VOID SHEET

TO: License Fee Management Branch

FROM: Region IV

SUBJECT: VOIDED APPLICATION

Control Number: 462531

Applicant: Kaysons, Inc.

Date Voided: 7/30/90

Reason for Void: Lack of response to deficiency letter. Review accomplished.

Billie Grunewski 7/30/90
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completen:

☐ Refund Authorized and processed

☑ No Refund Due

☐ Fee Exempt or Fee Not Required

Comments:

Log completed ☑

Processed by: M. Brown 8/6/90

MLAD 8/1

9011050049 900730
REG4 LIC30
MATLSLICENSING PDR

000031

OKLAHOMA TAX COMMISSION

STATE OF OKLAHOMA

2501 LINCOLN BLVD.
OKLAHOMA CITY, OKLAHOMA 73194

October 19, 1989

BUSINESS TAX
DIVISION

405/521-3161

AS OF JUNE 30, 89

CORPORATE NAME KAYMEN INC.

PRESIDENT DAN HAMILTON

VICE PRESIDENT MEL MARCUS

SECRETARY JOHN A. NOGALSKI

TREASURER JOHN A. NOGALSKI

STATE OF OKLAHOMA, COUNTY OF OKLAHOMA

I do hereby certify that this is a true listing of the officers now on file in this office this 19th day of October, 1989.

STATUTES DO NOT ALLOW US TO RELEASE THE NAMES OF THE CORPORATE DIRECTORS OR ADDRESSES.

Sincerely,

BUSINESS TAX DIVISION

Jeff Kiser, Supervisor
Franchise Tax Section

JK:PF:ms

OKLAHOMA TAX COMMISSION
STATE OF OKLAHOMA
2501 LINCOLN BLVD.
OKLAHOMA CITY, OKLAHOMA 73194-0001

BUSINESS TAX
DIVISION
405/521-3161

AS OF ~~JUNE~~ April 7, 1989

CORPORATE NAME Kaymen, Inc.

PRESIDENT Timothy J. Condrin

VICE PRESIDENT

SECRETARY Jon Condrin

TREASURER

STATE OF OKLAHOMA, COUNTY OF OKLAHOMA

I do hereby certify that this is a true listing of the officers now on file in this office this 29 day of June, 1989.

STATUTES DO NOT ALLOW US TO RELEASE THE NAMES OF THE CORPORATE DIRECTORS OR ADDRESSES.

Sincerely,

BUSINESS TAX DIVISION

Jeff Kiser

Jeff Kiser, Supervisor
Franchise Tax Section

M/S 16

T1

KAYMEN, INC.
P.O. Box 701648
Tulsa, OK 74170-1649

September 26, 1989

Nuclear Regulatory Commission
Jack E. Whitten
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Dear Mr. Whitten:

This is in reference to amend the application for Kaymen, Inc. for a byproduct material license for use of sealed sources and devices for well logging.

I will address the questions in your letter, by the following outline.

1. Item 2 of NRC Form 313 of the application identifies the name of my corporation as that of Kaymen, Inc. There are no persons that have had experience, with the exception of Marshall C. Etter, with radioactive materials. I, Tim Condrin, am the only officer of the company. There is no other person at present involved in the management aspect of the company. Marshall Etters' home address is 3568 McClaflin, Enid, OK 73701.

2. Since our telephone conversation, between Dr. D.A. Powers, Mr. J.E. Whitten, and myseld, I have hired a new radiation safety officer (RSO). The new RSO is Marshall Etter. His credentials are enclosed.

3. Please find enclosed an outline of the specific items that are to be reviewed during the practical examination to be administered to prospective logging supervisors.

4. Kaymen, Inc. has decided not to provide bioassay services or any type of traces studies. Iodine - 131 will not be used.

5. At present, Kaymen, Inc. nor any person involved in operating equipment for Kaymen, Inc. have any type of nuclear sources. When we do decide to run nuclear sources we will have our meter calibrated.

6. If there are any deficiencies in the annual inspection, the RSO will give more attention to each person that works under him and if need by we will provide more schooling. Also the annual inspection will, if at all possible, be unannounced.

462531

7. When Kaymen, Inc. does decide to purchase sources, the new location will be 1303 South 66th Street, Enid, OK 73701. We will build a 2' by 2' cube. It will be constructed of 1/4" steel plate. It will be cemented in the ground.

8. The name Saturn will no longer be used by Kaymen, Inc. When and if a license is given to Kaymen, Inc. we will notify the NRC of the name of the company.

If you have a need for further information, please feel free to call me.

Sincerely,

Tim Condrin
TC/mb
Enclosures

Marshall L. Etter
3568 McClaflin
Enid, OK 73701

Phone: 405-233-2131
Soc.Sec.: 448-50-9570
Birth: 11-13-51

1975 - Attended a school conducted by the NRC to become licensed to handle R/A sources and material. The school was held at Gearhart-Owen in Oklahoma City, OK.

1987 - Employed by the Tom Hansen Company. Duties consisted of being in charge of the monthly R/A reports, film badges, leak tests and meter calibrations.

1988 - Employed by the Wedge Wireline, Inc. Duties were the same when employed by the Tom Hansen Co.

As of 6-14-89 I have handled R/A material & sources from 1975 to 1989 for a total of 14 years experience.

Marshall L Etter 7-20-89

Marshall L. Etter Date

OIL FIELD RADIATION SAFETY SCHOOL

LOGGING SUPERVISORS

COURSE OUTLINE

1. In terms and conditions of the company license, our operating & emergency procedures.

2. 24 hours of classrooom instruction in fundamentals of radiation safety.

3. (a) Characteristics of radiation

   (b) Units of radiation dose & quantity of radioactivity

   (c) Hazards of exposure to radiation

   (d) Levels of radiation from licensed material

   (e) Methods of controlling radiation dose, time, distance, and shielding

   (f) Radiation safety practices (prevention of contamination) (methods of decontamination)

   (g) Radiation detection instruments; use, operation, calibration, and limitations of survey instruments

   (h) Survey techniques

   (i) Use of personnel monitoring equipment

   (j) Operation of equipment to be used, source and remote handling tools

   (k) Storage, control, and disposal of licensed material

   (l) Maintenance of equipment

   (m) Requirements of pertinent Federal regulations and case histories of accidents in well logging

462531

OFFICE OF THE SECRETARY OF STATE

STATE OF OKLAHOMA

CERTIFICATE OF INCORPORATION

To all to Whom these Presents shall Come, Greetings:

WHEREAS, *The Certificate of Incorporation, duly signed and verified, of*

KAYMEN, INC.

has been filed in the office of the Secretary of State as provided by the Laws of the State of Oklahoma.

NOW THEREFORE, *I, the undersigned, Secretary of State of the State of Oklahoma by virtue of the powers vested in me by law, do hereby issue this Certificate of Incorporation.*

IN TESTIMONY WHEREOF, *I hereunto set my hand and cause to be affixed the Great Seal of the State of Oklahoma.*

GREAT SEAL OF THE STATE OF OKLAHOMA 1907

Filed at the City of Oklahoma City this 7th. *day of* April, *A.D., 19* 89

Secretary of State

By

Return Copy

FILED

APR 7 1989

OKLA. SECRETARY OF STATE

CERTIFICATE OF INCORPORATION

OF

KAYMEN, INC.

TO THE SECRETARY OF THE STATE OF OKLAHOMA:

I, the undersigned incorporator, Timothy J. Condrin, being authorized by the subscribers under Okla. Stat. tit. 18, Sec. 1.1-1.250, and as amended under 18 O.S. Supp. 1988, Sections 1001 to 1143, hereinafter the "Oklahoma General Corporation Act" do hereby declare and certify:

ARTICLE I

The name of the corporation is Kaymen, Inc. (hereinafter "Corporation").

ARTICLE II

The address of the Corporation's registered office and the name of its registered agent in the State of Oklahoma are:

Timothy J. Condrin
6655 South Lewis
Suite 350
Tulsa, Oklahoma 74136

RECEIVED
APR 7 1989
Secretary of State

ARTICLE III

The purpose for which the Corporation is formed is:

To perform any lawful acts, or conduct any lawful business of any and all kinds, and to do all things necessary in connection therewith, as are permitted by the Oklahoma

ARTICLE VI

The powers of the incorporator are to terminate upon the filing of this Certificate of Incorporation and the name and address of the person who shall serve as director until the first annual meeting of shareholders shall be:

Timothy J. Condrin
6655 South Lewis
Suite 350
Tulsa, Oklahoma 74136

IN WITNESS WHEREOF I have hereunto subscribed my name this 5th day of April, 1989.

Timothy J. Condrin

ACKNOWLEDGMENT

STATE OF OKLAHOMA)
) SS.
COUNTY OF TULSA)

On this 5th day of April, 1989, before me, a Notary Public in and for said county and State, personally appeared Timothy J. Condrin, to me known to be the identical person who executed the foregoing and annexed instrument for the consideration and purposes therein mentioned, and I do hereby so certify.

Notary Public

My Commission Expire: 2/9/93

General Corporation Act, by other laws of this State and/or by the Constitution of the State of Oklahoma.

The foregoing clause shall be construed as a power as well as a purpose, and the matters expressed in said clause shall, unless herein otherwise expressly provided, by in no way limited by reference to or inference from the terms of any clause, but shall be regarded as an independent power and purpose and specific powers and purposes shall not be construed to limit or restrict, in any manner, the meaning of general terms or the general powers of the Corporation, nor shall the expression of one thing be demed to exclude another not expressed, although it be of like nature. The Corporation shall be authorized to exercise and enjoy all other powers, rights, and privileges granted by the Oklahoma General Corporation Act to corporations organized thereunder and all the powers of or supplemental to that statute. Provided, however, that nothing herein contained shall be deemed to authorized or permit the Corporation to carry on any business or to excercise any power to do any act in violation of the Constitution and laws of the State of Oklahoma.

ARTICLE IV

The name and address of the incorporator is:

Timothy J. Condrin
6655 South Lewis
Suite 350
Tulsa, Oklahoma 74136

ARTICLE V

The aggregate number of shares of capital stock the Corporation shall have authority to allot is Ten Thousand Shares of one class common stock and all such shares are to have One Dollar ($1.00) par value.

JUL 6 1989

NMLS:JEW
Control No. 462531

Kaymen, Inc.
ATTN: Tim Condrin, President
P.O. Box 701648
Tulsa, Oklahoma 74170

Gentlemen:

This is in reference to your application dated April 14, 1989, and letter received June 30, 1989, requesting a byproduct material license for use of sealed sources and devices for well logging. We have completed review of your application and have the following comments and need for additional information:

1. Item 2 of NRC Form 313 of your application identified the name and address of your corporation as that of Kaymen, Inc., P.O. Box 701648, Tulsa, Oklahoma. Please provide the name and home addresses of all current corporate officers, Board of Directors, and managers or supervisors who have experience with radioactive materials.

2. In the June 20, 1989, telephone conversation between Dr. D. A. Powers and Mr. J. E. Whitten of the NRC, and Mr. Tim Condrin, President, of Kaymen, Inc., Mr. Condrin indicated that Mr. J. G. LaMascus was to be immediately replaced as the Radiation Safety Officer (RSO). As a follow-up to this management action, we have not received written confirmation. Additionally, the credentials of the proposed RSO should be supplied for staff review.

   Provide written confirmation as to the status of the RSO position and if applicable, the necessary supporting credentials.

   Reference: Item 7 of the July 1987 well logging working draft paper entitled "GUIDE FOR THE PREPARATION FOR THE USE OF RADIOACTIVE MATERIALS IN WELL LOGGING OPERATIONS," hereafter referred to as the Guide.

3. Provide an outline of the specific items that are to be reviewed during the practical examination to be administered to prospective logging supervisors.

   Reference: Item 8.2 of the Guide

4. Paragraph 39.65(b) of 10 CFR Part 39 specifies that bioassay services will be provided to individuals using licensed material in subsurface tracer studies if required by the license. Bioassays are appropriate when individuals work with iodine-131 in quantities, chemical and physical

RIV:NMLS	C:NMLS
JEWhitten	DAPowers
7/6/89	7/6/89

forms, and activities that could result in ingestion, inhalation, or absorbance as indicated by Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131."

For routine "ready-to-use" iodine tracer materials, bioassays should be provided for any individual who will use 50 millicuries at any one time, or within a 5-day period. If you plan to use "ready-to-use" iodine tracer material in quantities of less than the above specified amounts, you should so state in your application.

Should you plan to use greater than the amounts specified above, you must have available a bioassay program. If you will contract with an outside group for a bioassay service, you should identify the firm and its NRC or Agreement State license number. Describe the bioassay services offered by the above identified firm.

Reference: Item 10.3 of the Guide.

5. Section II, Item B.6 of your Radiation Protection Manual specified that a calibration check would be performed on your survey meters at six month intervals and after repair. Item 10.4.2 of the Guide outlines the methods acceptable to NRC for having your survey meters calibrated. Provide the information requested in the Guide for each option selected for calibrating your survey meters.

   Reference: Item 10.4.2 of the Guide.

6. Paragraph 39.13(d) of 10 CFR Part 39 requires an annual inspection system adequate to ensure that NRC regulations, license provisions, and your operating and emergency procedures are followed by logging supervisors.

   Amend your application to address the actions management will take to correct deficiencies identified in your audit program. Additionally, your application should be amended to reflect that these audits should, insofar as possible, be conducted unannounced.

   Reference: Item 10.5 of the Guide.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application. Please reply in duplicate and refer to Control No. 462531.

Sincerely,

Original Signed By
Jack E. Whitten

Jack E. Whitten
Senior Health Physicist
Nuclear Materials Licensing Section

bcc:
ABBeach
WLFisher

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

JUL 06 1990

MEMORANDUM FOR: Robert D. Martin, Regional Administrator
Region IV

Robert Bernero, Director
Office of Nuclear Material, Safety
and Safeguards

Jack R. Goldberg, Deputy Assistant General Counsel
for Enforcement
Office of the General Counsel

FROM: James Lieberman, Director
Office of Enforcement

SUBJECT: OI REPORT 4-90-002, RE: KAYMEN, INCORPORATED

The above captioned OI report concludes that the alleged falsification of documents could not be substantiated. Therefore, the findings of the report indicate that enforcement action is not appropriate in this case. I do not intend to request an OGC analysis of this report. We will consider the matter closed unless we receive a different view within three weeks of the date of this memorandum. Please contact me or Joseph DelMedico with any comments.

Edward Baker, Deputy Director
Office of Enforcement

cc: H. Thompson, DEDS
R. Cunningham, NMSS
B. Hayes, OI

Copies to
(1) Russ Wise
(2) Bill Beach
(3) Bill Fisher

MS-16

T1

KAYMEN, INC.

P.O. Box 701648
Tulsa, OK 74170

Mr. Jack E. Whitten
United States Regulatory Commission Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

RE: Application For Material License

Dear Mr. Whitten:

Please find enclosed the revised application for Material License for Kaymen, Inc.

If you have any questions, please feel free to contact me at (918) 492-6919.

Sincerely,

Tim Condrin
President

TJC/mb
Enclosures

462531

NRC FORM 313
(7-86)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS. IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [XX] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Kaymen, Inc.
P. O. Box 701648
Tulsa, OK 74170

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

220 E. Main St.
Hominy, OK 74035

Temporary job sites

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Tim Condrin

TELEPHONE NUMBER: 918-492-6919

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*

FEE CATEGORY: 5A

AMOUNT ENCLOSED: $ 700.00

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
	Tim Condrin	President	4-14-89

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

- [ ] <$250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial–proprietary–information furnished to the agency in confidence)*

- [ ] YES
- [ ] NO 46253 1

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY

AMOUNT RECEIVED	CHECK NUMBER	DATE

SUPPLEMENT

ITEM 5 - RADIOACTIVE MATERIAL

5. a - ELEMENT and MASS NUMBER	5. b - CHEMICAL and/or PHYSICAL FORM
1. AMERICIUM-241:Be	1. Sealed sources (Gulf Nuclear Model 71-1)
2. Cesium-137	2. Sealed sources (Gulf Nuclear, Inc. Model CSV)
3. Cesium-137	3. Sealed sources (Amersham Model CDC.CY10)
4. Iodine 131	4. Liquid
5. Iridium-192	5. Liquid

5.c - MAXIMUM AMOUNTS
(NOT TO EXCEED 100ci TOTAL)

1. Not to exceed 4.6 Curies per source
2. Not to exceed 2 Curies per source
3. Not to exceed 2 Curies per source
4. 80 millicuries total, not to exceed 10 millicuries per unit
5. 80 millicuries total, not to exceed 10 millicuries per unit

Item 6 - PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED

1. For use in oil and gas well logging
2. For use in oil and gas well logging
3. For use in oil and gas well logging
4. For use in tracer studies in oil and gas wells
5. For use in tracer studies in oil and gas wells

Item 7 - INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

a. Our corporate structure is as follows:
President - Tim Condrin (Only Officer)
Vice President -
Secretary & Treasurer -

b. James Gregory LaMascus will serve as our Radiation Safety Officer. His resume can be found in attachment 4.

Item 8 - TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

a. We will use Mid-Continent Nuclear Consultants of Oklahoma City, OK; F.L. Clifford, Niantic, CN, for the classroom training of our Logging Supervisor and Logging Assistant. Course outlines and examples of tests may be found in attachment 1.

1. If any of the prospective Logging Supervisors and Logging Assistants are found to be deficient in any of the areas covered, a period of time (which will, of course, vary with the deficiency) will be spent in instruction.

b. The 3 months of on-the-job training that will be required of any prospective Logging Supervisor will include 520 hours of actual work performing well logging with licensed sealed sources.

Upon completion of the 3 month on-the-job training of a prospective Logging Supervisor, our Radiation Safety Officer will perform an evaluation of the training by observing the performance of the individual through a complete logging job. Any areas of deficiency found will be thouroughly reviewed at the time of evaluation.

An evaluation of the Logging Assistant willalso consist of observing them through a complete logging job.

c. The same approximately 8 hour training course as indicated in paragraph a. above will be given to any Logging Supervisor who has been carried as such on another license. In this case, the individual will be given the same written examination (approximately 50 questions), 70% G.P.A., and field examination as is given for any prospective Logging Supervisor.

d. The decision to make an employee a Logging Supervisor or an Logging Assistant can be made at any time during the individual's employment. Whenever it is decided to designate an employee an Logging Assistant, he will be given the in-house training specified above.

Subsequent to the decision to make an employee a Logging Supervisor, he will be placed on an on-the-job training program and during his OJT, he will be required to successfully complete 8 hours of in-house classroom training and the 24-hour classroom coursee. After completion of the two courses, he will be evaluated as per 8.b.

e. If the need arises for instruction of ancillary personnel, a 1 to 2 hour short course will be provided by Mid Continent Nuclear Consultants. Attachment 2 gives the outline for such a course.

f. Our Annual Safety Review will be conducted by our Radiation Safety Officer. It will consist of an overall review of tne previous year's operations involving radioactive material, a refresher on radiation safety, and the current regulations (including new regulations or requirements). Our procedures and company policies involving radiological safety will also be covered. We will, at that time, go over the results of the last annual inspection. A record will be kept of the Annual Safety Review.

Item 9 - FACILITIES AND EQUIPMENT - SEE OUR NEW RADIATION PROCEDURES MANUAL

ITEM 10 - RADIATION SAFETY PROGRAM

a. Attachment 3 is an example of an Agreement that we will use with our customers.

b. Personnel Monitoring Equipment - we use the beta, gamma, neutron film badge service provided by ICN.

c. Radiation Detection Instruments and Calebration we have two Victoreen Model 493 Survey Meters with Victoreen Model 493-50 probes. The probes are sensitive to +12 Kev gamma and +200 Kev beta. They have a range of 0 - 50 mr/hr. We also have a Victoreen Model 489-100c "Pancake" GM prove that is sensitive to alpha above 3.5 Mev, beta above 35 Kev and gamma above 6 Kev. All our survey meters are calibrated every 6 months. Calibrations and repairs will be made by G.E. Smith (NDS Products) 111 Anderson Pasadena, TX 77506 Phone (713) 475-2986

d. Annual Inspection Program - Our Radiation Safety Officer will make an inspectioon of the on-the-job operations (involving radioactive sources) of each of our Logging Supervisors at intervals not to exceed one year. These inspections will

be done, insofar as possible, unannounced. If a Logging Supervisor does not perform well logging operations for a period that exceeds one year, the inspection will be carried out the first time that person engages in well logging operations. See our new Radiation Procedures Manual for an example of our check list (Refer to fig.22 in RPM). The completed check list will be kept for 3 years. Annual inspection checklist is in Section 14 Fig. 22 of R.P.M.

e. Physical Inventory - we will perform a semiannual physical inventory of our sources. Our sealed Source Inventory form can be seen in our Radiation Procedures Manual. The completed forms will be kept 3 years.

f. Semiannual Maintenance - Each six months, we will perform a visual inspection and routine maintenance of source holders, logging tools, source handling tools, tracer handling tools, storage containers and transport containers. if defects are found, the equipment will be removed from service and a record listing the defects, inspection and maintenance operations performed, and the actions taken to correct the defects.

g. We will not perform any of the following operations:

1. removal of a sealed source from a source holder or logging tool nor attempt maintenance of sealed sources or holders.

2. attempt any drilling, cutting or chisiling to remove a sealed ssource which is stuck in a source holder.

3. attempt any opening, repair, or modification of any sealed source.

Item 11 - WASTE MANAGEMENT

We will use the facilities of Gulf Nuclear, Houston, Texas for the disposal of any radiation waste that we feel is excessive to what we can handle in our radioactive material storage.

Attachment 1

MID CONTINENT NUCLEAR CONSULTANTS
4305 Foxglove Lane
Oklahoma City, Oklahoma 73120
(405) 751-6937

OILFIELD RADIATION SAFETY SCHOOL

Logging Supervisors
Al Caswell, Instructor

COURSE OUTLINE

1st Day

8:30 to 9:00 - Opening Coffee and Registration
9:00 to 12:00 - Elementary Radiation Physics
- Radioactivity
- Radiation & Matter

1:00 to 5:00 - Elementary Radiation Physics (Cont'd.)
- Characteristics of Radiation
- Units of Radiation Dose & Quantity of Radicactivity
- Calculations involved in working with Radioactive Materials

2nd Day

8:30 to 9:00 - Review of Previous Day
9:00 to 12:00 - Radioactivity Health Considerations
- Characteristics of Radiation (Cont'd.)
- Factors considered in Safety Precautions
- Hazards of Exposure to Radiation
- Safety Precautions - Time, Distance and Shielding

1:00 to 5:00 - Radiation Detection
- Basis of Detection & Types of Detectors
- Use, Operation, Calibration & Limitations of Radiation Survey Instruments
- Survey Techniques
- Personnel Monitoring
- Equipment & Use of Equipment

3rd Day

8:30 to 9:00 - Review of Previous Day
9:00 to 12:00 - Safety Considerations for handling Radioactive Tracers
- Contamination Surveys & Waste Disposal
- Prevention of Contamination
- Methods of Decontamination
- Shipment of Radioactive Materials
- Source Storage, Handling & Maintenance of equipment
- Labeling & Posting Procedures
- Leak Tests, Survey Meter Calibration & Area Monitoring
- Lost Source & Accident Procedures

1:00 to 3:00 - Review of Applicable Regulations (Including 10 CFR 19, 20 & 39 and/or Applicable State Regulations) Also a Review of the NRC Licensing Guide for Well Loggers for Those Involved in Licensing
- Review of Case Histories of Accidents in Well Logging

3:00 to 5:00 - Course Review & Final Test

FINAL TEST

MID CONTINENT NUCLEAR CONSULTANTS
WELL LOGGING SAFETY TRAINING

NAME_____DATE_____

COMPANY_____

Circle the T if the statement is true, if false, circle F

1. T F A Proton has amass of 1 and a charge of +1.

2. T F After seven (7) half-lives, you have less than 1% of radioactivity left.

3. T F Man cannot detect nuclear radiation with his senses.

4. T F The atom is the smallest particle of matter; it cannot be split.

5. T F The film badge is used for gamma radiation only.

6. T F The protons and the neutrons make up the atomic mass (weight) of an element.

7. T F The basic philosiphy in assessing the public health aspects of radiation exposure can best be expressed by the following statement: Any unneccessary exposure to radiation should be avoided.

8. T F The unit of quantity of any radioactive substance is the curie.

9. T F A millicurie is one millionth of a curie.

10. T F REM is a rotation Roentgen equilavent to man.

11. T F Leak Testing of sealed radioactive sources is required for every 180 days or six months.

12. T F The unit for energy is the REM.

13. T F The largest most penetrating particle is the alpha particle.

14. T F Radiation is present in the atmosphere at all times.

15. T F Dental & Medical X-rays yield 0 dosage of radiation

16. T F Geiger counters are more efficient than scintillation.

17. T F Leukemia is a common disorder caused by bone seeking radioactive elements.

18. T F 750 REM is lethal dose of radiation.

19. T F By-Product Materials are naturally occuring radioisotopes.

20. T F If a proton is added to the nucleus of an atom, the atomic number changes.

21. T F Radioacitivty is the spontanious disintegration of unstable nuclei with the resulting emmission of nuclear radiation.

22. T F 3.7 X 10/10 disintegrations per sec. is one curie of radioactivity.

23. T F Specific Activity is irrelevent in determining the size of a source of radioactivity.

24. T F For storage of radioactive material, a sign stating "Caution Radioactive Materials" must be posted so it can be seen by all.

25. T F HVL is the symbol for half value layer in radiation shielding.

26. T F Time-Distance-Shielding are importatn factors in radiation safety.

27. T F Biological half life is the amount of time that it takes to excrete one half of a radioactive substance from the body.

28. T F The quarterly tolerance for the hands and feet is 18.75 REMS.

29. T F An exposure of 2.5 REMS is not reequired to be reported if it is received in one month.

30. T F Under certain conditions, the quarterly whole body tolerance of 1.25 REMS can be exceeded.

31. T F Geiger counters aree mandatory on vehicles transporting adioactive materials.

32. T F Alpha particles are not a biological problem when injested into the body.

33. T F Film badges can be stored on the windshield visors of vehicles.

34. T F Half Life is the time in which half the atoms in a radioactive substance disintegrate.

35. T F Gamma radiation can pass through a detector without being detected.

36. T F The blood is ot affected by high exposures.

37. T F Alpha radiation is an external hazard only.

38. T F The basic requirements for radiation detection instruments are calibrated, approved and operable.

39. T F The genetic effects of radiation are well documented and it is possible to predict such effects with great accuracy.

40. T F Two (2) mr/hr is the reading that distinguishes between a restricted area and nonrestricted area.

41. T F The inverse squaree law means that if the source is twice as far away as before, the intensity is one fourth as great.

42. T F A survey meter shall be used during any radiation activity or source manipulations.

43. T F The yearly allowable occupational dose is five (5) REM.

44. T F Lead is the best shielding material because it is the densist metal known.

45. T F Explain the following:

What is the 27?

What is the

What is the atomic mass of the cobalt? Before and after the addition of the neutron?

46. T F What is a curie of radioactivity?

47. What is a millicurie of radioactivity?

48. State the radiation levels indicated by a survey meter when the meter needle points to:

.2 on the X10 Range_____mr/hr
.20 on the X100 Range_____mr/hr
.45 on the X1 Range_____mr/hr
.18 on the X10 Range_____mr/hr
.3 on the X10 Range_____mr/hr

49. Calculate the radiation from an isotopr emitting 8400 mr/hr at one (1) foot from the source

(a) at a distance of three (3) feet
(b) at a distance of five (5) feet

50. Give the most efficient type of detector first and list the other major type.

51. Explain in your own words what procedures you would follow if you lost a source in a well.

52. Explain in your own words what you would do if you had a radioactive material spill.

53. There are regulations relating to the leak testing of radioactive sources. Explain:

(a) what constitutes a leaker?

(b) how often is the leak test to be taken?

54. What is ionizing radiation?

54. What is ionizing radiation?

55. What information should appear on the job site monitoring sheet?

56. In the event a radioactive material spill occurs in the field, special types of clothing and paraphenalia are required. Name these four items:

57. When gaseous radiotracers such as methyl and ethyl iodide are used in the field it is recommended that a face mask with an orgaic filter be worn. Why?

58. Where do all forms of ionizing radiation originate?

59. What is the best material for shielding fast neutron radiation and why?

60. What is the dose rate in mrem/hr at 40 inches (100cm) from a twenty (20) curie neutron source which emits 4 X 10 n/s?

Passing Grade is 75

FINAL TEST

MID CONTINENT NUCLEAR CONSULTANTS
WELL LOGGING SAFETY TRAINING

NAME_____ DATE:_____

COMPANY_____

Circle the T it the statement is true, if false circle the F

1.	(T)	F	A Proton has amass of 1 and a charge of +1.
2.	(T)	F	After seven (7) half-lives, you have less than 1% of radioactivity left.
3.	(T)	F	Man cannot detect nuclear radiation with his senses.
4.	T	(F)	The atom is the smallest particle of matter; it cannot be split.
5.	T	(F)	The film badge is used for gamma radiation only.
6.	(T)	F	The protons and the neutrons make up the atomic mass (weight) of an element.
7.	(T)	F	The basic philosiphy in assessing the public health aspects of radiation exposure can best be expressed by the following statement: Any unnecessary exposure to radiation should be avoided.
8.	(T)	F	The unit of quantity of any radioactive substance is the curie.
9.	T	(F)	A millicurie is one millionth of a curie.
10.	(T)	F	REM is a notation Roentgen equivalent to man.
11.	(T)	F	Leak Testing of sealed radioactive sources is required for every 180 days or six months.
12.	T	(F)	The unit for energy is the REM.
13.	T	(F)	The largest most penetrating particle is the alpha particle.
14.	(T)	F	Radiation is present in the atmosphere at all times.
15.	T	(F)	Dental and medical X-rays yield 0 dosage of radiation.
16.	T	(F)	Geiger counters are more efficient than scintillation detectors.
17.	(T)	F	Leukemia is a common disorder caused by bone seeking radioactive elements.

18. (T) F 750 Rem is a lethal dose of radiation.

19. T (F) By-Product Materials are naturally occuring radio-isotopes.

20. (T) F If a proton is added to the nucleus of an atom, the atomic number changes.

21. (T) F Radioactivity is the spontanious disintegration of unstable nuclei with the resulting emmission of nuclear radiation.

22. (T) F 3.7×10^{10} disintegrations per sec. is one curie of radioactivity.

23. T (F) Specific Activity is irrelevent in determining the size of a source of radioactivity.

24. (T) F For storage of radioactive materials, a sign stating "Caution Radioactive Materials" must be posted so it can be seen by all.

25. (T) F HVL is the symbol for half value layer in radiation shielding.

26. (T) F Time-Distance-Shielding are important factors in radiation safety.

27. (T) F Biological half life is the amount of time that it takes to excrete one half of a radioactive substance from the body.

28. (T) F The quarterly tolerance for the hands and feet is 18.75 REMS.

29. T (F) An exposure of 2.5 REMS is not required to be reported if it is received in one month.

30. (T) F Under certain conditions, the quarterly whole body tolerance of 1.25 REMS can be exceeded.

31. (T) F Geiger counters are mandatory on vehicles transporting radioactive materials.

32. T (F) Alpha particles are not a biological problem when injested into the body.

33. T (F) Film badges can be stored on the windshield visors of vehicles.

34. (T) F Half Life is the time in which half the atoms in a radioactive substance disintegrate.

35. (T) F Gamma radiation can pass through a detector without being detected.

36. T (F) The blood is not affected by high exposures.

37. T (F) Alpha radiation is an external hazard only.

38. (T) F The basic requirements for radiation detection instruments are calibrated, approved and operable.

39. T (F) The genetic effects of radiation are well documented and it is possible to predict such effects with great accuracy.

40. (T) F Two (2) mr/hr is the reading that distinguishes between a restricted area and a nonrestricted area.

41. (T) F The inverse square law means that if the source is twice as far away as before, the intensity is one fourth as great.

42. (T) F A survey meter shall be used during any radiation activity or source manipulations.

43. (T) F The yearly allowable occupational dose is five (5) Rem.

44. T (F) Lead is the best shielding material because it is the densist metal known.

45. Explain the following:

$_{27}Co^{59} + {}_{0}n^{1} \rightarrow {}_{27}Co^{60}$

What is the 27? Atomic Number - number of protons in the nucleus - " electrons in the orbits or shells

What is the $_{0}n^{1}$? neutron

What is the atomic mass of the cobalt? Before and after the addition of the neutron? Before - 59, After - 60

46. What is a curie of radioactivity?
A curie is that quantity of radioactivity that emits 3.7×10^{10} d/s

47. What is a millicurie of radioactivity? .001 Curie

48. State the radiation levels indicated by a survey meter when the meter needle points to:

.2 on the X10 Range 2.0 mr/hr
.20 on the X100 Range 20 mr/hr
.45 on the X1 Range .45 mr/hr
.18 on the X10 Range 1.8 mr/hr
.3 on the X10 Range 3.0 mr/hr

49. Calculate the radiation from an isotope emitting 8400 mr/hr at one (1) foot from the source

(a) at a distance of three (3) feet
(b) at a distance of five (5) feet

$I_1 (d_1)^2 = I_2 (d_2)^2$

$I_1 \times (3')^2 = 8400 \text{ mr/hr} \times (1')^2$

$I_1 \times 9 = 8400$

$I_1 = \frac{8400}{9} = 933.33 \text{ mr/hr at } 3'$

$I_1 = \frac{8400}{25} = 336 \text{ mr/hr at } 5'$

50. Give the most efficient type of detector first and list the other major type.

1. Scintillation
2. Geiger Muller

51. Explain in your own words what procedures you would follow if you lost a source in a well.

1. Immediately, notify the RSO
2. If the source is not in jeopardy or normal overshot or reverse fishing techniques are likely to recover the logging tool entirely, then the RSO + special monitoring equipment are not necessary. The RSO should be kept informed as to what is taking place
3. If the procedure in 2 do not recover the tool then drilling should be stopped until the RSO + th monitoring equipment can be brought in
4. The returning drilling fluid should be monitored continuously after recovery efforts are resumed (the accompanying survey equipment is to be used at the surface)

52. Explain in your own words what you would do if you had a radioactive material spill.

1. Immediately close off the area of the spill keeping all persons clear
2. Put on protective clothing + rubber gloves + survey the area of the spill protecting the survey meter probe from contamination. Survey with the probe window open
3. Proceed to decontaminate the area + equipment treating all material + fluids classified for decontamination as waste (radioactive).
4. After being satisfied that all the radioactive contamination has been cleaned up, then package up the RA waste, label it accordingly + return it to the base for further disposal

53. There are regulations relating to the leak testing of radioactive sources. Explain:

(a) what constitutes a leaker? If the wipe is analyzed to have .005 microcuries or more of activity

(b) how often is the leak test to be taken? Every 6 mos

54. What is ionizing radiation? Ionizing radiation is that radiation that creates an ion pair by knocking an electron from the orbital or shell of atom

55. What information should appear on the job site monitoring sheet?
1. Well Identification + Location
2. Survey Meter Identification
3. Radioactive Mat'l involved
4. Before + After Survey Meter readings
5. Signature of the Radiologist Supervisor + date

56. In the event a radioactive material spill occurs in the field, special types of clothing and paraphenalia are required. Name these four items: Rubber gloves, protective clothing, survey meter, protective film badge, face mask (if gaseous or fine particulate matter is involved)

57. When gaseous radiotracers such as methyl and ethyl iodide are used in the field it is recommended that a face mask with an organic filter be worn. Why? To avoid ingestion of the radioactive iodine. An organic filter is necessary because of the gaseous nature of the tracer.

58. Where do all forms of ionizing radiation originate?
The nucleus of the atom.

59. What is the best material for shielding fast neutron radiation and why? Use of certain plastics (e.g. water extended polyester) Because of their hydrogen content which allows the neutron, proton recoil reaction to slow down the neutrons

60. What is the dose rate in mrem/hr at 40 inches (100 cm) from a twenty (20) curie neutron source which emits 4 x 10^{7} n/s?

$$\frac{\text{source output}}{12.57 \times (\text{distance in cm})^2} \times 0.14 = \text{mrem/hr}$$

$$\frac{4 \times 10^{7}}{12.57 \times (100\text{ cm})^2} \times 0.14$$

$$\frac{4 \times 10^{7}}{12.57 \times 10000} \times 0.14$$

~~$\frac{4000}{12.57} \times 0.14 =$~~

$$\frac{4000}{12.57} \times 0.14 = 318.21 \times 0.14 = 44.54 \text{ mrem/hr at 40"}$$

Passing grade is 70

Quiz

IN-HOUSE TRAINING
LOGGING SUPERVISORS

1. T (F) The Company's Radioactive Material License authorizes the Company to use any radioactive material.

2. A shipment of radioactive material must: (circle one)
   (a) reflect that it meets USA DOT 7-A specs.
   (b) reflect (if a box) the manufacturer's test seal, etc.
   (c) have proper triangular labels.
   (d) have a packing slip and supplier's label.
   (e) all of the above.

3. T (F) Anyone can open a package of radioactive material if they are wearing rubber gloves.

4. T (F) Our logging trucks need placards only on the two sides reading "RADIOACTIVE" when carrying radioactive material.

5. Survey meters are calibrated: (circle one)
   (a) monthly.
   (b) annually.
   (c) every six months.
   (d) periodically.

6. (T) F Radioactive Material should not be carried in the cab of a Company vehicle.

7. T (F) It is permissible to burn radioactive waste if all the labels have been removed.

8. Radioactive waste is disposed of by: (circle one or more)
   (a) burial.
   (b) burning.
   (c) returned to a waste disposal company.
   (d) allowed to remain in approved storage until decayed to background and then disposed of as ordinary trash (after) removal of all labels).

9. T (F) The Radiological Safety Officer is the only Company employee allowed to confer with NRC/or State representatives during an inspection.

10. (T) F Any Company employee may request an inspection by the appropriate agency if he believes a violation has occurred.

QUIZ (In-House Training, Logging Supervisors)

11. The whole body quarterly occupational dose should not exceed 1.25 Rems.

12. (T) F The hands and feet can receive 15 times as much occupational dose as the whole body.

13. (T) F The whole body quarterly occupational dose of 1.25 Rems can be exceeded under certain conditions.

14. T (F) Employees under the age of 18 have the same occupational dose restrictions as all other employees.

15. T (F) It is permissible to borrow another person's badge if you record the time period that you have it.

16. T (F) In the event of a loss or theft of radioactive material, a telephone report to the NRC should be made within the next seven calendar days.

17. (T) F A Logging Assistant works under the personal supervision of a Logging Supervisor.

18. T (F) It is not necessary to have a survey meter on a logging truck which is involved in running a radioactive log if there is one available at the base.

19. (T) F A physical inventory of all radioactive material in the Company's possession is to be made semi-annually.

20. (T) F A survey should be made of each person's position and of the exterior of a logging truck before going on a logging job utilizing radioactive material.

21. T (F) Control badges are spare badges for anyone's use.

22. (T) F Sealed sources are to be leak tested every 6 months.

23. (T) F It is necessary to have a surveying capability of measuring alpha and/or 60 Kev gamma radiation available on a 24 hour call, if it is necessary to monitor returns from a well in which an AmBe neutron source is being fished.

24. (T) F All records are kept for 3 years except those for Film or TLD Badges which are kept until the NRC or Agreement State authorizes disposal.

25. T (F) Anyone can receive or pick up a package of tracer material or a sealed source.

QUIZ (In-House Training, Logging Supervisors)

26. List the records and forms that must be carried on the logging truck.

1. Copy of Operating + Emergency Procedures
2. Latest survey meter calibration
3. Latest survey records
4. Copy of Shippers Certification
5. Copy of License

27. (T) F Only the RSO and Logging Supervisors have access to the Radioactive Material Storage Facilities.

28. The Logging Supervisor must establish a restricted area of not less than 10 feet from the work area, which all personnel must observe during tracer or source handling.

29. List the appropriate equipment to be used when working with radioactive tracers.

1. Disposable rubber gloves
2. Calibrated survey meter
3. Protective clothing
4. Face masks (if working with particulate or gaseous tracers)

30. T (F) It is unnecessary to notify the NRC or Agreement State authorities in the event a source is placed in jeopardy down hole as long as a report is filed within 30 days.

31. (T) F It is necessary to have a signed written agreement with the customer prior to running any logging job involving radioactive materials.

32. (T) F It is permissable to free a stuck source capsule from a source housing by use of a lathe if you first receive approval for your procedures from the NRC or Agreement State authorities.

33. (T) F If the "fixed" contamination measures less than 0.2 mr/hr at one centimeter, the item of equipment, article of clothing, etc. can be returned to normal use.

34. A yellow Radioactive III label will be used when the activity limits of a package exceeds 50 mrem/hr at any point on the external surface or 1.0 mrem/hr at three feet from the external surface.

35. (T) F The DOT 7A label must be on all shipping containers requiring White I, Yellow II or Yellow III labels.

462531

QUIZ (In-House Training, Logging Supervisors)

36. (T) F The Transport Index is the dose rate at three feet from the surface of a package containing radioactive material.

37. Restricted Area means any area access to which is controlled by the license for purposes of protection of individuals from exposure to radiation and radioactive materials.

38. (T) F You may request on an annual basis to see your radiation exposure records and your employer is required, by law, to show them to you.

39. Radiation Area means any area in which a major portion of the body could receive 5 mrem/hr or 100 mrem in 5 consecutive days.

40. (T) F It is necessary to put the date of measurement on labels for relatively short half lived isotopes to let persons know the current source strength.

41. (T) F If a leak test reveals more than .005 microcuries of activity, the sealed source must be isolated, the NRC and/or Agreement State authorities notified and the source disposed of through a licensed disposal company.

42. Current NRC and Agreement State regulations require that a Survey Meter has a range of 0.1 through 50 mr/hr.

43. (T) F All sealed sources used in well logging must be double encapsulated.

44. T (F) It is only necessary to check source holders, logging tools and source handling tools for defects on a semi-annual basis.

45. T (F) No special approval is needed to log a well (using a radioactive source) without surface casing.

46. T (F) Three months of "on the job training" will substitute for the 24 and 8 hour training course.

47. (T) F A safety review for logging supervisors and assistant logging supervisors at least once a year.

8. (T) F A logging supervisor may leave the well in order to obtain assistance if a source becomes lodged in the well.

49. T (F) The source holder (or source sub) does not need any hazard warning engraved.

QUIZ (In-House Training, Logging Supervisors)

50. (T) F On warning signs or labels indentifying radioactive material either "Caution" of "Danger" can be used.

Quiz

IN-HOUSE TRAINING
LOGGING SUPERVISORS

1. T F The Company's Radioactive Material License authorizes the Company to use any radioactive material.

2. A shipment of radioactive material must: (circle one)
   (a) reflect that it meets USA DOT 7-A specs.
   (b) reflect (if a box) the manufacturer's test seal, etc.
   (c) have proper triangular labels.
   (d) have a packing slip and supplier's label.
   (e) all of the above.

3. T F Anyone can open a package of radioactive material if they are wearing rubber gloves.

4. T F Our logging trucks need placards only on the two sides reading "RADIOACTIVE" when carrying radioactive material.

5. Survey meters are calibrated: (circle one)
   (a) monthly.
   (b) annually.
   (c) every six months.
   (d) periodically.

6. T F Radioactive Material should not be carried in the cab of a Company vehicle.

7. T F It is permissible to burn radioactive waste if all the labels have been removed.

8. Radioactive waste is disposed of by: (circle one or more)
   (a) burial.
   (b) burning.
   (c) returned to a waste disposal company.
   (d) allowed to remain in approved storage until decayed to background and then disposed of as ordinary trash (after) removal of all labels).

9. T F The Radiological Safety Officer is the only Company employee allowed to confer with NRC/or State representatives during an inspection.

10. T F Any Company employee may request an inspection by the appropriate agency if he believes a violation has occurred.

QUIZ (In-House Training, Logging Supervisors)

11. The whole body quarterly occupational dose should not exceed _____ Rems.

12. T F The hands and feet can receive 15 times as much occupational dose as the whole body.

13. T F The whole body quarterly occupational dose of _____ can be exceeded under certain conditions.

14. T F Employees under the age of 18 have the same occupational dose restrictions as all other employees.

15. T F It is permissible to borrow another person's badge if you record the time period that you have it.

16. T F In the event of a loss or theft of radioactive material, a telephone report to the NRC should be made within the next seven calendar days.

17. T F A Logging Assistant works under the personal supervision of a Logging Supervisor.

18. T F It is not necessary to have a survey meter on a logging truck which is involved in running a radioactive log if there is one available at the base.

19. T F A physical inventory of all radioactive material in the Company's possession is to be made semi-annually.

20. T F A survey should be made of each person's position and of the exterior of a logging truck before going on a logging job utilizing radioactive material.

21. T F Control badges are spare badges for anyone's use.

22. T F Sealed sources are to be leak tested every ____ months.

23. T F It is necessary to have a surveying capability of measuring alpha and/or 60 Kev gamma radiation available on a 24 hour call, if it is necessary to monitor returns from a well in which an AmBe neutron source is being fished.

24. T F All records are kept for ____ years except those for _____ which are kept until the NRC or Agreement State authorizes disposal.

25. T F Anyone can receive or pick up a package of tracer material or a sealed source.

QUIZ (In-House Training, Logging Supervisors)

26. List the records and forms that must be carried on the logging truck.

27. T F Only the RSO and Logging Supervisors have access to the Radioactive Material Storage Facilities.

28. The Logging Supervisor must establish a restricted area of not less than_____feet from the work area, which all personnel must observe during tracer or source handling.

29. List the appropriate equipment to be used when working with radioactive tracers.

30. T F It is unnecessary to notify the NRC or Agreement State authorities in the event a source is placed in jeopardy down hole as long as a report is filed within 30 days.

31. T F It is necessary to have a signed written agreement with the customer prior to running any logging job involving radioactive materials.

32. T F It is permissable to free a stuck source capsule from a source housing by use of a lathe if you first receive approval for your procedures from the NRC or Agreement State authorities.

33. T F If the "fixed" contamination measures less than _____ mr/hr at one centimeter, the item of equipment, article of clothing, etc. can be returned to normal use.

34. A yellow Radioactive_____ label will be used when the activity limits of a package exceeds 50 mrem/hr at any point on the external surfave or 1.0 mrem/hr at three feet from the external surface.

35. T F The DOT_____label must be on all shipping containers requiring White I, Yellow II or Yellow III labels.

QUIZ (In-House Training, Logging Supervisors)

36. T F The Transport Index is the dose rate at three feet from the surface of a package containing radioactive material.

37. _____ means any area access to which is controlled by the license for purposes of protection of individuals from exposure to radiation and radioactive materials.

38. T F You may request on an annual basis to see your radiation exposure records and your employer is required, by law, to show them to you.

39. _____ means any area in which a major portion of the body could receive 5 mrem/hr or 100 mrem in 5 consecutive days.

40. T F It is necessary to put the date of measurement on labels for relatively short half lived isotopes to let persons know the current source strength.

41. T F If a leak test reveals more than .005 microcuries of activity, the sealed source must be isolated, the NRC and/or Agreement State authorities notified and the source disposed of through a licensed disposal company.

42. Current NRC and Agreement State regulations require that a Survey Meter has a range of 0.1 through_____mr/hr.

43. T F All sealed sources used in well logging must be double encapsulated.

44. T F It is only necessary to check source holders, logging tools and source handling tools for defects on a semi-annual basis.

45. T F No special approval is needed to log a well (using a radioactive source) without surface casing.

46. T F Three months of "on the job training" will substitute for the 24 and 8 hour training course.

47. T F A safety review for logging supervisors and ~~assistant logging supervisors~~ ASSISTANTS at least once a year.

48. T F A logging supervisor may leave the well in order to obtain assistance if a source becomes lodged in the well.

49. T F The source holder (or source sub) does not need any hazard warning engraved.

QUIZ (In-House Training, Logging Supervisors)

50. T F On warning signs or labels indentifying radioactive material either "Caution" of "Danger" can be used.

Attachment 2

SAFETY COURSE FOR ANCILLARY* PERSONNEL

COURSE OUTLINE

I. What is Radioactivity. How are radioactive materials used in well logging?

II. What are the relative hazards to Company personnel?

III. What are the Company's procedures to protect all personnel from any unnecessary exposure. To include:

(a) Informatioon concerning storage, transfer or use of radioactive materials at the base or job sites.

(b) The basic principles and fundamentals of radiation safety.

(c) Instruction in precautions and procedures to minimize radiation exposure.

(d) The purpose and function of protective devises.

(e) The appropriate response in the event of any emergency which may lead to radiation exposure or release of radioactive materials.

IV. Review of the Company's Radioactive Material License(s)

V. Review of applicable Federal and State regulations. Including:

(a) The worker's responsibility to report to the licensee any condition which may lead to or cause a violation of NRC and/or State regulations, license conditions, or any unnecessary exposure to or release of radioactive materials.

(b) Units of 10 millicuries or less would be more than adequate for the studies we would perform which are simple tracer surveys locating problem production zones, thief zones and channeling. 10 millicuries properly diluted would perform 5 to 6 studies in our area of operation.

*:Ancillary Personnel- Company personnel (secretariel, janitoral, clerks or other workers who might frequent any restricted area or who might assist in well logging operations at a temporary work site (excluding logging assistants). And that their training records will be maintained for 3 years.

AGREEMENT FOR CONTINGENCY OPERATION
LOSS OF RADIOACTIVE WELL LOGGING DEVICE

Whereas, _____ hereafter referred to as "OWNER/OPERATOR" wishes to engage Kaymen, Incorporated hereinafter referred to as "Licensee" to perform well logging operations involving the use of a well logging device containing radioactive material on wells owned or operated by OWNER/OPERATOR.

Whereas, regulations issued by the U.S. Nuclear Regulatory Commission (10 CFR 39.15) require LICENSEE to enter into an agreement similar to the presents prior to commencement of well logging operations utilizing such devices;

NOW, THEREFORE, in consideration of the presents and for other good and valuable considerations in hand received, OWNER/OPERATOR and LICENSEE do hereby agree as follows:

1. In the event that a radioactive well logging device being utilized in operation by LICENSEE in a well owned and operated by OWNER/OPERATOR shall be disconnected from the wireline suspending same in the well, the parties hereto agree that every reasonable effort, consistent with the prevailing oilfield practice, shall be utilized to retrieve said device from the well and agree not to attempt to recover said radioactive device in a manner which could result in its rupture.

2. LICENSEE shall provide radiation monitoring and should LICENSEE detect evidence that a radioactive source has ruptured, LICENSEE shall initiate emergency procedures immediately.

3. When LICENSEE and OWNER/OPERATOR agree that all reasonable efforts at recovery have been expended and determine that the radioactive well logging device must be abandoned, LICENSEE will contact the NRC Region IV office by telephone relating circumstances and must obtain approval to implement abandonment procedures. The parties hereto shall ensure that the actions listed below are accomplished within thirty (30) days after such determination.

4. The irretrievable radioactive well logging device shall be immobilized and sealed in place with a cement plug.

5. A whipstock or mechanical device, to prevent inadvertent intrusion of the radioactive well logging device, shall be set at a point in the well above the cement plug, as determined by OWNER/OPERATOR; provided, however, that no device shall be required to be installed if the cement plug and the irretrievable radioactive well logging device are inaccessible to any subsequent drilling operations.

6. A permanent identification plaque, constructed of a long lasting material such as stainless steel, brass, bronze, or monel, shall be mounted at the surface of the well, unless the mounting of the plaque is not practical. (Suggested size: 7 inch square) The following information shall be engraved of the plaque:

(a) The word "CAUTION", in large letters;
(b) The radiation symbol, (color not required);
(c) The date the source was abandoned;
(d) The name of the well owner or well operator;
(e) The well name and well identification number(s) or other designation;
(f) An identification of the sealed source by radionuclide and quantity of activity;
(g) The depth of the source and depth to the top of the plug; and
(h) An appropriate warning, such as "DO NOT RE-ENTER THIS WELL".

7. LICENSEE must, within thirty (30) days after radioactive well logging device is classified as irretrievable, send a written report to the NRC Region IV office and the state agency having authority over oil and gas well drilling operations, giving a description of retrieval attempts and details of the abandonment as outlined in 10 CFR Part 39.77 (d).

IN WITNESS WHEREOF, the parties hereto have executed this agreement this _____ day of _____, _____.

Kaymen, Inc.

By: _____

Well OWNER/OPERATOR:
Company: _____

By: _____

Title: _____

RADIOACTIVE MATERIALS

Resume of Training and Experience
James Gregory LaMascus

1980-1981
In June of 1980 I went to work for Great Guns Logging, Inc. in Hominy, Oklahoma.

We utilized the 3 Ci AmBe 241, and Cs 137, 2 Ci, sealed sources in well logging operations for the location and determination of porositees in various strata. We did both cased hole and open hole work.

While in their employ my experience consisted of "on the job training", safety meetings, performing "leak tests", and the attendance of a formal school presented by "Tracer Lab" of Midland, Texas. We were given intensive instruction in the proper handling and protection, use of handling tools, film badges, and records with regard to safe use, handling, and storage of radioactive materials, also the proper use of several different monitoring devices.

After leaving Great Guns in the Spring of 1981, I went to work for Saturn Wireline Services, Inc. in Hominy, Oklahoma.

We also used the AmBe 241, 3 Ci, and Cs 137, 2 Ci sealed source for the determination of porosities in oil and gas well logging. As Saturn Wireline was being formed, I was instrumental in obtaining the proper sealed source handling devices, building safe storage areas and purchasing DOT approved transporting containers and overseeing that they were properly attached to the transporting vehicles.

While in the employ of Saturn Wireline, I was promoted to trainee Logging Engineer in August, 1982. My job consisted of running cased hole and open hole logs using radioactive sealed sources. One year later, in August 1983, I was promoted to " Field Logging Engineer", overseeing and having full responsibility of a logging unit used to run logs and perforate oil and gas wells.

I also attended a school presented by Alfred Caswell in January 1989 at Oklahoma City, OK.

All of the people I have been associated with in the wireline industry have maintained a radiation safety program that continually keeps me aware of the priorities of time, distance, and shielding, to keep the public, customers and other employees from being subjected to radiation exposure.

OIL FIELD RADIATION SAFETY SCHOOL

LOGGING SUPERVISORS

COURSE OUTLINE

1. In terms and conditions of the company license, our operating & emergency procedures.

2. 24 hours of classrooom instruction in fundamentals of radiation safety.

3. (a) Characteristics of radiation

   (b) Units of radiation dose & quantity of radioactivity

   (c) Hazards of exposure to radiation

   (d) Levels of radiation from licensed material

   (e) Methods of controlling radiation dose, time, distance, and shielding

   (f) Radiation safety practices (prevention of contamination) (methods of decontamination)

   (g) Radiation detection instruments; use, operation, calibration, and limitations of survey instruments

   (h) Survey techniques

   (i) Use of personnel monitoring equipment

   (j) Operation of equipment to be used, source and remote handling tools

   (k) Storage, control, and disposal of licensed material

   (l) Maintenance of equipment

   (m) Requirements of pertinent Federal regulations and case histories of accidents in well logging

QUIZ

LOGGING ASSISTANTS

1. (T) F Man cannot detect nuclear radiation with his senses.

2. (T) F Radiation is present in the atmosphere at all times.

3. (T) F For storage of radioactive materials, a sign stating "Caution Radioactive Materials" must be posted so it can be seen by all.

4. (T) F Time - Distance - Shielding are important factors in radiation safety.

5. T (F) The quarterly tolerance for the total body is 18.75 Rems.

6. T (F) The genetic effects of radiation are well documented, and it is possible to predict such effects with great accuracy.

7. (T) F A survey meter shall be used during any radiation activity or source manipulations.

8. T (F) Any Company employee may work with radioactive material as long as he has a survey meter and is wearing a badge.

9. T (F) The Company's Radioactive Material License authorizes the Company to use any radioactive material.

10. T (F) It is permissible to loan radioactive sources or tracers to another logging company if the other company has a radioactive material license, regardless as to whether or not the source material you are loaning is listed on their license.

11. (T) F You, as an individual, can request an inspection by the appropriate agency if you believe that there has been a violation in license activities.

12. T (F) The records of radiation exposure are Company confidential and are not available for the employee's review.

13. T (F) The hands and feet are much more sensitive to radiation exposure than the remainder of the body.

14. Define a restricted area -

15. T (F) It is permissible for you to loan your film badge to another person as long as you record the time & date that you loan it.

16. T (F) The Curie and Millicurie are units of energy.

17. T (F) The tolerance dose of 1.25 Rem per 13 weeks is based on the short term (24 hr. or less) exposures and not the long term effects of radiation.

18. T (F) Anyone can enter a radioactive material storage area as long as he or she are accompanied by a licensed individual.

19. (T) F Smoking, eating and drinking are prohibited in areas where radioactive tracers are being used or decontamination is taking place.

20. T (F) It is unimportant if the beta shield on the survey meter probe is open or closed when using the probe for surveying for contamination.

21. (T) F A logging source (or tracer material) should be constantly attended when out of their shields or secure areas.

22. T (F) Radioactive waste can be burned.

23. T (F) Decontamination destroys radioactivity.

24. (T) F Only approved handling tools should be used when working with radioactive materials.

25. In your own words - what are your responsibilities as an Logging Assistants.

462531

June 20, 1989

Kaymen, Inc.
Tulsa, Oklahoma

Tim Condrin
Tulsa, Oklahoma

Telephone No. 918-492-6919

Control No. 462531

NRC Representatives: Dr. Dale Powers
Jack E. Whitten

1. In our telephone conversation with Mr. Condrin, we learned that he had undergone major events that would require that his license application be amended. He indicated that he was "getting rid of everybody that was associated with Saturn Services. That he was not going to put up with it anymore." When questioned, he was vague in his explanation of what the specific personnel problems were, but was specific in his plans to remedy these problems.

2. Mr. Condrin indicated that he was currently in the process of hiring a new Radiation Safety Officer (RSO) for his company. We explained, the necessary training and experience requirements that an RSO must possess. We indicted that the new RSO should be familiar with the appropriate Parts of 10 CFR, have completed the training outlined in the Well Logging Guide, and have at least 1 year of experience as a logging supervisor.

3. He ask that we explain the amendment procedure necessary to change locations of use after he received the license. I indicated that he must send us an amendment request along with the proper licensing fee. This request must describe the new facility and provide a sketch or diagram. He should provide the information that is requested in Facilities Section of the Well Logging Guide. Should this request satisfy our requirements we would amend the license to authorize materials in both locations. It would then be necessary to send us a closeout survey of the old facility. Upon review and staff approval, an amendment would be issued authorizing the old site to be returned to unrestricted use.

4. Dr. Powers ask the question "are there any other changes to your organization that NRC needs to be made aware of?" Mr. Condrin responded "no."

Jack E. Whitten
SR Health Physicist (Licensing)

May 24, 1989

MEMORANDUM FOR: File
Kaymen, Inc.
Docket No. 030-31128

FROM: J. E. Whitten
SR Health Physicist/Licensing

SUBJECT: PRE-LICENSING CONFERENCE

The initial phase of the pre-licensing conference was held with Mr. Tim Condrin at the applicant's corporate office at 6655 S. Lewis, Tulsa, Oklahoma, and continued into the second phase with Mr. Greg LaMascus and Mr. Condrin at the licensees proposed field site at 220 E. Main Street, Hominy, Oklahoma. The purpose of these meetings were to discuss the application for a byproduct material license for us of sealed sources and tracer materials in well logging. Mr. Charles L. Cain and Mr. Jack E. Whitten, NRC representatives, discussed the applicant's application dated April 14, 1989. The following issues were observed and discussed during these meetings:

1. When questioned where Kaymen, Inc., plans to obtain their sealed sources, Mr. Condrin indicated that he plans to purchase the assets of Saturn Wireline Wireline Services, Inc., and use the sources that are currently owned by this company. Should NRC have any objections to Kaymen, Inc., purchasing or using these sources, they would procure from an authorized supplier. He indicated that his purchase of Saturn is conditional on whether or not Kaymen, Inc., can secure an NRC byproduct material license.

   The NRC representatives indicated to Mr. Condrin that if it was his intention to purchase the sealed sources presently owned by Saturn that he should so indicate in his application.

2. Mr. Condrin indicated that initially only Mr. LaMascus would be involved in the day-to-day well logging operations. When question about his involvement in the day-to-day operations, as it pertains to radiation safety, Mr. Condrin indicated that he would not be. He would only be involved in the overall management of the company, with Mr. LaMascus responsible for the radiation safety program. He indicated that his brother Jon would not have any involvement in Kaymen, Inc.

3. Mr. Condrin was questioned as to the proposed use of Mr. O. C. LaMascus in the well logging operations. He indicated that Mr. O. C. LaMascus was not going to be used in the capacity of a logging supervisor or logging assistant. Because of his wealth of knowledge and experience in the well logging industry and familiarity of the geological structure in the area, he would be infrequently consulted. His only involvement in Kaymen, Inc. would be that of a consultant and would involve no contact with radioactive materials.

4. Mr. Condrin indicated that Kaymen, Inc., has no byproduct material licenses or offices in any Agreement State, and has no plans in the near future to apply for any such license.

5. Applicant's proposed training program was reviewed in detail.

6. Deficiency letter dated May 22, 1989, was covered item by item with the applicant.

6. NRC enforcement policy was discussed with the applicant.

7. Initial and routine inspection protocol was discussed with the applicant.

8. Applicability of the Decommissioning rule was reviewed with the applicant. Applicant indicated that he would request that the license be limited to a total of 100 curies of americium-241, thereby not requiring financial assurance.

9. The applicant's proposed facilities were reviewed and found as indicated in the application. Storage facilities were adequate, and handling tools were readily available.

Summary:

The applicant was very responsive and appeared knowledge in 10 CFR, transportation regulations, and contents of the application. Proposed facilities and equipment were reviewed and found to be adequate. When questioned about the availability and use of remote handling tools the applicant promptly produced them and demonstrated their use.

Based on the contents of the application and the May 23, 1989, pre-licensing visit, no apparent basis was found for denial.

MAY 22 1989

NMLS:JEW
Control No. 462531

Kaymen, Inc.
ATTN: Tim Condrin, President
P.O. Box 701648
Tulsa, Oklahoma 74170

Gentlemen:

This is in reference to your application dated April 14, 1989, requesting a byproduct material license for use of sealed sources and devices for well logging. We have completed review of your application and have the following comments and need for additional information:

1. 10 CFR Part 30, Sections 30.35-36, require that you submit financial assurance commitments for americium-241 sealed sources in amounts of greater than 100 curies. Optionally, you can elect to restrict your possession of americium-241 sealed sources to less than 100 curies.

   Amend your application by restricting your americium-241 sealed sources to a total of 100 curies or provide the required financial assurance certification.

2. Research of our sealed source/device catalog indicates that the Amersham/Gulf Nuclear Model NEEI-AmBe-71-1 neutron source is authorized for 4.6 curies, not the 5 curies you requested in your application.

   Amend your application to reflect the above change.

3. Identify the specific chemical or physical forms of iridium-192 or iodine-131 for each type of tracer study your wish to be authorized. Additionally, specify the maximum amount of each radioisotope that you will use in each type of tracer study and the individual chemical and physical forms of these isotopes to be used in each of these requested studies. Note: The authorization for "any form" as you requested in your application is not acceptable.

   Reference: Item 2 of the July 1987 well logging working draft paper entitled "GUIDE FOR THE PREPARATION FOR THE USE OF RADIOACTIVE MATERIALS IN WELL LOGGING OPERATIONS," hereafter referred to as the Guide.

4. Provide a chart or description of your organizational structure as it applies to your well logging radiation safety program. Specify the name and title of each individual who has the responsibility for management or supervision. Provide a training and experience resume consisting of specific dates of training in radiation safety, where and by whom the training was conducted, and an outline of the on-the-job training,

RIV:NMLS
JEWhitten
5/22/89

C:NMLS
CLCain
5/22/89

including dates, name and addresses of firms, radioactive materials and maximum activities used at any one time, and the date on which the title of logging supervisor or equivalent (as defined in Section 39.2 of 10 CFR Part 39) was obtained.

Reference: Item 7 of the Guide.

5. In your Radiation Procedures Manual (RPM), Section I, Subpart E.1 entitled "Training of Personnel," you indicated that no employee could supervise the use of licensed materials unless he or she had "successfully completed a State or Federally approved radiation safety training course." Contractor training will be limited to the single contractor you identified in your application, Mid Continent Nuclear Consultants. Should you intend to utilize additional contractor(s) other than the one identified in your application, you should specifically identify it by name. Amend your application, if applicable, to indicate the training contractor(s) you plan to use to provide the training specified in §39.61(e) of 10 CFR Part 39.

Reference: Item 8 of the Guide.

6. Paragraph 39.61(b)(1) of 10 CFR Part 39 specifies that an individual cannot act as a logging assistant until he has copies of, and instruction in, 10 CFR Parts 19 and 20. In your RPM, Section I, Subpart E.2, you indicated that before acting in the capacity of a logging assistant an individual must receive instruction in the applicable State or Federal rules and regulations. Your RPM should reflect the specific NRC regulations indicated above.

Amend your application to address the above.

Reference: Item 8 and 8.2 of the Guide.

7. Paragraph 39.61(a)(2)(i) of 10 CFR Part 39 specifies that an individual cannot act as a logging supervisor until he has copies of, and instruction in 10 CFR Parts 19, 20, and 39. In your RPM, Section I, Subpart E.1, you indicated that before acting in the capacity of a logging supervisor, an individual must "read and review instructions in the applicable State or Federal rules and regulations." Your RPM should reflect the specific NRC regulations indicated above.

Amend your application to address the above.

Reference: Item 8 and 8.2 of the Guide.

8. A copy of the "in-house" logging supervisor examination answer key was not included in your application. Provide a copy of this answer key for staff review. Additionally, you should indicate the grade necessary to pass the examination.

Reference: Item 8.2 of the Guide.

9. Indicate the grade necessary to pass the "in-house" logging assistant (assistant logging supervisor) examination .

10. In reviewing your application, we noted that the term "assistant logging supervisor" was used in lieu of the designated term "logging assistant." Because the operating and emergency (OE) procedures manual is an integral part of your in-house training, you should amend it to utilize the new terminology, logging assistant, as defined in Section 39.2 if 10 CFR Part 39.

Amend your application to address the above.

11. Provide an outline of the specific items that are to be reviewed during the practical examination to be administered to prospective logging supervisors.

Reference: Item 8.2 of the Guide.

12. You should provide a commitment that training records for ancillary personnel will be maintained for a minimum of 3 years. Amend your application to address the above.

Reference: Item 8.3 of the Guide.

13. Paragraph 39.65(b) of 10 CFR Part 39 specifies that bioassay services will be provided to individuals using licensed material in subsurface tracer studies if required by the license. Bioassays are appropriate when individuals work with iodine-131 in quantities, chemical and physical forms, and activities that could result in ingestion, inhalation, or absorbance as indicated by Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131."

For routine "ready-to-use" iodine tracer materials, bioassays should be provided for any individual who will use 50 millicuries at any one time, or within a 5-day period. If you plan to use "ready-to-use" iodine tracer material in quantities of less than the above specified amounts, you should so state in your application.

Should you plan to use greater than the amounts specified above, you must have available a bioassay program. If you will contract with an outside group for a bioassay service, you should identify the firm and its NRC or Agreement State license number. Describe the bioassay services offered by the above identified firm.

Reference: Item 10.3 of the Guide.

14. Section II, Item B.6 of your RPM specified that a calibration check would be performed on your survey meters at six month intervals and after repair. Item 10.4.2 of the Guide outlines the methods acceptable to NRC for having your survey meters calibrated.

Provide the information requested in the Guide for each option selected for calibrating your survey meters.

Reference: Item 10.4.2 of the Guide.

15. Paragraph 39.13(d) of 10 CFR Part 39 requires an annual inspection system adequate to ensure that NRC regulations, license provisions, and your OE procedures are followed by logging supervisors.

Amend your application to address the actions management will take to correct deficiencies identified in your audit program. Additionally, your application should be amended to reflect that these audits should, insofar as possible, be conducted unannounced.

Reference: Item 10.5 of the Guide.

16. Radioactive utilization logs must address the items required in §39.39 of 10 CFR Part 39. It is not clear from the Radioactive Material Utilization Survey form where the identity of the logging supervisor is to be indicated.

Amend your utilization log to add the identity of the logging supervisor. As indicated previously you should adopt the terms "logging supervisor" and "logging assistant," to be commensurate with 10 CFR Part 39.

Reference: 10.6.10 of the Guide.

17. Section 39.67(b) of 10 CFR Part 39 requires that a radiation survey be taken before and after the use of subsurface tracer materials to confirm the absence of contamination. Section 39.67(f) requires, in part, that records be maintained of these contamination surveys. Your Radioactive Material Utilization Survey form identified a location to provide an entry for the radiation survey taken after a tracer job had been completed, however, it did not provide a location for the radiation survey taken prior to beginning a tracer job.

Amend your Radioactive Material Utilization Survey form to address the above.

18. Your application should be amended to require that a record be made of the visual check specified in §39.43(a) of 10 CFR Part 39 for defects in source holders, logging tools, and handling tools. This visual check should establish that the equipment is in good working condition and the required labeling specified in §39.31 of this Part is present. If defects are identified, the equipment should be removed from service until repaired and a record made of the defective equipment. This record must include the date of check, the name of the inspector, equipment involved, defects found, and repairs made.

Reference: Item 10.6.11 of the Guide.

19. Identify items to be checked and the steps to be taken if any defects are noted in the daily inspection of logging tools and handling tools, including the need for 10 CFR Part 21 notification to NRC.

Reference: Item 10.6.12 of the Guide.

20. Paragraph 39.43(b) of 10 CFR part 39 requires a semiannual program for visual inspection and routine maintenance of source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling (as specified in §39.31 and §39.49 of this Part) is legible and that no physical damage is visible. If defects are found, the equipment must be removed from service until repaired and a record made listing the date, equipment involved, the defects, inspection, and maintenance operations performed, and the actions taken to correct the defects. These semiannual inspection and maintenance records must be retained for 3 years. Your instructions in your OE procedures should be tailored to your program and to the equipment you possess and use.

Your semiannual equipment inspection program should be amended to include the above identified elements.

Reference: Item 10.6.11 and 10.6.12 of the Guide.

21. Item VII, Section C.5, of your RPM indicates that leak testing of sealed sources will be conducted by an approved commercial leak test service at 6-month intervals. Item 10.7 of the Guide outlines the methods acceptable to the NRC for having your sealed sources leak tested.

Provide the information requested in the Guide for the option(s) selected for leak testing your sealed sources.

Reference: Item 10.7 of the Guide.

22. Paragraph 39.37 of 10 CFR Part 39 requires that a semiannual physical inventory be conducted and recorded to account for all licensed material received and possessed. The inventory record must indicate the quantity and kind of licensed material, the location of the licensed material, the date of the inventory, and the name of the individual conducting the inventory.

The form to be used for recording the inventory should be submitted with your application. Also, if logging personnel will conduct the inventory, a procedure should be included in your application.

Amend your application to address the above.

Reference: Item 10.8 of the Guide.

23. You should note, that relative to the disposal of materials resulting from "flow backs" or "sand outs," Item VI.C.12 and Item VIII of RPM are in conflict. Should your wish to be authorized to transport these materials to a field location for decay, you would not be authorized to do so. As the application is written currently, you would only be able to transport these materials to an authorized waste disposal company or site.

    Amend your application to correct this conflict in disposal methods.

    Reference: Item 11 of the Guide.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application. Please reply in duplicate and refer to Control No. 462531.

Sincerely,

Original signed by,
JACK E. WHITTEN

Jack E. Whitten
Nuclear Materials Licensing Section

Enclosures:
1. Draft Regulatory Guide "Guide for the Preparation of Applications for the Use of Radioactive Materials in Well Logging Operations," July 1987
2. "Transportation of Non-Fissile Radioactive Material in Type A Packaging," November 1988
3. Regulatory Guide 8.20
4. 10 CFR Parts 30 and 39

bcc:
ABBeach
WLFisher

MAY 18 1989

In Reply Refer To:
Docket: 030-31128

Kaymen, Inc.
ATTN: Tim Condrin
P. O. Box 701648
Tulsa, Oklahoma 74170

Gentlemen:

This is in regard to the telephone discussion between Mr. Tim Condrin and the undersigned on May 17, 1989, confirming our appointment to meet with you on Tuesday, May 23, 1989, at 9 a.m. This meeting will be initiated at your office at 6655 South Lewis, Suite 350, Tulsa, Oklahoma, and will be followed by a visit to your facility at 220 E. Main Street, Hominy, Oklahoma.

During this visit we will discuss your pending application for a license to use byproduct materials in well logging. Should you have any questions in regard to these arrangements, please contact the undersigned at (817) 860-8186.

Sincerely,

Original Signed By:
CHARLES L. CAIN

Charles L. Cain, Chief
Nuclear Materials Licensing Section

bcc:
DMB - Original (IE-07)
RDMartin
LShea, RM/ALF (AR-2015)
ABBeach
REHall
WLFisher
DAPowers
CLCain
JEWhitten
RIV File
NMSB
Oklahoma Department of Health

RIV:NMLS	C:NMLS
JEWhitten	CLCain
/89	5/17/89

IE-07

8905300235 890518
REG4 LIC30 PNU

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: _____
STATUS CODE: 3
FEE CATEGORY: _____
EXP. DATE: 0
FEE COMMENTS: _____

LICENSE FEE TRANSMITTAL

A. REGION IV

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: KAYMEN, INC.
RECEIVED DATE: 890424
DOCKET NO: 3031128
CONTROL NO.: 462531
LICENSE NO.:
ACTION TYPE: NEW LICENSEE

RECEIVED
MAY 3 1989

2. FEE ATTACHED
AMOUNT: $700.00
CHECK NO.: 0958

3. COMMENTS

SIGNED Billie Grumpacki
DATE 4/24/89

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /)

1. FEE CATEGORY AND AMOUNT: 5A ($700)

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT _____
RENEWAL _____
LICENSE /

3. OTHER _____

SIGNED Pat Higgins
DATE 4/28/89

10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS. IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

APR 24 1989

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

[XX] A. NEW LICENSE
[ ] B. AMENDMENT TO LICENSE NUMBER _____
[ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Kaymen, Inc.
P. O. Box 701648
Tulsa, OK 74170

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

220 E. Main St.
Hominy, OK 74035

Temporary job sites

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Tim Condrin

TELEPHONE NUMBER: 918-492-6919

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*

FEE CATEGORY: 5A

AMOUNT ENCLOSED: $ 700.00

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
Kim Cond	Tim Condrin	President	4-14-89

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS
[ ] ≤ $250K
[ ] $250K–$500K
[ ] $500K–$750K
[ ] $750K–1M
[ ] $1M–3.5M
[ ] $3.5M–7M
[ ] $7M–10M
[ ] > $10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)*

[ ] YES [ ] NO 462531

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
App	Apr-4-IV	5A		M. Hasse
AMOUNT RECEIVED	CHECK NUMBER			DATE
$700	0958			4/24/89

SUPPLEMENT

ITEM 5 - RADIOACTIVE MATERIAL

5. a - ELEMENT and MASS NUMBER	5. b - CHEMICAL and/or PHYSICAL FORM
1. Americium-241:Be	1. Sealed sources (Gulf Nuclear Model 71-1)
2. Cesium-137	2. Sealed sources (Gulf Nuclear, Inc. Model CSV)
3. Cesium-137	3. Sealed sources (Amersham Model CDC.CY10)
4. Iodine 131	4. Any Form
5. Iridium-192	5. Any Form

5.c - MAXIMUM AMOUNTS

1. Not to exceed 5 Curies per source
2. Not to exceed 2 Curies per source
3. Not to exceed 2 Curies per source
4. 80 millicuries total, not to exceed 20 millicuries per unit
5. 80 millicuries total, not to exceed 20 millicuries per unit

Item 6 - PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED

1. For use in oil and gas well logging
2. For use in oil and gas well logging
3. For use in oil and gas well logging
4. For use in tracer studies in oil and gas wells
5. For use in tracer studies in oil and gas wells

Item 7 - INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

a. Our corporate structure is as follows:

President - Tim Condrin (Only Officer)
Vice President -
Secretary & Treasurer -

b. James Gregory LaMascus will serve as our Radiation Safety Officer. His resume can be found in attachment 4.

Item 8 - TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

a. We will use Mid Continent Nuclear Consultants Oklahoma City for the class room training of our Logging Supervisors & Assistant Logging Supervisors. Course outlines and example of tests (with answers) can be found in Attachment 1.

1. If any of the prospective Logging Supervisors and Assistant Logging Supervisors are found to be deficient in any of the areas covered, a period of time (which will, of course, vary with the deficiency) will be spent in instruction.

b. The 3 months of on-the-job training that will be required of any prospective Logging Supervisor will include 520 hours of actual work performing well logging with licensed sealed sources.

Upon completion of the 3 month on-the-job training of a prospective Logging Supervisor, our Radiation Safety Officer will perform an evaluation of the training by observing the performance of the individual through a complete logging job. Any areas of deficiency found will be thoroughly reviewed at the time of evaluation.

An evaluation of the Assistant Logging Supervisors will also consist of observing them through a complete logging job.

c. The same approximately 8 hour training course as indicated in paragraph a. above will be given to any Logging Supervisor who has been carried as such on another license. In this case, the individual will be given the same written examination (approximately 50 questions) and field examination as is given for any prospective Logging Supervisor.

d. The decision to make an employee a Logging Supervisor or an Assistant Logging Supervisor can be made at any time during the individual's employment. Whenever it is decided to designate an employee an Assistant Logging Supervisor, he will be given the in-house training specified above.

Subsequent to the decision to make an employee a Logging Supervisor, he will be placed on an on-the-job training program and during his OJT, he will be required to successfully complete 8 hours of in-house classroom training and the 24-hour classroom course. After completion of the two courses, he will be evaluated as per 8.b.

e. If the need arises for instruction of ancillary personnel, a 1 to 2 hour short course will be provided by Mid Continent Nuclear Consultants. Attachment 2 gives the outline for such a course.

f. Our Annual Safety Review will be conducted by our Radiation Safety Officer. It will consist of an overall review of the previous year's operations involving radioactive material, a refresher on radiation safety, and the current regulations (including new regulations or requirements). Our procedures and company policies involving radiological safety will also be covered. We will, at that time, go over the results of the last annual inspection. A record will be kept of the Annual Safety Review.

Item 9 - FACILITIES AND EQUIPMENT - SEE OUR NEW RADIATION PROCEDURES MANUAL

Item 10- RADIATION SAFETY PROGRAM

a. Attachment 3 is an example of an Agreement that we will use with our customers.

b. Personnel Monitoring Equipment - we use the beta, gamma, neutron film badge service provided by ICN.

c. Radiation Detection Instruments and Calebration- we have two Victoreen Model 493 Survey Meters with Victoreen 493-50 probes. The probes are sensitive to +12 Kev gamma and +200 Kev beta. They have a range of 0 - 50 mr/hr. We also have a Victoreen Model 489-100c "Pancake" GM prove that is sensitive to alpha above 3.5 Mev, beta above 35 Kev and gamma above 6 Kev. All our survey meters are calibrated every 6 months.

d. Annual Inspection Program - Our Radiation Safety Officer will make an inspection of the on-the-job operations (involving radioactive sources) of each of our Logging Supervisors at intervals not to exceed one year. These inspections will

be done, insofar as possible, announced. If a Logging Supervisor does not perform well logging operations for a period that exceeds one year, the inspection will be carried out the first time that person engages in well logging operations. See our new Radiation Procedures Manual for an example of our check list. The completed check list will be kept for 3 years.

e. Physical Inventory - we will perform a semi-annual physical inventory of our sources. Our Sealed Source Inventory form can be seen in our Radiation Procedures Manual. The completed forms will be kept 3 years.

f. Semiannual Maintenance - Each six months, we will perform a visual inspection and routine maintenance of source holders, logging tools, source handling tools, tracer handling tools, storage containers and transport containers. If defects are found, the equipment will be removed from service and a record listing the defects, inspection and maintenance operations performed, and the actions taken to correct the defects.

g. We will not perform any of the following operations:

1. removal of a sealed source from a source holder or logging tool nor attempt maintenence of sealed sources or holders.

2. attempt any drilling, cutting or chisiling to remove a sealed source which is stuck in a source holder.

3. attempt any opening, repair, or modification of any sealed source.

Item 11 - WASTE MANAGEMENT - We will use the facilities of Gulf Nuclear, Houston, Texas for the disposal of any radiation waste that we feel is excessive to what we can handle in our radioactive material storage.

MID CONTINENT NUCLEAR CONSULTANTS
4305 Foxglove Lane
Oklahoma City, Oklahoma 73120
(405) 751-6937

OILFIELD RADIATION SAFETY SCHOOL
Logging Supervisors
Al Caswell, Instructor

COURSE OUTLINE

1st Day
8:30 to 9:00 - Opening Coffee and Registration
9:00 to 12:00 - Elementary Radiation Physics
- Radioactivity
- Radiation & Matter

1:00 to 5:00 - Elementary Radiation Physics (Cont'd.)
- Characteristics of Radiation
- Units of Radiation Dose & Quantity of Radioactivity
- Calculations involved in working with Radioactive Materials

2nd Day
8:30 to 9:00 - Review of Previous Day
9:00 to 12:00 - Radioactivity Health Considerations
- Characteristics of Radiation (Cont'd.)
- Factors considered in Safety Precautions
- Hazards of Exposure to Radiation
- Safety Precautions - Time, Distance and Shielding

1:00 to 5:00 - Radiation Detection
- Basis of Detection & Types of Detectors
- Use, Operation, Calibration & Limitations of Radiation Survey Instruments
- Survey Techniques
- Personnel Monitoring
- Equipment & Use of Equipment

3rd Day
8:30 to 9:00 - Review of Previous Day
9:00 to 12:00 - Safety Considerations for handling
- Radioactive Tracers
- Contamination Surveys & Waste Disposal
- Prevention of Contamination
- Methods of Decontamination
- Shipment of Radioactive Materials
- Source Storage, Handling & Maintenance of equipment
- Labeling & Posting Procedures
- Leak Tests, Survey Meter Calibration & Area Monitoring
- Lost Source & Accident Procedures

1:00 to 3:00 - Review of Applicable Regulations
- (Including 10 CFR 19, 20 & 39 and/or Applicable State Regulations) Also a Review of the NRC Licensing Guide for Well Loggers for Those Involved in Licensing
- Review of Case Histories of Accidents in Well Logging

3:00 to 5:00 - Course Review & Final Test

Passing Grade = 75

FINAL TEST

MID CONTINENT NUCLEAR CONSULTANTS
WELL LOGGING SAFETY TRAINING

NAME_____ DATE:_____

COMPANY_____

Circle the T if the statement is true, if false circle the F

1. (T) F A Proton has amass of 1 and a charge of +1.
2. (T) F After seven (7) half-lives, you have less than 1% of radioactivity left.
3. (T) F Man cannot detect nuclear radiation with his senses.
4. T (F) The atom is the smallest particle of matter; it cannot be split.
5. T (F) The film badge is used for gamma radiation only.
6. (T) F The protons and the neutrons make up the atomic mass (weight) of an element.
7. (T) F The basic philosiphy in assessing the public health aspects of radiation exposure can best be expressed by the following statement: Any unnecessary exposure to radiation should be avoided.
8. (T) F The unit of quantity of any radioactive substance is the curie.
9. T (F) A millicurie is one millionth of a curie.
10. (T) F REM is a notation Roentgen equivalent to man.
11. (T) F Leak Testing of sealed radioactive sources is required for every 180 days or six months.
12. T (F) The unit for energy is the REM.
13. T (F) The largest most penetrating particle is the alpha particle.
14. (T) F Radiation is present in the atmosphere at all times.
15. T (F) Dental and medical X-rays yield 0 dosage of radiation.
16. T (F) Geiger counters are more efficient than scintillation detectors.
17. (T) F Leukemia is a common disorder caused by bone seeking radioactive elements.

18. (T) F 750 Rem is a lethal dose of radiation.

19. T (F) By-Product Materials are naturally occuring radio-isotopes.

20. (T) F If a proton is added to the nucleus of an atom, the atomic number changes.

21. (T) F Radioactivity is the spontanious disintegration of unstable nuclei with the resulting emmission of nuclear radiation.

22. (T) F 3.7×10^{10} disintegrations per sec. is one curie of radioactivity.

23. T (F) Specific Activity is irrelevent in determining the size of a source of radioactivity.

24. (T) F For storage of radioactive materials, a sign stating "Caution Radioactive Materials" must be posted so it can be seen by all.

25. (T) F HVL is the symbol for half value layer in radiation shielding.

26. (T) F Time-Distance-Shielding are important factors in radiation safety.

27. (T) F Biological half life is the amount of time that it takes to excrete one half of a radioactive substance from the body.

28. (T) F The quarterly tolerance for the hands and feet is 18.75 REMS.

29. T (F) An exposure of 2.5 REMS is not required to be reported if it is received in one month.

30. (T) F Under certain conditions, the quarterly whole body tolerance of 1.25 REMS can be exceeded.

31. (T) F Geiger counters are mandatory on vehicles transporting radioactive materials.

32. T (F) Alpha particles are not a biological problem when injested into the body.

33. T (F) Film badges can be stored on the windshield visors of vehicles.

34. (T) F Half Life is the time in which half the atoms in a radioactive substance disintegrate.

35. (T) F Gamma radiation can pass through a detector without being detected.

36. T (F) The blood is not affected by high exposures.

37. T (F) Alpha radiation is an external hazard only.

38. (T) F The basic requirements for radiation detection instruments are calibrated, approved and operable.

39. T (F) The genetic effects of radiation are well documented and it is possible to predict such effects with great accuracy.

40. (T) F Two (2) mr/hr is the reading that distinguishes between a restricted area and a nonrestricted area.

41. (T) F The inverse square law means that if the source is twice as far away as before, the intensity is one fourth as great.

42. (T) F A survey meter shall be used during any radiation activity or source manipulations.

43. (T) F The yearly allowable occupational dose is five (5) Rem.

44. T (F) Lead is the best shielding material because it is the densist metal known.

45. Explain the following:

$_{27}Co^{59} + {}_{0}n^{1} \rightarrow {}_{27}Co^{60}$

What is the 27? Atomic Number - number of protons in the nucleus
" " electrons in the orbits or shells

What is the $_{0}n^{1}$? neutron

What is the atomic mass of the cobalt? Before and after the addition of the neutron? Before - 59, After - 60

46. What is a curie of radioactivity?
A Curie is that quantity of radioactivity that emits 3.7×10^{10} d/s

47. What is a millicurie of radioactivity? .001 Curie

48. State the radiation levels indicated by a survey meter when the meter needle points to:

.2 on the X10 Range 2.0 mr/hr
.20 on the X100 Range 20 mr/hr
.45 on the X1 Range .45 mr/hr
.18 on the X10 Range 1.8 mr/hr
.3 on the X10 Range 3.0 mr/hr

49. Calculate the radiation from an isotope emitting 8400 mr/hr at one (1) foot from the source

(a) at a distance of three (3) feet
(b) at a distance of five (5) feet

$I_1 (d_1)^2 = I_2 (d_2)^2$

$I_1 \times (3')^2 = 8400 \text{ mr/hr} \times (1')^2$

$I_1 \times 9 = 8400$

$I_1 = \frac{8400}{9} = 933.33 \text{ mr/hr at } 3'$

$I_1 = \frac{8400}{25} = 336 \text{ mr/hr at } 5'$

50. Give the most efficient type of detector first and list the other major type.

1. Scintillation
2. Geiger Muller

51. Explain in your own words what procedures you would follow if you lost a source in a well.

1. Immediately notify the RSO
2. If the source is not in jeopardy of being overshot or over spear fishing techniques are likely to recover the logging tool entirely then the RSO + special monitoring equipment are not necessary. The RSO should be kept informed as to what is taking place
3. If the procedure in 2 do not recover the tool then drilling should be stopped until the RSO with monitoring equipment can be brought in
4. The returning drilling fluid should be monitored continuously when recovery efforts are resumed (the monitoring survey equipment is to be used after the tool is recovered)

52. Explain in your own words what you would do if you had a radioactive material spill.

1. Immediately close off the area of the spill keeping all persons clear
2. Put on protective clothing + rubber gloves + survey the area of the spill protecting the survey meter probe from contamination. Survey with the probe window open
3. Proceed to decontaminate the area + equipment treating all wash + fluids (used for decontamination) as waste (radioactive).
4. After being satisfied that all the radioactive contamination has been cleaned up, then package up the RA waste, label it accordingly + return it to the base for further disposal

53. There are regulations relating to the leak testing of radioactive sources. Explain:

(a) what constitutes a leaker? If the wipe is analyzed to have .005 microcuries or more of activity

(b) how often is the leak test to be taken? Every 6 mos

54. What is ionizing radiation? Ionizing radiation is that radiation that creates an ion pair by knocking an electron from the orbital or shell of atom

55. What information should appear on the job site monitoring sheet?
1. Well Identification + Location
2. Survey Meter Identification
3. Radioactive Matl involved
4. Before + After Survey Meter readings
5. Signature of the Radiological Supervisor + date

56. In the event a radioactive material spill occurs in the field, special types of clothing and paraphenalia are required. Name these four items: Rubber gloves, protective clothing, survey meter, protective film badge, face mask (if gaseous or fine particulate matter is involved)

57. When gaseous radiotracers such as methyl and ethyl iodide are used in the field it is recommended that a face mask with an organic filter be worn. Why? To avoid ingestion of the radioactive iodine. An organic filter is necessary because of the gaseous nature of the tracer.

58. Where do all forms of ionizing radiation originate?
The nucleus of the atom

59. What is the best material for shielding fast neutron radiation and why? Use of neutron plastics (e.g. water extruded polyester) Because of their hydrogen content which allows the neutron, proton recoil reaction to slow down the neutrons

60. What is the dose rate in mrem/hr at 40 inches (100 cm) from a twenty (20) curie neutron source which emits 4 x 10^7 n/s?

$$\frac{\text{source output}}{12.57 \times (\text{distance in cm})^2} \times 0.14 = \text{mrem/hr}$$

$$\frac{4 \times 10^7 \times 20}{12.57 \times (100\ \text{cm})^2} \times 0.14$$

$$\frac{40,000,000}{12.57 \times 10000} \times 0.14$$

~~$\frac{\quad}{\quad} =$~~

$$\frac{4000}{12.57} \times 0.14 = 318.21 \times 0.14 = 44.54 \text{ mrem/hr at 40"}$$

Quiz

IN-HOUSE TRAINING
LOGGING SUPERVISORS

1. T F The Company's Radioactive Material License authorizes the Company to use any radioactive material.

2. A shipment of radioactive material must: (circle one)
   (a) reflect that it meets USA DOT 7-A specs.
   (b) reflect (if a box) the manufacturer's test seal, etc.
   (c) have proper triangular labels.
   (d) have a packing slip and supplier's label.
   (e) all of the above.

3. T F Anyone can open a package of radioactive material if they are wearing rubber gloves.

4. T F Our logging trucks need placards only on the two sides reading "RADIOACTIVE" when carrying radioactive material.

5. Survey meters are calibrated: (circle one)
   (a) monthly.
   (b) annually.
   (c) every six months.
   (d) periodically.

6. T F Radioactive Material should not be carried in the cab of a Company vehicle.

7. T F It is permissible to burn radioactive waste if all the labels have been removed.

8. Radioactive waste is disposed of by: (circle one or more)
   (a) burial.
   (b) burning.
   (c) returned to a waste disposal company.
   (d) allowed to remain in approved storage until decayed to background and then disposed of as ordinary trash (after) removal of all labels).

9. T F The Radiological Safety Officer is the only Company employee allowed to confer with NRC/or State representatives during an inspection.

10. T F Any Company employee may request an inspection by the appropriate agency if he believes a violation has occurred.

QUIZ (In-House Training, Logging Supervisors)

11. The whole body quarterly occupational dose should not exceed _____ Rems.

12. T F The hands and feet can receive 15 times as much occupational dose as the whole body.

13. T F The whole body quarterly occupational dose of _____ can be exceeded under certain conditions.

14. T F Employees under the age of 18 have the same occupational dose restrictions as all other employees.

15. T F It is permissible to borrow another person's badge if you record the time period that you have it.

16. T F In the event of a loss or theft of radioactive material, a telephone report to the NRC should be made within the next seven calendar days.

17. T F A Logging Assistant works under the personal supervision of a Logging Supervisor.

18. T F It is not necessary to have a survey meter on a logging truck which is involved in running a radioactive log if there is one available at the base.

19. T F A physical inventory of all radioactive material in the Company's possession is to be made semi-annually.

20. T F A survey should be made of each person's position and of the exterior of a logging truck before going on a logging job utilizing radioactive material.

21. T F Control badges are spare badges for anyone's use.

22. T F Sealed sources are to be leak tested every _____ months.

23. T F It is necessary to have a surveying capability of measuring alpha and/or 60 Kev gamma radiation available on a 24 hour call, if it is necessary to monitor returns from a well in which an AmBe neutron source is being fished.

24. T F All records are kept for _____ years except those for _____ which are kept until the NRC or Agreement State authorizes disposal.

25. T F Anyone can receive or pick up a package of tracer material or a sealed source.

QUIZ (In-House Training, Logging Supervisors)

26. List the records and forms that must be carried on the logging truck.

27. T F Only the RSO and Logging Supervisors have access to the Radioactive Material Storage Facilities.

28. The Logging Supervisor must establish a restricted area of not less than_____feet from the work area, which all personnel must observe during tracer or source handling.

29. List the appropriate equipment to be used when working with radioactive tracers.

30. T F It is unnecessary to notify the NRC or Agreement State authorities in the event a source is placed in jeopardy down hole as long as a report is filed within 30 days.

31. T F It is necessary to have a signed written agreement with the customer prior to running any logging job involving radioactive materials.

32. T F It is permissable to free a stuck source capsule from a source housing by use of a lathe if you first receive approval for your procedures from the NRC or Agreement State authorities.

33. T F If the "fixed" contamination measures less than _____ mr/hr at one centimeter, the item of equipment, article of clothing, etc. can be returned to normal use.

34. A yellow Radioactive_____ label will be used when the activity limits of a package exceeds 50 mrem/hr at any point on the external surfave or 1.0 mrem/hr at three feet from the external surface.

35. T F The DOT_____label must be on all shipping containers requiring White I, Yellow II or Yellow III labels.

QUIZ (In-House Training, Logging Supervisors)

36. T F The Transport Index is the dose rate at three feet from the surface of a package containing radioactive material.

37. _____ means any area access to which is controlled by the license for purposes of protection of individuals from exposure to radiation and radioactive materials.

38. T F You may request on an annual basis to see your radiation exposure records and your employer is required, by law, to show them to you.

39. _____ means any area in which a major portion of the body could receive 5 mrem/hr or 100 mrem in 5 consecutive days.

40. T F It is necessary to put the date of measurement on labels for relatively short half lived isotopes to let persons know the current source strength.

41. T F If a leak test reveals more than .005 microcuries of activity, the sealed source must be isolated, the NRC and/or Agreement State authorities notified and the source disposed of through a licensed disposal company.

42. Current NRC and Agreement State regulations require that a Survey Meter has a range of 0.1 through_____mr/hr.

43. T F All sealed sources used in well logging must be double encapsulated.

44. T F It is only necessary to check source holders, logging tools and source handling tools for defects on a semi-annual basis.

45. T F No special approval is needed to log a well (using a radioactive source) without surface casing.

46. T F Three months of "on the job training" will substitute for the 24 and 8 hour training course.

47. T F A safety review for logging supervisors and assistant logging supervisors at least once a year.

48. T F A logging supervisor may leave the well in order to obtain assistance if a source becomes lodged in the well.

49. T F The source holder (or source sub) does not need any hazard warning engraved.

QUIZ (In-House Training, Logging Supervisors)

50. T F On warning signs or labels indentifying radioactive material either "Caution" of "Danger" can be used.

OILFIELD RADIATION SAFETY SCHOOL
Assistant Logging Supervisors

COURSE OUTLINE
(2-4 Hours)

I. What is Radioactivity?

II. Relative Hazards in Working with Well Logging Sources of Radioactivity.

III. Review of Operating and Emergency Procedures
- Management Responsibility
- Radiation Safety and Monitoring Devices
- Procedures for Receiving Radioactive Isotopes
- General Rules for Transportation of Radioactive Isotopes
- Storage Facilities and Procedures
- General Procedure for Handling Radioactive Isotopes on Location (including use of remote handling tools)
- Procedures for Handling Sealed Sources of Radioactive Material
- Waste Disposal Procedures for Isotope
- Emergency Procedures - Tracer
- Decontamination Procedures
- Emergency Procedures - General
- Emergency Notification

IV. Review of Company's Radioactive Material Licence

V. Review of Applicable Federal and/or State Regulations
- Federal Regulations include 10 CFR Parts 19, 20 & 39

QUIZ

ASSISTANT LOGGING SUPERVISORS

1. (T) F Man cannot detect nuclear radiation with his senses.

2. (T) F Radiation is present in the atmosphere at all times.

3. (T) F For storage of radioactive materials, a sign stating "Caution Radioactive Materials" must be posted so it can be seen by all.

4. (T) F Time - Distance - Shielding are important factors in radiation safety.

5. T (F) The quarterly tolerance for the total body is 18.75 Rems.

6. T (F) The genetic effects of radiation are well documented, and it is possible to predict such effects with great accuracy.

7. (T) F A survey meter shall be used during any radiation activity or source manipulations.

8. T (F) Any Company employee may work with radioactive material as long as he has a survey meter and is wearing a badge.

9. T (F) The Company's Radioactive Material License authorizes the Company to use any radioactive material.

10. T (F) It is permissible to loan radioactive sources or tracers to another logging company if the other company has a radioactive material license, regardless as to whether or not the source material you are loaning is listed on their license.

11. (T) F You, as an individual, can request an inspection by the appropriate agency if you believe that there has been a violation in license activities.

12. T (F) The records of radiation exposure are Company confidential and are not available for the employee's review.

13. T (F) The hands and feet are much more sensitive to radiation exposure than the remainder of the body.

14. Define a restricted area -

15. T (F) It is permissible for you to loan your film badge to another person as long as you record the time & date that you loan it.

16. T (F) The Curie and Millicurie are units of energy.

17. T (F) The tolerance dose of 1.25 Rem per 13 weeks is based on the short term (24 hr. or less) exposures and not the long term effects of radiation.

18. T (F) Anyone can enter a radioactive material storage area as long as he or she are accompanied by a licensed individual.

19. (T) F Smoking, eating and drinking are prohibited in areas where radioactive tracers are being used or decontamination is taking place.

20. T (F) It is unimportant if the beta shield on the survey meter probe is open or closed when using the probe for surveying for contamination.

21. (T) F A logging source (or tracer material) should be constantly attended when out of their shields or secure areas.

22. T (F) Radioactive waste can be burned.

23. T (F) Decontamination destroys radioactivity.

24. (T) F Only approved handling tools should be used when working with radioactive materials.

25. In your own words - what are your responsibilities as an assistant Logging Supervisor?

SAFETY COURSE FOR ANCILLARY* PERSONNEL

COURSE OUTLINE

I. What is Radioactivity. How are radioactive materials used in well loggging?

II. What are the relative hazards to Company personnel?

III. What are the Company's procedures to protect all personnel from any unnecessary exposure. To include:

(a) Information concerning storage, transfer or use of radioactive materials at the base or job sites.

(b) The basic principles and fundamentals of radiation safety.

(c) Instruction in precautions and procedures to minimize radiation exposure.

(d) The purpose and function of protective devices.

(e) The appropriate response in the event of any emergency which may lead to radiation exposure or release of radioactive materials.

IV. Review of the Company's Radioactive Material License(s)

V. Review of applicable Federal and State regulations. Including:

(a) The worker's responsibility to report to the licensee any condition which may lead to or cause a violation of NRC and/or State regulations, license conditions, or any unnecessary exposure to or release of radioactive materials.

*Ancillary Personnel - Company personnel (secretarial, janitorial, clerks or other workers who might frequent any restricted area or who might assist in well logging operations at a temporary work site (excluding logging assistants).

AGREEMENT FOR CONTINGENCY OPERATION
LOSS OF RADIOACTIVE WELL LOGGING DEVICE

Whereas, _____ hereafter referred to as "OWNER/OPERATOR" wishes to engage Kaymen, Incorporated hereinafter referred to as "Licensee" to perform well logging operations involving the use of a well logging device containing radioactive material on wells owned or operated by OWNER/OPERATOR.

Whereas, regulations issued by the U.S. Nuclear Regulatory Commission (10 CFR 39.15) require LICENSEE to enter into an agreement similar to the presents prior to commencement of well logging operations utilizing such devices;

NOW, THEREFORE, in consideration of the presents and for other good and valuable considerations in hand received, OWNER/OPERATOR and LICENSEE do hereby agree as follows:

1. In the event that a radioactive well logging device being utilized in operation by LICENSEE in a well owned and operated by OWNER/OPERATOR shall be disconnected from the wireline suspending same in the well, the parties hereto agree that every reasonable effort, consistent with the prevailing oilfield practice, shall be utilized to retrieve said device from the well and agree not to attempt to recover said radioactive device in a manner which could result in its rupture.

2. LICENSEE shall provide radiation monitoring and should LICENSEE detect evidence that a radioactive source has ruptured, LICENSEE shall initiate emergency procedures immediately.

3. When LICENSEE and OWNER/OPERATOR agree that all reasonable efforts at recovery have been expended and determine that the radioactive well logging device must be abandoned, LICENSEE will contact the NRC Region IV office by telephone relating circumstances and must obtain approval to implement abandonment procedures. The parties hereto shall ensure that the actions listed below are accomplished within thirty (30) days after such determination.

4. The irretrievable radioactive well logging device shall be immobilized and sealed in place with a cement plug.

5. A whipstock or mechanical device, to prevent inadvertent intrusion of the radioactive well logging device, shall be set at a point in the well above the cement plug, as determined by OWNER/OPERATOR; provided, however, that no device shall be required to be installed if the cement plug and the irretrievable radioactive well logging device are inaccessible to any subsequent drilling operations.

6. A permanent identification plaque, constructed of a long lasting material such as stainless steel, brass, bronze, or monel, shall be mounted at the surface of the well, unless the mounting of the plaque is not practical. (Suggested size: 7 inch square) The following information shall be engraved of the plaque:

(a) The word "CAUTION", in large letters;
(b) The radiation symbol, (color not required);
(c) The date the source was abandoned;
(d) The name of the well owner or well operator;
(e) The well name and well identification number(s) or other designation;
(f) An identification of the sealed source by radionuclide and quantity of activity;
(g) The depth of the source and depth to the top of the plug; and
(h) An appropriate warning, such as "DO NOT RE-ENTER THIS WELL".

7. LICENSEE must, within thirty (30) days after radioactive well logging device is classified as irretrievable, send a written report to the NRC Region IV office and the state agency having authority over oil and gas well drilling operations, giving a description of retrieval attempts and details of the abandonment as outlined in 10 CFR Part 39.77 (d).

IN WITNESS WHEREOF, the parties hereto have executed this agreement this _____ day of _____, _____.

Kaymen, Inc.

By: _____

Well OWNER/OPERATOR:
Company: _____

By: _____

Title: _____

Attachment 4

RADIOACTIVE MATERIALS

Resume of Training and Experience
James Gregory LaMascus

1980-1981
In June of 1980 I went to work for Great Guns Logging, Inc. in Hominy, Oklahoma.

We utilized the 3 Ci AmBe 241, and Cs 137, 2 Ci, sealed sources in well logging operations for the location and determination of porositees in various strata. We did both cased hole and open hole work.

While in their employ my experience consisted of "on the job training", safety meetings, performing "leak tests", and the attendance of a formal school presented by "Tracer Lab" of Midland, Texas. We were given intensive instruction in the proper handling and protection, use of handling tools, film badges, and records with regard to safe use, handling, and storage of radioactive materials, also the proper use of several different monitoring devices.

After leaving Great Guns in the Spring of 1981, I went to work for Saturn Wireline Services, Inc. in Hominy, Oklahoma.

We also used the AmBe 241, 3 Ci, and Cs 137, 2 Ci sealed source for the determination of porosities in oil and gas well logging. As Saturn Wireline was being formed, I was instrumental in obtaining the proper sealed source handling devices, building safe storage areas and purchasing DOT approved transporting containers and overseeing that they were properly attached to the transporting vehicles.

While in the employ of Saturn Wireline, I was promoted to trainee Logging Engineer in August, 1982. My job consisted of running cased hole and open hole logs using radioactive sealed sources. One year later, in August 1983, I was promoted to " Field Logging Engineer", overseeing and having full responsibility of a logging unit used to run logs and perforate oil and gas wells.

I also attended a school presented by Alfred Caswell in January 1989 at Oklahoma City, OK.

All of the people I have been associated with in the wireline industry have maintained a radiation safety program that continually keeps me aware of the priorities of time, distance, and shielding, to keep the public, customers and other employees from being subjected to radiation exposure.

462531