

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Commissioners

February 27, 2002

)

In the Matter of )

)DUKE ENERGY CORPORATION ) Docket Nos. 50-369-LR,

) 50-370-LR,

McGuire Nuclear Station, Units 1 and 2 ) 50-413-LR, and

and ) 50-414-LR

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

\_\_\_\_\_)

This brief is filed by Blue Ridge Environmental Defense League, Inc. in response to the Nuclear Regulatory Commission's Memorandum and Order CLI-02-06.

Table of Contents

page

Part 1. Introduction and Summary of BREDL Recommendations 1

Part 2. NRC's Obligations Under the National Environmental Policy Act 3

Part 3. Risks of Terrorism at Commercial Nuclear Power Reactors 4

3A. Sabotage With Assistance from Individuals Within Power Plants 4

3B. Terrorist Attacks On Nuclear Plants and Fuel Storage Facilities 5

3C. Advanced Weapons Systems Are Widely Available 6

Part 4. Risks of Terrorism from Sabotage of Nuclear Fuel Shipments 8

4A. Re-Assessment of Nuclear Transport Regulations is Overdue 8

4B. Defense From Terrorist Attacks On Nuclear Waste Transports 8

- 4C. Risk of Terrorism and Sabotage From Plutonium Fuel Transportation 11
  - 4D. Emergency Response Problems 12
  - 4E. Nuclear Waste Transportation Secrecy versus Security in North Carolina 12
- 

### **Part 1. Introduction and Summary of BREDL Recommendations**

The Blue Ridge Environmental Defense League believes that the US Nuclear Regulatory Commission is falling far short of meeting its responsibilities under the National Environmental Policy Act. Although BREDL appreciates the opportunity to submit briefs on terrorism and security issues and NRC responsibilities, BREDL recommends that every community affected by the location of nuclear power plants within its jurisdiction, every community affected by the potential transport of irradiated fuel from nuclear plants to the proposed Yucca Mountain dump site, every community affected by the proposed shipment of plutonium to the proposed Savannah River Site plutonium fuel factory, and every community affected by the plutonium fuel transport to targeted reactors must have a formal opportunity to informational meetings, public comment, and public hearings. An in-house, even inter-agency, top to bottom review of terrorism and security issues which fails to involve state governments, local governments, and the concerned public does not meet the requirements of the National Environmental Policy Act. BREDL has concerns that assessments and studies will be done in secret and that the results will be hidden behind labels of confidentiality or national security.

The February 6, 2002 request by the NRC for briefs on security and terrorism issues and NEPA responsibility falls far short of the Commission's responsibilities under NEPA to elicit, receive, and assess input, information, and recommendations from affected state governments, affected local governments, concerned organizations, and concerned individuals. The February 6<sup>th</sup> order gives opportunities to submit briefs and supporting information only to those corporations and organizations that happen to have legal proceedings before the Commission. These entities may or may not be representative of the licensees, communities, and other parties which may be capable of providing the best guidance to the Commission on terrorism and security threats. The NRC must do more under the National Environmental Policy Act than examine snapshots of local and regional situations; the NRC must initiate a broad-based and truly inclusive call for state government, local government, and public involvement in the assessment of terrorism and security threats and solicit recommendations and plans for protection of affected communities throughout the nation.

Careful assessment and reflection on the US NRC's obligations under the NEPA regarding issues of terrorism and security lead our organization to the following recommendations:

US NRC must request from every state government a top to bottom analysis of terrorism threats and security risks at all nuclear plants within state boundaries.

US NRC must request from every state government a top to bottom analysis of terrorism threats and security risks from operating nuclear power plants in adjacent states which may have adverse effects on communities across state lines.

US NRC must request that all state governments submit detailed analyses of security risks and terrorist threats for all communities targeted for shipments from nuclear power plants to the proposed repository at Yucca Mountain, Nevada. The Commission should accept Nevada's petition for rulemaking on the protection of irradiated nuclear fuel shipments from domestic and foreign terrorists. The Commission must account for risks posed by new advanced weaponry on transport casks and the inherent weakness of larger casks.

US NRC must request from all affected local governments and multi-county government entities a top to bottom analysis of terrorism threats and security risks at all nuclear plants within their boundaries, from operating nuclear power plants in adjacent states which may have adverse effects on communities across state lines, and communities targeted for shipments from nuclear power plants to the proposed repository at Yucca Mountain, Nevada.

In order to achieve the first four objectives, the US NRC should promulgate a guidance document for state and local governments which includes recommendations for public notification, public comment opportunities, and public hearings.

Under its NEPA obligations the US NRC must not fail to identify specific vulnerabilities and, indeed, probable targets among the nation's nuclear power plants. Because of their eggshell containment structures, the nine ice condenser reactors currently operating in the United States must receive special consideration with regard to protection from potential terrorist attacks and additional security analyses. At the Duke Power McGuire and Catawba nuclear stations, four reactors are operating with the especially vulnerable ice condenser system and with only three feet of concrete containment.

Under its NEPA obligation the NRC cannot fail to fully assess the added target value and explosive impact of the proposed use of plutonium oxide fuel at the Catawba and McGuire reactors. Because these four reactors are currently the only ones in the nation being considered for plutonium fuel, the NRC must add the vulnerabilities of the ice condenser system to the special attractiveness of a more devastating impact of radiation from the fuel, both for use in the reactor and for irradiated fuel storage at the two nuclear stations.

Charlotte is the nation's second largest banking and financial center. The McGuire and Catawba plants operate within twenty miles of this urban center. The NRC must consider the attractiveness to terrorist organizations and countries of this important banking, insurance, and financial mecca.

Even though evacuation plans and neighboring development cannot be considered in the overly structured license extension proceedings, the NRC must not fail to evaluate, in a thorough analysis of terrorism and security impacts, the extraordinarily dense and growing development around Lake Norman at the McGuire reactors and Lake Wylie at the Catawba reactors. More than 100,000 people would have to be evacuated in the event of a terrorist assault from the McGuire reactor area on a tow lane road. Crescent, a subsidiary of Duke, is proceeding with a new 4,000 home development around the Catawba reactors and Lake Wylie. The NRC must evaluate whether Duke is exerting political influence over North Carolina and South Carolina government officials to block federal assistance with programs such as the provision of potassium iodide to reactor neighbors.

## **Part 2. NRC's Obligations Under the National Environmental Policy Act**

The National Environmental Policy Act of 1969 states Congress' legislative intent in terms of fundamental constitutional principles. Further, it specifies that federal agencies carry out its mandate in cooperation with state and local governments and public and private organizations.

“The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological

advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” (NEPA TITLE I Sec. 101 [42 USC § 4331](a). [emphasis added]

NEPA requires that agencies approving major federal actions assess them fully including any unavoidable environmental impacts caused by the action.

“All agencies of the Federal Government shall include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on: (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.” (Sec. 102 [42 USC § 4332](2)(C) ) [emphasis added]

Terrorist activity cannot be avoided. Therefore, to comply with the law, the NRC must develop a “detailed statement” on the impacts of terrorist acts upon both operating reactors and on the transport of irradiated and fresh fuels, including plutonium fuel slated for use in McGuire and Catawba, before granting a license extension.

### **Part 3. Risks of Terrorism at Commercial Nuclear Power Reactors**

#### **3A. Sabotage With Assistance from Individuals Within Power Plants**

Federal regulations rely on three techniques, background investigations, psychological assessments, and behavioral observations, to prevent unreliable individuals from gaining access to nuclear facilities. But the existing regulatory regime fails to protect the public.

Last year the Union of Concerned Scientists completed a review of 7,327 daily event reports and hundreds of thousands of fitness-for-duty statistics compiled by the NRC from reports submitted by plant owners. The UCS's investigations reveal unchecked dangers from sabotage by “knowledgeable individuals” working inside commercial reactors. Referring to background investigations, psychological assessments, and behavioral observations, Dave Lochbaum stated, “[T]wo of only three elements protecting the American public from radiological sabotage by insiders are totally useless while the third element is seriously impaired” (Letter to Glenn Tracy, Office of Nuclear Reactor Regulation, November 29, 2001) (BREDL Attachment A).

The snail's pace of the NRC with regard to its review of nuclear reactor security post-September 11 would be understandable if it meant the investigation was reaching out to state and local government agencies and non-governmental organizations. But old habits die hard. The NRC is shutting down access to information in a belated and misguided attempt to keep a lid on public knowledge about genuine security problems.

### 3B. Terrorist Attacks On Nuclear Plants and Fuel Storage Facilities

Nearly half of all US nuclear power plants subjected to tests failed to repel mock terrorist attacks. These exercises, overseen by the NRC, were severely limited in the types of weapons and tactics which were employed by the attackers. Paul Leventhal, President of the Nuclear Control Institute, addressed the existing problem at a recent national symposium on nuclear reactor security issues:

“The immediate danger is underscored by the fact by that prior to September 11, nearly half of the nuclear plants tested in NRC-supervised security exercises have failed to repel mock terrorist attacks---indeed 7 out of 11 plants failed exercises run since the beginning of 2000. These exercises involve a small number of simulated attackers compared with the 19 terrorists who waged the four sophisticated, coordinated attacks of September 11. The NRC’s mock terrorist exercises also severely limit the tactics, weapons and explosives used by the adversary; yet in almost half the tests they reached and simulated destruction of safety systems that in real attacks could have caused severe core damage, meltdown and catastrophic radioactive releases.” (Paul Leventhal, Keynote speech, BREDL Nuclear Insecurity Conference, Charlotte, NC, February 8, 2002) (BREDL Attachment D)

Prior to September 11, 2001, preparations for defense from attacks on nuclear power stations made certain assumptions regarding the nature and sophistication of the attack and the intent and experience of the assailant.

Robert Jefferson, an engineer and nuclear power industry consultant, managed Sandia National Laboratories’ Transportation Technology Center from 1975 to 1985 during tests of nuclear fuel transport casks. In testimony before the Office of Administrative Hearings in Minnesota on Northern States Power’s proposal for dry-cask irradiated fuel storage at its Prairie Island nuclear power station, Mr. Jefferson answered questions about those tests. He said that bulk explosives and shaped charges were used at Sandia and that a 4,000 pound explosive called ANFO resulted in destruction of the cask. He described ANFO as “a popular low-grade terrorist explosive.” (Minnesota OAH Docket No. E-002/CN-91-19, November 25, 1991, page 8) (BREDL Attachment E ).

Mr. Jefferson testified that shaped charges did penetrate the cask and that the results of these tests were published in the open literature, not classified as were many of the tests conducted at that time. The tests resulted in damage to fuel rods, also called pins. He said:

“When we did the test, penetrating the cask, the only fuel pins (rods) that were disrupted were those that were in the path of the jet that penetrated the cask. ... There is some subsequent damage to surrounding pins from expansion, but that damage was not disrupt -- totally disruptive in damage, it bent pins and, in a few cases, it broke cladding. Even if you do that, the amount of uranium that would be exposed to sufficient quantities of air to burn would be very, very small, and it takes temperatures on the order of 5,000 degrees Fahrenheit to burn uranium. The magnesium is indeed that hot.” (Minnesota OAH Docket No. E-002/CN-91-19, November 25, 1991, pages 17-18)

In the 1980’s Sandia subjected transport casks to M-3A1 platter charges, originally used during World War II and designed to “blow holes in concrete structures” (op. cit.). Mr. Jefferson testified that the types and availability of military and commercial explosives tested while he was at Sandia have changed a great deal since then.

Mr. Jefferson was familiar with weapons used during the Gulf War which utilized a uranium projectile behind a shaped charge propelled by a rocket. He stated that Sandia had not conducted tests using this type of weapon, arguing that it was beyond the means of most terrorists. He testified:

“When I say ‘most terrorists,’ I am excluding what are generally called to be national level terrorists, in other words, those who are backed by some government somewhere.” (Minnesota OAH Docket No. E-002/CN-91-19, November 25, 1991, page 14) (BREDL Attachment E ).

However, under continued questioning by Sandi Zellmer, the attorney representing the Prairie Island Mdewakanton Sioux Indian Community, Mr. Jefferson explained how a modern-day terrorist might actually use sophisticated means to breach the containment of a nuclear waste cask:

Zellmer: “A modern-day terrorist could use more than one commercial explosive on a single cask, couldn’t they?”

Jefferson: “They would have to be quite sophisticated. In order to assure proper placement, proper geometry, you would have to have very accurate timing.”

Zellmer: “A modern-day terrorist could certainly use a second device and a timer, couldn’t they?”

Jefferson: “It depends on the capabilities of the terrorist. If you are talking about a state-supported terrorist, that’s perhaps possible.”

(Minnesota OAH Docket No. E-002/CN-91-19, November 25, 1991, page 26) (BREDL Attachment E ).

### 3C. Advanced Weapons Systems Are Widely Available

A vast amount of information about high explosive weapons able to pierce armor plate is easy to find. Public libraries have copies of *Jane’s Weapon Systems* which is published in England. *Jane’s* carries photos, technical details, histories, and firing procedures for many types of weapons; for example, the High Explosive Anti-Tank Round, or HEAT, which weighs only a few pounds and is launched with a shoulder-fired recoilless gun. The shell velocity is 18,000 feet/second, in excess of 12,000 miles per hour, which gives the weapon much of its penetrating ability: ten inches of armor plate.

According to *Jane’s*, another weapon, the RPG-7, “is the standard man-portable short range anti-tank weapon of the former Warsaw Pact countries and their allies. It has had wide operational use in several wars since it was introduced in 1962 and despite its unconventional appearance it is an effective and efficient weapon.” (*Janes Weapon Systems*, Nineteenth Edition, 1988-89.) *Jane’s* National Inventories listing shows that the RPG-7 is available in many nations including Somalia, Lebanon, Serbia, Cuba, Syria, North Korea, Libya, Iran, and Iraq.

An advertisement in *Jane’s* by Euromissile, a German-French company, touts the “lightweight multipurpose assault weapon, the M72-E Series. ... In order to defeat heavy armor, the M72-E4 penetration capability has been enhanced to a minimum of 330 mm (13 inches). ... 300,000 missiles have now been sold to more than 40 countries and have been widely proven in combat.”

What this reveals is that, subsequent to the terrible events of September 11, previous assumptions about unsophisticated terrorist actions are completely inadequate. Acts of terror by armed national or state-sponsored groups must now form the basis of NRC's complete re-evaluation of security at nuclear power plants. Paul Leventhal again offers insight into the gravity of the problem which confronts the NRC and the nuclear industry:

“When President Bush disclosed in his State of the Union address that ‘diagrams of American nuclear power plants’ have been found among the items left by terrorists in Afghanistan, the President was sending a clear message to the American people that in the aftermath of the 9/11 attacks on the World Trade Center and the Pentagon, the 103 power reactors in this country are also potential targets for attack.”

“Only two days later the message was made even clearer. CNN disclosed that the operators of each of these plants had received an advisory from the Nuclear Regulatory Commission that ‘an al Qaeda senior operative...stated there would be a second airline attack in the U.S. The attack was already planned and three individuals were on the ground in the states recruiting non-Arabs to take part in the attack. The plan is to fly a commercial aircraft into a nuclear power plant to be chosen by the team on the ground.’ A high-level FBI source later told CNN that the threat ‘could not be verified, substantiated or dismissed.’ A spokesman for the Office of Homeland Security at the White House put it differently. ‘That information is uncorroborated,’ he said, but added that even if the threat could be discounted, ‘the continuing threat (to nuclear power plants) is still real.’

(Paul Leventhal, Keynote speech, BREDL Nuclear Insecurity Conference, Charlotte, NC, February 8, 2002, op. cit.)

US NRC must request from all state and local governments and other government entities a top to bottom analysis of terrorism threats and security risks at all nuclear plants within their boundaries and from operating nuclear power plants in adjacent states. Also, the NRC should promulgate a guidance document for state and local governments which includes recommendations for public notification, public comment opportunities, and public hearings.

#### **Part 4. Risks of Terrorism from Sabotage of Nuclear Fuel Shipments**

##### **4A. Re-Assessment of Nuclear Transport Regulations is Overdue**

On June 22, 1999 the State of Nevada petitioned the Nuclear Regulatory Commission to amend outdated regulations governing safeguards for shipments of irradiated nuclear fuel against sabotage and terrorism. Nevada's Attorney General cited 5 U.S.C. § 553 and 10 C.F.R. 2.800-804 as giving NRC authority to act on this matter. Frankie Sue del Papa, Attorney General for the State of Nevada said:

“It has been nearly two decades since the Commission reviewed its regulations designed to ensure the physical protection of spent nuclear fuel shipments. It is imperative that the Commission factor into its regulations the changing nature of threats posed by domestic terrorists, the increased availability of advanced weaponry and the greater vulnerability of larger shipping casks traveling across the country.” (Letter to NRC Chairwoman Jackson, June 22, 1999, Attachment B)

The regulations in need of amendment cited by Nevada are: 1) Design Basis Threat: “Radiological Sabotage” [10 C.F.R. 73.1(a)(1)]; 2) Definitions: “Radiological Sabotage” [10 C.F.R.

73.2]; 3) General Requirements: Advance Approval of Routes [10 C.F.R. 73.37(b)(7)]; 4) General Requirements: Planning and Scheduling [10 C.F.R. 73.37(b)(8)]; 5) Shipments by Road [10 C.F.R. 73.37(c)]; and 6) Shipments by Rail [10 C.F.R. 73.37(d)]. The petition further requested that NRC conduct a comprehensive assessment of the consequences of terrorist attacks and radiological sabotage on nuclear waste shipment casks involving capture of nuclear waste shipments, the use of high energy explosives on a cask, and direct attacks upon nuclear waste shipments using antitank missiles or other military weapons. (Nevada Petition, Attachment C)

Much has changed in a generation: new vehicles, new weapons, and new threats. Why has the petition from the State of Nevada languished for over two years? The request should serve as a wake up call for the NRC to overhaul regulations meant to protect the public from harmful radiation exposure. We hereby recommend that the NRC use its authority to implement Nevada's petition.

#### 4B. Defense From Terrorist Attacks On Nuclear Waste Transports: A Gordian Knot

Our review of incidents of rail and highway sabotage reveal that: 1) terrorist attacks would likely be designed to inflict maximum human injury, 2) electronic warning systems designed to alert officials and prevent accidents can be defeated by technical countermeasures, 3) effective attacks using home made explosives are possible, avoiding the need for exotic military weapons to breach transport containers, and 4) saboteurs have the ability to create damage which exceeds the containment standards of NRC certified shipping containers. A study done for the state of Nevada corroborates this finding:

“The willingness of terrorists to kill or injure large numbers of Americans, demonstrated in the World Trade Center and Oklahoma City bombings, compels any current assessment to focus on incidents that are clearly intended to cause, or could cause, radiological sabotage. The FBI's Terrorism in the United States: 1995 reported: ‘In the past year, the country witnessed the re-emergence of spectacular terrorism with the Oklahoma City bombing. Large-scale attacks designed to inflict mass casualties appear to be a new terrorist method in the United States.’” (Nuclear Waste Transportation Security and Safety Issues: The Risk of Terrorism and Sabotage Against Repository Shipments, Halstead and Ballard, December 1998) (BREDL Attachment F)

Halstead and Ballard state that risk assessments must consider direct attacks on transport casks using high energy explosive devices with or without capture of the shipments. Capture and control of the cask by terrorist agents would allow the cask to be breached with a variety of devices including commercially available conical shaped charges and cutting charges, or a massive diesel fuel-fertilizer truck bomb. Attackers may use transport personnel as hostages to retain control of the cask for hours. With the time gained, attackers could increase the effect of explosives by removing barriers and applying them to the most vulnerable part of the cask. A GA 4 truck cask with four PWR conventional fuel assemblies would contain 850,000 curies. The NAS-TSC rail cask with 26 assemblies would hold 5.5 million curies.

“A terrorist incident resulting in a one percent release of cask contents would have radiological consequences far greater than those assumed in the outdated DOE and NRC consequence assessments.” (Nuclear Waste Transportation Security and Safety Issues: The Risk of Terrorism and Sabotage Against Repository Shipments, Halstead and Ballard, December 1998)

Full scale tests by Sandia National Laboratory published in 1983 utilized a military shaped charge (US Army M3A1) on a GE IF-200 truck cask containing un-irradiated fuel. Even this



outdated test demonstrated that the cask could be breached and that radioactive materials would be released. Incredibly, NRC proposed relaxed rules for shipments in 1984, but public criticism caused the rulemaking to be terminated.

### Sandia Full-Scale Test Results

Hole diameter	6.0 inches (15.2 cm)	
Fuel rods damaged	111 of 223	50%
Fuel mass fractured	45.8 pounds (20.82 kg)	10%
Fuel mass released	5.6 pounds (2.55 kg)	1%
Released as aerosol	1/10 ounce (2.94 grams)	

Table 1: Shipping Cask Shell Materials and Thicknesses

tons, opposed by the Association of American Railroads because it exceeds the maximum weight limit for universal railcar interchange. Table 6 summarizes available information on current and proposed cask shell materials and thicknesses.

Table 6

Shipping Cask Shell Materials and Thicknesses(Inches)

Shell Materials	NSF-4	GA-4	GA-9	NAC-TSC	Lg MPC	Sm MPC
Containment: Stainless Steel	1.73	2	2.13	4.1	5.25	4.38
Gamma Shield: Lead	6.6			3.7	0.5	0.5
Gamma Shield: Depleted Uranium		2.63	2.45		1.5	1.5
Neutron Shield: Borated Water	4.5					
Neutron Shield: Borated Polypropylene		4.5	3.5	5.5	6	4
<b>Total Thickness</b>	<b>12.86</b>	<b>9.13</b>	<b>8.08</b>	<b>13.3</b>	<b>13.25</b>	<b>10.38</b>

Source: Calculated from References 27 and 53

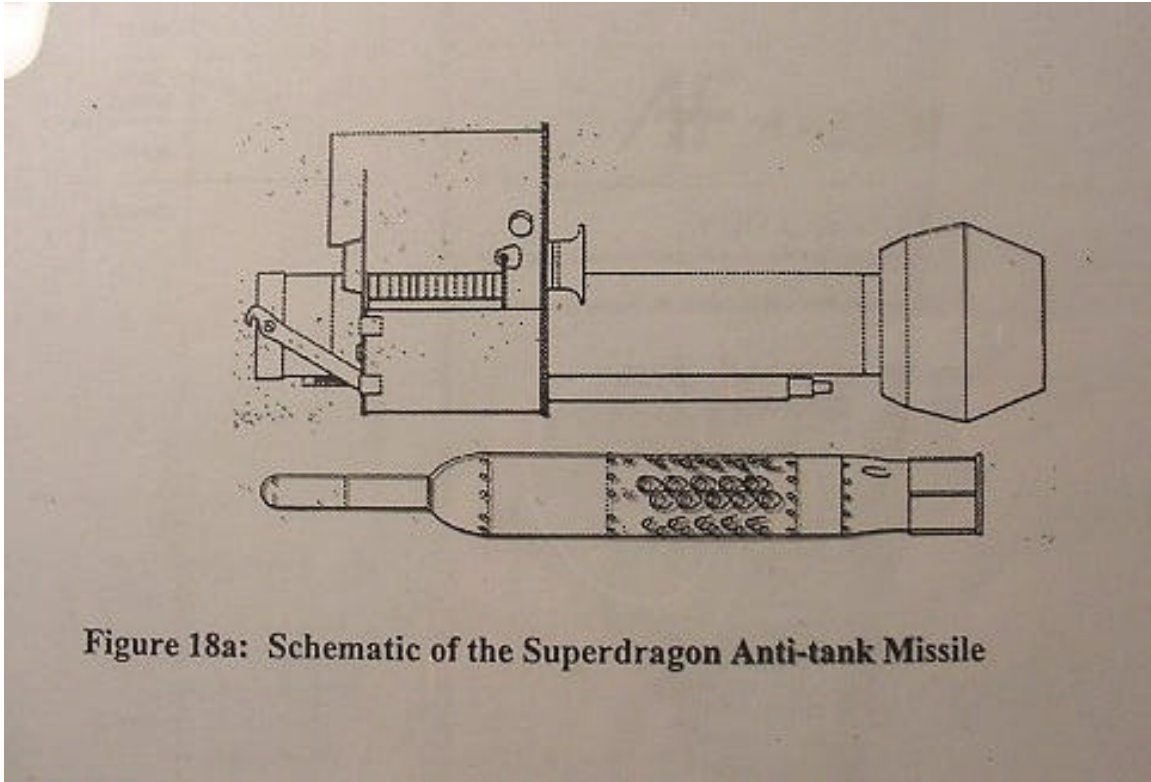
*From Nuclear Waste Transportation Security and Safety Issues: The Risk of Terrorism and Sabotage Against Repository Shipments, Halstead and Ballard, December 1998, page 64*

Total transport cask shell thicknesses range from 8.08 inches to 13.3 inches including the steel, lead, uranium, water, and polypropylene layers. Current weapons, such as the Superdragon anti-tank missile, (figure A) are more powerful and can penetrate 18 inches of armor plate. This weapon was used by the U.S. in Operation Desert Storm, and is used by at least ten other nations. The release of even more toxic radioactive elements would cause more fatalities immediately following an accident. Lindsay Audin's analysis of fuel rod behavior during incidents involving sabotage explains how much greater amounts of fine particles and vapors would be released from a conventional irradiated fuel cask.

"An attempt to disperse the fuel would likely involve a high explosive device that must first penetrate a transport cask. Such a device would penetrate one or both sides of the cask, shatter the fuel rods and pellets in its path, and heat the area along that path. The shock and heat involved would...initiate several processes not normally experienced by uranium dioxide and zirconium alloy. At high temperatures in the presence of oxygen, both materials will change form. Uranium dioxide  $UO_2$  will "reoxidize" and become  $U_3O_8$ ...expanding and forming a very fine powder in the process. Zirconium will literally ignite, vaporizing itself.... The fuel pellets may also shatter back to the consistency of the uranium powder involved in their manufacture. Ruthenium will vaporize and combine with oxygen to form minute particles, while other elements, such as iodine, will be released as

gases.” (Analyses of Cask Sabotage Involving Portable Explosives: A Critique, Lindsay Audin, 1989) (BREDL Attachment G)

**Figure A. Superdragon Anti-Tank Missile**



**Figure 18a: Schematic of the Superdragon Anti-tank Missile**

From Nuclear Waste Transportation Security and Safety Issues: The Risk of Terrorism and Sabotage Against Repository Shipments, Halstead and Ballard, December 1998, page 57

At a minimum, the NRC must request that all state and local governments submit detailed analyses of security risks and terrorist threats for all communities targeted for shipments from nuclear power plants to the proposed repository at Yucca Mountain, Nevada.

#### 4C. Risk of Terrorism and Sabotage From Plutonium Fuel Transportation

Plutonium oxide fuel would be particularly valuable target. The transport of the plutonium from existing DOE and DOD facilities to the Savannah River Site and then to reactor sites would add to the risk of accidental release of radiation. The US Department of Energy's mixed oxide fuel program would transport plutonium from Defense Department sites to South Carolina for fuel fabrication. From Savannah River 33 tons of plutonium in un-irradiated mixed oxide fuel would be transported across hundreds of miles of isolated countryside to utility reactors in North Carolina and South Carolina. This overland transport link presents a unique opportunity to those who might intercept and divert the fuel for weapons use. The freshly fabricated fuel rod assemblies would be the most desirable form for groups who would go after the plutonium for unlawful use in their own explosive devices. DOE admits this vulnerability: "...the un-irradiated fuel contains large quantities of plutonium and is not sufficiently radioactive to create a self-protecting barrier to deter the material from theft..."(Revised Conceptual Designs for the FMDP Fresh MOX Fuel Transport Package, Ludwig et al, ORNL/TM-13574, March 1998)

The risks of deliberate diversion and/or destruction of a fresh nuclear fuel or irradiated waste transport cask are increased by plutonium fuel. Higher actinide inventories increase the public health risks. The strategic value of plutonium oxide for new weapons increases the threat of diversion. Under its NEPA obligation the NRC must fully assess the added target value and explosive impact of the proposed transport of plutonium oxide fuel to the Catawba and McGuire reactors.

#### 4D. Emergency Response Problems

Emergency response to rail or highway accidents must be well-prepared and rapid. Delays in response to accidents which involve the release of radioactive material would expose unknown numbers of people to negative health effects. In 1996, a DOE Transport and Safeguards Division Safe Secure Transport (SST) trailer carrying nuclear weapons slid off the road and rolled over in rural Nebraska. Four hours elapsed before DOE headquarters were notified, and it was 20 hours before a Radiological Assistance Program team determined there was no release. A similar delay in response to a MOX fuel accident could make effective emergency response dangerous and clean-up impossible. The following comment by the Georgia Environmental Protection Division cites vehicular tests of powdered materials deposited on roadways and takes issue with the DOE's approach to emergency response to accidental plutonium fuel releases.

“After passage of about 100 cars only a small fraction of the original contamination remained on the road surface. Unless emergency officials promptly close the accident scene to vehicle traffic (an unlikely situation), emergency responders may face an incident scene that is, unknown to them, extremely hazardous due to respirable plutonium. Post emergency actions may also be complicated due to the enhanced spread of contamination by vehicle traffic.” (Georgia Environmental Protection Division comments on DOE SPD DEIS)

#### 4E. Nuclear Waste Transportation Secrecy versus Security in North Carolina

On October 19, 1995 The French-flagged freighter Bouguenais arrived in North Carolina with a cargo of 99 irradiated fuel rods containing 10.63 kg of U-235 from research reactors in Switzerland and Greece and an unknown amount of plutonium and glassified radioactive wastes. Its port of call was the Military Ocean Terminal at Sunny Point; the wastes ultimate destination was the Savannah River Site in South Carolina, requiring rail transport.

The Foreign Research Reactor Spent Nuclear Fuel program provided the Blue Ridge Environmental Defense League and our allies with an opportunity to expose a nuclear myth. The government's concealment of this transport of bomb-grade nuclear materials was primarily an attempt to shield the shipment from public view. The firestorm of publicity ignited by our campaign forced elected officials charged with protection of public health to take measures to provide adequate security.

The Governor of North Carolina responded with 40 radiation specialists, scores of highway patrolmen, the State Bureau of Investigation, and a helicopter to accompany the nuclear waste trains. The elaborate preparations for accidents underscores the true dangers represented by the transportation of nuclear waste.

Exposing these strategically valuable materials to shipment on the high seas and across isolated stretches of railroad presented would-be saboteurs, thieves, and terrorists with thousands of miles of opportunities for mayhem. We demonstrated that anyone so inclined can easily track

these shipments. "This just goes to show that any terrorist who can afford a pair of binoculars and a plane ticket could know their every move," said Janet M. Hoyle, BREDL's Executive Director. Jim Guisti, DOE-Savannah River spokesman, labeled BREDL's actions a "needless breach of security." (Winston-Salem Journal, October 20, 1995). But the publicity generated by our campaign did not make sabotage more likely. On the contrary, the increased surveillance and precautions taken by state officials were a direct result of the high media profile.

The DOE's experience with foreign research reactor fuel shipments has not been utilized. Additional security costs for the single shipment amounted to \$77,000 in North Carolina alone. The cost of security must also be a part of NRC's top to bottom review of nuclear transportation.

For Blue Ridge Environmental Defense League

---

Janet Marsh Zeller, Executive Director

---

Louis Zeller, Southern Anti-Plutonium Campaign Coordinator

Dated at Glendale Springs, NC

February \_\_\_\_, 2002

Electronic copy e-mailed February 27, 2002