

April 18, 2011
Defense Nuclear Facility Safety Board
Peter S. Winokur, Chairman

Dear Mr. Winokur,

Thank you for your letter of February 28, 2011 re: the DNFSB planned safety issues review for Sandia National Laboratories' Annular Core Research Reactor (ACRR). The reactor containment explosions, meltdowns, lack of spent fuel protection and radioactive contamination of the environment occurring in Japan underscore the importance of protection against earthquakes and other events that are beyond a reactor's design basis and radioactive storage sites. Certification for continued operation of the ACRR should be denied immediately on the basis of safety inadequacies already identified by the DNFSB Staff Report of September 27, 2004):

- The Highbay Building where the ACRR is housed is a decades old structure which does not meet Safety Class seismic criteria.
- The ACRR does not have "the inherent-safe design features similar to the advanced reactors." (Independent Report Assessment Form 1, p. 2).
- The postulated accidents for the ACRR of an earthquake, aircraft crash or complete loss of reactor pool water would be substantial for release of radiation.
- The ACRR has no containment and can have a criticality accident.
- A radioactivity release largely from Plutonium following an accident cannot be isolated for more than 10 minutes according to the Documented Safety Analysis (DSA) reviewed in 2004 by the DNSFB.
- An accident at the ACRR from a too rapid or uncontrolled regulating rod withdrawal would be severe and neither the water in the reactor pool nor the ventilation system would hold back the release of the radioactive inventory.

The reactor explosion possible for the ACRR is described by the DNFSB as being of the same type and could be more severe than the Idaho SL-1 reactor that killed three workers with unconfined release of radiation to the environment. The SL-1 reactor accident involved a criticality event, steam explosion and fuel meltdown from the improper withdrawal of a central control rod.

The ACRR experienced a control rod related reactor scram during high power operation in 1996 that violated 10 CFR 830.120. "The [reactor] power rise was caused due to a lack of operator attention to the control rods' movements that were being made to investigate a control rod problem." Safety logs were destroyed. There were eight safety violations in the incident.¹

¹http://docs.google.com/viewer?a=v&q=cache:ojvU8ryukJ:205.254.131.69/enforce/eas/ea9706R1.pdf+Annular+Core+Research+Reactor+scram&hl=en&gl=us&pid=bl&srcid=ADGEESgl6xGTIpSJHkAk1cAPg0TYR1fLxk0ZL10VSP3uEic9L8g1_5YyeM3yZIMacB4h6-GqXVpt0hUXzn9EQFqe2RYJv-sBDd360RHylh53YuM5NyT-NuTj9rDAIjUjRcD0OHJ45oU&sig=AHIEtbQDI_WPaJ67VOIDkjUTwlyOdrpsSw

There is no justifiable reason to continue ACRR operations given these glaring safety deficiencies. One questions why the ACRR operations were allowed to continue for years given the safety inadequacies already identified in 2004 by the DNFSB continuing to the present. The ACRR lacks a containment structure. The Highbay Bldg. housing the ACRR is an unsafe structure that Sandia cannot or will not upgrade to withstand a large earthquake. The Highbay Bldg.ventilation system cannot protect the public against radiation release. The ACRR has no identifiable mission at present.

In our letter of March 3, 2010 we identified these concerns to the DNFSB:

“According to the conclusions of a January 7, 2005 Sandia White Paper Analysis written by the Nuclear Reactor Facilities Department (Attachment D to the March 3, 2005 letter of Linton Brooks to John T. Conway of DNFSB) an upgrade for the Highbay Reactor Room and components has not been accomplished and would require major redesign and reconstruction (p.2):

“Another conclusion of this assessment was that the Active Confinement System safety function (which would be accomplished by [systems and safety components] SSCs associated with the ACRR Highbay (Bldg. 6588, Room 10) and the Highbay Ventilation System could not be transitioned to Safety Class. One major issue is the seismic qualification of the Highbay itself. In order to provide active confinement, it is necessary that the Highbay survive a design basis earthquake (DBE). The DSA currently states that the structure would not likely survive such an event. In addition, the Highbay Ventilation System (HBVS) ductwork , filters, and fan must also continue operating following a DBE. Thus, transitioning to Safety Class status would involve major redesign and reconstruction of the Highbay and the HBVS.”

“Nothing in documents reviewed by Citizen Action indicate that major redesign and reconstruction were/are accomplished for the ACRR.”

What is the scenario examined for cascading type of accident events, such as a powerful earthquake or an airplane crash ((accidental or intentional) simultaneously affecting the nuclear facilities at TA-V given their co-location?

The types of questions that the DNFSB should be reviewing for the ACRR are those set forth in a 4/15/2011 letter of Rep. Edward Markey to the Nuclear Regulatory Commission regarding nuclear reactor operations in the United States. <http://markey.house.gov/docs/4.15.11.nrc.pdf> The minimal protections provided for commercial reactors in the U.S. do not even exist at the ACRR.

Sandia National Laboratory is the only National Nuclear Security Administration (NNSA) facility operating on a U.S. military installation, i.e., Kirtland Air Force Base (KAFB). That creates reciprocal dangers not present at other military bases and not present for other national laboratories. This includes storage of 2000 nuclear weapons at KAFB.

The DNFSB 2/28/11 letter states that the Auxiliary Hot Cell Facility (AHCF), Building 6597², has established inventory controls. The letter does not identify the locations and proximity for the AHCF, the ACRR and the Hot Cell Facility buildings to address Citizen Action's concerns for accidents and releases. Both the AHCF and the ACRR appear to be located in the located in the same unsafe Highbay Bldg. where the ACRR is housed The interrelationship between the co-location of the ACRR (Bldg. 6588, High bay, Rm.10)³ and the AHCF⁴ and the safety systems and design basis have not been adequately described or considered. The Highbay building that houses the ACRR and AHCF are not safe for the size of earthquake that can occur at the TA-V site. The design basis earthquake and a thorough analysis of site geology related to the TA-V facilities were not described by Sandia.

What co-ordinated emergency notification and emergency preparation for the public outside the TA-V site boundary and *outside* the confines of Kirtland AFB has taken place for a major radioactive or chemical accident at Sandia?

With respect to the issue of the uncontrolled and unmonitored disposal in “**Yard holes**,” now referred to euphemistically as “Engineered Storage Silos,” Citizen Action does not consider that the issue has been resolved by presenting an adequate review to the public by DNFSB. For that reason, Citizen Action filed a Freedom of Information Act (FOIA) request with the DNFSB on March 14, 2011. DOE/Sandia has not included the Yard hole disposal sites in the Sandia Site-wide Annual Groundwater Monitoring Report, the Federal Facility Compliance Act statement, a Performance Assessment/Composite Analysis or the Sandia RCRA Part A or Part B permit application. 1). Is the storage, management, characterization and disposal of the hazardous and mixed wastes in the Yard holes without a RCRA permit a legal disposal practice under RCRA? 2). Does DNFSB review compliance with RCRA at weapons facilities? A March 16, 2006 NMED *Request for Information Regarding Storage of Irradiated Reactor Fuel and Reactor Irradiated Nuclear Materials Sandia Laboratories* identified “...the storage of metal-bearing materials potentially regulated as hazardous or mixed waste under the Resource Conservation and Recovery Act (RCRA). Metals include cadmium, lithium, silver and sodium; other potentially reactive materials in storage in the below-grade facilities were also documented.”

² <http://prod.sandia.gov/techlib/access-control.cgi/2003/033976.pdf>. -- p. 7 “Although the AHCF is a new facility, it has been constructed around a pre-existing hot cell, the THC, within a pre-existing building, Building 6597.”

³ Draft SNL RCRA Part B Permit, p. 117- MW storage: Annular Core Research Reactor (ACRR) High Bay Rm. 10 – Safe and Vaults I, IIA, IIB, and III, and Low Bay
[http://www.nmenv.state.nm.us/hwb/SNL/draft/draft_SNL_Permit_\(8-20-2007\).pdf](http://www.nmenv.state.nm.us/hwb/SNL/draft/draft_SNL_Permit_(8-20-2007).pdf)

⁴ [http://www.nmenv.state.nm.us/hwb/SNL/draft/draft_SNL_Permit_\(8-20-2007\).pdf](http://www.nmenv.state.nm.us/hwb/SNL/draft/draft_SNL_Permit_(8-20-2007).pdf) p. 211-- “The AHCU is located within the high bay of Building 6597 and comprises four designated waste management areas (see Figure 6-2 of this Permit Attachment). These waste management areas include:

1. The Auxiliary Hot Cell;
2. The work area near the hot cell, which includes the fume hood;
3. The storage silos; and
4. The container storage area.

Two years ago, on April 15, 2009, the New Mexico Environment Department reiterated its request of July 6, 2004 that Sandia Labs identify RCRA hazardous waste placed in the yard holes. http://www.nmenv.state.nm.us/hwb/documents/SNL_4-15-2009_YardHole_Info_request_ltr.pdf To our knowledge Sandia Labs did not respond to the request as indicated in the NMED 4/15/09 letter. Information previously obtained under the FOIA from NNSA/DOE/Sandia by Citizen Action specifies that RCRA hazardous waste is in the yard holes. What, if any steps can DNFSB take to gain compliance with DOE/Sandia with NMED's request for RCRA information?

Additionally, the radioactive contents of the yard holes has not been characterized. http://www.clarku.edu/mtafund/prodlib/newmexico/RWMA_CMS.pdf at page 7:

“According to a report by Eric Nuttall that is based on FOIA documents, canisters containing melted spent nuclear fuel residuals were buried at the MWL. Some of the material originated from tests of damaged fuel that were conducted at the Annular Core Research Reactor (ACRR) at Sandia after the accident at Three Mile Island in 1979.⁷ Other spent fuel came from the STAR program, which also involved the use of fuel irradiated in the ACRR reactor. A partial collection of documents obtained under the FOIA concerning the disposal of the irradiated reactor nuclear materials (IRNM) was recently released to Citizen Action. The document, “SNL Site Team Report on Assessment of Vulnerabilities of DOE Storage of Irradiated Reactor Fuel and other Reactor Irradiated Nuclear Materials, October 1993” acknowledges the IRNM were disposed of in yard holes in various locations at SNL; however, the actual inventories of these yard holes have not been made available. By law, this material must be excavated and removed to a geologic repository.”

The DNFSB should identify where and the length of time the ACRR and SPR reactor wastes and spent fuel have been disposed of in yard holes and other locations for their years of reactor operations. Does DNFSB consider that DOE Order 435.1 has been satisfied by the proper disposal path for mixed waste for safe disposal and monitoring for releases? Has Sandia performed the composite analysis to include the yard holes as required by DOE O 435.1? DOE O 435.1 provides:

Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing of future disposal facilities.

Pre-1988 radioactive waste needs to also be considered in a composite analysis across the Sandia site according to the DOE EM *Low-Level Waste Disposal Facility Federal Review Group Program Management Plan*, p.9:

Although a CA is not required by DOE Order 5820.2A, the decision was made in developing the DNFSB 94-2 Implementation Plan to consider pre-1988 waste and interacting source terms in a CA.⁵

⁵ http://www.em.doe.gov/pdfs/133663pmp_11-9-00.pdf

What is the year of disposal for each of the total number of yard holes and the characterization of the materials disposed of? What, if any groundwater and vadose zone monitoring exists in the proximity for the location of the yard holes? What air monitoring is in place for the Yard holes and other storage sites to determine radiologic releases to the air pathway as required by DOE O 435.1? Has DNFSB reviewed whether Sandia has developed site-specific comprehensive closure plans for new and existing operating low level waste disposal sites and inactive disposal facilities, and disposal sites as required by DOE O 5820.2 A j. (1) and (4)?

DNFSB Recommendation 94-2 was adopted by DOE for improvement to low-level waste management and specifically to disposed wastes so as not to pose a danger to the public and the environment. In accordance with DOE M 435.1-1 R. (1)-(3), has Sandia submitted a preliminary monitoring plan for a low-level waste disposal facility? Has DNFSB analyzed compliance for low-level radioactive waste management across Sandia? Operations at Sandia for Performance Assessment and Composite Analysis of low-level radioactive waste buried in what may be unmonitored and uncontrolled yard holes and the active and potential releases from the Mixed Waste Landfill are in non-compliance with DOE Orders 5400.1, 5400.5, 5820.2, 5820.2 A, and 435.1. DOE O 5820.2 and DOE O 435.1 required documents to be prepared and maintained and provided to the public for the ongoing and continuous process of performance assessment and composite analysis. We are unaware of the existence of any of these documents to comply beginning with DOE O 5820.2 and going forward to DOE O 435.1.

The programmatic assessment for the *environmental management system* has been improperly made. NNSA provided Citizen Action a Freedom of Information Act response that contained report # 2009-05-22 Programmatic Assessment of the Environmental Management System at Sandia National Laboratories for April 21, 2009-May 12, 2009. The assessment was performed by the NNSA itself. NNSA is not “a qualified party outside the control or scope of the environmental management system” to perform “a formal audit” under the provisions of 450.1 A 4.d.(1)(a).

The October 1993 Assessment of Vulnerabilities identified that “The Yard holes are the site of 19 stainless steel tubes buried in a corner of the SPR compound... but principally U-235.” What is the method and safety of the spent fuel operations? Does DNFSB consider that Sandia Labs should continue the storage of ACRR and SPR reactor wastes from past and future operations in either the existing yard holes or newly constructed storage silos? The application of DOE O 435.1 requires that mixed waste disposed of at any location after September 26, 1988 across the Sandia facility must be included in a current Performance Analysis/Composite Assessment report. The acquisition and consideration of field data for the yard holes has never been provided. Our analysis is that the field data provided for the Mixed Waste Landfill dump was inadequate to provide the required knowledge of contamination to the vadose zone and the groundwater. The filed data for the MWL dump is from defective groundwater monitoring wells and incorrect interpretation of data such as a large increase in the release of tritium to the vadose zone.

According to the October 1993 Assessment of Vulnerabilities (p. 5) “The ACRR facility includes the ACRR pool, one safe and eight dry floor storage vaults all located in the highbay of building 6588.” The October 1993 Assessment of Vulnerabilities identified that “The total inventory of RINM [Reactor Irradiated Nuclear Material] at the ACRR is 0.574 kg of U-235 and 0.069 kg of Pu-239.” Are U-235 and Pu-239 still stored in building 6588? Is this method of storage safe when it is known that the highbay building is incapable of withstanding a large earthquake and lacking a ventilation system that can contain radiation?

Secrecy⁶, inadequate waste characterization and defective groundwater monitoring of both Sandia Labs and Kirtland Air Force Base⁷ have allowed extensive toxic contamination of Albuquerque’s groundwater and soil that has traveled offsite.

Citizen Action requests that the DNFSB perform an extensive and thorough investigation of the nuclear weapons related operations for Sandia Labs that have continued for decades without adequate oversight. These operations have posed a continuing and unnecessary level of hazard for Albuquerque’s residents and Sandia workers.

Citizen Action would appreciate reviewing the DNFSB intended plan for the investigation of the ACRR to provide comment. We would appreciate the opportunity to meet with the DNFSB personnel conducting the inspection.

Thank you for your consideration.

Sincerely,

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⁶ See e.g., <http://www.radfreenm.org/pages/nr/pr-2008apr01a.html>;
<http://www.radfreenm.org/pages/PressReleases/20091111PressReleaseNmedObeysCourtOrderToReleaseTechLaw.pdf>; <http://www.radfreenm.org/pages/SecretDocuments/sd-2006jan31a.pdf>;
http://www.radfreenm.org/pages/FOIA/FOIA20100603/20100414-10-P-0100_HotlineReport.pdf

⁷ <http://riograndetribune.org/pdfs/trialballoon-2.pdf> Kirtland Showboat Sinking in a Jet Fuel Leak

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