



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
631 PARK AVENUE  
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 30-10311

JUL 16 1980

Spire Corporation  
ATTN: Dr. R. Little  
President  
Patriots Park  
Bedford, Massachusetts 01730

Gentlemen:

Subject: Inspection 80-01

This refers to your letters dated May 12, 1980 and May 19, 1980, in response to our letter dated April 18, 1980.

Our understanding of the information provided in your May 19, 1980 letter, is that over the years since your original license application was filed in 1976, the size and other physical characteristics of objects containing licensed material which you handle have changed. Based on these changes, you have planned changes in your operating procedures. However, you have implemented these procedures without the required review and approval of the NRC's Material Licensing Branch. The purpose of an NRC license such as the one issued to Spire Corporation, is to ensure that all operations involving licensed material are conducted using procedures which have been reviewed and approved by the NRC so that such activities will be conducted safely. Some of the changes which you implemented, such as the requirement that your contractor steam clean and then paint-dip the capsule body, did not require additional regulatory review and approval since they were not conducted under your license, and apparently resulted in additional safety in your operation. However, other changes such as the decision to use tongs to transfer the irradiated objects and not to use your reactor capsule opening fixture did require regulatory approval and appear to have reduced the margin of safety in your operation.

With regard to your response to Item B.1 of the enclosure to our April 18, 1980 letter, we agree that initial measurements of the radiation levels from the irradiated nose cones through the lead pig are an appropriate way of estimating the dose rate from the nose cone. However, when handling an object with radiation levels such as those associated with a nosetip, it is standard health physics practice to make periodic and/or continuous measurements of radiation levels in areas where individuals are working. This should require only minimal additional radiation exposure, and does not require a closer approach to the object being manipulated than any individual actually makes. Your response should reflect appropriate improvements in your radiation surveys during handling of irradiated objects. In addition, you failed to respond to that portion of Item B.1 which states that you failed to evaluate the dose to the extremities of the individual who handled the irradiated nosetip with his hands. An evaluation of this exposure

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is required even though you did not intend for this individual to touch the nosetip with his hands. Since the measurements discussed in your response were probably made with detectors of reasonable physical size, they are not likely to be representative of the actual dose rate at the surface of the nosetip. The actual surface dose rate is of little importance unless, as happened in this instance, an individual actually handles the nosetip. NRC regulations require that you make an evaluation of the actual exposure to the hands of this individual.

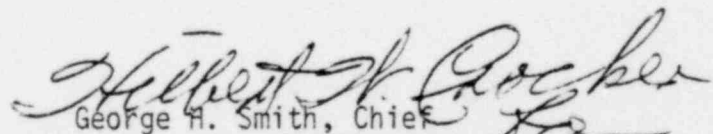
Your description of monitoring for airborne radioactivity in response to item B.2, is not adequate. Checking respirator cartridges for radiation using a pancake survey meter with a 0.25 mR (per hour?) background does not normally demonstrate that concentrations in Appendix B Table 1 of 10 CFR 20 were not exceeded. Your description of future air sampling in which "...total accumulated radiation...." on a filter of a air sampling device will be read out and recorded does not provide sufficient information for us to determine that the monitoring will be done properly.

Your discussion of Item C fails to respond to the fact that a sensitivity of 0.005 microcuries on the test sample and that accurate calibration of the measuring instrument are both required.

From our understanding of your response, we suggest that you prepare written descriptions of the actual procedures which will be followed in all future handling of licensed material and submit them to the USNRC, Office of Nuclear Material Safety and Safeguards, Materials Licensing Branch, Washington, D.C. 20555, with the appropriate fee and request that your license be amended to include these procedures.

Within 20 days of receipt of this letter, please provide the additional information with regard to each item discussed above and state your intentions with regard to changes in your procedures.

Sincerely,

  
George H. Smith, Chief  
Fuel Facility and Materials Safety  
Branch