70-1201

B&W FUEL COMPANY

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December 21, 1994

Robert R. Pierce, Chief
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Pierce:

REFERENCE: Docket No. 70-1201, SNM-1168

B&W Fuel Company has revised the above referenced license to reflect the requirements of new part 20. The changes are contained within Chapter Three and are easily identified by a side-bar. Please remove Chapter Three in its entirety and replace it with the one provided.

In addition, Section 4.1.6.3, page 4-6 has also been revised to allow a maximum width of 28 inches for hoods, pellet down draft tables and carts. Previously, we had committed to 25 inches. The slab width of material shall remain at 25 inches; the change is for the surface area only. This request is based on operational experience that has brought to our attention that a table that is the same width as the criteria causes the pellets to be right at the edge of the table. This creates more of a hazard of disrupting the geometry because the pellets are easily knocked off onto the floor. With this, we request that the pellet slab width remain at 25 inches, however the table may be 28 inches to allow a 3 inch gap between the worker and the trays of pellets.

If you have any questions, please feel free to call me at (804) 832-5202. I will be on maternity leave from January 9 - February 22, 1995. You may contact Gerald Lindsey at (804) 832-5021 during this time frame.

Sincerely,

B&W FUEL COMPANY
Commercial Nuclear Fuel Plant

Kathryn S. Knapp

Kathryn S. Knapp, Manager,
Safety and Licensing

NF04

3.1 Administrative Requirements

3.1.1 General

The business of the CNFP includes radiation hazards from alpha contamination (fuel fabrication) and from beta-gamma contamination (field service work for commercial nuclear utilities). While the levels of these respective hazards are different, the controls for each are similar.

3.1.2 ALARA

It is the policy of the CNFP to maintain occupational exposures to radiation and radioactive contamination in effluents as low as reasonably achievable. The responsibility for implementation of the ALARA policy is designated to the Health-Safety section.

3.1.3 Radiation Work Permit (RWP) Procedures

Radiological Work Permits (RWP) shall be used to define the protective clothing and equipment required to perform work involving surface contamination. RWPs shall be used to control all work in a RCA and work involving surface contamination above clean area limits outside of a permanent RCA that is not addressed by an approved operating procedure. RWPs are reviewed for industrial safety and approved by a Health Physicist.

3.1.4 Written Procedures

All licensed activities related to radiation protection shall be conducted in accordance with approved written procedure. Approval, scope, format, and distribution requirements are described in Section 2.6.

3.1.5 Postings

Local safety rules approved by Health-Safety providing personnel and supervision with specific directions essential to ensuring radiation safety shall be posted in areas where appropriate. Other radiation safety postings or warnings as required by 10CFR20 shall be placed in areas as required.

3.1.6 Radiation Control

Radiation areas shall be posted and controlled according to 10CFR20 requirements. Personnel radiation exposures shall be monitored by Health-Safety using

3.1.6 Radiation Control Con't.

appropriate devices based on the type of radiation and sensitivity requirements, including thermoluminescient dosimeters (TLD) or self-reading pocket ion chambers (SRD). Dosimetry issue to plant personnel and visitors will be determined based on the monitoring requirements of 10CFR20. Accidental neutron radiation exposures will be monitored by indium foil issued to personnel as an integral part of the standard identification badge. Other dosimetry will be issued as necessary for unusual circumstances such as source manipulation or work involving highly transient exposure rates. Extremity exposure monitoring is accomplished using TLD badges as required by 10CFR20. TLDs are processed by a vendor at monthly or quarterly intervals. Immediate processing is available for rapid evaluation of exposures. Personnel monitoring reports shall be prepared as required by applicable regulations.

3.2 Tecnnical Requirements

3.2.1 Controlled Areas - Personnel Contamination Control

Radiologically Controlled Areas (RCA) shall be established by Health-Safety as an area used to control work involving surface contamination above uncontrolled area limits. RCAs may contain a "clean area" which is a potentially contaminated area and one or more Contaminated Areas (CA), which are areas known to be contaminated. Personnel must frisk prior to leaving a RCA or the immediate area adjacent to the RCA boundary. Upon leaving a CA, personnel must frisk prior to working in another area of the RCA. Personnel working in a RCA shall be properly trained prior to work or be escorted by a qualified worker.

Contaminated Areas shall be designed to include a step-off pad or an intermediate change room. The purpose of the step-off pad is to establish a designated area where personnel enter and exit the Contaminated Area. Prior to stepping on the Step-of pad, all protective equipment and anti-contamination clothing shall be removed. In RCAs which do not contain a clean area (i.e., the entire RCA is a Contaminated Area), an intermediate change room may be provided in lieu of the step-off pad. Guidelines for entry into intermediate change rooms shall be established for each area.

Upon completion of radiological work involving surface contamination, personnel will perform a complete

3.2.1 Controlled Areas - Personnel Contamination Control Con't.

wholebody frisk. Frisking instruments will be provided and maintained by Health-Safety and will be selected based on the type of radiation or contamination being monitored within the particular area or the scope of work being performed. Friskers shall include a visual and audible alarm. The alarm set point will be established as low as possible taking into account the need to minimize the number of false alarms.

Personnel Decontamination Policy

Health-Safety shall be notified if contamination above the frisker alarm set point is detected on personnel skin or clothing as they exit from a RCA and when initial decontamination efforts fail to reduce the contamination below the alarm set point. Health-Safety shall assist with further decontamination efforts as necessary to reduce the exposure to a level as low as reasonably achievable, consistent with good health physics practice, before releasing the employee.

3.2.2 Ventilation System

3.2.2.1 Airborne Effluents to Uncontrolled Areas

Airborne effluents to uncontrolled areas shall be controlled to the limits specified in 10 CFR 20 by means of heat resistant absolute type filters with rated collection efficiencies of 99.95% for 0.3 micron DOP particulate. Effluents shall pass through single stage HEPA filtration before release. Also, recirculated air shall be HEPA filtered prior to reentering controlled areas. Filtration efficiency shall be evaluated in accord with Regulatory Guide 3.2 (Efficiency Testing of Air-Cleaning Systems Containing Devices for Removal of Particles, 1/8/73) upon installation, and following major maintenance. The minimum acceptable system efficiency shall be 99.9%. The ventilation system shall incorporate the following requirements.

- Air recirculated back into the controlled area is sampled on a continuous basis to verify

3.2.2.1 Airborne Effluents to Uncontrolled Areas Con't.

filter effectiveness. Air will not be recirculated if levels are above 25% DAC of 10 CFR 20 Appendix B, Table 1.

- At least one filter housing or bank in each system shall be equipped with a device for monitoring differential pressure. Differential pressure shall be checked weekly and filters replaced when damage is evident, or when the differential pressure exceeds 4 inches of water.

- Gaseous effluents shall be representatively sampled for gross alpha on a continuous basis, and when the facilities are in operational status, the samples shall be collected daily and counted after allowing for decay of radon and its daughters.

3.2.2.2 Uncontrolled Area Air Effluent Limits

Compliance with the following release limits shall be maintained in order to ensure that airborne releases to uncontrolled areas are maintained as low as reasonably achievable (ALARA).

If the gross alpha radioactivity (excluding radon and its daughters) in planned gaseous effluent discharges exceeds 10 uCi per calendar quarter, a written report shall be submitted to NMSS and the Regional Office of the Commission within 30 days; identifying the cause for exceeding the limit, and the corrective actions to reduce release rates.

If the gross beta radioactivity in planned effluent discharges exceeds 25% (based on a quarterly average) of the corresponding DAC specified in Table 2 of

3.2.2.2 Uncontrolled Area Air Effluent Limits Con't.

Appendix B to 10CFR20, an investigation of the system will be conducted to determine the reasons for abnormal levels of release.

If the parameters important to a dose assessment change such that the parameters no longer represent boundary conditions, a report shall be submitted within 30 days which describes the changes in parameters and includes an estimate of the resultant change in dose commitment (Ref.: Order to Modify License, January 28, 1980).

Personnel exposures monitored in uncontrolled areas will be assessed and evaluated according to section 3.2.3.

3.2.2.3 Ventilation Negative Pressure

A ventilation system will be provided for each Radiologically Controlled Area to maintain areas of higher contamination at a slight negative pressure to uncontrolled areas. For temporary RCAs, negative pressure does not have to be maintained if HP review determines radiological conditions do not require negative pressure.

3.2.2.4 Hoods and Gloveboxs

Hoods or equivalent airborne activity control devices are installed and utilized so as to maintain airborne contamination levels as low as reasonably achievable, consistent with operational requirements. The degree and type of containment required for individual operations shall be determined by Health-Safety based on the airborne radioactive particulate generation potential including the:

- potential for alternation of physical form or characteristics of

3.2.2.4 Hoods and Gloveboxs Con't.

the material being processed.

- possibility for resuspension based on the morphological characteristics of the material and the nature of the operation.

- potential for development of abnormal or unusual conditions.

- previous operational history and air sample documentation.

Hoods and gloveboxes shall be constructed of fire resistant materials. Windows and viewing ports, when included shall be fire resistant. Exhaust flow rates from gloveboxes shall be such that a minimum negative pressure of 0.25 inches of water is maintained when openings are closed.

Pressure differential shall be monitored by manometers or equivalent devices. Minimum face velocities for hoods and similar enclosures shall be 100 LFM whenever hood work involving dispersible radioactive particulate is being performed.

Air velocity surveys shall be conducted using heated thermocouple anemometers or equivalent. Higher velocities may be required, based on Health-Safety survey data.

1. Glovebox negative pressures shall be monitored weekly, except during plant shutdown of a week or longer.

2. Face velocities shall be measured weekly, except during plant shutdown of a week or longer.

"Elephant trunk" drops shall be used as required for maintenance or non-routine activities requiring exhaust ventilation and where other, more permanent types of containment are not practicable.

3.2.2.4 Hoods and Gloveboxs Con't.

Except as noted above, elephant trunks shall not be used as a routine control measure without the specific approval of Health-Safety. Minimum velocity at the point of entrance to "elephant trunk" drops shall be 1300 LFM and shall be measured weekly when the area is in operation.

3.2.3 Work-Area (Controlled Area) Air Sampling

To verify the effectiveness of the ventilation systems and contamination control enclosures or air capture devices, air samples in work areas at fixed or permanent locations will be collected and analyzed. Breathing zone air samples from employees performing work will be collected for the purposes of determining exposures as provided in Title 10, Code of Federal Regulations, Part 20, et. al. Collection of breathing zone samples shall be performed in accordance with Regulatory Guide 8.25, "Air Sampling in the Workplace". Evaluation of air sample results will be conducted to ensure compliance with applicable exposure limits and maintain appropriate cognizance of work area conditions. Work operations will be reviewed and evaluated when employees receive an exposure in excess of 4 DAC-Hrs for routine work or 6 DAC-Hrs for non-routine or infrequent work. The maximum evaluation period interval for routine work will be 1 shift (the largest period of continual work by one individual per day) and for non-routine work, the duration of the work operation.

General area air samples shall be collected and analyzed as stated in the preceding paragraph.

Upon initiation of new operations, non-repetitive operations, or operations modified such that previous airborne contamination levels may be affected, Health-Safety shall verify that satisfactory control is being maintained by means of the air sampling techniques stated above. The scope and duration of such special program shall be determined by Health-Safety based on good health physics practice.

Health-Safety shall maintain records of investigations and corrective actions taken. The action levels do not apply to non-routine operations conducted with the cognizance of Health-Safety, and in accord with

3.2.3 Work-Area (Controlled Area) Air Sampling Con't.

specific contamination control measures (for example, certain maintenance activities).

3.2.4 Radioactivity Measurement Instruments

3.2.4.1 Portable Instrumentation

Portable instrumentation used to evaluate general area radioactivity shall be capable of detecting contamination levels at or below license limits or action levels.

3.2.4.2 Effluent Measurements

Analytical capability for evaluation of effluent samples shall be such that instrument sensitivity and sample preparation techniques allow detection of the effluent stream at or below the most restrictive action level or release limit.

3.2.4.3 Criticality Monitoring System

A criticality monitoring system shall be maintained in compliance with the appropriate sections of 10 CFR 70. Response time for the system shall be in accordance with Regulatory Guide 8.5, "Criticality and Other Interior Evacuation Signals" dated March 1981. The criticality monitoring system will be functionally tested at least quarterly and detector units calibrated annually.

3.2.4.4 Instrument Calibration

All instrumentation shall be calibrated prior to first use, following major maintenance, and at other times as deemed necessary. In any case, calibration shall be performed at least semiannually. Laboratory counting instruments shall be calibration-checked daily when in use. Calibration records shall be maintained for a minimum of two years. Calibration shall be performed by Health-Safety personnel or other NRC licensed

3.2.4.4 Instrument Calibration Con't.

facilities. The criticality monitoring system is calibrated as indicated in 3.2.4.3. Functional response using check sources shall be made prior to use.

3.2.5 Radiologocal Surveillance and Monitoring

To monitor the radiological conditions in work areas and ensure the continued effectiveness of the radiological control program, routine surveys will be conducted. Routine surveys shall include surface contamination and radiation levels in and adjacent to radiological controlled areas (RCAs) and contaminated areas. Surveys shall also be conducted in uncontrolled areas to monitor the spread of contamination beyond established contamination control boundaries. Survey techniques and instrument selection will be selected based on the isotopes and type of radiation being monitored.

The following contamination levels are established to define the areas in which contaminated materials are processed or handled. If contamination is found in the area above the corresponding levels, the items must be moved to the appropriate area, the contamination levels reduced, or the area must be posted and controlled as required by the contamination levels present. The levels given for Contaminated Areas are established for maintaining exposures ALARA during routine work. Work is permitted on items exceeding these values provided that contamination controls are implemented consistent with the levels present.

Area Definition*	Alpha**	Beta/Gamma
Uncontrolled Areas	200/1000	1000/0.1
Change Rooms - Uncontrolled	200/1000	1000/0.1
Change Rooms - Intermediate	500/4000	NA
RCA - Clean Areas	500/4000	1000/0.1
RCA - Contaminated Areas	5000/100K	500K/100

* Units are DPM/100 cm^2 for except for beta/gamma fixed readings which are in mR/hr.

3.2.5 Radiological Surveillance and Monitoring Con't.

** Alpha limits are specified for Uranium processing only. These limits do not apply to beta/gamma work areas. 20 DPM/100 cm^2 has been established as an investigation level for alpha radiation/contamination in beta/gamma work areas.

3.2.6 Bioassay Program

Radiobioassay will be performed to determine whether personnel exposure assigned by airborne radioactivity measurements are accurate. Techniques will include analysis of urine samples and lung or whole body counts. Bioassay measurements will not be used to determine or assign routine personnel exposures. In the case of significant internal exposures, bioassay measurements may be used to supplement or separately determine the amount of internal exposure received.

3.2.7 Use for Unrestricted Handling (RFUH)

Equipment and areas previously contaminated above the limits specified in section 3.2.5 of this document shall be surveyed and released for unrestricted handling (RFUH) in accordance with "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material", USNRC, August 1987, Exhibit A to section 1 of this document.

4.1.6 Dedicated Controls

The CNFP primary criticality control for SNM prior to fuel bundle assembly is the four inch slab criteria and moderation control. Upon completion of fuel rod fabrication, spacing and moderation control are relied upon. These controls are maintained by the following:

4.1.6.1 Moderation Control

All accumulations of liquids and hydrogenous materials are regulated through the local safety rules. The authorized volume per container is one gallon with a total volume not to exceed 20 gallons. This criteria is exempt when SNM material is absent. For the fuel assembly areas, water lines are baffled.

4.1.6.2 Pellet Receipt

Pellets are received by the vendor in approved shipping containers which contain six cardboard boxes of fuel pellets. When they are removed from the shipping container, the boxes are stacked two high (8 inch slab) in-transit to the conveyor. This only occurs for a very short period of time and only one shipping container (six boxes of pellets) are transferred at any one given time. They are placed on the conveyor one cardboard box at time which initiates the four inch slab. There is a physical barrier on the conveyor to prevent anything above four inches from entering the pellet loading room.

4.1.6.3 Pellet Loading Room

The pellets remain in the box for storage purposes. The vault is constructed with a barrier to prevent double stacking of the boxes. Only if the boxes were manually lifted above this barrier could double stacking result and this would take great effort on one's part to do and could not be accomplished accidently.

For loading purposes, the pellets remain stacked on the corrugated trays in a four inch slab. All hoods, the pellet down draft table and carts are either twenty-eight inches in width or less or a red line indi-