Mr. Robert H. Neill, Director
Environmental Evaluation Group
7007 Wyoming, N.E., Suite F-2
Albuquerque, NM 87109

Dear Mr. Neill:

The Department of Energy (DOE) is continuing its review of the Environmental Evaluation Group (EEG) report, "An Evaluation of Air Effluent and Workplace Radioactivity Monitoring at the Waste Isolation Pilot Plant," EEG-52. The DOE believes that several of the issues presented in EEG-52 require further explanation of the WIPP air monitoring program and the technical and/or regulatory requirements for that program. This letter addresses our general concerns and therefore does not specifically respond to all of the technical issues in your report. These technical issues will be addressed in a future response.

The stated objective of EEG-52 "is to determine if the Waste Isolation Pilot Plant (WIPP) has adequate means to preclude radioactive releases to the environment and to prevent unnecessary exposure of site workers and the public." The report then proceeds to scrutinize the continuous air monitoring (CAM) systems which are key components to satisfying both aspects of this objective. While the report has selected the CAMs for special scrutiny, it is important to understand that the WIPP CAMs are only one part of the overall radiological control system.

Many of the issues raised in EEG-52 regarding the performance and technical reliability of the WIPP air monitoring system are based on old data collected prior to the incorporation of several recent system improvements. Two examples of these are the corrosion resistant gold detector and the new CAM detector/filter assembly holder. These modifications have improved the performance of the WIPP air monitoring system; however, this information may not have been available to the EEG during the development of EEG-52.

In addition to the EEG reviewing the CAM system, the WIPP had an independent expert panel of nationally recognized air monitoring experts review the system for operability. Several oversight organizations, including the DOE Advisory Committee on Nuclear Facility Safety, the Defense Nuclear Facility Safety Board, the DOE Office of Nuclear Safety, and the DOE-Albuquerque Health Protection Division, have also reviewed the status and operability of the CAM system at
WIPP. These groups have concluded that the CAMs are capable of fulfilling their intended role within the required standards.

Many of the issues raised by EEG-52 result from differing interpretations of the Waste Isolation Pilot Plant (WIPP) Final Safety Analysis Report (FSAR), applicable federal regulations, and DOE Orders. As you are aware, many of the more contentious issues surrounding EEG's interpretation of DOE policy and guidance have been the subject of considerable discussion and debate for a number of years. Reviews of EEG-52 by the DOE Office of Environment, Safety, and Health, the DOE Office of Environmental Restoration and Waste Management, the DOE-Albuquerque Environmental Programs, Safety Programs, and Health Protection Divisions, this office and the DOE site office, as well as the Westinghouse Waste Isolation Division, are in agreement that your report has misinterpreted portions of the WIPP FSAR, applicable federal regulations, and DOE orders as they apply to air effluent and workplace monitoring at the WIPP.

Responses to the major issues presented in EEG-52 are enclosed. The DOE's summary responses are divided into five topical categories, for which it is important to document the WIPP's positions and to correct the conclusions presented in EEG-52. The five topical categories are:

1. Statement of General Function of the WIPP Radiological Control Program
2. WIPP FSAR Interpretation/Applicability
3. Federal Regulations and DOE Orders Interpretation/Applicability
4. DOE 6430.1A Interpretation/Applicability
5. Air Monitoring System Performance and Technical Issues

Because of the voluminous amount of detailed technical information not addressed in the summary response, we believe an approach to consensus would be to work directly with the EEG staff toward resolution of the more technical aspects of the report. The DOE proposes to conduct several meetings with the EEG to discuss these outstanding technical issues and to share any newly generated information which will be useful to the EEG in evaluating the WIPP air monitoring system. We believe that meetings are the appropriate vehicle for addressing with the EEG, the numerous detailed technical issues raised in EEG-52.

The DOE is currently developing responses to the "Findings and Discussion" (pages 121-132), Section 8 of EEG-52. The completed response will be provided to the EEG in September 1993.
As discussed in our attached comments, the DOE believes that the current monitoring program adequately protects the workers, public, and the environment at WIPP.

If you have any questions regarding this matter, please contact Jerry Reese of the WIPP Project Site Office at (505) 887-8112.

Sincerely,

W. John Arthur, III
Project Director
WIPP Project Integration Office

2 Enclosures:
Responses to EEG Report 52
WIPP Position Paper

cc:
See Page 4
Mr. Robert H. Neill

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I. STATEMENT OF GENERAL FUNCTION OF THE WIPP RADIOLOGICAL CONTROL PROGRAM

The stated objective of EEG-52 was to determine if the Waste Isolation Pilot Plant (WIPP) has "adequate means to preclude radioactive releases to the environment and to prevent unnecessary exposure of site workers and the public." However, the document primarily concentrates on the operation and performance of one radiological system—the Continuous Air Monitors (CAMs). While Dr. Bartlett has selected the CAMs for special scrutiny, it is important to understand that the WIPP CAMs are only one part of a comprehensive radiological control program. It is this program, taken in its entirety, which is designed to provide adequate means to preclude radioactive releases to the environment and to prevent unnecessary exposure of site workers and the public.

Listed below are some of the salient features of the WIPP's radiological control program. These engineered designs, administrative controls, and processes are in place at the WIPP as primary mitigative measure to provide reasonable assurance that the potential for release of radioactive material is minimized. They demonstrate that the WIPP has been designed and will be operated as a "Start Clean - Stay Clean" facility.

- Prior to packaging and shipping to the WIPP, all transuranic waste is characterized as to form and content per the requirements of the Waste Acceptance Criteria (WAC) for the WIPP (DOE/WIPP-069).
- Prior to shipment to the WIPP, surface contamination surveys are performed on all exterior surfaces of waste containers and must meet WAC limits.
- Prior to shipment and upon arrival at the WIPP, surface contamination and radiation surveys are performed on all TRUPACT-II shipping containers. The results of these surveys must meet DOT limits.
- Upon receipt at the WIPP, surface contamination surveys are performed on all exterior surfaces of waste containers, and results must not exceed the levels listed in the DOE Radiological Control Manual, Table 2-2.
- Engineered controls implemented at the WIPP include: 1) NRC Type B (TRUPACT-II) and Type A (bins/drum) waste containers used for transport, handling, and testing of transuranic waste; 2) continuous, double HEPA-filtration of the exhaust air from the Waste Handling Building; 3) double HEPA-filtration of the exhaust air from the Overpack and Repair Room's enclosure whenever overpacking and repair operations on waste containers (an off-normal event) are being performed; 4) the TRUPACT-II venthood used for normal unloading of the waste containers.
from the TRUPACT II; and 5) the standard waste box (SWB) venthood used for normal loading of an SWB into double confinement in preparation for bin testing.

- All Waste Handlers and Health Physics Technicians (HPTs) are highly trained to performance-based standards. This process includes classroom training, qualification cards, and final oral certification boards. In addition, all radiation workers are trained using the DOE standardized core training materials.

- All waste handling operations and health physics operations and activities are conducted using approved and controlled procedures. The operations and activities using these procedures have been independently verified by the DOE/HQ-EM, the DOE WIPP Project Site Office (WPSO), the EEG during the July 1991 Operational Readiness Review, and other site assessment teams, such as the DOE Office of Nuclear Safety and Environmental Oversight Committee.

- Frequent removable surface contamination surveys are conducted to levels listed in the DOE Radiological Control Manual, Table 2-2. These surveys are performed on waste containers upon receipt, during unloading operations, handling operations, testing operations, routinely as area surveys, and as matter of good health physics practice.

- All personnel leaving the area where a waste container is being handled, loaded, tested, etc. are surveyed for personal contamination using hand-held instruments or fixed hand and foot monitors to levels listed in the DOE Radiological Control Manual, Article 221.

- The WIPP operating procedures require all real or suspected waste handling accidents to be immediately reported to the Central Monitoring Room (CMR). The CMR then immediately implements the WIPP Emergency Plan and Procedures (WP 12-9). These procedures detail the actions needed to evacuate all affected personnel in a timely manner and then quantify, mitigate, and recover from the effects of a possible contamination or airborne radioactivity event. At least once per year, the WIPP's ability to correctly respond to a site-wide emergency is exercised and assessed through the successful completion of a site-wide drill.

The air monitoring program at the WIPP complements these engineered designs and administrative controls. Any airborne radioactivity not mitigated by the systems and processes described above would be collected on both CAM and fixed air sampler (FAS) filters located throughout all areas where radioactive waste will be handled or stored and at all air effluent points. The function of the CAMs and FASs is to provide both real-time warning of elevated levels of airborne radionuclides, and retrospective sampling for documenting low-level releases.
II. WIPP FSAR INTERPRETATION/APPLICABILITY

EEG-52 states in the Executive Summary that:

"The WIPP Final Safety Analysis Report (FSAR) requires that the WIPP radiological facilities always have multiple confinement barriers to prevent the accidental release of radioactive material to the environment. The Waste Handling Building has standard confinement barriers that satisfy the regulatory requirements, but the underground confinement barriers include a more complex system for filtering air in the event of an accidental release."

The EEG derives the above conclusion from Chapter 3 of the FSAR and specifically from section 3.3.1.1. However, plain reading of this section within context shows that the section is describing, in general terms, the types of confinement systems for the total WIPP facility, without differentiation into surface and underground areas. Subsection 3.3.1.2.1 notes that the metal drums are a primary confinement barrier, while subsection 3.3.1.2.2 describes several types of secondary barriers including "shielded casks, the TRUPACT II shipping container, rooms and building walls. These barriers are designed to serve as impervious barriers in the event of a breach of the primary confinement. They also include the natural barrier formed by the salt in the underground storage areas and underground bulkheads, which separate the storage and mining areas." The above descriptions obviously refer to several confinement systems, (primary, secondary, surface, underground, physical and dynamic) as described and identified specifically in section 3.3.1.1. However, at no point in this generalized discussion of "confinement approach" is any requirement mandated regarding specific barriers.

Subsection 3.3.1.2.2 acknowledges that "The HEPA filtration system may be considered a secondary confinement barrier." However, no requirement for this is stated or implied. The word "may" is operative and it suggests that there are operating modes at the WIPP for which the HEPA filtration system is not considered a secondary confinement barrier. Further, this in no way justifies the second conclusion drawn in the paragraph quoted from EEG-52 regarding the requirement that "the underground confinement barriers include a more complex system for filtering the air in the event of an accidental release." Also, the EEG incorrectly contends that "CAMs at the Station A underground air exhaust point are an essential part of the underground repository secondary confinement barrier."

Clearly, the EEG's conclusion that the WIPP underground confinement barriers always include the underground HEPA filtration system and that the Station A CAMs are part of a secondary confinement barrier are not supported by the principal design chapter of the WIPP FSAR. Nor does the FSAR support the EEG-52 conclusion that "the WIPP design requires that multiple confinement barriers always be between the radioactive waste and the outside environment." The FSAR states that "The WIPP facility is designed to DOE Order 6430, General Design Criteria Manual for Department of Energy Facilities, draft, dated June 10, 1981." DOE Order 6430 does not require multiple confinement barriers for radioactive materials.

Although not a safety class system, the effluent monitoring CAMs provide an additional defense against the release of radioactive material. The operation of the CAMs is not essential to protect the health and safety of personnel or the public.
the effluent monitoring system CAMs do function as designed, then additional but not essential mitigation occurs.

The EEG suggests the DOE not make unrelated responses with reference to accident analysis and the inclusion or exclusion of the CAM system in Chapter 7. However, it is of utmost importance to recognize the purpose of a FSAR and how the accident analyses conducted based on facility description are the core content of the FSAR. In chapter 7, which documents the accident analyses of postulated WIPP accidents, the underground ventilation filtration system was not assumed to be initiated for any of the underground accident scenarios (FSAR Section 7.3.1). These safety analyses demonstrated that the activation of the underground ventilation filtration system was not required for the WIPP to meet regulatory requirements to protect the health and safety of employees, the public and the environment.

The EEG-52 quote, provided at the beginning of this section, clearly implies that the exhaust filtration system from the underground areas is a required component of "multiple confinement barriers" at the WIPP. More accurately, the underground ventilation system with its bulkheads, differential pressures, and directional air flows provides an additional confinement strategy by controlling the spread of potential contamination from entering occupied areas of the underground separate from the areas in which transuranic waste is present.

To fully understand the manner in which the WIPP ventilation system, both surface and underground, controls the spread of potential contamination and its role in the WIPP waste confinement strategy, the following information is provided.

Section 3.3.1.2.3 of the FSAR designates the WIPP ventilation system as a dynamic confinement barrier and subsequently explains the concept. This section states in part that:

"The ventilation system is designated as a dynamic confinement barrier in the multibarrier confinement system. In the waste handling areas, the ventilation system maintains a static pressure differential between the primary confinement barriers and the environment. Air locks between different design zones of potential contamination separate areas in which critical pressure differentials are maintained to ensure airflow from areas of lower to higher contamination potential."

For the underground areas the ventilation is further described as being:

"divided into three systems with a common air supply (Section 3.3.2.3) and a common exhaust. One system supports the radioactive waste storage operations, the second supports underground mining activities, and the third supports experimental activities. Separation of these air flows is maintained throughout the system until the flows are recombined at the exhaust shaft. A pressure differential is also maintained between the systems, so that any air leakage flows from the mining area to the waste storage areas."

In this manner by performing the above described functions, the dynamic underground ventilation system plays a role in the WIPP confinement strategy and would control the spread of potential contamination.
Moreover, section 3.3.1.2.2 of the WIPP FSAR states that "The HEPA filtration system may be considered a secondary confinement barrier." and section 3.3.2.3.1 of the WIPP FSAR states that "The subsurface ventilation system serves all underground facilities and provides confinement of radioactivity, viable working conditions, and a life-sustaining environment during foreseeable operational occurrences and postulated waste handling accidents."

During "foreseeable operational occurrences and postulated waste handling accidents" underground ventilation flow will have been manually placed in filtration. During filtration, the underground HEPA filtration system would be a part of a confinement system.

In summary, the accident analyses considered in Chapter 7 of the WIPP FSAR, the underground ventilation filtration system was not assumed to be initiated (FSAR Section 7.3.1) during any of the postulated underground accident scenarios. Neither the underground ventilation filtration system nor its activation by the CAMs were considered as mitigating the calculated consequences of these accidents. These safety analyses and their associated conservative assumptions demonstrated that the activation of the underground ventilation filtration system was not required for the WIPP to meet regulatory requirements for the protection of the health and safety of employees, the public, and the environment.

The CAMs in the underground Effluent Monitoring System are not required to, and do not perform a confinement function and are present only as an additional mitigative measure in the event of a measurable off-normal event. Additionally, the Effluent Monitoring System and its CAMs may be viewed as an extra step to assure that doses are maintained as low as reasonably achievable (ALARA). These are not essential safety related systems whose failure to operate would significantly affect the health and safety of personnel or the public. (The CAMs are not a "mitigative measure" - they may trigger mitigation.)

In the EEG-52 Executive Summary, the EEG states that:

"the Station A CAM, which monitors the underground exhaust, does not satisfy the requirements of the FSAR. The CAM system is not fail-safe, and operations appear to be affected by high levels of salt aerosol and poor detector performance."

The EEG has misinterpreted the FSAR as to what the FSAR requires of the Station A CAM. The Station A CAM meets all the FSAR requirements as listed in the WIPP FSAR Chapter 10, Operational Safety Requirements.

Section 10.3.1.2, Effluent Monitors, states that:

"Station A, the underground exhaust effluent monitor, alpha CAM and beta/gamma CAM shall be operating."

"The above CAMs shall be capable of detecting and warning of hazardous airborne radioactivity levels."

"All the above CAMs shall have operable remote and local alarms."
"The alarm setpoints shall be specified by the WIPP Radiation Safety Manager."

"Batch type sampling may be used in place of a CAM if immediate communications can be established between the point the sample is taken, the location the sample is counted, and the Central Monitoring Room (CMR)."

"If the remote alarm capability on the above Effluent Monitor CAMs is not operable, an HPT shall continuously monitor the local alarm."

"If either of the Station A CAMs is non-operable, underground waste handling operations shall be suspended."

"If either of the Station A CAMs is non-operable for greater than one hour, underground exhaust airflow shall be diverted through the filtration system or mechanically induced underground ventilation shall be stopped."

"If either of the Station A CAMs is non-operable and the like type of CAM (alpha or beta/gamma) at Station B is also non-operable, mechanically induced underground ventilation shall be stopped."

* Note: A second set of simultaneously operating alpha and beta CAMs have been installed at Station A since the finalization of the FSAR. These additional CAMs decrease the likelihood of initiating these action statements. The operating philosophy of the simultaneously operating Station A CAMs is established and documented at the WIPP. (See Attached Radiation Safety Position Paper.)

The EEG concludes from this that fail-safe reliability of an alpha CAM detector is an FSAR requirement. On the contrary, the FSAR expects that there will be times that electronic systems such as the Station A CAM could be inoperable. WIPP takes reasonable steps to minimize this potential down time by daily checking the operation of the CAMs, providing two simultaneously operated alpha and beta CAMs at Station A, and providing twenty-four hour remote monitoring of the CAMs functions. However, if the CAMs do become inoperable, waste handling operations will be suspended, underground exhaust airflow could be diverted to filtration, underground exhaust airflow could be suspended, or batch-type sampling could be performed.

III. FEDERAL REGULATIONS AND DOE ORDERS INTERPRETATION/APPLICABILITY

In Chapter 4.0 of EEG-52, the EEG has provided summaries of the requirements of DOE Order 5480.11 (Draft 10 CFR 835), 40 CFR 191, Part A, DOE Order 5400.5, and 40 CFR 61, Subpart H. However, the EEG's application on pages 27 and 36 of EEG-52 of the 100 mrem dose limit to members of the public either on-site or off-site for an accidental release is incorrect. Also, the contention in EEG-52 that the CAM "alarm levels criteria are not specifically documented and justified in the FSAR with appropriate references to requirements in 40 CFR Part 61, DOE Order 5480.11, DOE Order 6430.1A, DOE Order 5481.1B, and DOE Order 5400.5." (EEG-52 page 122) is misleading. Specifically, the EEG's statement regarding the application of 40 CFR Part 61 and DOE Orders 5400.5 and 5480.11 to CAM alarm levels suggests that both on-site and off-site dose limits to members of the public, included in the referenced
requirements, are applicable to accidental releases or off-normal conditions. The information presented below clearly demonstrates that the dose limits provided in the above mentioned federal regulations and DOE Orders are not applicable to accidental releases.

EEG-52 states on pages 27 and 36 that the public exposure limits due to accidental releases of radioactivity are defined in DOE Order 5480.11. This is not correct for two reasons:

1. DOE Order 5480.11 is titled "Radiation Protection for Occupational Workers." Although limits to the public are mentioned, they apply only to visitors to the site (per paragraph 9.e), and clearly exposures to the public are not the subject of this Order. DOE Order 5400.5, "Radiation Protection of the Public and the Environment," is the appropriate order regarding dose limits to the public.

2. The only exposure guidelines due to accidental releases of radioactivity contained in DOE Order 5480.11 are included in section 9.p, Guidance and Requirements for Emergency Exposure During Rescue and Recovery Activities." Again, this paragraph does not apply to the public.

The DOE does require, under normal conditions, that any member of the public be limited to 100 millirem (mrem) effective dose equivalent (EDE) in a year from all sources attributable to a DOE Facility.

DOE Order 5480.11, Section 9.e. (Draft 10 CFR 835.208) Radiation Protection Standards for Public Entering a Controlled Area. The effective dose equivalent received by any member of the public resulting from exposure during direct on-site access at a DOE facility shall not exceed a limiting value of 0.1 rem (0.001 sievert) per year from the committed effective dose equivalent...

However this statement cannot be taken out of context. There has to be an understanding of the definition of 'Controlled Area' and the radiological monitoring and access constraints that occur during visits to a controlled area.

DOE Order 5480.11, Section 8.c. (Draft 10 CFR 835.2) Controlled Area. Any area to which access is controlled in order to protect individuals from exposure to radiation and radioactive materials.

During normal conditions, visitors (i.e., members of the public) to a controlled area have their exposure controlled by administrative rules (e.g., dosimetry, both permanent and direct read, control of entry and time in areas where exposure may occur, etc.)

Neither the DOE Order 5480.11 nor Draft 10 CFR 835 exposure limit applies to accident conditions.

DOE Order 5480.11, Section 9.p. (Draft 10 CFR 835.1203) Guidance and Requirements for Emergency Exposure During Rescue and Recovery Activities. This paragraph provides emergency action guidance for determining appropriate actions for the rescue and recovery of persons and the protection of health and property in the event of an emergency.
DOE Order 5480.11 and Draft 10 CFR 835 apply to on-site exposures, while 40 CFR 191 and DOE Order 5400.5 apply to off-site exposures.

In Section 4.4 of EEG-52, permissible public radiation exposure limits due to routine activities and releases are presented as contained in each of these orders and regulations. The position of the DOE on each these was transmitted to the EEG on March 27, 1991 in a letter from Arlen E. Hunt, the WIPP Project Manager, to Robert H. Neill, the Director of the Environmental Evaluation Group. For the sake of clarity and to assure consistency in the discussion of these orders and regulations, the DOE positions stated in the March 27, 1991 letter are reiterated here.

From DOE Order 5400.5, "Radiation Protection of the Public and the Environment," (2/8/90, Change 1, 6/5/90), there are two stated objectives. The first deals with protecting the public and the second deals with protecting the environment. The first states:

"Protecting the Public. It is DOE's objective to operate its facilities and conduct its activities so that radiation exposures to members of the public are maintained within the limits established in this Order and to control radioactive contamination through the management of real and personal property. It is also a DOE objective that potential exposures to members of the public be as far below the limits as is reasonably achievable (ALARA) and that DOE facilities have the capabilities, consistent with the types of operations conducted, to monitor routine and non-routine releases and to assess doses to members of the public."
(DOE Order 5400.5, page 1)

The Order further defines "members of the public" as

"persons who are not occupationally associated with the DOE facility or operations, i.e., persons whose assigned occupational duties do not require them to enter the DOE site." (DOE Order 5400.5, page 10)

The term "public dose" is also defined as

"the dose received by member(s) of the public from exposure to radiation and to radioactive material released by a DOE facility or operation, whether the exposure is within a DOE site boundary or off-site." (DOE Order 5400.4, page 9)

The Order subsequently states the DOE Public Dose Limit and establishes it as

"the exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem (1 mSv)." (DOE Order 5400.5, page II-1)

From the March 27, 1991 letter, the applicability of this DOE Public Dose Limit at the WIPP site is stated as

"this public dose limit does not apply to people who work on the DOE site in question, it does apply to non-employee visitors to the site. ... It should also
be noted that the public dose limit refers only to routine operations and does not include accident or off-normal situations."

Again, per the Order, mandatory reporting requirements are effected if actual or potential exposures of members of the public could result in either an effective dose equivalent from DOE sources exceeding 10 mrem (0.1 mSv) in a year." (DOE Order 5400.5, page II-14)

The Order specifically addresses only the public dose limit for routine DOE operations. This public dose limit does not apply to accident or off-normal situations. This is clearly stated in the Order in Chapter II, Section 1.a.(3)(b)

"Doses Not Included in Evaluations. The public dose limits do not apply to doses from medical exposures, consumer products, and generally do not apply to doses from naturally occurring radiation sources or from exposures due to accident conditions, where controls of exposures cannot be maintained..."

The public dose limit of DOE Order 5400.5 of 100 mrem effective dose equivalent is applicable to all DOE sites. However, as stated in the Order, DOE must also comply with legally applicable requirements.

From DOE Order 5400.5, Chapter II, Section 1,

"PUBLIC DOSE LIMITS. ...DOE must also comply with legally applicable requirements (e.g., 40 CFR Parts 61, 191, and 192 and 10 CFR Parts 60 and 72), including administrative and procedural requirements. Except for those provided in paragraph II.1a(4), administrative and procedural requirements of legally applicable regulations are not addressed in this Order. Such legally applicable regulations must be consulted for provisions not addressed in this Order." (DOE Order 5400.5, page II-1)

Furthermore, DOE Order 5400.5 requires compliance to 40 CFR 191, Environmental Standards for the Management and Storage of Spent Nuclear Fuel, High-Level, and Transuranic Wastes, and states

"the exposure of members of the public to direct radiation or radioactive material released from DOE management and storage activities at a disposal facility for spent nuclear material or for high-level or transuranic radioactive wastes that are not regulated by the NRC shall not cause members of the public to receive, in a year, a dose equivalent greater than 25 mrem (0.25 mSv) to the whole body or a committed dose equivalent greater than 75 mrem (0.75 mSv) to any organ." (DOE Order 5400.5, page II-4)

The Order states for clarity that

"The Waste Isolation Pilot Plant, for purposes of this Order, is considered to be a disposal facility subject to this Order and 40 CFR Part 191. " (DOE Order 5400.5, page II-4)

40 CFR 191.03(b) states that activities at disposal facilities shall be conducted such that
"the combined annual dose equivalent to any member of the public in the general environment resulting from discharges of radioactive material and direct radiation from such management and storage shall not exceed 25 millirems to the whole body and 75 millirems to any critical organ."

The phrase "in the general environment" indicates that the dose limits stated were intended to apply off-site.

From the air-only pathway, DOE Order 5400.5 requires compliance with the Clean Air Act, 40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities." 40 CFR 61, Subpart H sets limits for exposure to the public (i.e., off-site) from air only.

Furthermore, the intent of both 40 CFR Part 191 and 40 CFR Part 61 is that annual dose equivalent standards apply to normal operations and not to accidental releases. However, any exceeding of dose limits during accidental releases are included in yearly dose calculations even though the scope of the referenced federal standards does not cover accidental releases.

The DOE Order in requiring compliance with 40 CFR 61 states

"the exposure of members of the public to radioactive materials released to the atmosphere as a consequence of routine DOE activities shall not cause members of the public to receive in a year, an effective dose equivalent greater than 10 mrem (0.1 mSv)." (DOE Order 5400.5, page II-3)

This limit is applicable as stated to routine DOE activities. However, as stated above, any accidental releases must be included in the calculations for the yearly releases.

Also, since this is the most restrictive dose limit, this limit was used to establish a calculated alarm setpoint for the Station A alpha CAMs. From an operational viewpoint, the WIPP has elected to operate the CAMs at the calculated alarm setpoint; however, compliance with dose limit standards is not maintained by operation of CAMs at the WIPP.

DOE Order 6430.1A, "General Design Criteria," addresses the design criteria as it relates to exposures to the public under accident conditions. This order states in Section 0200-1.3, Radiological Siting Guidelines, that

"The following siting guidelines apply to off-site individuals receiving maximum dose from exposure to internally-deposited radioactive materials and/or to radiation from external sources. Guidelines are based on a 50-year committed dose equivalent.

The maximum calculated dose shall not exceed 25 rem to the whole body, 300 rem to the thyroid, 300 rem to the bone surface, 75 rem to the lung, or 150 rem to any other organ." (DOE Order 6430.1A, page 2-3)

The Order goes on to state that
"The use of doses as set forth in these guides is not intended to imply that these doses constitute acceptable limits for emergency doses to the public under accident conditions. Rather, these are reference values that can be used in the evaluation of facility design in combination with the suitability of the site with respect to accidents having a low probability of occurrence and low risk of public exposure to radiation." (DOE Order 6430.1A, page 2-3)

The combination of these calculated doses and associated probabilities have been determined to be acceptable levels of risk in the design and siting of DOE facilities. These calculated doses, included in the design and siting criteria for DOE facilities, are equivalent to those proposed for commercial nuclear reactors by the Nuclear Regulatory Commission (NRC) and are found in 10 CFR Part 100. Clearly, the calculated doses applied to accidental releases by both the DOE and the NRC are much higher than the dose limits established for normal operations.

IV. APPLICATION OF DOE Order 6430.1A

The EEG reiterates in EEG-52 the same arguments addressed previously in regard to the DOE Order applicability governing the CAMs. This portion of EEG-52 presents an incorrect interpretation of the applicable DOE Order. The DOE continues to concur with the Hunt to Neill memorandum of March 27, 1991 that identifies the DOE 6430 draft version of June 10, 1981 as applicable to the design of the WIPP facility. This is confirmed by the review and subsequent approval of the WIPP FSAR in June 12, 1990 by DOE EM-1. The approval was partially based on an independent review which culminated in a Safety Evaluation Review (SER) dated July 1989. The SER and the Supplement of the SER, dated January 1990, which documented the closure of 23 open items from the original SER, concluded that the FSAR is complete and adequate in meeting the requirements of DOE Order 5481.IB. Thus, the DOE-EM approval of the FSAR affirms the utilization of draft DOE 6430 as the appropriate design criteria for WIPP.

The use of DOE Order 6430.1A to evaluate the entire WIPP facility as it stands today is inappropriate since the version in effect at the time of construction was DOE Order 6430.1. DOE Order 6430.1A states, "For existing facilities, original design criteria apply to the structure in general; however, additions or modifications shall comply with this Order (6430.1A) and the associated latest editions of the references herein."

Therefore, the EEG's assertion that the Station A CAMs should be safety class equipment is not valid. This matter is subsumed by the issue concerning the use of DOE Order 6430.1A. Version 6430.1 did not provide for safety class equipment. Only 6430.1A provides for safety class equipment and is not applicable as stated above. In addition, with the DOE defense-in-depth safety philosophy, safety is maintained by means of a hierarchical (generally three levels) structure of active and passive systems. Defense-in-depth is briefly addressed in DOE Order 5480.23, Attachment I, page 34. The highest and ultimate level of defense is the safety class items and systems. The safety class systems are necessary to mitigate the consequences of the postulated design basis accidents to an acceptable level; however, these are not required at the WIPP based on safety analysis in the FSAR. The next lower level defense are the nonsafety class monitoring systems. Both of these systems include Technical Safety Requirements (Limiting Conditions of
Operation and Limiting Safety System Setpoint). The lowest and first level of defense are the normal operating and control systems.

The WIPP effluent monitoring system, including its CAMs, is neither a process system nor a safety class system. It is a nonsafety class monitoring system whose operation is not essential to protect the health and safety of personnel or the public as documented in the WIPP FSAR. If it does function as designed, then additional but not essential mitigation occurs.

The EEG's concern for the lack of safety limits for the effluent monitoring system is not warranted. Safety limits apply to process variables to protect the integrity of physical barriers. There are no process variables that can be used to protect the integrity of any physical barriers involved with the effluent monitoring system. The effluent monitoring system itself does not constitute a physical barrier, nor is it involved with protecting the integrity of a physical barrier. See DOE Order 5480.22, Technical Safety Requirements for additional discussion of safety limits.

The WIPP Final Safety Analysis Report (FSAR) assumed that both the effluent monitoring system and the effluent filtration system did not function during accidents involving release of radioactive materials. The FSAR demonstrates that the dose estimates from normal operations and from postulated credible accidents are below all applicable DOE guidelines. This further indicates that the Station A CAMs should not be considered safety class equipment and do not require safety limits.

A review of the accident analyses for the WIPP indicates that the system in question is not an engineered safety feature essential to the mitigation of a postulated design basis accident nor for other abnormal events.

Even if the 6430.1A design criteria were incorrectly applied to WIPP, the Station A CAMs are not safety class systems. The following addresses each of the DOE Order 6430.1A, Section 1300-3.2:

"Safety class items are systems, components, and structures, including portions of process systems, whose failure could adversely affect the environment or the safety and health of the public. Specifically, safety class items are those systems, components, and structures with the following characteristics:

- Those whose failure would produce exposure consequences that would exceed the guidelines in Section 1300-1.4, Guidance on Limiting Exposure of the Public, at the site boundary or the nearest point of public access
- Those required to maintain operating parameters within the safety limits specified in the OSRs during normal and anticipated operational occurrences
- Those required for nuclear criticality safety
- Those required to monitor the release of radioactive materials to the environment during and after a DBA
- Those required to achieve and maintain the facility in a safe shutdown condition
- Those that control the safety class items described above"
- "Those whose failure would produce exposure consequences that would exceed the guidelines in Section 1300-1.4, Guidance on Limiting Exposure of the Public, at the site boundary or the nearest point of public access"

The failure of the Station A CAMs would not produce an exposure consequence that exceeds the guidelines in DOE Order 6430.1A, Section 1300-1.4. The Station A CAMs can not provide a barrier against the release of radioactive materials. The filters that are triggered by the Station A CAMs exist only to maintain the releases at a level that is as low as reasonably achievable (ALARA). The filters are not required to maintain doses to the public below established guidelines.

In terms of dose to the public at the site boundary, the worst case accident scenario in the WIPP FSAR results in an exposure at the site boundary of 1.7 REM CEDE. The guidelines in DOE Order 6430.1A allow for a maximum site boundary dose as allowed in the DOE 5400 series orders. The 100 mrem figure quoted by the EEG is the DOE Order 5400.5 limit for on site exposure to the public from routine operations and clearly does not apply to accident conditions. DOE Order 5400.5 states that exposures to the public from accident conditions will be maintained ALARA. While the DOE Order 5400 series does not specifically establish a fixed number for exposure to the public at the site boundary during accidents, a number can be derived from standards referenced in the Order. DOE Order 6430.1A, Section 0200-13, provides radiological guidelines for consideration when siting nonreactor nuclear facilities. These guidelines provide that for credible accidents the "maximum calculated dose shall not exceed 25 rem to the whole body . . ."

On the basis of normal operations at the WIPP and the applicable limit on exposure to the public at the site boundary during accident conditions, this criterion is satisfied. It would also be satisfied for accident conditions using the above mentioned guidance.

"Those required to maintain operating parameters within the safety limits specified in the OSRs during normal and anticipated operational occurrences"

Since there are no safety limits established for the WIPP in either the FSAR or the Test Phase Addendum, this criterion is satisfied.

"Those required for nuclear criticality safety"

Nuclear criticality at the WIPP has been demonstrated to be an incredible event. Therefore, no systems are required to ensure nuclear criticality safety and this criterion is satisfied.

"Those required to monitor the release of radioactive materials to the environment during and after a DBA"
The Station A CAMs are not an environmental monitoring system at the WIPP. The Station A CAMs are in place as a trigger for a system that provides an ALARA function. The primary environmental monitoring system at the WIPP is the fixed filter air sampler which is duplicated by the EEG sample.

"Those required to achieve and maintain the facility in a safe shutdown condition"

The Station A CAMs are not required to achieve and maintain a safe shutdown condition at the WIPP. A safe shutdown at the WIPP is achieved by response to emergency situations in accordance with established WIPP procedures. This criterion is satisfied on the basis that the Station A CAMs are not in place to monitor environmental releases.

"Those that control the safety class items described above"

There are no systems at WIPP that are affected by this criterion as there are no safety class systems at the WIPP. Thus the CAMs are not "safety class systems" even if the criteria of DOE Order 6430.1A inappropriately applied to the WIPP.

V. AIR MONITORING SYSTEM PERFORMANCE/TECHNICAL ISSUES

Many of the issues raised in EEG-52 regarding the performance and technical reliability of the WIPP air monitoring system are based on data collected prior to the incorporation of several recent system improvements. Two examples of these are the corrosion resistant gold detector and the new CAM detector/filter assembly holder. These modifications have improved the performance of the WIPP air monitoring system; however, this information may not have been available to the EEG during the development of EEG-52. Other technical issues raised in EEG-52 need to be examined more closely and subsequently discussed with the EEG. The DOE proposes to conduct several meetings with the EEG to discuss these outstanding technical issues and to share any newly generated information which will be useful to the EEG in evaluating the WIPP air monitoring system. We believe that meetings are the appropriate vehicle for addressing, with the EEG, the numerous detailed technical issues raised in EEG-52.

Also, as stated in the cover letter, the DOE is developing responses to the "Findings and Discussion" (pages 121-132) of EEG-52 in addition to the attached summary response and to the proposed meetings. The completed responses are expected to be available to the EEG in September 1993.

Several of the EEG's technical concerns are addressed below:

As to the EEG comment that "operations appear to be affected by high levels of salt aerosol and poor detector performance", at the WIPP site, the effects of salt on CAM performance are well documented, well understood, and appropriate modifications can be made to correct for these effects. Salt can potentially have three effects on CAM operation: Detector corrosion, degradation of plutonium spectrum, and degradation of radon spectrum.
As indicated on page 77 of EEG-52, the Station A Alpha CAM detector’s performance has been occasionally affected by the combination of salt and humidity. However, the EEG is also aware (again see page 77 of the EEG-52 report) that the original detector was recently replaced with a detector that is not susceptible to salt/moisture corrosion as were the older units.

A comprehensive experimental program has been, and is currently, underway at the Inhalation Toxicology Research Institute (ITRI) to document, and in some cases improve, CAM response to low concentrations of plutonium in the presence of salt dust and radon progeny. The ITRI Phase I report (December 1988) demonstrated the basic performance characteristics of the Eberline Alpha 6 CAM, and determined that it was a suitable technology for use at WIPP. The fundamental influence of salt burial on the detection of plutonium was quantified. The ITRI Phase II report (January 1990) addressed several technical issues of detector and filter configuration, and defined the operational limitations for CAM performance in the presence of salt. The ITRI report on Low Level Releases of Plutonium (June 1991) confirmed the ability of the CAM to meet the 8-DAC-h sensitivity requirement in the presence of ambient radon progeny, and demonstrated a timely response to acute releases. That body of work provided the technical basis for continued use of the Eberline Alpha 6 at WIPP. Work then turned to experimentally verifying some of the nuances of actual CAM performance in the presence of low levels of plutonium, plus relevant concentration of salt dust and radon progeny. A Phase III summary report is under preparation. Some of the results to date have been documented in the ITRI Annual Report LMF-138, dated December 1992.

The influence on plutonium spectrum from salt deposition on the CAM filters (i.e. CAM response to plutonium) is well understood as a result of studies performed by the Inhalation Toxicology Research Institute (ITRI) and presented in reports titled Evaluation of the Eberline Alpha-6 Continuous Air Monitor for use in the Waste Isolation Pilot Plant - Report for Phase II, dated January 31, 1990, and Response of the Eberline Alpha 6 to Low Level Releases of Plutonium in the Presence of Salt Dust, dated February 3, 1993. This later report builds on conclusions made by the Phase II report by stating:

"In the work reported here, we demonstrated that the Alpha-6 provides a predictable alarm response to slow releases of Plutonium in the presence of salt dust.... Interference from dust is not a concern for detection of sudden, large releases of Plutonium because an alarm condition will occur before burial becomes significant."

The influence on the radon spectrum from salt deposition on the CAM’s filter is also extremely well understood. This is evident in the ITRI report titled: Evaluation of the Eberline Alpha-6 Continuous Air Monitor for use in the Waste Isolation Pilot Plant - Report for Phase I, dated December 21, 1988. This report states:

"...the extent of salt loading has a relative minor influence on the shape of the (radon) spectra."

This report presents graphs showing the relatively minor changes in the radon spectrum in salt levels varying from 0.19 to 5.17 mg/cm². Contrary to the EEG-52 statement, these ITRI reports indicate that salt loading has only a minimal effect on
the CAMs operation and that operational compensation can be made for these effects.

The low-level plutonium and salt tests are currently being conducted with the addition of radon progeny concentrations that might be encountered at WIPP. Results to date show that ambient concentrations of radon progeny at ITRI and at WIPP do not alter the basic ability of the CAM to correctly measure low-level plutonium aerosol concentrations. Tests for the Phase III report are scheduled for completion in May 1993.

The DOE agrees with EEG’s summarization that additional test information is needed regarding the CAMs, and, in fact several studies are on-going and are expected to continue for several years. This does NOT imply that the CAM system is not operationally ready for receipt of waste at WIPP.
INTRODUCTION

This paper presents the general operational philosophy behind the use of two identical air monitoring trains at the Waste Isolation Pilot Plant (WIPP) Exhaust Station A, and the criteria for reportability of any incident involving Station A hardware. This paper does not specifically address the sensitivity of air monitoring equipment or its ability to assure that release limits are not exceeded.

BACKGROUND

The WIPP is a radiologically "clean" facility, as defined by DOE Order 5480.11, Attachment 2. All items shipped to the site are surveyed prior to shipment, and this radiological state is verified at the WIPP by procedure-driven surveys that continually survey for removable radioactive contamination. These surveys provide the steps necessary for detection of radioactive material that could become airborne and result in a very low level release. As such, any detection of airborne transuranics by the Continuous Air Monitors (CAMs) above a pre-selected point resulting in an alarm would be an off-normal event.

An important system for controlling the potential for release of airborne radioactivity from the WIPP is the ventilation system that controls the airflow within and from the WIPP underground waste storage areas. Since the transport, and thus the detection of any release of airborne radioactivity depends upon the airflow in the vicinity of the release, control of that ventilation air is important. Airflow in the underground is controlled so that the direction of flow is from areas of lower potential for release of
radioactivity to areas of higher potential. Several ventilation routes are used in the underground area. This helps to insure against the spread of contamination into the "clean" (non-radiologically controlled) areas of the underground, in the remote event of a radioactive release. In such a case, the underground area-specific CAMs would provide helpful information in detecting the release.

In the underground, fresh air from the Air Intake Shaft (AIS) is split to the north and south. One air split is used to ventilate the North areas. The other air split picks up air from the Salt Handling (SH) shaft and is used to ventilate the mine support and waste handling areas. Air entering through the Waste Handling Shaft is routed through the Waste Shaft Station area directly to the Exhaust Shaft. This airflow pattern ensures that air leaving the waste storage area flows down the Exhaust Drift directly to the Exhaust Shaft and is thus kept away from the working and North areas of the U/G. The large total volume of exhaust air is combined at the Exhaust Shaft and is normally released unfiltered into the environment. However, in the event of a release of radioactive material within the U/G, exhaust airflow can be manually or automatically (by CAM alarm) diverted through a bank of High Efficiency Particulate Air (HEPA) filters before being released into the environment. The role of the Exhaust Station A air monitoring in the detection of an underground release and the resulting "shift-to-filtration" mode is discussed later in this paper.

COMPONENTS OF THE WIPP EFFLUENT-MONITORING SYSTEM

Two types of instruments are used in the WIPP air monitoring/sampling system. These are CAMs and Fixed Air Samplers (FAS). Each has its own specific role and it is important to understand the capabilities and limitations of each.

The CAM is an air monitoring device that continually draws air through a collector/detector assembly. This assembly collects airborne particles and provides an electronic output that is proportional to the level of radioactivity on the collection medium. This output is used to trigger one or more alarms when the level of radioactivity exceeds a predetermined set point. Alarms are triggered both in the area where the CAM is physically located and also at the Central Monitoring Room (CMR). The WIPP employs both alpha radiation monitoring CAMs and beta radiation monitoring CAMs. As a monitor, the CAM's function is to provide an alert that airborne radioactivity exceeds expected
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(natural background) levels and that steps need to be taken to protect workers and/or the general public from potential overexposure. The CAM is a real-time, air-monitoring device that continuously samples airborne particulates. It is not used to determine the details or magnitude of continuous or single-event releases.

The FAS is an air sampler through which air is continuously drawn collecting airborne particles on a filter. The filters are removed and counted in a WIPP laboratory for radioactivity according to a set schedule. Unlike the CAMs, which act as real-time monitors, information from the FASs is not available until after the collection filters have been analyzed in the laboratory. However, since they are not being used to provide an initial alert to a significant release of airborne radioactive materials (this is the function of the CAMs), they are able to provide significantly higher sensitivity. Because the short-lived, naturally occurring radon progeny are allowed to decay before these filters are analyzed, small amounts of radioactivity that may be released during routine waste handling operations can be quantified at very low levels.

At the present time, Station A includes three sets of sampling trains. Each of the three sampling trains is designed to provide three representative samples for either monitoring or for retrospective samples. The WIPP's use of these nine sampling ports is to simultaneously operate two alpha CAMs, two beta-gamma CAMs, provide one representative FAS filter to the Environmental Evaluation Group (EEG), provide one representative FAS filter to the New Mexico Environment Department (NMED), and retain three FAS samples for WIPP evaluation and records.

GUIDELINES

DOE Order 5400.5, "Radiation Protection of the Public and the Environment," Chapter II, Paragraph 1.b. and 1.c., along with 40 CFR 61, establishes exposure limits for members of the public to radioactive materials released to the atmosphere as a consequence of routine DOE activities. These limits are established at a level that shall not cause members of the public to receive an annual Effective Dose Equivalent (EDE) greater than 10 mrem from routine airborne releases. For all routine releases, DOE Order 5400.5, repeating 40 CFR 191, establishes an EDE exposure limit of no greater than 25 mrem, or a committed organ dose exposure of no greater than 75 mrem.
By interpretation and discussions with the EPA Office of Radiation Programs, the requirements of 40 CFR 191, pertain only to releases due to routine operations, though this is not specifically stated therein. This parallels what is specifically stated for those limits in 40 CFR 61 (and 40 CFR 190). Clearly, 40 CFR 191 limits cannot be applied to accident scenarios, since facility operators cannot initially limit the release from an accident.

The primary means of ensuring that off-site dose limits from routine operations have not been exceeded is the laboratory analysis of FAS samples (filters). These filters are collected daily and counted after a 36-hour period for the decay of Radon progeny. This provides a retrospective of release quantities for reporting, and ensures that appropriate actions are taken if a release is detected.
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EFFLUENT MONITORING

Air monitors and samplers connected to probes located within the Exhaust Shaft, monitor and sample the unfiltered exhaust from the underground areas. In each case, a sample is drawn from the ventilation duct through a shrouded probe, a vertical transport line and a mass-flow measuring device, into a three-way splitter supplying a combination of CAMs and/or FASs. Three probes reside within the unfiltered exhaust air at Station A. Two of these probes supply identical, simultaneously-operating systems, each containing 1 alpha CAM, 1 beta CAM, and 1 FAS. A flow controller ensures that a constant airflow is maintained through each monitoring device.

The WIPP FSAR requires that one sampling train be operating whenever waste is situated in the U/G for the purpose of detecting a release of radioactive contamination, resulting from an accident situation. The intent behind operating two identical sampling trains, when no CAM is out of service for maintenance or repair, is to minimize the negative impact on plant operations mandated by the WIPP FSAR Sec. 10.3.1.2, attendant with the failure of one CAM. These impacts include suspension of waste handling, stopping of U/G ventilation, etc. This goal could be fulfilled by maintaining a second identical sampling train in a backup standby mode, but it was decided to operate the two systems simultaneously to avoid the needed startup time for a backup system. These two sampling trains will, under normal circumstances, be operated simultaneously and continuously, and will provide for effluent monitoring and sampling during all operating conditions. Either one is capable of initiating a shift-to-filtration in the event of a release of radioactive material.

The third probe at Station A supplies three identical FASs. It thus provides air sampling capability and is used to determine and document total airborne particulate radioactivity discharged from the underground.

OFF-NORMAL AND ACCIDENT SITUATIONS

The primary purpose of any CAM is to minimize internal exposure to workers and to minimize radiological releases to the environment. This is accomplished by setting the CAM alarm points at sensitive enough levels so that personnel are alerted to the elevated airborne radioactivity as quickly as possible.
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But, since the most probable cause for an airborne release at the WIPP is a breached-
drum scenario due to human error, the involved personnel should be immediately
aware of a possible release. As a result, shift-to-filtration will be initiated using
administrative policies. In the case of a breached drum involving on-site WIPP
personnel, the CMR operator is notified of the potential radiological release resulting
in action to manually shift underground ventilation to filtration until the radiological
release is contained and decontaminated. Manual shifting to filtration is discussed in
WIPP Operations procedure WP04-VU1001.

The CMR operator also informs all underground personnel of the possibility of a
radiological release, and that they should remain clear of the area. Underground waste
handling operations will be suspended, and the Facility Manager will be notified.

In the unlikely event of a large airborne radioactive release in excess of alarm levels
on any two underground CAMs (i.e., alpha or beta-gamma CAMs) located in the
exhaust drifts, an automatic shift to filtration (auto-shift) should occur before an alarm
is registered at one of the Station A CAMs.

If the first indication of airborne radioactive materials being released to the
environment is an alpha or beta-gamma alarm at Station A, then an automatic shift-to-
filtration will be initiated with the CMR operator then responsible for all the
notifications of underground personnel and the Facility Manager.

The WIPP FSAR requires that only one alpha CAM and one beta-gamma CAM
monitor the effluent air from the WIPP underground at any one time. But, it is
the intention of the WIPP to routinely and continuously operate two alpha CAMs
and two beta-gamma CAMs at Station A so that if one fails for any reason,
monitoring can be maintained without interruption. In addition, all operating
CAMs at Station A shall be aligned to automatically shift underground ventilation
to filtration. Operation of less than two each of alpha or beta-gamma CAMs is
allowable if a CAM or CAMs is out-of-commission or out-of-service for
modifications, as long as the WIPP FSAR requirement for one CAM of each type
is met.

1. DOE/WIPP 92-017, The Inventory of Radioactive Material in the Event of an Underground Accident at
the Point of Release, Its Pathway to Station A, and the Consequence of Off-site Dose to the Public,
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OCCURRENCE REPORTING

DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information," defines those situations that may be encountered at DOE-owned or operated facilities that require notification of DOE headquarters. This order is implemented at the WIPP through the procedure WP 12-918, "Reporting of Occurrences in Accordance With DOE Order 5000.3A."

Recent discussions have revealed a need to assess the legitimacy and necessity of the historic WIPP practice of reporting to the DOE, per DOE 5000.3A, any mechanical or electronic malfunction or failure of a Station A CAM as an Off-Normal Occurrence. An assessment of the issue, and an assessment of the letter and intent of the appropriate Orders and procedures have been performed with the following conclusions.

Though previous WIPP practice has been to report all Station A CAM malfunctions or failures as occurrences, it is the position of the WIPP that after waste is received onsite, the malfunction or failure of any particular CAM at Station A is not an "occurrence" and therefore not a reportable event, as long as Class A equipment (defined below) does not experience a failure or "performance degradation." This is true even if the failure generates a "radiation" alarm and an automatic shift to filtration (Prior to waste receipt, there may be times when all CAMs at Station A are out of service for maintenance or modification. This situation would not constitute a reportable occurrence). This position is defensible when a careful reading of DOE order 5000.3A is made, carefully assessing the intent of the Order and understanding the provisions of the WIPP FSAR. (Note: an actual radiation-induced "radiation" alarm at a Station A CAM would constitute a reportable event.)

Several provisions of DOE 5000.3A define reportable events. These provisions are premised upon a definition of "Class A" equipment. Attachment I to the Order defines Class A equipment as "any active or passive safety device... or any primary environmental monitors." "Primary environmental monitors" are defined as "monitoring equipment legally required to monitor ongoing discharges." While it could be argued that there are no "ongoing discharges" from the facility, the WIPP has taken the more conservative approach of defining CAMs at Station A as Class A equipment. Specifically, WP 12-918 states that within Class A equipment are "one alpha and beta-gamma continuous air
monitors (CAMs), either primary or simultaneous backup in any configuration operating at Station A to provide monitoring and an automatic signal to direct underground exhaust through the ...(HEPA) filters."

Attachment I of 5000.3A categorizes occurrences by group, and is the defining document, per the Order (Sec. 7), that establishes the reportability of an event.

Group 1, "Facility Condition" includes subgroup E. (p. 5) that addresses "a deficiency such that a system or component vital to program performance does not conform to stated criteria and cannot perform its intended function." Specifically, the "failure or performance degradation" of Class A equipment will result in an Unusual or Off-Normal Occurrence depending on other plant conditions. Presuming here that no procedures have been violated (subgroup F), a review of the remaining groups and subgroups reveals no other areas wherein the failure of a CAM would be a pertinent issue. This group and subgroup (1.E) are paralleled by words in WP 12-918, Att. 2, Sec. E.

The WIPP's position is founded, first, on an understanding of the intent of DOE 5000.3A. This Order's Policy maintains that the DOE must be "kept fully and currently informed of all events which could: (1) affect the health and safety of the public; (2) seriously impact the intended purpose of DOE facilities; (3) have a noticeable adverse effect on the environment; or (4) endanger the health and safety of workers." This mind-set is paralleled in secs. 7.a.(2) & (3), where Unusual and Off-Normal occurrences are defined in terms of real or high-probability threats to the public, workers or the environment.

With this premise in mind, the WIPP's position is solidified, second, by a proper understanding of the definition of Class A equipment at the WIPP. In fact, at the WIPP Station A, "Class A equipment" does not define a particular piece of equipment, i.e. a particular CAM set (e.g. CAMs 153/154 or 157/158), but defines either CAM set that is "up and running" and providing effluent monitoring. By using the definition "one set of alpha and beta-gamma... (CAMs)" (WP 12-918), it defines a monitoring function; not a piece of equipment. Therefore, if any Station A CAM configuration is operating properly and performing its monitoring and auto-shift functions, then Class A equipment is not experiencing "failure or performance degradation." And, the intent of the order is met in that the risk to the public, workers, and environment is not increased.
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(continued)

One argument that may be raised is that 5000.3A requires reporting in the case where a CAM failure at Station A precipitates a Radiation alarm, and thus a shift to exhaust filtration. This argument is based on sec. 7.a.(2).(e) that defines an Unusual occurrence as one that results "in the actuation of emergency systems or engineered safety features." This argument, though, ignores the intent of this section of the order. Item (e) is given within a list of circumstances, the context of which is clearly the presence of an actual hazard condition, e.g. "release of radioactive ... material", "significant internal or external threats to safety", etc. Clearly the intent of this passage does not encompass a shift to filtration in the case of a spurious alarm resulting from equipment malfunction. In such a case, a shift to filtration would not be a reportable event. In addition, it is the WIPP's position that the automatic shift to filtration is not an engineered safety feature.

CONCLUSION

The WIPP unfiltered-effluent-air monitoring system at Station A provides a comprehensive combination of monitoring (in real time) and sampling (analysis delayed) capability. The air monitoring capability includes two sets of simultaneously operating alpha and beta-gamma CAMs, thus mitigating the impact on plant operations in the event of a CAM failure. Only one operating alpha CAM and one beta-gamma CAM is required by the WIPP FSAR. The WIPP has adopted the position that all available (not out-of-commission or out-of-service) alpha and beta CAMs shall be aligned, at any given time, to provide automatic shift-to-filtration on a high-radiation alarm. The retrospective FAS samplers provide the WIPP with very sensitive retrospective sampling of any possible airborne release. In addition, the WIPP maintains that, in keeping with the letter and spirit of the applicable documents, occurrence reporting is not necessary or required in the event of a CAM failure or malfunction at Station A, as long as Class A equipment (defined above) is not experiencing "failure or performance degradation."