



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

PDR

SEP 8 1980

Ref: SA/McG

Mr. Albert J. Hazle, Director  
Radiation and Hazardous Waste Control  
Division  
Department of Public Health  
4210 East 11th Avenue  
Denver, Colorado 80220

Dear Al:

This is to confirm the comments made to you regarding the recent regulatory program review held by John McGrath and Craig Gordon.

Based on the results of the review, the staff believes that the State's program for control of agreement materials is adequate to protect the public health and safety and compatible with the Commission's program.

During our previous review we recommended that all applicants for license renewal be required to submit a complete new application so that references to out-dated and superseded materials can be deleted from licenses. We commend the State for its efforts in this area. Also during our last review specific comments were provided to the staff regarding deficiencies in two licenses, issued to Kaman Sciences Corporation and Joy Manufacturing Company. In the past year no action has been taken by the State to correct the deficiencies. We recommend that the State initiate action to upgrade these licenses. Our previous comments regarding their deficiencies are attached.

With regard to the States compliance program, our accompaniments of State inspectors revealed that inspections are for the most part being adequately conducted. Some specific suggestions for improvement were provided to you and your staff. In general, inspection reports were also adequate. We offer the following suggestions regarding the compliance program:

- 1) Field evaluations of materials inspectors should be performed by supervisory personnel at least annually.
- 2) Written procedures for handling escalated enforcement actions should be distributed to the staff.
- 3) Prior to a mill inspection, arrangements should be made with the State laboratories in order that environmental samples may be prepared, analyzed, and evaluated soon after the inspection is completed. Inspection reports and enforcement correspondence should also be completed in a timely manner following all mill inspections i.e., within 30 days.
- 4) Reports prepared by the State on incident investigations should indicate the status of the incident as well as the progress of any enforcement action taken following its investigation.

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Mr. Albert J. Hazle

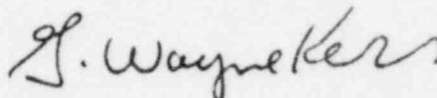
- 2 -

We have been asked by the National Wildlife Federation to review the State's actions regarding the Pioneer Uravan Ore Buying station. Information on this proposed action was obtained during our meeting, however we have not yet completed our review. Our specific comments on this action will be forwarded at a later date.

With regard to training, we recommend that Mike Brown and Janet Smith attend our Orientation Course in Regulatory Practices and Procedures. Janet Smith could also benefit from our Inspection Procedures Course.

We would appreciate your review of the above recommendations and would like to receive your comments on them. I appreciate the cooperation extended to Messrs. McGrath and Gordon during their meeting with you and your staff.

Sincerely,



G. Wayne Kerr, Assistant Director  
for State Agreements Program  
Office of State Programs

Enclosure:  
As stated

cc: F. Traylor  
R. Arnott

Issued: Not noted

Expires: Not noted

This is a major industrial license which was selected by the reviewer because the licensee has a potential for releasing significant quantities of radioactive material to the environment. The license authorizes the possession and use for development, production, repair and operation of neutron generators and distribution of specified models of equipment containing tritium, use of cesium 137 for tagging of graphite disks, the use of sealed sources of krypton 85, irradiated materials, 11 mg of radium for instrument calibration, atomic numbers 3-83 for instrument calibration purposes, uranium 235 95% enriched (50 grams) for thermocouple module response, cesium 137 sealed source for dosimeter calibration, and 10,000 pounds of depleted uranium in castings. Maximum quantity of tritium is permitted is 8,000 curies for neutron generators. The maximum quantity of cesium 137 for tagging is 1 curie and all other materials of the maximum quantity is less than 1 curie.

The license and compliance folder contains materials dating back to 1960. The present license tie down condition includes reference to an application dated August 15, 1960 and subsequent applications and letters in 1965, 1967, 1969, 1970, 1975, and 1976. The 1960 application asks for authorization to demonstrate a neutron source at unspecified locations. On September 8, 1965 the licensee submitted handling procedures to be used by licensed neutron generator users, but there were references to bioassay criteria which are now out-dated. There is also evidence a portion of these procedure was superceded by Amendment No 35. On August 23, 1967 an application was received containing radiation protection instructions. These contained inadequate criteria for tritium bioassays, and there is a reference to respiratory protection. A facility description is included, and the reviewer wondered if this facility description, now 22 years old, is still valid. There, however, were no other diagrams, no organization charts, no program for auditing the license program, no information on waste disposal, effluent monitoring, ventilation, instruction to employees, nor information on hood and exhaust effluents. In 1969 and in 1970 there were eight submittals pertaining to procedures, field servicing, and use of the neutron generator at the Kaman plant. In 1975, two applications were received for amendments on the authorized users and radioactive materials, and modifications of procedures. In 1976, an amendment was issued authorizing possession of 95% enriched uranium, 50 gram quantity. Since July 1978 there have been three amendments issued as follows: No. 46 was an amendment in its entirety based upon a September 30, 1977 letter, and it carries forward the license through a March 31, 1979 expiration date. This amendment was dated November 18, 1978. Amendment No. 47 changed the expiration date to February 28, 1984, in accordance with a written request by letter dated January 18, 1979. This was a simple request for renewal which stated there were no changes in the conditions for the license. Amendment No. 48, which is the last amendment found in the file, was dated June 22, 1979, and

made changes in the user condition in accordance to a letter received from a licensee and dated April 18, 1979.

In reviewing this license file, the following comments and recommendations were developed. Reference should be made to the NRC tritium bioassay guide dated October 19, 1977. There is a need for updated plans and description of the facility. This should include the storage areas, unrestricted and restricted areas, description of ventilation system and patterns, storage areas, hoods, interlocks, high radiation areas, shielding, and air monitors. There is a need for organization charts. No information on an internal audit program for the radiation safety program is included in this license. There is very little detail on training programs for employees, including a scope of training for persons approved for field work. No information is contained concerning instruction for janitorial personnel and there is no information concerning the giving of examinations to people who are trained to use radioactive material, and likewise, there is no information on retraining. There is no information on air sampling. Survey instruments which are used by the licensee should be specified by make, model number, and information on calibration and daily checks for operation should be provided. The licensee apparently is making wipe surveys but has not provided information on laboratory equipment used for counting the wipes. There is very little information on the cleanup system, monitoring, storage and disposal practices for effluents from the plant. There is no information on equipment used to contain radioactive material and no information on protective clothing that might be provided to employees, including the types that are provided and criteria as to when protective clothing should be worn. No information is provided on who performs surveys, when the surveys are performed, what types of surveys are performed, including surveys of ventilation systems. There is very little information contained in the license pertaining to the types of records being maintained by management regarding surveys, inventories, personnel monitoring, use and disposal records. There is no information pertaining to who reviews these records. There are no statements in the license concerning instructions to employees to prohibit food and smoking in contaminated areas. It would be appropriate for a licensee of this type to submit an environmental assessment outlining how much radioactive materials will be released out the stack and through waste water drains and describe a sampling program to confirm his assessments. Written procedures governing inhouse procedures, emergencies, and field operations should be included in this license. If protective clothing is used and laundered, then the information on the laundry operation should be provided. This licensee should also provide procedures for surveying and handling incoming packages of radioactive material.

In reviewing and handling this license, the license reviewers should make reference to NRC Regulatory Guides 8.10, 8.21, 10.2, 10.7, and the Guideline for Bioassay Requirements for Tritium.

A review of the information in the file did not disclose any hard information that would enable determination of how much radioactive material is being released by this licensee to the environment. As a results of the reviewer's inquiry, the staff member contacted Kaman and the following information was obtained. According to the licensee, 4.3 curies of tritium was released through the stack from the period September 1978 through September 1979 based

on a review of strip charts for their tritium monitor. With respect to sewage,  $8.9 \times 10^2$  microcures of tritium maximum was released during the last 12 months. At the present time, there is no laundry, however, it was not resolved as to whether or not there was a laundry previously in operation at this plant. Throughput at this plant for the period September 1978 to September 1979 was 516 curies. Therefore, the release up the stack represented a loss of about 1% of the throughput.

Joy Manufacturing Company  
Hard Rock Mining Division  
Denver, Colorado 80239

License No. 399-015

Issued: April 30, 1979

Expires: April 30, 1984

This license was selected by the State Agreements license reviewer for review. The license authorizes the evaluation and development of a tailings handling system and authorizes possession of 60,000 kilograms of uranium in slurry form in Aurora, Colorado. This is equivalent to 66 tons. The license file contains an undated application received by the State on August 4, 1978, signed by the Director of Technical Development requesting authorization for 4,000 kilograms of 0.02 to 0.03 percent of U-308 tailings and cesium 137 in an Omart density gauge. The instrumentation was stated "to be determined" and the film badge and other dosimetry would be provided per "suppliers recommendations." A drawing of the full process was provided. The disposal was to be to a mill tailings pond after going through the tailings handling system. Tailings from various mills would be received via 55-gallon drums in a DOT Spec 17-C container with an internal epoxy container. It was not specified whether it would be dry tailings but apparently it would be. The tailings would be repulped to 35% solids by volume and then be sent to a 1,000-gallon hold tank then to a feed tank and then to a closed circuit "tailings handling system" which was unspecified. The gauge would be used for density readings in the process. After use, the tailings would either be recycled via a hold tank or "pumped back into the original barrels where they are stored till deposition into an existing uranium tailings pond." (However, there is no existing uranium tailings pond at Aurora. This is intended to mean existing ponds at mill sites.) On October 2, 1978, Jacobi sent a deficiency letter asking for details on the operation, the length of time the operation would be in operation, identification of where the tailings pond would be, the emergency procedures for the truck driver hauling the tailings, and other information. On January 22, 1979, a letter was received from the applicant.

enclosing a pilot plan, operations report, and a description of plant operations and stating the life of the plant would be for an indefinite period. Decontamination activities would be in accordance with a radiation protection program and a copy of a tailings disposal agreement was included. This disposal agreement implied that the uranium mill licensees would have to be authorized to receive the tailings. It was not clear if this was done. A copy of the driver's emergency procedures was enclosed. One radiation survey instrument was specified as having alpha and gamma probes to be calibrated by a consultant who was specified or by the manufacturer. There was a reference to Radon 222 ventilation which was stated would decrease to background and no air sampling or monitoring for inhalation would be necessary. Mean dose rates would be multiplied by time sheets to determine if exposures to personnel were greater than 500 MRem. in a quarter. If exposure rates were greater than this value, personnel monitoring would be issued. It was noted, however, by the reviewer that the regulatory criterion and for personnel monitoring is that it is needed if radiation exposures of workers are greater than 25% of 1.25 Rem or 313 millirem.

Estimates of radon concentrations were also provided. The applicant stated that the maximum levels of radon would be 17% or 10 picocuries per liter or 0.05 working levels and the best level would be 1% or 1 picocurie per liter, and 0.003 working level. The reviewer attempted to verify these calculations and could not. According to his calculations, the maximum radon level would be not 17% but 41% of the MPC. Furthermore, it was not clear how all of the figures in the radon calculation were derived.

With respect to decontamination, the licensee stated that for small volumes of contaminated liquid (less than 50 gallons), wet vacuum or washing techniques to trench drains in the floor would be used. These drains connect via sand traps to the sanitary sewer system. The applicant estimated that the concentration of insoluble nuclides would be  $5 \times 10^{-4}$  microcuries per ml (which is 6 times the radium 226 or thorium 230 mpc for unrestricted areas). The applicant went on to say that since most of the solid materials are trapped in the sand traps and recovered for disposal, the small amount of solid material that escapes to the sanitary sewer system will be adequately diluted by the wash water. It was pointed out by the reviewer that to be disposed of in the sanitary sewer system the radioactive material must be soluble or readily dispersible. The licensee should also specify cleanup efficiencies of the traps and give data to back up their statement. There was also a need to evaluate the soluble activity. With respect to large volume disposals, the licensee stated that these will be held in holding tanks until properly sampled and analyzed. Again there is no discussion about the insoluble fraction. When the license was issued there was no authorization in the license for the cesium 137 gauge.

With respect to training, more information was required for instructions in the licensee's procedure and ALARA and who would receive the training.

In summary, the following points were made in regard to this license. There is a need for an organization chart showing the relationship of management to radiation safety and to employees. There is a need for management audit program. The training program needs to be better defined. A diagram showing the identification of controlled and uncontrolled areas needs to be provided.

If the tailings are to be returned to mill licenses, then the mill licensees need to be authorized to receive the tailings for processing and disposal in their tailings piles. With respect to radon 222, there should be measurements made by the licensee to verify his calculations. We also pointed out that the calculations looked questionable. With respect to personnel monitoring, the rationale for no personnel monitoring had a faulty criterion in that the criterion for issuing personnel monitoring should be 313 millirem in a quarter, not 500 millirem as stated by the licensee. The licensee needs to specify who will perform certain surveys, state the frequency and specify who will review the survey report. With respect to liquid waste disposal, sewer disposal requires material to be in soluble or dispersible form, not insoluble. The licensee needs to verify the cleanup efficiency of the traps and needs to evaluate the potential problems for radium buildup in the traps. The rationale for disposal of liquid radioactive waste through this method is questionable. Details need to be provided on laboratory and analytical procedures for evaluating the contents of large volumes filled prior to disposal. With respect to facilities, information is needed on ventilation, details on control of volumes, and information on prevention of overflows and whether or not the tanks are covered.

Maintenance, a important and significant area, is unaddressed in this application. Procedures and specifications for radiation work permits should be specified. Procedures for sampling tanks to insure that representative samples are collected need to be specified. Emergency procedures, including those covering overflows, pipe leaks, and pipe breaks, need to be provided. The licensee needs an authorization for the cesium 137 gauge. A May 9, 1979 letter, concerning lock-out procedures was not included in the license. It was recommended that the license incorporate the NRC Standard License Condition No. 43 concerning contaminated material. The new tie-down condition used by the NRC should be utilized. Controls over contaminated tools, articles, and equipment should be specified in the license application. The disposal of solid waste such as contaminated rags, disposable items, sand traps, etc. need to be specified. A condition specifying a maximum through put and a requirement for changes to the basic process must be approved by the State should be added to the license. It was also recommended that the staff make reference to Wyoming Minerals Corporation License SUA-1315 issued by the NRC particularly Condition Nos. 11, 13, 14, 15, 16, 17, 20, 23, and 30. A copy of this license was left with the staff. Finally, the licensee should be requested to provide a decommissioning plan.