Identical letter to each licensee on the attached list

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~~Docket No. 70-82~~
~~SNM-65~~

Whittaker Corporation
Nuclear Metals Division
ATTN: Mr. M. Albert Abreu
Manager, Administrative Services
West Concord, Massachusetts 01781

Gentlemen:

It is becoming increasingly important that uniform methods be followed for monitoring effluents released to the environment from nuclear fuel processing and fabrication plants. At present there is considerable variation among fuel processors and fabricators in the methods for collecting and measuring the effluent data necessary to assess environmental impact.

The Commission intends to require licensees authorized to conduct fuel processing and fabrication activities to carry out specified effluent monitoring programs and to report to the Commission the data obtained within 60 days after January 1 and July 1 of each year. The report would contain information concerning the concentrations and quantities of radioactivity released to unrestricted areas in liquid and air effluents.

For this purpose we have developed a license condition for the monitoring and reporting of effluents, a draft copy of which is enclosed. This document specifies effluent monitoring programs which appear to be appropriate for most fuel processing and fabrication plants. In some cases there may be good reasons to supplement or modify the condition because of particular circumstances. The need for supplemental or modified programs will be determined on an individual case basis.

We would appreciate receiving your comments to help us finalize the condition. Comments should be furnished within 60 days from the date of this letter. Our present schedule for implementing the condition calls for the first report to be submitted within 60 days following January 1, 1973, covering the previous 6-month period.

Sincerely,

Original Signed by
S. H. Smiley

S. H. Smiley, Director
Division of Materials Licensing

A/22

Enclosure:
Draft License Condition

CRESS 3/2 T2028 R13 & 2021 R19	DML	DML	DML	CO	DML
	RJDube/gl	LERouse	DANussbaumer		SHSmiley
	3/ /72	3/ /72	3/ /72	3/ /72	3/ /72

Draft
2/24/72

LICENSE REQUIREMENTS

MEASURING AND REPORTING OF EFFLUENTS

FUEL PROCESSING AND FABRICATION FACILITIES

Discussion

As nuclear facilities increase in number and size, it is essential to develop uniform methods of measuring, recording, and reporting data on effluent releases. This will permit the comparison of data from different sources and the preparation of meaningful summary compilations of data; it will also supply the Commission with the necessary information to estimate maximum potential annual radiation doses to the public resulting from effluents from fuel processing and fabrication facilities.

To obtain quantitative information on the identity and quantity of radionuclides released to the environment and to provide a uniform basis for evaluating potential environmental consequences of these releases, carefully planned programs are needed for the measurement of radioactive effluents from fuel processing and fabrication facilities and for periodically summarizing and reporting the results from these programs.

The specific composition of radioactive material in fuel processing and fabrication facility effluents may vary depending on the material being handled, types of operations, or other factors. Because radiation dose

depends on the radionuclides released, specific radionuclides in effluents should be identified and measured.

In view of these considerations, the Commission intends to require licensees authorized to conduct fuel processing and fabrication activities to submit a report to the Commission within 60 days after January 1 and July 1 of each year which specifies the concentrations and quantities of radioactivity released to unrestricted areasin liquid and airborne effluents. The report must include certain other information necessary to estimate annual potential radiation doses to the public resulting from effluent releases.

The following license specifications appear to be appropriate for most fuel processing and fabrication plants. In some cases there may be good reason to supplement or modify the specifications because of particular plant design operational features or other factors. The need for supplemental or modified programs would be determined on an individual case basis.

In submitting license applications for a proposed plant, the proposed technical specifications should deal with the various elements of the following plan, along the lines indicated, or along different lines with an explanation for the alternate route. For existing plants, the licensee should identify any modifications which he feels are necessary and should describe the bases for these modifications.

LICENSE SPECIFICATIONS

I. Monitoring and Record Retention Requirements

A. Air Effluents

1. For air effluents from process confinement systems and process areas, a representative sample of the effluent from each stack, vent, or other point of release shall be collected continuously to determine total radioactivity and average concentration of radioactivity released. Other air effluents (e.g., analytical laboratory, storage area) shall also be continuously sampled as indicated or shall be sampled with a sufficient frequency to assure that they are not contributing significantly to the total radioactivity released.

2. The samples shall be analyzed at least weekly for gross alpha and gross beta radioactivity.[1/] (This does not preclude, in appropriate cases, the need for a continuous monitoring system with alarm to detect unexpected concentrations.)

3. Isotopic analyses of samples shall be made at least quarterly. These analyses shall provide the identity and quantity of the principal radionuclides. The purpose of the analyses is to

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[1/] For facilities handling only uranium and/or plutonium, samples need not be analyzed for gross beta. However, for plutonium, the Pu-241 content must be known and included in the assessment of the concentrations and total activity of plutonium released.

confirm the isotopic content assumed in Section A.2. above and that there are no unanticipated radionuclides present.[2/]

4. The sampling processes and the sensitivity of the gross and isotopic analyses shall be such that a total release rate from all stacks and vents of 10^{-5} μCi/sec of uranium and 10^{-7} μCi/sec of plutonium is measurable.

5. For each effluent stream, records shall be retained of the concentration at the point of release, the quantity of gross alpha and beta radioactivity released, and isotopic analyses.

6. For the period of release, measurements shall be made and records retained of the existing meteorological conditions on an hourly basis (i.e., wind speed, wind direction, and atmospheric stability,[3/] which are representative of conditions at principal points of release). For some fuel

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[2/] Depending on the nuclides used to calibrate for gross activity, the sum of the specific nuclide activities may be greater or less than the gross activity. Results of isotopic analyses should be used to modify calibration techniques to maximize the correlation between gross activity measurements and actual total radioactivity. If changes in the material processed or other factors could result in a significant variation in the isotopic content, isotopic analyses should be performed more frequently or performed on a composite of the weekly samples.

[3/] In lieu of measurements of atmospheric stability, the concentration estimates specified in Section II.A.3 may be calculated using the mean effective wind speed and assuming the following Pasquill categories: 1/3 Type F, 1/3 Type D, and 1/3 Type C. The mean effective wind speed is defined as the reciprocal of the mean of the reciprocal of hourly average wind speeds. Calms can be assigned the value of 1/2 the starting speed of the anemometer.

processing and fabrication facilities releasing continuously at low effluent levels, hourly meteorological measurements may only be necessary until meaningful average meteorological parameters are established. Additional measurements shall be made during the plant lifetime to confirm these meteorological parameters.

B. Liquid Effluents

1. Samples shall be collected of liquid effluents released to holding ponds or lagoons and liquid effluents released to the unrestricted area or a natural body of water (if the effluent enters a natural body of water within the restricted area.) These samples shall be taken at the frequencies specified in items 2. and 3. below, prior to the addition of dilution water to the effluents.

2. For continuous release, a representative sample of the effluent shall be continuously collected. The sample shall be proportional to the flow rate of the effluent stream. Samples may be composited for purposes of analysis but not for periods exceeding one week.[4/]

[4/] For certain enriched uranium operations a preferential separation of Th-231, which has a radiological half-life of 25.6 hours, may occur resulting in a higher concentration in the effluent stream than anticipated. Sampling procedures and analyses should be modified accordingly.

3. For batch releases, a representative sample of each batch shall be collected and analyzed prior to release.

4. Representative samples shall also be collected from liquids in holding ponds or lagoons at least once in any calender quarter during which no liquids were released.

5. Each sample or composite shall be analyzed for gross alpha and gross beta activity.[5/]

6. Isotopic analyses shall be made at least quarterly of samples of effluents to holding ponds or lagoons, samples of effluents to the unrestricted area or a natural body of water, and samples collected from holding ponds or lagoons. These analyses shall provide the identity and quantity of the principal radionuclides. The purpose of the analysis is to confirm the isotopic content assumed in Section B.5. above and that there are no unanticipated radionuclides present.[2/]

7. The sampling processes and the sensitivity of the gross and isotopic analyses shall be such that 0.005 of the appropriate concentration in Appendix B, Table II, Column 2 of 10 CFR 20 is measurable.

[5/] For facilities involved only in plutonium fuel processing and fabrication operations, samples need not be analyzed for gross beta activity if the Pu-241 content is known and included in the assessment of the concentrations and total activity of plutonium released.

8. Determinations shall be made of the volume of all liquid effluents; the volume of dilution water added, both upstream and downstream of the outfall from holding ponds or lagoons; and the mean flow rate of natural bodies of water receiving liquid effluents within the restricted area.

9. Records shall be retained of all determinations specified above, including concentrations, volume of liquids, gross alpha and beta radioactivity, and isotopic analyses.

II. Reporting Requirements

The data specified in A. and B. below shall be reported, in triplicate, to the Director, Division of Compliance, U. S. Atomic Energy Commission, Washington, D. C., 20545, within 60 days after January 1 and July 1 of each year covering the previous 6-month period.[6/] Except as noted otherwise, effluent data shall be summarized on a monthly basis. Estimates of the error associated with the six month total for each data category shall be reported.

The initial report filed for each facility shall include a description of sampling techniques, sample preparation, analytical methods, and methods of calibration. Subsequent reports shall include a description of any changes in the information.

[6/] The attached format should be used for reporting the required data.

A. Air Effluents

1. For each effluent stream, the gross alpha and gross beta radioactivity (in curies) released and the average alpha and average beta concentration (in microcuries/ml) at the point of exit from the stack or vent, excluding background radioactivity.

2. For each effluent stream, the radioactivity (in curies) released, by nuclide, based on representative isotopic analyses performed.

3. The calculated maximum percent of the 10 CFR Part 20, Appendix B limit at the site boundary, averaged over the reporting period. Identify the location on the site boundary where the maximum percent occurred and describe the method of calculation, including the bases for any assumptions or approximations.

B. Liquid Effluents

1. Gross alpha and gross beta radioactivity (in curies), total volume (in liters) of liquid effluent, and average concentration (in microcuries/ml) released to each holding pond or lagoon and to the unrestricted area or a natural body of water (if the effluent enters a natural body of water within the restricted area), excluding background radioactivity.

2. The maximum concentration released to the unrestricted area or a natural body of water (averaged over the period of a single release for batch releases or over a period of a week for continuous releases), excluding background radioactivity.

3. The total volume (in liters) of dilution water added, both upstream and downstream of the outfall from holding ponds or lagoons.

4. The total radioactivity (in curies) released to each holding pond or lagoon and to the unrestricted area or a natural body of water, by nuclide, based on representative isotopic analyses performed.

5. The percent of the applicable 10 CFR 20, Appendix B limit released to the unrestricted area or a natural body of water (if the effluent enters a natural body of water within the restricted area).

6. Mean flow rate (in liters per day) of natural bodies of water receiving liquid effluent within the restricted area.

7. If no liquids are released from a holding pond or lagoon during a calender quarter, the gross alpha and gross beta concentration (in microcuries/ml) of the contained liquid.

X A

SES - FUEL FABRICATION FACILITIES

_____ Reporting Period _____

estination of effluent:[1/]

May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Estimate of error (%)

II. AIR RELEASES

Identification of effluent stream:[1]

	Units	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Estimate of Error
1. Gross alpha radioactivity															
a) Total release	curies														
b) Average concentration at the point of exit from the stack or vent	uCi/ml														
2. Gross beta radioactivity															
a) Total release	curies														
b) Average concentration at the point of exit from the stack or vent	uCi/ml														
3. Isotopes released: (specify below)	curies														
4. Maximum percent of 10 CFR 20, Appendix B limit at site boundary, averaged over the reporting period[2]	%														

[1] Submit a separate sheet for each effluent stream.

[2] Enter on first sheet only. Identify the location on the site boundary and attach description of the method of calculation, including the basis for any assumptions or approximations.

Addressees

Fuel Fabrication Licensees

Docket No. - License No.		Addressee
70-25	SNM-21	Atomics International Division of North American Rockwell Corporation ATTN: Mr. L. W. Wheeler, Director Contracts and Pricing P.O. Box 309 Canoga Park, California 91304
70-824	SNM-778	The Babcock & Wilcox Co. Research & Development Division ATTN: Mr. R. H. Clark, Manager Licensing, Safety & Administrative Services P.O. Box 1260 Lynchburg, Virginia 24505
70-27	SNM-42	The Babcock & Wilcox Co. Nuclear Facilities Plant ATTN: Mr. Henry McClanahan, Manager Nuclear Materials Control P.O. Box 785 Lynchburg, Virginia 24505
70-1201	SNM-1168	The Babcock & Wilcox Co. Power Generation Division Commercial Nuclear Fuel Plant ATTN: Mr. Richard Alto P.O. Box 1260 Lynchburg, Virginia 24505
70-8	SNM-7	Battelle Memorial Institute Columbus Laboratories ATTN: Mr. Harley L. Toy Licensing Coordinator 505 King Avenue Columbus, Ohio 43201

70-984	SNM-942	Battelle Memorial Institute Pacific Northwest Laboratory ATTN: Dr. R. S. Paul Director P.O. Box 999 Richland, Washington 99352
70-1100	SNM-1067	Combustion Engineering, Inc. ATTN: Mr. H.V. Lichtenberger Director Nuclear Products Manufacturing Windsor, Connecticut 06095
70-1007 70-1113	SNM-54 SNM-1097	General Electric Co. ATTN: Mr. A. N. Tschaeche Administrator-Licensing MAIL CODE 273 175 Curtner Avenue San Jose, California 95125
70-754	SNM-960	General Electric Company Vallecitos Nuclear Center ATTN: Mr. G. E. Cunningham Pleasanton, California 94566
70-72 70-734	SNM-69 SNM-696	Gulf Oil Corporation ATTN: Mr. C. H. Fox, Acting Director Licensing Administration P.O. Box 608 San Diego, California 92112
70-36 70-903	SNM-33 SNM-871	Gulf United Nuclear Fuels Corporation ATTN: Mr. Peter Loysen, Manager Nuclear & Industrial Safety Department Grasslands Road Elmsford, New York 10523
70-1257	SNM-1227	Jersey Nuclear Company ATTN: Dr. Roy Nilson, Manager Quality Assurance and Licensing 2101 Horn Rapids Road Richland, Washington 99352
70-925 70-1193	SNM-928 SNM-1174	Kerr-McGee Corporation ATTN: Mr. George E. Wuller, Staff Engineer Licensing and Regulations Nuclear Division Kerr-McGee Building Oklahoma City, Oklahoma 73102

70-33	SNM-23	Metal & Controls, Inc. A Corporate Division of Texas Instruments, Inc. ATTN: Mr. N. M. Weiss Health Physicist 34 Forest Street Attleboro, Massachusetts 02703
70-143	SNM-124	Nuclear Fuel Services, Inc. ATTN: Mr. C. J. Michel, Supervisor Criticality and Licensing Erwin, Tennessee 37650
70-135 70-364	SNM-145 SNM-414	Nuclear Materials and Equipment Corporation ATTN: Mr. Edward K. Reitler, Manager Health, Safety and Licensing Apollo, Pennsylvania 15613
70-371 70-820	SNM-368 SNM-777	United Nuclear Corporation ATTN: Mr. D. F. Cronin, Manager Nuclear & Industrial Safety Department P.O. 1883 New Haven, Connecticut 06508
70-337 70-1143 70-1086 70-1151	SNM-338 SNM-1120 SNM-1170 SNM-1107	Westinghouse Electric Corporation ATTN: Mr. Karl R. Schendel License Administrator Monroeville Nuclear Center P.O. Box 355 Pittsburgh, Pennsylvania 15230
70-82	SNM-65	Whittaker Corporation Nuclear Metals Division ATTN: Mr. M. Albert Abreu Manager, Administrative Services West Concord, Massachusetts 01781
70-456	SNM-840	W. R. Grace & Co. ATTN: Mr. D. R. Telesca Washington Research Center Clarksville, Maryland 21029

Selected SNM Licensees Possessing More Than A Critical Mass

Docket No.-	License No.	Addressee
70-157	SNM-180	The University of Texas ATTN: Dr. Stephen J. Gage, Director Nuclear Reactor Laboratory Austin, Texas 78712
70-64	SNM-56	Stanford University Health Physics & Occupational Health ATTN: Mr. R. C. Barrall, Director 67 Encina Hall Stanford, California
70-807	SNM-746	National Aeronautics & Space Administration Lewis Research Center ATTN: Mr. Bruce T. Lundin Director 21000 Brookspark Road Cleveland, Ohio 44135
70-287	SNM-280	University of Wyoming ATTN: Mr. Victor H. Ryan Chief Reactor Supervisor Laramie, Wyoming 82070
70-1068	SNM-1050	University of Florida Department of Nuclear Engineering Sciences ATTN: Dr. M. J. Ohanian Gainesville, Florida 32601
70-1059	SNM-1016	McDonnell Douglas Astronautics Company ATTN: Mr. J. A. Hopkins Director - Employee Safety 2955 George Washington Way Richland, Washington 99352
70-150	SNM-148	Texas A & M University ATTN: Mr. John Simek Health Physicist College Station, Texas 77843
70-938	SNM-986	Massachusetts Institute of Technology ATTN: Mr. John L. Cochrane Assistant to the Director MIT Research Reactor 138 Albany Street Cambridge, Massachusetts 02139

Fuel Reprocessing Plants

Docket No. - License No.	Addressee
50-268	Mr. Ray C. Lambert General Electric Company Midwest Fuel Recovery Plant Route 1, Box 219-B Morris, Illinois 60450
50-201 CSF-1	Mr. J. P. Duckworth Plant Manager Nuclear Fuel Service, Inc. Box 124 West Valley, New York 14171