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OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

June 4, 1985

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTN: Docketing and Service Branch

Dear Sir:

In reference to the proposed U.S. NRC rule concerning Licenses and Radiation Safety Requirements for Well-Logging Operations (10 CFR Parts 19, 20, 21, 30, 39, 40, 51, 70, 71, and 150), Consolidation Coal Company (Consol) is submitting the following comments.

Consol is engaged in coal mining operations and as part of its work conducts routine coal exploration programs which at times involve radioactive density logging of bore holes. Consol's coal exploration programs are conducted throughout the continental United States and involve drilling depths usually less than 2,000 ft. Our radioactive density logging of bore holes use low level gamma ray sealed sources when compared with sources utilized in the oil and gas industry. Source types and their respective activity utilized by Consol include: Americium-241 (500 millicuries), Radium-226 (3.4 millicuries), and Cesium-137 (20 millicuries).

For your information, and as documentation of Consol's current practices, we have enclosed a copy of Consol's Radiation Safety Program Guidelines.

COMMENTS TO PROPOSED PART 39:

Section 39.15 - Written Agreement between Well Owner/Operator and Well Logging Company - Consolidation Coal Company primarily uses its own company operated well logging equipment. In this case, where the well owner and well logging company are one entity under license to the NRC and/or Agreement State, Consolidation Coal Company requests that the requirement for a written agreement be waived. By not requiring execution of a written agreement reduced

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paper work would be achieved; however, Consolidation Coal Company would still be governed to handle lodged or irretrievable radioactive sources in the same manner as proposed by the NRC. In the few cases when Consol sub-contracts well logging to an outside company, it is agreed to execute a written agreement between both companies.

Section 39.35 - Leak Testing of Sealed Sources - Paragraph (b) - Method of Testing - Consol currently performs leak testing of all sources at 6 month intervals and agrees with the proposed NRC rules concerning leak testing. Consol requests further clarification concerning how the NRC plans to specify and approve "persons or companies authorized to perform the leak testing". Consol currently contracts leak testing services from companies such as Nuclear Sources & Services, Inc., Houston, TX and RAD Services, Inc., Pittsburgh, PA. Will these companies be authorized by the NRC under the proposed new rule? Will NRC authorization be reviewed by the NRC on a case-by-case basis or will the NRC continually issue update lists of approved service companies?

Section 39.41 - Design and Performance Criteria for Sealed Sources Consolidation Coal Company agrees with the overall NRC objective of developing minimum performance criteria for sealed sources; however, it is recommended that the NRC conduct further research and extensive review of source/logging probe designs offered or under development by present manufacturers.

The primary concerns involve the timely development and prototype testing of insoluble/non-dispersable sources and their compatibility with existing logging probe designs. For example, Consol has recently pursued the replacement of our doubly encapsulated Americium-241 sources (powdered oxide form) with new ceramic matrix form Americium sources. The present problem involves the unavailability of double encapsulation sizes to retrofit into existing slim-line logging probes used in coal and mineral exploration.

In reference to paragraph (a) (2) of the proposed rule 39.41, the timely development and commercial availability of sources which are as insoluble and non-dispersible as practical may be unattainable to meet the 2 year compliance period. Also, if ceramic matrix form Americium sources are mandated to be put in service, increased shielding effect is encountered from the ceramic matrix whereby

requiring much higher radioactive source activity sizes. These higher source activities would increase radioactive exposure to the licensed operator/ supervisor. At the present time, these larger source sizes do not allow the sealed sources to fit within existing slim-line logging probes.

As an alternative, it is recommended that the NRC consider extending the 2 year compliance time for low level Americium-241 sources used in coal and mineral exploration. It is felt that at least 5 years would be necessary for source and logging equipment manufacturers to develop, test, and market new slim-line probe designs which would employ ceramic form Americium sources.

Section 39.43 - Inspection, Maintenance, and Opening of a Source or Source Holder - Consolidation Coal Company recommends that further explanation and clarification be added to paragraph (d) of this section on maintenance. It is our interpretation that routine inspection and maintenance (i.e. changing O-ring) can be performed by the licensed operator provided the radioactive source has been removed from the probe/holder assembly and securely stored in a shielded storage vault while maintenance is being performed. As long as the sealed source is removed and properly stored, the licensee can perform routine daily or monthly maintenance without special written approval from the NRC.

Also, it is our interpretation that sources can be changed from one source holder to another as long as the action is performed by the licensed operator under controlled procedures which maximize handling safety and minimize radiation exposure. Written approval and/or instruction from the NRC would only be necessary in the event that a non-routine, stuck source, or defective condition is encountered concerning the source or source holder containing a radioactive source.

Section 39.51 - Use of a Sealed Source in a Well Without Surface Casing - This section, requiring installation of surface casing designed to protect fresh water aquifers, is considered too restrictive and can not be accommodated in routine coal exploration drilling programs. In the majority of coal and mineral drilling programs, the drill hole depths are considered relatively shallow (less than 2,000 ft), normally ranging from 50 ft. to 1,000 ft. in depth. Fresh water aquifers in these shallow holes can be

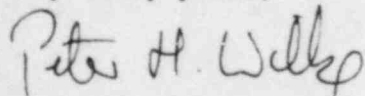
encountered throughout the entire hole depth, whereby requiring surface casing to be installed through the entire hole. Under the NRC definitions, the only method to protect and isolate suspected or known aquifers would be to cement or grout surface casing in the entire hole, making the casing a permanent installation. In order to perform geophysical logging (i.e. density logs) through the steel surface casing, a higher energy radioactive source would have to be employed. This casing requirement would increase radiation exposure levels to the operator and increase handling risks due to the requirement of higher energy radioactive sources.

Under the most conservative cost estimates, the added cost of surface casing and installation would double present drilling costs. As previously stated, fresh water aquifers normally can be encountered throughout the entire drilled section in coal exploration. For example, in the western and mid-continent regions of the U.S., ground water aquifers can be encountered in the coal seams themselves.

It is therefore recommended that coal and mineral exploration be exempt from the proposed surface casing requirement. This requested exemption is based upon 1) the low energy level nature of present radioactive sources (i.e. Americium-241), which are utilized in open hole logging, and 2) the increased radiation exposure and handling risks should higher energy level sources be necessary to log through steel casing.

As an alternative to provide adequate protection of fresh water aquifers from radioactive contamination, it is recommended that the NRC expand its requirements concerning Operating and Emergency procedures - Section 39.63 of the proposed rules. Specifically, the NRC should strongly enforce and review each licensed operators written procedures to be followed if a sealed source is lodged in a well. Paragraph (j) of Section 39.63 should specify accepted retrieval procedures to be used in handling lodged probes with radioactive sources. By adopting sound and accepted retrieval procedures, the risk of rupturing a radioactive source would be minimized.

Very truly yours,



Peter H. Wilke

PHW/js
Enclosure

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RADIATION SAFETY PROGRAM
GUIDELINES

OFFICE OF SECRETARY
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Central Exploration
Geophysical Loggers

Distribution:

- (1) - Central Exploration (Consol Plaza)
- (1) - Safety Dept. (Consol Plaza)
- (2) - Evansville Exploration
- (2) - Bluefield Exploration
- (2) - Denver Exploration
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Consolidation Coal Company
May 1984

RADIATION SAFETY PROGRAM

CENTRAL EXPLORATION - GEOPHYSICAL LOGGERS--

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RADIATION SAFETY PROGRAM

I. GENERAL PROCEDURES FOR THE USE OF RADIOACTIVE SOURCES

Licensed company personnel, i.e. E-logger, R.S.O., directly in charge of logging operations utilizing radioactive sources are responsible for the health protection of all personnel associated with the source and the general public who also may be exposed to this radioactive source at times. The licensed user (E-logger, R.S.O.) must personally supervise all source handling operations, usage, transportation, storage and shipping according to all regulatory guidelines and the following company directives:

1. Personnel who have been trained in handling sealed sources shall be the only ones who perform or directly supervise operations involving the source. Non-licensed or untrained personnel, including geologists, engineers, contractors, or general public, shall be required to be a safe distance ($> 20'$) from the source or wear the proper film badge, T.L.D., or dosimeter while near the source.
2. The source or source holders shall be returned directly to the proper transportation container or shield upon completion of logging operations at the drill hole. Any manufacturer supplied remote handling tools will be utilized to handle the radioactive source. No source or source holder will be transported from hole-to-hole or job-to-job outside of the approved transportation container or shield (see Checklist I).
3. All surveys, leak tests, and pertinent records are the responsibility of the E-logger, R.S.O. Copies of all surveys

RADIATION SAFETY PROGRAM

CHECKLIST I
BASIC RULES WHEN HANDLING RADIOACTIVE
SOURCES DURING WELL LOGGING

- ☐ - ALWAYS WEAR APPROPRIATE FILM BADGE, T.L.D. OR DOSIMETER
- ☐ - ALWAYS HAVE OPERATING AND CALIBRATED SURVEY METER
- ☐ - DO NOT HANDLE RADIOACTIVE SOURCE WITH BARE HANDS. Always use manufacturer supplied handling tools where required.
- ☐ - ALWAYS RETURN SOURCE TO SHIELDED STORAGE VAULT OR CONTAINER AT COMPLETION OF LOGGING OPERATION
- ☐ - STORAGE CONTAINER WITH RADIOACTIVE SOURCE SHOULD BE LOCKED AND SECURED TO PREVENT THEFT OR UNAUTHORIZED REMOVAL.
- ☐ - LIMIT TIME AND MAINTAIN SAFE DISTANCE WHEN PHYSICALLY HANDLING RADIOACTIVE SOURCE.
- ☐ - MAINTAIN PROPER LABELING OF RADIOACTIVE MATERIAL AND STORAGE CONTAINERS.
- ☐ - ALWAYS COMPLETE UTILIZATION LOG AT EACH WELL SITE & INVENTORY SOURCE AT COMPLETION OF WORK.
- ☐ - CONDUCT LEAK TEST AT LEAST EVERY SIX (6) MONTHS ON ALL SEALED SOURCES.
- ☐ - REQUIRE THAT ALL NON-ESSENTIAL OR UNTRAINED PERSONNEL BE AT A SAFE DISTANCE (>20') OF AREA WHEN HANDLING UNSHIELDED RADIOACTIVE SOURCE.
- ☐ - DO NOT TAMPER WITH, ATTEMPT TO REPAIR OR MODIFY A SEALED RADIOACTIVE SOURCE.
- ☐ - BE PREPARED TO HANDLE AN EMERGENCY AND ALWAYS CONTACT AND ADVISE MANAGEMENT AND REGULATORY AGENCIES.

*SURVEY INSTRUMENT MAINTENANCE & CALIBRATION:

- ☐ - Licensed survey instrument is at all times in working condition and carried in logging vehicle. ...
- ☐ - Survey instrument is calibrated at least every 6 months
- by a qualified testing laboratory.
- ☐ - Calibration certificates on permanent file at the regional office and a copy of the most recent certificate carried in logging vehicle.

*SOURCE CONTAINER D.O.T. CERTIFICATION:

- ☐ - All radioactive source containers (i.e. lead vault, steel box) must meet minimum requirements.
- ☐ - Certificates for each container must be available, indicating that tests were performed which meet minimum transport requirements.
- ☐ - Certificates are placed on permanent file at the regional office and copy carried in logging vehicle.

*RADIOACTIVE MATERIAL LICENSE:

- ☐ - Valid licenses are at all times maintained by regional office E-log operator (R.S.O.).
- ☐ - License renewal and ammendment changes are applied for by each regional office.
- ☐ - The Radioactive Material License, Applications, and Regulations are maintained on permanent file at each regional office.
- ☐ - Copies of the valid license and applicable regulations are carried in the logging vehicle.

*UTILIZATION LOG FOR SOURCES:

- ☐ - The E-log operator maintains an accurate record when and where a radioactive source is handled and used at each well site or facility.
- ☐ - The log records readings of a pre- and post- radiation survey with the licensed survey instrument at each well site or facility.
- ☐ - The utilization log includes drill hole identifications, dates, time, personnel involved, etc. when the radioactive source is utilized or handled.

II. PRECAUTIONS TO MINIMIZE THE RISK OF STICKING A GEOPHYSICAL PROBE

The operator of the logging truck has the responsibility to minimize the risk of sticking a geophysical probe before logging a drill hole. The following are precautions and procedures that should be followed by logger operators to avoid sticking the geophysical probe in the hole:

1. Always consult the driller to determine hole conditions and possible hazards.
2. Consult with the Geologist on core condition and possible trouble spots in the hole.
3. Make sure all logging equipment is in proper working order (cable, cable connector, bow spring, etc.).
4. Enter the hole at a safe speed (30 ft/min.) paying close attention to the weight indicator (if applicable) for restrictions as the probe is descending to the bottom.
5. Pay close attention to the weight indicator (if applicable) when approaching the bottom of the surface casing and slow logging speed.
6. If the hole conditions are in your judgement unsuitable for running the geophysical probe, request that the hole be reconditioned or log through the drill rods.

III. EMERGENCY OPERATIONS

A. VEHICLE ACCIDENT

In the event of an accident while transporting radioactive sources to and from a job site, whereby the vehicle is severely damaged or impact has occurred in or about the source storage area, the following procedures should be followed:

1. Do not leave the scene of the accident. Send someone to make the appropriate phone calls. Instruct them to call the police, ambulance service, if needed, and your home office.
2. Begin surveying for possible source rupture and contamination with the licensed survey instrument. Should the survey instrument be damaged due to the accident, immediately contact your home office which will in turn secure necessary instruments from Conoco, the NRC or State agencies.
3. If contamination is detected, immediately cordon off the area with materials from emergency kit (see Checklist III) and advise your home office of the situation and await further instructions. The resident manager or radiation protection officer (R.P.O.) will contact the appropriate regulatory authorities (i.e. State and/or NRC).

In the event of injury to the operator of the logging vehicle, the police or fire department will have to handle the situation at the accident. The Department of Transportation (D.O.T.) requires that shipping papers for the sources be carried on the driver's side door. These papers will include the type of source or sources carried on board the vehicle, the chemical and physical forms of the sources, the amount of activity of each source and the location on board the vehicle of each source and the type of transportation

B. RETRIEVAL PROCEDURES FOR STUCK GEOPHYSICAL LOGGING PROBES

The potential for the sticking of a geophysical logging tool downhole exists in any drill hole; regardless of hole diameter, hole conditions, or type of probe.

Whether caused by wedging, bridging, or caving, probes which become lodged downhole stand a very good chance of being retrieved if proper steps are taken. When a probe is stuck, time is of the essence and retrieval procedures should be implemented as rapidly as possible after giving thorough consideration to the situation. Hole integrity and stability can deteriorate rapidly and a probe can become severely stuck, requiring special retrieval techniques to free it.

The main objectives in any recovery operation will be to retrieve the source or sources intact in such a manner as to protect personnel and property now and in the future.

The steps necessary to recover a probe will be useful on any type of probe. Specific precautions and instructions will be emphasized for retrieval of those probes utilizing radioactive sources.

1. Initial Radiation Safety

Any attempt, to free a stuck radioactive probe, should be "monitored" by using the licensed survey meter carried in the logging vehicle or by using a gamma density tool minus sources, if available (see Checklist III). This precaution will enable detection of any release of contamination which might occur if the sources have been damaged at the time of sticking. Monitor any fluid flow from the hole. Continuous monitoring is also necessary in the event of damage and release of contamination during subsequent retrieval activities.

After accomplishing the previous tasks, request that all non-essential personnel leave the site and begin to monitor the drilling fluid while the following probe retrieval steps are taken.

With the cable intact and still attached to the probe and logging unit, gently lower the drill rods, without drilling bit, downhole to the level where the probe is stuck. Begin to circulate fluid at this time so that the washing action may loosen the lodged probe or wash away the obstruction. Also, at the same time, pull on the logging cable by hand to aid in freeing the probe.

If it becomes apparent that washing and pulling operations fail to free the stuck probe, the logging operator will:

1. Cease recovery operations while still maintaining the closed circuit fluid system.
2. Contact the resident manager and/or radiation protection officer and await further instructions.
3. No attempt should be made at this time to separate the cable from the probe.

Management will decide the course of action to be followed. The best recovery alternative is to secure a company that specializes in tool and cable retrieval from bore holes. Within all of the regions in which Consol has operations, there are various tool retrieval companies which provide help to oil and gas companies. Many of their techniques used for tool and cable recovery are applicable to our needs and will help to minimize the possibility of abandonment and probe damage.

At this point in time, the Nuclear Regulatory Commission and/or state regulatory offices should be notified of the problems with the stuck probe and the course of action to be followed from this point on.

d. Consol Safety Department
Consol Plaza
Pittsburgh, PA
(412) 831-4050

Note: These offices will be able to assist with radiation safety and any specialized equipment or technical support needed in addition to the assistance provided by the NRC or any state agency.

10. Conduct a complete radiological survey of the area, as soon as possible. Surveys will be made with appropriate, high resolution instrumentation as specified by Conoco or NRC specialists.
11. Based upon radiological surveys, contamination should be identified, isolated, and contained as soon as possible, to prevent further spread of radioactive material.
12. Advise Consol - Public Relations Department which will inturn keep public officials, local residents and news media informed.
13. The decontamination program should be conducted under the direct supervision of a trained Radiation Safety Technician or Radiation Health Physicist.
14. The contaminated area should remain restricted under security guard until decontamination is completed and approved for release by NRC inspectors.

1. Cost of the tool versus best estimate of the minimum cost and probable maximum cost of retrieval.
2. The risk of sticking any retrieval rods or fishing tools.
3. The influence an abandoned probe will have on mine planning or coal production in the vicinity of the source or sources.
4. The value of the drill hole for further use; i.e. water or methane monitoring, coal seam degasification, or mine service.

If after careful consideration, it is decided a source is to be abandoned, the following steps should be undertaken.

1. The N.R.C. and/or the proper state authorities will be notified by telephone. The final abandonment proposal should be presented to these agencies and no action should be taken until final approval.
2. The abandonment proposal should contain the following:
 - a. The procedure for sealing the source downhole.
 - b. The type of permanent marker to be installed at the surface of the drill hole and all pertinent information.
 - c. A written report containing detailed information describing the incident.
 - d. Information regarding specific actions to be taken to safeguard the public, now and in the future.

- ☐ - Operational 2-way radio (when available).
- ☐ - Radioactive placards on outside of logging vehicle.

*EMERGENCY SUPPLIES & EQUIPMENT:

- ☐ - First aid kit
- ☐ - Fire extinguisher (ABC type; fully charged).
- ☐ - Rubber or plastic slip on boots.
- ☐ - Plastic sample bags (to contain contaminated material or articles).
- ☐ - Roll of surveyors ribbon and radioactive contamination signs to cordon off contaminated area.
- ☐ - Patch cable kit to operate backup gamma probe for radiological surveys.
- ☐ - Rubber or latex gloves.
- ☐ - Bottle of fresh water.