

John T. Conway, Chairman  
A.J. Eggenberger, Vice Chairman  
Joseph J. DiNunno  
John E. Mansfield  
Jessie Hill Roberson

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004-2901  
(202) 694-7000

00-0000848



April 21, 2000

Mr. Don Moniak, Program Director  
Serious Texans Against Nuclear Dumping  
7105 W. 34<sup>th</sup> Avenue, Suite E  
Amarillo, TX 79109-2907

Dear Mr. Moniak:

The Defense Nuclear Facilities Safety Board (Board) received your letter of February 9, 2000, providing comments and questions resulting from our recent public meeting in Amarillo, Texas. The Board appreciates your kind words regarding our activities at Pantex, and we share your interest in ensuring that work there be conducted safely.

The large number and wide variety of questions you posed preclude a complete response at this time. In some instances your questions were related to staff technical assessments already underway. The enclosure to this letter provides answers to most of your questions; we will forward the remaining answers when our technical review is complete.

Sincerely,

A handwritten signature in black ink, appearing to read "John T. Conway".

John T. Conway  
Chairman

c: Mr. Daniel E. Glenn  
Mr. Mark B. Whitaker, Jr.

Enclosure

**Enclosure**  
**Board Response to Questions from**  
**Serious Texans Against Nuclear Dumping (STAND)\***  
 (\*posed in STAND letter dated, February 9, 2000)

Section	Question	Response
<p><b>I. Justification for Continued Operations (JCO) at Pantex</b></p>	<p><b>A. What are the safety implications for increased nuclear weapons reassembly and maintenance work?</b></p> <p><b>STAND Question/Statement:</b> This year's funding for Pantex operations shows a nearly 10:1 ratio of stockpile weapons funding to dismantlement funding. . . . At least one Pantex JCO (for using flammable solvents) warrants continued dismantlement operations because the weapons are safer dismantled than stored, whereas continued stockpiled weapons work is justified in terms of national security. Yet dismantlement is heavily underfunded relative to stockpile programs.</p> <p>STAND requests that the Defense Nuclear Facilities Safety Board (Board) ask the Department of Energy (DOE) to explain its rationale for this inequity.</p>	<p><b>Board response:</b> Pantex activities to support the enduring nuclear weapons stockpile and to dismantle retired nuclear weapons are both directed by presidential decisions. Properly conducted, both activities produce safety benefits. For example, dismantling retired weapons enhances safety by separating the nuclear material from the high explosives and surveillance of weapons enhances safety by allowing experts to detect potential aging-related safety effects. The Board is not aware of any specific safety issue or condition that requires expedited dismantlement of retired weapons. As such, prioritizing mission-related activities at Pantex is beyond the Board's purview. However, the Board evaluates the activities at Pantex to ensure that all the work DOE is directed to undertake is performed safely.</p>

Section	Question	Response
<p><b>I. Justification for Continued Operations (JCO) at Pantex (continued)</b></p>	<p><b>STAND Question:</b> Is the lack of funding affecting safety during dismantlement? If so, to what extent?</p>	<p><b>Board response:</b> At present, the Board does not know of any particular safety issues that would drive an expedited processing rate for the weapons dismantlement programs. The safety controls applicable to the dismantlement processes are developed and implemented prior to DOE authorization to start up the process. Thus, as far as process safety is concerned, the resource-intensive period for weapon dismantlement programs actually occurs before any hands-on work is initiated. The safety basis for the W79 Dismantlement Program relies on a Nuclear Explosive Hazards Assessment and an Activity-Based Controls Document. The latest weapon system dismantlement program at Pantex, for the W56, was developed using the Seamless Safety for the 21st Century (SS-21) process. This comprehensive design, development, and operating process resulted in an exceptionally well-controlled and safe dismantlement program. (In fact, current efforts to improve safety are aimed at applying the SS-21 process to enduring stockpile activities.) From the perspective of safety during dismantlement, the pace of dismantlement efforts generally does not affect the safety of the activities performed.</p>

Section	Question	Response
<p><b>I. Justification for Continued Operations (JCO) at Pantex (continued)</b></p>	<p><b>B. How big is the safety envelope?</b>            (Discussion about Pantex operating outside of the stated safety envelope with the use of JCOs.)</p> <p><b>STAND Comment:</b> In regard to these JCOs, STAND recommends that the most recent version and all updates be made publicly available.</p>	<p><b>Board response:</b> It is not within the Board's purview to determine the classification or availability of DOE or DOE contractor documents. The Board suggests that STAND work with DOE directly to address this recommendation. (See discussion, page 4).</p>

Section	Question	Response
<p><b>I. Justification for Continued Operations (JCO) at Pantex (continued)</b></p>	<p><b>STAND Question:</b> At what point does the accumulation of Band-Aids and justifications become so great that a short-term safety shutdown of operations or particular buildings is necessary to insure the safety envelope exists as we are told?</p>	<p><b>Board response:</b> At present, two JCOs are in effect at Pantex—one involving lightning protection and the other involving operations with flammable solvents. If current schedules are met, both of the JCOs will be subsumed within more formal safety documentation—the Basis for Interim Operation at the Pantex Plant and Technical Safety Requirements for Pantex facilities—before the year is out. Beyond these two JCOs, the safety envelope at Pantex resides in formally approved (by DOE) documents such as the BIO and individual facility Safety Analysis Reports. Of late, the Board has observed an improving trend in the rigor with which DOE and the Pantex contractor have been applying the requirements of DOE Order 5480.21, <i>Unreviewed Safety Questions</i>. This Order is the controlling document when new safety information is discovered or a previously unanalyzed condition is encountered. In some of these situations, it is prudent or safer to continue ongoing operations. Usually, DOE-approved compensatory measures are put in place to address the potential risk associated with the new information or unanalyzed scenario until a final solution has been developed and implemented. The Board closely reviews documents such as JCOs, and the associated compensatory measures, to assess the technical content and ensure that they are adequate. As you know, the point at which a shutdown of operations becomes necessary is not always clear, and can involve competing safety concerns. However, the Board and its staff monitor closely the effect that an aggregation of these conditions might have on the safety at Pantex and stand ready to take action if the total risk increases to an unacceptable level.</p>

Section	Question	Response
<p><b>II. Plutonium Pits</b></p>	<p><b>A. Improving Existing Conditions</b></p> <p><b>STAND Request:</b> STAND requests that the Board urge the Secretary of Energy to explore fast-track development of pit shipping containers.</p>	<p><b>Board response:</b> The Board recognizes that the development of a pit shipping container is of vital importance to the success of DOE's current pit disposition strategy. In fact, the Board addressed this issue in its Recommendation 99-1, <i>Safe Storage of Fissionable Material Called Pits</i>. The Board and its staff will continue to engage DOE to ensure the timely development of adequate pit shipping containers.</p>
	<p><b>STAND Request:</b> STAND requests that the Board urge the Secretary of Energy to negotiate with the Defense Department to find a reasonable compromise to the overflights.</p>	<p><b>Board response:</b> The Board and its staff have been working with DOE, the Federal Aviation Administration, and local government officials to reduce the number of Pantex overflights for several years. Progress has been made, and changes to flight operations have been instituted. For example, you may have observed that the VORTAC (Very High Frequency Omni-Directional Radio Range with Tactical Air Navigation) associated with flight control in the local area has been relocated; the new unit can be seen just south of U.S. Highway 60, north of the runways at Amarillo International Airport. The Board continues to encourage DOE to perform the analyses necessary to assess the effectiveness of these changes, and to take further action if the analyses indicate that such action is warranted.</p>
	<p><b>STAND Request:</b> STAND requests that the Board urge the Secretary of Energy to announce the decision on how surplus pits will be stored pending disposition. The fall 2000 date identified in the Pantex implementation plan for Recommendation 99-1 is unacceptable.</p>	<p><b>Board response:</b> The focus of the Board's Recommendation 99-1 is to ensure that DOE accelerates placement of all pits in an improved storage environment and monitors that environment to ensure that it remains adequate. Thus, the Board's emphasis is on ensuring safety regardless of the outcome of pending storage decisions. Provided that storage locations are structurally adequate and address ambient temperature concerns where necessary, the Board believes all current pit storage locations at Pantex are acceptable from a safety perspective.</p>

Section	Question	Response
<p><b>II. Plutonium Pits (continued)</b></p>	<p><b>B. Is the AL-R8 Sealed Insert a potential shipping container?</b></p> <p><b>STAND Comment:</b> Recognizing that it (the Sealed Insert) was not designed for off-site transportation, STAND believes it is worthwhile to at least determine whether the AL-R8 Sealed Insert meets transportation requirements, even if this is inadvertent.</p>	<p><b>Board response:</b> The off-site transportation of pits constitutes shipment of Type B quantities of radioactive material in the national security interest. It is therefore the responsibility of DOE to ensure that this activity is performed in accordance with the requirements of 49 CFR Part 173.7(b). It is DOE's policy also to comply with the tenets of 49 CFR Part 173.7(d) by meeting federal regulatory requirements, particularly 10 CFR Part 71, <i>Packaging and Transportation of Radioactive Material</i>. Compliance with 10 CFR Part 71 requires that Type B containers be certified to the same standards applied by the Nuclear Regulatory Commission. To obtain this certification, it is necessary to establish that a candidate container will contain its radioactive material inventory under all prescribed design basis accident environments. The AL-R8 Sealed Insert container was not designed as a Type B off-site transportation container, and DOE has determined that it does not meet the performance requirements for Type B certification.</p>

Section	Question	Response
<p><b>II. Plutonium Pits (continued)</b></p>	<p><b>C. How Stable are the Pits?</b></p> <p><b>STAND Comment:</b> STAND urges the Board to consider advocating the formation of a panel that is independent-as-possible and that has nonexpert members as well as expert members. This panel would evaluate the current status of the U.S. plutonium pits as fairly and impartially as possible, and determine:</p> <p>The range of time, in years, at which pit cladding can be expected to fail, possibly fail, or inevitably fail under both present conditions and optimal conditions?</p> <p>If pits become unreliable, are they unsafe?</p> <p>What is an “unreliable” pit and how reliable must a pit be before it cannot be used?</p> <p>Are the present storage conditions, which include widely fluctuating temperatures and humidity, impacting the reliability of pits at an unacceptable rate?</p>	<p><b>Board response:</b> The Board participates in DOE’s regular meetings to evaluate the safety of pit storage and the potential for safety issues due to pit aging. Some factors and issues addressed as part of this effort appear to be similar to those that would be addressed when considering pit reliability (an issue that is beyond the Board’s safety purview). The information available to the Board from the assembly of experts currently addressing this issue has been adequate to allow the Board to reach an independent conclusion on safety issues related to pit storage. The Board has communicated its conclusion on the safety of pit storage in its Recommendation 99-1 and will continue to assess the health and safety implications of pit storage and pit aging. The Board is not in a position to assess the need for a broader evaluation of pit reliability issues.</p>



Section	Question	Response
<p><b>III. Facility Safety</b></p>	<p><b>A. Basis for Authorization in Cells</b></p> <p><b>1. What is authorization for nuclear explosives operations in 12-44 based on?</b></p> <p><b>STAND Comment:</b> STAND requests that the Board help answer these questions:</p> <p>Were the 1982 tests conducted to document the design of the gravel gerties at the Nevada Test Site's Device Assembly Facility which are "modeled after" the Pantex cells, and were designed in 1986 to meet criteria in DOE Order 6430.1? Do these tests apply to all Pantex cells?</p> <p>In what ways, if any, does the design of the Device Assembly Facility gravel gerties differ from the Pantex gravel gerties?</p> <p>Were there changes in design between eras?</p>	<p><b>Board response:</b> STAND's questions regarding gravel gerties and cell operations are good ones. The Board has touched on some of the same issues in a peripheral manner, but has not yet done a comprehensive review. The Board's staff is currently planning a technical review of these issues, and we will forward the results to you when they are available.</p>

Section	Question	Response
<p><b>III. Facility Safety (continued)</b></p>	<p><b>2. What tests prove the 12-44 cells will contain plutonium?</b></p> <p>(Discussion of a cell containment test failure)</p> <p><b>STAND Comment:</b> The questions raised by this failed test include:</p> <p>What tests, if any, were taken subsequent to this to uphold this assertion?</p> <p>Has the contamination resulting from this test, or other tests, been accounted for?</p> <p>Where and when were the tests taken, and where were the results documented?</p> <p>How long did nuclear weapons assembly and disassembly involving sealed pits take place in the "gravel gerties" at Pantex and the Burlington, Iowa, plants based upon the limited test results and research cited in 1956 to justify these operations?</p>	<p><b>Board response:</b> See response to question 1 under this topical area.</p>

Section	Question	Response
<p><b>III. Facility Safety (continued)</b></p>	<p><b>3. Was the new roofing material considered similar enough to justify the absence of going through startup procedures?</b></p> <p><b>STAND Question:</b> Did the roof replacement on Building 12-44 qualify as a substantial modification (according to DOE O 425.1A)?</p>	<p><b>Board response:</b> No. The work performed on the Building 12-44 roofs was not performed on those design features of the roof credited with mitigation of an explosive event (i.e., the catenary cable suspension system, the gravel, or the earth overburden). Rather, the work was performed on the erosion control membrane used to protect the earth overburden. The old material (Gulfseal®) had exceeded its useful lifetime and was replaced with a new material (Teranap®). As this work did not involve any of the design features relied upon as safety controls, it was not even necessary to transfer the facilities to repair mode while the work was being done. Other than a visual inspection, no postconstruction testing of the new erosion control membrane was required for this project.</p> <p>Since the changes did not affect the portion of the system credited in the safety basis, DOE and the contractor concluded that the repair was not a “substantial process, system, or facility [modification]” per section 4.a.1(d) of DOE Order 425.1A and that restart requirements from DOE Order 425.1A did not apply.</p> <p>As you know, during the roof replacement construction process, the Pantex contractor filed Occurrence Report ALO-AO-MHSM-Pantex-1999-0058, “Potential Inadequacy in the Safety Analysis of the Building 12-44 Cells Leakage Rate.” Based upon analyses performed by Sandia National Laboratories, it was subsequently determined that the safety analysis was, in fact, adequate. Additionally, although the potential inadequacy was discovered during the membrane replacement, it did not involve the membrane replacement, and was therefore not a part of the restart requirements decision.</p>

Section	Question	Response
<p><b>III. Facility Safety (continued)</b></p>	<p><b>4. In what way can gravel gerties not function as intended?</b></p> <p>(Discussion of the potential for gravel gerties failing)</p> <p><b>STAND Comment:</b> STAND requests that the Board help answer these questions:</p> <p>Is the probability of failure so high that it warrants cutting back on safety in other areas?</p> <p>Is this information incorporated into the operation permit documents?</p> <p>What other documentation is there that even remotely suggests that there are doubts about whether gravel gerties will not function as designed?</p>	<p><b>Board response:</b> See response to question 1 in this topical area.</p>

Section	Question	Response
<p><b>IV. Canned Subassemblies of Highly Enriched Uranium (CSAs)</b></p>	<p><b>STAND Questions:</b></p> <p>Is Pantex storing CSAs outside of its authority in terms of time and quantity?</p> <p>Does the use of Building 12-66 for CSA storage preclude its use for surplus pit storage?</p>	<p><b>Board response:</b> The Board's staff has identified several issues with regard to CSA storage and is currently planning a technical review of this area. We will forward the results to you when they are available. In the meantime, the answer to the direct questions posed is no. The current Pantex authorization basis allows long-term storage of CSAs in Building 12-58 Bays 4 and 5; Zone 4 magazines; and Building 12-66. In general, CSAs can be stored in either a DOE-approved on-site container, or their shipping container. In the case of Building 12-66, all CSAs are stored in their shipping containers, an approach that is beneficial from both a containment and a security perspective. Because of the stringent certification process required for the shipping containers, materials stored in such containers are considered separately for purposes of facility inventory limits. Therefore, presence of the containers in Building 12-66 would not preclude its use as a surplus pit storage facility. At present, however, pit storage is not authorized for Building 12-66.</p>

Section	Question	Response
<p>V. Beryllium Operations</p>	<p><b>STAND Questions:</b></p> <p>Does Firing Site 24 qualify as a beryllium regulated site?</p> <p>Have people been potentially exposed to any beryllium while on public tours?</p> <p>Related questions asked at the public meeting.</p> <p>Demilitarization of parts containing beryllium takes place at Firing Site 24, yet the public is often taken there during the monthly tours of the site. Is that a problem? What about Firing Site 23?</p>	<p><b>Board response:</b> Firing Site 24 does not qualify as a beryllium regulated area. In fact, the contractor reports (and DOE concurs) that Pantex currently does not have any facilities on site that qualify as beryllium regulated areas. The definition of a beryllium regulated area, as stated in 10 CFR Part 850, "Chronic Beryllium Disease Prevention Program; Final Rule," § 850.3, "Definitions," is as follows: "An area demarcated by the responsible employer in which the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the action level." Specific requirements for beryllium regulated areas are then levied in § 850.26, <i>Regulated Areas</i>.</p> <p>Based on characterization sampling completed to date, there are no areas on the Pantex site that satisfy this definition. This includes sampling done at Firing Site 23, Firing Site 24, and the Building 12-63 component crushing operations. That is not to say that care is not taken to protect site workers from potential exposure: the total containment chamber (silver bullet) at Firing Site 23 is known to have internal beryllium and uranium surface contamination [but no measurable airborne component], and is therefore kept locked to prevent inadvertent or unauthorized entry; the component crushing operations are contained within a ventilation hood that exhausts through a high efficiency particulate air filter, and operations are conducted remotely.</p>