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STINE GEBBIE
Secretary

STATE OF WASHINGTON

Air 91-802

DEPARTMENT OF HEALTH

Airdustrial Center, Bldg. 5 • Mail Stop LE-13 • Olympia, Washington 98504

August 20, 1991

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E. A. Bracken, Director
Environmental restoration Division
P.O. Box 550
U.S. Department of Energy
Richland, Washington 99352

Dear Ms. Bracken:

Last fall the Department of Health (DOH) received supplemental information from the Department of Energy (DOE), as required by the Hanford site permit FF-01. During this year, my staff have reviewed that information and have found that some of it is incomplete. A condition of the renewed permit that took effect August 15, 1991, was that the remaining supplemental information must be submitted to DOH by January 1, 1992.

Enclosed is my staff's review of the supplemental information requirements. If there are any questions, please contact me at (206) 586-0254. Discussions with DOE and Westinghouse staff will be scheduled in the near future to discuss the details.

Sincerely,

Allen W. Conklin

Allen W. Conklin, Head
Air Emissions & Defense Waste Section
Division of Radiation Protection

AWC/seg
Enclosure

DEC 1991
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EDMC

Department of Health
Environmental Health Programs
Division of Radiation Protection

Air Emissions Section

Aug. 20, 1991

To: Al Conklin
From: John Blacklaw JRB

Subject: Supplemental Information

Supplemental Information was prepared as a condition of the DOE Hanford Permit FF-01. Technical review of the four major facilities included are attached. Each review is documented separately to facilitate a response from each organization. Some items are repeated in each report when they represent general site-wide comments. These need overview response.

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SUPPLEMENTAL INFORMATION
TECHNICAL REVIEW
FAST FLUX TEST FACILITY (FFTF)

by
John R. Blacklaw

Aug. 20, 1991

PURPOSE:

The supplemental information provided in the referenced (#4) report was reviewed for technical compliance to the requirements of Permit FF-01 (#1) and its attached instructions for providing supplemental information (#2). This review is organized according to the outline provided in the instructions for submission. Appended to each comment is a code indicating the importance of each item and the action needed to meet the requirements of the permit. See Appendix A for code identification.

The objective of this review is to obtain information requested and not provided, and to verify the accuracy of information. In addition, this review gives guidance on the expected level of completeness desired in future submissions. Corrective action is expected for all deviations from the requirements.

Specific instructions for submission of supplemental information for radioactive air emissions sources are shown in bold italics. Review comments from WDOH follow each item.

I. Facility Information

Describe the facility/facilities operations (chemical and physical). Identify the facilities as they were identified on the source registration form(s). Supply blueprints or drawings.

The facility physical and operational description is well done and understandable. Provide a description of the specific processes contributing to the emissions from each stack. [II]

II. Source Information

A. List the source(s) to which the information in this section pertains. Identify all sources consistent with the source registration identification.

[I]

B. Describe the sources. Supply blueprints or drawings. Include the following information for each source:

[I]

1. System function/area exhausted.

[I]

2. Effluent system layout (filters, absorbers, exhausters, etc.).

[I]

3. Efficiency values of each control device for removal of radioactivity (eg., filter efficiencies, etc.)

Provide realistic efficiencies for all devices and how they correspond to the air control schematic. Provide source term corresponding to the air control schematic. [III]

4. Means and frequency of testing effluent system

[I]

5. Operating mode (continuous or batch; give % of time operated)

[I]

6. Chemical and physical forms of the releases. For chemical forms indicate the radioactive chemical compounds and ICRP 26 solubility classes of the radioactive elements or compounds; for physical forms indicate whether particulate, vapor or gas.

[I]

7. Stack (or release point) data:

a. height from ground/inside diameter (meters)

The stack height is given relative to the roof. Provide stack height relative to the ground. [II]

b. building height (meters)

For adjacent buildings (RSB and RCB) provide height, relative location and size for use as input to the stack data for code input in dose calculations. [II]

c. building width/length (meters). Needed only if stack height is less than 2.5 times building height and source to receptor distance is less than 1000 meters.

[I]

d. annual average stack and ambient air temperature (degrees F.)

[I]

e. windrose

[I]

f. Chi/Q data, if it exists (sec/cubic meter)

The department can obtain Chi/Q data from the GENII program using the input data provided. [I]

g. annual average volumetric flow rate (cubic meters/sec)

[I]

h. release rates. Annual average release rates in Ci/yr for each radionuclide from each source. The facility inventory should be listed and compared to that fraction available for potential airborne release.

The quantity available for potential release can be interpreted to mean the emissions rate without mitigating air controls. This information is not included and is of interest to determine emissions potential and in evaluating for equipment effectiveness. The inventory quantity itself is also of interest to give an order of magnitude appreciation of the plant emissions under unlikely accident or safety considerations, and for emergency preparedness purposes. Provide a back calculation from recent effluent data and realistic efficiencies for HEPA filtration. [III]

C. Describe the sampling/monitoring system(s). Supply blueprints or drawings. Include the following information for each source:

Information is included for the Combined Exhaust only. Blueprints and drawings were not submitted. [III]

1. Stack flow measuring system

Stack flow is measured indirectly at the containment building influent. All flow paths are not measured. Frequency of stack flow measurement is not given. The portable system used and the measurement procedure and location are not described. Provide procedures, including equipment descriptions. [III]

2. Sample probes (isokinetic). For exemption from isokinetic sampling, operator must demonstrate that no particulate fraction is possible.

Drawings and descriptions are needed. Provide actual flow and velocity measurements to verify that the probes are isokinetic. Provide procedures for setting flow rates. Estimate the velocity ratio from sampling and stack flow. Estimate sampling error due to non-isokinetic flow. [III]

3. Number and location of sampling points

The number and placement of the sampling probe inlets across the duct is needed. Provide sampling location relative to upstream and downstream disturbances. [III]

4. Description of sample lines including: diameters, lengths, materials, bends (radii), entry points into effluent line and angles of entry into effluent.

Drawings are not included. Bend radii are needed. An evaluation for compliance with the EPA NESHAPs (40CFR61) is not possible without the requested data. Provide an estimate of line losses. [II]

5. Sample flow regulation

The sample flow rate set point is needed along with the administrative control procedures for control of sample flow rate. [II]

6. Sampling media (filters, silica gels, charcoal, etc.)

[I]

7. Frequency of sampling (continuous or batch)

How is the tritium level monitored to determine when the level exceeds 10% of the DCG? Is this a conservative level based on the standard of 10 mrem/yr? [II]

8. Frequency of sample collection.

[I]

III. General Information

A. Effluent sampling and monitoring systems designs, procedures and quality assurance must be consistent with accepted industry standards. Reference the appropriate standards and describe how they have been used -- e.g., ANSI N13.1-1969; ANSI N323-1978; ANSI N42.18-1980; 40 CFR 61, App. A and B; etc. Include calibration schedule and the frequency of audits and inspections. Submit copies of procedures used.

The description states annual calibration of instrumentation, twice yearly audit frequency, and daily checks of sampling/monitoring equipment for operability. Generalized DOE orders are referenced, but specific detail which can be attributed to the FFTF Combined Exhaust is not present. Provide written procedures. [III]

B. Effluent sample analysis (provide documentation):

1. Methodology

A description of the organizational responsibility is given for effluent and environmental sampling and tracking. There is no documentation of methodology for effluent sample analysis. For instance, how is a sample evaluated (counted)? What is the resulting radiation level and how is it calculated? How are the resulting values averaged or trended over time? How are the yearly effluent statistics determined and documented? Provide this methodology. [II]

2. Procedure references

The references cited have appropriate titles to cover the general requirements. It is difficult from the titles alone to judge the adequacy or detail of procedures used in a particular situation (e.g., FFTF stack monitor). In addition, the submission requirements state that documentation must be provided, not just cited. Provide procedures. [II]

3. Detection Limits

The detection limits given appear to be for environmental monitoring and sampling. Are these also the limits for effluent sampling and monitoring for CAMs, samplers and other devices? The derived concentration guides (DCGs) are noted but not specified as the basis for the standard on detection limits at Hanford. Provide specific values and the method used to determine the detection limits. [II]

4. Quality assurance (include internal audit schedule and results)

A general discussion of quality assurance standards is given. The existence of quality control programs is noted for effluent monitoring and sampling and for the analytical laboratories. Quality verification programs through audits, appraisals, inspections, assessments, evaluations, reviews and environmental surveys are noted along with the various in-plant and oversight organizations involved. Audit results are expressed as available, given reasonable advanced notification. Provide the internal audit schedule and the results of audits performed in recent years. [III]

C. Environmental monitoring program. Give a description of the program and a summary of the data (including background or control station data) which relate to assessing possible environmental impacts from radioactive airborne releases from the registered sources. Include copies of applicable procedures.

A description of the program and a summary of the data is given by reference. Additional information is provided for the sampling network, media sampled and monitored for air pathway, equipment used for sampling and monitoring, frequency of sampling and

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monitoring, and calibration and audit frequency. References are cited. Provide a general description and summary of the environmental trends. Provide copies of applicable procedures. [II]

IV. Demonstration of Compliance

A. Give methodology used to demonstrate compliance (specify computer model or manual method).

[I]

B. Include all input data used.

[I]

C. Present the results. Unless demonstration of compliance is by the EPA COMPLY code "possession" or "concentration" method, the results should be calculated annual dose equivalents in mrem/yr for the whole body and relevant organs of the nearest resident or the maximally exposed hypothetical member of the public.

[I]

D. Describe any internal standards used to ensure compliance with applicable state and federal laws and regulations. Include copies of those standards.

Standards are expressed as: (1) DOE orders and applicable federal, state and local regulations, (2) design and construction to ALARA, (3) management of facilities and activities in a cost/effective and environmentally responsible manner, (4) per specific DOE orders given, and (5) controls and procedures used reflect current regulatory requirements. References are cited. Provide copies of standards. [II]

REFERENCES:

#1 Radioactive Air EMissions Permit, Department of Health, State of Washington, Permit Number FF-01, Permittee: U.S. Department of Energy, Richland Operations Office, Permitted Area: Hanford Reservation, Date Effective: 8/15/89, Expiration Date: 8/15/91.

#2 Instructions for Submission of Supplemental Information for Radioactive Air Emissions Sources, as attached to and as part of Permit FF-01.

#3 Registration for the Hanford Site: Source of Radioactive Emissions, DOE/RL 89-08, United States Department of Energy, March, 1989.

#4 Radioactive Air Emissions Permit FF-01: Supplemental Information, State of Washington, Department of Health, DOE/RL-90-34, United States Department of Energy, Richland, WA, September, 1990.

#5 Verbal Agreement, between Department of Health, State of Washington, Department of Energy, Richland Operations Office, Pacific Northwest Laboratories, and Westinghouse Hanford Company, March 28, 1990. "Supplemental information will be provided for the Plutonium-Uranium Extraction Facility, Uranium Oxide Plant, Plutonium Finishing Plant, and the Fast Flux Test Facility only, because the emissions from these facilities constitute greater than 98 percent of airborne radioactive emissions from the Hanford Site."

APPENDIX A: Code for importance of deficiency and corrective action needed.

[I] - Not Significant. No further action required.

[II] - Significant. Provide the requested information as specified in the Aug. 1, 1991 permit renewal letter requesting information by Jan. 1, 1992.

[III] - Important. Provide information as soon as possible during an on-site technical review (before Jan. 1, 1992).

SUPPLEMENTAL INFORMATION
TECHNICAL REVIEW
PLUTONIUM FINISHING PLANT (PFP)

by
John R. Blacklaw

Aug. 20, 1991

PURPOSE:

The supplemental information provided in the referenced (#4) report was reviewed for technical compliance to the requirements of Permit FF-01 (#1) and its attached instructions for providing supplemental information (#2). This review is organized according to the outline provided in the instructions for submission. Appended to each comment is a code indicating the importance of each item and the action needed to meet the requirements of the permit. See Appendix A for code identification.

The objective of this review is to obtain information requested and not provided, and to verify the accuracy of information. In addition, this review gives guidance on the expected level of completeness desired in future submissions. Corrective action is expected for all deviations from the requirements.

Specific instructions for submission of supplemental information for radioactive air emissions sources are shown in bold italics. Review comments from WDOH follow each item.

I. Facility Information

Describe the facility/facilities operations (chemical and physical). Identify the facilities as they were identified on the source registration form(s). Supply blueprints or drawings.

When reviewing the registration of sources data from the reference (#3) document, an inconsistency is apparent. In the supplemental information, the facility is described in terms of buildings and their contents, while in the source registration data, facility information relates to discharge points or stacks. This inconsistency is in organization of information. The description should relate to specific processes for each stack.

Six stacks are noted as discharge points, four of which have specified emissions data (291-Z-1,296-Z-3,-5, and -6). Stacks 296-Z-10, and -11 do not have specified emissions in the source registration data. Provide emissions data. The department needs

the expected annual emissions to determine if these stacks require registration. We are in the process of establishing minimum emission levels that would require stacks to be registered. [II] [Resolve before revised registration is provided.]

II. Source Information

A. List the source(s) to which the information in this section pertains. Identify the sources consistent with the source registration identification.

[I]

B. Describe the sources. Supply blueprints or drawings. Include the following information for each source:

[I]

1. System function/area exhausted.

[I]

2. Effluent system layout (filters, absorbers, exhausters, etc.).

The supplemental information contains an excellent general description of the effluent system. Figures 2.1 and 2.2 are helpful, although a careful reading of the description is needed to get a feel for the size and function of the air system. Components other than filters are not shown on the drawing; for example, KOH scrubber, vacuum system, etc. The use of zone 1 gloveboxes exhausted to atmosphere without a HEPA filter is a concern. What are these gloveboxes used for? [II]

3. Efficiency values of each control device for removal of radioactivity (eg., filter efficiencies, etc.)

Filters are described in the supplemental for HEPA, sintered metal and graphite. The efficiency values or decontamination factors (DFs) are noted according to the 40CFR61, Appendix D. The KOH scrubber and possibly other devices are not described, while the filters noted are not described in detail. Missing completely is a means of relating the components to the air control diagrams supplied, for a visual portrayal of air control effectiveness. Although a specific request for the source term (emissions values without air controls in place) is contained in a separate part of the instructions for submission, these values are required here and that they be organized to correspond to the air control schematic. A systematic analysis of source term reduction through the various air pathways can be performed to predict system efficiency. Expected DF values for the components are required for a "realistic" appraisal. [II]

4. Means and frequency of testing effluent system

The filter test method and frequency is well documented and clear. Tests of other effluent components, such as scrubbers, sintered metal filters, absorbers, etc., are not specified. Provide any test procedures used and justify any lack of testing. [II]

5. Operating mode (continuous or batch; give % of time operated)

[I]

6. Chemical and physical forms of the releases. For chemical forms indicate the radioactive chemical compounds and ICRP 26 solubility classes of the radioactive elements or compounds; for physical forms indicate whether particulate, vapor or gas.

Why is the less conservative solubility class of "Y" used for PU-241? [II]

7. Stack (or release point) data:

a. height from ground/inside diameter (meters)

[I]

b. building height (meters)

[I]

c. building width/length (meters). Needed only if stack height is less than 2.5 times building height and source to receptor distance is less than 1000 meters.

[I]

d. annual average stack and ambient air temperature (degrees F.)

[I]

e. windrose

[I]

f. Chi/Q data, if it exists (sec/cubic meter)

The department can obtain Chi/Q data from the GENII program using input data provided. [I]

g. annual average volumetric flow rate (cubic meters/sec)

There is a presumption that the value provided is due to a constant flow rate during the year. Is this so, or is there some variation with time or with processing conditions? Specify expected flow

rates and timing. [II]

h. release rates. Annual average release rates in Ci/yr for each radionuclide from each source. The facility inventory should be listed and compared to that fraction available for potential airborne release.

The specified release rates are precisely the same as presented in the source registration reference. A check of the ODIS data shows order of magnitude agreement. A national security comment was made regarding information on the quantity of plutonium being unavailable to the public. In the instructions for submission, it states that facility inventory should be listed and compared to that fraction available for potential release. The quantity available for potential release means the emissions rate without mitigating air controls. This information is not included and is of interest to determine emissions potential and in evaluating for equipment effectiveness. The inventory quantity itself is also of interest to give an order of magnitude appreciation of the plant emissions under unlikely accident or safety considerations, and for emergency preparedness purposes. Provide a back calculation from recent effluent data and realistic efficiencies for HEPA filtration. [III]

C. Describe the sampling/monitoring system(s). Supply blueprints or drawings. Include the following information for each source:

1. Stack flow measuring system

Frequency of stack flow measurement is given as monthly. On-site review determined that stack flow is measured quarterly. The portable system used and the measurement procedure and location are not described. Provide procedures, including equipment descriptions. [II]

2. Sample probes (isokinetic). For exemption from isokinetic sampling, operator must demonstrate that no particulate fraction is possible.

Drawings and descriptions are given. The sample probes are not shown specifically (Drawing H2-28545 is needed). Provide actual flow and velocity measurements to verify that the probes are isokinetic. A schematic of the monitor assembly is described under this topic. The monitoring CAMs description gives 2.0 CFM flow rate for both CAMs and sampler and later in the text notes that 3.5 CFM is required to coincide with the stack flow rate of 225,000 CFM. For isokinetic operation, the flow velocity must be equal for the probe and the stack. Which flow rates are used and/or are they adjusted according to stack flow? Provide procedures for setting CAM and sampler flow rates. Estimate the velocity ratio from sampling and stack flow. Estimate sampling error due to non-isokinetic flow. [III]

3. Number and location of sampling points

Drawing H2-28543 shows the sampling probe installation. The number and placement of the sampling probe inlets across the stack diameter can be determined from the scaled drawing. Provide data for each sampling location relative to upstream and downstream disturbances. [III]

4. Description of sample lines including: diameters, lengths, materials, bends (radii), entry points into effluent line and angles of entry into effluent.

The drawings included in the report show the relative positioning of components. Specific descriptions are not included. An evaluation for compliance with the EPA NESHAPs (40CFR61) is not possible without the requested data. Provide an estimate of line losses. [II]

5. Sample flow regulation

[I]

6. Sampling media (filters, silica gels, charcoal, etc.)

[I]

7. Frequency of sampling (continuous or batch)

[I]

8. Frequency of sample collection.

[I]

III. General Information

A. Effluent sampling and monitoring systems designs, procedures and quality assurance must be consistent with accepted industry standards. Reference the appropriate standards and describe how they have been used -- e.g., ANSI N13.1-1969; ANSI N323-1978; ANSI N42.18-1980; 40 CFR 61, App. A and B; etc. Include calibration schedule and the frequency of audits and inspections. Submit copies of procedures used.

The description notes inspection frequency on CAM units and air monitoring systems, source check frequency on CAMs and rotameter calibration. The Westinghouse Hanford Environmental Assurance audit frequency is given as twice per year. Appendix B in the supplemental information includes descriptions under the titles of: effluent monitoring system design, procedures, and quality assurance standards. Provide a short statement in the PFP section referred the reader to "additional information" contained in the

Appendices. Generalized DOE orders are referenced, but specific detail which can be attributed to the PFP effluent is not given. Submit copies of procedures. [II]

B. Effluent sample analysis (provide documentation):

1. Methodology

A description of the organizational responsibility is given for effluent and environmental sampling and tracking. There is no documentation of methodology for effluent sample analysis. For instance, how is a sample evaluated (counted)? What is the resulting radiation level and how is it calculated? How are the resulting values averaged or trended over time? How are the yearly effluent statistics determined and documented? Provide this methodology. [II]

2. Procedure references

The references cited have appropriate titles to cover the general requirements. It is difficult from the titles alone to judge the adequacy of detail procedures used in a particular situation (e.g., PFP stack monitor). In addition, the submission requirements state that documentation must be provided, not just cited. Provide copies of procedures. [II]

3. Detection Limits

The detection limits given appear to be for environmental monitoring and sampling. Are these also the limits for effluent sampling and monitoring for CAMs, samplers and other devices? The derived concentration guides (DCGs) are noted but not specified as the basis for the standard on detection limits at Hanford. Provide specific values and the method used to determine the detection limits. [II]

4. Quality assurance (include internal audit schedule and results)

A general discussion of quality assurance standards is given. The existence of quality control programs is noted for effluent monitoring and sampling and for the analytical laboratories. Quality verification programs through audits, appraisals, inspections, assessments, evaluations, reviews and environmental surveys are noted along with the various in-plant and oversight organizations involved. Audit results are expressed as available, given reasonable advanced notification. Provide the internal audit schedule and the results of audits performed in recent years. [III]

C. Environmental monitoring program. Give a description of the program and a summary of the data (including background or control station data) which relate to assessing possible environmental impacts from radioactive airborne releases from the

registered sources. Include copies of applicable procedures.

A description of the program and a summary of the data is given by reference. Additional information is provided for the sampling network, media sampled and monitored for air pathway, equipment used for sampling and monitoring, frequency of sampling and monitoring, and calibration and audit frequency. References are cited. Provide copies of applicable procedures. [II]

IV. Demonstration of Compliance

A. Give methodology used to demonstrate compliance (specify computer model or manual method).

[I]

B. Include all input data used.

[I]

C. Present the results. Unless demonstration of compliance is by the EPA COMPLY code "possession" or "concentration" method, the results should be calculated annual dose equivalents in mrem/yr for the whole body and relevant organs of the nearest resident or the maximally exposed hypothetical member of the public.

[I]

D. Describe any internal standards used to ensure compliance with applicable state and federal laws and regulations. Include copies of those standards.

Standards are expressed as: (1) DOE orders and applicable federal, state and local regulations, (2) design and construction to ALARA, (3) management of facilities and activities in a cost/effective and environmentally responsible manner, (4) per specific DOE orders given, and (5) controls and procedures used reflect current regulatory requirements. References are cited. Provide copies of standards. [II]

REFERENCES:

#1 Radioactive Air Emissions Permit, Department of Health, State of Washington, Permit Number FF-01, Permittee: U.S. Department of Energy, Richland Operations Office, Permitted Area: Hanford Reservation, Date Effective: 8/15/89, Expiration Date: 8/15/91.

#2 Instructions for Submission of Supplemental Information for Radioactive Air Emissions Sources, as attached and as part of Permit FF-01.

#3 Registration for the Hanford Site: Sources of Radioactive Emissions, DOE/RL 89-08, United States Department of Energy, March, 1989.

#4 Radioactive Air Emissions Permit FF-01: Supplemental Information, State of Washington, Department of Health, DOE/RL-90-34, United States Department of Energy, Richland, WA, September, 1990.

#5 Verbal Agreement, between Department of Health, State of Washington, Department of Energy, Richland Operations Office, Pacific Northwest Laboratories, and Westinghouse Hanford Company, March 28, 1990. "Supplemental information will be provided for the Plutonium-Uranium Extraction Facility, Uranium Oxide Plant, Plutonium Finishing Plant, and the Fast Flux Test Facility only, because the emissions from these facilities constitute greater than 98 percent of airborne radioactive emissions from the Hanford Site."

APPENDIX A: Code for importance of deficiency and corrective action needed.

[I] - Not Significant. No further action required.

[II] - Significant. Provide the requested information as specified in the Aug. 1, 1991 permit renewal letter requesting information by Jan. 1, 1992.

[III] - Important. Provide requested information as soon as possible during an on-site technical review (before Jan. 1, 1992).

SUPPLEMENTAL INFORMATION
TECHNICAL REVIEW
PLUTONIUM-URANIUM EXTRACTION FACILITY (PUREX)

by
John R. Blacklaw

Aug. 20, 1991

PURPOSE:

The supplemental information provided in the referenced (#4) report was reviewed for technical compliance to the requirements of Permit FF-01 (#1) and its attached instructions for providing supplemental information (#2). This review is organized according to the outline provided in the instructions for submission. Appended to each comment is a code indicating the importance of each item and the action needed to meet the requirements of the permit. See Appendix A for code identification.

The objective of this review is to obtain information requested and not provided, and to verify the accuracy of information. In addition, this review gives guidance on the expected level of completeness desired in future submissions. Corrective action is expected for all deviations from the requirements.

Specific instructions for submission of supplemental information for radioactive air emissions sources are shown in bold italics. Review comments from WDOH follow each item.

I. Facility Information

Describe the facility/facilities operations (chemical and physical). Identify the facilities as they were identified on the source registration form(s). Supply blueprints or drawings.

A more detailed drawing of the PUREX process flow, including effluent recycling, is required to clarify the description. [II]

II. Source Information

A. List the source(s) to which the information in this section pertains. Identify all sources consistent with the source registration identification.

[I]

B. Describe the sources. Supply blueprints or drawings. Include the following information for each source:

[I]

1. System function/area exhausted.

Further description is required for the process offgas system, the plutonium oxide conversion facility offgas system, and the dissolver offgas system. [II]

2. Effluent system layout (filters, absorbers, exhausters, etc.).

Why doesn't the dissolver offgas system use HEPA filtration and/or discharge to a position upstream of the final filters in the main ventilation system? [III]

3. Efficiency values of each control device for removal of radioactivity (eg., filter efficiencies, etc.)

The use of DOS for HEPA filter testing needs to be updated to the use of EMORY. The efficiency for the sintered metal filter is unrealistic. What is the efficiency of the condensers, liquid separator, scrubber and NH3 scrubber shown in the process diagram? The manufacturer's specification is needed to verify the efficiency of glass fiber filters. Provide realistic efficiencies. Provide source term organized to correspond to the air control schematic. [III]

4. Means and frequency of testing effluent system

Provide test procedures, and justify any lack of testing. [II]

5. Operating mode (continuous or batch; give % of time operated)

Provide justification for the dissolver offgas system being shut down and under what operating status conditions. [III]

6. Chemical and physical forms of the releases. For chemical forms indicate the radioactive chemical compounds and ICRP 26 solubility classes of the radioactive elements or compounds; for physical forms indicate whether particulate, vapor or gas.

[I]

7. Stack (or release point) data:

a. height from ground/inside diameter (meters)

[I]

b. building height (meters)

[I]

c. building width/length (meters). Needed only if stack height is less than

2.5 times building height and source to receptor distance is less than 1000 meters.

[I]

d. annual average stack and ambient air temperature (degrees F.)

Is the temperature compensated in the stack flow measurement? [II]

e. windrose

[I]

f. Chi/Q data, if it exists (sec/cubic meter)

The department can obtain Chi/Q data from the GENII program using the input data provided. [I]

g. annual average volumetric flow rate (cubic meters/sec)

Under what operating status conditions does the stack flow vary? Is the frequency of stack flow measurement coordinated with administrative flow changes? Is the effluent (Ci/yr) calculation made with correctly updated stack flow measurement data? Is the effluent report based on correctly updated measurement data? What is the frequency of stack flow measurement? [III]

h. release rates. Annual average release rates in Ci/yr for each radionuclide from each source. The facility inventory should be listed and compared to that fraction available for potential airborne release.

Itemize the facility inventory and fraction available for potential airborne release by radionuclide emitted. With Kr-85 being such a large contributor to PUREX and to Hanford site emissions, justify that the release rate is calculated from plant inventory, rather than obtained by measurement. Provide a back calculation from recent effluent data and realistic efficiencies. [III]

C. Describe the sampling/monitoring system(s). Supply blueprints or drawings. Include the following information for each source:

1. Stack flow measuring system

Provide drawings for velocity probe geometry. Include information on distance to upstream and downstream disturbances. [III]

2. Sample probes (isokinetic). For exemption from isokinetic sampling, operator must demonstrate that no particulate fraction is possible.

Provide flow rates for each probe. Provide procedure for setting flow rate. Estimate the velocity ratio from sampler and stack

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flow. Estimate sampling error due to non-isokinetic flow. [III]

3. Number and location of sampling points

Provide data for each sampling location relative to upstream and downstream disturbances. [III]

4. Description of sample lines including: diameters, lengths, materials, bends (radii), entry points into effluent line and angles of entry into effluent.

Provide specific descriptions necessary to evaluate compliance to EPA NESHAPs (40CFR61). Provide an estimate of line losses. [II]

5. Sample flow regulation

Is the stack flow rate used to adjust the sampler flow rates for isokinetic flow? Is a daily check and adjustment sufficient for variations in stack flow? Should sample flow be adjusted concurrently with changes in stack flow? How accurately is the sample flow (velocity) adjusted (regulated) to match stack flow (velocity)? How are adjustments to sample flow reported and coordinated in effluent concentration and release rate data? [III]

6. Sampling media (filters, silica gels, charcoal, etc.)

Provide specific information on the sampling media for efficiency of collection, limits of use and other general specifications. [II]

7. Frequency of sampling (continuous or batch)

[I]

8. Frequency of sample collection.

[I]

III. General Information

A. Effluent sampling and monitoring systems designs, procedures and quality assurance must be consistent with accepted industry standards. Reference the appropriate standards and describe how they have been used -- e.g., ANSI N13.1-1969; ANSI N323-1978; ANSI N42.18-1980; 40 CFR 61, App. A and B; etc. Include calibration schedule and the frequency of audits and inspections. Submit copies of procedures used.

The requirement to provide written procedures is not followed. Generalized DOE orders are referenced, but specific detail which can be attributed to the 291-A-1 stack is not present. Provide copies of procedures. [II]

B. Effluent sample analysis (provide documentation):

1. Methodology

A description of the organizational responsibility is given for effluent and environmental sampling and tracking. There is no documentation of methodology for effluent sample analysis. For instance, how is a sample evaluated (counted)? What is the resulting radiation level and how is it calculated? How are the resulting values averaged or trended over time? How are the yearly effluent statistics determined and documented? Provide this methodology. [II]

2. Procedure references

The references cited have appropriate titles to cover the general requirements. It is difficult from the titles alone to judge the adequacy or detail of procedures used in a particular situation (e.g., PUREX stack monitors). In addition, the submission requirements state that documentation must be provided, not just cited. Provide procedures. [II]

3. Detection Limits

The detection limits given appear to be for environmental monitoring and sampling. Are these also the limits for effluent sampling and monitoring for CAMs, samplers and other devices? The derived concentration guides (DCGs) are noted but not specified as the basis for the standard on detection limits at Hanford. Provide specific values and the method used to determine the detection limits. [II]

4. Quality assurance (include internal audit schedule and results)

A general discussion of quality assurance standards is given. The existence of quality control programs is noted for effluent monitoring and sampling and for the analytical laboratories. Quality verification programs through audits, appraisals, inspections, assessments, evaluations, reviews and environmental surveys are noted along with the various in-plant and oversight organizations involved. Audit results are expressed as available, given reasonable advanced notification. Provide the internal audit schedule and the results of audits performed in recent years. [III]

C. Environmental monitoring program. Give a description of the program and a summary of the data (including background or control station data) which relate to assessing possible environmental impacts from radioactive airborne releases from the registered sources. Include copies of applicable procedures.

A description of the program and a summary of the data is given by reference. Additional information is provided for the sampling

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network, media sampled and monitored for air pathway, equipment used for sampling and monitoring, frequency of sampling and monitoring, and calibration and audit frequency. References are cited. Provide a general description and summary of the environmental trends. Provide copies of applicable procedures. [II]

IV. Demonstration of Compliance

A. Give methodology used to demonstrate compliance (specify computer model or manual method).

[I]

B. Include all input data used.

[I]

C. Present the results. Unless demonstration of compliance is by the EPA COMPLY code "possession" or "concentration" method, the results should be calculated annual dose equivalents in mrem/yr for the whole body and relevant organs of the nearest resident or the maximally exposed hypothetical member of the public.

[I]

D. Describe any internal standards used to ensure compliance with applicable state and federal laws and regulations. Include copies of those standards.

Standards are expressed as: (1) DOE orders and applicable federal, state and local regulations, (2) design and construction to ALARA, (3) management of facilities and activities in a cost/effective and environmentally responsible manner, (4) per specific DOE orders given, and (5) controls and procedures used reflect current regulatory requirements. References are cited. Provide copies of standards. [II]

REFERENCES:

#1 Radioactive Air Emissions Permit, Department of Health, State of Washington, Permit Number FF-01, Permittee: U.S. Department of Energy, Richland Operations Office, Permitted Area: Hanford Reservation, Date Effective: 8/15/89, Expiration Date: 8/15/91.

#2 Instructions for Submission of Supplemental Information for Radioactive Air Emissions Sources, as attached to and as part of Permit FF-01.

#3 Registration for the Hanford Site: Sources of Radioactive

Emissions, DOE/RL 89-08, United States Department of Energy, March, 1989.

#4 Radioactive Air Emissions Permit FF-01: Supplemental Information, State of Washington, Department of Health, DOE/RL-90-34, United States Department of Energy, Richland, WA, September, 1990.

#5 Verbal Agreement, between Department of Health, State of Washington, Department of Energy, Richland Operations Office, Pacific Northwest Laboratories, and Westinghouse Hanford Company, March 28, 1990. "Supplemental information will be provided for the Plutonium-Uranium Extraction Facility, Uranium Oxide Plant, Plutonium Finishing Plant, and the Fast Flux Test Facility only, because the emissions from these facilities constitute greater than 98 percent of airborne radioactive emissions from the Hanford Site."

APPENDIX A: Code for importance of deficiency and corrective action needed.

[I] - Not Significant. No further action required.

[II] - Significant. Provide the requested information as specified in the Aug. 1, 1991 permit renewal letter requesting information by Jan. 1, 1992.

[III] - Important. Provide information as soon as possible during an on-site technical review (before Jan. 1, 1992).

SUPPLEMENTAL INFORMATION
TECHNICAL REVIEW
URANIUM OXIDE PLANT (UO3)

by
John R. Blacklaw

Aug. 20, 1991

PURPOSE:

The supplemental information provided in the referenced (#4) report was reviewed for technical compliance to the requirements of Permit FF-01 (#1) and its attached instructions for providing supplemental information (#2). This review is organized according to the outline provided in the instructions for submission. Appended to each comment is a code indicating the importance of each item and the action needed to meet the requirements of the permit. See Appendix A for code identification.

The objective of this review is to obtain information requested and not provided, and to verify the accuracy of information. In addition, this review gives guidance on the expected level of completeness desired in future submissions. Corrective action is expected for all deviations from the requirements.

Specific instructions for submission of supplemental information for radioactive air emissions sources are shown in bold italics. Review comments from WDOH follow each item.

I. Facility Information

Describe the facility/facilities operations (chemical and physical). Identify the facilities as they were identified on the source registration form(s). Supply blueprints or drawings.

[I]

II. Source Information

A. List the source(s) to which the information in this section pertains. Identify all sources consistent with the source registration identification.

[I]

B. Describe the sources. Supply blueprints or drawings. Include the following information for each source:

[I]

1. System function/area exhausted.

[I]

2. Effluent system layout (filters, absorbers, exhausters, etc.).

[I]

3. Efficiency values of each control device for removal of radioactivity (eg., filter efficiencies, etc.)

For the 296-U-2 stack, the efficiency for bag filters is needed. The 296-U-4 stack is being modified to add a mist eliminator. A notice to construct or an application to construct is not on file in the WDOH office. Provide information and/or justification for non-submission. Realistic efficiencies are needed for this stack. It appears that HEPA or other filters are needed that can handle the high temperatures, high humidities and presence of NOx. Provide an engineering evaluation of present control technology compared with additional filtration. Provide source term information organized to correspond to the air control schematic. [III]

4. Means and frequency of testing effluent system

HEPA filters are described. The use of DOS for field testing needs to be updated for the use of EMORY. Tests of other devices are not specified. Provide any test procedures used, and justify any lack of testing. [III]

5. Operating mode (continuous or batch; give % of time operated)

The 296-U-2 and -13 stacks are shut-down on weekends and standby periods. Is this safe for zone control and contamination control? [III]

6. Chemical and physical forms of the releases. For chemical forms indicate the radioactive chemical compounds and ICRP 26 solubility classes of the radioactive elements or compounds; for physical forms indicate whether particulate, vapor or gas.

Why was class "D" solubility class chosen? It is 500 times less conservative than class "Y". [II]

7. Stack (or release point) data:

a. height from ground/inside diameter (meters)

[I]

b. building height (meters)

[I]

c. building width/length (meters). Needed only if stack height is less than 2.5 times building height and source to receptor distance is less than 1000 meters.

[I]

d. annual average stack and ambient air temperature (degrees F.)

[I]

e. windrose

[I]

f. Chi/Q data, if it exists (sec/cubic meter)

The department can obtain Chi/Q data from the GENII program using the input data provided. [I]

g. annual average volumetric flow rate (cubic meters/sec)

[I]

h. release rates. Annual average release rates in Ci/yr for each radionuclide from each source. The facility inventory should be listed and compared to that fraction available for potential airborne release.

The reported effluent release rates from Table 2-2 and Table 3-2 are for U 238. Effective dose equivalent rates are based on those inputs. The ODIS report for 1988 notes effluents for several isotopes of Uranium, as well as, Pu-239, -240, Am-241, Sr-89, -90, and Cs-137 for the UO3 stacks. Provide justification for the lack of completeness in reporting releases. Provide an updated dose assessment. [III]

C. Describe the sampling/monitoring system(s). Supply blueprints or drawings. Include the following information for each source:

1. Stack flow measuring system

[I]

2. Sample probes (isokinetic). For exemption from isokinetic sampling, operator must demonstrate that no particulate fraction is possible.

Estimate the velocity ratio from sampling and stack flow. Estimate the sampling error due to non-isokinetic flow. [II]

3. Number and location of sampling points

Provide sampling location relative to upstream and downstream

disturbances. [II]

4. Description of sample lines including: diameters, lengths, materials, bends (radii), entry points into effluent line and angles of entry into effluent.

Drawings are difficult to read. An evaluation for compliance with the EPA NESHAPs (40CFR61) is not possible without the requested data. Provide an estimate of line losses. [II]

5. Sample flow regulation

Provide the sample flow rate set point along with the administrative control procedures for control of sample flow rate. [II]

6. Sampling media (filters, silica gels, charcoal, etc.)

[I]

7. Frequency of sampling (continuous or batch)

[I]

8. Frequency of sample collection.

Why are samples collected each shift during operation compared to each week during shut-down and standby periods? PFP sample collection frequency is weekly. Are all collected samples analyzed. Provide justification for frequency chosen. [II]

III. General Information

A. Effluent sampling and monitoring systems designs, procedures and quality assurance must be consistent with accepted industry standards. Reference the appropriate standards and describe how they have been used -- e.g., ANSI N13.1-1969; ANSI N323-1978; ANSI N42.18-1980; 40 CFR 61, App. A and B; etc. Include calibration schedule and the frequency of audits and inspections. Submit copies of procedures used.

Provide written procedures. Generalized DOE orders are referenced, but specific detail which can be attributed to the UO3 plant stacks is not present. [III]

B. Effluent sample analysis (provide documentation):

1. Methodology

A description of the organizational responsibility is given for effluent and environmental sampling and tracking. There is no documentation of methodology for effluent sample analysis. For

instance, how is a sample evaluated (counted)? What is the resulting radiation level and how is it calculated? How are the resulting values averaged or trended over time? How are the yearly effluent statistics determined and documented? Provide this methodology. [II]

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IV. Demonstration of Compliance

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Subject: DEPARTMENT OF HEALTH REVIEW OF FF-01 SUPPLEMENTAL INFORMATION

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