

BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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June 15, 1999

United States Department of Energy Office of Fissile Materials Disposition Washington, DC

Re: Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement

My name is Louis Zeller. I am on the staff of the Blue Ridge Environmental Defense League where I have studied and commented on nuclear issues since 1986. I have read the documents provided by the DOE including the Supplement Draft SPD EIS, Appendices K & M, the Environmental Synopsis, and materials from the Nuclear Regulatory Commission and others.

We oppose the use of plutonium fuel in commercial power reactors. The planned use of mixed oxide, or MOX fuel, in the reactors operated by Duke Power and Virginia Power sets a dangerous precedent in the nuclear industry by needlessly exposing many people to the risk of additional radiation exposure from a plutonium fuel-powered plant accident. Safety hazards in nuclear plants are a combination of human and technical errors. Both types of error are noted in the Nuclear Regulatory Commission's most recent Plant Performance Review of the McGuire, Catawba, and North Anna reactors. The nuclear dice are loaded because of the inherent hazards in these plants. DOE will be engaging in a crap shoot if it moves forward with the MOX plan.

First, I must say that the DOE's Environmental Synopsis is at least two steps removed from the original data which the DOE required offerers to submit in its Request For Proposal (#DE-RP02-98CH10888). Third-hand information does not provide a sufficient level of detail required for a thorough independent analysis. I hereby request that DOE make all information on the MOX project submitted by DCS (Duke Engineering & Services, COGEMA Inc., and Stone & Webster) available for review to members of the affected public. Also, I request that the data be provided before the close of the written public comment period. These data include:

- DOE's Environmental Critique
- DCS environmental data and analyses for design, licensing, construction, operation, and eventual decontamination and decommissioning of a MOX facility,
- DCS environmental data and analyses for irradiation of MOX fuel in existing domestic, commercial reactors,
- DOE projections of populations surrounding the proposed reactor sites and evaluations of air dispersal patterns,
- Oak Ridge National Laboratory data on the expected radionuclide activities in MOX fuel compared to that in low enriched uranium fuel used in reactor accident analyses, and
- DCS data used in computer models for determining radiation doses from normal operations and accident scenarios.

Second, the Environmental Synopsis contains an NRC Systematic Assessment of Licensee Performance (page 4) for the Catawba, McGuire, and North Anna nuclear power stations. The SALP rates the reactors as good to superior. However, the Nuclear Regulatory Commission has suspended the SALP program in favor of Plant Performance Reviews.

Esse quam videre

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Alternatives

DOE acknowledges the commentator's opposition to the use of weapons-grade plutonium in MOX fuel and irradiating it in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel. There would be no expected releases of plutonium from the proposed reactors occurring from normal operating conditions. Furthermore, annual doses to an MEI at each of the plants are estimated to be small—i.e., McGuire, 0.31 mrem; Catawba, 0.73 mrem; and North Anna, 0.37 mrem. All of these doses fall within stringent NRC 10 CFR 20 and 10 CFR 50 regulatory requirements and are much lower than radiation annually received from natural background sources.

This SPD EIS also analyzed several reactor accidents, including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. Both of these accidents have an extremely low probability of occurrence. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

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PPR's were completed in March 1999 for these reactors and rate all three merely "acceptable." The PPR's note shortcomings in ice condenser maintenance and inspection in McGuire and Catawba reactors and corrosion of service water pipes and auxiliary feedwater pipes (the only source of water for steam generators when the main feedwater system fails), and examples of poor engineering performance at North Anna and Catawba.

McGuire NRC Plant Performance Review, March 25, 1999

These Duke Power plants in North Carolina began operation in 1981 and 1983. The following excerpts are from the NRC's PPR:

"...shortcomings in oversight of diesel generator vendors were noted."

"Several human performance errors during routine plant evolutions were identified..."

"Minor program and procedure problems still indicate room for improvement. In addition to core inspections, a regional initiative inspection is planned for ice condenser inspections during the Unit 2 refueling..."

"An area for improvement was engineering programs and processes such as ... procedures and work instructions for maintenance and calibration of instrumentation..."

"... some fire protection system maintenance material conditions weaknesses have been noted..."

"Self-identified problems with fire barrier penetration seals were reported to the NRC and improvements are being made."

Catawba NRC Plant Performance Review, March 25, 1999

These Duke Power reactors began operation in 1985 and 1986. The following excerpts are from the NRC's PPR:

"Unit 1 experienced a forced outage of approximately three weeks in duration due to blocked flow channels in portions of the ice condenser."

"Engineering performance continued to be acceptable but declined since the last assessment as a result of emergent issues rooted in shortcomings in engineering's performance."

"Examples of poorly supported or non-conservative operability or root cause determinations were noted."

"Problems in maintenance programs and processes included examples of surveillance deficiencies for ventilation systems and ice condensers."

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Section 4.28 was revised to include information on the latest Plant Performance Reviews for each reactor. This information was not available at the time the Environmental Synopsis was prepared. As noted by the commentor, the reactor operations at each of the plants were assessed by NRC to be acceptable. (In 1999, NRC began to perform plant performance reviews instead of the systematic assessments of licensee performance. At that time, NRC changed its rating system from adjectives of acceptable, good or superior, to one of acceptable or unacceptable.)

While it is acknowledged that there were shortcomings at the proposed reactors noted in NRC's Plant Performance Reviews, these shortcomings have been evaluated and corrective actions are in place to avoid future concerns. As part of the plants' continuous improvement programs, the results of NRC reviews, and other evaluations, audits and inspections are continuously reviewed and used to improve plant performance.

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General SPD EIS and NEPA Process

The SPD Final EIS was not issued until specific reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4.

With regard to the information requested, all of the Environmental Critique information is included in the Environmental Synopsis in Appendix P. The

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"The engineering performance decline was the result of deficiencies in auxiliary building ventilation system testing, an overheating event of the upper surge tank, and degraded conditions in the Unit 1 ice condenser. While the issues were ultimately resolved properly, each had roots in poor engineering performance."

North Anna NRC Plant Performance Review, March 24, 1999

The North Anna reactors operated by Virginia Electric and Power Company started up in 1978 and 1980. The following excerpts are from the NRC's PPR:

"...several examples of inadequate or untimely problem resolution were noted."

"A number of human performance problems, especially during refueling outages, indicates a decline in operations performance during infrequently performed evolutions."

"...poor material conditions of the auxiliary feedwater pipe tunnels and continued problems with microbiological induced corrosion in the service water system,..."

"...however a negative trend was noted in the area of problem resolution. There were performance-based examples of inadequate corrective actions where equipment problems were not aggressively pursued and corrected. The initial proposed corrective action for a violation involving pipe supports not installed in accordance with the drawings was inadequate. Only after NRC involvement was adequate corrective action initiated. Corrective actions to resolve corrosion of the auxiliary feedwater tunnel pipe supports which had been identified in September 1996 were also inadequate. An AFW safety system engineering inspection (SSEI) conducted in July 1998 concluded that the system met the design basis requirements, however, mechanical calculations had numerous discrepancies."

The Department of Energy's selection of DCS and the planned utilization of Virginia Power and Duke Power reactors must be opened to full public scrutiny. Are these the best reactors in the nation? If so, the MOX program is already on shaky ground. Additional information is required to fully assess the safety of this program.

Finally, please consider additional public hearings in the vicinity of the three reactor sites before closing the public comment period. I enclose as part of my testimony a videotape of speakers who attended a grassroots-sponsored People's Hearing in Charlotte, NC on February 22, 1999. Please include their remarks in your decision-making.

Thank you for the opportunity to present these remarks today. We plan to submit additional information before the end of the comment period.

Respectfully submitted,


Louis Zeller

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projections of population around each of the reactor sites are included in Appendix K along with a comparison of the amount of each radionuclide in MOX fuel versus LEU fuel. The data used in determining doses from normal operation is discussed in Sections 3.7 and 4.28 and can be found in publicly available Final Safety Analysis Reports published by Duke Power and Virginia Power and referenced in this SPD EIS. Additional data can be found in the *MOX Fuel Fabrication Facility and Nuclear Power Reactor Data Report* (DOE/MD-0015, August 1999). This report is available by contacting DOE through its Web site at <http://www.doe-md.com>, by phone or fax at 1-800-820-5156, or through DOE's public reading rooms.

Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include detailed environmental information submitted by DCS and the reactor plant operators as part of their license applications. The fabrication of MOX fuel and its use in commercial reactors has been accomplished in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD and the community near the proposed MOX facility would be able to submit comments during the 10 CFR 70 licensing process.

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General SPD EIS and NEPA Process

DOE acknowledges the commentor's request for additional hearings in the vicinity of the proposed reactor sites. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional

Comment Documents and Responses on the Supplement—North Carolina

representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. As stated in response DCR005-2, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process. The comments from the videotape of two public hearings are addressed in the responses identified as DCR005A and DCR005B.

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Attachment 1: Transcript of Blue Ridge Environmental Defense League Videotape of March 12, 1999

My organization is Women's International League for Peace and Freedom, and it is an organization that has branches all over the world including in Russia, and I hope that maybe we can have a chance to talk maybe a little about connecting through our organizations. Now I'm going to take no more time and turn to Lou Patrie who is with Physicians for Social Responsibility and he will talk for just a minute about his organization.

Lou Patrie:....including the members who are here to take part in the evening's meeting. We have chapters that are nationwide and we think we have one of the smaller more active chapters in the country. We are also affiliates with the international organization, International Physicians for the Prevention of Nuclear War, so we've been involved in many aspects of anti-nuclear campaigns from the initial claim that there's no defense against nuclear warfare, there's only prevention and I think many of the things we're here tonight [to discuss] have to do with that same issue. So we welcome you all and I turn the meeting over to Fran Macey who is with Earth Island Institute and take over from here.

Along with Enid Shriver, my colleague, at the Earth Island Institute in San Francisco, some of you may have heard or seen David Brower, a great environmentalist and he founded the Earth Island Institute and at 85 is still very actively President of it and speaking everywhere. I was happy to be in Atlanta a few years ago and do a presentation on nuclear guardianship that some of you might

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have been participating in. Because I've been concerned with nuclear issues for a long time. For 10 years I've been working with Russian environmental activists, including a number who are guests tonight, so what we're [doing] this evening is part of a long program of collaboration between America, Russian, Ukrainian, Jordan environmental activists. It started before the dissolution of the Soviet Union. We were very inspired that citizens of the Soviet Union started their own environmental organizations when it was still dangerous to have independent organizations there. These were the perestroika days of Modema Choc [sp?] and that movement has grown and you're going to meet some of the leaders of that movement tonight. We have people from 6 different cities in Russia stretching from Siberia to St. Petersburg and they all are heading organizations that are in cities in the shadow of nuclear power plants. And in one case a very important nuclear weapons complex. So there are big issues for them of radioactive contamination and the danger of nuclear facilities. These issues have become particularly sharp recently as the Russian and American governments have discussed the use of plutonium from dismantled weapons, warheads, the use of the plutonium in civilian reactors for the generator of electricity. And we're very happy that we have Mary Olson with us tonight who is one of our country's experts on this subject of the use of plutonium in reactors. Which is called MOX fuel, mixed oxide fuel or MOX fuel, and she'll next be talking about that and how it affects your particular region, your particular neighborhood. So this is a very timely evening, this is a very current issue, both in Russia and in America and particularly in North Carolina and South Carolina, and Georgia, and in Virginia where we're going next for reasons you'll soon hear but I have a feeling you already know by the nods I see in the audience, because you're well informed of the subject obviously.

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So I want to briefly introduce our Russian guests who have come so far and who have spent with us some days in Washington meeting with many citizen groups and specialists and will be returning there to meet with members of Congress and their staff on Thursday the 18th and some White House officials on Friday the 19th, particularly people engaged in negotiations at the government level. We've been engaged at the citizens level in international collaboration particularly with the leader of this delegation Lydia Popova, would you hold up your hand....and she worked for many years in the nuclear industry as a researcher and a scientist in the Soviet Union, and I consider her a whistle blower. She decided to leave, and she can tell you the reasons, I hope you will, the nuclear industry, which is a very elite, was in her case, a very elite high status position and she began working with a non-governmental organization like so many represented in this room tonight and she now heads the center for nuclear ecology which I find a fascinating phrase, [it] suggests all the implications, all the impacts and interactions. Ecology is about interaction isn't it? And inter-dependence. So nuclear ecology points us at all the interactions that the nuclear industry, nuclear activity can have. So it's the center for nuclear energy, nuclear ecology, and energy policy, and she had some network of activists who are educating the public in many cities around Russia and Ukraine about nuclear developments and particularly in their own backyards and most currently about MOX fuel, and plutonium use in reactors. We also have Oleg Bodrov [who] is a nuclear engineer, [a] physicist who also worked in an institution of a nuclear industry in Russia, near St. Petersburg, 50 miles only away in Sosnovyy Bor, and he is also a whistle blower, he decided that he wanted to leave, what was a very good research position, designing reactors for submarines and testing them in order to

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create an environmental organization called Green World which he has headed for years and he has been very active in using the Internet, the whole electronic communication opportunities and puts out a wonderful bulletin, both in English and Russian, on nuclear developments in northwest Russia and I am inspired because he has a vision of a nuclear free Baltic ocean basin, imagine a vast area like the Baltic involving so many different countries being without any nuclear weapons or facilities or dangers, in other words, for the local populations and our grandchildren. We also have Leonid Piskounov is a PhD physicist from the Ural mountains which has a very intense concentration of nuclear facilities. He lives in the city of Eketerinburg and has been studying with other scientists there on an independent basis, the radioactive contamination of a particular power plant there, which is the only one to use plutonium as fuel, at least in Russia. So he is very knowledgeable about potential consequences of using plutonium in reactors and he was able to tell the press about that this morning in a press briefing and did so very well. We have Olga Pitsunova [sp?]. Olga is from Saratov from the beautiful Volga River that I had the good opportunity of spending 10 days on one time. And she heads an environmental organization that's been working both on nuclear problems and on the problem of dismantling chemical weapons. Which they, the government chose to do in the Saratov area, and her organization has been opposing that. She will talk about the reactors in her region that are designated to be some of the 1st experiments with plutonium MOX fuel. We have Irina Reznikova [sp?] she is from the Don River area and Volgodonsk city and she has been fighting the construction and opening of a nuclear power plant for over 8 years and it's still not been opened, still not been completed, and she is working hard to get a referendum there to put that power plant to sleep. Finally we have

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Vladimir Belaev and he is in the Siberian city of Krasnoyarsk which is very famous for producing plutonium for nuclear weapons. They therefore have nuclear reactors there and some of them are still operating and producing plutonium. Among the only ones in the world that are still producing plutonium and he is a journalist, photographer, environmentalist, organizer. He's organized already 3 international conferences on the environmental consequences of the nuclear industry. I've been able to participate in some of those and they've been very informative and inspiring. So I hope you feel with me, that it's a privilege to be able to meet with them tonight and to hear their stories and to hear your response to them. So I'll ask Mary Olson to brief you more on the substance of this delegation's trip.

Mary Olson: I'm going to set my timer, because I want to be brief. But I want to mention to you that I work for a national organization based in Washington, DC that works with communities that are affected by nuclear program, specifically nuclear energy and the waste from nuclear power reactors. So we've had the honor and privilege of working with the people in North Carolina on so-called low-level waste issues and also the mobile Chernobyl proposals in Congress and now we have a new issue facing this region and this proposal will undoubtedly affect the south east. The question is, in what ways? And ultimately I think I am here to tell you a brief story. Because I'm happy to see people here who are probably hearing about this for the first time. So those of you who have heard this story before please understand that we all need to remember why we're talking tonight. Back at the time of the Manhattan Project in 1945 where the Trinity Bomb was tested, Hiroshima and Nagasaki were destroyed by nuclear weapons.

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Russia, then the Soviet Union and the U.S. were allies. But as history would take us forward we entered into the Cold War, and during those years, like mad men and women, neither country considered what they would do with all the weapons if one side were to win the cold war. We kept making more, and more, and more plutonium, and more and more bombs out of the plutonium until we had not only hundreds of bombs, not only thousands of bombs, but tens of thousands of bombs. Now we must remember, we still have these bombs and we're even designing new ones, but it was a wonderful day when President Bush and President Gorbachov decided to start taking some of these weapons apart, and I personally am still celebrating that moment because I think it says something about human nature and our ability to choose life and the ability to cooperate and work together.

And I think it's something we have to hold on to in this story now about the plutonium. Because this decision to take apart the weapons created a new problem and that problem is what do you do with the plutonium to keep it from becoming another weapon again. Many of you have heard that if we had some plutonium setting here, if it was in the metallic form, we would be very worried if it was going to explode, but it wouldn't be something we could inhale, we wouldn't be eating it, it wouldn't be coming inside our bodies and someone could pick it up and walk out the room and take it away and make a bomb out of it. So there's a lot of security issues around plutonium pits that are dismantled from the warheads. The problem is how do we take those pits and make them unavailable. I'm first going to tell you about the alternative that is only the lesser idea in the U.S. and it's not currently planned in Russia at all, but this program is called immobilizing plutonium and

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by immobilizing it we are taking it and putting it in a form where someone can not steal it easily and where it will move in the environment less. I'm not going to say its going to be safe. I don't believe that, but immobilizing, impeding the motion in the environment. How would we do this? We would actually take the plutonium and turn it in to a ceramic form. It looks like a puck, it's called a puck, like a hockey puck, and those pucks are stacked inside a tennis can, it looks like a tennis can, it's actually stainless steel, but the same size and many of these cans would be put into a large 10 foot tall cannister which is also made of steel, and into this cannister would be loaded wastes left from making the bombs in the first place. It's almost like a re-marriage after a divorce, OK. We take the plutonium out of the irradiated fuel and we leave behind these highly radioactive wastes in large tanks at Savannah River Site and at Hanford in Washington State, Savannah River Site is in South Carolina. So these wastes are setting here. They are being currently put into glass form anyway. It is like Pyrex glass. They take the radioactivity out of the liquid and then they put into glass and its being put into large 10 foot tall canisters anyway. So the difference in this picture is we put the plutonium in ceramic and put it inside there. Now I think that there's problems with handling plutonium no matter what, and I work for an organization that will only report this to you. We will not jump up and down and say this is the program we should pursue, but I work with many organizations, including some in this room who do advocate this as the path forward. So now that's my halfway marker. What's the other plan? It's the one we're talking about tonight. This is the plan where the nuclear cartel, I will call them. Some are government, some of them are in quasi-private corporation, and some of them are in private corporations. This would be Duke Power, Virginia Power, Cogema from France, which

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is a government corporation, British Nuclear Fuels from England, the Department of Energy, and Minatom from Russia. They are planning together, that the idea would be to take this plutonium from warheads and make reactors fuel out of it for commercial reactors. So in this picture we're processing the plutonium again, the goal is the same, were going to make it highly, highly radioactive by putting it in the reactor. But there are many steps that are not the same as immobilization. One of those is the transportation of MOX fuel from Savannah River Site, where it would be produced in SC, into NC, and into Virginia. This fuel is a proliferation risk because it is not highly radioactive yet, and it is weapons-grade plutonium. It would be on the roads and on the rails in North Carolina. The second issue is that when we put plutonium into reactors, these reactors were designed for uranium fuel. Uranium and plutonium have different physics. I'm not going to go through that right now, but in our discussion if you have questions about well what are those differences, I'd be happy to tell you about that. But, they are different, and we can document this and I can tell you that the differences increase the likelihood of a reactor accident. We're talking about the Catawba reactors, the McGuire reactors, and the North Anna reactors in Virginia. Go further, we're not only talking about increasing the possibility of an accident, but a recent study that was just published has shown that the consequences of an accident, that really was a severe accident and the fuel was vented, like at Chernobyl. The core with plutonium fuel has much more radioactivity inside, it has much more plutonium inside, it has much more heavier than plutonium elements, called actinides, inside, and if these are vented, the impacts on the population, on the people, on the communities that would be affected, are greater, in proportion to the amount of plutonium that is in there. If you have a full replacement of uranium fuel with plutonium fuel, it will

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DCR005A-1**Transportation**

Weapons-grade plutonium, including plutonium being shipped to the immobilization facility, is considered a proliferation risk. It would be transported in DOE's SST/SGT system. As described in Section 2.4.4 and Appendix L, the SST/SGT is a specially designed component of an 18-wheel tractor-trailer vehicle. Although details of the vehicle enhancements are classified, key characteristics are not, and include: enhanced structural supports and highly reliable tie-down system to protect cargo from impact; heightened thermal resistance to protect the cargo in case of fire; deterrents to protect the unauthorized removal of cargo; couriers who are armed federal officers and receive rigorous training and are closely monitored through DOE's Personnel Assurance Program; an armored tractor to protect the crew from attack and advanced communications equipment; specially designed escort vehicles containing advance communications and additional couriers; 24 hour-a-day real-time monitoring of the location and status of the vehicle; and significantly more stringent maintenance standards.

DCR005A-2**Facility Accidents**

While it is understood that there are differences from the use of MOX fuel versus LEU fuel, these differences are not expected to result in substantial changes in the frequency of severe accidents in MOX-fueled reactors. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications pursuant to 10 CFR 50.

This SPD EIS analyzed several reactor accidents, including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood

be a doubling of cancers from such an accident. If it's a 1/3 replacement, as the proposals are talking about, it would be a 33% increase, 1/3 more. So its in direct relation to how much plutonium is in the core. So this program will cost more money, because for one thing the U.S. is planning to pay not only the costs of utilities in this country with tax payer dollars, but also the entire Russian plutonium fuel program. And while helping with plutonium disposition in Russia is a good idea for some people, there is this alternative that could be pursued there, as well as here, called immobilization of plutonium. And we stand here telling North Carolina that you are an affected community by this program and that you need to know about this and you need to not leave this in the hands of the nuclear utilities because they are working with plutonium interests at the international level to promote this. Now the last thing I want to tell you is that soon you will hear that a major contract has been awarded and the only group that is trying to get this contract at this time is led by Duke Power and Virginia Power and Cogema and it would all happen at Savannah River Site in terms of making the plutonium fuel, and also processing the plutonium prior to that, and also the immobilization program is at the Savannah River Site. However, this contract is only an initial phase of the program, it does not have any money in it for large facility construction, it does not have money for changing the reactors for using plutonium fuel. That will come in a subsequent contract, and subsequent contract award. So while there'll be big news that the deal is done in fact, we are still in a research and design phase in the U.S. and we have not yet finished an agreement with the Russian government which is also a condition for that second contract. So I'm very excited that we have citizen-to-citizen contact with Russian people who have reactors in their communities just as you have the Duke Power reactors in your

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of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

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MOX Approach

DOE acknowledges the commentor's support of alternatives that consider only immobilization. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The United States is not paying utilities to use MOX fuel. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would otherwise have purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

The United States and the other G-8 nations (Group of Eight industrialized nations: Canada, France, Germany, Great Britain, Italy, Japan, Russia, and United States) are supporting plutonium disposition efforts, both financially and by providing technical assistance, in Russia because these countries consider it vitally important to ensure that weapons-usable nuclear material does not fall into the hands of terrorists or rogue states. Russia considers the plutonium a valuable resource that can be used for energy production. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

state, that are also affected by this same program. And it's such a beautiful place here in Asheville and I'm thrilled to finally see it, So. Thank You.

..... thank you for coming to meet with us today. Russian people who are concerned about the global environment and who found friends in the U.S. with whom they can share these concerns. So Fran and Mary so nicely introduced us, and described the program that I should probably better talk about Russian environmental movement and to tell my personal story, how I got involved, and what I'm doing now. For 21 years, I used to work for the Ministry of Atomic Power of the Soviet Union. We call it Minatom now. Earlier it had a very peculiar name, a secret name, the Ministry of Medium Machine Building, so no one could guess what they were doing. Like Manhattan Project, absolutely, and my job was analyzing nuclear fuel cycle, to look at different kinds of fuel, whether to use uranium or plutonium in the fuel, and what would be the impact on the economy and all this stuff. And unfortunately I could see that Minatom was not interested in the problems which were emerging in the world, I mean the problem of radioactive waste management, and the problem of dismantlement of aging nuclear power plants. I tried to pull this information, which I received from libraries, from the foreign magazines, from British and American which were published in English and then tried to draw attention to these problems and they were totally neglected. So I always loved nature. My ancestors are from countryside, they were peasants, and I have a deep affection to the countryside, the forest, to clean water in lakes, I love it very much and of course what I saw and what I heard from the experts, who also worked nuclear industry about contamination, and dangers, and accidents and they just were talking between themselves about this, got me more and more

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MOXRFP

The commentor is correct that DOE awarded a contract to the team of Duke Engineering & Services, COGEMA Inc., and Stone & Webster (known as DCS), in March 1999 to provide MOX fuel fabrication and irradiation services, and that agreements between the United States and Russia will affect surplus plutonium disposition in the United States. As discussed in Section 2.1.3, the services to be provided include design, licensing, construction, operation, and eventual deactivation of the MOX facility, as well as irradiation of MOX fuel in six domestic, commercial nuclear reactors. The Request for Proposals for the contract defined the activities that could be performed prior to issuance of the SPD EIS ROD. These activities include nonsite-specific work primarily associated with the development of the initial conceptual design for the fuel fabrication facility; and plans (paper studies) for outreach, long lead-time procurements, regulatory management, facility quality assurance, safeguards, security, fuel qualification, and deactivation. No construction, fabrication, or irradiation of MOX fuel would occur until the SPD EIS ROD is issued. Such site-specific activities would depend on decisions in the ROD.

In July 1998, Vice President Gore and former Russian Prime Minister Sergei Kiriyenko negotiated the *Agreement on Scientific and Technical Cooperation in the Management of Plutonium* that enables the two countries to explore mutually acceptable strategies for disposing of surplus weapons-usable plutonium. The U.S. and Russian governments are currently working on their respective plutonium disposition programs under a *Joint Statement of Principles* which was signed by Presidents Clinton and Yeltsin on September 2, 1998, in Moscow. The two presidents agreed on principles to guide implementation of this program by building industrial-scale facilities in both countries. In 1999, negotiations are proceeding for a *Bilateral Plutonium Disposition Agreement* to enable the United States and Russia to work together to ensure that the disposition facilities are technically viable and that progress is made on implementing the selected approaches. The United States does not currently plan to implement a unilateral program; however, it will retain the option to begin certain surplus plutonium disposition activities in order to encourage the Russians and set an international example.

frustrated and I started looking for the contacts with environmental organizations in Russia and I thought where there is anybody interested in the environment like with me. And once I saw an announcement about the socio-ecological union, an environmental organization, has a meeting and they invite people citizens in Moscow to come and to see them. So I went, and I was really very impressed by the presentations of these people, and by themselves, and when they asked people to give their coordinates if they want to somehow support the movement and help it, I sent my phone number and wrote that I am an expert on nuclear power and I'm very much interested in alternative energy and people contacted me in a while and I consulted them on the issues which were in my field of expertise. And then in 1990, the socio-ecological union received it's first grant from the W. Alton Jones Foundation and I was invited to come and work for that organization full time. And for me it was really very hard decision because I had to lose some good medical care, which I could get in the Ministry, for example, to lose in salary, totally change my life, to have some new job I was not quite aware of, so I had a lot of space for initiatives when I came to work for this organization. But my husband told me, you are so frustrated that just change your life, its time to change your life and I did it. And for me it was very new, very interesting experience and I met all the wonderful people first in, from the Soviet Union and in Russia and Ukraine and in middle Asia and some of these people are here. I met people, very courageous people, who live in Siberia in shadow of nuclear military facilities and they had very good contacts with whistle blowers, so for me it was a new and amazing transformation that was very closed, very secret facilities, where people reported who about discharges of radioactivity, and dumping of plutonium containing waste into the environment and I did my best to support such people to help

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them and later on when environmental movement in Russian met their counterparts in the U.S. and I first met Fran Macey and then I met Dina Tribeman and there were many other Americans and I traveled in the U.S. more than 12 times since 1990, and I helped my Russian colleagues to make such contacts. Fran Macey and me, in 1993, Fran receive grant from some American foundations and we organized this [team] of the Russian activists who were struggling [to stop?] production of materials which could be used in nuclear weapons to the U.S. and then a group of American activists the next year came to Russian. And this exchange of the delegates, of exchange of ideas of the delegates, was very, very productive. And now we saw that its time probably to activate such work because we saw that we believe that our governments are acting in not quite the right direction. The disarmament which gave so much inspiration to citizens was going the wrong way, that laboratories still continue on designing new weapons, as the governments are arguing about where the plutonium was smuggled in Russia, whether the nuclear scientists defected from Russia to Iran or not. And very little attention is given really to these dangerous stuff, how to handle it safely and securely, and we believe that their idea to use plutonium, dangerous material, as a source of energy, was very bad idea and we see that the nuclear industries in our countries, back-up each other, they want expansion, they want development, they want to survive, and so they innovated this new [Love Shares] Program. It's not [Love Shares]. Its danger for citizens, its danger for our children and for our grandchildren because plutonium, it always little by little goes thru the stacks of the MOX fabrication plants, of nuclear power plants. It sits in the environment for 250,000 years and until it decays totally and it effects human health, when it is accumulated and then inhaled or ingested. And we believe that if it's not quite

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DCR005A-5**MOX Approach**

DOE understands the environmental and health impacts of plutonium, and would design, build, and operate the proposed surplus plutonium disposition facilities using today's stringent environmental, safety and health requirements. This SPD EIS analyzes the potential environmental impacts associated with implementing the proposed activities at the candidate DOE and reactor sites. The results of these analyses are presented in Chapter 4 of Volume I and summarized in Section 2.18.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide the general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for high purity feed materials. Since it is vitally important to ensure that weapons-usable nuclear material does not fall into the hands of terrorists or rogue states, the United States has accepted Russia's position. Issues related to financing other projects in Russia are beyond the scope of this SPD EIS.

a good element for production of electricity in our countries we believe that there are new, there are more other opportunities. In Russia 50% of energy is just lost in the environment [in leaks], in heat pipes, appliances, and Russia has very big potential for energy savings, energy conservation and energy efficiency. And Russia has big potential for renewables. There are areas where renewables, where windmills, could be used in the way they are being used in California for example. So the money that the government and the industry wants to direct onto the MOX program we believe could be used in a better way on completion of the construction of storage facilities for excess weapons plutonium, on energy conservation, energy efficiency, and renewables, and this will help to activate and to help the Russia economy, not MOX program. Because MOX program in Russia, it's not just burning excess weapons plutonium and forgetting about it. The nuclear industry will create infrastructure and it will be in the U.S. the same will create infrastructure for recycling, they call it recycling plutonium. Can you imagine any other industry which is allowed to recycle with the production of huge amounts of radioactive waste? This is only nuclear industry and we do not think that this is recycling. We think that this is destruction of the environment and that is why we came here, and we were very happy when we were invited to come here. It was not easy because you know that, when the governments have tense relationships it always reflects on citizens so for us it was not easy for us to get visa's to come here. American Embassy was not very friendly until Fran reached some top officials in the Embassy and just required that Russians get visa's to come to the U.S., but we did it, and we're here and we

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met very interesting, experience people and we met citizens who are interested in the problem and who are friendly to their possible friends overseas. Thank you very much.

I am scientific support for our delegation, we have Leonid Piskounov from Ekaterinburg. He is part of the organization which consists of retired and active scientists and engineers and they do monitoring of the environmental situation around the nuclear power plants with is just 35 kilometers or less than 20 miles away from the city of Ekaterinburg where Leonid lives and they are not only doing monitoring, they also do their own independent environmental impact assessment, and with the results they get, while operation of nuclear power plant, they manage to discover accidents which were concealed from the public and environmental hazards of these accidents, and they provided this information to the regional government, and government announced moratorium on the construction of a new unit, which the nuclear industry wanted to build on this site and Leonid will tell how they work themselves. Thank you.

My name is Alice and I am translating.

I represent a citizens organization called the Committee for Radiation Safety. The city is called Ekaterinburg, it's in the Ural mountains and we represent the Committee for Radiation Safety. We work on monitoring radioactivity that's released from the, even the so-called peaceful, working of the nuclear power plant there, and what we

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have discovered can be said to have immeasurable effects, not only on the present population, but on future generations. In the whole world, including in your country, a great amount of radioactivity has accumulated. There has still been no safe way found of protecting the people from the effects of exposure to the radiation and no way of storing this radioactive material for the next decades and over the next centuries. Using plutonium as MOX fuel will only contribute to increasing the radioactivity levels and not decreasing them. And this will bring about unforeseeable, horrible results. MOX fuel has already been tested in small amounts in the Krasnoyarsk reactor near Ekaterinburg where Leonid works. These experiments have resulted in raising the levels of contamination from radiation that already exists in the Ekaterinburg region of the Ural mountains, only this is a new kind of contamination, this is plutonium contamination. A few months ago we did research in the city of Ekaterinburg which is a city of one and a half million residents. We discovered plutonium contamination in the city. This is a result of the Beloyarsky power plants normal operation, and accidents which we were formerly unaware of. This plutonium contamination is two times higher than the global fall-out from testing of nuclear weapons. The fall-out in such countries as Italy, Great Britain and other countries. During the use of breeder reactors, of the type that we have in Beloyarsky which are not used anymore in the U.S. and the technology which the U.S. dismisses as a viable technology, is still being used across Krasnoyarsk as well as a new breeder reactor of even greater capacity, which is being constructed there. So the breeders in Beloyarsky are giving off radioactivity as a consequence of normal operation and even more in cases of accidents or incidents. There was another case which we still know only a little about. So this will mean that releases into the

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Human Health Risk

Radiation concerns associated with experiments in the former Soviet Union are beyond the scope of this SPD EIS. However, as shown in Chapter 4 of Volume I, the release of radiation from the fabrication and use of MOX fuel in commercial, domestic reactors is expected to be low in any of the hybrid alternatives under normal operating conditions. This program is not expected to increase radiation levels above the very low levels already emitted from the proposed reactors nor extend their operating lives.

environment of tritium, which is even more dangerous than plutonium into the environment. In American reactors and Russian reactors there's no possibility yet of containing tritium and preventing releases of it. We discovered tritium last year in the drinking water of the citizens of Ekaterinburg. If we continue to use the breeder reactor there, and even another breeder reactor of greater capacity, then we could expect an increase in Down Syndrome among children. This has already occurred around certain reactors in Canada. You probably know about this pretty well already. We believe it's absolutely crucial for the citizens and scientists from all the countries of the world, especially those that have plutonium weapons, to work together to prevent using plutonium as reactor fuel, and to try to prevent further accidents from occurring. You all know about the catastrophe at Chernobyl and how it affected all the countries of the Northern hemisphere. If you imagine an accident of even ½ that scale, but using MOX fuel, plutonium fuel, it's difficult to even foresee what kind of results could occur. Many kinds of diseases, such as cancer and changes in genetic material could occur by the release of plutonium into the environment, into the water, into food. That's why our Committee for Radiation Safety is working and speaking out against the use of MOX fuel in the Beloyarsky breeder reactors. We have 2 scientists working on our staff who are designers of the Bilibino and Beloyarsky and another reactor and they perfectly were understand the dangers that such power plans can create for the people. That's exactly why they have come to join our citizens committee to try to protect the populace from such dangers. Thank you.

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DCR005A-7**Human Health Risk**

Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents. Several reactor accidents were analyzed including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

Human health and environmental impacts from Russian breeder reactor programs are beyond the scope of this SPD EIS.

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I think we shall move to the activist part of the meeting delegation and we shall ask Olga Pitsunova [sp?] from Saratov from Volga River, it's really very beautiful river, to tell about her organization and the problems they meet and how they cope with the problems.

Olga: Good evening dear friends. I'm very happy to see all of you at this meeting, and I will try to talk in English, but my English is not very well, and I hope that it will be understandable for you. My name is Olga Pitsunova [sp?] I am from Saratov it is a big city on the Volga River. It's about 1 million citizens and we have near Saratov a big nuclear power station 4 reactors with capacity of one thousands megawatts and I'll tell you a short story about my organization and our activities. We started our activities as an informal environmental group and 1998 - 1999 with the help and support of many other groups and individuals shutdown the chemical weapons disposal plant and now the main mission of our organization is to support [any of those] grass roots communities and citizens in the protection of their rights for health, environment, and [for future], Leonid and Mary already say to you why we confront the nuclear industry in using MOX fuel in civil reactors. Because nuclear industry and plutonium economy is development as [to ?] and because both of them are very dangerous for our environment, health and our future. In 1999, we stopped the construction of two reactors of Bluvonia station. It was a very, very successful time for environmental movement. We not only we, but other environmental activists have success in the activity and during this time we stopped fuel reactors and [?] against nuclear power stations. We right now, I mean environmental movement of Russia, not my organization only. But, now its very hard very difficult time for Russians and environmental [?] and for

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Russian citizens because nuclear industry became very, increased their pressure for the citizens. They want to develop their plans of using MOX fuel or plutonium fuel in civil reactors. They know that they can get money from America for these plans and so we decided that we can confront successfully only when we all join together and we started a wake-up campaign in our region. We went to the citizens, to the communities and tried to explain to them why this plan is unacceptable for citizens, why they are dangerous and what nuclear industry [?] It was the 1st time, last year, that we know about the plants of using MOX fuel in the Bluvonia power station reactors and nobody in our region knows about these plans. We know about these only from our American friends and it formed a bond in our region. And now we try to create a association of villages and, towns, and communities all villages, towns, communities around Bluvonia power stations. To confront successfully of nuclear [?] and I hope that you will joint efforts and for this. Thank you for your attention.

We're going down to the South in Russia, we have an activist Irina Reznikova [sp?] from Volgodonsk which is maybe about 1,000 miles to the south of Moscow and she has an organization which for 10 years held off completion of the construction and start up operation of nuclear reactors which were projected by the nuclear industry for the use of MOX fuel.

Irina: Our organization, which I represent is 10 years old just as perestroika in Russia is 10 years old. One might say that at this moment 10 years ago the anti-nuclear movement in Russia began to be born. Radiation knows no boundaries, and radiation is ecology and not politics. I'm very pleased to have this opportunity to

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communicate among the continents, which is an opportunity that has only arisen recently. So in Russia we say that we now have a mission as people's deputies, and non-governmental, non-profit organizations can now go ahead of politicians. That is the way it should be, and we must influence the politicians. Because in the modern world radiation has become politics, political. But all together we can manage to do quite a lot. In our region, the place where I come from, we are now preparing a great campaign for a regional anti-nuclear referendum, and of course this is a little bit more complex in Russia, than here, because in Russia there are laws, but they don't work very well, and when laws don't work very well, that's a scary thing. So this trip, here to visit you, must have an international resonance. The last words I'm going to say are the words of my 7 year old granddaughter when she saw me off on my trip here. She said grandma I believe that all together you will win over evil. Here we are on the threshold of the 21st century, we must bring out progress and not catastrophe.

Lydia:and then it will be a story about the weapons production facility. We have here Oleg Bodrov from Sosnovyy Bor and he's a physicist and nuclear engineer as Fran mentioned, but he left his institute, governmental organization and established, was a co-organizer of the non-governmental organization the Green World which basically deals with the problems of radiation safety in the region and this is really a very, very beautiful region on the shore of the Gulf of Finland and the shore is called [Grispines ?]and just maybe 1 hour drive from the nuclear power plant. There is a nature reserve where swans have to rest they fly to the north and there are thousands of swans and they will come just a month. The government had plans to expand the nuclear power plant there

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and to build 6 more reactors designed specifically to be loaded 100% of the core by MOX fuel. But Oleg will tell the story about the very bad shape of the nuclear power plant, of aging destroying the walls and equipment. He will show you some photographs and he will tell more.

Oleg: Thank you Lydia. Ladies and Gentlemen, I arrive here from St. Petersburg region. This is as you can see the Baltic region, and this is place where the biggest nuclear power plant in the Baltic Sea region. There are about 4 nuclear reactors like in Chernobyl and they continue to produce electricity there, but I'd like to begin my story, my personal story. I was a physicist in research technological institute in this city, it is a small city Sosnovyy Bor if you translate to English it is Pine Forest or Pine Wood. It is a really nice place and at once when I went to my job to research technological institute to, we had planned to tests, nuclear reactor for submarine, but in this morning it was not my duty because at night was huge explosions and all building was destroyed. It was state secret 20 years ago, but now it is not any secret anymore. It was not nuclear accident, but some people was killed in this moment. It was signal for me that it was not possible to have absolutely safety nuclear reactors. And I went, and I changed my job and I began to investigate ecological situations in eco lab and we investigated environmental problems around the Leningrad nuclear power plant and around research technological institute where 3 nuclear reactors for submaries and during certain years, I was like researcher, like scientist, in this laboratory and after the Chernobyl, I understood that it was not environmental laboratory, not ecological laboratory, because we have a lot of information but it was not published of this information because this lab I receive

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money from Minotom of Russia and in this case I go away from this lab and begin to be active in Green World, non-governmental charity organization, and me and my colleague from Sosnovyy Bor and from St. Petersburg to focus public opinion in our region that the problem in Sosnovyy with four nuclear reactor like in Chernobyl and 3 nuclear reactors for submarine. It is not only local problem for Russia but for the whole Baltic region. There are in nine countries, about 90 million people and only one accident on one of the 27 reactors would be great problem for all these countries, but maybe you know in Sweden, was a referendum and they decided to close nuclear power plants in Sweden and the same decision made in Germany, but at the same time Siemens from Germany, support Russian atomists for the project, was very very hard [640] nuclear reactors and they plan to use 100% MOX fuel in this type of reactor and they decided to build this nuclear reactor in Sosnovyy Bor, too, so it will be really support for the export danger rules from Germany to Russia and the main reason for this to produce electricity in Russia and to export to German. And in the same time it is not only MOX problem, not only problem for the Baltic Sea region, because Russian atomists and nuclear specialist from U.S. suggested to use MOX fuel and in this case it will be problem not only for the Russians not only for the States but for our whole planet and I think we need to stop this process now. Because, if this plutonium economy will start, it will not be possible to stop this process. Thank you. The problem with the spent fuel storage in Sosnovyy Bor. During 25 years Leningrad power plants produced electricity, but they produced not only electricity, but spent fuel. It is high-level of radioactive waste. There is not any technology for repetition of this spent fuel and they collect the spent fuel to the building near the Baltic Sea. In this picture you will see and there are only 90 meters from this

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Facility Accidents

DOE is not advocating the start of a plutonium economy. Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

storage and the Baltic Sea and I will show you the condition of this building. There are many cracks you will see and this is leakages.

Q: Is the building itself radioactive?

Yes, all spent fuel, about 5,000 tonnes, it is about 15 [50?] Chernobyl accidents, like 80-90 meters from the Baltic Sea and in this case when we asked people to, we need to find solution for this problem, it is not possible to continue, it's terrible, but local authorities at the same time support it they have [no] money for this storage, but they have money to continue building 640 nuclear reactors with MOX fuels. So I think it terrible and there's this place where they began to build this MOX fuel reactor, a light water reactor. At the same time there are no panics in Sosnovyy Bor, this is nuclear power plant and these are people at the beach. WHY? Because all people in this city Sosnovyy Bor, about 60,000 people who are connected with nuclear industry, 80% percent of the city is nuclear money and they want to continue this way.

Q: On the map, the little red things are those.....? [QUESTION CUT OFF]

....to the east now to Siberia, Vladimir will tell about the problems related to the production of nuclear weapons materials for nuclear bombs. He lives in the city of Krasnoyarsk which holds 1.5 million people and it is located 50 kilometers, about 30 miles, away from this huge plutonium production facility which was built just inside the mountain, underground. It is totally located underground and

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in one book I read that for construction of this facility the workers had to excavate the same amount of ground that has been excavated to produce Moscow Metro, Moscow Subway. So the story related to this facility is really horrible, but we have an energetic and optimistic activists who managed when he was just started, his activity as an environmentalist he began publishing a newsletter, Environmental Herald. And in the 1st issue he published a map with silos of rockets in the Krasnoyarsk region so I didn't ask him how he managed to get his secret information, but he publicized it and KGB was searching for him, was looking for him and the print shops where copies of the newsletter were printed but this time Radgina [?] was lucky he was elected as a Deputy of the Regional Council so he had immunity and despite all these interest from KGB which I could also see when Radgina [sp?] organized the conferences on radiation and nuclear safety in Krasnoyarsk. But Radgina [sp?] continues his work, as a journalist, as a photographer, as very active environmentalist. Thank you.

Radgina [sp?]: We used to have three reactors at our site, in 1992, two of the reactors were closed, the 3rd one continues to operate and produce weapons plutonium. I only know of three reactors in the world that are creating weapons-grade plutonium now, and all three are in Russia. Two in Tomsk and one in Krasnoyarsk. In 30 years of operations of the reactors in Krasnoyarsk there's been contamination of the Yenisey River of the North Sea to the Arctic Sea. The ministry of Atomic Energy wants to build the largest factory in the world for reprocessing for irradiated nuclear fuel. Radioactive wastes are also injected underground in Krasnoyarsk. If we account

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for all of the radioactivity of the waste in Krasnoyarsk region, with all of the facilities there, it would amount to 70 Chernobyls. And Minatom still wants to build another storage facility for irradiate nuclear fuel, and if these crazy ideas of Minatom are brought into force then we will have something like 200 Chernobyls. So in our little visit here in America we have found out that the Americans also want to help bring these waste to Krasnoyarsk, to develop plans, for examples for Japan nuclear waste to come to Krasnoyarsk, Taiwan and South Korea, as well. But I think this could never happen because our people are very proud and optimistic and our organization has been around for 10 years and we know how to fight against Minatom. For example, Minatom put a huge tunnel under the Yenisey River for carrying radioactive waste under the river, from one side of river to the other, and thanks to the protests by the citizens, we stopped this in 1990. So millions of dollars were thrown to the winds, and this tunnel is just lying there, it doesn't really serve anything. We made some new friends here in America this visit and I hope that we altogether can become even stronger our actions against the crazy plans of the U.S. Department of Energy and the Ministry of Atomic Energy in Russia. The bureaucrats in both American and in Russia think only about today and they don't care at all about the future, and where they're going to live and how it's going to be. We have one earth and we have to take care of it. Thanks for your attention.

Speaker[?]: I'm all the more shocked at what governments lay upon us and upon our grandchildren. Can anyone of us imagine what 240,000 year is? Out written history is what 3,000-4,000 maybe 5,000. It's just a little fraction, but plutonium, as we've heard, has a half-life of 24,000 year and radioactivity continues for 10 times

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Nonproliferation

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this.

Issues regarding activities occurring in Russia are beyond the scope of this SPDEIS.

the half-life. So this plutonium is going to be toxic for all living organisms, including humans, for 240,000 years. It's just unimaginable, its just in effect forever. When the Department of Energy for example was planning to bury underground radioactive wastes in New Mexico, all they could think of the longest term the could think of was 10,000 years. It was going to be dangerous for at least 10,000 years. So they let out a contract, invited people to provide warning signs for the nuclear waste depository. They said the assumption you have to make is that it would still be there in 10,000 years, that the English language will no longer be used or known by people living in that area, so your sign has to convey the danger without using the English language. We're just dealing with scales here that humanity has never dealt with before. The earth has dealt with it, but the human part of the earth has not. So this really stretches our imagination. But it also needs to inspire our will. It's been very dangerous in Russia, in earlier times, to not only distrust the government, but to speak skeptically about government policies. These people have been brave enough to do that before the dissolution of the Soviet Union before the end of dictatorial power. I must say I feel I'm not doing nearly as much as we have freedom to do, to stop this kind of nuclear tractor, steam roller, that we're confronted with. So, you may have some questions or comments and we'd love to hear them and love to turn this now into a dialogue and you can decide who of the Russians would be most appropriate to address comments or maybe Kitty or PSR.

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Speaker[?]: I'm here in American for 8 years, I lived in Ukraine, it's not far away from Chernobyl. So that's one reason also to be here in American because you want to go away and have no radiation, you know, [?] a big family and I believe that people who are doing that are doing a good job. That's what everybody has to do, because stuff like this kills people and in my opinion we have to help each other, not to kill, but to help to survive. I'm very glad to see people from my country come here and talk about problems like this and you know I'm proud of that, so they spend their time and money to do stuff like this and I hope that we can do something here in America to help here and there to stop it. I don't know what else to say.....

Speaker[?]: Of organizations that will stop MOX, stop plutonium fuels in this country, stop plutonium fuel in Russia and so I'm so pleased with the number of people here tonight but I'm a little shame faced that we didn't come away with enough hand-outs for you so if you have signed up on the sign-up sheet that went around, we will send you a follow-up packet. There is also some discussion about a declaration that individuals and member groups can get involved in. Certainly those of us who are in the Southeast can work together to break up the Duke Consortium because if we were able to break up, Duke, Virginia Power, Cogema and the other members of the consortium then we would strike a real blow to the plutonium fuels program and help not only ourselves in this country, but the communities in Russia as well. So we see this as the beginning of an international campaign and we want every person here to join in that, and we will continue to strategize together on how we can cooperate. Our website is going to be in the materials that you'll be getting in the mail and we will work out

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details before the delegation goes back home to share with you and get input from you in ways to solve this problem together. Watch in the news for the announcement of the design contract for the plutonium fuels program. Duke and the consortium are the only game in town, the only applicant for this, and so that means that we have responsibility here in the southeast and an opportunity to strike a hard blow. And Mary would you like to mention international next MOX day?

Mary: Yes and I'm also going to put the Capital switch board number up, because I earnestly believe that even if there are no votes on this in Congress, which there aren't right now, your delegation needs to hear from you. I have seen three phone calls change a Senator's mind. And handwritten letters are like gold. That is how to reach your congressional delegations 202-225-3121, and they won't let you stay on the phone very long and you always feel nervous when you call the 1st time that you're going to have a lot to say. Believe me these are very busy people and they don't want you to talk long. So all you have to do is call up and tell them why you're calling that's really about all it takes.

Q: What would you suggest we say? [answer cut off]

Q: How is plutonium being manufactured now and how can we stop the manufacturing of plutonium?

[TAPE CUTS OFF AND COMES BACK]

DCR005A

We're going to have by the middle of next week if not early in the week addition action item, on our web page www.bred1.org Blue Ridge Environmental Defense League.

May I make a suggestion, for your website, if you could publicize Duke's annual shareholder meeting date.

Okay, April the 15th, in Charlotte and we do have stockholders who are bringing a resolution on the elimination of the MOX or plutonium fuels program and we have plans to share information with the public in general, outside the stockholders meeting in Charlotte, so this is an event that is coming up soon in Charlotte and we need people to come. A small number of people will be inside and will focus on the economic impacts of insurance city and banking city, like Charlotte and also the economic impacts involving the questions of liability because those are absolutely totally unanswered.

And I just want to stick in one little thing.....

TAPE ENDS.

DCR005A

Attachment 2: Transcript of Blue Ridge Environmental Defense League Videotape of February 22, 1999 Meeting

My name is Jess Reilly and a number of years ago I was active in opposition to the licensing of the McGuire Plant and later to the Catawba Plant, and when I first heard about the proposals to convert plutonium (military plutonium) to peaceful uses it sounded pretty good. I had no basis for saying whether the plutonium cycle would be worse than the enriched uranium cycle, knowing that plutonium forms in it, too. SECC has been very helpful to me with respect to pointing out that there is almost certainly a significant level (significantly different level) of risk in the two processes. First, we heard about the fuel pins burning hotter. Some years ago about 10% of fuel pins were leakers. These leakers provide the radioactive materials that are picked up by ion exchange resins and filters. This is what primarily constitutes low-level radioactive waste. You may read about medical waste in papers and so forth and so on, now that's a lot of nonsense. About 95% of the radioactivity is in these ion exchange resins. That amount will apparently go up with the fuel pins running at a higher temperature. With respect to the embrittlement problem, as I'm sure you know the NRC calls for what they call coupons inside the reactor vessel and these coupons are small pieces of the same sort of metal as the reactor itself is made of and they are tested each time there is a refueling to see how much embrittlement has occurred. And so I sort of wonder is the increased embrittlement rate due to using MOX sufficiently great so that significantly greater than normal embrittlement takes place at a given period of operating time?

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DCR005B

DCR005B-1

Facility Accidents

The percentage of fuel elements that would be expected to leak is much lower than expressed in the comment. FRAGEMAs (a subsidiary of COGEMA and FRAMATOME) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMAs alone has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. There have been no failures and leaks have occurred in only 3 assemblies (a total of 4 rods). All leaks occurred as a result of debris in the reactor coolant system and occurred in 1997 or earlier. French requirements for debris removal were changed in 1997 to alleviate these concerns. Since that time, there have been no leaks in MOX fuel rods.

DCR005B-2

Facility Accidents

Differences between MOX fuel and uranium fuel are well characterized and can be accommodated through fuel and core design. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications.

Reactor vessel embrittlement is a condition in which the fast neutron fluence from the reactor core reduces the toughness (fracture resistance) of the reactor vessel metal. Analyses performed for DOE indicated that the core average fast flux in a partial MOX fuel core is comparable to (within 3 percent of) the core average fast flux for a uranium fuel core. All of the mission reactors have a comprehensive program of reactor vessel analysis and surveillance in place to ensure that NRC reactor vessel safety limits are not exceeded.

(Unidentified speaker) Unless you take provisions to counter that, yes.

Well, if, I've see certain controls on the embrittlement but if the situation significantly changes and embrittlement occurs much more rapidly during the operating cycle than it had in the past then I see the chances of reactor vessel failure going up. But over long term it seems to me that it's not in the utilities interest to use the MOX fuel because it means that the reactor life will be short. At least this seems like a sort of stupid thing to do. Not that the industry hasn't done a few stupid things already. So I don't want to stretch time too far here but I did want to say that I think it is worth expressing concern about going over to this particular change cycle. I'd hate to see what the economics look like. Are the utilities going to have to pay for the reactor fuel or are they going to be paid to use it, or are profits going to go up even higher than they are or?

(Unidentified speaker) Paid to use it.

What have we got here? Well, I mean if you're not particularly happy about the prices of electricity and you tell the industry and you can tell the industry is making a pile this may provide a little additional motivation. But anyway when we consider the whole picture including the possibility of an accident, seeing transported fuel assemblies falling into water and perhaps reaching criticality I'd be just as happy to see the cycle not happen and instead to see the glassification process go ahead.

DCR005B

DCR005B-3

MOXRFP

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would otherwise have purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

DCR005B-4

Transportation

Analyses in this SPD EIS have demonstrated that no LCFs from radiological exposures would be expected from transportation associated with implementation of any of the proposed alternatives. As described in Appendix L, MOX fuel assemblies would be shipped in DOE's specially designed SST/SGT system, inside Type B containers. Type B containers must be shown to withstand significant forces and temperatures without being breached. Additionally, SST/SGTs have been shown to have a significantly lower frequency of accidents than commercial trucks. In the extremely unlikely event that an accident severe enough to cause breaches in both the SST/SGT and the shipping cask, the MOX fuel rods still cannot become critical. NRC regulations 10 CFR 71 require that the maximum amount of material transported in a single shipment cannot become critical in the optimum (most reactive) configuration. This analysis would include configurations in which MOX fuel would be submerged in water.

My name is Bill Gay. My address is 7301 Leesburg Road, Charlotte and I'm also Professor of Philosophy and Chair the Department of Philosophy at UNC Charlotte. Since the early 1980's I've been researching, publishing, teaching and speaking on nuclear issues. Particularly about nuclear weapons. So it might be surprising that I'm concerned about what our local utility company is doing with nuclear reactors. But I really don't think it's all that surprising that some of what's been said tonight should make clear. I've long believed that we need to think globally and act locally and several times I've tried to speak out about what first Duke Power and now Duke Energy has been doing in compromising traditional separation between military uses of nuclear materials and commercial uses of nuclear materials. On September 5, 1998, an article appeared in the Observer about the plans of Duke Energy to use this mixed oxide fuel. I sent a letter to the Observer that was published on September 9th and so far I've only received one response, it was on September 30th. A staff member of the Nuclear Regulatory Commission, who had the luxury of not one column inch as he did in the paper, but a seven page article in which he tried to set me straight. I also teach logic and know that everything in his article was true. It wouldn't imply that what I said in my letter was false. I think that the concern is still genuine and I'm going to pass over repeating many of the things that were said about particularly proliferation and my concerns with what's happening in Russia today and to raise a slightly different question. Why is Duke Energy so silent about this potential move? What we've seen tonight makes very clear that we are concerned. It's not a matter that we're not concerned. It's also clear that we're smart enough. It's not the case that we're not smart enough to talk about these issues. If we're smart enough and if we're concerned enough why is there the silence? And, I think there was one hint of this in some of the comments about

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DCR005B

DCR005B-5

Nonproliferation

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. This activity permanently removes nuclear materials from the military arena, and does not compromise the traditional separation between military and commercial uses of nuclear materials.

DCR005B-6

MOXRFP

DOE is working with Duke and DCS on a public education program about the MOX program to better inform the public about the proposed activities. However, issues on Duke Power holding a public forum to discuss their thoughts are beyond the scope of this SPD EIS. It should be noted that Duke personnel participated and answered questions at the June 15, 1999, public hearing in Washington, D.C. on the *Supplement to the SPD Draft EIS*. They also participated in a meeting held by South Carolina State Senator Phil Leventis. DOE, DCS, and Duke Power personnel attended and participated in this meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

fuel, then even though it uses up some plutonium, it makes a lot more and you may not have much less left at the end plus it's still in fuel form which is easier to make nuclear weapons out of. I mean I just have difficulty imaging a crazier idea. I hope the government will quit wasting our money on it.

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My name is Katherine Mitchell and I live at 5101 Markay Street in Matthews, North Carolina, and I just want to say as a citizen, I am appalled, I'm stunned and I'm very angry at the fact that this has happened in such a way. The silence is unacceptable. The fact that we could get to this point and have so little information, and I think that Duke Energy should be ashamed of itself for trying to shove this down our throats with so little dialogue by the very people that are going to be impacted the most by this and I would also like to ask a question. I think that beyond this particular issue, the MOX question, I really believe that we also need to look at the industry as a whole, and the secrecy with which they've operated all these years, I think we need to ask why the regulatory body that is supposed to be overseeing this industry functions more as a partner and a mouthpiece of the industry as opposed to a regulatory body. How can we trust this? And, if we can't trust it, and our lives, and at the very least our pocketbooks are affected by it, but certainly the lives, not only lives, but the generations to come, are so profoundly affected by these decisions. We should be standing up and screaming about this situation and we should as citizens demand that changes are made and I think it was a grave mistake to think that they could slide this thru in this area without public debate and I think it might have just angered enough people that they're going to see a ground swell of resistance to the idea and I think that we should make sure that happens and I also think that as citizens we probably need to pay close attention to the press, to

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for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

DCR005B-14

MOX Approach

DOE acknowledges the commentor's concern regarding the lack of communication and information available to people who would be most directly impacted by the MOX approach. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. For those interested parties who could not attend the meeting on the *Supplement*, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

Comments on the role of NRC and the nuclear industry are beyond the scope of this SPD EIS.

the media, and demand that they recognize these questions and to ask why these situations are not being addressed in the media and try to hold the press accountable as well.

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My name is David Swain, I live at 21 Oxford Road, Lake Junaluska, NC. For 40 years I was privileged to be a missionary in Japan. I was rather good in the language and I was asked by the major publishing house to work with the cities of Hiroshima and Nagasaki to bring out the first and most comprehensive accounting of the whole body radiation from the bombings of those two cities. I mention that only to say I underwent my second conversion through that process. I have made personal trips to Hanford, to Savannah River Project, I missed Pantex, but I'll be there. I want to thank all these gentleman and ladies who came and helped remind us of what is the answer to your question. When the bombs were first dropped, Lewis Mumford wrote in the Saturday Review, these lines, "We in America live among mad men, the generals, the senators, the scientists, the Secretary of State, even the President. Without a public mandate of any kind, these mad men have taken it upon themselves to lead us by graded stages to that final act of madness.....skip a few lines,to blow the human race off the face of the earth. We've heard about scientific controls, technical controls, administrative controls, and the key one that remains is the public, the social controls. Not only the information but of these processes themselves". He also wrote "we are mad, too. Our failure to act is the measure of our madness. We know that the mad man is still making these machines" and now the waste that spews out from all their entrails, he didn't add that line, "and we do not even ask the reason. Still less do we ask them to bring their work to a halt." Now, that was 1946. 1999 is too late to be repeating these words. Without a public mandate of any kind, it is not

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DCR005B-15

General SPD EIS and NEPA Process

The SPD Final EIS was not published until the public had an opportunity to comment on the SPD Draft EIS and the *Supplement to the SPD Draft EIS*. Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations at various locations around the country, not just near the potentially involved DOE sites, to engender a high level of public dialogue on the program. In addition, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It is DOE policy to encourage public input into these matters of national and international importance.

enough for any President or any agencies under his administration just to decide to do these things, to withhold information about them, and we're mad if we let it continue. I'm not content to live in any age of madness. I want sanity, decency, honesty, openness, and some degree of democratic control about these insane practices.

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My name is Dr. Pam Wesfilan-Sholler (sp?) and I'm a medical oncologist at Arlen county, Forrestville, and Statesville, NC. 708 Parkers Road, Statesville, NC 28677. I feel the only way to impact cancer deaths, cancer incidents and cancer suffering will be in prevention. Treatment is very difficult and very expensive. The use of plutonium will increase the risk thru transportation, thru processing as we've heard tonight, not to speak of accidents in the nuclear power plants, such as 3 Mile Island and Chernobyl which can happen here. I believe that if the citizens knew it, that they would up in arms. This has not had adequate publicity. I believe the use of MOX is unnecessary, provides unnecessary expense, unnecessary risks, and this is unnecessary.

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My name is Linda Pentz, I'm from the Safe Energy Communication Council. This is just a suggestion, you mentioned the media, my job at SECC is to disseminate this message thru the media on a daily basis. I would encourage you all, we've spent the day going to the paper at Spartanburg, paper in Rock Hill, the Charlotte Post and the Charlotte Observer. They may or may not write editorials. We hope they do, endorsing our position. For all we know they may write editorials contradicting our position. I would urge you all if you possibly can to send in what's called opinion editorials, op eds stating your position. If you don't feel up to that, send a

DCR005B

DCR005B-16**MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. The goal of surplus plutonium disposition program is to reduce the threat of nuclear weapons worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications pursuant to 10 CFR 50. As discussed in response DCR005B-4, analyses in this SPD EIS have demonstrated that no LCFs from radiological exposures would be expected from transportation associated with implementation of any of the proposed alternatives.

As discussed in response DCR005B-13, although there is an increase in both risk and consequences from facility accidents, they have an extremely low probability of occurrence.

It is DOE policy to encourage public input into these matters of national and international importance. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (<http://www.doe-md.com>)—have been provided to facilitate the public debate. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

letter to the editor, but the most important thing is that once this dialogue is initiated, once this subject is aired at all by the media, once it airs hopefully tonight on channel 6, NBC, even if it airs for 10 seconds, write letters to the editor, write op eds keep the flow of information going so that people understand, that newspapers understand that there is this ground swell of opinion, that you do feel strongly. That there are public forces that need to be heard and that's the best way to utilize this free advertising arm that exists out there, that should give you space one way or another. So I just wanted to add that to you.

(Unidentified speaker)

And while we're in the public service announcement mode, I spent a little time on Capital Hill and I'll tell you the one thing that is read religiously is the letters to the editors in all the local papers, so don't ever think it was a waste of your time.

(Unidentified speaker)

I was going to add that the letter that was sent asking for these hearings to the Department of Energy and they declined to hold them, was also signed by dozens and dozens of groups and individuals also....(tape cuts off)

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DCR005B

DCR005B-17

General SPD EIS and NEPA Process

DOE acknowledges the commentor's issue that DOE declined to hold additional public hearings. During the 45-day public comment period on the *Supplement to the SPD Draft EIS*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE
LOUIS ZELLER
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BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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June 28, 1999

Bert Stevenson
 United States Department of Energy
 Office of Fissile Materials Disposition
 PO Box 23786
 Washington, DC 20026-3786
 fax: 1-800-820-5156

Re: Supplement to the Draft Surplus Plutonium Disposition EIS

Dear Mr. Stevenson:

I write to provide additional information on the Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement. Please consider these comments in addition to my oral and written remarks submitted in Washington, DC on June 15, 1999.

The planned use of mixed oxide (MOX) plutonium fuel is unsafe, uneconomical, and unnecessary. International experience with plutonium fuel is limited. The MOX program is experimental in that no reactor has ever been operated with fuel derived from weapons-grade plutonium. Recent reports on Duke Power's McGuire and Catawba reactors and Virginia Power's North Anna reactors describe human and technical errors which raise questions as to safety and reliability. Without modifications of the plants' containment vessels, inspection schedules, and maintenance procedures, the increased danger of reactor embrittlement may be hidden by outwardly normal appearance. Safety margins would be reduced if commercial power reactors designed for uranium fuel use plutonium fuel.

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"The U.S. Department of Energy is proposing to dispose of some fraction of the Nation's excess weapons-grade plutonium by converting this plutonium into MOX for use in commercial nuclear power plants. There is, however, rather limited operational or regulatory experience with the use of MOX in the U.S. Even the experience in other countries is not extensive."

—Letter from Advisory Committee on Reactor Safeguards to Nuclear Regulatory Commission Chairman, May 17, 1999

Therefore, we will place the reactors operated by Duke Power and Virginia Power under a magnifying glass in order to determine comprehensively the risk to public health in the communities which neighbor these reactors and along potential transport routes. We will also gauge financial impacts on utility ratepayers and to taxpayers in United States. The Department of Energy selection process, Duke, Cogema, Stone & Webster (DCS) and its subcontractors must also be subject to full public scrutiny. Moreover, the impacts on the people and institutions of Russia will be fully considered, as well as the nuclear security of the entire planet. We will continue to develop our contacts with Russian citizens' organizations in order to gain better understanding of their views. As we gather new information, we will continue to inform you of our findings.

Esse quam videre

FR005

FR005-1

MOX Approach

The major difference between weapons-grade plutonium and reactor-grade plutonium (i.e., plutonium recovered from spent nuclear fuel) is the level of plutonium 239. Reactor fuel in Europe is fabricated to similar enrichment levels (about 5 percent plutonium 239) to the levels being proposed for the U.S. reactors that would be used to irradiate MOX fuel. There is no NRC limit concerning the amount of plutonium 239 in the reactor core at this time. The use of enriched boron, the intended two-cycle MOX fuel use, the use of six similar Westinghouse-designed reactors, and a single fuel assembly design provide one method for safely achieving plutonium disposition. If any specific safety limits or restrictions are required, they would be identified during the process of applying for and receiving NRC approval for operations with MOX fuel.

FR005-2

MOX RFP

While it is understood that there are differences from the use of MOX fuel versus LEU fuel, these differences are not expected to result in substantial changes in the frequency of severe accidents in MOX-fueled reactors. Because differences between MOX fuel and uranium fuel are well characterized, they can be accommodated through fuel and core design. For example, MOX fuel assemblies can be placed away from reactor vessel walls to decrease the possibility of premature embrittlement. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications. NRC would also consider the plants' ability to use MOX fuel safely taking into account human factors and the material condition of the proposed reactors.

June 28, 1999
Bert Stevenson, US DOE, Office of Fissile Materials Disposition
page 2

Plutonium Fuel Hazards

Atom splitting in a reactor releases neutrons which split other atoms. This chain reaction is what drives the reactor. The chain reaction must be precisely controlled in order to produce power safely. Compared to neutrons from uranium atoms, plutonium releases more neutrons at a higher speed and energy during the fission process.

"Technical issues that arise in the analysis of risk at plants using MOX focus on the vulnerability of fuel to neutronically induced core disruption and the different inventory of radionuclides available for release from the fuel during accidents. The differences in neutronics and coupling between neutronics and thermal hydraulics result in different responses of MOX and conventional fuel to reactivity transients."

-Letter from Advisory Committee on Reactor Safeguards to Nuclear Regulatory Commission Chairman, May 17, 1999

Adding plutonium to the reactor in the form of MOX reduces the ability to control the chain reaction:

- The rate of fission in plutonium increases with temperature, and the problem is greater with MOX fuel made from weapons-grade plutonium. MOX fuel in a reactor attains higher temperatures than uranium fuel because of the higher quantity of transuranic elements produced during irradiation.
- The percentage of delayed neutrons emitted seconds to minutes after a plutonium atom splits is just one-third that of uranium (Pu239=0.2%, U235=0.65%). This means plutonium releases a higher amount of its neutrons in a single burst and adds to reactor control problems.
- Plutonium captures more neutrons than uranium, increasing fission and making control measures less effective.

-Data from Institute for Energy and Environmental Research, SOA February 1997

Reactor Embrittlement Problems

Higher energy neutrons from plutonium are more likely to strike reactor parts such as the stainless steel containment vessel. This neutron bombardment degrades the metal parts of the reactor and the metal becomes brittle. An embrittled reactor may look unchanged, but it will not perform as well under extreme conditions. For example, an event causes the water level in the reactor to drop. Normally, the heated water is replaced by cold water from outside the reactor. However, this cold water bath may cause the embrittled metal part to fail and a minor reactor failure becomes a major one. Embrittlement of reactor parts is a well-known phenomenon and has caused premature closing of commercial power reactors. The additional neutron bombardment caused by MOX fuel's plutonium will increase the tendency of parts to wear out and fail.

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FR005

Esse quam videri

FR005-3

Facility Accidents

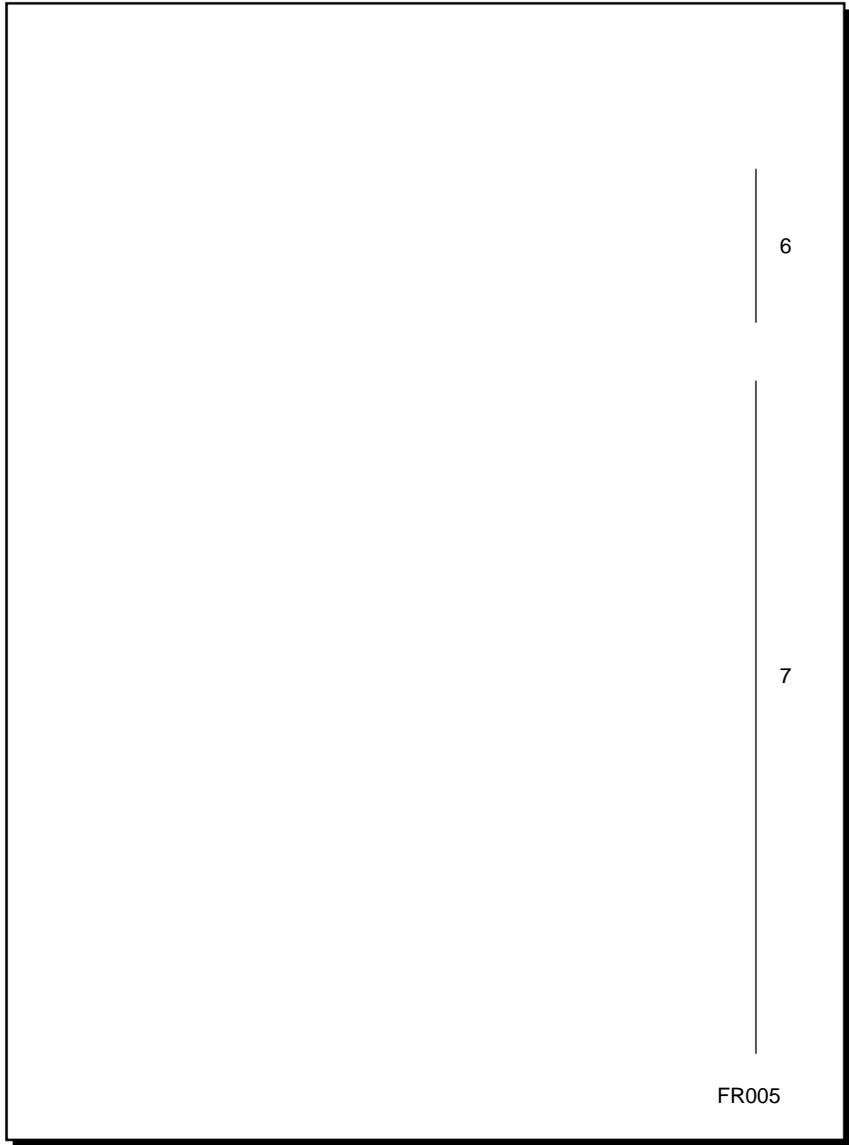
Differences between MOX fuel and uranium fuel are well characterized and can be accommodated through fuel and core design. All of the factors discussed by the commentor were evaluated by the proposed reactor licensees to ensure that the reactors can continue to operate safely using MOX fuel and will continue to be evaluated. Initial evaluations indicate that partial MOX fuel cores have a more negative fuel Doppler coefficient at hot zero power and hot full power, relative to LEU fuel cores for all times during the full cycle. These evaluations also indicate that partial MOX cores have a more negative moderator coefficient at hot zero power and hot full power, relative to LEU fuel cores for all times during the full cycle. These more negative temperature coefficients would act to shut the reactor down more rapidly during a heatup transient.

The remainder of this comment is addressed in response FR005-2.

FR005-4

Facility Accidents

As noted in response FR005-3, differences between MOX fuel and uranium fuel are well characterized. For example, MOX fuel assemblies can be placed away from reactor vessel walls to decrease the possibility of premature embrittlement. Additional engineering would be undertaken by DCS to ensure that MOX fuel can be safely used in the proposed reactors if the decision is made in the SPD EIS ROD to go forward with the MOX approach.



FR005-7

Facility Accidents

Analyses of a 40 percent weapons-grade MOX core indicate there would be approximately two times more americium 241 and plutonium 239, and slightly less than one and a half times the curium 242 than a reactor using LEU fuel. There are differences in the expected risk of reactor accidents from the use of MOX fuel. Some accidents would be expected to result in lower consequences to the surrounding population, and thus, lower risks, while others would be expected to result in higher consequences and higher risks. There is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE
LOUIS ZELLER
PAGE 5 OF 6

June 28, 1999
 Bert Stevenson, US DOE, Office of Fissile Materials Disposition
 page 5

Transportation Hazards

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 comment on DOE SPD DEIS

Many rural communities in South Carolina, North Carolina, and Virginia resemble Nebraska in that fire departments and emergency first-responders are entirely volunteer. This does not imply a lack of dedication, but limited resources do not allow volunteers to be prepared for every possible emergency. I served as a volunteer fireman in NC for many years and our experience, training, and equipment did not prepare us for radionuclide transport accidents. The SPD-DEIS does not address the problems outlined above.

Loss of Democracy

A total of 3.7 million people live within 50 miles of the McGuire and Catawba nuclear power stations, and another 1.6 million live within 50 miles of the North Anna reactors in Virginia. Yet the Department of Energy did not see fit to have public hearings in those communities, opting instead to hold a lone hearing in Washington DC on a weekday during working hours. Our written requests to the Secretary of Energy for additional hearings have so far met with rejection. The unprecedented veil of secrecy which envelops this civilian project threatens to undermine free debate on important issues of public policy.

Respectfully,



Louis Zeller
 DOE-SPD-DEISadd-comments28jun99

Attachments

Esse quam videre

FR005

FR005-8

Transportation

DOE acknowledges the commentor's concern about transporting surplus plutonium. Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material.

The subject of emergency response and subsequent cleanup of an accident that involves the release of nuclear materials, both special nuclear material and waste, is a topic of continuing discussion and planning between DOE and State, local, and tribal officials. Several venues, such as DOE's State and Tribal Governments Working Group and the Southern States Energy Board, are being used to facilitate these discussions. DOE's Transportation Safeguards Division has a formal liaison program with the States related to the transportation of special nuclear materials.

No credit was taken for interdiction or other activities that could be taken after a transportation accident involving a radioactive release, so the doses reported in this SPD EIS are considered conservative. As indicated in the revised Appendix L.8.4, mitigative actions would be taken following such an accident in accordance with EPA guidelines for nuclear accidents. These actions would result in lowering the actual dose to the surrounding population. As with any transportation accident, local, tribal, and State police, fire departments, and rescue squads are the first to respond to accidents involving radioactive materials. DOE maintains eight regional coordinating offices across the country, staffed 24 hours per day, 365 days per year, to offer advice and assistance. Radiological Assistance Program teams are available to provide field monitoring, sampling, decontamination, communication, and other services as requested. Dose to emergency response personnel is accident-specific and can not be globally estimated. Responders are trained to minimize dose.

**Nuclear Regulatory Commission Plant Performance Reviews of Proposed MOX Reactors
Shortcomings, problems, errors, and poor engineering performance**

McGuire NRC Plant Performance Review, March 25, 1999

These Duke Power plants in North Carolina began operation in 1981 and 1983. From the NRC's PPR:

"...shortcomings in oversight of diesel generator vendors were noted."

"Several human performance errors during routine plant evolutions were identified..."

"Minor program and procedure problems still indicate room for improvement. In addition to core inspections, a regional initiative inspection is planned for ice condenser inspections during the Unit 2 refueling..."

"An area for improvement was engineering programs and processes such as ... procedures and work instructions for maintenance and calibration of instrumentation..."

"... some fire protection system maintenance material conditions weaknesses have been noted..."

"Self-identified problems with fire barrier penetration seals were reported to the NRC and improvements are being made."

Catawba NRC Plant Performance Review, March 25, 1999

These Duke Power reactors began operation in 1985 and 1986. The following excerpts are from the NRC's PPR:

"Unit 1 experienced a forced outage of approximately three weeks in duration due to blocked flow channels in portions of the ice condenser."

"Engineering performance continued to be acceptable but declined since the last assessment as a result of emergent issues rooted in shortcomings in engineering's performance."

"Examples of poorly supported or non-conservative operability or root cause determinations were noted."

"Problems in maintenance programs and processes included examples of surveillance deficiencies for ventilation systems and ice condensers."

"The engineering performance decline was the result of deficiencies in auxiliary building ventilation system testing, an overheating event of the upper surge tank, and degraded conditions in the Unit 1 ice condenser. While the issues were ultimately resolved properly, each had roots in poor engineering performance."

North Anna NRC Plant Performance Review, March 24, 1999

Virginia Electric and Power Company's North Anna reactors started up in 1978 and 1980. From the NRC's PPR:

"...several examples of inadequate or untimely problem resolution were noted."

"A number of human performance problems, especially during refueling outages, indicates a decline in operations performance during infrequently performed evolutions."

"...poor material conditions of the auxiliary feedwater pipe tunnels and continued problems with microbiological induced corrosion in the service water system..."

"...however a negative trend was noted in the area of problem resolution. There were performance-based examples of inadequate corrective actions where equipment problems were not aggressively pursued and corrected. The initial proposed corrective action for a violation involving pipe supports not installed in accordance with the drawings was inadequate. Only after NRC involvement was adequate corrective action initiated. Corrective actions to resolve corrosion of the auxiliary feedwater tunnel pipe supports which had been identified in September 1996 were also inadequate. An AFW safety system engineering inspection (SSEI) conducted in July 1998 concluded that the system met the design basis requirements, however, mechanical calculations had numerous discrepancies."

6

FR005-9

General SPD EIS and NEPA Process

DOE acknowledges the commentor's request for additional public hearings in the communities surrounding the proposed reactor sites that would use the MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

Leah R. Karpen

400 Charlotte St #803
Asheville NC
28801

Phone: 828-254-5489
FAX: 828-254-5489
email:

Friday, June 18, 1999

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

Dear Decision-Makers:

Use of Mixed-Oxide Fuel

Since I was unable to attend the June 15th hearing in Washington, DC, I wish to comment on the proposed plans for disposition of weapons-grade plutonium

I strongly oppose the use of weapons-grade plutonium in commercial nuclear power reactors, that called mixed-oxide fuel or MOX for short. | 1

The Department of Energy should hold hearings near the potential reactor sites that would use MOX fuel. Sites were chosen in South Carolina, North Carolina and Virginia. People living in those areas should have a chance to express their opinion on the proposals; and you would have a chance to hear from them. | 2

The use of MOX in the United States could encourage other nations to embrace a plutonium fuel economy. Also, a severe accident at a reactor fueled with MOX could cause many cancers. | 3

Immobilization of plutonium in glass costs less than MOX and is successfully underway already. When utilities use MOX they will be heavily subsidized by the government; in other words, taxpayers would be paying utilities to use MOX. | 1
4

Any number of organizations have protested the use of plutonium as an energy source. Is it not time for the government to listen to its people?

Sincerely yours,



(Mrs.) Leah R. Karpen
Concerned Citizen

MR008

MR008-1

MOX Approach

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR008-2

General SPD EIS and NEPA Process

DOE acknowledges the commentor's request for additional public hearings in the communities surrounding the proposed reactor sites that would use the MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the

proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

MR008-3

Nonproliferation

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials. DOE will continue to discourage Russia from reprocessing its spent nuclear fuel and starting a plutonium cycle but this issue is beyond the scope of this SPDEIS.

There are differences in the expected risk of reactor accidents from the use of MOX fuel. Some accidents would be expected to result in lower consequences to the surrounding population, and thus, lower risks, while others would be expected to result in higher consequences and higher risks. There is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number

of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

MR008-4**MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to produce energy. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

June 9, 1999
104 Stuyvesant Rd.
Asheville, N.C. 28803

Mr. Bert Stevenson
NEPA Compliance Officer
U. S. Dept. of Energy
P.O. Box 23786
Washington, D.C. 20026

Dear Mr. Stevenson:

After reading and hearing about the plans for the production of Mixed-Oxide Fuel (MOX) I am writing to say that I am opposed to this. It is not the way to safely dispose of the plutonium from dismantled nuclear weapons. It would add to rather than lessen the immense radioactive waste burden. The plutonium should be immobilized with the utmost vigilance in glass. This lethal material should not be used and should be rendered as safe as possible.

1

I do not want my tax money used to bolster up nuclear sources of electricity.

2

Sincerely,

Llewellyn Perry
Llewellyn Perry

cc: The President of the United States
Mr. Frederic Pena, Secretary of Energy
Senator Charles Carter, N.C. Assembly
Senator Steve Metcalf, " "
N.C. Public Utilities Commission
Duke Power

MR005

MR005-1

Alternatives

DOE acknowledges the commentator's support of alternatives that consider only immobilization. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR005-2

MOX Approach

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

PHYSICIANS FOR SOCIAL RESPONSIBILITY
LEWIS E. PATRIE
PAGE 1 OF 2

STATEMENT BY LEWIS PATRIE, M.D., M.P.H, PRESIDENT OF WESTERN
 NORTH CAROLINA OF PHYSICIANS FOR SOCIAL RESPONSIBILITY

DOE SUPPLEMENTAL EIS HEARING ON PLUTONIUM DISPOSITION

14 JUNE 1999, WASHINGTON, D.C.
 presented by Curt Wozniak, Physicians for Social Responsibility

The U.S. Department of Energy's current strategy in developing its Environmental Impact Statement is inadequate in that DOE has never held a hearing near the potential reactor sites where MOX fuel would be utilized. DOE proposes that most of the 50 tons of plutonium declared surplus by the military would be converted into MOX for use in civilian nuclear power reactors. Already DOE has signed an \$130 million contract for the irradiation of plutonium MOX fuel with DCS, a consortium of contractors including: COGEMA, Inc., Duke Engineering and Services, and Stone and Webster. The six reactor sites that have already been chosen for MOX use are located in South Carolina, North Carolina, and Virginia.

The one remaining public hearing announced by the DOE is scheduled in Washington, DC on June 15. This is not a satisfactory alternative to holding hearings in Charlotte and Charlottesville with adequate notice and publicity so that an optimum amount of dialogue and testimony could be aired by citizens who would live closest to where the plutonium fuel would be used.

Furthermore, the characteristics of MOX fuel, as compared with existing nuclear fuel, with its increase in energy output, increasing the radioactive bombardment of the reactor chambers, its characteristic of more rapid increase of energy output and the potential for greater release of carcinogenic nuclides in the event of a significant accident all suggest that it is not as desirable an alternative as the immobilization option.

For these latter reasons I oppose the MOX option, but if DOE continues to move forward with this ill advised plan, it would seem that consistent with our democracy, DOE is obligated to holds hearings as I described above.

Lewis E. Patrie, M.D., M.P.H.
 99 Eastmoor Drive
 Asheville, N.C. 28805

(828) 299-1242 (R)
 (828) 258-3500 (o)

DCR014

DCR014-1

General SPD EIS and NEPA Process

DOE acknowledges the commentor's request for additional public hearings in Charlotte and Charlottesville so citizens living closest to the proposed reactor sites could provide dialogue and testimony. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before

the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

DCR014-2

MOX Approach

DOE acknowledges the commentor's opposition to the MOX approach. Differences between MOX fuel and uranium fuel are well characterized and can be accommodated through fuel and core design. For example, MOX fuel assemblies can be placed away from reactor vessel walls to decrease the possibility of premature embrittlement. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications. NRC would also consider the plants' ability to use MOX fuel safely taking into account the material condition of the proposed reactors.

There are differences in the expected risk of reactor accidents from the use of MOX fuel. Some accidents would be expected to result in lower consequences to the surrounding population, and thus, lower risks, while others would be expected to result in higher consequences and higher risks. There is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

The remainder of this comment is addressed in response DCR014-1.

UNITARIAN UNIVERSALIST CHURCH OF ASHEVILLE
JEANNETTE O. PATRIE ET AL.
PAGE 1 OF 1

UNITARIAN UNIVERSALIST CHURCH OF ASHEVILLE
SOCIAL ACTION COMMITTEE
ONE EDWIN PLACE
ASHEVILLE, N.C. 28801

May 16, 1999

Secretary of Energy Bill Richardson
1888 Independence Ave. SW
Washington, DC 20585

Dear Secretary Richardson

We are concerned about proposed the plutonium fuel use in civilian nuclear reactors and ask for formal public hearings on MOX to be held in cities near the nuclear reactors selected for MOX: Charlotte, NC and Charlottesville VA.

1

Sincerely yours,

Jeannette O. Patrie
Laura E. Patrie, MO
Ruth Beard
Al Mjavenir
Nancy Palmberg
Theresa
Sam Jato
Robert M. Johnson, Ph.D.
Robert
Timothy Baker, M.P.

MR003

MR003-1

General SPD EIS and NEPA Process

DOE acknowledges the commentors' request for additional public hearings in Charlotte, North Carolina, and Charlottesville, Virginia. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

36 Bust-O'-Dawn Drive
Waynesville, NC 28786
June 22, 1999

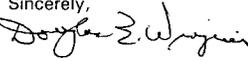
U.S. Department of Energy
Office of Fissile Materials Disposition
PO Box 23786
Washington, DC 20026-3786

Dear Friends:

I write to urge you not to use weapons-grade plutonium in commercial nuclear power reactions, called mixed-oxide fuel, or MOX. Instead, I urge you to employ the option of immobilizing the plutonium in glass. 1

I believe MOX is a bad idea because it is dangerous, is slower and more expensive, is not needed, and is not wanted.

I also urge you--before implementing any policy for disposing of weapons-grade plutonium--to hold hearings in all affected communities--especially those near the chosen reactor sites. It is only fair that the people who would be affected by this dangerous material should have an opportunity to be heard. 2

Sincerely,

Dr. Douglas E. Wingeier

MR010

MR010-1

MOX Approach

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR010-2

General SPD EIS and NEPA Process

DOE acknowledges the commentor's request for public hearings in all communities affected by the use of MOX fuel, especially those near the proposed reactor sites. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

