standpoint.

As noted earlier, however, several comments to the Commission questioned whether the record provides sufficient evidence to support the numbers in the modified Table. The general thrust of these comments was that the model facilities analyzed by the staff were for one reason or another unacceptable as a basis for determining fuel cycle impacts. The Commission believes that the substance of these comments has been adequately addressed by the Hearing Board in the discussion supporting its recommendations, Conclusions and Recommendations of the Hearing Board, Docket RM–50–3. The issues of greatest importance or special concern to commenters are reviewed in the following subsections.

a. Economic Feasibility. The proposed rule clearly would be open to serious question if the model facilities on which the values in Table S–3 are based would be prohibitively expensive to build and operate. In response to the Board's request for evidence on economic feasibility, viewed in this narrow sense, the staff submitted cost estimates based on material from the GESMO proceeding.[16] From these estimates the Hearing Board found per-reactor costs of reprocessing and waste management to be on the order of ten percent of the total costs for building and operating an individual reactor. The Board concluded that such costs were not prohibitive. Recommendations, page 58.

Comments by the State of New York challenged the Board's conclusion that establishing fuel cycle costs at a few percent of total generating costs sufficed to demonstrate economic feasibility.[17] New York cited testimony by its own witnesses asserting that the economics of nuclear power are precarious and that back-end fuel cycle costs will tip this doubtful balance against the nuclear option. This evidence, New York concluded, "mandates a finding of economic infeasibility of the back end of the uranium fuel cycle."

The Commission believes New York missed the distinction between the broad issue of nuclear power economics and the much narrower question of economic feasibility of specific models for waste management and reprocessing. Whether nuclear power is good business is not an issue in this rulemaking. The fuel cycle rule will be used only when someone has decided, rightly, or wrongly, that nuclear power is sufficiently viable economically to warrant applying for a reactor license. Once the reactor has operated, back-end fuel cyle activities must be carried out, whatever the cost. This rulemaking addressed the environmental impact of those activities based on methods and facilities which could on technological grounds reasonably be employed. The economic feasibility question, correctly identified by the Hearing Board, is simply whether these methods might be so outlandishly expensive that there will be a "major incentive for reducing [costs] at the expense of increasing the radioactive effluents above the values * * * in Table S–3." Recommendations, page 58. The Commission believes that the fuel cycle cost estimates arrived at by the Hearing Board took adequate account of matters in controversy and provided a reasonable basis for the Board's conclusion that the staff's models are economically feasible in the sense described above.[18]

b. Waste Management and Disposal. In determining the impacts associated with waste management and disposal the staff assumed that high-level waste (or reactor spent fuel treated as waste) would be stored in interim facilities (water basins and retrievable surface storage facilities) for about twenty years and then disposed of by burial in a bedded salt geologic repository.[19] The

[16] Generic Environmental Statement on the Use of Recycle Plutonium in Mixed Oxide Fuels in Light Water Cooled Reactors, NUREG–0002, August 1976.

[17] Also, during the hearing and in a separate motion filed before the Commission on December 18, 1978, New York, together with Wisconsin and Ohio, urged that dollar value impacts should be brought within the scope of the S–3 proceeding. The matter of dollar value economic impacts is separate from the issue of economic feasibility. The Commission made clear earlier in an order issued February 9, 1978, Docket RM–50–3, that this rulemaking "was not intended to encompass a full economic analysis leading to inclusion of economic costs in the uranium fuel cycle rule." The Order left open the possibility that the detailed economic costs of the fuel cycle might be dealt with in a later generic rulemaking. The Commission will refer the States' motion to the staff for treatment as a petition for rulemaking pursuant to 10 CFR 2.802. To the extent that fuel cycle dollar value impacts are relevant to the cost-benefit balance for a reactor they may at present be considered in individual licensing proceedings.

[18] The Board's cost estimates took into account New York's vigorous objection to the staff's use of a 10 percent discount rate. The Board computed a range of estimated fuel cycle costs based on return on investment of 2 and 0 percent, suggested by New York as more realistic, and based its judgment on an overall cost estimate large enough to include the upper limit of the range. The Board also noted its view that costs of decommissioning a power reactor, a matter of controversy at the hearing, are facility-specific and should be considered in individual reactor proceedings rather than included among the costs of the fuel cycle activities which are the subject of the generic rule. The Commission finds the Board's reasoning correct on this point and confirms that reactor decommissioning costs are not relevant to this rulemaking.

[19] The program of interim storage followed by geologic disposal is in broad outline the same waste management model considered in the original fuel cycle rulemaking, but the record developed in the present proceeding is far more extensive, particularly with respect to disposal. Dr. Pittman's testimony at the original rulemaking in 1973 consisted largely of a description of a proposed retrievable surface storage facility for continuously monitored interim storage. Concerning ultimate disposal without further surveillance, Dr. Pittman noted that a major effort was underway to determine whether disposal in bedded salt was acceptable, but he did not describe the concept in any detail. In contrast, NUREG–0116, Section 4.4, provides a 30-page quantitative discussion of disposal of long-lived wastes in a bedded salt repository, with citations to many relevent technical documents prepared since 1973. The bedded salt concept was discussed extensively in written and oral testimony at the hearing. For example, the Board's oral examination of witnesses from the

Footnotes continued on next page

for waste disposal. That kind of judgment is in the first instance to be made by the Department of Energy and will be subject to further review in a Commission licensing proceeding when a particular proposal comes before us. Nor is the Commission making judgments in this proceeding as to the likelihood of waste disposal being accomplished safely. That issue has been addressed separately by the Commission.[25]

Furthermore, the Commission intends in the near future to conduct a generic proceeding to reassess the outlook for the availability of safe waste disposal methods in light of new data and recent developments in the Federal waste management program.[26]

In view of the uncertainties noted regarding waste disposal, the question then arises whether these uncertainties can or should be reflected explicitly in the fuel cycle rule. The Commission has concluded that the rule should not be so modified. On the individual reactor licensing level, where the proceedings deal with fuel cycle issues only peripherally, the Commission sees no advantage in having licensing boards repeatedly weigh for themselves the effect of uncertainties on the selection of fuel cycle impacts for use in cost-benefit balancing. This is a generic question properly dealt with in this rulemaking as part of choosing what impact values should go into the fuel cycle rule. The Commission concludes, having noted that uncertainties exist, that for the limited purpose of the fuel cycle rule it is reasonable to base impacts on the assumption which the Commission believes the probabilities favor, *i.e.*, that bedded-salt repository sites can be found which will provide effective isolation of radioactive waste from the biosphere.[27]

Assuming an initially suitable site is found, the Board noted that particular concern had been expressed regarding the possibility that heat released by radioactive decays in the waste might alter conditions in the salt so as to give access to water and promote migration of the waste. As the Board points out in its recommendations, however, the average temperature rises in the salt will depend on the density of waste emplacement. Increasing the amount of land committed to the repository reduces this density and may be expected to be an effective measure for meeting concerns about temperature effects. During the proceeding the staff proposed a modification to Table S-3 raising the acreage committed to waste disposal. This modification is included in the table adopted as the final rule.

Even allowing for some eventual leakage of water into the repository, information in the record indicates that transport of materials out of the repository area would take tens of thousands of years. The only apparent natural mechanisms cited which might reasonably cause major releases involved very low probability catastrophic events such as a large meteor strike on the repository or formation of new geologic faulting intersecting the area. Releases through accidential intrusion by man remain possible but in the Commission's view unlikely since casual intrusions should be virtually impossible and sites should be selected in areas offering little incentive for deliberate intrusion in search of natural resources. Given the staff's assumption that volatile fission products are totally released before the repository is sealed, the Commission finds that taking post-sealing releases as zero does not significantly reduce the overall conservatism of the table.

In summary, the Commission concludes, based on the above considerations and the more detailed analysis given in the Board's recommendations, that the staff's model for assessing impacts of waste disposal is reasonable and adequate for the purposes of the fuel cycle rule.

c. *Reprocessing.* The reprocessing alternative considered in this proceeding involved reprocessing of spent fuel for purposes other than recycle of plutonium.[28] In considering this alternative, the Commission expresses no view on the likelihood that such reprocessing will take place.[29] Under this alternative the staff assumed that spent fuel after 160 days cooling at the reactor would be shipped to a model reprocessing facility, where the uranium, plutonium, and fission products would be separated by the Purex solvent extraction process into three liquid fractions. The uranium would be converted to uranium hexafluoride for recycling at an enrichment plant. The plutonium, still containing about five percent of the fission products to deter diversion, would be converted to plutonium oxide and packaged for disposal in a Federal waste repository. The high-level liquid waste (HLLW), containing the bulk of the fission products, would be stored up to five years in tanks and then calcined and formed into glass for repository disposal.

No significant question was raised at the hearing regarding the staff's choice of processes, but considerable controversy arose concerning the staff's assumption that the performance of the model facility would show a significant improvement over previous commercial reprocessing experience. The only commercial experience in the United States with reprocessing spent uranium oxide fuel from light water reactors was obtained at the Nuclear Fuel Services plant (NFS) in West Valley, New York.

---

[25] 42 *Fed. Reg.* 34391, July 5, 1977. See also *Natural Resources Defense Council* v. *NRC*, 582 F. 2d 166 (2d Cir. 1978).

[26] The immediate occasion for this proceeding is the D.C. Circuit's remand to the Commission of *State of Minnesota* v. *NRC*, Nos. 78-1269 and 78-2032 (May 23, 1979) to consider whether there is reasonable assurance that an off-site storage solution for nuclear wastes will be available by the years 2007-09, the expiration dates for licenses of certain nuclear plants where the Commission has granted permits to expand on-site spent fuel capacities and if not, whether there is reasonable assurance that the fuel can be stored safely at the site beyond those dates. A continuing reassessment of the Commission's views on waste disposal is part of the commitment which the Commission has made to Congress. The final IRG report, which was available to the fuel cycle rulemaking participants only at the close of the rulemaking and only in draft form, will be part of the new information which the Commission will consider in its reassessment. The Commission will announce at a later date the specific procedures to be adopted for this proceeding and its precise scope.

[27] Even if, contrary to the evidence in the record and the Commission's expectation, bedded-salt repositories should ultimately be found not adequate, the strong incentive to develop sound waste disposal methods and the major effort now directed to this goal make it likely that a means of effective isolation will be found among the many geologic disposal techniques being considered. The IRG Report (see note 24 above) notes on page 3 that "increased levels of support . . . and broader range of disciplines involved have led to a greatly increased accumulation of knowledge within the [waste management] program. The current rate of growth of knowledge is very large."

[28] On December 23, 1977, in response to President Carter's nuclear non-proliferation policy, the Commission terminated proceedings on pending or future plutonium recycle-related license applications and halted proceedings on the Generic Environmental Statement on Mixed Oxide Fuel (GESMO) to determine under what condition uranium and plutonium might be recycled from spent light water reactor fuel and fabricated into fresh mixed oxide fuel on a wide scale. In the Matter of Mixed Oxide Fuel, 6 NRC 861 (1977). See also 7 NRC 711 (1978).

[29] The Commission's instructions to the S-3 Board of January 25, 1978 (Commissioner Gilinsky dissenting) noted that "Although the 'once-through' fuel cycle is currently the reference case for United States policymaking purposes, the possibility of some form of reprocessing for waste management purposes is not excluded and therefore the Commission decided that this alternative should be included as well. The Commission paid particular attention to the fact that the spent fuel processing surveyed in this proceeding would treat plutonium solely as a waste product and would not make plutonium available in a form suitable for use as reactor fuel. The Commission emphasized that its refusal to cut back the scope of the fuel cycle rulemaking is not to be allowed to convert this rulemaking into a GESMO proceeding."

resolved within this rulemaking by adopting tabulated impacts based on model facilities using technology most likely to be employed. Except for technetium-99 releases, the Commission has therefore found that the modified Table S–3 provides an adequate treatment of reprocessing impacts. It appears from the record that technetium releases from the fuel cycle will occur but are not included in the table. The Commission believes that Table S–3 should be supplemented during the general update by inclusion of an appropriate value for technetium releases. Pending this supplementation, both the magnitude and the environmental significance of technetium releases from back end fuel cycle activities may be considered in individual reactor licensing proceedings which have not been noticed for hearing on environmental matters prior to the effective date of this final rule. In view of the Hearing Board's conclusion that the conservative assumption of complete release of iodine-129 tends to compensate for the omission of technetium from Table S–3, the Commission finds it unnecessary to reopen closed proceedings or to disturb consideration of environmental issues in presently pending proceedings to provide for consideration of technetium-99 releases.

2. The Explanatory Narrative.

As the comments indicate, this rulemaking grew well beyond a narrow inquiry into the evidentiary basis supporting the numbers tabulated in the interim rule. The broader perspective taken by the participants and the Hearing Board has helped clarify many aspects of fuel cycle environmental impacts not covered by Table S–3 which need to be addressed, at least conceptually, in a comprehensive fuel cycle rule. Until such a rule is developed important generic fuel cycle issues must continue to be litigated in individual reactor licensing proceedings. These issues include—but are not necessarily limited to—environmental dose commitments and health effects from fuel cycle releases, fuel cycle socioeconomic impacts, and possible cumulative impacts. Pending further treatment by rulemaking, the NRC staff is directed to address these matters in the environmental analysis accompanying a proposal to issue a limited work authorization, construction permit, or operating license for a power reactor.

The Commission has accepted the Hearing Board's recommendation that an explanatory narrative which addresses these subjects should be prepared and adopted as part of the fuel cycle rule. Although such a narrative is not legally required, provided an adequate description of fuel cycle impacts is given in individual proceedings, the same reasons which favor treatment of fuel cycle impacts by generic rulemaking also favor evaluating the significance of those impacts by rulemaking, rather than by repeated adjudication. The Commission agrees, however, that adoption of a narrative by rulemaking will require adequate notice and opportunity for public comment and therefore cannot be done without a further proceeding. Since the narrative must address important basic issues in arriving at a method for evaluating the significance of fuel cycle impacts,[35] the Commission has determined that such a proceeding should begin promptly.

The Commission has directed the staff to prepare by October 1, 1979, a draft narrative for the Commission's review prior to issuance for public comment.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, the National Environmental Policy Act of 1969, as amended, and sections 552 and 553 of Title 5 of the United States Code, the following amendment to 10 CFR Part 51 is published as a document subject to codification, to be effective on September 4, 1979.

10 CFR Part 51 is amended by revising § 51.20(e) and 51.23(c) as follows:

§ 51.20 Applicant's Environmental Report—Construction Permit Stage.

* * * * *

(e) The Environmental Report required by paragraph (a) for light-water-cooled nuclear power reactors shall take Table S–3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low level wastes and high level wastes related to uranium fuel cycle activities to the environmental costs of licensing the nuclear power reactor. Table S–3 shall be included in the Report and may be supplemented by a discussion of the environmental significance of the data set forth in the Table as weighed in the cost-benefit analysis for the proposed facility. This paragraph applies to any applicant's environmental report submitted on September 4, 1979, or thereafter.

§ 51.23 Contents of Draft Environmental Statement.

* * * * *

(c) The draft environmental impact statement will include a preliminary cost-benefit analysis which considers and balances the environmental and other effects of the facility and the alternatives available for reducing or avoiding adverse environmental and other effects, as well as the environmental, economic, technical and other benefits of the facility. The contribution of the environmental effects of the uranium fuel cycle activities specified in § 51.20(e) shall be evaluated on the basis of impact values set forth in Table S–3, Table of Uranium Fuel Cycle Environmental Data, which shall be set out in the draft environmental impact statement. With the exception of radon-222 and technetium-99 releases, no further discussion of fuel cycle release values and other numerical data that appear explicitly in the Table shall be required.[36] The impact statement shall take account of dose commitments and health effects from fuel cycle effluents set forth in Table S–3 and shall in addition take account of economic, socioeconomic, and possible cumulative impacts and such other fuel cycle impacts as may reasonably appear significant. The cost benefit analysis will, to the fullest extent practicable, quantify the various factors considered. To the extent that such factors cannot be quantified, they will be discussed in qualitative terms. The cost-benefit analysis will indicate what other interests and consideration of Federal policy are thought to offset any adverse environmental effects of the proposed action identified pursuant to paragraph (a). Due consideration will be given to

[35] Among these issues is the question of the time period over which dose commitments from long-lived radioactive effluents should be evaluated. The court of appeals observed with regard to waste disposal that: "[T]he toxic life of the waste under discussion far exceeds the life of the plant being licensed. The environmental effects to be considered are those flowing from reprocessing and passive storage for the full detoxification period." 547 F. 2d 639, note 12. The analysis required by NEPA is, of course, subject to a rule of reason. *See Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 551 (1978); NRDC v. Morton, 458 F. 2d 827, 837 (D.C. Cir. 1972).* How dose commitment evaluations over extended periods of time might be performed and what their significance might be are subjects which the Commission expects an explanatory narrative would address.

[36] Values for releases of Rn–222 and Tc–99 are not given in the Table. The amount and significance of Rn–222 releases from the fuel cycle and Tc–99 releases from waste management or reprocessing activities shall be considered in the draft environmental impact statement and may be the subject of litigation in individual licensing proceedings.

Table S-3.—*Table of Uranium Fuel Cycle Environmental Data*[1]—*Continued*

(Normalized to model LWR annual fuel requirement (WASH-1248) or reference reactor year (NUREG-0116))

Environmental considerations	Total	Maximum effect per annual fuel requirement or reference reactor year of model 1,000 MWe LWR
TRU and HLW (deep)	1.1 x 10 [7]	Buried at Federal Repository
Effluents—thermal (billions of British thermal units)	4,063	<5 percent of model 1,000 MWe LWR
Transportation (person-rem):		
Exposure of workers and general public	2.5	
Occupational exposure (person-rem)	22.6	From reprocessing and waste management

[1] In some cases where no entry appears it is clear from the background documents that the matter was addressed and that, in effect, the Table should be read as if a specific zero entry had been made. However, there are other areas that are not addressed at all in the Table. Table S-3 does not include health effects from the effluents described in the Table, or estimates of releases of Radon-222 from the uranium fuel cycle or estimates of Technetium-99 released from waste management or reprocessing activities. These issues may be the subject of litigation in the individual licensing proceedings.

Data supporting this table are given in the "Environmental Survey of the Uranium Fuel Cycle," WASH-1248, April 1974; the "Environmental Survey of the Reprocessing and Waste Management Portion of the LWR Fuel Cycle," NUREG-0116 (Supp. 1 to WASH-1248); the "Public Comments and Task Force Responses Regarding the Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle," NUREG-0216 (Supp. 2 to WASH-1248); and in the record of the final rulemaking pertaining to Uranium Fuel Cycle Impacts from Spent Fuel Reprocessing and Radioactive Waste Management, Docket RM-50-3. The contributions from reprocessing, waste management and transportation of wastes are maximized for either of the two fuel cycles (uranium only and no recycle). The contribution from transportation excludes transportation of cold fuel to a reactor and of irradiated fuel and radioactive wastes from a reactor which are considered in Table S-4 of § 51.20(g). The contributions from the other steps of the fuel cycle are given in columns A-E of Table S-3A of WASH-1248.

[2] The contributions to temporarily committed land from reprocessing are not prorated over 30 years, since the complete temporary impact accrues regardless of whether the plant services one reactor for one year or 57 reactors for 30 years.

[3] Estimated effluents based upon combustion of equivalent coal for power generation.

[4] 1.2 percent from natural gas use and process.

It is so ordered.

For the Commission.

Samuel J. Chilk,

Secretary of the Commission.

Dated at Washington, D.C. this 27th day of July, 1979.

Furthermore, I think that the Commission goes too far in terming its assumption that a "bedded salt repository or its equivalent will be found" to be a "judgment." I think that little more can be said by a prudent regulatory agency at this time in the face of this record and the general uncertainty than that the direction of current federal programs makes a bedded salt repository a responsible working assumption for NEPA purposes. That is really all that I think the staff testimony supports.[2]

More seriously, I continue to disassociate myself from the optimistic assessment of the waste management program cited by the majority that is in 42 Fed. Reg. 34391.[3] In July 1977, the Commission reached a sweeping conclusion on the sufficiency of what then passed for a waste management program without benefit even of a notice and comment proceeding, never mind a formal review. For this Statement of Considerations to reference that denial of a requested rulemaking as an expression of a Commission view on the safety of a waste repository proceeding is procedural farce of a low order. It should not be done here, especially in light of the commitment to a new generic proceeding.

As to reprocessing, I have concluded that Commissioner Gilinsky was in many respects correct in his dissenting views from our January 26, 1978 Memorandum on the scope of this rulemaking. Nevertheless, the record has now been built on what may be an unlikely case, and it seems to me the Commission's decision so circumscribes it that the worst harms foreseen by Commissioner Gilinsky cannot result from any responsible reading of the current Statement of Considerations.

II

By memorandum of January 26, 1978, to the Fuel Cycle Rulemaking Hearing Board, the Commission ordered that the Board entertain requests for cross-examination of particular witnesses on specific factual issues where a showing could be made with particularity that this procedure was necessary for an adequate record. While the Commission left the decisions on cross-examination to the sole descretion of the Hearing Board, it expected that the Hearing Board would apply the procedures "in a sensitive and careful fashion so as to assure the ventilation and consideration of waste management issues called for in *NRDC v. NRC*, 547 F.2d 633 (D.C. Cir. 1976)." I dissented from the extraordinary discretion delegated to the Board and the restrictive criteria for cross-examination.

The Board was neither sensitive nor careful in its decision to deny all cross-examination. Rather than assuring the ventilation and consideration of waste management and disposal issues, the Board stifled full exploration of crucial and difficult subjects even when the staff, to its credit, did not object.

The denial of cross-examination on two particular issues serves to illustrate the consequences. The Sierra Club sought to cross-examine several witnesses on the release of technetium from the waste management and disposal fuel cycle facilities. The Board denied the request in general terms,[4] stating that many of the matters were not involved in this proceeding or not in serious dispute. Moreover, the Board said its review indicated that each subject was "fully ventilated" through other procedures. The Commission's finding on technetium rejects these conclusions of the Board. The Commission found that technetium releases should be included in Table S-3. However, because there was not sufficient evidence in the record to derive a release figure, the Commission ordered that the issue be litigable in individual proceedings. Thus the Commission, contrary to the Board, viewed the release of technetium both as being insufficiently serious dispute and so inadequately ventilated as to require further litigation.

By avoiding a full record on technetium, the Board has shown the futility of the Commission's procedural shortcut. As I noted in my January 26, 1978 dissent, the delays caused by withholding cross-examination can far exceed the "delays" inherent in cross-examination. The issue of technetium release now may be litigated in every individual licensing proceeding. Instead of being cross-examined once, staff witnesses are potentially subject to cross-examination in many proceedings, with licensing boards, the Appeal Board, and possibly the Commission reviewing the record of each case.

The Board also refused to allow cross-examination regarding the uncertainties of bedded salt as a waste medium. This refusal was particularly unfortunate since, as noted by the petitioner for cross-examination, it came immediately after the DOE Task Force on Nuclear Waste Management stated it was "aware of scientific issues concerning the adequacy of salt as suitable geologic medium for emplacement of concentrated waste exhibiting high surface temperatures." (Report of Task Force for Review of Nuclear Waste Management, U.S. DOE at 9, February 1978).

One of the issues on which NRDC requested cross-examination was the staff's lack of analysis of media other than salt. Now, without this inquiry, the Commission makes a "judgment" that an "equivalent" to a bedded salt repository will be found. This statement rests on some statements from the IRG Report, issued after the hearing was over.[5] Thus the Commission has, through the dubious procedural device of its "irrevocable delegation," treated a subordinate board like a distant and separate part of the government and has thereby cost itself any chance to correct the weakness of the record.

In refusing to permit cross-examination on waste disposal, the Board has kept perfect the past record of the Commission's obsessive need not to know about the uncertainties regarding its waste disposal assumptions. While continuing to express "confidence" that the wastes can and will be disposed of safely and while judging that a bedded salt repository or its equivalent will

[2] Transcript, p. 534, 575.

[3] Memorandum and Order, p. 41.

[4] Memorandum and Order, May 4, 1978.

[5] Report to the President by the Interagency Review Group on Waste Management, TID-29442, March 1979.