AREVA

February 28, 2007
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U. S. Nuclear Regulatory Commission
Director, Office of Nuclear Material
Safety and Safeguards
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Application for Amendment to License No. SNM-1227; Revised Facility Ventilation Requirements, AREVA NP Richland Facility (Docket No. 70-1257)

The purpose of this amendment request is to allow for modified workplace ventilation requirements for radioactive contamination areas under certain defined conditions, specifically when a process area has been shut down and no processing of radioactive materials is ongoing. AREVA NP Inc.'s (AREVA's) current license for the Richland site (Lic. No. SM-1227) establishes a number of requirements relative to the ventilation of radioactive contamination areas, notably:

- Provision of general ventilation systems designed and maintained to limit the spread of airborne contamination by maintaining air pressure gradients and airflows from general areas of low potential airborne contamination to general areas of higher potential contamination;
- maintenance of contaminated areas at a negative air pressure with respect to adjacent clean areas so that air flow is from the clean area toward the contaminated area;
- monthly smoke tests to visually demonstrate that airflows are from general areas of low contamination potential to general areas of higher contamination potential;
- maintenance of a minimum of seven air changes an hour in contaminated areas; and
- maintenance of prescribed air flow velocities into the openings in uranium handling hoods and into laboratory hoods.

The requirements noted above are found in Section 3.2.2, Ventilation, of SNM-1227.

Requirements are also imposed on the ventilation systems exhausting air from radioactive contaminated areas, notably:

- Continuous representative sampling on all exhaust air stacks servicing areas in which uncontained radioactive materials are used, processed, or otherwise handled;
- Prescribed analyses of the samples derived from the stack sampling systems; and

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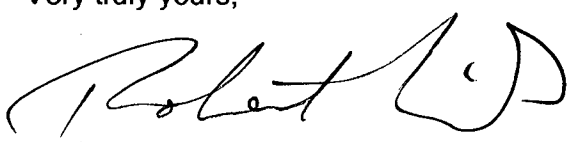
- Passage of air exhausted from contaminated areas and process equipment or enclosures where uncontained uranium compounds are handled through at least one stage of fire-resistant HEPA filtration.

These requirements are contained in Sections 5.1.1 and 5.1.1.1, Gaseous Effluent Controls and HEPA Filtration, respectively, of SNM-1227. Requirements for differential pressure monitoring across installed HEPAs are contained in Section 3.2.2 of SNM-1227.

The current license gives no provision for reduced ventilation requirements when the processes served by the ventilation unit are in a shutdown mode in which all processing of uncontained or unencapsulated radioactive materials has been suspended. As such, there is no possibility for capturing the significant energy (electrical) savings that could be realized by shutting down ventilation fans during times when radioactive material source terms are inconsequential. Accordingly, AREVA is requesting amendments to pertinent sections of License SNM-1227, Chapters 3 (Radiation Protection) and 5 (Environmental Protection) to allow for shutdown of general and process ventilation systems in areas of the plant in which all radioactive material processing has been suspended and appropriate controls are in-place to preclude adverse worker or environmental impacts. Enclosed in support of this request are six copies of amended Chapters 3 and 5 of License No. SNM-1227 with appropriate revisions to Sections 3.2.2 and 5.1.1, respectively.

This reduction in energy consumption is consistent with AREVA's commitment to continuous improvement in its environmental performance under its ISO 14001-certified Environmental Management System, and can be achieved with no adverse impacts to the site's occupational/ environmental ALARA program. We appreciate the NRC's consideration of this amendment request. If you have questions, please contact me at 509-375-8409 or Rich Burklin of my staff at 509-375-8638.

Very truly yours,



R. E. Link, Manager
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/mah

Enclosures

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Chapter 3 RADIATION PROTECTION

3.1 Administrative Requirements

3.1.1 ALARA Policy

AREVA NP Inc.'s (AREVA's) policy is to conduct its business in a manner to assure that its facilities are in compliance with radiation control and other nuclear regulations, and that its operations will not be detrimental to the environs. In implementing this policy, AREVA shall assure that radiation exposure to persons both in-plant and off-site is maintained as low as reasonably achievable (ALARA). In providing this assurance, conditions of applicable NRC and State licenses and other regulatory permits or licenses shall be complied with, and regard shall be given to applicable NRC regulatory guides and industry standards.

Responsibility for establishing and assuring adherence to this policy shall rest with the President of AREVA. This policy shall be implemented through appropriate delegations to Vice Presidents responsible for facilities processing or handling radioactive materials.

In order to facilitate implementation of this policy, key positions in organizations involved with facilities processing or handling radioactive materials shall be filled by persons knowledgeable of, and experienced in, the nuclear industry, and the responsibilities under this policy shall be identified in writing. Each responsible manager shall be required to know, understand, and carry out the provisions of this policy, as well as the procedures for its implementation.

3.1.2 Radiation Work Procedures

Radiation Work Procedures (RWP's) are prepared by Radiological Safety, and establish the radiological safety requirements of all work involving radiation and/or radioactive materials. The applicable RWP's shall be immediately available to personnel working with such material.

RWP's shall be approved in accordance with Figure I-2.3 and include the following information:

1. The identification number of the procedure;
2. A description of the nature, extent, and location of the work to be done;
3. A description of the types and potential for contamination that may be encountered;
4. A description of the types and estimated maximum personnel dose rates;
5. Personal survey and protective clothing requirements;

6. Personal dosimetry requirements; and

7. A statement of the respiratory protection equipment required for entry into an airborne radioactive materials area.

3.2 Technical Requirements

3.2.1 Controlled Areas

The perimeter fence and outside office building walls define the controlled areas of the AREVA facility. Access to controlled areas shall be controlled by AREVA security personnel in accordance with a formal, NRC-approved physical protection plan.

3.2.1.1 Restricted Areas

All radioactive materials at AREVA's Engineering and Manufacturing Facility shall be stored and processed within restricted areas. Each access point to restricted areas (as defined in 10 CFR 20) shall be posted in accordance with 10 CFR 20.1902. Additionally, RWP's for the respective areas shall specify the existing or potential radiological conditions and radiation protection measures required.

3.2.1.2 Clean, Intermediate and Contaminated Radioactive Materials/Radiation Areas

With the possible exception of temporary stepoff pads, clean areas shall be separated from contaminated controlled areas by intermediate areas. Intermediate areas shall be identified, and their boundaries visibly marked. Personnel shall follow posted special procedures or restrictions when leaving one area and entering another.

3.2.1.3 Change Rooms and Step-Off Areas

Change rooms servicing contamination controlled area workers shall be divided into contaminated, intermediate, and clean areas to minimize the spread of contamination. Step-off pads shall be provided when exiting contaminated areas. Separate toilet facilities may be located in contaminated, intermediate, and clean areas. Use of the toilets in contaminated and intermediate areas without removal of protective clothing shall be permitted provided a personnel survey is performed first.

Additional step-off areas may be established for maintenance work, temporary situations or conditions, or to accommodate personnel entry and exit not requiring the use of change room facilities. Personnel survey requirements shall be adhered to at all step-off areas.

3.2.1.4 Protective Clothing

Protective clothing shall be provided for personnel entering contamination controlled areas. The type(s) of clothing required shall be consistent with the individual's work assignment and is dependent upon the type and level of contamination anticipated.

Used protective clothing shall be removed prior to entering clean areas from contaminated areas, with the exception of emergency evacuations or if specifically authorized by a Radiation Work Procedure.

3.2.1.5 Personnel Surveys

Personnel survey instruments shall be provided in change rooms and at step off pads for use by personnel leaving contaminated areas. Personnel exiting contaminated areas shall be required to survey themselves after removing their protective clothing prior to leaving the step-off area. An exception to survey requirements is exiting during emergency evacuations.

3.2.2 Ventilation

General ventilation systems shall be designed and maintained to limit the spread of airborne contamination by maintaining air pressure gradients and airflows from general areas of low potential airborne contamination to general areas of higher potential contamination. Where ventilation barriers exist between areas, these systems shall be balanced so that the contaminated areas are maintained at a negative air pressure compared to that of the clean area, so that air flow is from the clean area toward the contaminated area.

Air locks shall be installed, where necessary, to insure maintenance of proper flow direction. Installed differential air pressure measuring instrument readings shall be recorded at least monthly.

Monthly smoke tests shall be conducted to visually demonstrate that the airflows are from general areas of low contamination potential to general areas of higher contamination potential.

General recirculating air systems shall recirculate air only from room areas (not from process enclosures) and pass it through fire retardant HEPA filters, which have installed efficiencies of at least 99.95% for 0.8 micron particles, before returning it to the room.

In addition to general ventilation systems, AREVA may employ local ventilation units designed to recirculate room air through HEPA filters, and then discharge room air at low velocities, to minimize the airborne concentrations in breathing zones.

Recirculated air, excluding that from the local ventilation units described above, shall be continuously monitored prior to the final stage of HEPA filtration. An indication that airborne levels are such that a 40 DAC-hour (derived air concentration-hour) exposure could be realized in a week from the recirculated air shall automatically divert the air from the recirculation mode to the respective facility exhaust air system. Manual diversion shall be allowed during maintenance on the system.

A minimum of seven air changes an hour shall be maintained in contaminated areas.

Unless safety concerns override, the average air velocity through openings in uranium handling hoods, with exception of laboratory hoods, and equipment containing readily dispersible uranium shall be average of 125 LFPM (linear feet/min) ±15%. The average flow through laboratory hoods shall be 100 LFPM ±15%. These velocities shall be checked at least monthly.

Both general recirculation and exhaust air system HEPA filter installations shall be equipped with continuous pressure differential measuring and indicating systems whose readings shall be recorded at least monthly. The differential pressure across the final HEPA filters shall not exceed four inches of water gauge. The final HEPA filter installations shall also be checked prior to first use for efficiency against 0.8 micron particles and must meet or exceed a removal efficiency of 99.95 percent.

General and process ventilation and supporting performance tests/criteria (monthly smoke tests, room differential air pressure readings, air change rates, prescribed hood entry velocities, and HEPA filter differential pressure readings) may be suspended in radioactive contamination areas where all processing of uncontained or unencapsulated radioactive material has been suspended and appropriate controls are in place to preclude adverse worker or environmental impacts. Such controls shall be imposed by the radiation protection function and shall be formally documented/ implemented.

3.2.3 Work Area Air Sampling

In areas where unencapsulated radioactive materials are handled, processed, and/or air concentrations are likely to exceed 10 percent of DAC, air shall be routinely monitored. Fixed air sampling heads may be used for calculating DAC-hours in areas where internal dose monitoring is required. Air sample concentrations determined by fixed samplers may be modified by correction factors.

Specialized air sampling or monitoring equipment, such as continuous air monitors, portable, high volume, and/or lapel air samplers, shall be available to supplement the normal air sampling system, and for use in studies or work on special problems.

Fixed air sampling used to determine DAC-hour exposures shall be evaluated to assure results remain reasonably representative of workers exposures. Re-evaluation of representativeness

shall be conducted at least every 12 months for those work stations which averaged 25 percent or greater of DAC the previous calendar year and at least every 24 months for the remaining work stations. Representativeness studies shall also be performed following significant process or equipment changes.

The frequency of air sampling in contaminated areas shall be based upon historical experience for each sampling area.

Flow rates through air samplers, as measured by in-line rotameters, shall be checked at the start and end of each sampling period. Rotameter accuracy shall be confirmed at least annually.

AREVA may use ICRP Publication 68 as a basis for determining the Annual Limit of Intakes (ALIs) and Derived Air Concentrations (DACs). ALI and DAC will be based upon an activity median aerodynamic diameter (AMAD) of 5 micrometers. In addition, AREVA may elect to take credit for measured particle size distributions, based upon the ICRP 68 model, that is, further adjust ALI and DAC, when particle size data indicate AMADs are in excess of 5 micrometers. Such adjustments would increase ALI and DAC by the same ratio as that of the ratio of the committed effective dose equivalent assuming the AMAD of 5 micrometers to the committed effective dose equivalent, derived from the measured AMADs.

AREVA at its discretion, may choose to use more conservative (lower) values for DAC and ALI than those used in ICRP Publications 68.

If AREVA chooses to adjust DACs and ALIs by particle size, a particle size measurement and analysis will be performed at least semi-annually in each group of locations for which particle size credit is taken. After one year, the Health Physics Component may relax the frequency to once per calendar year if DAC determined by new measurement(s) for a group of locations does not differ significantly from that established from previous measurements.

Particle size will be reassessed following significant process changes deemed likely to change the particle size distribution.

Air sample counting instruments shall be checked for acceptable operation and background each day they are used.

For breathing zone samplers, the system counting time and airflow rate of the sampler shall be adequate to obtain a lower limit of detection less than 4 DAC-hours for samples collected over a 40 hour period. All airborne radioactivity monitoring programs shall provide for investigation and/or increased sampling frequency if the activity concentration, not directly resulting from a known cause, exceeds the applicable action levels in Table I-3.1.

3.2.4 Radioactivity Measurement Instruments

3.2.4.1 Radiation Safety Instruments and Equipment

The general capabilities of radiation safety instruments used to make radiation protection measurements are described in Table I-3.2.

The Manager, Plant Engineering, shall be responsible for the maintenance and calibration of radiation safety instruments and equipment. The following general requirements shall apply to all such equipment and instruments:

1. All radiation detection and measurement instruments shall be inspected (and repaired when necessary) and calibrated at least semiannually or tagged out (except for direct-reading dosimeter pencils which shall be calibrated at least annually);

2. Instruments shall be calibrated following any maintenance deemed likely to affect operation before they are put back into routine service;

3. Each on-line radiation detection instrument shall be checked for proper operation either by Health and Safety Technicians or by electronic surveillance daily (Monday through Friday for a normal work week). When daily checks are performed in a manner which qualifies as calibration, separate semiannual calibrations shall not be required;

4. Portable survey instruments shall be source-checked each shift they are used;

5. Each AC-operated personnel contamination survey instrument shall be provided with an individual check source to allow personnel to source-check the instruments;

6. Calibration sources shall be traceable to the National Institute of Standards and Technology (NIST); and

3.2.4.2 Criticality Accident Alarm System

See Chapter 1, Section 1.6.1.

3.2.4.3 Criticality Dosimeters

Criticality dosimeters shall be strategically located throughout the process facilities. These criticality dosimeters shall be capable of measuring 0.1 to 10^4 rems of neutron radiation over a neutron spectrum of thermal to 2.5 MeV. The criticality dosimeters shall be inspected at least annually to confirm their presence and undamaged condition.

3.2.5 Radiation Exposure

AREVA shall strive to maintain external radiation exposures as far below the limits specified in 10 CFR 20.1201(a) as reasonably achievable. Radiation exposure records shall be reviewed by the ALARA Committee.

In the event that it is necessary to exceed the exposure limits specified in 10 CFR 20.1201(a), exceptions shall be authorized in accordance with 10 CFR 20.1206. Respiratory protective equipment shall be used for entry into areas where airborne radioactive materials are known to exist in excess of the occupational DAC.

In addition to the controls specified elsewhere, the following methods of external radiation exposure control may be employed as applicable and reasonable:

1. Automation of operations;
2. Minimization of quantities of radioactive material and/or use of shielding;
3. Time and distance control;
4. Special handling tools; and
5. Exposure awareness, planning, and scheduling.

3.2.5.1 Radiation Surveys

A detailed survey of radiation levels (beta-gamma and neutron, as applicable) shall be performed for each new operation and radioactive material storage facility when activity in the area is first initiated.

Routine radiation surveys shall be performed at least monthly in all general areas where radioactive materials are stored or processed, where personnel have access.

Radiation surveys shall be performed on all incoming and outgoing shipments of radioactive materials per 10 CFR 20.

3.2.5.2 Dosimetry

Persons requiring radiation exposure monitoring per 10 CFR 20.1502(a) shall wear beta-gamma sensitive dosimeters which shall be processed and evaluated by a processor holding current accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the NIST. For these personnel, exposure monitoring dosimeters shall be exchanged and analyzed quarterly. The beta-gamma dosimeters shall be supplemented, as appropriate, by other types of dosimeters (e.g., finger rings, direct-reading dosimeters, and neutron dosimeters), and by radiation measurements made with radiation survey instruments. Film badge dosimeters, if used, shall be exchanged and analyzed monthly.

Indication of exposure of uranium fuel fabrication workers exceeding the action levels stated below shall be investigated and the report placed in the personnel folder of the individual.

Action/Investigation Levels	Rem/Qtr.
Deep Dose Equivalent to the Whole body: head and trunk, including gonads, arm above the elbow, and leg above the knee	1
Eye Dose Equivalent	3
Shallow Dose Equivalent to the skin or extremities	10

3.2.6 Surface Contamination

Radioactive materials shall be contained and/or confined during processing, transfer, and storage as necessary to maintain intake of such materials by personnel as low as reasonably achievable. As appropriate, operations involving readily dispersible forms of radioactive materials shall be accomplished within enclosures (e.g., process equipment, glove boxes, glove-port hoods, laboratory type hoods, etc.) which are exhausted to facility exhaust air systems.

3.2.6.1 Facility Surveys

The following minimum frequency schedule shall be applied to the facility contamination survey program:

Area Surveyed	Survey Frequency
Contaminated radioactive materials areas	Weekly
Non-contaminated radioactive material areas	Monthly
Intermediate areas	Daily
Lunchrooms adjacent to radioactive materials/radiation areas	Daily

Action levels for cleanup of the various areas are listed below.

1. Noncontaminated Radioactive Material Areas. The goal for these areas is to keep them contamination-free. Any contamination in excess of 200 dpm/100 cm^2 (alpha) shall be cleaned up during the shift detected.

2. Intermediate Areas. The goal for these areas is to keep them free of significant contamination. Cleanup is required during the shift detected if contamination is found and the level is greater than 200 dpm/100 cm^2 (alpha). Contamination in excess of 500 dpm/100 cm^2 (alpha) shall be cleaned up immediately. If the contamination level is in excess of 2000 dpm/100 cm^2 (alpha), the area shall be reclassified and posted as a contaminated area until it is cleaned up.

3. Contaminated Radioactive Material Areas. Visible contamination in these areas and/or smearable contamination in excess of 10,000 dpm/100 cm^2 (alpha) shall be cleaned up immediately. These limits are not applicable to nonroutine tasks being conducted under special controls or inside process equipment.

4. Plutonium Contamination. Plutonium contamination shall be limited to 100 dpm/100 cm^2 average fixed, 300 dpm/100 cm^2 maximum fixed, and 20 dpm/100 cm^2 removable.

3.2.6.2 Release of Personnel, Materials, Equipment, Facilities, and Shipments

Contamination surveys are performed on all personnel leaving contaminated areas, on all materials, equipment and facilities to be released from radiation protection requirements, and on all incoming and outgoing shipments of radioactive materials. Release of equipment and packages from the plant site, or to clean areas on-site, shall be in accordance with NRC guidelines dated May 1987 (see Appendix A).

1. Personnel. Personnel contamination surveys are conducted according to the following schedule:

   a. All persons leaving contaminated areas are required to survey themselves for contamination with survey instruments located at respective step-off areas after removing protective clothing, and prior to leaving the step-off area.

   b. Personnel are not released to eat or leave the respective facility, except with the approval of the Radiological and Industrial Safety Supervisor and the respective facility manager, if their personal clothing is contaminated in excess of 200[1] dpm/100 cm^2 (alpha) direct, or skin is contaminated in

[1] 200 dpm/100 cm^2 (alpha) represents the practical lower detection level for most direct-

excess of 200[(1)] dpm/100 cm^2 (alpha).

c. Protective clothing is not reused if the removable alpha contamination exceeds 1000 dpm/100 cm^2 after laundering. During the workday, protective clothing in a contaminated area will be changed if contamination is visible (≥10,000 dpm/100 cm^2 alpha).

2. Materials, Equipment, and Facilities. Contamination surveys re performed by Health Physics Technicians on all materials and equipment removed from contaminated areas, and on areas or facilities to be released from radiation protection requirements. Limits for release are:

Smearable:	Less than or equal to 220 d/m/100 cm^2 alpha
Fixed:	500 d/m/100 cm^2 alpha

In special cases, the NRC guidelines contained in Appendix A to this chapter may be utilized.

3. Shipments of radioactive materials arriving at the facility are surveyed to the requirements of 10 CFR 20.1906. All outgoing shipments of radioactive materials are packaged and surveyed in accordance with 10 CFR 71 and 49 CFR 173.443.

3.2.7 Bioassay Program

Bioassay analyses shall be conducted on a scheduled basis to evaluate the effectiveness of radioactive material control and personnel protection programs.

Routine urine sampling frequencies shall be established for all operators and maintenance personnel normally assigned to work in areas where transportable uranium compounds are processed. These individuals shall be directed to submit urine samples at least monthly. Samples shall be scheduled throughout the month to provide a continuing overview of facility environment. Action levels and required actions are presented in Table I-3.3 for samples scheduled on a nominal routine 28 day frequency. Health Physics may adjust the action levels upward for shorter sampling periods. Such adjustments will be made in accordance with consensus models, such as ICRP 30, recognized by national and international radiation protection experts, and may make use of site-specific data.

Routine lung-counting frequencies shall be established for all operators and maintenance personnel normally assigned to work in areas where non-transportable compounds are processed. The minimum frequency for lung-counts shall be semi-annually for personnel routinely working in

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reading contamination survey instruments.

areas exceeding 10 percent of DAC the previous quarter. Action levels and required actions are presented in Table I-3.4.

Fecal analyses shall be substituted in lieu of lung-counting, for personnel such as claustrophobics, who cannot go through lung counting. Fecal sample analytical results shall be used to calculate lung burdens. Action levels and required actions for fecal sampling shall be the same as those for lung-counting.

Diagnostic bioassay studies shall be performed as necessary to evaluate the extent of actual personnel exposure whenever there is a good probability that an individual exceeded 200 DAC-hrs in an acute exposure. Analysis of the bioassay results shall be founded on consensus models recognized by national and international radiation protection experts and may make use of incident-specific data and/or an exposed individual's personal characteristics.

TABLE I-3.1

RESTRICTED AREA AIRBORNE RADIOACTIVITY CONCENTRATION ACTION LEVELS AND ACTIONS	
Action level multiple of derived air concentration	Required action
1.0 For a weekly average	Document investigation. Special air sampling study.
0.5 For a quarter average	Document investigation. Special air sampling study. Engineering evaluation.
10 For a single shift sample	Notify Supervisor, Radiological Safety or the Health Physicist and the General Area Supervisor. Assure use of appropriate equipment. Initiate investigation.

TABLE I-3.2

Error! Bookmark not defined.**RADIATION SAFETY INSTRUMENT CAPABILITIES**Error! Bookmark not defined.

Type of Instrument	Radiations Detected	Range	Lower Detection Level
Air sample analyzers	α	0-10^6 cpm	1 cpm
Air contamination monitors	α	0-5x10^3 cpm	1 cpm
AC-Operated survey meters	α	0-10^6 cpm	20 cpm
Portable survey meters	α	0-5x10^5 cpm	20 cpm
Portable survey meters	β,γ	0-5x10^4 cpm	20 cpm
Portable low energy dose rate survey meters	β,γ,x	0-300 mR/hr	0.1 mR/hr
Portable dose rate meters	β,γ,x	0-25 R/hr 0-100 R/hr 0-300 R/hr 0-500 R/hr	0.5 mR/hr 1.0 mR/hr 0.1 mR/hr 0.2 mR/hr
Portable dose rate meters	n	0-2 rem/hr	0.01 mrem/hr
Direct-Reading dosimeters	γ,x γ γ	0-200 mR 0-10 R 0-600 R	10 mR 500 mR 20 mR

TABLE I-3.3

ROUTINE URINALYSIS PROGRAM ACTION LEVELS AND ACTIONS (Transportable Uranium Compounds)	
Sample Results Exceed:	Required Action
15 µgU/l	Confirm result Document investigation
130 µgU/l	Confirm result Impose work restriction Collect and analyze additional urine sample(s) Document investigation Test urine sample for indications of kidney damage Initiate appropriate corrective action
400 µgU/l	Confirm result Impose work restriction Collect and analyze additional urine sample(s) Contact medical personnel and inform of results Document investigation Test urine sample for indications of kidney damage Initiate appropriate corrective action

TABLE I-3.4

ROUTINE LUNG-COUNTING PROGRAM ACTION LEVELS AND ACTIONS	
Lung Count Exceeds	Required Action
0.21 nCi U-235	Confirm result. Document investigation. If confirmed results were unexpected review relevant data to attempt to find probable cause. Initiate appropriate corrective action.
0.32 nCi U-235	Confirm result. If confirmed result was unexpected, impose work restriction. Document investigation. Perform additional bioassay measurement and at least one other bioassay technique. If confirmed results were unexpected, review relevant data to attempt to find probable cause. Initiate appropriate corrective action.

PART I – LICENSE CONDITIONS	REV. 40

APPENDIX A

CHAPTER 3

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT PRIOR TO RELEASE FOR UNRESTRICTED USE OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL

U.S. Nuclear Regulatory Commission
Division of Industrial and
Medical Nuclear Safety
Washington, DC 20555

August 1987

The instructions in this guide, in conjunction with Table 1, specify the radionuclides and radiation exposure rate limits which should be used in decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use. The limits in Table 1 do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control is considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.

2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table 1 prior to the application of the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.

3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.

4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:

   a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.

   b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment, or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table 1. A copy of the survey report shall be filed with the Division of Industrial and Medical Nuclear Safety, U. S. Nuclear Regulatory Commission, Washington, DC 20555, and also the Administrator of the NRC Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:

   a. Identify the premises.

   b. Show that reasonable effort has been made to eliminate residual contamination.

   c. Describe the scope of the survey and general procedures followed.

   d. State the findings of the survey in units specified in the instruction.

   Following review of the report, the NRC will consider visiting the facilities to confirm the survey.

PART I – LICENSE CONDITIONS	REV. 40

Table 1
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES[a]	AVERAGE[b c f]	MAXIMUM[b d f]	REMOVABLE[b e f]
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm $\beta\gamma$/100 cm^2	15,000 dpm $\beta\gamma$/100 cm^2	1000 dpm $\beta\gamma$/100 cm^2

[a]Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b]As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c]Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d]The maximum contamination level applies to an area of not more than 100 cm^2.

[e]The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f]The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

CHAPTER 5 ENVIRONMENTAL PROTECTION

5.1 Effluent Controls

5.1.1 Gaseous Effluent Controls

This site's goal is to limit releases of radioactive material in gaseous effluents to maintain doses to members of the public as far below the public dose limits, specified in 10 CFR 20, as is reasonably achievable. The major isotopes that can be emitted in gaseous effluents are U-232, U-234, U-235, U-236, U-238 and their daughters. The chemical forms of these nuclides typically include UF_6, UO_2F_2, $UO_2(NO_3)_2$, UO_2, and U_3O_8.

Continuous representative sampling shall be provided on all exhaust air stacks servicing areas in which uncontained radioactive materials are used, processed, or otherwise handled. These samples shall be analyzed for particulate radioactive material content periodically, generally on a weekly basis. Samples of gaseous effluents potentially containing uranium shall be analyzed for gross alpha activity. Non-uranium isotopes likely to contribute greater than 0.1 mrem (TEDE) per year to a member of the public will be accounted for.

Sampling of exhaust air stacks may be suspended when the underlying ventilation system has been shut down in conjunction with a formal cessation of the processing of uncontained and/or unencapsulated radioactive materials in the affected ventilated spaces (see Sec. 3.2.2, Ventilation). Any passive emissions of radioactive materials from the stack shall be abated via the continued presence of the HEPA filters required to be in place when the emission unit is operating. Special provisions for restart, if deemed necessary, shall be formally documented/ implemented.

The site will maintain procedures with action levels to assure that members of the public do not exceed dose limits established by the NRC in 10 CFR 20. Dose calculations and effluent concentration values Table 2 of Appendix B to 10 CFR Part 20, for members of the public, may be modified based on ICRP 66 and 68 assuming an AMAD (Activity Median Aerodynamic Diameter) of 1 micrometer.

Reports of environmental releases will be forwarded to the NRC as required in 10 CFR 20 and 10 CFR 70.

5.1.1.1 HEPA Filtration

Air from contaminated areas and process equipment or enclosures, where uncontained uranium compounds are handled, shall be passed through one stage of fire-resistant HEPA filtration which meets Military Specification MIL-F-51068 prior to being exhausted to the atmosphere. Filtration is not required for air exhausted from rooms or facilities where radioactive materials are encapsulated or otherwise contained, and the outside surfaces of the containers have been surveyed and

released.

Only HEPA filters which are certified by the manufacturer to be at least 99.97 percent efficient for the removal of 0.3 micron particles shall be used. The adequacy of final HEPA filter installations shall be determined by in-place testing to assure that they are at least 99.95 percent efficient for the removal of 0.8 micron particles prior to initiating operations with radioactive materials in the following instances:

1. Startup of a new facility;

2. Following maintenance work on the filter bank and/or replacement filters; or

3. Following actuation of the sprinkler deluge system if determined necessary by Plant Engineering following a visual/operational inspection.

5.1.1.2 Final HEPA Filter Protection

Air exhausted from process equipment containing corrosive fumes may be liquid scrubbed, heated and/or diluted prior to final HEPA filtration. Final HEPA filters potentially exposed to corrosive fumes shall be visually inspected at least quarterly.

Final HEPA filters in the fuel fabrication buildings shall be protected from damage in the event of fire by one of the following design features:

1. A liquid scrubber in the exhaust air stream upstream of the filters; or

2. An automatic (actuated by rate-of-rise/heat detectors located in the exhaust air ducts) fog deluge system in the exhaust air stream upstream of the filters.

Final HEPA filter installations shall be equipped with continuous pressure differential measuring/indicating devices, the readings of which shall be recorded at least monthly. The pressure differential across final HEPA filters shall not exceed four inches of water gage.

5.1.2 Liquid Effluent Controls

AREVA shall maintain and use liquid effluent treatment systems to maintain releases of radioactive material in liquid effluents to unrestricted areas as far below the limits specified in 10 CFR 20.1302 as reasonably achievable and in accordance with 10 CFR 20.2003. Procedures shall be adequate to assure that the effluent treatment systems function properly, and that immediate steps are taken to rectify any observed deficiencies as soon as practicable. See Table I-5.1 for action levels and required actions regarding liquid effluents.

Released liquid wastes are combined and discharged to the AREVA-City lift station where the total

combined liquid effluent from the plant is pumped to the Richland Municipal Sewerage System. The combined liquid effluent shall be continuously sampled at the AREVA effluent station and the flow measured at the lift station. The composited samples shall be analyzed for uranium and regulated chemicals. Any increase in the chemical or uranium content of the composited samples statistically above those limits described in 10 CFR 20.2003 or the State of Washington Liquid Waste Discharge Permit shall be cause for an investigation and appropriate corrective action.

5.1.2.1 Sanitary Wastes

Sanitary wastes shall be discharged to the sanitary sewer system which joins other liquid wastes prior to being discharged to the AREVA-City lift station.

5.1.2.2 Process Cooling Waste Water

Process cooling water shall be isolated from actual process atmosphere by double physical barriers. Process cooling water shall be discharged from various facilities (with the exception of the ELO Building) via building sewer systems separate from both sanitary and process chemical waste sewers. Process cooling water may be disposed of by discharge to the municipal sewerage system or discharge to the AREVA Process Chemical Waste Lagoon System or Process Chemical Waste Storage Tank System.

5.1.2.3 Process Chemical/Radioactive Wastes

All process radioactive liquid wastes shall be routed to the lagoon system or the process chemical waste storage tank system that is replacing the lagoons. Some process waste solutions require further treatment prior to discard to the sewer. These solutions shall be treated, as necessary, for chemical/radioactivity removal prior to release to the sanitary sewer system.

The release of chemical wastes to the sanitary sewer system is controlled by local authorities via a permit system. The licensee shall notify NRC for informational purposes of any occurrences which, by permit, require reporting to the authorities.

5.1.3 Process Chemical Lagoon Management System

The lagoons shall be sealed on the bottom and all sides with an impervious liner to prevent the migration of lagoon contents to the adjacent subsurface soil or groundwater. The liner consists of a double layer of impervious material, separated by a layer of sand or other material used to maintain spacing between liners. A system of sampling tubes shall be installed between the liners to provide sampling capability to permit detection of leaks in the upper liner.

Routine monitoring of the integrity of the upper liners shall be accomplished by drawing a vacuum on each group of the "between-liners" sampling heads at least monthly, unless weather conditions (e.g. ice and/or snow) make it too hazardous to personnel to perform such sampling. In the event

that a significant amount of liquid is pumped from any sampling head(s), the liquid shall be analyzed for fluoride and uranium content. If uranium and fluoride are present above previously measured levels, an investigation shall be initiated which shall include:

1. Additional between-liner sampling;

2. Lagoon solution sampling for comparison of the content of the sample to that of the lagoon;

3. Checking the integrity of the lower liner of affected lagoons; for Lagoons 1 and 3 by activating sampling lines located between the lower liners and the original Petromat liners of these two lagoons; or checking the integrity of the lower liner of Lagoon number 4 by sampling the three dry wells associated with the three "French Drains" located under the lower liner of this lagoon; and

4. Making use of the lagoon test well system.

The between-liner sampling system is the first line of defense for detecting liner leaks, and sampling shall be scheduled monthly. The beneath-the-bottom liner leak detection system shall be activated at anytime the upper liner is determined to be leaking to confirm the integrity of the lower liner. Test wells are provided around the lagoon system as a backup to provide the capability to detect leaks penetrating both liner layers.

In the event that a leak in an upper liner is confirmed, the liner shall be repaired. A report of the leak, including results of the investigation and corrective actions taken, shall be forwarded, in writing, to the Administrator, NRC-Region II within 90 days of detection of the leak.

The monthly between-liner monitoring program applies to lagoons actively managing inventory (liquids and sludges). In conjunction with AREVA's ongoing program to permanently remove the entire lagoon system from service, the between-liner monitoring may be suspended on a lagoon-by-lagoon basis once a lagoon has been emptied of inventory and is not slated for any future receipt of inventory.

5.2 Environmental Monitoring

AREVA shall conduct a routine environmental surveillance program in relation to the operation of the Engineering and Manufacturing Facility. Surface and groundwater samples shall be collected from strategic locations in the environment and analyzed for pertinent chemicals and uranium.

5.2.1 Surface Sampling

Sampling stations shall be established both on-site and off-site near points of expected maximum concentrations. The schedules for the various sampling stations are identified below. See Figure

I-5.1 for the location of the stations.

Sample Station	Sample Type	Sampling Frequency	Analysis
1	Soil	Quarterly	Uranium
2	Soil	Quarterly	Uranium
3	Air	Monthly	Fluoride
4	Air	Monthly	Fluoride
5	Forage	Monthly[1]	Fluoride
6	Forage	Monthly[1]	Fluoride

5.2.2 Groundwater Sampling

Section 5.1.3 describes the between-liners sampling of the lagoons as well as the actions taken to confirm and repair possible leaks. The groundwater sampling program is described below. See Figure I-5.2 for the locations of the sample stations.

Gross Alpha/Beta[2], fluoride, NO_3-N, NH_3-H, and pH	Quarterly	GM Wells 1, 5, 6, 7, and 8 and TW Wells 6, 7, and 21	Grab

5.2.3 Sanitary Sewer Sludge Sampling

The release of radioactive material to the sanitary sewer system shall be controlled and monitored as described in Section 5.1.2. At the Richland sewage treatment facility, the sludge is removed from the process, de-watered to a semi-dry solid, and trucked to a sanitary landfill on a daily basis. Samples of sludge taken to the landfill shall be taken monthly by AREVA and analyzed for uranium and moisture. The analyses shall be converted to picocuries of uranium per gram of sludge as transferred to the landfill. If a running average of the analyses over a six-month period exceeds 25 picocuries per gram or any single confirmed result equals or exceeds 30 picocuries per gram, an investigation shall be required, and a plan of action instituted. The action plan, as a minimum, shall require a reduction of discards to the sewer system until the sewer sludges contain less than 25 picocuries uranium per gram. Any confirmed monthly sludge sample result of 25 picocuries per gram or higher shall be brought to the attention of Chief, Fuel Cycle Licensing Branch, NRC.

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1 During the growing season only (April-October).

2 The analytical method shall be capable of detecting 5 picocuries/liter alpha and 15 picocuries/liter beta.

PART I – LICENSE CONDITIONS	REV. 39

Table I-5.1 Liquid Effluent Action Levels and Actions

Effluent Sample Concentration (μCi/mℓ-Uranium)	Required Action[3]
$1.6x10^{-7}$	Investigate probable cause. Take correction action as necessary.
$1.6x10^{-6}$	Shut down discharge to sewer, until cause can be determined and corrected.
$3.0x10^{-5}$ [4]	Submit report to NRC within 30 days of learning of the occurrence (per 10 CFR 20.2203).

[3] Actions required at any one action level include all actions that would have been undertaken at lower action levels.
[4] Monthly average concentration.

Figure I-5.1 Field Sample Station Locations

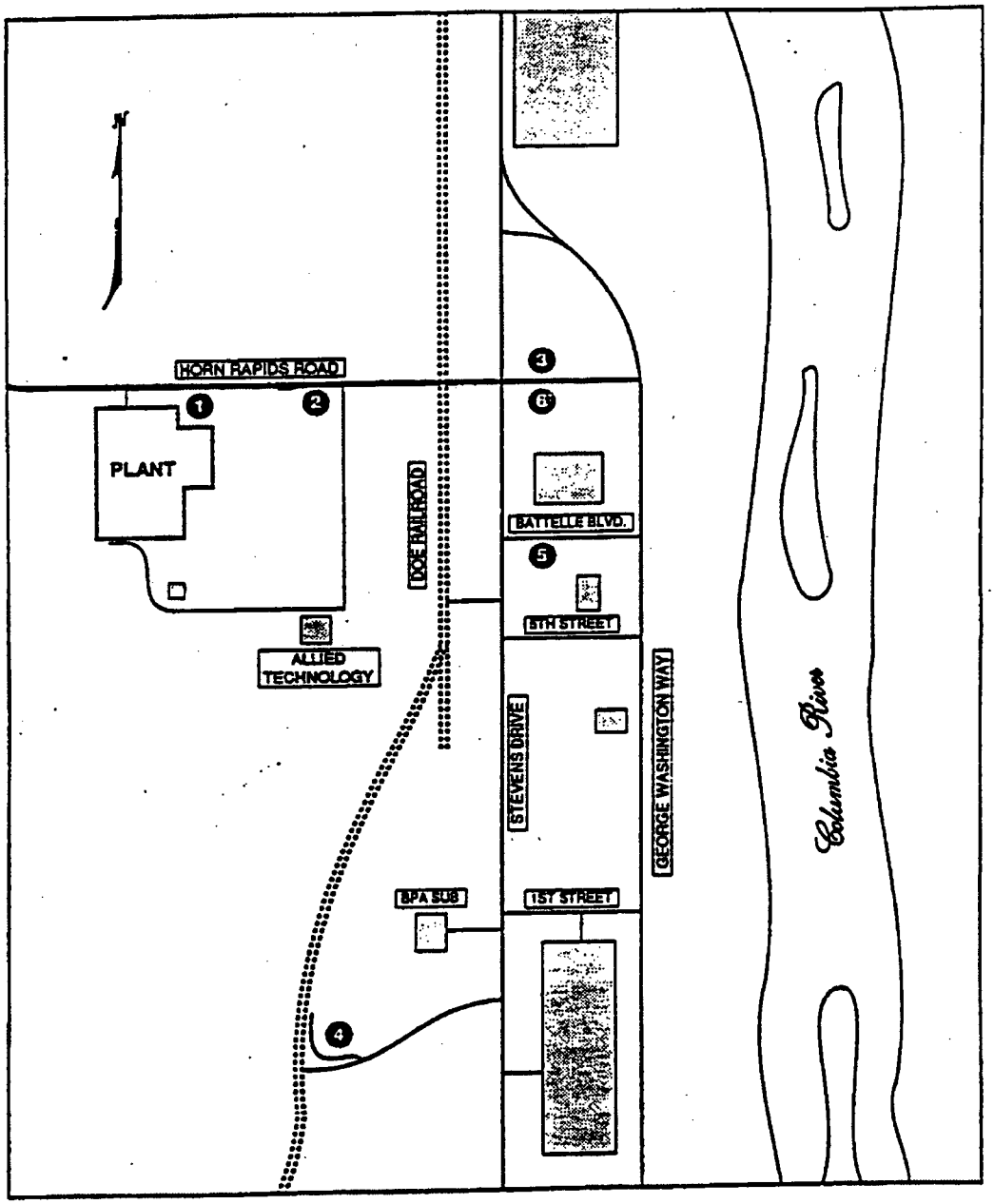

Figure I-5.2 Lagoon Test Well Locations