

Form AEC-313
(2-73)
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-40027

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

1. (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital person, etc. include ZIP Code and telephone number.)

Halliburton Industrial Services, Inc.
1015 Bois D'Arc
(P. O. Box 207)
Duncan, Oklahoma 73536
Phone - (405) 251-3360

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1(a), include ZIP Code.)

The items will be stored at locations described in attachment 1, page S-1. The items will be decontaminated at the location described in attachment 1 page D-1.

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Operations

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

None

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)

See attachment 1, pages D-4 and D-5.

5. RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

Paul J. Pettit, PhD.
Resume' attachment 2

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)

1. Cobalt-60
2. Detectable quantities of nuclides with atomic numbers 3 through 83.

(See attachment 1, page S-2)

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

1. Solid oxides adhering to surface of equipment - maximum of (b)(4), (b)(7)(F)
2. Solid oxides adhering to surface of equipment - maximum of (b)(4), (b)(7)(F)

(See attachment 1, page S-2.)

APPROVED
DATE REC'D 364572
APPROVED FOR CATEGORY 110-3C
TYPE OF FEE 0770
LAW ENFORCEMENT 1/6/83
REMOVED BY 1003-1

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

The purpose of this license is to permit storage and decontamination of equipment used for service in nuclear power plants throughout the United States.

See attachment 1 for details.

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 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1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 193

INFORMATION FOR LICENSING OF STORAGE SITES
For Low-Level Radioactive Equipment For
Industrial Cleaning of Nuclear Power Plants

1) & 2) Address of Sites:

- (a) Halliburton Industrial Services, Inc.
Box 68
Mt. Laurel, New Jersey 08054
- (b) Halliburton Industrial Services, Inc.
P. O. Box 18346
Raleigh, North Carolina 27619
- (c) Halliburton Industrial Services, Inc.
P. O. Box 650
Seabrook, New Hampshire 03874
- (d) Halliburton Industrial Services, Inc.
105 Prairie Avenue
Dwight, Illinois 60420

3) Responsible Individuals

- (a) Functional Responsibility - Manager
Zanesville District
Halliburton Industrial
Services, Inc.
Box 989
Zanesville, Ohio 43701-0366
- (b) Management Responsibility - Manager - Nuclear Project
Halliburton Industrial
Services, Inc.
910 Clopper Road
Gaithersburg, Maryland 20878
- (c) Overall Responsibility
President
Halliburton Industrial
Services, Inc.
P. O. Box 297
Duncan, Oklahoma 73536

4) Storage Facilities

The storage facilities will consist of metal-sided, wheeled, 30 to 40 foot long box trailers with lockable doors.

5) & 6) Levels of Contamination

Contamination will be primarily Cobalt-60. Very small amounts of the nuclides with atomic numbers 3 through 83 may also be present.

Stored items and equipment will be decontaminated by water flushing, wiping or rinsing prior to arriving on site.

7) The maximum level of all isotopes will be

(b)(4), (b)(7)(F)

Ex 4/
7F

8) Equipment To Be Stored

The items stored will be equipment used to water-lance and clean nuclear power plant equipment such as steam generators. The equipment will include such items as pumps, water lancing mechanisms, hose, vessels, filters, electric controllers control instrumentation, electrical cable, tools, storage containers, etc.

9) Source of Contamination

The stored materials and equipment will become contaminated with radioactivity through use for service work in nuclear power plants.

INFORMATION FOR LICENSING OF DECONTAMINATION STORAGE AND MAINTENANCE
Sites For Low-Level Radioactive Equipment For
Industrial Cleaning of Nuclear Power Plants

1) The Site

A. Address -

Halliburton Industrial Services, Inc.
P. O. Box 989
Zanesville, Ohio 43701-0366

B. Facilities -

(a) Overall Site -

The site will consist of a 100' X 100' level paved area. The area will be surrounded by an eight (8) foot high, intrusion resistant fence with lockable gate(s).

(b) Storage -

Trailer(s) - metal-sided, wheeled, 30 to 40 feet long box trailers with lockable doors.

Building(s) - wood frame or concrete/cinder block or temporary metal building constructed to good engineering standards and to all state, local and applicable code requirements as required for storage of radioactive contaminated items and equipment. All buildings to have lockable doors and windows.

(c) Personnel Facilities -

Buildings constructed to all applicable codes and standards for use as offices, sanitary facilities, general work areas and weather protection for personnel.

2) Responsible Individuals

A. Functional Responsibilities:

Health Physicist
Halliburton Industrial Services, Inc.
910 Clopper Road
Gaithersburg, Maryland 20878

and

Manager
Zanesville District
Halliburton Industrial Services, Inc.
Box 989
Zanesville, Ohio 43701-0366

B. Management Responsibilities:

Manager - Nuclear Projects
Halliburton Industrial Services, Inc.
910 Clopper Road.
Gaithersburg, Maryland 20878

C. Overall Responsibility:

President
Halliburton Industrial Services, Inc.
P. O. Box 297
Duncan, Oklahoma 73536

3) The Decontamination Facility

A. Pavement -

All decontamination operations will be conducted on the site facility pavement described in 1)A. The pavement will be covered and protected as described below to prevent spread of contamination.

B. Pavement Cover -

The paved area where decontamination operations are conducted will be covered with heavy-duty plastic sheeting to prevent contamination of the pavement.

C. Temporary Protective Structure -

When a risk of airborne contamination exists, or when weather conditions dictate, a temporary, plastic lined, wood or metal frame, self supporting structure will be used to enclose the area where decontamination operations are being conducted. Figure 1 is a sketch of such a protective structure.

4) Fluid Containment Systems

Small quantities of cleaning fluids such as used in spray bottles or atomizers may be used occasionally for decontamination operations. The objective of the decontamination operations would be to remove small quantities of swipable surface contamination to prevent the spread of such contamination from subsequent maintenance activities. The method of decontamination would be by wiping the contaminated objects with rags or towels dampened with commercially available alcohol-based or water-based cleaning fluids, or by wiping the objects that have been dampened with the cleaning fluids.

The surfaces under the objects to be decontaminated would be protected and covered by plastic sheet.

5) Disposal Procedure

Contaminated items including rags and anti-contamination clothing would be disposed of by placing them in properly marked, approved drums that would be sealed and shipped to an approved disposal site by a commercial radioactive waste disposal contractor.

6) On-Site Radiation Monitoring Equipment

A simple "frisker" will be available for monitoring radiation.

7)

Personnel To Perform Decontamination Work

<u>NAME</u>	<u>Soc. Sec. Id. No.</u>	<u>Birth Date</u>
S. Colby	(b)(6)	
J. Pristavok		
R. H. Whitney		
L. J. Sloan		
B. H. Timmerman		
G. W. Boughton		
A. J. McLaughlin		
R. J. Greer		
E. J. Wasson		
M. R. Daignault		
J. W. Salvaneschi		
L. Seidl		
A. R. Knighten		
C. R. Egger		
L. D. Taylor		
W. E. Schloendorn		
G. E. Miller		
F. A. Bush		
P. E. Hunley		
J. E. Sherman		
W. R. Adams		
R. L. Meek		
D. S. Van Weort		
F. M. Blizzard		
D. P. Burnell		
R. Coney		
K. J. Luff		
R. J. Satterwhite		
J. D. Klaiber		
J. G. Minix		
T. E. Swink		
S. S. Mickel		
R. W. Adams		
E. W. Hollis		
J. N. Clark		
W. F. McDonald		
R. E. Morris		
J. C. Brower		
J. M. Joyner		
G. A. Eldredge		

(b)(6)

S. Colby
 J. Pristavok
 R. H. Whitney
 L. J. Sloan
 B. H. Timmerman
 G. W. Boughton
 A. J. McLaughlin
 R. J. Greer
 E. J. Wasson
 M. R. Daignault
 J. W. Salvaneschi
 L. Seidl

A. R. Knighten
 C. R. Egger
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 W. E. Schloendorn
 G. E. Miller
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 R. W. Adams
 E. W. Hollis
 J. N. Clark
 W. F. McDonald
 R. E. Morris
 J. C. Brower
 J. M. Joyner
 G. A. Eldredge

NAMESoc. Sec. Id. No.Birth Date

M. E. Holt
D. Burt
G. W. Cartrette
C. S. Bullock
J. G. East
D. T. Trent
J. W. Mayo
J. L. Trantham
R. R. Clark

R. T. Ramler
B. R. Combs
S. J. Schneider
D. R. Guinn
C. W. Grissom
L. Burkett
J. L. Bramble
T. L. Jones
T. L. Cutlip
O. E. Smith
D. W. Haney
S. W. Barnhart
J. A. Bilby

(b)(6)

13069

8) Training

Each person who is to perform decontamination work is to receive prior training as follows:

Classroom Training:

- Basic information on radiation, its sources and effects;
- Method of minimizing radiation exposure;
- Method of minimizing contamination of equipment, facilities and personnel;
- Planning and preparation for job;
- Method of decontamination, spill prevention;
- Emergency procedures.

On the Job Training:

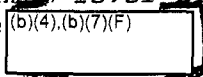
- First-hand instruction in decontamination procedures and methods.

9) Experience of Decontamination Workers

All of the personnel listed in item "7" above are engaged full time in the performance of industrial cleaning work. All of the personnel who will be performing decontamination work will receive classroom training in radiation protection and radioactive decontamination. Most of the personnel who will do decontamination work have performed cleaning work in commercial nuclear power plants.

10) The Contamination To Be Removed

The physical form of the contamination will be solid particulate and other metal corrosive products which (loosely) adhere to the surfaces of process equipment used for industrial service work such as high pressure water cleaning, chemical cleaning and testing in nuclear power plants. The predominant contaminant is expected to be Cobalt-60, but non-transuranic contaminants found in BWR and PWR plants are expected to be present in small quantities. The maximum level of contamination to be removed is expected to be (b)(4),(b)(7)(F)



EX-4
7f

11) Monitoring of Personnel Radiation Exposure and Contamination

A simple "frisker" located appropriately at step-off pads and zone interfaces will be used to monitor personnel to prevent spread of contamination on personnel.

Radiation exposure to individual workers will be monitored by use of TLD badges.

12) Protective Clothing

Personnel performing the decontamination work will be provided with appropriate protective clothing to prevent contamination of the workers. The protective clothing will include (plastic) shoe covers in all cases, and laboratory coats or coveralls and caps and safety glasses or face shields as required for the particular job. Gloves would be used in all cases, and particular rubber gloves will be provided when liquid is used for decontamination.

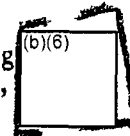
(b)(4)

Attachment 2

PAUL J. PETTIT
Manager of Nuclear Projects
Halliburton Services
Gaithersburg, MD

EDUCATION:

McMaster University, Ph.D., Chemical Engineering
Nova Scotia Tech., B. Eng., Chemical Engineering,



5-6

EXPERIENCE:

Halliburton Services	1981 - Present
Atomic Industrial Forum	1979 - 1981
U. S. Department of Energy	1976 - 1979
Atomic Energy of Canada, Ltd.	1971 - 1976

HALLIBURTON SERVICES: Manager of Nuclear Projects. Responsible for nuclear plant chemical cleaning and decontamination efforts. Coordinates staff engineers from Halliburton Services, Brown & Root, and NUS Corporation in joint-venture nuclear projects. Directed sludge lancing the "A" and "B" nuclear steam generators at R. E. Ginna, Spring 1982.

ATOMIC INDUSTRIAL FORUM: Manager, Environmental Studies. Directed a technical studies program intended to (1) develop technology to cut costs of complying with environmental regulations, and (2) influence the establishment of practical environmental regulations. Responsibilities included technical program, marketing, budget and overseeing several contracts on issues such as: plant decommissioning, emergency planning, and plant siting and operating licenses.

U. S. DEPARTMENT OF ENERGY: Program Manager, Radiation Control and Chemistry. Formulated and managed program to reduce occupational radiation exposure and improve plant availability in commercial nuclear power plants. Oversaw numerous technical projects involving reducing radiation dose, reduction of cooling system corrosion, and chemical cleaning and decontamination.

Was DOE Project Manager for development of steam generator chemical cleaning processes demonstrated at Indian Point power plant.

ATOMIC ENERGY OF CANADA, LTD.: Responsible for an applied research and engineering project on chemical cleaning methods and decontamination. Experiences: filtration, ion-exchange, corrosion, radioactivity transport, loop operation and power plant commissioning and troubleshooting.

Lead engineer for the first chemical decontamination of the whole primary coolant system of both a PWR and BWR nuclear power plant (patent).

Lead engineer for clean-up of spilled fuel and fission product contamination in fuel handling machines at Pickering and NPD reactors.

PAUL J. PETTIT
PAGE TWO

PUBLICATIONS:

Publication	P. J. Pettit and P. F. McTigue, "Chemical Cleaning of PWR Steam Generators to Relieve Denting", "Materials Performance, Volume 17, No. 10, pp. 36-41, October 1978.
Corrosion/78	P. J. Pettit and P. F. McTigue, "Chemical Cleaning of PWR Steam Generators to Prevent Denting", presented at National Association of Corrosion Engineers Conference, Houston, Texas, March 1978.
Corrosion/78	P. J. Pettit, J. E. LeSurr, W. B. Stewart, R. J. Strickert, and S. B. Vaughan, "Decontamination of the Douglas Point Reactor by the Can-Decon Process", presented at National Association of Corrosion Engineers Conference, Houston, Texas, March 1978.
CRNL-1358	P. J. Pettit, "Decontamination of the NPD CANDU-PHW Reactor by the Can-Decon Process, Step IIA", November 1975.
AECL-5113	P. J. Pettit, "Decontamination of CANDU Primary Coolant Systems", (Part of CANDU Conference Proceedings) September 1975.
CRNL-1144	P. J. Pettit, "Decontamination of the Gentilly-1 CANDU-BLW Reactor Heat Transport System by the CAN-DECON Method", November 1974.
Patent	P. J. Pettit, et al., "Reactor Decontamination Process No. 1062590. Canada. AECL. 9/18/79, INT. CL C11D, C09K 13/00.

- b. Who enters a high radiation area.
- c. Who is involved in the transport of contaminated equipment or materials.
- d. Who is involved in the storage, transfer or use of any source or material made radioactive.
- e. Who is involved indirectly with any of the above four conditions.

B. Required Personnel Monitoring

Recommended personnel monitoring devices for HISI employees shall be of adequate types and numbers to accurately assess each person's accumulated exposure. Each HISI employee scheduled to work under any one of the conditions mentioned above shall be provided with the minimum monitoring devices listed below:

One (1) TLD (preferred) or Film Badge.
Numerous suppliers provide this service.
Presently Nuclear Sources and Services, Inc.,
Houston, Texas supply TLD to field personnel.
As an option the Supervisor RSO may pre-
scribe use of Self Reading Dosimeters Low
Range, and Self Reading Dosimeters High Range.
See attached Dosimeter Corporation list of
pocket dosimeters.

The TLD or Film Badge and pocket dosimeters, if used, will be worn by each employee at chest level.

The necessary low and high range pocket dosimeter will be worn on the outside of one's clothing and these two dosimeters will be read and recorded frequently during the duration of work to determine each employee's accumulated radiation exposure.

The accumulated exposure of the pocket dosimeters worn shall be recorded on a dosimeter log and maintained for review.

4. Special Personnel Bioassays

HISI shall initiate special bioassays for specified HISI employees under the following conditions:

- A. When necessary or desirable in order to aid in determining the extent of an individual's exposure to concentrations of radioactive material.
- B. Each HISI employee who is scheduled to perform work in any licensed nuclear power plant requiring personnel monitoring shall:
 - a. Have had an appropriate bioassay performed and recorded prior to initiating his scheduled duties on the first day of the contracted job at any one facility.
 - b. Have at the completion of the contracted job an appropriate bioassay performed and recorded.

5. Radiation Overexposures - Emergency Procedures

HISI shall take whatever emergency measures necessary if an employee receives or is suspected to have received a radiation overexposure. The emergency measures may involve but not limited to the following:

- A. Special bioassays
- B. Medical blood work-ups
- C. Chromosome studies
- D. Medical treatment

V. GENERAL RULES FOR WORK IN

RESTRICTED OR CONTROLLED AREAS

- 1. Controlled Area - is an area to which access is controlled due to the presence of radioactive material and levels of radiation higher than those allowed to the general public.

2. Area Designations

- A. Clean Area ≤ 1000 dpm/100 cm² for β and removable
 ≤ 100 dpm/100 cm² for α
 ≤ 0.4 mR/hr fixed contamination

- B. Contaminated Area ≥ 1000 dpm/100 cm² for β and α removable
 ≥ 100 dpm/100 cm² for α
 ≥ 0.4 mR/hr fixed contamination

C. Airborne Radioactivity Area

- a. Any room, enclosure or operating area in which airborne radioactivity concentrations exceed 25% of the values given in App. B, Table I, Col. 1, 10 CFR 20, when averaged of the number of hours in any week the room is occupied.
- b. Whenever the gross airborne radioactivity is 3×10^{-10} μ Ci/cc in the above areas.

- D. Radiation Area ≥ 5 mrem in any hour
 ≥ 100 mrem in 40 hours

- E. High Radiation Area ≥ 100 mrem/hr

3. Radiation Work Permit

The purpose of the Radiation Work Permit (RWP) is to insure that personnel are aware of radiation safety related conditions and take the prescribed precautions listed on a RWP when working in the Controlled area.

A RWP is required for all work in the following areas:

- A. Radiation Area
B. High Radiation Area
C. Contaminated Area
D. Airborne Activity Areas
E. Controlled Areas

VI. EQUIPMENT CONTROL

These rules apply to all HISI equipment used for the decontamination in the "Controlled Area".

1. Decontamination of the equipment must be performed before the equipment is disassembled and moved. The utility company will be responsible for disposal of the waste generated during the decontamination process.
2. When decontamination is complete, smear or wipe tests must be performed on the equipment. The wipe tests should be made over a 100 square centimeter area. Again the utility company will provide the analysis of the smear tests and provide HISI with the results. The analysis can also be performed by Chemical Research, Duncan, Oklahoma.
3. Disassembly of our equipment must proceed with extreme caution to prevent contamination to employees and to the work area. The individual(s) performing the disassembly will be provided and wear anti-c clothing consisting of boot covers, coveralls, gloves and head covers or any portion necessary as dictated by the equipment surveys.
4. Once the equipment is disassembled, each piece will be labelled or tagged with a color coded tag. The analysis of the smear tests (wipe tests) will determine the color coded tag to be used.
5. A green tag will be used to label equipment that contains radioactivity at levels of 1000 dpm/100 cm² Beta, Gamma radiation or less, and less than 0.4 mr/hr fixed Beta, Gamma radiation. The analytical results will be recorded on the green tag.

The green tagged equipment is considered not contaminated and can be used for any HISI operation.

6. A yellow tag will be used to tag equipment with radioactivity at levels greater than 100 dpm/100 cm², Beta, Gamma radiation, and greater than 0.4 mr/hr fixed Beta, Gamma.

The yellow tagged equipment is considered contaminated and cannot be used on conventional HISI operations. Instructions for decontamination of this equipment will be forthcoming.

VII. TRANSPORTING OF COMPONENTS

These rules apply to all tagged equipment that is used in the "Controlled Area". The driver and other occupants of the transport vehicle must be monitored for radiation in the manner described under "IV - Personnel Monitoring". Table I (attached) lists the items in stock for tagging equipment to be used in radioactive projects. The catalog number is given for requisitioning these items.

1. Each piece of equipment will be sealed in plastic or in a container adequate to prevent spread of contamination to the transport vehicle or to personnel for transporting and storing. Care must be taken to prevent contamination of the transport vehicle and storage area.
2. Once the equipment is placed in an enclosed, lockable trailer, the transport vehicle then becomes the "Shipping Container" and all DOT regulations for transporting radioactive materials are applicable.
3. Radiation monitoring equipment such as a survey meter with a GM detector will be used for determining the proper DOT labels to be placed on the shipping container (trailer). Samples of the DOT labels are enclosed. The following criteria is used to determine the proper label:

	Surface Readings in	Transport Index MR/HR at 1 Meter from	Vehicle Placard
<u>Label</u>	<u>MR/HR</u>	<u>Shipping Container</u>	<u>(Radioactive)</u>
White I	Maximum 0.5	0.0 or Background	not required
Yellow II	Maximum 50	1.0 or less	not required
Yellow III	Maximum 200	10.0 or less	required
LSA	N/A	N/A	required

4. The labels affixed on opposing sides of the "Shipping Container" must be properly filled in and legible.

A. White I labels requires:

Contents: list major radioactive components by name and mass number.

Number of Curies: this cannot be accurately determined so the words "Residual Quantities" will suffice.

B. Yellow II labels require:

Contents: list major radioactive materials by name and mass numbers.

Activity: This refers to the number of mCi or Ci but cannot be estimated. Again the words "Residual Quantities" will suffice.

Transport Index: This is a survey meter reading made at one meter from the external surface of the package. This meter reading is written in the rectangle and the mR/hr is assumed, so it is not necessary to write mR/hr.

C. Yellow III Label*:

Contents: Same as White I and Yellow II.

Activity: Same as Yellow II.

Transport Index: Same as Yellow II.

*Note: A vehicle transporting Yellow III Labeled or LSA radioactive material requires "Placarding" of the vehicle, front, rear and both sides, with a placard containing the words "RADIOACTIVE". (See Table I attached)

VIII. STORAGE OF EQUIPMENT

1. These rules apply to all equipment used for decontamination in the "Controlled Area".
 - A. Preferably, the equipment should be stored in a completely covered building or warehouse. The storage building must be access controlled by having the entrance padlocked. The following warning signs are to be properly displayed:
 - a. "Restricted Area - Authorized Entrance Only" on the entrance to the storage facility.
 - b. "Caution - Radioactive Materials" signs must be placed on all four exterior walls visible to anyone approaching the storage facility.
 - c. "Caution - Radiation Area" signs must be placed on all four exterior walls visible to anyone approaching the storage facility.

- B. A fenced area will suffice as a storage facility if an enclosed building is not available. This will require that the components (equipment) be kept in the trailer (Shipping Container). The entrance or gate must be padlocked and access to the storage area controlled. The same warning signs must be displayed.
- a. "Restricted Area - Authorized Entrance Only" sign must be permanently affixed at the entrance.
 - b. "Caution - Radioactive Materials" signs on all sides of the fenced area visible to any direction of approach.
 - c. "Caution - Radiation Area" signs on all sides of fenced area visible to any direction or approach.

2. Monitoring and Surveying Storage Area

These rules apply to any and all storage facilities where the equipment is maintained after it has been in a "Controlled Area".

Regulations require a minimum of quarterly surveys of storage facilities. Surveys are required more often when equipment is removed or added to. Accurate records of this survey must be kept at the storage facility and copies of these records must be maintained at the office of the RSO.

The surveys must include: (See attached "Storage Record Form").

- A. Survey meter readings of the floor, walls and ceiling of the warehouse or on the inside of the fenced area if no warehouse is available.
- B. Survey meter readings on the exterior walls of the warehouse or at the fence of the fenced area. Readings on the exterior walls or at the fence should never exceed 0.6 mR/hr.
- C.* "Wipe Tests" must be performed on floors or slabs at quarterly intervals if movement in or out of the storage facility takes place during that quarter.
- D.* "Wipe Tests" must be performed on the interior walls and floor of the "Transport Storage" trailer at quarterly intervals if any contaminated equipment is placed into or removed from the trailer during the calendar quarter.

*Note: The "Wipe Tests" are to be performed as described earlier and the analysis can be performed using the Ludlum Model 2200 Scaler, by CRD, Duncan, Oklahoma on the multichannel analyzer, or by a commercial laboratory.

IX. DECONTAMINATION OF CONTAMINATED
COMPONENTS

1. Decontamination of equipment contaminated with radioactive materials will be accomplished at only one of two designated locations.
 - A. HISI - Zanesville, Ohio
 - B. HISI - Duncan, Oklahoma
2. It will be necessary to evaluate the need for decontamination by performing surveys of the equipment. This is to be done by:
 - A. Survey each piece of equipment using a survey meter with a GM detector probe. As these readings are taken the radiation levels must be recorded, documented and kept on file. Any piece of equipment or any area of that piece of equipment that indicates radiation levels above 0.4 mR/hr must be decontaminated
 - B. Perform "Smear or wipe tests" on appropriate areas of each piece of equipment as previously described. The analysis of the "Smear Tests" may be accomplished by using the Ludlum Model 2200 scaler, by CRD, Duncan, Oklahoma, or a commercial laboratory. Any area or piece of equipment with a smear test result indicating more than 1000 dpm per 100 cm² (Beta, Gamma) must be decontaminated.

The licensed facility for which the equipment was last used will normally perform these tests prior to release of the equipment to HISI for removal from site of the licensed facility. Shippers certification documents will be provided by the Health Physics Department and these documents will indicate the radiation levels as determined by the licensed facility. In such cases where the information is complete the decision for decontamination of our equipment may be based on this. The licensed facility may also perform minor decontamination by rinsing and flushing techniques for removal of radioactive liquids and loosely adhering solids. When radiation levels are reduced significantly each piece of equipment will be sealed in plastic or in a container adequate to prevent spread of contamination and placed in the designated, engineered shipping containers.

3. The equipment to be decontaminated may be placed in the decon facility shown in Figure 1.
 - A. A minimum number of trained employees should be involved in the decontamination efforts.

- B. Each employee involved will be furnished a TLD badge or pocket dosimeter and will wear appropriate clothing, including coveralls, boot covers, gloves, as well as, hood and respirator when required. Upon work completion, the anti-c clothing will be surveyed and appropriately contained.
 - C. Each individual will be surveyed prior to and following the handling of contaminated equipment using the "Frisker". All readings including background readings must be recorded and documented. If the work is properly performed there will be no contamination of the employee or clothing. If the survey does indicate contamination to clothing or skin, the clothing must be immediately removed and treated as rad-waste and appropriately contained. Contamination on the skin must be removed by showering in copious volumes of water using adequate amounts of soap or detergent. This is repeated until the body survey using the "Frisker" indicates background levels of radiation. If this is not attained CONSULT A PHYSICIAN IMMEDIATELY, and notify the local health physicist and the Company RSO.
4. Equipment decontamination should be accomplished within the confines of the Protective Structure by a minimum of trained personnel, proceeding as follows:
- A. Initial decontamination will be accomplished by thoroughly wiping the surface of the equipment with absorbent paper or cloth. This paper or cloth must be appropriately contained and treated as rad-waste.
 - B. Once the surface is thoroughly wiped it will be necessary to survey the equipment again by survey meter and smear or wipe test as previously described.
 - C. The equipment is considered releasable to unrestricted areas if the removable contamination is below 1000 dpm/100cm² and fixed contamination is below 0.4 mR/hr. It is highly desirable to continue the decontamination of fixed contamination to a radiation level not exceeding 0.2 mR/hr.

- D. If dry wiping or cleaning does not reduce the radiation levels to those stated above the decontamination procedure must continue using absorbent paper or cloth dampened with minimal quantities of surfactant. An alternative approach is to wet the equipment with a minimum quantity of surfactant. Wet the contaminated surface with the surfactant and let it remain for approximately five minutes, then repeat steps A., B. and C., above. Always contain the cloth or paper used to wipe the surface and treat as rad-waste.
- E. When decontamination is complete the equipment is to be re-wrapped in plastic and replaced in the shipping containers.
- F. The plastic liner of the "Protective Structure" and the plastic pavement over-layer are to be carefully removed, contained and treated as rad-waste.
- G. The super structure and pavement area will then be surveyed by both survey meter and smear or wipe test and decontaminated if necessary.

X. RAD-WASTE TREATMENT AND CONTROL

Regulation strictly prohibits the burning or burial of radioactive materials in any quantity or magnitude. All materials that are collected as rad-waste as indicated in these instructions and procedures must be adequately contained and properly disposed of. This includes equipment that becomes significantly contaminated as to present a possible health hazard and is not decontaminated by recommended procedures.

- 1. All radioactive materials (rad-waste) such as solids or liquids totally absorbed on cloth or paper, anti-c clothing, etc. are placed in metal drums as described in these procedures. It was recommended that green and yellow coded drums be used for all waste with the yellow coded drums containing the rad-waste. Once this drum is full, the lid must be placed on the drum and sealed with the adjustable metal ring. The drum must be properly labelled or stencilled:
 - A. Halliburton Industrial Services, Inc., "Location" such as Dwight, Illinois in two-inch letters.
 - B. Radioactive Material, LSA, n.o.s. in two-inch letters.

2. With proper shipping papers the drum may be transported by company warehouse truck to the Duncan, Oklahoma facility where it will be transported on to a licensed holding facility. See attached sample of a Halliburton Services shipping document. The transport vehicle must be placarded, front, rear and both sides with a radioactive placard; part number 70.22537. Another alternative would be to present the properly stencilled drum for shipment to a local licensed holding facility by an authorized transport firm. Always provide adequate shipping papers and radioactive vehicle placards to the transport driver. If the transport driver does not have radioactive placards displayed on the vehicle or refuses the ones offered get his signature on a statement to the effect that they were offered to him.
3. Any rad-waste liquids must be treated differently from the LSA solids described in the paragraphs immediately above. Two choices exist for possible disposal of liquid rad-waste.
 - A. Once the liquid is contained in a U.S. DOT 7A Type A shipping container (obtain from Plastic-Drum, 1225 Davies, Lockport, Illinois, phone 815/838-7210), it can be stencilled with Company name and address and the words "radioactive material, n.o.s.," in two-inch letters, labelled with the appropriate radioactive labels on opposing sides, and shipped as described above for solids.
 - B. An analysis of the liquid can be obtained from Analytical Research of Chemical Research Department, Duncan, Oklahoma, identifying the various nuclides and the concentration in microcuries per milliliter. If it meets all requirements of CFR, Title 10, Part 20.303 it could be releasable into a sanitary sewerage system. This is not to be done without the express approval of the RSO, and the guidelines set forth by the RSO.

ANY QUESTIONS RELATING TO THESE PROCEDURES SHOULD BE DIRECTED TO DR. PAUL PETTIT, HISI, GAITHERSBURG, MARYLAND. TELEPHONE NUMBER 301/258-6045.

XI. INSTRUCTIONS TO WORKERS DOING MAINTENANCE
ON RADIOACTIVE EQUIPMENT

1. Introduction

HISI is engaged in performing industrial cleaning service work in nuclear power plants. Some of the equipment used for the service work will become contaminated to low levels with radioactive corrosion product contaminants that exist in the power plants where the work is performed. Certain HISI facilities will be licensed for storage and building of the radioactive equipment when it is not being used in nuclear plants. The equipment to be stored or handled will be equipment used to water-lance and clean nuclear power plant equipment such as steam generators, and will include such items as pumps, water lancing mechanisms, hose, vessels, filters, electronic controllers, instrumentation, electrical cable, tools, storage containers, etc. From time to time between jobs in plants, some of the equipment may need to be maintained. The maintenance may consist of such tasks as repacking of pump seals, repair of electrical cable connections, replacement of bearings in the automated lancing mechanisms, etc. HISI employees handling the slightly contaminated equipment and performing the maintenance will need to exercise certain precautions and work practices to prevent the contamination of personnel and prevent the unwanted spread of contamination. This document provides instructions and guidelines for handling and working with radioactive equipment at licensed HISI facilities.

2. General

All practices by HISI personnel should be conducted in such a manner as to cause radiation exposure to workers to be as low as reasonably achievable (ALARA) and to minimize the spread of radioactive contamination.

3. Responsible Individual(s)

Work with radioactive contaminated items and equipment at licensed HISI facilities will be done under the supervision of the facility manager, who, in most cases will be an alternate for or designate of the HISI Radiation Protection Officer. The facility manager is responsible for seeing that surveys are conducted and proper records are kept of materials present on site, radiation levels in work areas, and exposure to personnel.

4. Work Areas

All work with radioactive contaminated equipment is to be conducted in a Controlled Area with proper provisions to minimize personnel exposure and contamination.

- A. Trailers - The radioactive contaminated equipment is brought to the HISI facilities in trailers that are properly marked to indicate radioactive contents. When possible, handling and maintenance of the equipment should be done inside the trailer, which is to be set up as a Controlled Area with access through a port with a permanent elevated threshold. For example, maintenance of pumps in the lancing filter trailer should be done inside the trailer, since each filter trailer is designated to be a controlled, isolated radiation area completely inside its own metal catch basin. Other equipment such as cables that are not normally used inside the trailer should be brought into the trailer (or other exclusion area) for maintenance whenever it is particle to do so. The doorway of the trailer should be provided with "hot" and "cold" step-off pads and a radiation "frisker" as appropriate when being used for maintenance.
- B. Controlled Areas - When work cannot be conducted inside a specially designed trailer, a Controlled Area must be established. Work is to be conducted only within the Controlled Area that is isolated from the other area. The floor of the controlled area is to be covered with heavy-duty plastic sheeting to prevent spread of contamination. The Controlled Area is to be provided with appropriate step-off pads and radiation "friskers". The controlled area is to be entered only by those workers that are authorized to do so by the facility manager. Proper protective clothing must be worn and surveys conducted as described below.

5. Protective Clothing

Gloves must be worn at all times by workers handling contaminated items. Cotton gloves will be adequate in most cases when working on dry equipment. When any fluids are present, rubber or plastic gloves should be used.

Shoe covers must be worn at all times by workers in controlled radiation areas. Plastic, disposable high-top covers are preferred, but rubber shoe covers will also be provided.

Laboratory coats are the minimum street-clothes covering that must be worn at all times by workers in a controlled radiation area.

Overalls must be worn when there is a significant risk of personnel contamination from loose radioactive particles, such as when a worker must enter and work inside a surge tank inside a lancing filter trailer. Overalls must also be worn when workers are expected to need to crawl over pipes or lie or sit on the floor of such trailers or similar equipment. Whenever overalls are used, tape should be used to seal the cuffs of the overalls to the necessary gloves and high shoe covers.

Hoods must be worn whenever there is a significant risk of personnel contamination to the head, hair or neck resulting from loose radioactive particles such as may be encountered when a worker must enter a tank.

Any HSI worker may have access to his or her own exposure information at any time by contacting the facility manager at the place of employment.

6. Entering/Leaving Controlled Radiation Areas

Each entrance to a Controlled Area will be provided with step-off pads. A "cold" pad will be placed immediately on the outside or non-radioactive side of the entrance. The entrance will be provided with an elevated threshold. A "hot" step-off pad will be placed immediately on the inside of the entrance. The purpose of these pads is to offer some protection to the worker in recalling the proper procedures for entry and exit. A further purpose of the pads is to serve as an additional method of avoiding the spread of contamination.

The site manager is responsible to assure that adequate supplies of all necessary protective clothing and radiation frisker are available near the entrance to the Controlled Area. The facility manager has prime responsibility to determine the type of protective clothing that must be worn for each task or in each Controlled Area.

Workers entering a Controlled Area must be fully clothed in all required protective clothing prior to entry to the area. All requested personnel dosimeters must also be worn. If a self-reading dosimeter is provided, the worker must record the time and initial reading on the log sheet provided at the time of entry. Once a worker steps over the threshold and onto a "hot" step-off pad, he or she is considered to be in the Controlled Area, and must not exit without removing the protective clothing and frisking for contamination (see below).

Upon exiting a Controlled Area the worker must remove contaminated protective clothing and place it in the receptacles provided, or on hangers as indicated. The receptacles will be drums in most cases. Follow the directions for which items go in which receptacle. In all cases, workers must remove the outer protective footwear before stepping onto the cold step-off pad.

After stepping onto the cold step-off pad, each worker must frisk with the personnel monitor provided on the cold side of the access to the Controlled Area. If a self-reading dosimeter has been provided, the worker must record the reading and time of exit, using the log sheet provided at the access point.

Respirators are not expected to be necessary for working on the radioactive equipment, but should the need arise, use of the respirators would be the same as per instructions in other Halliburton class training for respirator use.

7. Dosimetry

HISI will provide each person who is to work in a radiation environment with appropriate personnel radiation exposure monitoring including a thermoluminescent dosimeter (TLD). Each worker must wear a TLD on the upper trunk of the front of his or her body at all times while working in a Controlled Area. The TLD badge must be worn on the outside of protective clothing, and must not be obstructed. (Remember, the TLD badge is for your protection).

At the discretion of the Radiation Protection Officer, Health Physicist or facility manager, self-reading dosimeters will be provided for use by the worker in monitoring his or her own rate of accumulation of exposure.

Dosimeters are to be kept at the facility in the racks provided, and are not to be taken home or off site by the worker. When the worker is required to wear his or her dosimeter on a service job in a plant, dosimeters will be taken to the plant by the job supervisor. The job supervisor will make proper distribution of each person's dosimeter on the job, and will return the dosimeters to the workers place of employment or will arrange for counting of the dosimeters as appropriate.

Dosimeters will be changed and read periodically and the results recorded.

8. Surveys

Radiation surveys will be conducted regularly when contaminated equipment and/or radioactive material is present at the HISI facility. The purpose of the survey is to provide information for protecting the health and safety of workers, and to minimize the risk of spread of contamination. The surveys will consist of three types of measurements: (a) general area radiation fields in workarea, (b) radiation field associated with particular items or equipment that workers will handle, and (c) swipable contamination in work areas and on equipment and items to be handled by workers.

"Baseline" Surveys are to be performed prior to the arrival of new or additional contaminated items or equipment at the facility. Surveys are to be correlated by the RPO's designate, by an HISI Health Physicist, or by a trained technician, as available. Surveys are to be made on a regular basis when the radiation geometry changes and daily when decontamination work is actually being performed on contaminated equipment. Section XI. 8. provides more information on Surveys.

Results of the radiation surveys are to be recorded and posted in full view in the work area(s). This information is to be used in the selection of proper protective clothing, erection of shielding, and the design of maintenance work to maintain exposure ALARA.

9. Shielding

It is likely that no significant use of shielding will be required because the contamination levels on the equipment are expected to be very low. If need for a prolonged stay of workers in the vicinity of a radiation source does develop, the facility manager or others should consider placing shielding such as lead blankets, blocks or water shields between the source and the workers.

10. Movement of Equipment

When contaminated equipment is moved from one location to another on the HISI facility site, precautions must be taken to prevent spread of contamination to the workers and to the facility. All equipment should be relocated using its own approved shipping container whenever practical; otherwise, the equipment or item should be wrapped with heavy plastic sheet. Tape should be used to secure plastic sheet and close the seams. When removing the plastic sheet it should be rolled inside-out to help contain any loose contamination.

11. Storage of Contaminated Equipment

All contaminated items wastes, equipment and tools must be stored in a locked enclosure when the items are not being used or worked on. The equipment storage trailers and lancing filter trailers have been designed for this purpose and shall be used whenever practical. Special secure areas provided at the licensed HISI facility may also be used.

No radioactive contaminated items or equipment are to be left in an unattended and unlocked area during lunch times, overnight or otherwise, even when the items are in a proper Controlled Area. All such items must be locked away when not being worked on.

12. Waste

Certain work on the contaminated equipment is expected to produce some solid waste that is contaminated with low-level radioactive material. For example, towels used to wipe away contamination from the equipment, and plastic used to wrap the equipment for transportation. Some protective clothing such as plastic shoe covers will also become waste. All waste should be placed in the drums labeled "Radioactive Waste" which are provided at the HISI facility. (See Section X.1.)

No material other than radioactive waste is to be placed in the waste containers. Do not dispose of cigarettes, drink containers, etc. in the waste containers. Under no circumstances should any liquid material be placed in the waste container.

It is the responsibility of the facility manager to arrange for the disposal of radioactive waste by a commercial disposal company that is licensed to handle radioactive waste. (Section X)

13. Emergency Instructions for Spills, Wrecks and Fires

Procedure to be followed in case of spillage of radioactive materials:

A. Isolate Area: Confine the contamination to the smallest possible area. Notify RSO.

a. In case of spillage, on the highway, due to an accident:

- (1) Rope or mark off the area of possible contamination in such a manner that personnel cannot enter the contaminated zone.
- (2) Post signs around the area, if possible.
- (3) Ask aid of local police in keeping people away, if it is necessary.
- (4) Immediately contact the RSO or his designate.

b. In case of spillage at or near warehouse dock.

- (1) Block off contaminated area as above indicated.
- (2) Have warehouseman help in isolating the area, preventing any traffic or material or personnel into or through the area.
- (3) Immediately contact the RSO or his designate.

B. Issue film badges and/or personal dosimeters to everyone assisting in decontamination. Explain the procedure to be followed and use the minimum number of persons necessary to deal with the spill, in accordance with permissible exposure levels. Contact the RSO for advice or assistance.

C. Decontamination

a. Liquid Spills (No Liquid Is Expected To Be In Use):

- (1) Wear protective clothing such as rubber gloves and rubber boots. Drop absorbent paper or rags on the spill. If the surface remains radioactive after absorbing all the liquid, use a small quantity of water to dissolve the remaining isotope and absorb the liquid. Repeat until radiation level is below 0.1 mR/hr.

b. Dry Spills:

- (1) Wear protective clothing such as rubber gloves and dust mask. Use tongs, shovels, etc. that can be readily decontaminated or discarded, to pick up the radioactive materials.
- (2) Place all waste and contaminated materials in a closed can, such as that used for oil rags. Label and store in enclosed area as radioactive material.
- (3) Should the radiation level remain above 0.1 mR/hr, when checked with probe at surface, and all visible material has been removed, the areas should be washed with surfactant [see Section 13.D.a.(1)]
- (4) If the spillage occurred on the ground, pick up enough of the dirt to bring radiation level below 0.1 mR/hr and probe as close as possible to the surface.
- (5) Any wash liquid or dirt with radiation intensity above 0.1 mR/hr at surface should be retained, labelled and stored in a sealable can. Store as other contaminated waste.
- (6) Follow printed instructions for rad-waste disposal. (See Section X above)

D. Monitor all persons involved in spill and clean-up.

a. Use a portable survey meter, such as Victoreen Model 6B, Ludlum Model 2, Precision Model 107-C, Eberline E 120 or equivalent. Open probe and survey hands, arms, feet, legs, face and any other areas of the skin suspected of contamination with the probe, as close as possible without contacting the skin area.

(1) Personnel: Wash any contaminated areas of skin with mild soap and tepid water. DO NOT abrade skin. Repeat until no activity is detectable.

(2) Clothing: All clothing, protective and otherwise, must be below two times background at surface. Decontaminate by washing, using detergent and water. Save, label and store wash water in closed can. If several washings fail to bring clothing below two times background at surface, clothing must be stored, or destroyed with other radioactive waste. Any wash water with radioactive contamination should be retained, labelled, and stored in a sealable can. Store as other rad-waste.

(3) Permit no one to resume work in the area until a survey, using a portable survey meter, shows it to be cleared of all contamination.

(4) The Radiation Safety Officer should be notified immediately by telephone of the occurrence of any accident or incident involving radioactive materials. Within 10 days a completed "Emergency Procedures Report" must be submitted to the Radiation Safety Officer.

XII. INSTRUCTIONS TO DRIVER -
EMERGENCY DURING TRANSPORTATION

1. Procedure to be followed in case of spillage of radioactive materials during transportation over highways.
 - A. The driver and all occupants of a vehicle transporting radioactive materials must be equipped with an operable rate meter and film badges for measuring the accumulated dose rate during transportation. (Also, See Section XI. 13)
 - B. Isolate area immediately.

In case of spillage, on highway, due to accident:

 - a. Rope or mark off the area of possible contamination in such a manner that personnel cannot enter the contaminated area.
 - b. Post signs around area, if possible.
 - c. Ask aid of local police in keeping people away, if it is necessary.
2. In case of spillage at or near warehouse dock.
 - A. Block off contaminated area and have warehouseman to help in isolating the area, preventing any traffic of material or personnel in or through the area.
 - B. Notify, by telephone, the person to whom the radioactive shipment was addressed; or the RSO, phone 301/258-6045, whichever is the nearest.
 - C. Prevent, by all possible means, any spreading of contamination and entrance of unauthorized personnel into the area.
 - D. DO NOT ATTEMPT to clean up or remove any material from or through contaminated areas, until authorized persons arrive with the proper equipment to assist in the clean up.
3. Procedure to be followed in case of fire.
 - A. Upon establishing a radioactive storage or decontamination facility at any location, the local municipal fire department should be notified in writing all the details including, storage facility design, storage container designs, identity of radioactive materials, quantity of radioactive materials, form of radioactive materials and containment of all radioactive materials.

- B. The municipal fire department will be prepared to react to a fire if adequately informed. Call the fire department immediately.
- C. Permit no personnel access to the fire area. Put no water on the fire.
- D. If the fire is sufficiently contained to a small area, use smothering type of extinguishers to put out the flames and prevent spread.
- E. Do not assume the fire is extinguished. Permit the municipal fire department to proceed with their investigations.
- F. Notify the RSO and his local designates as quickly as possible for advice in performing radiation surveys necessary for recovery operations once the fire is extinguished.
- G. The RSO will respond as necessary. The Emergency Response Team will respond as advised by the RSO.
- H. Emergency telephone numbers are on the front page of these instructions. It is suggested these be posted near each telephone service within the service camp.

TABLE I

PART NUMBER FOR TAGGING
RADIOACTIVE MATERIAL AND EQUIPMENT

<u>Catalog No.</u>	<u>Item</u>
70.70791	RADIOACTIVE III
70.71091	EMPTY (6 X 6)
70.72253	FLIP PLACARD - RADIOACTIVE
70.72537	RADIOACTIVE - ONE WAY VINYL
70.48595	RADIOACTIVE - MAGNETIC
70.79227	POSI-GRIP TONGS - 30 INCH
70.79222	SIGN - METAL - CAUTION RADIOACTIVE AREA
70.79223	SIGN - METAL - CAUTION RADIOACTIVE MATERIAL
70.79206	LABEL - RADIOACTIVE - WHITE I
70.79207	LABEL - DENSOMETER - RADIOACTIVE - YELLOW II

(b)(4)

RECEIVED
1/6/83

SAFETY & SUPPLY COMPANY

5510 EAST ALI WAY SOUTH
SEATTLE WASHINGTON 98134
206 767-5500



January 7, 1983

TABLE II - (Page 1 of 2)

Halliburton Services
462 Fair Foundation Bldg.
Tyler, Texas 75702

Attention: Richard Leonardi

Dear Mr. Leonardi;

We appreciate all of the orders we received from Halliburton Services in 1982.

Due to price increases on January 1, 1983 attached is an updated quote on the items your company has been purchasing. We carry a variety of industrial safety equipment, if any of your facilities would like our catalogs please have them contact us.

You will notice that I gave you an option on the gloves. These close out gloves come in lengths of 12 and 15 inches; colors of orange, amber or white; straight cuff or rolled cuff. All of these gloves are 18 mil thick.

Please distribute these prices on to your facilities. Feel free to call Louise Pasche or myself if we can be of any assistance.

Sincerely,

Lorraine Zander
Nuclear Sales Coordinator

Attachment

QUOTATION

From

TABLE II - (Page 2 of 2)

SAFETY & SUPPLY COMPANY
5510 EAST MARGINAL WAY SOUTH
SEATTLE, WA 98134
206-762-8500 OR 800-462-5254

To

HALLIBURTON SERVICES
462 FAIR FOUNDATION BLDG.
TYLER, TEXAS 75702

ATTENTION: RICHARD LEONARDI

We are pleased to quote as follows. Your inquiry

Inquiry No. UPDATE PHONE Q

Date JANUARY 7, 1983

Terms NET 30

Prices quoted are
F.O.B. SHIPPING POINT

Delivery STOCK TO 3 WEEK

Quantity	Description	Price	Amount
	P2120Z--POLYLAMINATED COVERALL, ZIPPER FRONT, LONG SLEEVE, COLLAR SIZES SMALL, MEDIUM AND LARGE SIZE X-LARGE	\$6.00 EA \$6.60 EA	
	RC4082--HIGH TOP PVC DISPOSABLE 8 MIL SHOECOVER	\$.55 PR	
	RAD 52--ECONOMY ANTI-C GLOVES, 18 MIL, WHITE SIZES 7, 8 AND 9 SIZES 10 AND 11	\$7.54 DZ \$8.06 DZ	OR \$.63 OR \$.68
	<u>OPTION</u> CLOSE OUT 18 MIL LATEX GLOVES, SIZES 7 TO 11	\$5.80 DZ \$.50 PR	
		<u>OR</u>	

By *Lorraine Zander*

LORRAINE ZANDER, NUCLEAR SALES