

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

April 16, 2003 (12.27PM)

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

In the Matter of

Docket No's. 50-369-LR, 50-370-LR,
50-413-LR, and 50-414-LR

DUKE ENERGY CORPORATION

ASLBP No. 02-794-01-LR

(McGuire Nuclear Station, Units 1 and 2,
Catawba Nuclear Station, Units 1 and 2)

April 11, 2003

**BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE'S AND
NUCLEAR INFORMATION AND RESOURCE SERVICE'S REQUEST FOR
REINSTATEMENT OF NIRS CONTENTION 1 REGARDING
ENVIRONMENTAL IMPACTS OF MOX FUEL USE****I. INTRODUCTION**

Intervenors Blue Ridge Environmental Defense League ("BREDL") and Nuclear Information and Resource Service ("NIRS") hereby request that the Atomic Safety and Licensing Board reinstate the environmental claims of NIRS Contention 1, which asserts that the Supplemental Environmental Impact Statement ("EIS") for renewal of the Catawba and McGuire nuclear power plant licenses must address the environmental impacts of using Mixed Oxide ("MOX") fuel in those reactors.¹ While the contention initially was admitted by the Atomic Safety and Licensing Board ("ASLB") in LBP-02-04, 55 NRC 49, 96-107 (2002), the Commission reversed the ASLB's decision on the grounds that the possible use of MOX fuel did not meet the two-fold test for inclusion in the EIS, of ripeness and nexus. CLI-02-14, 55 NRC 278, 294-97 (2002).

Intervenors submit that events which have occurred since the contention was first considered now demonstrate that the issues raised by NIRS Contention are ripe for

¹ NIRS was the original sponsor of Contention 1 when it was filed in November of 2001. BREDL now joins NIRS in seeking reinstatement of the contention. If the contention is admitted, BREDL will serve as the lead intervenor.

consideration, and that a nexus between license renewal and MOX use is sufficiently established to warrant consideration of the contention. These events consist of Duke Energy Corporation's ("Duke's") recent application for a license amendment that would allow it to use MOX lead test assemblies in the Catawba or McGuire reactor, various statements by Duke that clarify its intention to proceed with the use of MOX fuel in the Catawba and McGuire reactors, and statements by the U.S. Department of Energy ("DOE") to the effect that (a) international plutonium disposition agreements depend on the use of MOX fuel in U.S. reactors, and (b) the amount of surplus plutonium committed to the MOX program has doubled.

As discussed in Section IV, a balancing of the factors for admission of late-filed contentions in 10 C.F.R. § 2.714 (a)(1)(i)-(v) weighs in favor of reinstating NIRS Contention 1.

II. BACKGROUND

On November 29, 2001, NIRS and BREDL filed initial sets of contentions in this proceeding. NIRS' contentions included Contention 1.1.1, which challenged the failure of Duke's safety-related licensing documents to address the effects of using MOX fuel on the aging of the Catawba and McGuire plants. Contentions of Nuclear Information and Resource Service at 2 (November 29, 2001). In addition, NIRS Contention 1.2.4 challenged the failure of Duke's Environmental Report ("ER") to address the environmental impacts of using MOX Fuel. *Id.* at 20.

In LBP-02-04, the ASLB consolidated and renumbered the two contentions as NIRS Contention 1, and admitted them. 55 NRC at 88, 107. The ASLB also reworded the contentions as follows:

Anticipated MOX fuel use in the Duke plants will have a significant impact on aging and environmental license renewal issues during the extended period of operations in the Duke plants, through mechanisms including changes in the fission neutron spectrum and the abundance of fission products, and must therefore be considered in the license renewal application and addressed in the Supplemental EIS.

55 NRC at 107.

Duke appealed the ASLB's decision to the Commission, which reversed it in CLI-02-14. With respect to the safety issues raised by NIRS Contention 1, the Commission found that they were not encompassed by the license renewal rule, because Duke's future plan to use MOX fuel do not amount to an application to change the current licensing basis for the four plants. 55 NRC at 293.

With respect to the environmental issues raised by NIRS Contention 1, the Commission held that "the possibility of a future MOX application satisfies neither the ripeness nor the nexus test." 55 NRC at 295. As the Commission explained:

To bring NEPA [the National Environmental Policy Act] into play, a possible future action must at least constitute a 'proposal' pending before the agency (i.e., ripeness), and must be in some way interrelated with the action that the agency is actively considering (i.e., nexus).

55 NRC at 295. The Commission found that "[t]he mere possibility that Duke might, at some undetermined future time, file a MOX-related amendment application is speculative by its very nature." 55 NRC at 296. It also concluded that "major uncertainties" attend the potential filing of a MOX application, including actions by the U.S. Department of Energy ("DOE"), the consummation of certain international agreements, the outcome of a licensing proceeding for the proposed MOX fuel fabrication facility, and plutonium disposition activities in Russia. *Id.* Therefore, the Commission held that the MOX issue was not ripe.

The Commission also found there was no nexus between the license renewal case and MOX use, because license renewal and MOX use could take place independent of each other: license renewal can go forward without reference to the MOX issue, or MOX could be used without renewing the Catawba or McGuire licenses. *Id.*, 55 NRC at 297. Accordingly, the Commission dismissed the contention.

III. NEW INFORMATION WARRANTS RECONSIDERATION OF THE ENVIRONMENTAL ISSUES RAISED BY NIRS CONTENTION 1.

A series of developments during the past month demonstrate both that the MOX use issue is ripe and that there is a nexus between MOX use and license renewal. Therefore, Intervenor seeks reinstatement of the environmental claims in NIRS Contention 1.²

A. The MOX Use Issue is Ripe.

On February 27, 2003, Duke submitted a license amendment application to the U.S. Nuclear Regulatory Commission ("NRC" or "Commission") that would allow it to use four MOX fuel lead assemblies at McGuire or Catawba.³ According to the Environmental report that is included as Attachment 5 to the license amendment

² Intervenor does not seek reinstatement of the safety-related aspects of the contention, because it appears that such claims may only be raised if an application for full-scale use of MOX, involving changes to the current licensing basis, has been docketed. CLI-02-15, 55 NRC at 293.

³ Letter from M.S. Tuckman, Duke Executive Vice President, to U.S. Nuclear Regulatory Commission, re: Duke Energy Corporation, Catawba Nuclear Station Units 1 & 2, Docket Nos. 50-413, 50-414 McGuire Nuclear Station Units 1 & 2, Docket Nos. 50-369, 50-370 Proposed Amendments to the Facility Operating License and Technical Specifications to Allow Insertion of Mixed Oxide (MOX) Fuel Lead Assemblies and Request for Exemption from Certain Regulations in 10 CFR Part 50 (hereinafter "License Amendment Application"). Duke plans to insert the fuel lead assemblies into McGuire Unit 2 or Catawba Unit 1 during the Spring 2005 refueling outage. However, Duke is requesting permission to insert lead assemblies into any of the four Catawba or McGuire reactors. *Id.* at 3-2.

application, the purpose of the proposed license amendment is to evaluate the performance of MOX fuel by substituting four MOX fuel lead assemblies for uranium fuel assemblies in the reactor core, and operating the reactor for at least two fuel cycles. License Amendment Application at 5-1. Thus, Duke has now submitted a “proposal” to use MOX fuel at the Catawba and McGuire nuclear plants. *See* CLI-02-14, 55 NRC at 295. While the proposal is for the use of only four MOX fuel lead assemblies, it constitutes the first concrete step toward full use of MOX fuel in the reactors. As Duke stated in a February 27, 2003, press release:

‘We plan to use four MOX fuel assemblies (out of 193 total fuel assemblies) in one of the McGuire or Catawba nuclear reactors beginning in 2005. This process is designed to confirm the acceptable fuel performance we have already seen in European reactors, and allow us to request regulatory approval for larger-scale use of MOX fuel beginning around 2008,’ said Steve Nesbit, MOX fuel project manager.⁴

Moreover, during the past year, various events have reduced the uncertainty that MOX fuel will be used at Catawba and McGuire. *See* CLI-02-14, 55 NRC at 296. First, in April of 2002, the DOE formally announced that it had decided to drop immobilization as a strategy for disposing of 17 tons of surplus weapons-grade plutonium. Surplus Plutonium Disposition Program; Department of Energy, National Nuclear Security Administration: Amended Record of Decision, 67 Fed. Reg. 19,432 (April 19, 2002) (hereinafter “Amended ROD”). As a result, the entire inventory of 34 tons of surplus weapons-grade plutonium that is covered by the U.S.-Russian agreement is now slated to be transformed to MOX fuel. *Id.* During that time, the DOE has not identified any nuclear plants where MOX fuel will be used, other than McGuire and Catawba. Thus, by

⁴ A copy of the press release is attached as Exhibit 1. It can also be found at <http://www.dukepower.com/content/news/article/2003/feb/2003022703.html>.

increasing its reliance on the MOX consumption for disposal of surplus weapons-grade plutonium, and by failing to identify any other nuclear plants that would use the MOX fuel, the DOE has substantially reduced any uncertainty regarding the likelihood that MOX fuel will be used at Catawba and McGuire.

B. A Nexus Exists Between License Renewal and MOX Use

In dismissing NIRS Contention 1, the Commission found that license renewal and MOX fuel use have independent utility, i.e., that license renewal could be carried out without MOX fuel, and that MOX fuel could be used without license renewal. More recent developments have shown that this supposition is no longer viable.

First, the DOE has made it clear that use of MOX fuel in nuclear power plants is essential to the fulfillment of the U.S.-Russian agreement for disposition of surplus weapons-grade plutonium. In the Amended ROD, for example, the DOE summarized a report that it had made to Congress, in which it stated that:

The DOE/NNSA's current disposition strategy involves a MOX-only approach, under which DOE/NNSA would dispose of up to 34 t of surplus plutonium by converting it to MOX fuel and irradiating it in commercial power reactors. *Implementation of this strategy is key to the successful completion of the agreement between the U.S. and the Russian Federation discussed in Section I.A., above*⁵

⁵ The agreement discussed in Section I.A. is the Agreement between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated as No Longer Required for Defense Purposes and Related Cooperation, which was signed in September, 2000. As DOE explains in Section I.A. of the Federal Register notice:

This agreement provides that the United States and Russia will each dispose of 34 t of 'weapons-grade' plutonium and allows for disposition either by immobilization, or by MOX fuel fabrication and subsequent irradiation. One purpose of the DOE/NNSA's Surplus Plutonium Disposition Program is to help implement this agreement.

67 Fed. Reg. at 19,435 (emphasis added). Thus, Duke's license amendment application for the use of MOX fuel lead assemblies states that:

This license amendment request is being made as part of the ongoing United States-Russian Federation plutonium disposition program. The goal of this nuclear nonproliferation program is to dispose of surplus plutonium from nuclear weapons by converting the material into MOX fuel and using that fuel in nuclear reactors.⁶

License Amendment Application at 2. Because Catawba and McGuire are the only plants that have been designated for MOX use, it is implicit that the participation of these reactors in the MOX program is considered "key" to the successful completion of the U.S.-Russian agreement. License renewal and MOX use therefore are inextricably interrelated, because use of MOX fuel in the Catawba and McGuire plants, for an extended time into the future, is the only available avenue for disposal of the 34 tons of MOX that is to be produced under the U.S.-Russian agreement. If the Catawba and McGuire licenses are renewed without provision for use of MOX fuel, then the overall governmental policy of disposing of surplus weapons-grade plutonium will not be

⁶ Similarly, Duke's February 27, 2003, press release asserts that:

MOX fuel is a mature technology in Europe where 35 reactors currently use the fuel to generate electricity. *Applying the technology in the United States is a key element of the international program to dispose of surplus plutonium from nuclear weapons, and thereby reduce the risk of terrorist groups or rogue nations obtaining the material.*

(emphasis added).

fulfilled.⁷ Thus, the renewal of the Catawba and McGuire licenses is inextricably tied to the MOX program.

IV. A BALANCING OF THE NRC'S CRITERIA FOR LATE-FILING WARRANTS ADMISSION OF THE CONTENTION.

A balancing of the criteria in 10 C.F.R. 2.714 § (a)(1)(i)-(v) for consideration of late-filed contentions weighs in favor of admitting NIRS Contention 1. First, NIRS and BREDL have good cause for filing late. The principal event on which this request for reinstatement is based consists of Duke's application to use MOX fuel lead assemblies in the Catawba or McGuire plant. This request for reinstatement of NIRS Contention 1 is being filed within 30 days of March 18, 2003, the date on which the application to use MOX fuel lead assemblies became publicly available.⁸

The Intervenor also satisfy the other four elements of the late-filing standard. Apart from this proceeding, BREDL and NIRS have no means for protecting their interest in ensuring that the Supplemental EIS for the Catawba and McGuire nuclear plants provides a thorough discussion of reasonably foreseeable environmental impacts. Nor is any other party representing the Intervenor's interests in NIRS Contention 1.

In addition, the Intervenor's participation may reasonably be expected to assist in the development of a sound record. NIRS Contention 1 was prepared with the

⁷ Moreover, the government's goal of disposing of 34 tons of plutonium by using it in reactors could not be fulfilled by using MOX during the remaining terms of the Catawba and McGuire licenses (a possibility suggested by the Commission in CLI-02-14, see 55 NRC at 297). The Catawba licenses expire in 2024 and 2026; the McGuire licenses expire in 2021 and 2023. Assuming that MOX fuel is loaded in 2010, the four reactors would have a total of 54 operating years for use of MOX before expiration of their licenses. At a consumption rate of half a ton of plutonium per year per reactor, however, 68 years would be needed to consume 34 tons of plutonium.

⁸ Although the application was submitted on February 27, 2003, it was not placed on the NRC's public document retrieval system (ADAMS) until March 18, 2003.

assistance of Dr. Edwin Lyman, who is a qualified expert on the environmental impacts of using MOX fuel in nuclear power plants. As stated in his attached declaration, Dr. Lyman has agreed to provide testimony on Intervenor's behalf if the contention should be admitted. See attached Exhibit 2. The content of his testimony is summarized in the bases of NIRS Contentions 1.1.1 and 1.2.4, which were submitted to the ASLB on November 29, 2001.

Finally, while litigation of NIRS Contention 1 may broaden or delay this proceeding, such broadening or delay is not due to any lack of diligence on the Intervenor's part. NIRS attempted to litigate Contention 1 at the very outset of the proceeding, but was refused by the Commission. The Intervenor should not be penalized for raising the issue now, because this is the earliest point at which the Commission has indicated that consideration of the contention may be appropriate.

CONCLUSION

For the foregoing reasons, the ASLB should reinstate NIRS Contention 1.

Respectfully submitted,



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April 11, 2003

EXHIBIT 1

*A Duke Energy Company*

News Release

Feb. 27, 2003

DUKE ENERGY BEGINS REGULATORY PROCESS TO USE MOX FUEL

CHARLOTTE, N.C. – Duke Energy has begun the regulatory process to allow the corporation to place mixed oxide (MOX) fuel lead assemblies in one of its nuclear reactors. Today, Duke Energy submitted an application to the Nuclear Regulatory Commission asking for approval to use the lead assemblies.

MOX fuel is a mature technology in Europe where 35 reactors currently use the fuel to generate electricity. Applying the technology in the United States is a key element of the international program to dispose of surplus plutonium from nuclear weapons, and thereby reduce the risk of terrorist groups or rogue nations obtaining the material.

Duke Energy routinely conducts lead fuel assembly programs to support fuel design changes. "We plan to use four MOX fuel assemblies (out of 193 total fuel assemblies) in one of the McGuire or Catawba nuclear reactors beginning in 2005. This process is designed to confirm the acceptable fuel performance we have already seen in European reactors, and allow us to request regulatory approval for larger-scale use of MOX fuel beginning around 2008," says Steve Nesbit, MOX fuel project manager.

MOX fuel is a blend of about 95 percent uranium oxide (conventional nuclear fuel) and about 5 percent plutonium oxide. The MOX fuel will be used alongside conventional low enriched uranium fuel, as has been the practice in European reactors for more than two decades.

The MOX fuel program is part of an international initiative to reduce the stockpiles of weapon-grade plutonium in the United States and in Russia. The U.S. Department of Energy will convert 34 metric tons of plutonium from its weapons programs into nuclear fuel, while Russia does likewise with its own surplus plutonium. Duke Energy plans to use that MOX fuel at its McGuire Nuclear Station in Huntersville and its Catawba Nuclear Station in York, S.C.

"We are proud to be part of this program. In addition to supporting an important national security initiative, MOX fuel will provide McGuire and Catawba nuclear stations with a long-term, economical supply of nuclear fuel," says Nesbit.

Duke Energy is a diversified multinational energy company with an integrated network of energy assets and expertise. The company manages a dynamic portfolio of natural gas and electric supply, delivery and trading businesses – meeting the energy needs of customers throughout North America and in key markets around the world. Duke Energy, headquartered in Charlotte, N.C., is a Fortune 500 company traded on the New York Stock Exchange under the symbol DUK. More information about the company is available on the Internet at: www.duke-energy.com.

Contact Duke Power Media

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April 4, 2003

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

Docket No's. 50-369-LR, 50-370-LR,
50-413-LR, and 50-414-LR

DUKE ENERGY CORPORATION


ASLBP No. 02-794-01-LR

(McGuire Nuclear Station, Units 1 and 2,
Catawba Nuclear Station, Units 1 and 2)

**DECLARATION OF DR. EDWIN S. LYMAN
IN SUPPORT OF BREDL'S AND NIRS' REQUEST
FOR REINSTATEMENT OF NIRS CONTENTION 1**

Under penalty of perjury, Edwin S. Lyman declares as follows:

1. My name is Edwin S. Lyman. I am scientific director of the Nuclear Control Institute ("NCI"), is a non-proliferation research and advocacy organization located in Washington, D.C.
2. I am a qualified expert on nuclear safety issues. I hold a PhD, a master of science and a bachelor's degree in physics. For over eleven years, I have conducted research on security and environmental issues associated with the management of nuclear materials and the operation of nuclear power plants. I have published articles in journals and magazines, including *The Bulletin of the Atomic Scientist* and *Science and Global Security*. A copy of my resume, including a partial list of publications and invited speeches, is attached.
3. I am familiar with the licensing-related documents in this proceeding. I am also generally familiar with the design and operation of ice-condenser nuclear power plants. I assisted NIRS in preparing its Contentions 1.1.1 and 1.2.4, which NIRS submitted on November 29, 2001.
4. If NIRS Contention 1 is reinstated, I intend to provide expert testimony regarding the contention. The substantive elements of my testimony can be found in the basis statements for NIRS Contentions 1.1.1 and 1.2.4. The factual assertions in those contentions are true and correct to the best of my knowledge and belief, and the opinions expressed therein are based on my best professional judgment.


Edwin S. Lyman, Ph.D

Edwin Stuart Lyman
Curriculum Vitæ

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M.S., Cornell University, Physics, January 1990.
A.B., *summa cum laude*, New York University, Physics, June 1986; Phi Beta Kappa.

Professional Experience

June 2002-Present: President, Nuclear Control Institute, Washington, D.C.

July 1995-May 2002: Scientific Director, Nuclear Control Institute, Washington, D.C.

August 1992—June 1995: Postdoctoral research associate, Center for Energy and Environmental Studies, Princeton University, Princeton, NJ.

Spring 1995: Preceptor for Environmental Studies 302, "Perspectives on Environmental Issues: Values and Policies."

Spring 1994: Lecturer, Woodrow Wilson School. Preceptor for WWS 304, "Science, Technology and Public Policy."

July 1988—June 1992: Graduate research assistant, Newman Laboratory of Nuclear Studies, Cornell University, Ithaca, NY. Conducted thesis research on high-energy physics under the supervision of Prof. S.H.-H. Tye.

August 1986- June 1988: Andrew D. White Graduate Fellow, Physics, Cornell University.

Publications

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G. Bunn, C. Braun, A. Glaser, E. Lyman and F. Steinhausler, "Research Reactor Vulnerability to Terrorists," December 2002, submitted to *Science and Global Security*.

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E. Lyman, "Interim Storage Matrices for Excess Plutonium: Approaching the 'Spent Fuel Standard' Without the Use of Reactors," PU/CEES Report No. 286, Center for Energy and Environmental Studies, Princeton University, August 1994.

E. Lyman, "The Solubility of Plutonium in Glass," PU/CEES Report No. 275, Center for Energy and Environmental Studies, Princeton University, April 1993.

Selected Invited Talks

"U.S. Nonproliferation Policy, Plutonium Disposition and the Threat of Nuclear Terrorism," seminar on "Recycling Plutonium: Risks and Alternatives," sponsored by the Green Group, European Parliament, Brussels, Belgium, January 9, 2003.

"Current Status of the U.S. Plutonium Disposition Program," seminar, Princeton University Program on Science and Global Security, Princeton University, Princeton, NJ, June 12, 2002.

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"Addressing Safety Issues in the Sea Transport of Radioactive Materials," presentation to the Special Consultative Meeting of Entities Involved in the Marine Transport of Nuclear Materials Covered by the INF Code," International Maritime Organization, London, March 4-6, 1996.

"Prospects and Unsolved Issues for Plutonium Immobilization," INESAP/IANUS/UNIDIR Fissile Cutoff Workshop, Palais des Nations, Geneva, June 1995.

"An Intermediate Solution for Plutonium from Dismantled Nuclear Warheads," Annual Meeting of the German Physical Society, Berlin, Germany, March 1995.

"The Sea Transport of High-Level Radioactive Waste: Environmental and Health Concerns," Channel Islands International Conference on Nuclear Waste, St. Helier, Jersey, United Kingdom, January 1995.

Conference Papers

E. Lyman and A. Kuperman, "A Reevaluation of Physical Protection Standards for Irradiated HEU Fuel," 24th International Meeting on Reduced Enrichment for Research and Test Reactors, RERTR-2002, Bariloche, Argentina, November 2002.

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