Department of Energy
Washington, DC 20585

August 6, 2004

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, D.C. 20004-2941

Dear Mr. Chairman:

The purpose of this letter is to provide the response to your letter dated May 3, 2004, regarding the Defense Nuclear Facilities Safety Board observations on the Waste Isolation Pilot Plant Mobile Characterization Unit Generic Documented Safety Analysis. You transmitted a letter with concerns on the Department of Energy (DOE) approved Basis for Interim Operation (BIO) for the Mobile Waste Characterization and Loading Units (MCU). Your letter requested a report that documents: 1) an independent assessment of the adequacy of the BIO; 2) a plan and schedule for correcting deficiencies identified in the "Staff Issue Report," dated March 25, 2004; 3) an assessment of ongoing activities that may have used a similar safety basis; and 4) actions that will be taken to ensure an adequate set of controls until a technically justifiable safety basis has been prepared and approved.

With respect to item 1), an independent peer review was commissioned on the draft version of the BIO and technical comments were addressed before the document was finalized. Attachment 1 to my letter provides the independent reviewer's comments and the BIO development team's responses. The independent reviewer has also reviewed and concurred with the team's resolution of issues identified by your letter. Additionally, the host sites will document the acceptance of the BIO along with any deviations in accordance with the "licensing criteria" contained in the BIO companion document, *Application Guide for Mobile Waste Characterization System Components in Support of the Mobile Operations Authorization Basis.*

Regarding item 2) in your letter, several improvements are planned for the BIO, Technical Safety Requirements and Application Guide that will resolve concerns identified in the "Staff Issue Report." A summary of proposed changes to these documents are discussed in Attachment 2 and are linked to various issues identified by your staff. These changes and other recent lessons learned will be incorporated in the next annual update of the MCU safety basis documents that will be issued in November 2004. A copy will be provided to the Board staff. The BIO development team is currently working with the Carlsbad Field Office to implement proposed changes.

In response to items 3) and 4) of your letter, no site has implemented the BIO. Any site-specific implementation will be in accordance with the annual update. Based on the attached response, the revised safety basis and associated control set will be further improved for transuranic waste characterization activities.

We appreciate your input and will continue to work with your staff as the annual update process proceeds. If you have any further questions, please call me at (202) 586-7709 or Mr. Dae Y. Chung, Director, Licensing Office, at (301) 903-3968.

Sincerely,

Paul M. Golan
Acting Assistant Secretary for
Environmental Management

Attachments

Washington Group International
Integrated Engineering, Construction, and Management Solutions

July 9, 2004 WSMS-SAE-04-0147

Dr. Dae Y. Chung
Director, Office of Licensing
DOE/EM-20 /Cloverleaf Building
U.S. Department of Energy
1000 Independence Ave., S.W.
Washington, DC 20585-2040

Independent Peer Review of the Hazard and Accident Analysis of the Mobile Characterization Unit Generic Documented Safety Analysis

Dear Dr. Chung:

This letter documents the technical review performed on the hazard and accident analysis for the Waste Isolation Pilot Plant (WIPP) Mobile Characterization Unit as documented in the Documented Safety Analysis ("Basis for Interim Operation (BIO) for the WIPP Mobile Characterization Units"), and associated Technical Safety Requirements (TSRs) and Application Guide. The review encompassed early drafts of the BIO and ended with the final version that was finished in early September and later published on the Department of Energy/EM website.

The review concluded that the events identified from the hazard analysis and analyzed further in accident analysis space were properly developed, including

- Fire Involving TRU Waste in Glovebox of Visual Examination and Repackaging Unit (Section 3.4.2.1)
- Large Fire Involving Staged TRU Waste Containers in Yard (Section 3.4.2.2), and
- Deflagration in TRU Waste Drum (Section 3.4.2.3).

In addition, arguments for quantifying the airborne release fractions (ARFs) and the respirable fractions (RFs) for the three accident types were found to be sufficiently conservative.

The consequence analysis for each of the three accidents is traceable to the radiological dispersion and consequence analysis. However, the use of both MACCS2 (fire accidents) and HOTSPOT (deflagration accident) for the accident dose consequences, while not without precedent, is somewhat confusing, and it would be recommended to use one code for all three accidents in BIO updates.

In addition, it is not clear that the *sector-specific* 95th percentile MACCS2 doses meet the intent of the dose evaluation specified in Appendix A to DOE-STD-3009-94. It is recommended to

omit citing these doses in future BIO updates until the Sandia National Laboratories code developers agree that MACCS2 is providing the intended measure of consequence.

While comparing the 95th percentile doses from the five DOE sites and selecting the highest dose is a conservative approach, the NTS results appear to be an outlier across the board. It is not required to omit these results in the current BIO, but the document's authors should investigate the basis for the consistently high numerical values when this particular data set is used in a MACCS2 calculation.

On the whole, the BIO is written to a high standard. It provides a satisfactory technical basis for identifying the subsequent control set to mitigate potential doses due to postulated accident conditions.

More detail is included in the attachment. If you or the documents' authors have questions, please free to contact me at 803.502.9620.

Sincerely,

Kevin R. O'Kula

DOCUMENT REVIEW RECORD

DOCUMENT TITLE: Basis for Interim Operation for the WIPP Mobile Characterization Units DOC. NUMBER/REV: June 2003 - XX-XXXXXXX	REVIEWER:	Kevin O'Kula
	Phone No:	803.502.9620

No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
1.	Page iv	Correct to: Immediately Dangerous to Life or Health	Agree. Recommended changes incorporated.
2.	Page v	Fill in missing definition: TRUPACT: Transuranic Package Transporter	Agree. Recommended changes incorporated.
3.	Page vii: Executive Summary	Incomplete sentence: By meeting the requirements specified in this DSA and the associated Application Guide (DOE 2003).	Agree. Sentence completed by adding "a site can authorize TRU waste characterization without performing additional analysis"
4.	Page vii: Executive Summary	Placeholder for quantity of activity to be processed: There are approximately *insert total Ci inventory* that will be processed over a period of *years.* Also, . *Note that if the WIPP limit of 80 PE-Ci/drum is used, the BIO should be revised to HC-2*	Agree. Placeholder removed. BIO changed to HC 2.
5.	Page viii	Recommend change to second sentence, i.e., "NPH considerations change to "Postulated NPH events . . ."	Agree. Recommended changes incorporated.
6.	Chapter 1; Page 1-1	Incomplete sentence: By meeting the requirements specified in this DSA and the associated Application Guide (DOE 2003).	Agree. See response to Comment #3
7.	Chapter 1; Page 1-1	Change to CN 1 to CN 2	Agree. Removed and reference section added.
8.	Chapter 1; Page 1- 3	For consistency, use *onsite* and *offsite* instead of on-site and off-site. It varies throughout the document depending on the chapter.	Agree. Recommended changes incorporated.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
9.	Chapter 1; Page 1-4	This sentence is very confusing, *Due to the temporary nature of MCU placement the majority of normal siting criteria for DOE non-reactor nuclear facilities is considered to be non applicable or the risk acceptable for the period of use.* What siting criteria are the subject of the statement? It is not clear how the time at risk argument is being applied here, especially in the second half, i.e., "is considered to be non applicable or the risk acceptable for the period of use." Recommend "are considered not to be applicable. Furthermore, the short-duration nature of the activity would suggest that a time-at-risk argument is applicable for the MCU processing".	Agree. Recommended changes incorporated.
10.	Chapter 1; Page 1-4	Last sentence in the first paragraph: Qualitative accident analysis has been performed which establishes a minimum site boundary distance of 200 m from MCU segments to be acceptable This statement needs a reference and it does not seem plausible that qualitative accident analysis can be used to define a 200-meter minimum distance for a site boundary.	Agree. Sentence clarified that Accident Analysis uses a 200 m site boundary distance.
10.	Chapter 1; p. 1-4	Title is italicized, deviating from earlier format. One common font and style should be applied throughout the document. DOE 2003. U.S. Department of Energy, *Application Guide for Mobile Waste Characterization System Components in Support of the Mobile Operations Authorization Basis.* June 2003. Washington, D.C.	Agree. Corrected during technical editing
11.	Chapter 2; page 2 – 1	This chapter is lengthy and contains complete descriptions of each of the fourteen mobile waste characterization units. An overall process description is needed early in this chapter of not more than a page so that the reader can gain an appreciation of the sequencing of the waste container assay and possible repackaging steps. A flow diagram (stick and box figure) of the steps the typical waste container takes as it is assayed would be very useful.	Agree. Flow diagram added of overall process.
12.	Chapter 2; p. 2 – 1	Change "upstanding" to "understanding": A graded approach was established for this chapter by providing a typical description of the mobile waste characterization units that would allow an independent reader to develop an upstanding of the mobile waste characterization units and process operations without extensive consultation of controlled references.	Agree. Recommended changes incorporated.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
13.	Chapter 3; page 3 – 1 and throughout the document.	DOE-STD-3011-2002 uses Process Hazards Analysis (PrHA) – not a big deal but for consistency, let's revise this throughout the document as a global change. This section describes the process hazard analysis (PrHA) performed for the TRU waste characterization and TRUPACT-II loading operations.	Agree. Recommended changes incorporated.
14.	Chapter 3: Page 3-2	First paragraph under Requirements: Move the following sentence to immediately before the listing of the two standards: Other requirements and standards that are implemented are listed below.	Agree. Recommended changes incorporated.
15.	Chapter 3: Page 3-5	In Table 3-1, the term "yr" is used. The convention is "y" or "/y" or "per y".	Agree. Recommended changes incorporated.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
16.	Chapter 3: Page 3-7	Fifth paragraph: The impacts onsite are evaluated based on a receptor distance at 100 meters in order to provide a perspective of the consequences. Accident consequences from spills are evaluated using HOTSPOT, which is a simplified Gaussian plume model, widely used for initial emergency assessment or safety-analysis planning. The simplicity of this model was an appropriate tool to support a semi-qualitative evaluation. MACCS2 was used to provide a perspective on the range of onsite consequences associated with fire events. Evaluations were based on site-specific meteorology associated with the Nevada Test Site and Lawrence Livermore National Laboratory, which both have employed the MCUs. Use of different site meteorologies is not expected to significantly impact consequence evaluation results. From a graded approach perspective, HOTSPOT is appropriate in terms of providing an estimate of the onsite exposure at a receptor distance of 100 m. Persistent weather conditions (stability and wind speed) are entered as an input, and spills as well *as fire-induced* releases can be assessed. In contrast, MACCS2 would not seem to be useful in the same context, in that it is more applicable to accident analysis stage of analysis. Furthermore, the description indicates that NTS and LLNL site meteorological data were the bases for the analysis – this level of specificity is not necessary. It is recommended that persistent conditions be used, e.g. F and 1 m/s or 1.5 m/s. The resulting doses in this case would be site-independent and easier to apply across the Complex wherever the BIO is referenced. Suggest a short appendix showing key steps in dose calculation, or providing a reference to support the quoted doses.	Observations are noted. However, the approaches used in the BIO (i.e., HOTSPOT for non-lofted plumes and NTS/LLNL site data) are more conservative than the recommended changes. Therefore, no change to the methodology will be incorporated at this time.
17.	Chapter 3; Page 3-8	Table 3-2: Use "offsite" and "onsite" consistently. In the notes section rewrite comment on ERPG and TEEL, for example, If ERPG values for a chemical do not exist, the TEEL values are used.	Agree.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
18.	Chapter 3; Page 3-12	Second sentence in section 3.3.2.2: "Hazard categorization results have not been adjusted based on the hazard analysis as allowed by DOE-STD-1207." This sentence is unclear. Is this final hazard categorization and is the standard referred to "1027", rather than "1207"? Based on the next three sentences, the adjustment of the hazard categorization may also be referring to final hazard categorization allowing changes with justified differences to the ARFs compared to those discussed in Attachment 1 of DOE-STD-1027-92 (also guidance provided in NSTP 2002-1).	Revised. " *Final hazard categorization has not been adjusted using alternate airborne release fractions (ARF) as allowed by DOE-STD-1027.*" This is because the ARF associated with various accident events would not be substantially different than the default value of 1E-03 used to calculate threshold quantities (i.e., ARF of 5E-04 could be justified for many events, though ARF of 1E-02 is possible for limited drum fires with ejection of contents).
19.	Chapter 3; Page 3-12	Same paragraph as above – suggest making 2 sentences out of the long sentence currently being used, i.e., This is because the airborne release fractions (ARF) associated with various accident events would not be substantially different than the default value of 1E-03 used to calculate threshold quantities. For example, an ARF of 5E-04 could be justified for many events, though ARF of 1E-02 is possible for limited drum fires with ejection of contents. Therefore, the final hazard categorization is based only on an inventory comparison to threshold quantities in DOE-STD-1027, Table A.1.	Agree. Recommended changes incorporated.
20.	Chapter 3; Page 3-13	Correct spelling of therefore: "Mobile units are typically located in relative close proximity to one another, and thefore . . . "	Agree. Recommended changes incorporated.
21.	Chapter 3; Page 3-13	First paragraph, next to the last sentence: Specify "host site" rather than "site".	Agree. Recommended changes incorporated.
22.	Chapter 3; Page 3-13	Fifth paragraph: All mitigated worker risks are low, . . .Change to consequences.	Reference removed.
23.	Chapter 3; Page 3-13	What would be classified as a Category 2 facility? The segments or the container?	Facility segments.
24.	Chapter 3: Page 3-14	NDA – Neutron Assay; Correct to Non-Destructive Assay	Agree. Recommended changes incorporated.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
25.	Chapter 3: Page 3-14	Typo: Remove "o" in: " . . . must with drops up to o 4 feet)."	Agree. Recommended changes incorporated.
26.	Chapter 3: Page 3-15	Electrical fire: Comparing to Table B-3 and ID No. CH-1: Both unmitigated and mitigated risk levels for the worker (& public) are Class III.	Agree. Recommended changes incorporated.
27.	Chapter 3: Page 3-13	Last sentence before Section 3.3.2.3: Suggest rewording to say " Appendix C provides further discussion for MCU situations where greater than 56 PE-Ci is being considered as the MAR . . .".	Section was changed to include an assumption of 100 PE-Ci as MAR.
28.	Chapter 3: Page 3-15	Middle of first paragraph: Using a plume sensible heat of 5 MW, no plume meander and building wake effects associated with the MCU trailers, and 95% meteorology, maximum dose consequences at the 100 meter evaluation point are 63.5 rem/PE Ci. The level of sophistication for this type of calculation is not warranted under graded approach. Five MW sensible energy, no meander but with wake effects? Also why not apply Briggs F and 1 m/s rather than apply a specific site meteorology? How valid is the claim that LLNL meteorology is representative?	The assumptions mentioned in the comment and used in the analysis provide an added measure of conservatism that result in higher dose consequences. The level of rigor used in the analysis is not uncommon for accident analyses performed for Hazard Category 2 facilities.
29.	Chapter 3: Page 3-15	Same paragraph – Change "Workers" to "Worker exposures"	Agree. Recommended changes incorporated.
30.	Chapter 3: Page 3-15	Under Deflagration: Unlikely (once every 1000 to 10,000 years) change to (once every 100 to 10,000 years).	Agree. Recommended changes incorporated.
31.	Chapter 3: Page 3-16	List DOE/WIPP 88-014 in reference section.	Agree. Recommended changes incorporated.
32.	Chapter 3: Page 3-16	Fourth paragraph: *It is important to not confuse plutonium equivalent Curies with grams of fissile material (the high Curies in some drums are typically due to Am-241 and Cm-244).* This sentence is not needed at this point. If it is used at all, it should be placed closer to the first use of FGE and PE-Ci, rather than near the end of Chapter 3.	Removed the sentence.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
33.	Chapter 3: Page 3-17	**3.3.2.3.7 Mobile Visual Examination and Repackaging (MOVER)** **should be 3.3.2.3.6**	Agree. Recommended changes incorporated.
34.	Chapter 3: Page 3-17	Middle of fourth paragraph: *Using these assumptions of a medium size fire, no plume meander and building wake effects associated with the MOVER trailer, and 95% meteorology.* Again, this use of MACCS2 appears to be too much detailed modeling for what is intended to an approximate engineering judgment-based estimate of the likely consequence. Can't see this as warranted in light of being applied to demonstrate that this is a Risk I event.	The assumptions mentioned in the comment and used in the analysis provide an added measure of conservatism that result in higher dose consequences. The level of rigor used in the analysis is not uncommon for accident analyses performed for Hazard Category 2 facilities.
35.	Chapter 3; Page 3-18	TRUPACT-II Loading: Suggest that a last sentence be added to this text indicating that this results in a Risk Class III event if unmitigated. Operators are used to operate the crane. The rigging procedure (payload assembly and lift) is per a DOE approved TRUPACT-II SAR. The process of loading the TRUPACT-II is controlled by a special WIPP trained team.	Agree. Recommended changes incorporated.
36.	Chapter 3; Page 3-18	Section 3.3.2.3.8 External Events, last sentence: Per Table 3-4, should this be "consequence" instead of "risk"? In Table B-9, the worker consequences for mitigated appear to be lowered by two bins rather than one bin compared to unmitigated.	Agree. Reference to risk removed.
37.	Chapter 3; Page 3-19	Change last sentence under lightning to; This event is expected to result in low radiological consequences.	Agree. Recommended changes incorporated.
38.	Chapter 3; Page 3-19	Immediate before 3.3.2.5: Suggest a Table 3-6 be used to roll-up the key release conditions described in Section 3.3.2.3, Hazard Evaluation. Pages 3-13 to 3-19. See Table on last page as a suggested format.	Disagree. Information adequately summarized in 3.3.2.10.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
39.	Chapter 3; Page 3-22	First paragraph after section 3.3.2.7 heading: This text is not part of the BIO, but a restatement of DOE philosophy and approach to use of TSRs. Consistent with guidance of DOE-STD-3009, *TSRs should not be used as a vehicle to cover the many procedural and programmatic controls inherent in any operation. Excessive use of TSR limits to manage operations can result in distortion of the regulatory structure DOE is attempting to develop and will dilute the emphasis intended for the most critical controls.*	Deleted
40.	Chapter 3; Page 3-23;	Table 3-6: Define "TSR-DF" and "TSR-AC" in first use in Table 3-6.	Not necessary. Terms are widely recognized.
41.	Chapter 3; Page 3-25	3.3.2.9 Environmental Protection *The impacts to the environment from the scenarios discussed in this chapter are considered less than the impacts to the public.* The controls identified in the PrHA are considered sufficient to address the impacts to the environment. The above assertions are not substantiated (that environmental impacts are less than those to the public).	Disagree. Based on the nature of operations and possible releases, the BIO conclusion does not need to be further substantiated
42.	Chapter 3; Page 3-26	DOE (2000). *Guidance for Preparation of Basis for Interim Operation (BIO) Documents*, U.S. Department of Energy, Washington, DC (DOE-STD-3011-2002). Should be DOE (2002).	Agree. Recommended changes incorporated.
43.	Chapter 4; Page 4-2	Last sentence in section 4.4.1.1: Suggest that this sentence be reworded to: Vents are installed in drums for flammable gas control that do not contain vents used as part of the TRU waste head gas sampling activities.	Agree. Recommended changes incorporated.
44.	Chapter 4; Page 4-7	Suggest adding "characteristics" to the end of the first sentence. "along with aid of the normally existing negative pressure and the significant airflow characteristics.	Agree. Recommended changes incorporated.
45.	Chapter 4; Page 4-7	Same paragraph: Use possessive - plenum's Spectrometer	Agree. Recommended changes incorporated.
46.	Chapter 4; Page 4-7	Same paragraph: Delete "to" in front of minimizes, i.e., The backflow prevention device present in the cabinet minimizes the probability of filter failure in the case of overpressurization.	Agree. Recommended changes incorporated.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
47.	Chapter 4; Page 4-7	Use same style and font for references: DOT (1999) *SHIPPERS--GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS*, U.S. Department of Transportation, Washington, D.C. (49 CFR 173, Mar. 5, 1999). DOT (1990) *SPECIFICATIONS FOR PACKAGINGS*, U.S. Department of Transportation, Washington, D.C. (49 CFR 178, Dec. 21, 1990). AGS (1994) *Guideline for Gloveboxes,* American Glovebox Society, Santa Rosa, CA 95405 (AGS-G-001-94).	Agree. Recommended changes incorporated.
48.	Chapter 5; Page 5-1	Correct table numbering and correct spelling of "administrative": Shown in Table 5-1 are the individual design features and their safety function that require coverage in the MCU Segments TSR. Table 5-2 shows the specific administrative control features and their safety function that requires coverage in the TSR. Table 5-3 shows the programmatic administrative control features and their safety function that requires coverage in the TSR. The details of these controls are discussed in Section 5.5.	Agree. Recommended changes incorporated.
49.	Chapter 6; Page 6-1	Suggest inserting the phrase *when an ISMS is implemented* into sentence beginning, "The Site Contractor ..." The Site Contractor is committed to using an integrated process to perform work safely when an ISMS is implemented at the Site.	Agree. Recommended changes incorporated.
50.	Chapter 6; Global change	Use consistent referencing, i.e., similar to first five chapters. For example, reference 1 would be (DOE, 1997b) and the DEAR clause reference (2) would be (DOE, 1997a).	Referencing style made consistent throughout.
51.	Chapter 6; Page 6-2 First paragraph	First time use – spell out acronym for CCP.	Term is first used in Chapter 1

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
52.	Chapter 6; Page 6-4	It'spolicy requires work be performed in a manner that protects the health and safety of employees and the public, preserves the quality of the environment, and prevents property damage. This policy is implemented through use of engineering and administrative controls and personal protective equipment (PPE). Use "Its", or better yet, revise the sentence to "The Hazardous Material Protection Program requires work . . ."	Agree. Recommended changes incorporated.
53.	Chapter 6; Page 6-6	Change 4th paragraph in section 6.6 "It's goal is to achieve a workplace free" to "Its goal is to achieve a ..."	Alternate wording used.
54.	Chapter 6; Page 6-7	Paragraph under 6.7: "QAPjP" change to QAPP?	QAPjP is the proper acronym
55.	Chapter 6; Page 6-7	Last sentence under 6.7 Procedures and Training - Correct "this" to "Use of AK" or another equivalent	Agree. Recommended changes incorporated.
56.	Chapter 6; Page 6-8	2nd paragraph under 6.7.2 Training: A "Training Implementation Matrix for the Hazardous Waste Management Personnel" 2001) describes the selection, qualification, and training requirements for *Site Contractor* personnel involved in the operation, maintenance, and technical support of the TRU characterization activities. This reference is incomplete and not included in Section 6.13	Sentence clarified to remove reference
57.	Chapter 6; Page 6-10	Correct first sentence in second paragraph under Section 6.11: 'Except of one, the TRU Characterization Units . . ." to "With the exception of one of the modular units," or something similar.	Agree. Recommended changes incorporated.
58.	Chapter 6; Page 6-11	Section 6.12: Suggest using "shall meet" instead of "meets" This program meetsthe requirements of the DOE Integrated Safety Management System that consists of seven general principles and five functions that form the basis for how work is to be performed by DOE contractors, such as the *Site Contractor* and the CCP. Roles, responsibilities and reporting relationships are specified in the SOW and Interface Document.	Agree. Recommended changes incorporated.
59.	Chapter 6; Page 6-11 or 6-12	Suggest rewording to: "Appropriate ES&H staff shall have independent safety review, audit, and compliance oversight.'	Agree. Recommended changes incorporated.

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No.	Chapter/ Page. No./Paragraph	COMMENT	RESPONSE
60.	Appendix C; Page C-1	The following guidelines can be used to help in this review: The two bounding events associated with the hazard analysis relate to a fire that impacts a staged drum (WH-6) and a glovebox fire (VE-5). These events were considered to result in "moderate" onsite consequences. The MAR assumed in these events could be doubled and still be within the "moderate" level consequence range (i.e., ST of 1.12 PE Ci still results in consequences less than 100 rem onsite). Therefore, it is conservatively assumed that a MAR of 100 PE-Ci can be accommodated with no change in selection or classification of controls. However, it is also recommended that site boundary distances to the nearest point of public access be maintained greater than 200 meters in order to provide additional buffer from accident consequences. The paragraph is more of an example rather than a set of guidelines. Also, the example ends with the recommendation to maintain a boundary at minimum of 200m if required. This statement first appeared in Section 1.5, but wasn't supported then and is not supported now. A reference would be valuable to check this statement.	The mzximum drum inventory of 100 PE-Ci and 200 meters as the minimum distance to the nearest site boundary are parameters assumed in the accident analysis. These are minimum licensing conditions that must be satisfied and are identified in the Application Guide as such.

	Date:		
Reviewer Signature:			Response By:

Table 3-6 Representative Release Scenarios from the PrHA (Table B-2)

Activity/Function/Hazard		ID No.	Unmitigated		
			Frequency	Worker Consequence	Worker Risk
3.3.2.3.1	Waste Handling and Staging	WH-2; WH-3	Anticipated	Low	III
		WH-6	Unlikely	Moderate	II
3.3.2.3.2	Common Operational Hazards	CH-1	Anticipated	Low	III
		CH-2	Unlikely	Low to Moderate	II
		CH-3	BEU	High	III
3.3.2.3.6	MOVER	VE-1	BEU	Moderate	IV
		VE-5	Anticipated	Moderate	I
3.3.2.3.7	TRUPACT-II Loading	L-1	Unlikely	Low	III
3.3.2.3.8	External Events	EE-3	EU	High	II
3.3.2.3.9	NPH	NPH-1 NPH-2 NPH-3	U	Low	III
		NPH-4	EU	Low	IV
		NPH-6	EU	Low	IV
		NPH-7	A	Low	III

Attachment 2: Response to DNSFB Concerns Identified in Staff Issue Report, dated March 25, 2004

DNFSB Concerns	EM Response	Planned Upgrades to BIO/TSR
DNFSB Bullet #1 (*General Deficiencies*): Section 5 of the TSR, "Administrative Control" does not include the container inspection program as credited in the HA. This is needed to ensure appropriate inspection and maintenance of unvented containers.	Section 5.6.5, *Initial Testing, In-Service Inspection and Test, Configuration Management, and Maintenance Program*, states that the "Container Inspection Program provides visual surveillance and inspection of drums to identify signs of pressurization or degradation that could challenge drum integrity." These controls are presented in the TSR derivation of the BIO Table 5-3 and in Table 3-6, Safety Significant SSCS and TSR Administrative Controls. This control is also included in the TSR as a design feature as presented in Section 6.1, "Approved TRU Waste Drums" Further improvements will be made to the BIO and TSR to more explicitly describe the container inspection program and any actions to be taken when degraded containers are found.	1. The "Container Inspection Program" will be presented as an independent program in Section 5.6. 2. A credited element of this program will require segregation of containers found to be damaged or pressurized and movement to the MOVER or DVS for correction. 3. The BIO will be updated to be consistent with the modified TSR controls
DNFSB Bullet #2 *(General Deficiencies):* The BIO calculates the unmitigated consequence of a fire involving TRU waste in the MOVER glovebox to be about 15 rem to the public, yet no SC SSC is established.	The site boundary distance will be increased to reduce the accident consequences. Initial scoping calculations indicate that a site boundary of 400 meters will reduce the consequences below 5 rem. Options will also be presented in the Application Guide to allow shorter site boundary distances for cases where MAR at a particular site is expected to be below that assumed in the analysis. In spite of these planned changes, it should be noted that a conservative approach was used to model the glovebox fire without refinement. This includes use of an ARF of 1×10^{-2} (unconfined combustible material) which is applied to the maximum glovebox inventory of 100 PE-Ci (damage ratio and leak path factor set to unity). Additionally, accident analysis and controls selected are considered based on the 95th percentile sector-independent atmospheric dispersion results at the worst case DOE site sampled (i.e., NTS). Sector-specific meteorology, using the most conservative DOE site data, results in dose consequences that are lower by a factor of three.	1. Assumptions in the accident analysis will be revised to assure that the predicted dose consequences from unmitigated accident scenarios do not challenge the evaluation guideline. This will strengthen the conclusion that SC SSCs are not necessary. 2. The Application Guide will be changed to require additional site boundary distance to be applied to MOVER unit. A procedure will be added in the Application Guide to allow shorter site boundary distance if MAR is less than 80 PE Ci (see later comment response on changes to MAR). A sliding scale will be provided for MAR vs. distance to assure that predicted dose consequences at the site boundary do not challenge the evaluation guideline. 3. Section 3.4 will be updated with new accident analysis information.
DNFSB Bullet #3 (*General*	Assistant Secretary Jessie Roberson approved the BIO based on the	The Application Guide will be clarified to

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Deficiencies): EM did not prepare a Safety Evaluation Report for the approval of the BIO.	results of the independent review and her confidence in a multi-site BIO development team with expertise in TRU waste operations and safety basis development. A "traditional" Safety Evaluation Report was not deemed necessary given these circumstances and the fact that DOE actually prepared the BIO.	indicate that an SER will be required by the host site in those cases where deviations are taken to the BIO and TSRs.
DNFSB Bullet #4 (*General Deficiencies*): The dose consequence calculations provided in the BIO do not appear to be supported by a well-documented analysis that is referenced and available for review by the DNFSB staff.	A supporting calculation package, *Dose Consequence Analysis for MCU BIO*, was prepared in September 2003 and was independently reviewed. A copy of the calculation package has been provided to DNFSB staffers.	The BIO will be updated to show the referenced calculation package.
DNFSB Bullet #5 (*Deficiencies in the Hydrogen Deflagration Analysis*): The DNFSB believes it would be prudent to include engineered controls for unvented drums.	The original scope of the BIO was focused on MCU operations and did not include drum transport and handling from existing storage locations. As an additional measure of conservatism, the team agrees that use of drum restraints during handling of certain unvented drums is a good practice and has been recommended by the EM approval authority at Area 5 of the Nevada Test Site. A copy of EM correspondence on this matter has been provided to DNFSB staff. While the radioactivity level that exists in unvented TRU waste drums at many DOE sites is so low that it does not warrant TSR designation of this type of control, the generic BIO can apply to TRU waste operations with activity levels that are relatively higher (up to 80 PE Ci). Therefore, the BIO will be revised to reflect a TSR control for physical drum restraints during certain unvented drum movement and vent installation activities.	1. An additional specific AC will be added to Section 5.5.3 of the TSR that requires unvented drums that are not overpacked to utilize a drum lid restraint during transportation and handling activities 2. The BIO will be updated to be consistent with TSR modifications
DNFSB Bullet #6 (*Deficiencies in the Hydrogen Deflagration Analysis*): The deflagration event uses 80 PE-Ci in the consequence analysis, which is below the 100 PE-Ci material inventory limit. This results in 20% lower	Initial calculations were done using 80 PE Ci as the inventory limit. Through development and review, the limit was increased to 100 PE Ci to address out of compliance containers that may exist in the population that must be repackaged. Subsequent to the issuance of the BIO, EM has gained better information regarding likely MAR values at potential user sites. These values are well below those assumed in the BIO. Therefore, the BIO will be	1. Update BIO Chapter 3 information to reflect single container MAR value of 80 PE Ci. 2. Update Application Guide to be consistent with new values in the BIO.

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consequence values.	revised using a single container value of 80 PE Ci throughout the document to be consistent with the WIPP Waste Acceptance Criteria.	
DNFSB Bullet #7 (*Deficiencies in the Hydrogen Deflagration Analysis*): The DNFSB believes the use of a lump-sum mass model is non-conservative and does not take into account the varying porosity of the combustible materials.	Subsequent to the issuance of BIO, a detailed evaluation of INEEL drum pressurization tests was performed by Flour Hanford (see HNF-194192). Calculations show that waste in the worst-case drum (20 percent hydrogen, 50 percent full) could, but would not likely, ignite and burn. Because of the uncertainties, and to be conservative, it was assumed that ignition takes place. A composite release fraction was developed based on a 5% ejection and subsequent ignition of drum contents. Given this new information, the BIO will be updated to reflect the more conservative Hanford calculations. However, it should be noted that consequences are not appreciably affected.	Update BIO Chapter 3 accident analysis and associated source term calculations for drum deflagration accident, consistent with Hanford calculations
DNFSB Bullet#8 (*Deficiencies in the Hydrogen Deflagration Analysis):* The BIO uses an incorrect radiolytic hydrogen generation rate (G value).	The assumed G value is conservative for the medium in which the radiolytic decomposition reaction is postulated, e.g., solid TRU waste. However, the assumed value is immaterial to the analysis, given that the deflagration is postulated and evaluated assuming presence of a flammable concentration of hydrogen in air. The rate of hydrogen generation has no effect on the unmitigated consequences.	The discussion related to the duration for reaching lower flammability limit of hydrogen (Section 3.4.2.3.1) will be removed.
DNFSB Comment on Operational Readiness: The DNFSB believes the use of a Readiness Assessment may not ensure safety.	The Application Guide for the Mobile Waste Characterization Unit Basis for Interim Operation states: "Per DOE Order 425.1C, a Readiness Review is required prior to startup of a new facility. This readiness review may be graded based on the complexity of the operation, personnel experience, and the similarity of the activity to activities currently performed by the site." For systems that have not been previously reviewed, an ORR may be appropriate. The Application Guide will be clarified to ensure this is understood.	The Application Guide will be revised to emphasize that an ORR is the appropriate level of review for those systems that have not been previously reviewed. Clarification will also be added to the Application Guide's readiness checklists to emphasize a check that MCU equipment is operable and in the same configuration as described in the BIO. It will also convey the use of equipment setup and pre-operational readiness procedures.