

August 19, 2014

INFORMATION NOTICE: KS IN 2014-02

Inadequate surveys for wireline operations

ADDRESSEES

All Kansas well logging licensees

PURPOSE

The Kansas Department of Health and Environment (KDHE) is issuing this Information Notice to remind licensees of the requirement to know the radiation field present around the logging tool when it contains the maximum loading of radioactive material, the potential exposure to members of the public (drilling crews and other non-radiation workers), the minimum safe distance members of the public may approach without challenging the 2 mR in any one hour public dose limit.

This Information Notice also identifies the minimum requirement for survey meters 0.1 mR/hr to 50 mR/hr range of operation may not be adequate to measure the radiation field around the logging tool.

The information contained in this Information Notice does not represent new regulatory requirements and does not require a written response or specific action. Addressees should review this Information Notice for applicability to their circumstances.

CIRCUMSTANCES

Various surveys are required by K.A.R. 28-35-359 Radiation surveys in occupied positions and on the exterior of each vehicle used to transport radioactive material, after removal of the sealed source from the logging tool and before departing the job site check the logging tool for contamination, and if the sealed source may have become damaged. These surveys have typically been well documented and described in the operating and emergency procedures.

Licensees seem to have forgotten K.A.R. 28-35-341. **Persons to whom these regulations apply.** The regulations in this part shall apply to each licensee or registrant who uses any source of radiation for wireline service operations, including mineral logging, radioactive markers, or subsurface tracer studies. The requirements of this part shall be in addition to, and not in substitution for, the requirements of Parts 1, 2, 3, 4, and 10 of these regulations. Survey requirements in part 4 include K.A.R. 28-35-214b to demonstrate compliance with the dose limits to individual members of the public and K.A.R. 28-35-217b requires surveys to evaluate radiation levels and potential radiological hazards present.

A typical 2 curie cesium-137 sealed source may measure 7.1 R/hr at one foot and 0.7 R/hr at 1 meter when installed in the logging tool. The readings will be slightly higher when the americium-241 neutron source is installed on the logging tool. A 15 curie americium/beryllium sealed source may measure 0.4 rem/hr gamma and 0.4 rem/hr neutron at 1 foot.

Members of the public (drilling crew, other miscellaneous personnel, property owner) may not be exposed to greater than 2 mR in any one hour. The distance corresponding to 2 mR/hr is approximately 60 feet for a bare cesium-137 sealed source exposed for an hour or longer. The source holder (bull nose) and logging tool do provide a small amount of shielding and the source is not exposed for an hour. Each logging crew needs to understand 1) the time needed to install the sealed sources in the logging tool and get the logging tool in the borehole to begin logging operations, 2) the dose rate when the logging tool is loaded and 3) the minimum distance to place the boundary so members of the public are not challenging the public dose limit. These values need to be determined and confirmed at least annually or when new sources are received and reinforced during the annual safety review and during annual job performance inspections.

Survey instrumentation needs to be capable of measuring the radiation fields expected to be encountered. As shown, the potential dose rates far exceed the minimum operating range permitted by the regulations. The recommended gamma survey instrument operating range is 2 mR/hr to 1000 mR/hr. A licensee who uses neutron sources such as americium-241/beryllium the recommendation is to have available at least one survey instrument capable of measuring neutron radiation or at least know the relationship of gamma to neutron radiation of the sources used.

CONCLUSION

Logging personnel need to understand the dose rates they are working around and the importance of time, distance and shielding in their daily job. Logging personnel need to understand the effect of how well they do their job will affect the exposure to individual members of the public. Logging personnel need to have better control of a well site including posting of the area when the logging tool is not in the borehole. Logging personnel need to understand the types of radiation they are working around and how the different types of radiation may affect their total exposure.