INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH

6935 Laurel Avenue, Suite 201
Takoma Park, MD 20912

Phone: (301) 270-5500
FAX: (301) 270-3029
e-mail: ieer@ieer.org
http://www.ieer.org

Comments on the Draft Environmental Impact Statement (EIS) For the Proposed Chemical and Metallurgical Research (CMR) Building Replacement Project at the Los Alamos National Laboratory (LANL)

Submitted by
Arjun Makhijani
Institute for Energy and Environmental Research, Takoma Park, Maryland

to

Ms. Elizabeth Withers
NEPA Compliance Officer
U.S. DOE/NNSA Los Alamos Site Office
Fax: 505.667.9998; e-mail: cmrreis@doeal.gov

June 30, 2003

A. Need for the Project

While the CMR Replacement (CMRR) Draft EIS is not very forthcoming on the details of the need for the new facility, there is an abundant amount of indication that this is an unneeded facility.

The CMR Replacement Facility is proposed primarily to create advanced capabilities for analytical chemistry and for materials characterization related to nuclear materials, non-radioactive analogs and other aspects of nuclear weapons programs that are part of the DOE Stockpile Stewardship Program.

DOE historical data shows that there have never been aging related safety problems in the primaries of nuclear weapons. Nor have any of the pits in the current arsenal ever had aging related reliability problems. As part of the evidence for that, I am enclosing the IEER study on the Stockpile Stewardship Program that analyzed aging-related issues based on data supplied by LANL. That study is an integral part of these comments.

The CMRR EIS itself states that "no problems [related to aging of pits] have been identified" (p. S-11). The Draft EIS on the Modern Pit Facility states that aging research provides confidence that pit lifetime is 45 years or more and indicates that data exists to support a lifetime estimate of 60 years. It identifies no problems that require pit replacement even beyond that time. Other evidence along the same lines is cited in the comments of Jay Coghlan of Nuclear Watch of New Mexico. Those citations from the DOE and other literature regarding aging are incorporated here by reference and I will not repeat them.[1]

Some materials characterization activities are being carried on in the restricted operations mode in the current CMR building. The Draft EIS provides no detailed rationale that for the going beyond these activities, much less a rationale for an entirely new replacement facility for the CMR. The estimated radiological impacts from some accident events postulated in the Draft EIS are among the most severe outside of reactor and reprocessing plant related events. They are also far more severe than the "no action alternative." Given that the DOE/NNSA is planning

to increase risks to the public considerably, there is a need to justify the project in detail to the public that will suffer these risks. A great deal has, in the past, been simply swept under the rug of national security, only later to be revealed to be gratuitously damaging to the health and environment of the people. It is worthwhile, in this context, to recall the statement of then-Deputy Secretary W. Henson Moore in 1989, during the administration of President George H.W. Bush, on his visit to Rocky Flats in June of that year. Nuclear weapons production, he told the press, has been "a secret operation not subject to laws . . . no one was to know what was going on." He added that "the way the government and its contractors operated these plants was: This is our business, it's national security, everybody else butt out."[2]

The skimpiness of the Draft EIS on the justification for a facility that will create significant risks (see below) is lamentable and raises the possibility of a return to these attitudes that should be consigned to regrettable footnotes in history books. The problem should be fixed in the final EIS with a detailed justification for the project including exactly what will be done in the new facilities. Based on the present information, it appears clear that the "no action alternative" is the soundest one among the ones enumerated. Further, the serious consequences of a main vault fire in the existing CMR building described in Appendix C indicate the need to perform operations there with a plutonium inventory that is significantly lower than the 200 kilograms indicated in the Draft EIS.

B. Air Emissions from Routine Operations

The Draft EIS shows that emissions to the air from routine operations would increase greatly. Current CMR emissions are stated to be 0.03 millicuries of actinides, including plutonium, with no releases of fission products or tritium. The new facility releases would be much higher. Actinide releases would increase by more than 25 times to 0.76 millicuries, and there would be significant releases of fission product noble gases, krypton-85, xenon-131m, and xenon-133 (100, 45, and 1,500 curies per year respectively). The new facility would also release 1,000 curies of tritium, mostly in the more hazardous form of radioactive water vapor.

The Draft EIS does not detail where the fission products will come from. The two xenon isotopes mentioned have relatively short half-lives (11.9 and 5.2 days respectively). Hence these would appear to be from some kind of hot cell operations in which newly radiated actinides would be processed. However, the Draft EIS states that the hot cell operations in Wing 9 of the present CMR building would not be transferred to the new facility. The EIS does not discuss where the irradiated material would come from. It also does not discuss any new hot cell operations, though these seem to be implied by the release in Table 4-21 on page 4-41. Finally, the Draft EIS does not mention potential releases of other fission products such as cesium-137, strontium-90, or iodine-131 even in case of accidents and severe fires. This is mysterious, since the presence of fission product noble gas mixtures is generally accompanied by the presence of other fission products. While these other products might be filtered out of routine emissions, it is unlikely that their release could be prevented in severe accidents, such as those discussed in Appendix C.

C. Accident Analysis

Chapter 4 and Appendix C of the Draft EIS contain accident analysis that suffers from a number of technical deficiencies. They also appear therefore to misstate the risks arising from the various events that are postulated. At any rate, they provide no sound and sufficient scientific basis for the conclusion of low overall risk, given the conclusion of high accident consequences for several of the postulated events.

Appendix C lists five different accidents that it estimates would result in cancer deaths in the offsite population within 50 miles of the facility. These accidents, together with the comparable accidents for the no action alternative are summarized in Table 1 below.[3]

Plutonium-239 (equivalent) release, offsite population dose, and offsite fatal cancer estimates for No Action and Preferred Alternatives, CMR Replacement Facility

Event	No Action Alternative, Pu-239 release, grams	No Action Alternative population dose, rem	No action Alt., fatal cancers	Preferred Alt. (#1), Pu-239 release, grams	Preferred Alt. (#1), population dose, rem	Preferred Alt. (#1), fatal cancers
Facility-wide (wing-wide for No Action) fire	102	1,020	0.51	2,030	17,029	8.5
Main vault fire	400	4,000	2.0	1,430	14,500	7.25
Seismic induced spill	101	1,680	0.84	600	8,394	4.2
Seismic induced fire	not listed	not listed	not listed	600	6,110	3.1
Facility wide spill (radioactive spill for No Action)	0.02 (Note 1)	0.31	0.00016	12,000	167,705	83.9

Source of table: Appendix C, Draft CMRR EIS

Note 1: The Draft EIS gives a Pu-238 spill of 0.000075 grams. The Pu-239 equivalent of this is estimated here (to one significant figure) by multiplying the weight by the inverse of the half lives and the ratio of the whole body dose equivalent for inhalation for the insoluble varieties of these isotopes.

Note that in every case, the consequences of an accident at the proposed new facility would be far greater than that at the present facility. The existing building is estimated to potentially cause more than one fatal cancer in only one possible event - a main vault fire. This possibility could be eliminated by reducing the amount of plutonium stored in this building from the present 200 kilograms mentioned in the Draft EIS. Instead of that the new facility would greatly increase the plutonium stored.

In order to get the annual risks, the DOE/NNSA multiplies the dose and fatal cancer estimates by an estimate of the frequency of occurrence. Since the frequencies of occurrences are estimated to be very low (apart from the case of a process spill, not shown here) where the population dose estimate is low in any case, the DOE/NNSA estimates that the risk to offsite populations is very low. The highest fatal cancer risk calculated in this way is about 4 in 10,000 per year for the whole offsite population.

A quick check of the calculations indicates that the arithmetic appears to have been properly done using models that are in common use currently. However, there are some problems with these figures. A good part of the problem lies in the estimates of event probabilities and to some extent in the determination of fractions of radionuclides that would be released in case of catastrophic events. It is also noteworthy that if the analysis had been extended to a 60-mile radius instead of 50 miles used in the Draft EIS, the affected population would increase from just over 300,000 to more than 800,000, since Albuquerque would come within a 60-mile radius.

For instance, in case of a fire that "engulfs the entire contents of plutonium" in the main vault amounting to 5.7 million grams, the total estimated to be released is only about one part in 3,000. The event probability is assumed as one in a million. And voilà, the risk to the public become minuscule - a chance of about 7 in a million of a fatal cancer per year in the entire population in a fifty mile radius. In other words if 2,000 identical CMR replacement facilities were built and each operated for 70 years, there would be only one additional cancer in that time in the

entire population in a fifty mile radius due to a catastrophic fire. Given the reality of intense fires in the region, this does not appear, on the face of it, to be a credible estimate unless it is provided with a detailed empirical and statistical justification.

This kind of result may be credible in Cheerapunji, which is the wettest place on Earth, or something resembling it, but not in semiarid, New Mexico. Astonishingly, the Draft EIS makes no mention of the immense Cerro Grande Fire on May-June 2000 that almost engulfed LANL and did destroy many homes in the town of Los Alamos. New Mexico has been suffering from an extended drought and is at risk of large forest fires. To assume that the risk of a fire in the main vault without an analysis of fires that have occurred historically and the probability that they might reach the main vault of the proposed facility is unscientific and renders the risk estimates invalid. Interestingly, the probability of a facility wide fire is assumed to be five times that of a fire in the main vault. Throughout the analysis, the DOE/NNSA has not provided a single reference or piece of data on how the event probabilities were calculated. The complete absence of any discussion of large forest fires indicates that existing data may not have been factored into the analysis at all. It is imperative that DOE/NNSA publish the data and the basis on which it has estimated event probabilities.

Similarly, the DOE/NNSA has not cited any data to support its assumptions regarding the tiny fractions of plutonium in the proposed facilities that would be released in case of severe fires. During the Cerro Grande fire, LANL facilities had to be abandoned, and had the doors been left open, as postulated in the Draft EIS for the Main Vault fire, the result could have been far more catastrophic than that estimated by DOE/NNSA. The town of Los Alamos also had to be abandoned by its residents. The fire reached within a furlong or two of Area G, where a large amount of radioactive waste is stored in plastic tents and 55-gallon drums.

The possibility that the Rio Grande near Los Alamos and a considerable downstream area would be severely contaminated with plutonium in the aftermath of the more severe accidents is also not discussed in the Draft EIS. This could be among the most damaging consequences of a main vault fire or a facility wide spill, for instance.

Further, the DOE/NNSA has not properly examined the consequences of the events it has postulated. Cancer risks are important, but only one part of the problem. For instance, if there were a 12,000 gram spill of plutonium-239, as postulated in one of the events, a part of the town of Los Alamos would turn into a low-level radioactive waste dump. Much of LANL itself, if not all of it would have to be written off. The postulated event is much more severe than most scenarios for dirty bombs. All of the severe events postulated by the DOE/NNSA for the new facility are far more serious than any postulated for the current CMR building, including those arising from an earthquake. The root of the problem is that the inventory of plutonium-239 and other radionuclides that the DOE/NNSA proposed to store in the proposed CMR replacement facility is about 30 times the inventory currently at risk in the CMR building. The amount currently at risk is stated to be 200 kilograms.

In the aftermath of the Cerro Grande fire a good case can be made that large inventories of plutonium do not belong in the Los Alamos area precisely because the entire facility as well as the towns of Los Alamos and White Rock, as well as the nearby San Ildefonso pueblo would be seriously affected. Other pueblos and towns farther away such as Española and Santa Fe could be at serious risk. The possibility that LANL, which is now at the center of the nuclear weapons establishment, would have to be abandoned along with its namesake town in the event of three or four of the events described is not even mentioned in the Draft EIS. What any of these events would do to the economy and society of New Mexico is, of course, not broached at all.

The Draft EIS also does not consider the alternative of locating the new building at another site, or moving the existing restricted CMR facilities to another site. Neither does the Draft EIS make a serious substantive case for a massive new facility, given that the analytical and materials characterization capabilities proposed for the new CMR Replacement facility would also be present at the proposed new Modern Pit Facility. The Draft EIS mentions that analytical chemistry and materials characterization would be created in the MPF, but provides no real in-depth case for a facility at LANL over and above that now in use at the CMR building. All in all, the proposal for a new CMR facility has the strong scent of plutonium pork (the silvery meat, one might call it).

Were it just a matter of pork-barrel politics, IEER would not make any comments on this Draft EIS. But as discussed above, the proposed facility would greatly increase the severity of the harm that would occur to LANL, nearby communities, and possibly to the entire state of New Mexico.

Conclusions and recommendations for the Final EIS

This is perhaps the most unusual Draft Environmental Impact Statements to have been issued by the DOE. A new facility has been proposed to replace one that is half-a-century old. Yet the consequences of severe accident estimates of cancer fatalities has gone up dramatically. The most severe consequences estimated for an accident at the existing CMR projects two cancer deaths in the fifty mile radius. The corresponding estimate for the new facility is more than 80 cancer deaths.

Granted that the scale of operations and plutonium storage would be greater at the new facility. Still, it is proposed to build a new facility because the old building can no longer withstand seismic and other rigors for the nature of the work proposed. IEER suggests that, even taking an inadequate and seriously deficient analysis at face value, the proposed new facility does not meet the minimal test of protecting public health.

The Draft EIS is deficient both scientifically and as regard the alternatives that are considered. It is also seriously lacking in its exploration of the consequences of the most serious events for LANL, for the US nuclear posture, for communities near LANL and for the economy and society of New Mexico. Shockingly, it appears not to have taken the Cerro Grande fire of only three years ago into account in its event analysis. Equally disturbing is the lack of any discussion of the impact of any of the postulated events on the Rio Grande and the quality of water resources in the region. There is no estimate of the potential economic damage that could result to the state and possibly even to areas beyond the state.

Also problematic is the omission of frank discussion of the impact of a severe accident on Native Americans. The deposition of a large amount of plutonium on Native lands might threaten the survival of the Native Americans of the area as a people connected to the land. Their entire culture depends on it. For these lands to be contaminated with plutonium in range of tens or hundreds of picocuries per gram could have catastrophic consequences. The Draft EIS discussion on environmental justice wrongly dismisses the potential impact as being low and states that it "would not be disproportionately high" (p.4-65). Given that one of the severe incidents postulated might result in high levels of plutonium contamination that could raise the possibility of one of more pueblos becoming too polluted to live and farm on, and given the fact that Native American identity is closely tied to specific lands, the statement by the DOE/NNSA without an accompanying analysis of how much plutonium would be deposited on pueblo lands is cavalier at best.

The Draft EIS implies that irradiated materials would be processed in the new facility because it gives estimates of releases of fission product noble gases. But it does not discuss any hot cell operations. Nor does it provide any explicit estimate of releases of other fission products such as iodine-131 or strontium-90 in case of accidents. If these are present in the facility, it could have a material impact on the post accident analysis. The allusion to "plutonium-equivalent" may include fission products. If it does, this is scientifically inappropriate and highly unusual. It also does not allow for estimation of long-term impacts of accidents, notably the impacts on land and water resources. The limits for some radionuclides, such as strontium-90, in safe drinking are far more stringent in terms of implied radiation dose than the limits for plutonium.

The very least that the DOE/NNSA could do in the Final EIS is to:

- Provide a scientific basis for its accident and release fraction estimates, based on real, historical data as well as realistic technical analysis.
- Provide a realistic analysis of the risk, taking into account the fires that have recently occurred, and especially the Cerro Grande fire.
- Provide details on any hot cell or irradiated material processing that would occur in the new facility and explicitly include a range of fission products, as they are proposed to be present in the facility, in accident and radiation dose scenarios and social and economic impacts of accidents.

- Estimate that consequences of severe events to life and property, given that nearby areas may be converted into de facto radioactive waste sites in the event of a facility-wide spill.
- Estimate the consequences to the present national nuclear posture in case of a severe event.
- Estimate the consequences to the economy and society of New Mexico in case of a severe event.
- Provide a detailed case for why the new facility is needed, with and without the assumption that the Modern Pit Facility might be built.
- Provide an analysis of the consequences of similar events at a different location, where severe fires pose a smaller hazard than at LANL.
- Extend the accident analysis radius to include impacts on Albuquerque.
- Perform a detailed analysis of the consequences of severe plutonium releases on the nearby pueblos.
- Perform a detailed analysis of the consequences of severe plutonium releases on the Rio Grande, on the economy and society of nearby communities, of New Mexico, and of states near New Mexico.
- Conduct an analysis of whether a major deposition of plutonium in the Rio Grande Basin might affect U.S.-Mexico relations.
- Provide an alternative in which no new facility is built and the present inventory of plutonium at the CMR building could be reduced. Such an alternative would seem to be called for in light of the fact that tens of billions of dollars of research on stockpile stewardship have yet to reveal a single aging-related problem connected to plutonium pits.
- Provide an environmental justice analysis in case pueblos have to be abandoned.

Endnotes

[1] Jay Coghlan, "Comments on the Draft EIS on the CMRR," Nuclear Watch of New Mexico, Santa Fe, June 30, 2003.
[2] As quoted in *The Washington Post*, 17 June 1989.
[3] The accident designations in the no-action alternative are not exactly the same as those in the preferred alternative (Alternative 1), so the closest terms have been put together for comparison.