



UNION CARBIDE CORPORATION
P.O. BOX 8361, SOUTH CHARLESTON, WV 25303

Nuclear Materials Licensing Section
U.S. Nuclear Regulatory Commission, Region II
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323-0199

August 4, 1995

David Collins:

Attached are the revisions to our application for renewal of USNRC License Number 47-00260-02 as you suggested in our telephone conversation.

I have added wording to Item 6. Purpose of Form 313 as you suggested. Changes are in italics.

I have added information to our Draft Radiological Control Manual as was suggested in the Reg. Guides that you sent to me. A complete chapter on emergency procedures was added as well as sections on procedures for installation of radiation sources and dosimeter calibration. There were also several minor changes incorporated as a result of reviewing the suggestions in the Reg. Guides.

If you should have any questions or need more information, please call me at 304/747-5314.

Yours truly,

Michael L. Green
Radiation Protection Officer
So. Charleston Technical Center

Item 5. Radioactive Material

| | <u>Radioisotope</u> | <u>Form</u> | <u>Max. Amount</u> |
|---|--|--|--------------------|
| A | Any byproduct material, except alpha emitters with atomic numbers 1 through 83 inclusive | Any sealed source registered pursuant to the requirement of 10 CFR 32.210 | 300 curies total |
| B | Americium 241 | Any sealed neutron source registered pursuant to the requirements of 10 CFR 32.210 | 25 curies total |
| C | Hydrogen 3 | Any | 250 millicuries |
| D | Carbon 14 | Any | 750 millicuries |

Item 6. Purpose (Revised 7/26/95, revisions in italic print)

| | |
|-------|--|
| A & B | Possession, storage and/or use in the following: 1) Research and development as defined in 10 CFR 30.4 2) Maintenance, repair, installation, removal and replacement of sealed sources, operation testing, and servicing of gauging devices including the performance of initial radiation surveys and leak testing of sealed sources <i>for the UCC So. Charleston Technical Center, other UCC Locations and UCC Temporary job sites.</i> 3) In gas chromatographs for sample analysis 4) Instrument calibration <i>for the UCC So. Charleston Technical Center, other UCC Locations and occasionally for non-UCC facilities.</i> 5) Field analysis of level and/or density <i>for the UCC So. Charleston Technical Center, other UCC Locations and UCC Temporary job sites.</i> 6) Testing steel vessels for carbon buildup (Am-241 only) <i>for the UCC So. Charleston Technical Center, other UCC Locations and UCC Temporary job sites.</i> |
| C&D | For possession, storage and/or use in research and development as defined in 10 CFR 30.4. |

Item 7. Responsible Individuals Training and Experience

See attached

Item 8. Training for IndividualsSee Chapter XII, Technical Center Radiological Control Manual. A copy of training materials will be provide upon request.Item 9. Facilities and EquipmentSee Chapter XI and Appendix III of Technical Center Radiological Control Manual.Item 10. Radiation Safety ProgramSee Technical Center Radiological Control Manual.Item 11. Waste ManagementSee Chapter IV, Technical Center Radiological Control Manual.

RADIATION SAFETY COMMITTEE
Training and Experience

The following people are current members of the Radiation Safety Committee.

| | |
|-------------------|--|
| J. H. Brubaker | Management |
| W. K. Becher | Nucleonics Applications |
| M. L. Green (RPO) | Nucleonics Applications/Radiation Safety |
| P. D. Johnson | Purchasing |
| K. B. Gasaway | Nucleonic Applications/Radiation Safety |
| M. A. Patel | Industrial Hygiene |

Each person's training and experience are on the following pages.

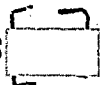
*Mr. James A. Boggess has retired and is no longer a member of the Radiation Safety Committee. His qualifications are still listed since he is occasionally brought back to work on a spot basis.

M. L. GREEN

| TYPE OF TRAINING | WHERE TRAINED | DURATION OF TRAINING | ON THE JOB | FORMAL COURSE |
|---|--------------------------|-------------------------|---------------|------------------|
| a. Principles and practices of radiation protection | Univ. of Kentucky | 9 months | No | Yes |
| | Univ. of Kentucky | 3 months | Yes | No |
| | Mound Lab. (AEC) | 39 months | Yes | No |
| | Univ. of Cincinnati | 8 months | No | Yes |
| | Union Carbide Corp. | 6 months | Yes | No |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Univ. of Kentucky | 9 months | No | Yes |
| | Univ. of Kentucky | 3 months | Yes | No |
| | Mound Lab. (AEC) | 39 months | Yes | No |
| | Univ. of Cincinnati | 8 months | Yes | No |
| | Union Carbide Corp. | 6 months | Yes | No |
| | Harvard School of Public | 1 week | No | Yes |
| Health (4-84) | | | | |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Univ. of Kentucky | 9 months | No | Yes |
| | Univ. of Cincinnati | 8 months | No | Yes |
| | Union Carbide Corp. | 3 months | Yes | No |
| | Mound Lab. (AEC) | 39 months | Yes | No |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |
| d. Biological effects of radiation | Univ. of Kentucky | 5 days | No | Yes. |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |

EXPERIENCE (M. L. GREEN)

| <u>ISOTOPE</u> | <u>MAXIMUM AMOUNT</u> | <u>WHERE EXPERIENCED GAINED</u> | <u>DURATION OF EXPERIENCE</u> | <u>TYPE OF USE</u> |
|-----------------------|---------------------------|-------------------------------------|-----------------------------------|-------------------------|
| U-238 | Kilograms | Univ. of Kentucky | 3 months | Sub-critical Reactor |
| Classified | Classified | Monsanto Research Corp. | 39 months | Classified |
| Cs-137 | Curies | Union Carbide Corp. | 24 years | Gauging |
| Ra-226 | m Curies | Union Carbide Corp. | 3 years | Gauging |
| Xe-133 | m Curies | Union Carbide Corp. | 6 months | Tracer |
| Cs-137 | m Curies | Union Carbide Corp. | 6 months | Tracer |
| Am-241 | Curies | Union Carbide Corp. | 21 years | Testing and Gauging |
| C-14 | m Curies | Union Carbide Corp. | 7 years | Tracer Studies |
| H-3 | m Curies | Union Carbide Corp. | 1 month | Tracer Studies |
| Rn-222 & daughters | pCi | Union Carbide Corp | 2 year | NORM Studies |

EDUCATIONB.S.  Physics - University of Kentucky

MLG

J. A. BOGGESS

| ISOTOPE | WHERE EXPERIENCED GAINED | DURATION OF EXPERIENCE | ON THE JOB | FORMAL COURSE |
|--|--|--------------------------------|------------------|-------------------|
| a. Principles and practices of radiation protection | Union Carbide Corp. UCC RPO School Army CBR Training | 8 months 2 weeks 2 weeks | Yes Yes No | No No Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Union Carbide Corp. UCC RPO School Army CBR Training | 8 years 2 weeks 2 weeks | Yes Yes No | No No Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Union Carbide Corp. UCC RPO School Army CBR Training | 8 years 2 weeks 2 weeks | Yes Yes No | No Yes Yes |
| d. Biological effects of radiation | Union Carbide Corp. UCC RPO School Army CBR Training | 8 years 2 weeks 2 weeks | Yes Yes No | No. Yes Yes |

EXPERIENCE (J. A. BOGGESS)

| ISOTOPE | MAXIMUM AMOUNT | WHERE EXPERIENCED GAINED | DURATION OF EXPERIENCE | TYPE OF USE |
|--------------------|-------------------|-----------------------------|---------------------------|---------------------------------|
| CS-137 | Curies | Union Carbide Corp. | 28 years | Density and Level Gauge, Tracer |
| Co-60 | Curies | Union Carbide Corp. | 11 years | Density and Level Gauge |
| Ra-226 & daughters | Millicuries | Union Carbide Corp. | 11 years | Density and Level Gauge, Tracer |
| C-14 | m Curies | Union Carbide Corp. | 10 years | R&D Tracer |
| H-3 | m Curies | Union Carbide Corp. | 6 years | Tracer |
| Xe-133 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Kr-79 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Sr-90 | m Curies | Union Carbide Corp. | 8 years | R&D |
| Au-198 | m Curies | Union Carbide Corp. | 1 year | Tracer |
| I-131 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Cs-131 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Rb-86 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Am-241-Be | m Curies | Union Carbide Corp. | 20 years | Carbon Measurement |

Supplement to USNRC Form

Renewal of USNRC License No. 47-00260-02

Union Carbide Corp., Technical Center, So. Charleston, WV 25303

January 17, 1995

revised 8/4/95

J. H. BRUBAKER

| TYPE OF TRAINING | WHERE TRAINED | DURATION OF TRAINING | ON THE JOB | FORMAL COURSE |
|--|---|-------------------------|---------------|------------------|
| a. Principles and practices of radiation protection | Union Carbide Corp. RPO School | 2 weeks | Yes | Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Union Carbide Corp. RPO School | 2 weeks | Yes | Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Union Carbide Corp. RPO School Univ. of Florida | 8 years 9 months | Yes No | No Yes |
| d. Biological effects of radiation | Union Carbide Corp. | 2 weeks | Yes | Yes |

EXPERIENCE

| ISOTOPE | MAXIMUM AMOUNT | WHERE EXPERIENCE GAINED | DURATION OF EXPERIENCE | TYPE OF USE |
|---------|-------------------|----------------------------|---------------------------|------------------|
| Cs-137 | Curies | Union Carbide Corp. | 8 yrs. | Process Gauging |
| Am-241 | m Curies | Union Carbide Corp. | 8 yrs. | Carbon Detection |

EDUCATION

| Degree | College or University | Date Acquired | Major |
|--------|-----------------------|---|-------------------|
| AA | Hershey Jr. College | <div style="border: 1px solid black; width: 100px; height: 100px;"></div> | Science |
| BS | Univ. of Florida | | Physics |
| MS | Univ. of Florida | | Astronomy-Physics |

W. K. BECHER

| TYPE OF TRAINING | WHERE TRAINED | DURATION OF TRAINING | ON THE JOB | FORMAL COURSE |
|--|---|---|-------------------------|-------------------------|
| a. Principles and practices of radiation protection | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |
| d. Biological effects of radiation | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |

EXPERIENCE

| ISOTOPE | MAXIMUM AMOUNT | WHERE EXPERIENCE GAINED | DURATION OF EXPERIENCE | TYPE OF USE |
|------------------|----------------|-------------------------|------------------------|-----------------------|
| Co ⁶⁰ | Curies | Westinghouse Electric | 4 yrs. | Medical |
| Co ⁶⁰ | Curies | CGR Medical Corp. | 5 yrs. | Medical |
| Cs-137 | m Curies | Union Carbide Corp. | 18 yrs. | Density & Level Gauge |
| Am-241 Be | Neutron | Union Carbide Corp. | 18 yrs. | Carbon Measuremt. |

Supplement to USNRC Form
 Renewal of USNRC License No. 47-00260-02
Union Carbide Corp., Technical Center, So. Charleston, WV 25303

January 17, 1995
 revised 8/4/95

K. B. Gasaway

| TYPE OF TRAINING | WHERE | DURATION OF COURSE | ON THE JOB | FORMAL |
|--|---|--------------------|------------|--------|
| a. Principals and practices of radiation protection | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification Univ. of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification Univ. of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification University of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |
| d. Biological effects of radiation | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification University of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |

EXPERIENCE (K B GASAWAY)

Supplement to USNRC Form . J

Renewal of USNRC License No. 47-00260-02

Union Carbide Corp., Technical Center, So. Charleston, WV 25303

January 17, 1995

revised 8/4/95

| <u>ISOTOPE</u> | <u>MAXIMUM AMOUNT</u> | <u>WHERE EXPERIENCED GAINED</u> | <u>DURATION OF EXPERIENCE</u> | <u>TYPE OF USE</u> |
|----------------|---------------------------|-------------------------------------|-----------------------------------|--------------------|
| Cs-137 | m Curies | ARCO Chemical Co. | 3 Years | Level Gauge |
| NORM | uR/Hr&CPM | ARCO Chemical Co. | 3 Years Contaminant | Industrial |

EDUCATION

| <u>Degree</u> | <u>College or University</u> | <u>Date Acquired</u> | <u>Major</u> |
|---------------|---|--|---|
| BS | University of Houston Clear Lake, TX | <div style="border: 1px solid black; width: 100px; height: 30px;"></div> | Natural and Applied Science - Industrial Hygiene and Safety |

Supplement to USNRC Form 3
Renewal of USNRC License No. 47-00260-02
Union Carbide Corp., Technical Center, So. Charleston, WV 25303

February 17, 1995
revised 8/4/95

PHILIP D. JOHNSON

Mr Philip Johnson has no formal training or experience with radioactive materials. His sole purpose for sitting on the committee is to provide a direct link between the Committee and the Purchasing Department. He has all responsibility for processing purchase orders for radioactive material controlled by this license

EDUCATION

West Virginia University, Morgantown, WV 26506
Bachelor of Science in Industrial Engineering
Date of Graduation: [redacted]

EMPLOYMENT

Purchasing Agent: Union Carbide Chemicals & Plastics Co., Inc., South Charleston, WV, August 1990 to present. Write purchase agreements and contracts for a variety of products and services.

M. A. PATEL

Mr Patel is a Certified Industrial Hygienist. He earned a B.S. in Biology and Chemistry in [redacted] an M.S. in Biochemistry in [redacted] and a Masters of Science in Public Health in [redacted] from the University of Michigan. He has also successfully completed a Union Carbide class in radiation safety. He is currently the site Industrial Hygienist.



UNION CARBIDE CORPORATION
P.O. BOX 8361, SOUTH CHARLESTON, WV 25303

Nuclear Materials Licensing Section
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David Collins:

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If you should have any questions or need more information, please call me at 304/747-5314.

Yours truly,

A handwritten signature in black ink, appearing to read "Michael L. Green".

Michael L. Green
Radiation Protection Officer
So. Charleston Technical Center

D-13

Item 5. Radioactive Material

| | <u>Radioisotope</u> | <u>Form</u> | <u>Max. Amount</u> |
|---|--|--|--------------------|
| A | Any byproduct material, except alpha emitters with atomic numbers 1 through 83 inclusive | Any sealed source registered pursuant to the requirement of 10 CFR 32.210 | 300 curies total |
| B | Americium 241 | Any sealed neutron source registered pursuant to the requirements of 10 CFR 32.210 | 25 curies total |
| C | Hydrogen 3 | Any | 250 millicuries |
| D | Carbon 14 | Any | 750 millicuries |

Item 6. Purpose (Revised 7/26/95, revisions in italic print)

| | |
|-------|--|
| A & B | Possession, storage and/or use in the following: 1) Research and development as defined in 10 CFR 30.4 2) Maintenance, repair, installation, removal and replacement of sealed sources, operation testing, and servicing of gauging devices including the performance of initial radiation surveys and leak testing of sealed sources <i>for the UCC So. Charleston Technical Center, other UCC Locations and UCC Temporary job sites.</i> 3) In gas chromatographs for sample analysis 4) Instrument calibration <i>for the UCC So. Charleston Technical Center, other UCC Locations and occasionally for non-UCC facilities.</i> 5) Field analysis of level and/or density <i>for the UCC So. Charleston Technical Center, other UCC Locations and UCC Temporary job sites.</i> 6) Testing steel vessels for carbon buildup (Am-241 only) <i>for the UCC So. Charleston Technical Center, other UCC Locations and UCC Temporary job sites.</i> |
| C&D | For possession, storage and/or use in research and development as defined in 10 CFR 30.4. |

Item 7. Responsible Individuals Training and Experience

See attached

Item 8. Training for IndividualsSee Chapter XII, Technical Center Radiological Control Manual. A copy of training materials will be provide upon request.Item 9. Facilities and EquipmentSee Chapter XI and Appendix III of Technical Center Radiological Control Manual.Item 10. Radiation Safety ProgramSee Technical Center Radiological Control Manual.Item 11. Waste ManagementSee Chapter IV, Technical Center Radiological Control Manual.

RADIATION SAFETY COMMITTEE
Training and Experience

The following people are current members of the Radiation Safety Committee.

| | |
|-------------------|--|
| J. H. Brubaker | Management |
| W. K. Becher | Nucleonics Applications |
| M. L. Green (RPO) | Nucleonics Applications/Radiation Safety |
| P. D. Johnson | Purchasing |
| K. B. Gasaway | Nucleonic Applications/Radiation Safety |
| M. A. Patel | Industrial Hygiene |

Each person's training and experience are on the following pages.

*Mr. James A. Boggess has retired and is no longer a member of the Radiation Safety Committee. His qualifications are still listed since he is occasionally brought back to work on a spot basis.

M. L. GREEN


| TYPE OF TRAINING | WHERE TRAINED | DURATION OF TRAINING | ON THE JOB | FORMAL COURSE |
|---|--------------------------|-------------------------|---------------|------------------|
| a. Principles and practices of radiation protection | Univ. of Kentucky | 9 months | No | Yes |
| | Univ. of Kentucky | 3 months | Yes | No |
| | Mound Lab. (AEC) | 39 months | Yes | No |
| | Univ. of Cincinnati | 8 months | No | Yes |
| | Union Carbide Corp. | 6 months | Yes | No |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Univ. of Kentucky | 9 months | No | Yes |
| | Univ. of Kentucky | 3 months | Yes | No |
| | Mound Lab. (AEC) | 39 months | Yes | No |
| | Univ. of Cincinnati | 8 months | Yes | No |
| | Union Carbide Corp. | 6 months | Yes | No |
| | Harvard School of Public | 1 week | No | Yes |
| Health (4-84) | | | | |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Univ. of Kentucky | 9 months | No | Yes |
| | Univ. of Cincinnati | 8 months | No | Yes |
| | Union Carbide Corp. | 3 months | Yes | No |
| | Mound Lab. (AEC) | 39 months | Yes | No |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |
| d. Biological effects of radiation | Univ. of Kentucky | 5 days | No | Yes. |
| | IsoTopics/NUS Corp | 40 hr | No | Yes |
| | Harvard School of Public | 1 week | No | Yes |
| Health (3/91) | | | | |

January 17, 1995
revised 8/4/95

EXPERIENCE (M. L. GREEN)

| <u>ISOTOPE</u> | <u>MAXIMUM AMOUNT</u> | <u>WHERE EXPERIENCED GAINED</u> | <u>DURATION OF EXPERIENCE</u> | <u>TYPE OF USE</u> |
|-----------------------|---------------------------|-------------------------------------|-----------------------------------|-------------------------|
| U-238 | Kilograms | Univ. of Kentucky | 3 months | Sub-critical Reactor |
| Classified | Classified | Monsanto Research Corp. | 39 months | Classified |
| Cs-137 | Curies | Union Carbide Corp. | 24 years | Gauging |
| Ra-226 | m Curies | Union Carbide Corp. | 3 years | Gauging |
| Xe-133 | m Curies | Union Carbide Corp. | 6 months | Tracer |
| Cs-137 | m Curies | Union Carbide Corp. | 6 months | Tracer |
| Am-241 | Curies | Union Carbide Corp. | 21 years | Testing and Gauging |
| C-14 | m Curies | Union Carbide Corp. | 7 years | Tracer Studies |
| H-3 | m Curies | Union Carbide Corp. | 1 month | Tracer Studies |
| Rn-222 & daughters | pCi | Union Carbide Corp | 2 year | NORM Studies |

EDUCATION

B.S.  Physics - University of Kentucky

MLG

J. A. BOGGESS

| ISOTOPE | WHERE EXPERIENCED GAINED | DURATION OF EXPERIENCE | ON THE JOB | FORMAL COURSE |
|--|--|--------------------------------|------------------|-------------------|
| a. Principles and practices of radiation protection | Union Carbide Corp. UCC RPO School Army CBR Training | 8 months 2 weeks 2 weeks | Yes Yes No | No No Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Union Carbide Corp. UCC RPO School Army CBR Training | 8 years 2 weeks 2 weeks | Yes Yes No | No No Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Union Carbide Corp. UCC RPO School Army CBR Training | 8 years 2 weeks 2 weeks | Yes Yes No | No Yes Yes |
| d. Biological effects of radiation | Union Carbide Corp. UCC RPO School Army CBR Training | 8 years 2 weeks 2 weeks | Yes Yes No | No. Yes Yes |

EXPERIENCE (J. A. BOGGESS)

| ISOTOPE | MAXIMUM AMOUNT | WHERE EXPERIENCED GAINED | DURATION OF EXPERIENCE | TYPE OF USE |
|--------------------|-------------------|-----------------------------|---------------------------|---------------------------------|
| CS-137 | Curies | Union Carbide Corp. | 28 years | Density and Level Gauge, Tracer |
| Co-60 | Curies | Union Carbide Corp. | 11 years | Density and Level Gauge |
| Ra-226 & daughters | Millicuries | Union Carbide Corp. | 11 years | Density and Level Gauge, Tracer |
| C-14 | m Curies | Union Carbide Corp. | 10 years | R&D Tracer |
| H-3 | m Curies | Union Carbide Corp. | 6 years | Tracer |
| Xe-133 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Kr-79 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Sr-90 | m Curies | Union Carbide Corp. | 8 years | R&D |
| Au-198 | m Curies | Union Carbide Corp. | 1 year | Tracer |
| I-131 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Cs-131 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Rb-86 | m Curies | Union Carbide Corp. | 3 months | Tracer |
| Am-241-Be | m Curies | Union Carbide Corp. | 20 years | Carbon Measurement |

J. H. BRUBAKER

| TYPE OF TRAINING | WHERE TRAINED | DURATION OF TRAINING | ON THE JOB | FORMAL COURSE |
|--|---|-------------------------|---------------|------------------|
| a. Principles and practices of radiation protection | Union Carbide Corp. RPO School | 2 weeks | Yes | Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Union Carbide Corp. RPO School | 2 weeks | Yes | Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Union Carbide Corp. RPO School Univ. of Florida | 8 years 9 months | Yes No | No Yes |
| d. Biological effects of radiation | Union Carbide Corp. | 2 weeks | Yes | Yes |

EXPERIENCE

| ISOTOPE | MAXIMUM AMOUNT | WHERE EXPERIENCE GAINED | DURATION OF EXPERIENCE | TYPE OF USE |
|---------|-------------------|----------------------------|---------------------------|------------------|
| Cs-137 | Curies | Union Carbide Corp. | 8 yrs. | Process Gauging |
| Am-241 | m Curies | Union Carbide Corp. | 8 yrs. | Carbon Detection |

EDUCATION

| Degree | College or University | Date Acquired | Major |
|--------|-----------------------|---|-------------------|
| AA | Hershey Jr. College | <div style="border: 1px solid black; width: 100px; height: 100px;"></div> | Science |
| BS | Univ. of Florida | | Physics |
| MS | Univ. of Florida | | Astronomy-Physics |

W. K. BECHER

| <u>TYPE OF TRAINING</u> | <u>WHERE TRAINED</u> | <u>DURATION OF TRAINING</u> | <u>ON THE JOB</u> | <u>FORMAL COURSE</u> |
|--|---|---|-------------------------|-------------------------|
| a. Principles and practices of radiation protection | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |
| d. Biological effects of radiation | Electric Corp. Westinghouse CGR Medical Corp. Union Carbide Corp. Training for RPO USAF Keesler AFB | 4 years 5 years 80 hours 2 weeks | Yes Yes Yes No | Yes No Yes Yes |

EXPERIENCE

| <u>ISOTOPE</u> | <u>MAXIMUM AMOUNT</u> | <u>WHERE EXPERIENCE GAINED</u> | <u>DURATION OF EXPERIENCE</u> | <u>TYPE OF USE</u> |
|------------------|-----------------------|--------------------------------|-------------------------------|-----------------------|
| Co ⁶⁰ | Curies | Westinghouse Electric | 4 yrs. | Medical |
| Co ⁶⁰ | Curies | CGR Medical Corp. | 5 yrs. | Medical |
| Cs-137 | m Curies | Union Carbide Corp. | 18 yrs. | Density & Level Gauge |
| Am-241 Be | Neutron | Union Carbide Corp. | 18 yrs. | Carbon Measuremt. |

K. B. Gasaway

| TYPE OF TRAINING | WHERE | DURATION OF COURSE | ON THE JOB | FORMAL |
|--|---|--------------------|------------|--------|
| a. Principals and practices of radiation protection | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification Univ. of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification Univ. of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification University of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |
| d. Biological effects of radiation | Eagle Environmental Inc, Houston, TX | 1.5 Years | Yes | No |
| | ARCO Chemical Co. Radiation Consultants, Inc. Houston, TX | 3 Years | Yes | No |
| | RSO Certification University of Houston | 16 hours | No | Yes |
| | -Clear Lake, TX Radiation Safety | 1 College Semester | No | Yes |
| | Suntrac Services, Inc. NORM Training | 16 hours | No | Yes |
| | | | | |

EXPERIENCE (K B GASAWAY)

Supplement to USNRC Form - J

Renewal of USNRC License No. 47-00260-02

Union Carbide Corp., Technical Center, So. Charleston, WV 25303

January 17, 1995

revised 8/4/95

| <u>ISOTOPE</u> | <u>MAXIMUM AMOUNT</u> | <u>WHERE EXPERIENCED GAINED</u> | <u>DURATION OF EXPERIENCE</u> | <u>TYPE OF USE</u> |
|----------------|---------------------------|-------------------------------------|-----------------------------------|--------------------|
| Cs-137 | m Curies | ARCO Chemical Co. | 3 Years | Level Gauge |
| NORM | uR/Hr&CPM | ARCO Chemical Co. | 3 Years Contaminant | Industrial |

EDUCATION

| <u>Degree</u> | <u>College or University</u> | <u>Date Acquired</u> | <u>Major</u> |
|---------------|---|--|---|
| BS | University of Houston Clear Lake, TX | <div style="border: 1px solid black; width: 100px; height: 30px;"></div> | Natural and Applied Science - Industrial Hygiene and Safety |

Supplement to USNRC Form 3
Renewal of USNRC License No. 47-00260-02
Union Carbide Corp., Technical Center, So. Charleston, WV 25303

January 17, 1995
revised 8/4/95

PHILIP D. JOHNSON

Mr Philip Johnson has no formal training or experience with radioactive materials. His sole purpose for sitting on the committee is to provide a direct link between the Committee and the Purchasing Department. He has all responsibility for processing purchase orders for radioactive material controlled by this license

EDUCATION

West Virginia University, Morgantown, WV 26506
Bachelor of Science in Industrial Engineering
Date of Graduation:

EMPLOYMENT

Purchasing Agent: Union Carbide Chemicals & Plastics Co., Inc., South Charleston, WV, August 1990 to present. Write purchase agreements and contracts for a variety of products and services.

M. A. PATEL

Mr Patel is a Certified Industrial Hygienist. He earned a B.S. in Biology and Chemistry in [1969] an M.S. in Biochemistry in [1972] and a Masters of Science in Public Health in [1977] from the University of Michigan. He has also successfully completed a Union Carbide class in radiation safety. He is currently the site Industrial Hygienist.

May 1999

M. L. Green (5/99)

| TYPE OF TRAINING | WHERE TRAINED | DURATION OF TRAINING | ON THE JOB | FORMAL COURSE |
|--|---------------------|----------------------|------------|---------------|
| a. Principles and practices of radiation protection | Univ. of Kentucky | 9 mo. | No | Yes |
| | Univ. of Kentucky | 3 mo. | Yes | No |
| | Mound Lab. (AEC) | 39 mo. | Yes | No |
| | Univ. of Cincinnati | 8 mo. | No | Yes |
| | Union Carbide | 29 yr. | Yes | No |
| | IsoTopic/NUS | 40 hr | No | Yes |
| | Harvard | 40 hr | No | Yes |
| b. Radioactivity measurement standardization and monitoring techniques and instruments | Univ. of Kentucky | 9 mo. | No | Yes |
| | Univ. of Kentucky | 3 mo. | Yes | No |
| | Mound Lab. (AEC) | 39 mo. | Yes | No |
| | Univ. of Cin. | 8 mo. | No | Yes |
| | Union Carbide | 29 yr. | Yes | No |
| | IsoTopic/NUS | 40 hr | No | Yes |
| | Harvard 4/84 | 40 hr | No | Yes |
| | Harvard 3/91 | 40 hr | No | Yes |
| c. Mathematics and calculations basic to the use and measurement of radioactivity | Univ. of Kentucky | 9 mo. | No | Yes |
| | Univ. of Kentucky | 3 mo. | Yes | No |
| | Mound Lab. (AEC) | 39 mo. | Yes | No |
| | Harvard | 40 hr | No | Yes |
| | Union Carbide | 29 yr. | Yes | No |
| | IsoTopic/NUS | 40 hr | No | Yes |
| d. Biological effects of radiation | Univ. of Kentucky | 40 hr | No | Yes |
| | IsoTopics/NUS | 40 hr | No | Yes |
| | Harvard | 40 hr | No | Yes |
| | Union Carbide Corp. | 29 yr | Yes | No |

EXPERIENCE

| ISOTOPE | MAXIMUM AMOUNT | WHERE EXPERIENCE GAINED | DURATION OF EXPERIENCE | TYPE OF USE |
|-------------|----------------|-------------------------|------------------------|----------------------|
| Cs-137 | Curies | Union Carbide Corp. | 29 yrs. | Process Gauges |
| Am-241 Be | Curie | Union Carbide Corp. | 29 yrs. | Carbon Block Meas. |
| U-238 | Kilograms | Univ. of Ky | 3 mo. | Sub-critical reactor |
| Classified | Classified | Mound Lab. (AEC) | 39 mo. | Classified |
| Ra-226 | mCi | Union Carbide Corp. | 3 yrs. | Gauging |
| Xe-133 | mCi | Union Carbide Corp. | 6 mo. | Tracer Study |
| Cs-137 | mCi | Union Carbide Corp. | 6 mo. | Tracer Study |
| Am-241 | mCi | Union Carbide Corp. | 29 yrs. | Testing & Gauging |
| C-14 | mCi | Union Carbide Corp. | 9 yrs | Tracer Study |
| H-3 | mCi | Union Carbide Corp. | 1 mo. | Tracer Study |
| Rn-222 | pCi | Union Carbide Corp. | 7 yrs. | NORM Studies |
| Nat. U & Th | pCi | Union Carbide Corp. | 5 yrs. | Site Remediation |

EDUCATION

BS-Physics] University of Kentucky (b)(6)