RAS 4675

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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COMMISSIONERS

Richard A. Meserve, Chairman
Greta Joy Dicus
Nils J. Diaz
Edward McGaffigan, Jr.

In the Matter of	)	
DUKE ENERGY CORPORATION	)	
(McGuire Nuclear Station, Units 1 & 2, Catawba Nuclear Station, Units 1 & 2	)	Docket Nos. 50-369-LR, 50-370-LR, 50-413-LR, 50-414-LR

CLI-02-17

MEMORANDUM AND ORDER

I. Introduction

This order addresses one portion of appeals filed by licensee Duke Energy Corporation and the NRC staff in this license renewal proceeding. The proceeding stems from Duke's application to renew its operating licenses for the McGuire Nuclear Station, Units 1 and 2, and the Catawba Nuclear Station, Units 1 and 2. In LBP-02-04, 55 NRC 49 (2002), the Atomic Safety and Licensing Board granted the petitions to intervene and requests for hearing of the Blue Ridge Environmental Defense League (BREDL) and the Nuclear Information and Resource Service (NIRS). The Board found that BREDL and NIRS each had shown standing to intervene and submitted at least one admissible contention. Among the contentions admitted was one challenging the adequacy of the Severe Accident Mitigation Alternatives (SAMA) analysis provided in Duke's Environmental Reports, submitted with its license renewal

application. In their appeals, both Duke and the NRC staff argue that the contention was inadmissible. We agree in part and disagree in part.[1]

II. Background

The full procedural background of this proceeding is described in the Commission's decision in April, 2002, reversing a Board order admitting a contention on Duke's possible use of mixed oxide fuel.[2] We confine our discussion here to the admitted SAMA contention. Because the contention relates to particular characteristics and vulnerabilities of plants with ice condenser containments, we begin with a brief description of ice condenser containments.

a.) Ice Condenser Containments and Hydrogen Control

Plants with ice condenser containments, such as McGuire and Catawba, do not have large dry or subatmospheric reactor containment buildings. Instead of a massive concrete containment building designed to withstand strong internal pressures, ice condenser containments rely upon "ice beds" -- baskets filled with blocks of ice -- to prevent steam pressure from building up. In the event of a severe accident, these ice beds are intended to cool and condense steam, suppress pressure, and maintain containment integrity. Ice condenser plants are relatively more vulnerable to the risk of hydrogen combustion events in the containment because (1) the containment volume is smaller, leading to higher hydrogen

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[1] In LBP-02-04, the Licensing Board also admitted a contention concerning the possible use of mixed oxide (MOX) fuel at the McGuire and Catawba facilities, and certified to the Commission the petitioners' issues on the risks from acts of terrorism. The Commission reversed the MOX ruling in CLI-02-14, thus eliminating that contention from this proceeding. Still pending before the Commission are the petitioners' issues relating to terrorism. Those will be addressed in a future Commission decision.

[2] See Duke Energy Corp. (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-14, 55 NRC 278.

concentrations, and (2) the smaller, thinner containment and lower ultimate capacity cannot withstand the same degree of internal pressure as large dry containments.

During the Three Mile Island accident in 1979, a large amount of hydrogen gas was released into the containment and burned, but the large dry TMI-2 containment building withstood the increase in pressure and did not fail. Following the TMI accident, the NRC has required all plants with ice condenser containments to have "hydrogen igniters" -- devices to intentionally ignite hydrogen and burn it off at a controlled rate, preventing dangerous concentrations from forming. Current hydrogen igniter systems require alternating current (AC) power. Therefore, these systems would not function in the event of a simultaneous loss of both off-site and on-site AC power, known as station blackout (SBO). Thus, under particular severe accident sequences involving station blackout, in which neither off-site AC power nor backup AC power provided by emergency diesel generators were available, the hydrogen igniter system would be unavailable and containment integrity could be challenged.

A recent NRC-sponsored study conducted by the Sandia National Laboratories (SNL) addresses this concern and notes that such severe accident scenarios would be largely dependent upon plant-specific probabilities for station blackout. Issued in April of 2002, the Sandia study evaluates the early containment failure probability (given core damage) for all Westinghouse plants with ice condenser containments, including McGuire and Catawba. See generally NUREG/CR-6427, "Assessment of the DCH [Direct Containment Heating] Issue for Plants with Ice Condenser Containments," (April 2000) ("Sandia study").[3]

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[3] While the study addresses the concern over hydrogen igniters functioning during station blackout, the overall focus of the study was on another issue -- Direct Containment Heating (DCH) and plants with ice condenser containments. DCH is a severe accident issue. In a light-water reactor core melt accident, if the reactor pressure vessel fails while the reactor coolant system is at high pressure, the expulsion of molten core debris may pressurize the reactor containment building beyond its failure pressure. The Sandia study examined the DCH issue for ice condenser plants. Sandia concluded that early containment failure probability in

(continued...)

a. The Commission's Environmental Requirements and SAMAs

The Commission's environmental protection requirements for license renewal are found in 10 C.F.R. Part 51. Part 51 divides environmental issues into those for which "generic" conclusions -- applicable to all existing nuclear power plants or to a specific subgroup of plants -- can be made, and those for which no such all-encompassing conclusions can be drawn. For the latter, the license renewal applicant must provide a plant-specific assessment of the issue. In other words, as we said last year in the Turkey Point license renewal case, "if the severity of an environmental impact might differ significantly from one plant to another, or, if additional plant-specific measures to mitigate the impact should be considered, then the applicant must provide a plant-specific analysis of the environmental impact."[4] Under our license renewal rules, the NRC staff already has assessed some environmental impacts in a Generic Environmental Impact Statement, and the license renewal applicant must address other environmental impacts in plant-specific fashion in its Environmental Report.[5] Turkey Point contains a detailed description of NRC environmental requirements governing license renewal. It need not be repeated here.

For purposes of this decision, it suffices to say that severe accident mitigation alternatives -- SAMAs -- generally must be addressed by the applicant on a plant-specific basis. Specifically, 10 C.F.R. § 51.53(c)(3)(ii)(L) requires license renewal applicants to consider

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[3](...continued)
ice condenser plants is dominated not by DCH events, but by non-DCH hydrogen combustion events (which only occur during station blackouts). Therefore, the study also touched upon the issue of the availability of hydrogen igniters during station blackout.

[4] Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3, 11 (2001).

[5] See 10 C.F.R. Part 51, Subpart A, Appendix B, and Table B-1; NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Final Report, Vol. 1 (May 1996).

alternatives to mitigate severe accidents "[i]f the staff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement or related supplement or in an environmental assessment." For McGuire and Catawba, the staff had not previously considered SAMAs, and therefore Duke provided a SAMA analysis in its Environmental Reports for these facilities.

The purpose of the SAMA review is to ensure that any plant changes -- in hardware, procedures, or training -- that have a potential for significantly improving severe accident safety performance are identified and assessed. If the cost of implementing a particular SAMA is greater than its associated benefit, the SAMA would not be considered cost-beneficial. SAMAs, in short, are rooted in a cost-benefit assessment. Duke concluded in its Environmental Reports that none of the assessed SAMAs relating to hydrogen control during station blackout warranted implementation because none would be cost-effective.[6]

b. The Admitted Contention

In LBP-02-04, the Licensing Board admitted a contention challenging the SAMA analyses submitted by Duke for the McGuire and Catawba plants. Two bases underlie the contention. First, both BREDL and NIRS challenged Duke's SAMA analysis for its failure to include information from the recent Sandia study, NUREG/CR-6427, including particularly its assessment of the early containment failure probability during station blackout accidents at McGuire and Catawba. The Board agreed that Duke's SAMA analysis had not applied the same underlying "values" for containment failure probability as the Sandia study, and that this omission called into question the ultimate cost-benefit determinations presented in Duke's

[6] See, e.g., Table 4-2, Attachment K, McGuire Nuclear Station SAMAs Analysis (May 2001) at 19; Table 4-2, Attachment H, Catawba Nuclear Station SAMAs Analysis (May 2001) at 18.

SAMA discussion.[7] "Whether or not [Duke] *should* apply these values" was a material issue of dispute between the parties and a question for the merits, reasoned the Board.[8] As a second basis for the contention, the Board admitted an argument raised by NIRS that the SAMA analysis should have addressed the additional mitigation alternative of a dedicated electrical line to nearby hydroelectric generating dams, that could provide an alternate power source during station blackout events.

On appeal to the Commission, both Duke and the NRC staff argue that the SAMA contention is inadmissible.

III. Analysis

The admitted SAMA contention, termed "BREDL/NIRS Contention 2," is a consolidated and condensed version of three related contentions, one submitted by BREDL and two by NIRS.[9] As reframed by the Board, the contention reads as follows:

> The Duke SAMA analysis is incomplete, and insufficient to mitigate severe accidents, in that it
> (a) fails to include information from NUREG/CR-6427 [the Sandia study], and (b) fails to include a severe accident mitigation alternative relating to Station Blackout-Caused Accidents, namely, a dedicated electrical line from the hydroelectric generating dams adjacent to each reactor site.

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[7] See 55 NRC at 126-27.

[8] Id. at 126 (emphasis in original).

[9] The admitted contention is based upon BREDL's Contention 4 and NIRS's Contentions 1.1.4 and 1.1.5. See BREDL Submittal of Contentions in the Matter of Renewal of Licenses for Duke Energy Corp. McGuire Nuclear Stations 1 & 2 and Catawba Nuclear Stations 1 & 2 (Nov. 29, 2001)("BREDL's Amended Contentions") at 37-45; Contentions of NIRS (Nov. 29, 2001) at 12-15.

55 NRC at 128. We address these bases separately and in greater detail below. As always, we consider the specificity, factual support and legal basis of the admitted contention.[10]

a. Failure to include information from NUREG/CR-6427

As support for the contention, BREDL argues that "[t]he licensee's SAMA analysis is incomplete because it fails to incorporate new and extensive information regarding ice condenser vulnerabilities."[11] Specifically, BREDL claims that Duke's SAMA analysis should have taken into account information from the Sandia study, which looked at the likelihood for early containment failure from particular accidents involving station blackout at plants with ice condenser containments. BREDL quotes extensively from a November 2000 report by Dr. Edward S. Lyman of the Nuclear Control Institute. Dr. Lyman's report, entitled "Vulnerabilities of Ice Condenser Containments," discusses the risk of hydrogen combustion during station-blackout. According to Dr. Lyman, the Sandia study found a relatively high risk of ice condenser containment failure in particular severe accident sequences involving hydrogen combustion and station blackout.

> This study, which was performed by Sandia National Laboratories (SNL) in Albuquerque, calculated that for accidents in which the hydrogen igniters were not available, such as SBOs, the probability that the containment would rupture as a result of hydrogen combustion is 34% for Catawba and 58% for McGuire....
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> SNL found that certain SBO accidents -- namely, those in which the reactor coolant system remains at high pressure at the time that the reactor vessel is breached by molten fuel -- the probability of early containment failure as a result of detonation of pre-existing hydrogen is nearly 100% for both Catawba and McGuire.

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[10] See Dominion Nuclear Connecticut, Inc. (Millstone Nuclear Power Station, Units 2 & 3), 54 NRC 349, 358-59 (2001); Duke Energy Corp. (Oconee Nuclear Station, Units 1, 2 & 3), 49 NRC 328, 333-35 (1999).

[11] BREDL's Amended Contentions at 38.

> This means that if one of these [accident] sequences were to occur, there would be little difference between the ice condenser plants and nuclear plants without containments like Chernobyl....
>
> The SNL report concludes that 'all [ice condenser] plants, especially McGuire, would benefit from reducing the station blackout frequency or some means of hydrogen control that is effective in station blackout,' noting that the latter course would reduce early containment failure probabilities 'by more than an order of magnitude in all plants and especially McGuire.'
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> However, according to the report, 'previous cost/benefit studies generally do not justify the expense in providing hydrogen control in SBO because ... the SBO probability is a small fraction of the core damage frequency...' This assumption has now been called into question.

BREDL's Amended Contentions at 42-43.

Directly quoting conclusions of the Sandia study, BREDL's contention highlights the disparity between the early containment failure probability for McGuire that Duke reported in its Individual Plant Examination (IPE)[12] (2%), and the early failure probability estimated in the Sandia study (13.9%):

> This higher containment failure probability for McGuire is dominated by the relatively high SBO frequency and the relatively weak containment for McGuire. The IPE assessments of early containment failure at McGuire (2%) are significantly lower than our assessments; however we have not investigated the reasons for the difference.

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[12] As part of the Commission's ongoing regulatory programs, licensees have performed an individual plant examination (IPE) to look for plant vulnerabilities to internally initiated events and a separate IPE for externally initiated events, called the IPEEE. These examinations look for potential improvements to reduce both the frequency and consequences of severe accidents and "essentially constitute a broad search for severe accident mitigation alternatives." See Final Rule, "Environmental Review for Renewal of Nuclear Power Plant Operating Licenses," 61 Fed. Reg. 28,467, 28,461 (June 5, 1996). IPEs have led to numerous procedural and programmatic improvements and also to some plant modifications to reduce the risk of severe accidents. IPEs and IPEEEs are essentially site-specific probabilistic risk assessments that identify the probabilities of core damage and evaluate containment performance under severe accident conditions. It has been the Commission's expectation that IPE and IPEEE results would be used in the consideration of SAMAs. See id.

BREDL's Amended Contentions at 40 (quoting Sandia study at 124). In BREDL's view, the Duke and SNL estimates were "so different" that the adequacy and conclusions of Duke's SAMA analysis was in question.[13]

The Commission finds the contention admissible. While the contention might have been more detailed or otherwise better supported, the petitioners have done enough to raise a question about the adequacy of the probability figures used in Duke's SAMA analyses, namely, whether they should have incorporated or otherwise acknowledged information from the Sandia study. Whether a SAMA may be worthwhile to implement is based upon a cost-benefit analysis -- a weighing of the cost to implement the SAMA with the reduction in risks to public health, occupational health, offsite and onsite property.[14] For Catawba and McGuire, Duke found that no form of hydrogen control SAMAs would be cost-beneficial because the costs of implementing any of the SAMAs would outweigh their benefits.

The Sandia study, however, concluded that previous cost-benefit studies may not have justified additional hydrogen control measures because those studies viewed the probability of station blackout as only a small fraction of core damage frequency.[15] The Sandia study went on to find significantly higher station blackout frequencies and consequently, higher probabilities of containment failure, particularly for the McGuire station. Thus, as Duke's own counsel acknowledged, if the event frequencies used in the Sandia report had been used in

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[13] See, e.g., Transcript (Dec. 18, 2001) at 389.

[14] Severe accident risk is assessed in terms of the total averted risk: averted public exposure (health risk converted into dollars to estimate the cost of the public health consequence), averted onsite cleanup cost, averted offsite property damage costs, averted occupational exposure costs, and averted power replacement costs. For detailed information on how averted risk is calculated, see NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook (1997); see also, e.g., draft NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Supplement 8, regarding McGuire Nuclear Station, Units 1 & 2 (May 2002) at 5-23 to 5-26.

[15] See Sandia study at 114 (referenced in BREDL's Amended Contentions at 43).

Duke's SAMA analysis, the calculated "benefits" of implementing different particular SAMAs "probably would be larger."[16] In turn, had larger benefits been identified for hydrogen control-related SAMAs, the ultimate conclusions of the Duke SAMA cost-benefit analysis could have been different. In the Board's view, for example, the difference between the data used in Duke's SAMA analysis and the Sandia report was of "some magnitude, possibly a large enough magnitude to justify one or more of these [SAMA] alternatives."[17] As NIRS has emphasized, "the cost/risk equation that is the SAMA 'bottom line' is only accurate if the risk assessment is valid."[18]

In sum, the petitioners presented and discussed relevant results from an NRC-sponsored study which cited McGuire and Catawba specifically, and which highlighted a discrepancy between the containment failure probabilities found by the study and those earlier calculated by Duke. This contention raises a question about whether information from the Sandia study should have been utilized or otherwise addressed in Duke's SAMA analysis. The plausibility of the contention is further reinforced by the SAMA review contained in the staff's recently-issued draft Supplemental Environmental Impact Statements for McGuire and Catawba. Staff discusses and applies the containment failure probabilities reported in the Sandia study in order to estimate the benefits of particular hydrogen control-related SAMAs. The staff itself, then, apparently has not treated the Sandia study as discountable or otherwise irrelevant to the SAMA cost-benefit analysis.[19]

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[16] Transcript at 366-67; see also id. at 374-75.

[17] Id. at 367.

[18] NIRS Appeal Brief (Feb. 4, 2002) at 11.

[19] Using the underlying assumptions of the Sandia study, the estimated benefits of particular SAMAs -- such as installing ac-independent back-up power to the hydrogen igniters -- grow significantly higher than when the values from the Duke Probabilistic Risk Assessment

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On appeal, Duke stresses that while the Sandia study specifically references the containment failure probabilities for McGuire and Catawba, it "does not on its face purport to address the current design, operation, or maintenance of the two plants," and therefore "provides no insights or commentary on the plant-specific McGuire and Catawba analyses described in the discussion of the SAMA issue in the license renewal application."[20] For instance, "Duke has already taken actions (not reflected in the [Sandia study] data) to reduce the frequency of Station Blackout sequences by improving diesel generator reliability."[21] Duke stresses, therefore, that the best technical data available to use for the SAMA analysis is Duke's own plant-specific data, which takes into account safety-enhancing plant improvements that Duke already has implemented -- improvements which reduce the risk of station blackout and containment failure, and which were not taken into account by the Sandia study.

Duke is correct in stressing that its own data may represent the best assumptions and frequencies to use in the SAMA cost-benefit analysis. The Board fully acknowledged as much, both in its decision and at the prehearing conference.[22] But the Board nonetheless found that a sufficient question had been raised about the SAMA analyses' failure to address or otherwise acknowledge results from the Sandia study. Whether the SAMA analysis in fact should have

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[19](...continued)
(PRAs) are used. See, e.g., NUREG-1437, Supp. 8, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Regarding McGuire Nuclear Station, Units 1 & 2 (May 2002)("Draft SEIS for McGuire") at 5-28 (which includes information from Duke's responses to staff RAIs). In contrast to Duke's earlier Environmental Reports, the staff concludes in the draft SEISs that "supplying existing hydrogen igniters with back-up power from an independent power source during SBO events[] is cost-beneficial under certain assumptions." See Draft SEIS for McGuire at 5-30 (emphasis added); see also Draft SEIS for Catawba (NUREG-1437, Supp. 9) at 5-28 to 5-29.

[20] Duke Appeal Brief at 34.

[21] Id. at 35.

[22] See 55 NRC at 126; Transcript at 377.

addressed the study was a question for the merits, the Board held.[23] We cannot say that the Board's view is unreasonable. It did not resolve the merits questions whether the Sandia study's assumptions reflected better estimates than Duke's or whether Duke's SAMA analysis should have addressed the study. But for an admissible contention the petitioners did not have to prove outright that Duke's SAMA analysis was deficient.[24] In short, the Board merely found that a sufficient genuine dispute existed on whether the SAMAs should have applied the containment failure probability estimates from the Sandia study, which would have resulted in larger "benefits" being associated with the individual SAMAs.

Duke further argues that while the SAMA analyses never explicitly cited the Sandia study, the analyses nonetheless addressed the same kind of early containment failures discussed in the Sandia study.[25] But the mere fact that Duke in its Environmental Reports identified the possibility of early containment failure during station blackout events, and identified some alternatives to mitigate that failure, does not resolve the basic question ultimately raised by the contention: the possibility that the overall cost-benefit assessment was skewed or incomplete because of a failure to include -- or at least acknowledge and discount -- the higher event frequencies from the Sandia study.

Duke also claims that the contention is inadmissible because NEPA cannot require Duke to implement any particular SAMA, regardless of how the cost-benefit calculations come

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[23] 55 NRC at 126.

[24] Whether the Sandia study in fact provides helpful information on the hydrogen igniters/station blackout issue remains disputed. Industry representatives, for example, have challenged the relevance of the Sandia study, arguing that its underlying assumptions are overly conservative (e.g., significant amounts of zirconium-water reaction, guaranteed ignition, ignition at worst time and global burn which includes the upper containment compartments) and therefore unsurprisingly led to higher containment failure probabilities. See, e.g., NIRS Appeal Brief (Feb. 14, 2002) at 8-9 (referencing internal NRC memorandum on public meeting).

[25] Duke Appeal Brief at 35.

out.[26] Quoting Robertson v. Methow Valley Citizens Council, Duke stresses that "NEPA imposes no substantive requirement that mitigation measures actually be taken."[27] Thus, argues Duke, the contention would not entitle petitioners to any meaningful relief in this proceeding.[28] This argument, however, is fallacious. While NEPA does not require agencies to select particular options, it is intended to "foster both informed decision-making and informed public participation, and thus to ensure that the agency does not act upon incomplete information, only to regret its decision after it is too late to correct."[29] If Duke's premise held true, there never could be an admissible NEPA contention because, as Duke notes, "the only relief possible [under NEPA] is further analysis."[30] But the adequacy and accuracy of environmental analyses and proper disclosure of information are always at the heart of NEPA claims. If "further analysis" is called for, that in itself is a valid and meaningful remedy under NEPA. As the Board explained, if the petitioners prevailed on this contention, they would be entitled to "consideration in Duke's SAMA analysis of the [Sandia study] information."[31]

Duke argues that the contention has now become moot because, in responses to staff RAIs, Duke has now addressed the Sandia study. Moreover, after Duke's appeal was filed, the NRC staff issued draft SEISs for McGuire and Catawba that also take into account the

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[26] See id. at 38;

[27] Id. at 38 n.47; see Robertson, 490 U.S. 332, 353 n.16 (1989).

[28] Id. at 38

[29] Louisiana Energy Services (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 88 (1998)(internal quotations and citations omitted).

[30] Duke Appeal Brief at 38.

[31] 55 NRC at 128.

containment failure probabilities from the Sandia study.[32] Because they address the Sandia study results, the draft SEISs may -- indeed largely appear to -- render moot the contention's first concern: the SAMA analysis's "fail[ure] to include information from [the Sandia study]." The Commission believes, however, that whether the contention is moot is a factual question best addressed by the Licensing Board in the first instance, perhaps in response to a summary disposition motion. [33]

b. Failure to Include as a SAMA a Dedicated Electrical Line to Hydro-Electric Generating Dams Adjacent to Each Reactor Site

The Board also included a second basis for the SAMA contention -- Duke's failure to include as a SAMA the installation of a dedicated electrical line to hydro-electric generating dams. This was originally a separate contention proposed by NIRS, which the Board incorporated into the admitted contention involving Duke's SAMA analysis and the Sandia report.

As support for the contention, NIRS first states that "diesel generators have many problems, and that the NRC's stated 95% reliability rate is not good enough."[34] In the past 10 years, NIRS argues, "diesel generator failure contributed to station blackout at 3 reactor sites and near blackout at several more. It would appear that margins of safety have been sufficient to prevent a severe accident due to station blackout to date, however, the compounding factors

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[32] See, e.g., Draft SEIS for McGuire at 5-27 to 5-28; Draft SEIS for Catawba at 5-26 to 5-27.

[33] Recently, the petitioners filed before the Board an Amended Contention challenging the sufficiency of Duke's responses to the staff RAIs. See "BREDL and NIRS's Amended Contention 2" (May 20, 2002). Whether the amended contention is timely and otherwise admissible are issues currently before the Board.

[34] Contentions of NIRS at 15.

of terrorism and climate change may reduce this margin into the danger zone."[35] It is "vital" to consider the alternative of a dedicated electrical line to hydro-electric dams, NIRS claims.[36] This would be an "alternative to reliance solely on emergency diesel generators at Catawba and McGuire."[37] NIRS concludes by claiming that "[s]ince these hydro generation units are also owned by a subsidiary of Duke Power, and there are switchyards adjacent to both reactor sites as well, this would not pose a great challenge."[38]

We find that the petitioners' minimal information in support of their contention is inadequate. For any severe accident concern, there are likely to be numerous conceivable SAMAs and thus it will always be possible to come up with some type of mitigation alternative that has not been addressed by the licensee. In the end, whether a SAMA alternative is worthy of more detailed analysis in an Environmental Report or SEIS hinges upon whether it may be cost-beneficial to implement. Under the rule of reason governing NEPA, "[t]o make an impact statement something more than an exercise in frivolous boilerplate the concept of alternatives must be bounded by some notion of feasibility."[39] It would be unreasonable to trigger full adjudicatory proceedings based merely upon a suggested SAMA under circumstances in which the petitioners have done nothing to indicate the approximate relative cost and benefit of the SAMA.

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[35] Id.

[36] Id.

[37] Id.

[38] Id.

[39] Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519, 551 (1978); see also Citizens Against Burlington v. Busey, 938 F.2d 190, 195 (D.C. Cir. 1991).

A conclusory statement that an envisioned SAMA "would not pose a great challenge" is insufficient. The petitioners have not even in the broadest sense acknowledged or outlined what logistical or technical concerns might be involved in implementing their proposed hydro-electric SAMA at the Catawba and McGuire sites. Significantly, they provide no ballpark figure for what the cost of implementing this SAMA might be. Without any notion of cost, it is difficult to assess whether a SAMA may be cost-beneficial and thus warrants serious consideration. The Commission is unwilling to throw open its hearing doors to petitioners who have done little in the way of research or analysis, provide no expert opinion, and rest merely on unsupported conclusions about the ease and viability of their proposed SAMA.

Again, any number of possible SAMAs may be theoretically conceivable, but many will prove far too costly compared to the reduction in risk that they might provide. A mitigation alternative that costs relatively far more to implement than its incremental benefit does not require a detailed analysis in an Environmental Report or SEIS.[40] In addition, it bears noting that Duke in its Environmental Reports did address specific mitigation alternatives related to the issue of the hydrogen igniters during station blackout. Duke discussed, for instance, the alternatives of installing a third diesel, and of providing backup power to the igniters themselves. In claiming the Environmental Reports also should have analyzed a dedicated line to hydroelectric stations, the petitioners never even intimated why this alternative might be more cost-beneficial than those already rejected by Duke as too costly relative to benefit. As Duke argues on appeal, "[t]here is no comparison made in the proposed contention, and no basis offered, to conclude that the extraordinary cost of installing another dedicated offsite power line

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[40] See, Supplement 1 to Regulatory Guide 4.2, "Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses" (Sept. 2000) at Section 4.20 ("Potential SAMAs that are not expected to be cost beneficial, even when uncertainties in the analysis ... are taken into consideration, may be screened out based on a bounding analysis").

would be cost-justified" while other obviously less costly alternatives were not found to be cost-beneficial.[41]

It may be, in any event, that the petitioners' hydro-electric proposal has been rendered moot by the recently issued draft SEIS. While the staff in its RAIs never requested that Duke address a dedicated electrical line to the hydroelectric dams, Duke nevertheless did provide estimates of the cost and benefits of such an alternative among its other responses to staff RAIs. The staff then addressed this SAMA in its draft SEIS, concurring that its estimated cost -- $3,000,000 for McGuire and $8,000,000 for Catawba -- were "far greater" than the calculated benefit for either plant.[42]

c. Summary

We conclude, therefore, that the petitioners' contention is admissible, but only insofar as it raises the question whether the values from the Sandia study should have been utilized in the McGuire and Catawba analyses of mitigation alternatives for hydrogen control during station blackout. By admitting this contention, the Commission does not intimate any view on the merits of the issue. We note, parenthetically, that our Office of Nuclear Regulatory Research has been conducting a generic review of the hydrogen igniter concern -- Generic Safety Issue 189, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure From Hydrogen Combustion During A Severe Accident." This review is separate from the license renewal proceeding, and may on its own lead to new rulemaking or NRC-mandated backfits.

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[41] See Duke Appeal Brief at 36-37.

[42] See Draft SEIS for McGuire at 5-21; Draft SEIS for Catawba at 5-18.

IV. Conclusion

For the reasons given in this decision, the Commission hereby affirms LBP-02-04 in part, and reverses it in part.

IT IS SO ORDERED.

For the Commission[43]

/RA/

Andrew L. Bates
Acting Secretary of the Commission

Dated at Rockville, Maryland,
this 23rd day of July 2002.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
DUKE ENERGY CORPORATION	)	Docket Nos. 50-369/370/413/414-LR
	)	
(McGuire Nuclear Station, Units 1 and 2;	)	
Catawba Nuclear Station, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing COMMISSION MEMORANDUM AND ORDER (CLI-02-17) have been served upon the following persons by deposit in the U.S. mail, first class, or through NRC internal distribution with copies by electronic mail as indicated.

[43] Commissioner Dicus was not present for the affirmation of this Order. If she had been present, she would have approved it.

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Dated at Rockville, Maryland,
this 23rd day of July 2002