

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

July 26, 2001

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW.
Suite 700
Washington, D.C. 20004-2901

Dear Mr. Chairman:

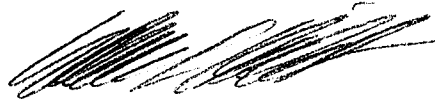
This letter is an interim response to the Defense Nuclear Facilities Safety Board (Board) letter of May 29, 2001. Your letter noted continuing concerns related to hazardous material storage at the Y-12 National Security Complex (Y-12), specifically, their identification and disposition plans for excess materials and activities to support safe, long-term storage of materials required for national security. I share these concerns. In January 2001, BWXT Y-12 formed a non-Material Access Area (MAA) Storage Assessment Task Team whose initial focus was to develop a project plan to resolve Building 81-22 disposition and storage by May 25, 2001. The NNSA Y-12 Area Office (YAO) agreed that Building 81-22 was the highest priority for the non-MAA Storage Assessment Task Team and that it should be addressed first. The plan for Building 81-22 (enclosed) was submitted to YAO on May 18, 2001, noting that BWXT Y-12 proposes to vacate, terminate operations, and transfer Building 81-22 for disposition as an excess facility. NNSA YAO has noted increased contractor efforts to remove inventory from Building 81-22, and these efforts are currently ahead of schedule to meet the projected completion date of December 2001.

To assess all Y-12 current and future needs for the storage of non-MAA materials, including 9720-14 and the Sealand trailers, the non-MAA Storage Assessment Task Team is to focus on producing a Comprehensive 10-Year Storage Plan (10-Year Storage Plan) that will be integrated into the overall infrastructure modernization plan for Y-12. The 10-Year Storage Plan will take into account national security material requirements and hazard evaluation and risk reduction for non-MAA materials. The recommendations coming from the 10-Year Storage Plan will be balanced against other Y-12 hazards and improvement requirements, and prioritized utilizing the Y-12 Complex budget planning development and submission process. The project plan for developing the 10-Year Storage Plan is currently under development and will be forwarded to the Board by August 31, 2001.



If you have any questions concerning our approach for improving the storage of hazardous materials at Y-12, please contact me or have your staff contact Mr. Phil Aiken at 301-903-4513.

Sincerely,

A handwritten signature in black ink, appearing to read "David E. Beck". The signature is somewhat stylized and scribbled.

David E. Beck
Assistant Deputy Administrator
for Military Application and
Stockpile Operations
Defense Programs

Enclosure

cc w/enclosure:
M. Whitaker, S-3.1



May 18, 2001

Mr. William J. Brumley, Manager
National Nuclear Security Administration
Y-12 Area Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Brumley:

Contract DE-AC05-84OR22800, Revised Authorization Basis For The 9720-18/81-22 Complex

- Reference:
1. Letter dated January 29, 2001, J. A. Conner to W. J. Brumley, "Contract DE-AC0584OR22800, Revised Authorization Basis For The 9720-18/81-22 Complex"
 2. Letter dated January 3, 2001, W. J. Brumley to J. T. Mitchell, "Contract DE-AC05-84OR22800, Revised Authorization Basis For The 9720-18/81-22 Complex"
 3. Letter dated April 17, 2001 J. T. Mitchell to W. J. Brumley, "Contract DE-AC05-00OR22800, Highly Enriched Uranium Material Facility (HEUMF) Project – Revalidation of Mission Requirements and Development of an Integrated Management and Storage Plan for HEU (U)."

BWXT Y-12 committed in Reference 1 to evaluate all non-Material Access Area (MAA) storage needs for the site and provide a specific plan for Building 81-22 by May 25, 2001. This action was the result of Reference 2. Reference 3 provided the long-range storage plan for both MAA and non-MAA materials. This communication specifically addresses the actions taken and planned to the 81-22 facility.

Based on a review of required actions to bring 81-22 into compliance for continued use as a Cat III nuclear facility, BWXT Y-12 purposes to vacate, terminate operations, and transfer the 81-22 facility to Infrastructure Reduction. Actions to relocate the materials have already started and 186 containers have been repackaged and removed from 81-22. The remaining materials will be relocated into 9204-4 upon creation of additional basement storage areas. This relocation activity along with the current inventory will continue to be in compliance with the existing and upgraded 9204-4 Basis for Interium Operations. The attached Project Plan (Attachment A) details the activities to complete this relocation. Based on funding, the relocation of the materials and vacating 81-22 should be completed by December 31, 2001.

A letter for safe, continued, limited occupancy was provided by Structural Engineering and is attached (Attachment B).

Y-12 AREA OFFICE
LOG NO. <u>01-1392</u>
FILE CODE _____

Mr. William J. Brumley
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May 18, 2001

The potential inadequacies of the electrical system in building 81-22 were identified during an inspection of the electrical system by the electrical Authority Having Jurisdiction. A Departmental Standing Order was issued by the Material Control Organization, SO-NMSO-00-001, identifying precautions and compensatory measures to personnel concerning the electrical deficiencies and shall remain in place until the facility is vacated. Due to the limited life of this facility, no upgrades will be undertaken. This standing order also directs personnel to leave building 81-22 if the Plant Shift Superintendent announces a severe weather condition, such as high winds or heavy snow predictions.

The Conex Trailers currently used for storage in the 9720-18/81-22 Complex will continue to be monitored for environmental compliance. Potential disposal methods for these materials will be investigated in FY 2002. Once the methods are developed, materials will be recovered from the trailers and the trailers disposed.

If you have any questions, please call Lisa Bowie Shope at 574-2001.

Sincerely,



James A. Conner
Deputy General Manager

JAC:emp

Enclosures: As Stated

cc/enc: R. V. Carlson/BWXT Y-12, L.L.C.
D. J. Dearolph/NNSA-YAO
D. K. Hayes/BWXT Y-12, L.L.C.
D. P. Kohlhorst/BWXT Y-12, L.L.C.
M. A. Schlitz/BWXT Y-12, L.L.C.
L. B. Shope/BWXT Y-12, L.L.C.
S. E. Spagnolo/NNSA-YAO
YDCC/RC

Enclosure A
Letter, J. A. Conner to W. J. Brumley
Dated: May 16, 2001

Project Plan to Remove Material from Building 81-22

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**Project Plan
to
Remove Material from Building 81-22**

May 16, 2001

Prepared by BWXT Y-12, L.L.C.
Managing the
Y-12 National Security Complex
under Contract DE-AC05-00OR22800
for the U. S. Department of Energy



Shirley Cox, Manager
Materials Stewardship Program



Lisa Bowie Shope, Manager
Material Control Organization

This document has been reviewed by an
Authorized Derivative Classifier and
UCNI Reviewing Official and has been
determined to be UNCLASSIFIED
and contains no UCNI. This review
does not constitute clearance for
public release.



Marshall Jones 5/16/01

Project Plan to Remove Material from Building 81-22

I. Introduction

This plan has been formulated to describe major activities necessary and identify issues needing resolution in order to relocate all materials from Building 81-22. The plan was initiated in response to a Department of Energy (DOE) expectation to evaluate future use of the building and to upgrade the building structural, fire protection, and electrical systems. Upon Engineering evaluation, the building was determined not to be worthy of the needed upgrades. A search of other areas in the Y-12 complex was conducted, and some areas in Building 9204-4 were identified as potential locations for much of the material in Building 81-22. This plan discusses the efforts necessary to relocate material from Building 81-22 to Building 9204-4.

II. 81-22 Building Conditions

Building 81-22 is a 14,578 square-foot, wood-framed building, built in 1944, which is operated by the Manufacturing Material Control Organization (MCO). The building is categorized as a Category 3 nuclear facility. The building contains excess classified and unclassified material including, but not limited to, depleted uranium in various forms, nonuranium weapon parts, and bulk material. Adjacent to the building and included in facility footprints are 16 sea/land containers and 600 square feet of outside storage (coops). The estimated total area used for storage is 26,000 square feet.

The building is old and in a state of disrepair. The building does not meet the current safety regulations for structural, electrical, or fire protection. The roof has leaked for several years and structural members are deteriorated. BWXT Y-12, L.L.C. (BWXT Y-12) Civil and Structural Engineering recently evaluated the building and, although the building has been approved for daily access, it was recommended that it not be occupied during severe weather conditions. Significant and costly repairs are needed to the electrical system, fire protection system, and building structure for continued long-term operation occupation.

During the last DOE review of the facility Basis for Interim Operation (BIO), Revision 2, the conditions of approval required a resolution to the electrical system, fire protection system, lightning protection system, and structural deficiencies. Although short-term compensatory measures have been put into place, the cost of the needed repairs greatly exceeds the value of Building 81-22 and was determined not to be a wise long-term investment.

III. Scope

The scope of this project will include efforts needed to prioritize, clear out, and modify existing space in Building 9204-4. To meet storage requirements for materials in Building 81-22 presently, material that currently resides in these areas of Building 9204-4 will either be consolidated into other areas of the building or discarded. The scope of this project will also include the effort to recontainerize, consolidate, and transport the material presently in Building

81-22 to its new location in Building 9204-4. The project will include termination of operations in Building 81-22 and transition to Infrastructure Reduction. Materials stored in the coops or sea/land containers will be addressed following development of disposal paths.

IV. Materials to Be Moved

There are a variety of materials to be moved from the facility (including the porch area), that are in many different configurations. The material configurations consist of, but are not limited to, depleted uranium billets, derbies, and parts of subassemblies, natural uranium in the form of reserve parts and process remnants and oxide powder, and nonuranium weapon parts in subassemblies. The material may be excess or in process, classified or unclassified, contaminated or uncontaminated. It is packaged in many different configurations and methods of storage. All of the material is containerized in drums, or other form of storage containers.

Each material and container storage type will be evaluated, and a determination will be made regarding the need to consolidate, or recontainerize before relocating.

All materials inside Building 81-22 in the C1-type containers have been removed from the building and repackaged to save space. The C1 containers were opened, the component removed, and the components placed in a B-24 box. The C1 containers will be discarded. This effort reduced the needed space to store these components by 90 percent and reduced the facility combustible loading. This activity is complete.

V. Proposed 9204-4 Storage Areas

The proposed storage space in Building 9204-4 is actually nine different areas that comprise approximately 15,000 square feet of total space. However, with aisle spacing, egress paths, electrical panel OSHA requirements, and existing equipment interference, the nine areas would provide approximately 8,000 to 11,000 square feet of storage space depending on final area configurations. The specific locations of these areas are identified in the area floor plan contained in Attachment 1.

The areas to be utilized for storage within Building 9204-4 currently contain scrap materials, old/unused office equipment, a maintenance shop, tooling storage, and excess machinery/equipment that may be contaminated. The items will require characterization and evaluation in order to determine the disposition for future storage or disposal. Contaminated waste materials will be placed in B-25 boxes and stored, while noncontaminated materials will be taken to the appropriate classified or unclassified landfill areas for disposal. Some of the materials in the areas will be relocated and/or consolidated with existing materials to provide the additional storage space.

VI. Area Preparation

Different storage locations within Building 9204-4 will require different levels of preparation. An evaluation will be conducted to determine which areas are best suited for which type of material, storage type, and security measures. Unclassified, uncontaminated material may require little in the way of area preparation; however, classified, contaminated components may require access controls and the creation of radiological boundaries and/or vault-type rooms.

The movement and storage of unclassified, uncontaminated, nonhazardous materials requires few specialized skills and are currently performed in many buildings including Building 9204-4 by MCO and is not considered a new activity. The creation and use of a new classified, contaminated storage area will be evaluated using the Y15-190 process to determine the scope of a readiness review.

Part of the preparation for preparing Building 9204-4 for the additional storage shall be for MCO to perform an assessment per Y15-012, *Hazard Identification Planning*. This Job Hazard Identification (JHI) shall identify hazards associated with the preparation of the facility, integration and coordination of work with applicable Environment, Safety, and Health requirements, and hazards associated with the new materials. The Job Hazard Analysis (JHA) shall then be performed by Operations per Y73-043, *Job Hazard Analysis*. The JHA identifies the barriers/controls for the hazards identified by the JHI. This JHA process will eliminate or minimize the hazards associated with this storage task through established barriers/controls such as repackaging of hazardous materials, training to identify the hazards of handling hazardous materials, and implementation of personnel protective equipment. Detailed operating procedures typically are not required for general material moves and are not expected for this activity. However, if access-control procedures or specialized handling procedures are needed, the procedures will be created and subjected to the Y15-190 review process.

Unreviewed Safety Question Determinations (USQDs) will be conducted against the authorization-basis documents for the 81-22 and 9204-4 facilities. If an unreviewed safety question (USQ) is found to exist, DOE will be informed through the appropriate channels. Although the need for revisions to both facilities' authorization-basis documents is expected from this activity, a USQ is not anticipated.

VII. Cost and Schedule

The total estimated cost for the preparation of these areas and relocation of material is in the range of \$665K–\$1,000K depending on the facility modifications required to meet security requirements for the storage of classified components. Facility modifications will be designed by BWXT Y-12 Engineering and installed through the new BWXT construction organization. The creation of access-controlled, classified storage is expected to be the long lead-time effort in removing all material from Building 81-22.

Activities that do not require significant funding have already started or will soon start. Components in C1 containers have been removed and repacked into B-24 boxes, which saved several hundred square feet of storage space and reduced combustible loading. Storage areas in Building 9204-4 that can easily be cleaned out and are suitable for nonclassified storage (nonradiological area, no hardwired equipment) will be cleared and made available.

VIII. Follow-on Activities

Decontamination and Decommissioning (D&D) for Building 81-22

This project will terminate operations in Building 81-22 and transition the facility to Infrastructure Reduction. Future actions for this building will be conducted by Infrastructure Reduction under a different project.

Sea/land containers

This project does not involve materials contained in the sea/land or coop containers surrounding Building 81-22. Additional projects will be considered to resolve these storage issues.

IX. Issues

Modification to Buildings 81-22 and 9204-4 BIOs

USQDs have not been completed for this activity. If a USQ is determined to exist for the Building 9204-4 authorization basis due to the additional inventory of hazardous materials, the project completion will be delayed until the USQ can be resolved.

Need for Project Funding Release

The success of this project is dependent upon receiving funds from the FY 2001 and FY 2002 budgets.

Need for additional Classified Material Storage

This project maintains the classified storage space at Y-12 but results in an overall reduction in the footprint. Projections indicate that Y-12 will run out of classified storage by 2004 if additional space is not created or the need reduced.

Enclosure B

Letter, J. A. Conner to W. J. Brumley

Dated: May 16, 2001

**Letter dated May 1, 2001 from Structural Engineering
Subject: Limited Continued Operation of Building 81-22**



Date: May 1, 2001

To: R. V. Carlson

cc: L. J. Bowie, D. R. Norris, T. C. Howell, D. P. Kohlhorst, W. E. Manrod, C. E. Tilley Jr.

From: *LLLucas*
L. L. Lucas

Subject: **LIMITED CONTINUED OPERATION OF BUILDING 81-22**

BWXT Y-12 has recently completed a structural evaluation of Building 81-22 as part of the Revised Authorization Basis for the 9720-18/81-22 Complex. The evaluation included a condition assessment of the existing facility, along with determining potential areas where the building will not meet the natural phenomena requirements imposed by DOE-STD-1020-94.

The complete findings of the engineering evaluation are included in the Attachment. It is understood that the Y-12 National Security Complex intends within the next 12 months to have the building empty and not in further use. Based on this understanding it is our recommendation that Building 81-22, as it currently exists, is safe for limited occupancy for a period not to exceed 12 months with the following conditions:

1. Administrative controls should be implemented to limit access to the building to those personnel who need to access to the facility. There shall be no permanent residents in the building
2. The standing order issued on January 11, 2001, shall remain in effect until the building is emptied. This standing order requires personnel not to enter the facility or for those already inside evacuate it in the event the PSS Office announces a wind advisory (the PSS will issue such an advisory at 25 mph in order to suspend all roof activity), severe weather, tornado watches/warnings, and a detected earthquake.
3. Unlike tornados and high winds, there is no way to predict an earthquake, so Administrative Controls of the building for earthquake is not possible; however the probability of an earthquake occurring within the 12 month period which could result in a seismic failure is less than 10^{-2} . In facility safety space, this type of accident is considered unlikely.
4. During removal of the contents, extreme care should be taken to ensure that fork lift trucks do not impact the columns, as these could be moved quite easily since they are restrained at the floor slab only by friction.
5. If for any reason, continued use of this building past the twelve month period is needed, then Engineering shall perform another condition assessment before such use is allowed.

LLL:KEF
Attachment

ENGINEERING EVALUATION OF BUILDING 81-22 FOR CONTINUED, LIMITED, OCCUPANCY DURING THE NEXT 12 MONTHS

INTRODUCTION

As part of the Revised Authorization Basis for the 9720-18/81-22 Complex, it has been requested that a structural review of Building 81-22 be conducted to determine if the facility is safe to occupy without structural repairs and with or without requiring any interim compensatory measures for a period not to exceed 12 months. The following writeup discusses the structural issues relating to Building 81-22.

BUILDING 81-22 DESCRIPTION

Building 81-22 is a one-story wood frame building supported on a concrete floor slab, having dimensions of 70' x 209' with asbestos siding. The building was built in 1944.

No design drawings have been found for this building. Past experience with other wood frame buildings at Y-12 would indicate that the building was probably designed for about a 70 mph wind, but had no earthquake design. For a one-story wooden building with siding, the wind would normally control the design and satisfy normal building code seismic design requirements.

OVERALL CONDITION OF FACILITY

This facility has been inspected by Structural Engineering in 1997 and 2001, and by Lockwood Greene Technologies (LGT) in July 2000. The results of the three inspections have been similar. The walk-through of the building showed significant aging effects and changes in the structural load carrying path. LGT's report indicated that there were missing and/or damaged knee braces at the top of columns, damaged and displaced or rotated columns, and that no anchorage existed at the base of columns. There are several roof leaks which have or will eventually affect the load carrying capacity of the roof joists. Several of the original main wood columns have been replaced or modified, and during the replacement the columns were not anchored to the concrete slab or footing. The base of each column is sitting on a metal plate (restrained from lateral movement with respect to the steel plate) which has been placed over a hole in the concrete slab (where the original columns were embedded in the slab). In general, the columns appear to be in acceptable condition. Several knee braces (which are essential for the frame to resist lateral forces) are missing along with some wood splice connections which provide continuity for the wooden beams. There are some wall braces missing at the two east corners of the building, a side door on the south is badly deteriorated and should be replaced, the main sliding door needs new door jambs, and the outside columns at the north east corner are badly deteriorated (this area is currently roped off limits).

NATURAL PHENOMENA (NP) EVALUATION

Based on these walk-throughs of the building, the wind and seismic capacity of the building has been reduced from the original design levels due to the aging effects and changes in the lateral load structural members/connections.

Wind and Seismic: The primary NP problems are the missing braces and splices, and the total lack of anchorage at the base of all of the interior columns in the building. It appears that as originally designed, these columns were inserted into a square hole in the floor slab which provided lateral support (they still were not anchored for uplift). As these columns now exist, they are sitting on a 1/2" thick base plate, are restrained from lateral movement with respect to the base plate with two clamps welded to the base plate (but not attached to the column), but the base plate is just sitting on the floor slab and is free to slide, restrained only by whatever friction happens to exist between it and the concrete slab. In order to create a load path for the structure to adequately resist lateral loads, in addition to

installing all missing braces and beam splices, it would be necessary to anchor all the base plates to the floor slab using some type of concrete anchors. The quantity, size, and type of the anchors will depend on the magnitude of the forces and also on the thickness of the concrete floor slab. Some repair (or reinforcing) of the concrete slab in the vicinity of several columns may be required.

NP Induced Fire: If the building collapses, the only source for creating a fire appears to be broken electrical wires. This condition does not necessarily cause a fire. Experience shows that fires caused by NP induced failure of buildings usually result from failure of more flammable components than broken electrical wires, such as gas lines, containers of flammable liquids, etc. If needed, documentation of the experience data could be compiled to demonstrate that an NP induced fire for building 81-22 is probably unlikely.

Flood and Rain: The floor slab of Building 81-22 is at about elevation 990-ft. This elevation is above any potential stream flooding and the topography of the area around the building is such that local flooding from precipitation runoff should not be a problem. The roof is sloped with no parapets, therefore roof ponding is not a concern.

Lightning: There is no lightning protection for Building 81-22.

JUSTIFICATION FOR CONTINUED OCCUPANCY

The current evaluation of the facility clearly indicates that it is not adequate to meet the requirements of DOE-STD-1020-94 for natural phenomena hazards, specifically wind and seismic events. However, despite the numerous deficiencies found during the inspections, there is no indication that the building is not adequate for static loading conditions (e.g. design snow load). None of the main load carrying structural elements (columns, beams, and roof joists) showed signs of any serious degradation (the exterior columns in the northeast corner are not part of the support system for the material stored inside the facility, they only support a portion of the roof covering a small ground level porch). The missing members, knee-braces and beam splice members are needed only for continuity during lateral motion events, and those few that are missing do not seriously reduce the current stability of the structure under gravity loads (almost all of the knee-braces and beam splice members are in place). The degraded door siding on the south side of the building do not, in any way, affect the stability of the structure.

Thus, it is concluded that the structure, as it currently exists, is safe for occupancy for a period not to exceed 12 months with the following caveats:

1. That Administrative controls should be implemented to limit access to the building to those personnel who need to enter. There shall be no permanent residents in the building.
2. That the standing order issued on January 11, 2001, shall remain in effect until the building is emptied. This standing order requires personnel not to enter the facility or for those already inside to evacuate it in the event the PSS Office announces a wind advisory (the PSS will issue such an advisory at 25 mph in order to suspend all roof activity), severe weather, tornado watches/warnings, and a detected earthquake.
3. Unlike tornados and high winds, there is no way to predict a future earthquake; however the probability of an earthquake occurring within the 12 month period which could result in a seismic failure is less than 10^{-2} . In facility safety space, this type of accident is considered unlikely.
4. During removal of the containers inside Building 81-22, extreme care should be taken to ensure that fork lift trucks do not impact the columns, as these could be moved quite easily since they are restrained at the floor slab only by friction.

Kenneth E. Fricke, Ph.D., P.E.
Civil and Structural Engineering
BWXT Y-12, L.L.C.

R. Joe Hunt, P.E.
Civil and Structural Engineering
BWXT Y-12, L.L.C.