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65FR 4856
Feb. 1, 2000

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Chief
Rules and Directives Branch
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Comments on: Draft NUREG 1718, Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility, January 2000

These comments are submitted 03/27/2000 (under extension) via fax to 301-415-5390 as per phone instructions from Nuclear Materials Safety and Safeguards personnel and also via e-mail to axpl@nrc.gov because web address given in extension notice would only give an "error message," and the individual named in the notice was 1) not available and 2) voice mail box was full. I request that these comments be validated as within the comment deadline if they have been misdirected.

We reserve the option to add to these comments at a future date.

The Commission Should Actively Oppose MOX Fuel, Not Establish Acceptance

NUREG 1718 is a document designed to enable the construction of a MOX fuel production facility. There is nothing in the document that even mentions the possibility that a license would not be granted.

The mission statement for the Nuclear Regulatory Commission (NRC) paraphrased from NUREG 1718, is to 'identify factors that are inimical to the common defense and security and to provide reasonable protection of the health and safety of workers and the public and the environment.' The use of Mixed Oxide plutonium fuel is contrary to this mission. It is a failing that the Commission did not intervene in the national process to select a plutonium disposition strategy to forestall MOX as an option for the following reasons.

MOX undercuts our security and common defense. In a global era of nuclear disarmament and the need to more strongly affirm nuclear nonproliferation policy, the United States government in the body of the Department of Energy (DOE) is acting irresponsibly to convert weapons plutonium into commercial reactor fuel. This action reinforces the counterproductive and dangerous idea that plutonium is a commodity, opens the door to much more difficult safeguarding and removes any separation between US military and civilian nuclear programs. NRC should oppose it.

MOX reduces the margins of safety on nuclear reactor operation and therefore jeopardizes public health and the environment. Weapons MOX has NEVER been used anywhere in the world and NRC should recognize that it is completely inappropriate to launch this experiment with full

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scale implementation in civilian reactors in communities that could be affected by an accident to a much greater degree than a similar accident with conventional uranium fuel, the consequences of which the NRC has already managed to ignore over its entire regulatory existence. DOE itself acknowledges that there would be more cancer deaths from a major reactor accident with a MOX plutonium core than the same accident with uranium fuel.

MOX, particularly weapons MOX will have adverse impacts on a number of reactor operations, including moderation of the fission reaction, aging of reactor components and complications of source term and all types of waste and emissions. Again, NRC in its mission to protect our health and our environment should oppose this program altogether.

MOX fuel fabrication in particular will place workers, the rest of us, and our environment at greater risk than the alternative of plutonium immobilization since it will require more plutonium processing steps, and produce more waste.

If all of this perspective were adequately reflected in NRC's implementation of its mission, even if the Commission did not take action to stop the DOE's program, the Review Plan would look very different as a document. Instead of defining "acceptance criteria" and providing affirmative text about acceptance throughout the document, NUREG 1718 would take the core values in the mission statement seriously. Then guiding principles would be used to define regulatory criteria and means for determining if the facility and program would meet **or fail to meet** those criteria. There would be the possibility that NRC would not in fact license the facility.

The Nuclear Regulatory Commission's Habit of Exemptions Must Stop Here

Since it is unlikely that our point of view will change the Commission or its staff over night, we would like to note that NUREG 1718, and indeed our comments on it, are not worth the paper they are written on, or the electronic memory they reside in, if the Commission continues with its long history of granting regulatory exemptions. If these are the rules, use them. Do not make of new ones on the spot when the process or facility cannot meet these!

Nonetheless, we do have some specific comments following on deficiencies in these guidelines.

Quality Assurance: Learn from the Nuclear Lessons of 1999 and 2000

The world has been astounded by events in England and Japan in the last year. A workers at a fuel fabrication facility in Japan and the community around it suffered from an inadvertent nuclear criticality reaction. The fission products from this event were recorded as far away as California. In the same time frame the scandal of criminal negligence in MOX fuel production procedures at Sellafield has unfolded. Both of these events has bearing upon the commencement of plutonium fuel production in the US.

NUREG 1718 refers to the need to establish a "safety culture" but nowhere are the attributes of this culture defined. In the light of Tokaimura, where workers who had been in employ for decades did not even know about the possibility of a criticality accident, it cannot be stressed

enough that education is a key piece of the required culture.

In England, not only was the situation ripe for worker negligence, but indeed Management was unaware of the falsification of inspection records for apparently as long as 4 years. Clearly the actions of all levels of the organization were beyond a functioning safety culture, and cannot be pinned solely on the workers or seen as an isolated event. The vast contamination which exists at the Savannah River Site now also bespeaks of the absence of a safety culture or any respect for workers, environment or health.

The following section 3.5 of the Health and Safety Executive report entitled "HSE Team Inspection of the Control and Supervision of Operations at BNFL's Sellafield Site" where workers decided to falsify MOX fuel inspection reports contains many specific recommendations which NRC staff should evaluate and distill into a section for NUREG 1719 on what appropriate "safety culture" looks like. (the entire report is worthy of review, and can be accessed at: <http://www.hse.gov.uk/nsd.team3.htm>)

"3.5 Safety Culture

We did not specifically look at safety culture using the HSE's Health and Safety Climate Survey Tool. Rather we have derived our views based on observations whilst undertaking the inspection. We therefore report on a number of specific observations.

Elements we would expect to see in a good safety culture include learning from experience, encouragement to report minor happenings (no blame culture), a proactive management and good communications. We inspected a number of activities which had previously been subject to incidents to see how learning points had been picked up. We were disappointed to find failures to learn from experience in most of our sample. We were more concerned to observe that the learning points from two Improvement Notices served by HSE within the past year on BNFL had not been effectively taken up across the company.

An example of particular concern was the considered response of a senior level manager to justify one such failure. He based his justification on a claim that the risk was under control and hence was acceptable. This argument was fundamentally flawed given that for the particular situation, action could have been taken to remove the risk at the point in time it was created. Furthermore, if proper planning had taken place, the risk would have never been created in the first place.

We found plant log book entries which in our opinion warranted being reported as either a happening or event. Although the numbers were not large given the small size of our sample, we consider that these observations are indicative of a failure by people who are responsible for reporting happenings or events, which is not acceptable. We noted the tolerance by management on a number of plants of the Hazard Log book entry not being properly closed-out in a timely manner. We found examples where staff on plant were not aware of incidents elsewhere on site which had substantive learning points for them. It appeared to us that there were too many occasions where the event review teams failed to derive lessons from events. We recognise that BNFL is aware of this shortfall and is putting in efforts to improve its learning from experience system.

In one plant we noted that staff were of the view that if safety had not been affected at the time, then an occurrence where the intended operational control had been lost was not reportable under the site system for reporting happenings, events and incidents. We consider

this reflects a lack of understanding of the need to learn from such occurrences. In another plant we observed that this view had even been reinforced by the provision of an operating instruction which covered a recovery operation to bring the product back within specification. We suggest that BNFL should be spending effort to minimise such events rather than putting the effort in to recover the situation or more succinctly, "get it right first time".

In one example we learned that one of two duplicate pieces of equipment, which was a safety mechanism, had been defective for a considerable period of time. Staff argued that it was not necessary to repair it, as the safety case was based on the availability of a single piece of equipment. We consider that given duplicated equipment had been provided, it would have been reasonably practicable to repair or replace the defective item, so as to maintain the levels of safety which had initially been designed into the plant.

We observed operators in some of the older plants running them with a number of systems in an alarm state. The numbers involved were sufficient to be poor practice. We noted operators using uncontrolled copies of operating instructions at work locations and in one case a temporary instruction, posted up for use despite it having been formally withdrawn. We believe that if copies of instructions are required at work locations, normal quality assurance requires that they should be subject to control procedures.

We found that there were widely varying working cultures and practices across the site, particularly apparent with the general process worker and skilled trade positions. We noted a relationship between the age of the plant and the working practices adopted. In some of the more modern plants, there was a flexible approach to worker skilling and the basis of allocating tasks to individuals. We understand this flexibility was possible because staff had been trained and encouraged to build up actual work experience in different skills from those for which they were originally trained or that their jobs formerly required. We observed in some of the older plants, the practice was to retain an approach of almost single skill areas for process workers and skilled trade positions. We found that the staff in these areas in general felt less valued than those in the areas of more flexible working.

An important indicator of a safety culture is the so called no blame culture. This encourages people who have found something wrong or done something inappropriate to report the matter so that colleagues can learn to avoid the event. It is important to emphasise that there is a difference between a no blame and a no discipline culture. There will be times in a no blame culture where disciplinary action has to be considered because of the nature of the event. We looked at a small number of investigations for evidence of this no blame culture.

Whilst not wishing to comment on the appropriateness or otherwise of any specific disciplinary action, we note from the sample of incidents studied that the effect of BNFL Sellafield's shift in attitude to following-up events is often to challenge either the individual, or his or her immediate supervisor. This can be seen to be in line with BNFL's recent exhortations that people must comply with their instructions. However, in the sample of incidents we specifically examined, we observed that behind any deficiency in an individual's performance was often a trail of poor standards which had been tolerated by management. In the sample of incidents we examined, it appeared that higher levels of management were unaware of day to day custom and practice. When the custom and practice was brought to their attention by an incident, they considered the custom and practice to be unacceptable.

We note that concern amongst employees and others such as contractors at BNFL Sellafield, and the sense of injustice which is engendered, has grown within the past year.

We noted a lack of critical questioning attitude by staff, for example when considering the potential impact of a modification proposal if it were inadequately conceived or executed."

As the HSE report continues, it is very important to note that it was not only negligence on the part of the

workers. Management, to the top level of the operation was involved in this long term, systemic negligence. From the report:

"Recommendation 26 - BNFL should implement a programme to improve the safety behaviour of staff and management.

It is inevitable that some staff will fall short of perfection in matching their deeds with their words. For example we have already noted that at the highest level, the company has not reissued the company vision statement or updated the Company Manual. We have examples of similar failings across all levels within BNFL. We consider the shortcomings are sufficient to warrant BNFL taking remedial action. Key areas which we have identified during our inspection are ensuring consultation with all stakeholders, delivering the requirements of high level company documentation, ensuring that a better balance of communication is achieved (good news versus bad news reporting), dealing with incidents and associated potential disciplinary action, and ensuring actions are properly closed out.

Recommendation 27 - BNFL should review the resources available to and the expertise of management and demonstrate to NII that this is sufficient to ensure that management's actions match their words."

A recent (March 22, 2000) article in the New York Times (appended) quotes this very management of BNFL, David Bonser as saying "We feel very badly about the pellets." If a major reactor accident had been caused by MOX fuel failure or dysfunction due the negligence of BNFL, they would be doing more than "feeling bad."

There is no area more important than Quality Assurance

NUREG 1718 gives lip service to this concept. However, in a number of key areas there is blatant disregard for this principle. The following two examples are chosen for comment, but the lack is endemic throughout the document.

Criticality: The detailed nuclear criticality (chapter 6) requirements are summed by the Safety evaluation which cross-references many other sections of the Review Plan, but omits the Quality Assurance, Quality Control section.

There are also a great many opportunities for exemptions given throughout the NUREG. One which startled this reviewer was the statement that overhead water pipes could be flatly ignored in the evaluation of limiting fission moderator material. There was no mention of necessity to qualify such pipes to seismic standards or consideration of water hammers. Thus NUREG 1718 itself dismisses the very safety culture it gives lip service to.

Fire Protection: Quality assurance and quality control (QA/QC) are vital in the area of fire protection. Section 7.4.3.2 C. states: "Combustible materials are not used in the construction and confinement system." Given the problematic and even fraudulent history of both the industry and the NRC as regulator in the area of fire barrier QA and QC it is vital that there be specific guidelines as to what is and is not a combustible material. This also applies to 7.4.3.2. G. on electrical wiring. The history of the installation of Thermo-Lag and RTV silicon foam is an illustration of what can happen when words are used but their meaning is contravened. Both of these so-called fire barrier materials are in fact combustible.

Thermo-Lag has been installed across the U.S. in nuclear power reactors to "protect" key electrical wiring. It has subsequently been shown to be combustible, and also in some situations to increase the possibility of a fire starting. RTV silicon foam has been used extensively as a fire penetration seal where wiring has to pass through structures. This material has been shown to be combustible, support combustion and harbor fire. It has been demonstrated to be difficult to install correctly industry wide, where inspections show insufficient fill, voids, cracking and these problems are exacerbated by the lack of a non-destructive method of evaluating the seal's reliability.

When it comes to QA/QC on plutonium handling, the regulator **MUST** categorically and specifically exclude the use of problematic materials already known through a history of dysfunction to be non-protective. Further, aging of any fire protection materials must also be factored into the QA/QC regulatory scheme. Not only manufacturer and installation problems have been seen, age related degradation can significantly affect these systems and must be controlled for.

Risk Modeling

It is unacceptable to use risk modeling in the case of plutonium handling. We have seen in this past year what the results can be. All plans should be geared to prevent the high consequence events that are possible at such a facility, regardless of their probability.

In the area of Fire Protection risk modeling is particularly inappropriate as part of the acceptance criteria. What we have seen is that risk modeling on fire is next to impossible to do with any reliability. There are too many variables that are impossible to predict, such as transient combustible such as lubrication oil, diesel fuel and combustible gases.

Financial Qualification

There has been a quiet policy decision completely un-reviewed in the NEPA process, that the MOX fuel fabrication facility under question will **NOT** be dismantled and decommissioned under the DOE contracts with the applicant. This opens a tremendous uncertainty about the financial liability for this eventual costly process. Plutonium contaminated waste is most certainly not cheap to deal with. Is it possible since it is completely omitted in this Standard Review Plan, which clearly states that it is intended to apply to license amendments and extensions, and per chance, other possible MOX fuel fabrication facilities in the future (? perhaps implied, not stated) that this **HUGE** area of financial consideration is simply to be ignored?

Is it therefore possible that under some eventual bankruptcy of this completely uneconomical, high risk and ill advised nuclear expansionism that NRC and DOE are pursuing together at the expense of the "common defense and security and to provide reasonable protection of the health and safety of workers and the public and the environment" that the cost of decommissioning could devolve to the people of South Carolina? This is exactly what happened to the people of Oklahoma with regard to the contamination of the Gore, Oklahoma Sequoyia Fuels site for which no decommissioning funds were ever secured. This situation in Oklahoma is the direct result of inadequate action on the part of NRC as regulator, allowing the General Atomics Corporation to apparently transfer not only their assets, but their federal ID number to an international "off shore" entity, leaving Sequoyah fuels all "washed up" and a sea of uranium in the ground water on the borders of the Cherokee Nation and a number of fast growing communities.

While we have offered some specific critique of NUREG 1718, we nonetheless find it

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inconceivable that an agency such as NRC that clearly supports and endorses the nuclear energy option would go forward with such a misguided plan as the licensing of a MOX plutonium fuel fabrication facility. We suggest you get your priorities straight.

At the very least we urge you to rewrite the document to indicate that rejecting the application is at least an option.

Mary Olson
Nuclear Information & Resource Service
from the Southeast Office
3/27/2000

A LAPSE AT HOME COMES TO HAUNT A BRITISH EXPORT

New York Times

Wednesday, March 22, 2000

by Matthew L. Wald

WASHINGTON, March 21 -- From simmering tanks of high-level nuclear waste in Washington State and plutonium laced with chemical poisons in Idaho to production of radioactive gases in South Carolina, the federal government's nuclear weapons program has festering technical and environmental problems like no one else in the country.

With no easy way to solve them, the Energy Department has gone to one of the few entities in the world with experience as broad as its own: British Nuclear Fuels, part of the nuclear power and weapons agency of the British government, now spun off as a government-owned company.

But as the British company now known as BNFL prepares to tackle the American problems, an embarrassing lapse has emerged back home in its core business, which is producing plutonium fuel. British government inspectors reported in February that for months, employees who were supposed to be performing a final measurement of fuel pellets bound for Japanese reactors were instead copying numbers from previous shipments. BNFL executives said workers felt the work was boring and a crew on the night shift had apparently found it easier to falsify the numbers.

Concern over the company's business practices is now affecting its contracts with the United States government. Energy Secretary Bill Richardson, in a telephone interview from Algeria, where he is meeting OPEC ministers, said he had ordered his department to send a team to England to meet with British investigators. "We are now placing BNFL under extra scrutiny because of these problems," he said. "I have been uneasy about some of their operations in the U.S. If we uncover anything, I will take swift and strong action."

He added, "Business as usual is over with BNFL and with all our contractors, but especially with BNFL." The situation, Mr. Richardson

said, was "itching for stronger management review."

The company said the incident with the pellets was an isolated problem. "We feel very badly about the pellets," said David R. Bonser, a director of the government-owned company, and head of waste management and decommissioning. He said it was a problem caused by "a handful of people in one of the plants who did things they absolutely should not have done."

Britain's nuclear installations inspection agency, however, rejected that defense. "Although various individuals were at fault, a systematic failure allowed it to happen," a report, published in February, said. "In a plant with the proper safety culture, the events described in this report could not have happened."

John J. Taylor, the company's chief executive, has resigned, but the company's problems continue. Sellafield, the plant on the west coast of England where the fuel was made, was never popular with neighbors: for years it has dumped radioactive waste into the Irish Sea; English anti-nuclear advocates and the Irish government would like it shut; and the British government reported that pigeons in the area had become radioactive from the plant's emissions. But now the problem is not just with neighbors, but with customers.

Japan asked the British company to take back the fuel, although the company insists that two automatic systems measured the pellets and found their diameter to be within specifications. A German utility, PreussenElektra A.G., shut a reactor running on the fuel that was not properly measured, and asked for compensation; Germany also suspended imports of additional fuel.

Well before its fuel problem at Sellafield, however, it was clear to leaders of the British company that the future profitability of that business was uncertain. As a result, they moved decisively into the United States. With an American partner, the Morrison Knudson Corporation, the company acquired many assets of the old Westinghouse Corporation, which had been a major Energy Department contractor; it also bid directly on Energy Department work at Oak Ridge, Tenn., and Hanford, Wash. And it has hired several former Energy Department officials, including one who approved giving a contract to BNFL without making the company take part in a fully competitive bidding process.

The Hanford contract, which involves solidifying liquid nuclear wastes in glass, is expected to take decades and cost tens of billions of dollars. At Hanford, BNFL hired the Energy Department's former site manager, one of four high-ranking Energy Department officials now on its payroll.

Meanwhile, a coalition of American groups that has been pressing the Energy Department for years to clean up its nation-wide archipelago of weapons operations plans to file a petition with the department on Thursday urging that BNFL be barred from government contracts, for lack

of integrity and competence. "We think clearly a case can be made, and that the case is self-evident, that this is a company that does not possess those qualities," said Thomas Carpenter, a lawyer with the Government Accountability Project, in Seattle.

The problem is serious for the Energy Department, critics say, because its track record on overseeing its contractors is particularly poor. No evidence of wrongdoing has been found in BNFL's American operations. But at Rocky Flats, near Denver, where a BNFL subsidiary works in plutonium clean-up, a prior contractor committed five felony violations of environmental laws with no apparent notice from the department, which owned the plant. At Savannah River, where the company is now involved with the plant that refuels hydrogen bombs with a radioactive form of hydrogen gas, a prior contractor's list of 30 reactor accidents over the years came as a complete surprise to top Energy Department officials.

Secretary Richardson has had the department put special emphasis on improving its oversight, but in January of this year a report by its own inspector general complained that at Hanford, where BNFL has been selected for the largest environmental cleanup in the country, the department lacked the personnel, plans and other management tools needed to oversee the project. Without those plans, the inspector general warned, "the Department may be unable to control, predict, explain, or defend future changes to cost and schedule." The cost estimate is now \$47 billion, up from an estimate of \$30 billion to \$38 billion in 1996. The company's portion would be \$6.8 billion to \$10 billion, by current estimates. A decision on a contract is supposed to be made by August.

In addition, outside groups that have followed the Energy Department's clean-up efforts for years now say that the company has taken on other jobs for the department in areas in which it has no special qualifications. For example, in Oak Ridge, the department has enormous derelict factories that it formerly used to enrich uranium for reactor and weapons fuel, and which it would like to release for private industrial use. Forgoing bidding, the Energy Department gave BNFL a \$238 million contract in 1997 based on the idea that it had done similar work at Capenhurst, in England. The department relied on a contracting system called "other than full and open competition."

The Energy Department reported to Congress that it wanted BNFL because of "efficiencies in the approach to recycle and building decontamination based on the company's successful experiences at Capenhurst." A key point for the Energy Department was the ability to decontaminate tons of nickel, a valuable metal that was used in the enrichment process.

But the company did not do that work at Capenhurst; the nickel there is still contaminated. And the system it proposed to use for decontamination of nickel at Oak Ridge is now the subject of a patent

dispute between its American inventor and the Energy Department. In a suit brought by the Oil, Chemical and Atomic Workers International Union against the plan, a federal district court judge in Washington described the process as "entirely experimental." Because of uncertainty about what standards should apply, the department has dropped plans, for now at least, to sell the nickel on the open market.

The contracting officer for the Energy Department who approved "other than full and open competition" later went to work for BNFL. So did the former manager of the Hanford site, who is now an executive vice president at an American subsidiary of the company, and so did the former manager of the Energy Department's Idaho Engineering and Environmental Laboratory, where BNFL won a contract to build an incinerator for plutonium mixed with hazardous chemicals not far from Yellowstone National Park.

"They're swallowing fairly important and influential executives right and left," said Mr. Carpenter of the Government Accountability Project. Energy Department officials said that none of the officials had violated any conflict-of-interest rules.

BNFL's problems at Sellafield have produced ammunition for a group opposed to the incinerator, Keep Yellowstone Nuclear Free, as they have for other critics around the country.

"It is inconceivable," said Tom Patricelli, the group's executive director, "that the United States government would allow a foreign corporation surrounded by such scandal and turmoil to build a first-of-its-kind incinerator on American soil, so close to the crown jewel of our national park system."

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