DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400

May 26, 1994

The Honorable Hazel R. O'Leary
Secretary of Energy
Washington, DC 20585

Dear Secretary O'Leary:

On May 26, 1994, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 94-1 which is enclosed for your consideration. Recommendation 94-1 deals with Improved Schedule for Remediation in the Defense Nuclear Facilities Complex.

42 U.S.C. § 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161-68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the Federal Register.

Sincerely,

John T. Conway
Chairman

Enclosure

Copy to: Mark B. Whitaker, EH-6

RECOMMENDATION 94-1 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: May 26, 1994

The halt in production of nuclear weapons and materials to be used in nuclear weapons froze the manufacturing pipeline in a state that, for safety reasons, should not be allowed to persist unremediated. The Board has concluded from observations and discussions with others that imminent hazards could arise within two to three years unless certain problems are corrected.

We are especially concerned about specific liquids and solids containing fissile materials and other radioactive substances in spent fuel storage pools, reactor basins, reprocessing canyons, processing lines, and various buildings once used for processing and weapons manufacture.

It is not clear at this juncture how fissile materials produced for defense purposes will eventually be dealt with long term. What is clear is that the extant fissile materials and related materials require treatment on an accelerated basis to convert them to forms more suitable for safe interim storage.

The Board is especially concerned about the following situations:

- Several large tanks in the F-Canyon at the Savannah River Site contain tens of thousands of gallons of solutions of plutonium and trans-plutonium isotopes. The trans-plutonium solutions remain from californium-252 production; they include highly radioactive isotopes of americium and curium. These tanks, their appendages, and vital support systems are old, subject to deterioration, prone to leakage, and are not seismically qualified. If an earthquake or other accident were to breach the tanks, F-Canyon would become so contaminated that cleanup would be practically impossible. Containment of the radioactive material under such circumstances would be highly uncertain.

- The K-East Basin at the Hanford Site contains hundreds of tons of deteriorating irradiated nuclear fuel from the N-Reactor. This fuel has been heavily corroded during its long period of storage under water, and the bottom of the basin is now covered by a thick deposit of sludge containing actinide compounds and fission products. The basin is near the Columbia River. It has leaked on several occasions, is likely to leak again, and has design and construction defects that make it seismically unsafe.

- The 603 Basin at the Idaho National Engineering Laboratory (INEL) contains deteriorating irradiated reactor fuel from a number of sources. This basin

also contains sludge from corrosion of the reactor fuel. The seismic competence of the 603 Basin is not established.

- Processing canyons and reactor basins at the Savannah River Site contain large amounts of deteriorating irradiated reactor fuel stored under conditions similar to those at the 603 Basin at INEL.

- There are thousands of containers of plutonium-bearing liquids and solids at the Rocky Flats Plant, the Hanford Site, the Savannah River Site, and the Los Alamos National Laboratory. These materials were in the nuclear-weapons-manufacturing pipeline when manufacturing ended. Large quantities of plutonium solutions are stored in deteriorating tanks, piping, and plastic bottles. Thousands of containers at the Rocky Flats Plant hold miscellaneous plutonium-bearing materials classed as "residuals", some of which are chemically unstable. Many of the containers of plutonium metal also contain plastic and, in some at the Rocky Flats Plant, the plastic is believed to be in intimate contact with the plutonium. It is well known that plutonium in contact with plastic can cause formation of hydrogen gas and pyrophoric plutonium compounds leading to a high probability of plutonium fires.

We note that removal of fissile materials from the 603 Basin at INEL has begun. We are also following the plans for remedying several of the other situations listed. In general, these plans are at an early stage. In addition, we are aware of steps DOE has taken to assess spent fuel inventories and vulnerabilities. We also note that a number of environmental assessments are being conducted in relation to the situations we have listed above. Finally, we note that a draft DOE Standard has been prepared for methods to be used in safe storage of plutonium metal and plutonium oxide.

These actions notwithstanding, the Board is concerned about the slow pace of remediation. The Board believes that additional delays in stabilizing these materials will be accompanied by further deterioration of safety and unnecessary increased risks to workers and the public.

Therefore the Board recommends:

(1) That an integrated program plan be formulated on a high priority basis, to convert within two to three years the materials addressed in the specific recommendations below, to forms or conditions suitable for safe interim storage. This plan should recognize that remediation will require a systems engineering approach, involving integration of facilities and capabilities at a number of sites, and will require attention to limiting worker exposure and minimizing generation of additional waste and emission of effluents to the environment. The plan should include a provision that, within a reasonable period of time (such as eight years), all storage of plutonium metal and oxide

should be in conformance with the draft DOE Standard on storage of plutonium now being made final.

(2) That a research program be established to fill any gaps in the information base needed for choosing among the alternate processes to be used in safe conversion of various types of fissile materials to optimal forms for safe interim storage and the longer term disposition. Development of this research program should be addressed in the program plan called for by (1) above.

(3) That preparations be expedited to process the dissolved plutonium and trans-plutonium isotopes in tanks in the F-Canyon at the Savannah River Site into forms safer for interim storage. The Board considers this problem to be especially urgent.

(4) That preparations be expedited to repackage the plutonium metal that is in contact with, or in proximity to, plastic or to eliminate the associated existing hazard in any other way that is feasible and reliable. Storage of plutonium materials generated through this remediation process should be such that containers need not be opened again for additional treatment for a reasonably long time.

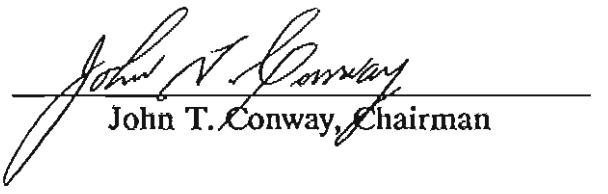
(5) That preparations be expedited to process the containers of possibly unstable residues at the Rocky Flats Plant and to convert constituent plutonium to a form suitable for safe interim storage.

(6) That preparations be expedited to process the deteriorating irradiated reactor fuel stored in basins at the Savannah River Site into a form suitable for safe interim storage until an option for ultimate disposition is selected.

(7) That the program be accelerated to place the deteriorating reactor fuel in the K-East Basin at the Hanford Site in a stable configuration for interim storage until an option for ultimate disposition is chosen. This program needs to be directed toward storage methods that will minimize further deterioration.

(8) That those facilities that may be needed for future handling and treatment of the materials in question be maintained in a usable state. Candidate facilities include, among others, the F- and H-Canyons and the FB- and HB-Lines at the Savannah River Site, some plutonium-handling glove box lines among those at the Rocky Flats Plant, the Los Alamos National Laboratory, and the Hanford Site, and certain facilities necessary to support a uranium handling capability at the Y-12 Plant at the Oak Ridge Site.

(9) Expedited preparations to accomplish actions in items (3) through (7) above should take into account the need to meet the requirements for operational readiness in accordance with DOE Order 5480.31.



John T. Conway, Chairman

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 94–1]

Improved Schedule for Remediation in the Defense Nuclear Facilities Complex

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice; recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has made a recommendation to the Secretary of

Energy pursuant to 42 U.S.C. 2286a concerning improved schedule for remediation in the defense nuclear facilities complex. The Board requests public comments on this recommendation.

DATES: Comments, data, views, or arguments concerning this recommendation are due on or before July 5, 1994.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue, NW., suite 700, Washington, DC 20004.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Carole C. Morgan, at the address above or telephone (202) 208–6400.

Dated: May 31, 1994.

John T. Conway,

Chairman.

Improved Schedule for Remediation in the Defense Nuclear Facilities Complex

The halt in production of nuclear weapons and materials to be used in nuclear weapons froze the manufacturing pipeline in a state that, for safety reasons, should not be allowed to persist unremediated. The Board has concluded from observations and discussions with others that imminent hazards could arise within two to three years unless certain problems are corrected.

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John T. Conway,

Chairman.

[FR Doc. 94–13509 Filed 6–2–94; 8:45 am]

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