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April 10, 1998

98-RF-01985

D. L. Noyes
Standards
DOE, RFFO

SUBMITTAL OF VARIANCE REQUEST RFPK-DOE-5633.3B-VR-064, DETERMINATION OF ATTRACTIVENESS LEVELS WITHIN MATERIAL ACCESS AREAS - ALG-178-98

Variance Request (VR)-064, Determination of Attractiveness Levels within Material Access Areas, is attached for review and approval.

Please provide formal disposition of the subject VR.

If you have any questions, contact Dee Sherrill at extension 6823.

A handwritten signature in black ink, appearing to read 'A. L. Germain', is written over the typed name.

A. L. Germain
Division Manager
Safeguards and Security

sad

Attachment:
As Stated

Orig. and 1 cc - J. D. Steward

cc:
S. Bolling - DOE, RFFO
S. L. Cross - DOE, RFFO
S. R. Grace - DOE, RFFO
J. D. Steward - DOE, RFFO

Kaiser-Hill Company, L.L.C.

Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.7000

Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

5500

Deviation Request
Kaiser-Hill Company, L.L.C.

REQUEST NUMBER: RFPK-DOE-5633.3B-VR-064
OSS-RF-98-4

TOPIC: Determination of Attractiveness Levels within Material Access Areas

DATE OF REQUEST: April 10, 1998

DIRECTIVE: DOE Order 5633.3B **ISSUE DATE:** 9-7-94

TITLE: Control and Accountability of Nuclear Materials

1.0 ORDER CITATION

DOE Order 5633.3B Control and Accountability of Nuclear Materials

Chapter I Basic Requirements

2. GRADED SAFEGUARDS

- a. Operations Offices and facilities shall establish and follow a graded safeguards program for nuclear materials. Graded safeguards is the concept of providing the greatest relative amount of control and effort to the types and quantities of special nuclear material that can be most effectively used in a nuclear explosive device. Categories of nuclear material for implementation of DOE's graded safeguards program are shown in Figure I-2. The "Guide for Implementation of DOE 5633.3A [sic]" contains more descriptive guidance for material attractiveness and examples of category determination.

Guide for Implementation of DOE 5633.3B, "Control and Accountability of Nuclear Materials" (April 1995)

Chapter I Material Attractiveness and Category Determination

B. Material Attractiveness

3. Attractiveness Level C: High-Grade Material

General Description. Materials that can be easily converted to special nuclear material metal. Generally, these materials are of low bulk and high purity and require relatively little processing time or effort to obtain Level B material. Specific criteria follow:

REVIEWED FOR CLASSIFICATION
By _____ S. A. Doty u/nu
Date _____ 4/9/98 _____

- a. Solid material containing less than or equal to 50 atom percent plutonium, U-233, and U-235 (either individually or combined) but greater than 100 grams special nuclear material per kilogram of material (10 weight percent).
- b. Solid material containing enriched uranium that meets all of the following conditions:
 - (1) the atom percent of U-235 in the material is less than or equal to 50%,
 - (2) the enrichment of the uranium is greater than or equal to 50% U-235 (see Section 6.c.), and
 - (3) the U-235 concentration in the material is greater than 100 g/kg of material.

4. Attractiveness Level D: Low-Grade Materials

General Description. Materials that are more dilute or of lower purity than Level C materials, and require greater processing time or greater processing complexity to convert to metal than Level C materials. Diversion or theft of a large quantity of bulk materials is required to obtain an improvised nuclear device quantity of special nuclear material or processing requires extensive precautions for protection against radioactive emissions. Specific criteria follow:

- a. For plutonium, U-233, and uranium enriched to greater than or equal to 50% U-235, materials that contain less than or equal to 10 weight percent special nuclear material but contain greater than 0.1 weight percent special nuclear material. For enriched uranium enriched to greater than or equal to 20% U-235 but less than 50% U-235, materials than [sic] contain greater than 0.1 weight % U-235.

2.0 IMPACTED ENTITY

Rocky Flats Environmental Technology Site (Site)
MFR: 3772

3.0 DEVIATION JUSTIFICATION

Deviation

Kaiser Hill proposes to assign attractiveness levels C and D to nonmetal solid forms of special nuclear materials within material access areas (MAAs) according to the following criteria:

ATTRACTIVENESS LEVEL C (high-grade material) consists of nonmetal solid SNM that can be "easily" converted to metal. Generally, these materials are low bulk, high purity (greater than 10 weight percent) and require relatively little processing time or effort. They include oxides, hydrides, and fluorides.

ATTRACTIVENESS LEVEL D (low-grade material) consists of nonmetal solid SNM that is bulkier or of lower purity than level C materials (generally less than or equal 10 and greater than to 0.1 weight percent). They require greater processing time or greater processing complexity to convert to metal than level C materials. Examples include line-generated waste, rags, filter media, HEPA filters, glass, plastic, SS&C (sand, slag, and crucible), ash, graphite, combustibles, crucibles, molten salts, electrorefining salts, direct oxide reduction salts, and insulation.

Holdup materials are usually considered attractiveness level D. The assumption is made that all materials which can reasonably be removed from an area have been removed before holdup is measured. If holdup measurements indicate greater than 0.5 gram SNM per square foot, further evaluation is necessary to make a final determination of the attractiveness level (i.e., B or C rather than D). That determination will be made based on process knowledge, historical measurement data, ease of recoverability of the SNM from the matrix, and expert opinion.

A specific group of item description codes (IDCs) may be either attractiveness level C or D, depending on the assay of the material. The following table contains a list of those IDCs and the weight percent (assay) cutoff point between levels C and D.

Table of Attractiveness Level Determination for Specified IDCs

<u>IDC</u>	<u>Assay*</u>	<u>IDC</u>	<u>Assay*</u>	<u>IDC</u>	<u>Assay*</u>
200	> 10	368	> 40	417	> 40
201	> 10	370	> 40	420	> 40
289	> 40	374	> 40	421	> 40
290	> 40	376	> 40	426	> 40
299	> 40	390	> 40	427	> 40
300	> 40	391	> 40	429	> 40
303	> 40	392	> 40	433	> 40
310	> 40	393	> 40	434	> 40
312	> 40	394	> 40	435	> 40
320	> 40	398	> 20	440	> 40
330	> 40	404	> 40	441	> 40
331	> 40	405	> 40	454	> 40
333	> 40	407	> 40	473	> 40
335	> 40	409	> 40	480	> 40
336	> 40	411	> 40	523	> 40
337	> 40	413	> 40	532	> 40
338	> 20	414	> 40	654	> 40
340	> 40	415	> 40	655	> 40

* Assays listed are the cutoff point between attractiveness levels C and D. Materials whose assays are greater than the cutoff point are attractiveness level C.

This deviation will apply only to those items stored inside of material access areas (MAAs). SNM stored outside of MAAs will be categorized using the Guide to DOE Order 5633.3B. That is, materials containing greater than 10 weight percent SNM are attractiveness level C, materials containing less than or equal to 10 weight percent SNM but containing greater than 0.1 weight percent SNM are considered attractiveness level D. Materials that are being shipped between MAAs will be categorized per this deviation.

Rationale

Subject matter experts (SMEs) with historical processing experience, extensive process knowledge, and experience in graded safeguards reviewed the various forms of special nuclear material at the Site and determined the difficulty involved with recovery of each. Attractiveness levels were assigned to the various IDCs (either by whole IDC group or by assay within the IDC) based on these reviews. The difficulty or ease of recoverability of the materials combined with the controls in place within the MAA (listed in Section 4.0 below) meet the intent of the Order requirement for protection on SNM.

4.0 PROTECTION MEASURES

Determination of material category for a special nuclear material location or activity within an MAA will be made using the approved criteria described above.

Procedures are in place (NMS-INSTR-010, Rev 0, *Calculating In-Process Control Limits*) to monitor the quantities of SNM within the protected area which are not secured within a vault or vault-type room (V/VTR). An enhancement to the Safeguards Accountability Network (SAN) was developed and implemented to generate a daily report. The report lists all attractiveness level B and C items, using the criteria in this deviation, which are outside of V/VTRs within each MAA. A similar report of materials outside of MAAs inside the protected area is generated using DOE 5633.3B and the Guide criteria. Using these reports, the Nuclear Materials Safeguards organization calculates the category of each area to assure that appropriate material controls are in place. The daily reports are also used to monitor roll up of SNM.

If the quantity of attractiveness level C material (by the aforementioned criteria) within an MAA outside of V/VTRs equals or exceeds a Category I threshold, compensatory measures are put in place (i.e., material is moved into a V/VTR or material surveillance teams are implemented). When a Category II quantity (by the aforementioned criteria) is outside of a V/VTR within an MAA, it is monitored through the Daily Administrative Checks performed by Nuclear Material Control (NMC) personnel. Additionally, the Protective Force is notified whenever Category I, or Category II quantities that roll up to Category I, are outside of V/VTRs in the MAAs so that appropriate security response procedures are implemented.

Quantities of SNM in material transfers are also monitored and included in MAA categorization calculations. Transfers are recorded on source documents (NMDTR) and require authorization from NMC personnel. When a transfer is prepared, the quantity of material in the transfer is categorized and the category recorded on the NMDTR. The quantity of material in the transfer is included in the categorization calculations so that a running balance of SNM outside a V/VTR is

maintained for an MAA. NMC monitors this running balance to ensure the appropriate material control and security procedures are in place at all times.

5.0 DURATION

This variance is requested for an indefinite time.

6.0 RISKS

A vulnerability assessment (VA) was conducted as part of the Site Safeguards and Security Plan (SSSP) preparation process. In the VA, materials considered to be targets were identified by using categorization calculations, which are based on attractiveness level determinations. The VA only considered Category II items (not quantities) that can roll up to a Category I quantity. This variance will not increase the risk to any current target, although the number of targets that must be considered in the roll up calculation may increase. Materials recategorized based on the new criteria will have no increased risk due to the in-place controls (i.e., running balance, DACs, and implementation of material surveillance teams, as necessary.)

7.0 REVIEW AND APPROVALS

PREPARER:



D. L. Heath
Manager, Nuclear Materials Safeguards
Safe Sites of Colorado, L.L.C.

4-10-98

Date

APPROVAL:



A. L. Germain
Division Manager, Safeguards and Security
Kaiser-Hill Company, L.L.C.

10 April 98

Date

memorandum

DATE: **AUG 17 1998**

REPLY TO: EM-62 (M. Daugherty, 301-903-9978)
ATTN OF:

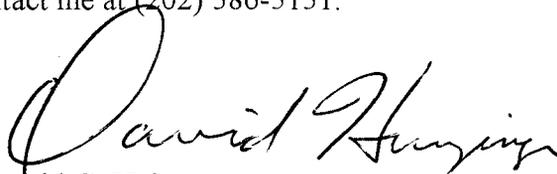
SUBJECT: Residue Shipping Plan and Safeguards Termination Limit Variance
(FPK-DOE-5633.3B-VR-062)

TO: Henry F. Dalton, Assistant Manager for Material Stabilization,
Rocky Flats Field Office

Attached is the concurrence from the Office of Safeguards and Security (OSS) for the subject variance request. As noted, the OSS concurrence is contingent upon one or more security enhancements recommended by the vulnerability assessment being implemented at the Waste Isolation Pilot Plant.

This office also concurs with the variance and agrees with the OSS rationale for implementing one or more of the security enhancements. We will be in contact with the Carlsbad Area Office to coordinate implementation.

If you have any questions, please contact me at (202) 586-5151.



David G. Huizenga
Acting Deputy Assistant Secretary
for Nuclear Material and Facility Stabilization
Office of Environmental Management

Attachment

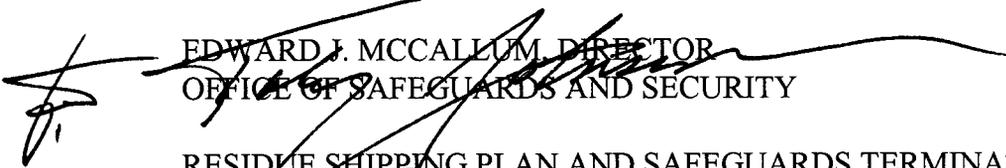
cc:
M. Frei, EM-30
E. McCallum, NN-51
P. Bubar, EM-64
G. Dials, CAO



Department of Energy
Germantown, MD 20874-1290

May 15, 1998

MEMORANDUM FOR DAVID G. HUIZENGA, DEPUTY ASSISTANT SECRETARY
NUCLEAR MATERIAL AND FACILITY STABILIZATION
OFFICE OF ENVIRONMENTAL MANAGEMENT

FROM:  EDWARD J. MCCALLUM, DIRECTOR
OFFICE OF SAFEGUARDS AND SECURITY

SUBJECT: RESIDUE SHIPPING PLAN AND SAFEGUARDS TERMINATION
LIMIT VARIANCE (RFPK-DOE-5633.3B-VR-062)

REFERENCE: DALTON MEMORANDUM TO MARTINEZ AND MCCALLUM,
SAME SUBJECT, DATED APRIL 2, 1998

My office has received the above referenced request for a variance to the requirements in the DOE 5633.3B for the control and accountability of plutonium bearing residues while at the Rocky Flats Environmental Technology Site. We concur with the request for the materials identified in the request based on low risk related to diversion, theft and sabotage. This concurrence is based on the condition that all of the processing and packaging activities described in the variance are performed (e.g., blending of residues to below 10 weight percent plutonium and placing the blended residues in the pipe overpack containers) prior to removing the residues from the Protected Area. These activities will reduce the proliferation attractiveness of the residues when limited quantities (not to exceed Category IV) of blended residues are transferred from safeguards to waste management controls when loaded into TRUPACTs for shipment to the Waste Isolation Pilot Plant (WIPP). The recently conducted vulnerability assessments of the WIPP transportation, staging and underground emplacement identified and recommended several measures that can enhance capabilities to further reduce risk. These measures include motion detection systems, surveillance, searches, patrols and access controls. This concurrence is contingent upon one or more of these measures being implemented at WIPP.

This concurrence has been reviewed and concurred upon by the Directors of the Office of Arms Control and Nonproliferation (NN-40) and the Office of Nonproliferation and National Security (NN-1). Please contact David W. Crawford of my staff at (301) 903-2536 if you have any questions concerning this matter.

