

INTERIM REPORT

ACCESSION NO. _____

ORNL/HASRD-92 _____

Contract Program or
Project Title:

Evaluation of Docket Files of
Terminated Licenses

Subject of this Document:

Technical Progress

Type of Document:

Monthly Progress Report

Author(s):

C. F. Holoway and J. P. Witherspoon
Health and Safety Research
Division*

Date of Document:

August 1980

Responsible NRC Individual and
NRC Office or Division:

William T. Crow
Fuel Processing and Fabrication Branch
Office of Nuclear Material Safety
and Safeguards

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

Prepared for
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Under Interagency Agreement(s) DOE #40-549-75
NRC FIN No. A9085-7

*Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830
operated by
Union Carbide Corporation
for the
Department of Energy

INTERIM REPORT

NRC Research and Technical
Assistance Report

8010220

599

MONTHLY PROGRESS REPORT FOR AUGUST 1980
EVALUATION OF DOCKET FILES OF TERMINATED LICENSES
(189 No. A9085-7)

PRINCIPAL SCIENTISTS: C. F. Holoway and J. P. Witherspoon

Objectives:

The technical objective of this project is to review terminated licenses in the Nuclear Regulatory Commission (NRC) Docket File System, extract pertinent data, create a computer file of these data and identify which previously licensed sites potentially could constitute residual radiological safety hazards.

Major Accomplishments:

During August, 96 docket files were group analyzed as shown in Table 1.

Table 1. Group analysis of docket files
for month of August

| Category | Categorization before group analysis | Categorization after group analysis |
|----------|---|--|
| No | 19 | 46 |
| Un | 77 | 5 |
| OK | | 45 |
| Total | 96 | 96 |

The 51 docket files categorized as No or Uncertain after group analysis are tabulated in Attachment 1.

During the group analysis session the question arose how to deal with licenses superseded by later licenses. These licenses would be OK provided authority for possession of by-product material was included on a later license. When all of the licenses are on the permanent data base, searches will be made to verify that there is a later license in our file. Until these verifications can be made the license will remain in the No or Uncertain category.

The initial screening factors for radionuclides were based on the annual limits of intake (ALI) via ingestion or inhalation. When the radionuclide is in the form of a sealed gamma source, an operation factor of 0.01 is also applied. That is the allowable quantity of residual radioactivity that is 100 times higher than for cases where it is in an unsealed form.

In some cases, however, the limiting potential exposure mode for sealed sources (considering an operation factor of 0.01) is not ingestion or inhalation, but direct exposure. Thus, a rationale is needed for establishing a secondary screening factor based on direct exposure which is consistent with the screening factor for ingestion or inhalation.

The allowable residual level for radionuclides was set at 100 times the limit for annual intake via ingestion or inhalation by radiation workers. This intake would give rise to a dose commitment of 500 rem to the whole body, or a dose of equivalent risk to the critical organ. Applying an operation factor of 0.01 to account for the probability of intake of a sealed gamma source increases the allowable residual. Using a similar basis for external exposure and assuming a limiting duration of exposure of one year (8760 hr), the equivalent limiting direct exposure rate would be about 4 r/hr. The quantities of some gamma emitters that would give rise to this exposure rate at a distance of 1 m and comparative quantities based on inhalation are given in Table 2.

Table 2.

| Radionuclide | Limiting quantity (curies) | |
|-------------------|----------------------------|------------|
| | Direct exposure | Inhalation |
| ^{60}Co | 4.5 | 22 |
| ^{137}Cs | 18 | 37 |

The number of Part 30 docket screened by individual analysts to date is 5909 of which 4229 are computer retrievable. Of these 4229 docket, approximately 240 have been identified as questionable by group analysis so far.

The number of radionuclides on the list covered by licenses has increased to 192. The 13 additional radionuclides with their respective annual limits of intake (ALI) are listed in Attachment 2.

To ensure quality control, four docket categorized as OK were taken at random from each of 19 boxes previously screened by ERC analysts and reviewed by a senior staff member of ERC. The results are listed in Attachment 3.

Licenses which are referenced in general files containing inspection reports but which are not assigned specific docket are listed in Attachment 4.

Status of Project:

A preliminary screening has been made of 83 of the 101 boxes of Part 30 docket files and the data analysis/computer input forms prepared. Fifty-seven boxes have been entered on the permanent file.

Manpower and Cost Summary:

| Efforts in Man Months | | | Cost K\$ | | | Additional cost to completion (est.) |
|-----------------------|------------|------------------|--------------|------------|---------------------------|---|
| Aug. 1980 | FY 1980 | Total to date | Aug. 1980 | FY 1980 | Total cost to date K\$ | |
| 1.3 | 13.5 | 68.4 | 22.7 | 193.5 | 481.5 | \$75,761 |

POOR ORIGINAL

Attachment 1.

ERC/ORNL

Group
Docket Analysis

Date: August 5, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|---|
| 301 | 2787 | 6-0200-02 | Hospital of St. Raphael 1450 Chapel St. New Haven, CT | 2Un | 2No | Disposition of Sr-90 unknown. Presently hold licenses #06-0200-01, -03. |
| 302 | 2809 | 4-0011-05 | Hughes Aircraft Co. Culver City, CA | 2No | 2No | Possible external radiation hazard. |
| 303 | 3810 | 04-0011-06 | Hughes Aircraft Co. Culver City, CA | 2No | 2No | Possible external radiation hazard. |
| 306 | 2849 | 12-0088-01 | University of Illinois 1853 W. Polk St. Chicago, IL | 2No | 2No | 145 mCi of Sr-90 disposition unknown. Presently hold licenses #12-0088-08, -07, -06. |
| 307 | 2855 | 12-0330-01 | University of Illinois Urbana, IL | 2Un | 2Un | Disposition of 20 mCi of Sr-90 unknown. Presently hold licenses #12-0330-05, -06, -09, -10. |
| 308 | 2860 | 13-0108-02 | Indiana University Bloomington, IN | 2Un | 2No | Could hold large amounts of potentially hazardous materials. Presently hold license #13-0108-05. |
| 309 | 2861 | 13-0108-01 | Indiana University Bloomington, IN | 2Un | 2No | Could hold large quantities of potentially hazardous materials. Presently hold license #13-0108-05. |
| 310 | 2863 | 13-0108-04 | Indiana University Bloomington, IN | 2Un | 2No | Could hold large quantities of potentially hazardous materials. Presently hold license #13-0108-05. |

Attachment 1. (continued)

ERC/ORNL

Group
Docket Analysis

Date: August 5, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|---|
| 312 | 2918 | 24-0513-25 | Curators of the University of Missouri Columbia, MO | 2Un | 2Un | Disposition of 20 mCi of Sr-90 unknown. |
| 313 | 2934 | 34-0825-03 | Monsanto Chemical Co. Dayton, OH | 2Un | 2No | Possibility of external radiation hazard. Presently hold license #34-7138-01. |
| 314 | 2935 | 34-0825-04 | Monsanto Chemical Co. Dayton, OH | 2No | 2No | Disposition of 1 Ci sealed Sr-90 source and 205 mCi of Sr-90 in any form unknown. Presently hold license #34-7138-01. |
| 315 | 2967 | 37-0118-06 | University of Pennsylvania Philadelphia, PA | 2Un | 2No | Possibility of external radiation hazard. Presently hold license #37-0118-09, -07. |
| 316 | 2969 | 37-0185-02 | Pennsylvania State University University Park, PA | 2Un | 2No | Could hold large amounts of potentially hazardous materials. Presently hold licenses #37-0185-04, -05, -06. |
| 319 | 3006 | 15-0538-10 | University of Kansas 39th and Rainbow Blvd. Kansas City, KS | 2Un | 2No | Disposition of 50 mCi Sr-90 in medical applicator unknown. |
| 323 | 3017 | 31-0246-04 | M.W. Kellogg Co. 711 Third Ave. New York, NY | 2Un | 2No | Possible external radiation hazard from Co-60 and Cs-137 sources. |

UN

POOR ORIGINAL

Attachment 1. (continued)

ERC/ORNL

Group
Docket Analysis

Date: August 5, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|--|
| 325 | 3034 | 37-0408-01 | Philco Corp. 'C' and Tioga Sts. Philadelphia PA | 2Un | 2No | Disposition of 30 mC of Sr-90 in battery unknown. |
| 331 | 3067 | 37-0862-02 | Pittsburgh Plate Glass Co. Creighton, PA | 2Un | 2No | Disposition of 20 mCi Sr-90 source unknown. |
| 332 | 3073 | 10-3320-01 | Dr. Gregory Flynn 340 Blvd., N.E. Atlanta, GA | 2Un | 2No | Disposition of 50 mCi Sr-90 in medical applicator unknown. |
| 333 | 3075 | 42-5992-01 | Dr. Donald Ford 5200 Montrose Blvd. Houston, TX | 2Un | 2No | Disposition of 25 mCi Sr-90 in medical applicator unknown. |
| 337 | 3124 | 52-0544-01 | J. Gonzalez Martinez Oncologic Hospital Parque St. Santurce, PR | 2Un | 2No | Possible external radiation hazard from 600 Ci Co-60 source. |
| 338 | 3139 | 7-3417-02 | Delaware Hospital Inc. 501 W. 14th St. Wilmington, DE | 2Un | 2No | Disposition of 100 mCi Sr-90 in medical applicator unknown. |
| 339 | 3146 | 21-1190-02 | Detroit Memorial Hospital 1420 St. Antoine St. Detroit, MI | 2Un | 2No | Possible external radiation hazard. |

Attachment 1. (continued)

ERC/GRWL

Group
Docket Analysis

Date: August 5, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|---|
| 341 | 3156 | 42-0014-02 | Dow Chemical Co. Texas Div. Freeport, TX | 2Un | 2No | Possible external radiation hazard. |
| 343 | 3162 | 35-0161-03 | Well Surveys Inc. 624 E. 4th St. Tulsa, OK | 2Un | 2No | Held 1 Ci of Sr-90. |
| 344 | 3163 | 35-0161-04 | Well Surveys, Inc. 624 E. 4th St. Tulsa, OK | 2No | 2No | Held large quantities of hazardous materials. |
| 345 | 3164 | 35-0161-05 | Well Surveys, Inc. 624 E. 4th St. Tulsa, OK | 2No | 2No | Held large quantities of hazardous materials. |
| 346 | 3169 | 32-6655-08 | Duke University Durham, NC | 2Un | 2No | Possible external radiation hazard. |
| 347 | 3170 | 32-6655-09 | Duke University Durham, NC | 2Un | 2No | Possible external radiation hazard. |
| 348 | 3183 | 7-0455-02 | E.I. duPont de Nemours and Co. Wilmington, DE | 2Un | 2No | No record of how much by-product material held. Also held 30 mCi Sr-90 source. Presently hold licenses #07-0455-02, -12, -18, -19, -27, -28, -29, -30, -33. |
| 350 | 3201 | 31-0461-06 | Eastman Kodak Co. Rochester, NY | 2No | 2No | Disposition of 300 mCi Sr-90 source unknown. Presently hold 31-0461-10. |

Attachment 1. (continued)

ERC/ORNL

Group
Docket Analysis

Date: August 29, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|---|
| 351 | 3295 | 31-0461-13 | Eastman Kodak Co. Paper Mill Rochester, NY | 2Un | 2Un | OK on condition that license # 31-0461-20 is verified. |
| 352 | 3254 | 19-0149-38 | Johns Hopkins Medical Inst. 601 N. Broadway Baltimore, MD | 2Un | 2Un | OK on condition that license # 19-0994-01 is verified. |
| 354 | 3278 | 29-1256-03 | Johns-Manville Research Center Manville, NJ | 2Un | 2No | License would be OK except for the 675 mCi Sr-90 source which was at the site superseded by #29-1256-01. Presently hold license #29-01256-05. |
| 355 | 3306 | 31-5429-04 | Anton Electronic Labs, Inc. 1226-38 Flushing Ave. Brooklyn, NY | 2No | 2No | Large quantities of highly toxic material held. External exposure hazard potential. Superseded by #31-5429-05. |
| 360 | 3358 | 10-1988-01 | Ponce de Leon Infirmary 79 Juniper St. Atlanta, GA | 2Un | 2No | Final disposition of Sr-90 in medical applicator unknown. |
| 361 | 3371 | 6-0550-02 | United Aircraft Corp. Fox Project East Hartford, CT | 2No | 2No | Controlled by DOE manual chapters but large sources, external and internal radiation hazard potential. Call to attention of FUSRAP (DOE). Presently hold license #06-7522-03. |
| 368 | 3426 | 24-0468-01 | Nuclear Consultants Inc. 9842 Manchester Rd. St. Louis, MO | 2Un | 2No | Large amounts of potentially hazardous materials held. |

Attachment 1. (continued)

ERC/ORNL

Group
Docket Analysis

Date: August 29, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|---|
| 370 | 3441 | 13-0025-01 | Reynolds Metals Co. 3840 Georgia St. Gary, IN | 2Un | 2Un | Disposition of Sr-90 in beta gauge unknown. |
| 371 | 3447 | 42-0812-01 | Dr. Henry Ricci 602 S. Abe St. San Angelo, TX | 2Un | 2No | Disposition of 50 mCi of Sr-90 in medical applicator unknown. |
| 373 | 3465 | 42-4399-01 | Dr. James T. Robinson 909 Capital Natl. Bank Building Austin, TX | 2Un | 2No | Disposition of 50 mCi of Sr-90 in medical applicator unknown. |
| 374 | 3481 | 31-6268-11 | Rockefeller Inst. for Medical Res. York Ave. at 66th St. New York, NY | 2No | 2No | Large quantities of Sr-90 held. |
| 376 | 3507 | 12-2530-01 | Rockford Memorial Hospital 2400 N. Rockton Ave. Rockford, IL | 2Un | 2No | Disposition of 50 mCi of Sr-90 in medical applicator unknown. Presently hold license #12-2530-03. |
| 377 | 3544 | 9-3603-01 | Reilly, Leo Davis, David K., Drs. St. Anthony's Hosp. St. Petersburg, FL | 2Un | 2No | Disposition of 50 mCi of Sr-90 in medical applicator unknown. |
| 382 | 3561 | 47-0588-02 | Ohio Valley General Hospital 2000 Eoff St. Wheeling, WV | 2Un | 2No | Disposition of 50 mCi Sr-90 in medical applicator unknown. Presently hold license #47-0588-01. |

Attachment 1. (continued)

ERC/ORNL

Group
Docket Analysis

Date: August 29, 1980

| No. | Record No. | License No. | Licensee | Orig. Cat. | Group Cat. | Comments |
|-----|------------|-------------|---|------------|------------|--|
| 385 | 3605 | 9-1872-01 | Dr. Hugh Parsons 442 W. Lafayette St. Tampa, FL | 2Un | 2No | Disposition of 50 mCi Sr-90 in medical applicator unknown. |
| 386 | 3620 | 13-2812-02 | Purdue University Lafayette, IN | 2Un | 2No | Potential external hazard from 300 Ci of Co-60. Presently hold license #13-2812-04. |
| 388 | 3636 | 53-0686-01 | Queen's Hospital 1301 Punchbowl St. Honolulu, HI | 2Un | 2No | Disposition of 50 mCi of Sr-90 in medical applicator unknown. Presently hold licenses #53-16533-01, -02. |
| 390 | 3681 | 9-0457-01 | Radiation Research Corp. 312 Florida Ave. West Palm Beach, FL | 2No | 2No | Atomic batteries disposition unknown. 50 Ci of tritium lost. Handled large amounts of Sr-90. |
| 392 | 3698 | 5-2518-01 | Dr. Gerald Maresh 3705 E. Colfax Ave. Denver, CO | 2Un | 2No | Disposition of 50 mCi of Sr-90 in medical applicator unknown. |
| 393 | 3702 | 19-1398-16 | Martin Co. Nuclear Division Baltimore, MD | 2Un | 2No | Unlimited amounts of by-products 3-83 could be possessed. |
| 396 | 3752 | 31-1299-21 | Memorial Hospital 444 East 68th St. New York, NY | 2Un | 2No | Disposition of 100 mCi of Sr-90 in medical applicator unknown. |

Attachment 2.

| ISOTOPE | CRITICAL ORGAN(S) | HALF-LIFE(YRS) | ALI(MBq) | PERMISSIBLE AMTS ^a AFTER TIME t (yrs) (MBq) | | | |
|---------|-------------------|----------------|----------|--|---------|------|------|
| | | | | t=0 | t=5 | t=10 | t=20 |
| Ca-49 | | 1.7(-5) | 0.27 | 27 | >3.7(7) | | |
| Zn-69 | Prostate | 1.1(-4) | 540 | 5.4(4) | >3.7(7) | | |
| Zn-69m | GI(LLI) | 1.6(-3) | 18 | 1.8(3) | >3.7(7) | | |
| Ga-70 | <i>b</i> | 4.0(-5) | 0.27 | 27 | >3.7(7) | | |
| As-73 | Lung | 0.22 | 27 | 2.7(3) | >3.7(7) | | |
| Ag-108 | --- | 5(-6) | 0.27 | 27 | >3.7(7) | | |
| Cd-117 | --- | 3(-4) | 0.27 | 27 | >3.7(7) | | |
| Te-125m | Lung | 0.16 | 11 | 1.1(3) | >3.7(7) | | |
| Tb-161 | <i>b</i> | 0.019 | 0.27 | 27 | >3.7(7) | | |
| Dy-165 | GI(ULI) | 2.7(-4) | 1.2(2) | 1.2(4) | >3.7(7) | | |
| Hf-180 | <i>b</i> | 6.3(-4) | 0.27 | 27 | >3.7(7) | | |
| Ir-190 | Lung | 0.033 | 27 | 9.9(2) | >3.7(7) | | |
| Pa-233 | Lung | 0.074 | 16 | 1.6(3) | >3.7(7) | | |

^aPermissible original amount at t = 0, after t years have elapsed.

^bSince MPC (DAC) values were not available for these nuclides, the MPC (or DAC) for unknown nuclide mixtures was used.

Attachment 3.

| <u>Box No.</u> | <u>Analysts</u> | <u>License</u> | <u>Categorization</u> |
|----------------|-----------------|--|-----------------------|
| 34 | LEB | 20-1823-4 32-6655-7 37-2279-1 18-190-2 | OK OK OK OK |
| 39 | JSE | 3-2492-2 19-149-22 19-149-39 19-994-13 | OK OK OK OK |
| 42 | JSE | 6-6083-1 19-1243-1 20-2376-3 37-4877-1 | OK OK OK OK |
| 49 | MGR | 29-2830-1 52-3569-4 20-445-1 42-9000-2 | OK OK OK OK |
| 46 | JSE | 42-2309-1 37-2327-1 18-301-1 45-317-1 | OK OK OK OK |
| 40 | BCR | 15-538-6 15-538-8 31-246-5 10-280-1 | OK OK OK OK |
| 47 | LEB | 9-1534-1 17-1450-1 34-7228-1 14-1837-2D58 | OK OK OK OK |
| 36 | JSE | 31-6840-1 6-5590-1 12-755-1 22-1642-5 | OK OK OK OK |

Attachment 3. (continued)

| | | | |
|----|-------------|---|----------------------|
| 44 | BCR | 21-5848-1 29-270-2 26-4750-12 31-1751-3 | OK OK OK OK |
| 48 | LEB | 37-2726-4 37-134-2 35-7488-1 12-929-7 | OK OK OK OK |
| 41 | LEB | 48-4773-1 34-5694-1 17-532-2 18-6104-1 | OK OK OK OK |
| 51 | LEB | 32-3838-2 48-4866-1 31-6268-8 31-6268-27 | OK OK OK OK |
| 50 | JHJ | 42-1841-1 5-5620-1 29-2518-1 31-944-3 | OK OK OK OK |
| 45 | MGR | 6-1671-1 35-7464-4 18-1926-1 21-1443-4 | OK OK OK OK |
| 52 | LKV/ JHJ | 15-4055-2 32-3508-1 29-5218-7 20-0634-1 | OK OK OK OK |
| 62 | JHJ | 5-0046-1 42-2967-3 1-0126-12 53-0458-2 | OK OK OK OK |

Attachment 3. (continued)

| | | | |
|----|-----|-----------|----|
| 53 | JHJ | 12-0610-1 | OK |
| | | 24-0188-1 | OK |
| | | 48-0919-2 | OK |
| | | 09-5252-1 | OK |

| | | | |
|----|-----|-----------|----|
| 57 | JHJ | 34-1308-4 | OK |
| | | 19-4809-1 | OK |
| | | 42-0044-2 | OK |
| | | 31-0230-2 | OK |

| | | | |
|----|-----|-----------|----|
| 87 | KRE | 28-1221-2 | OK |
| | | 01-3568-2 | OK |
| | | 22-8209-1 | OK |
| | | 35-4017-1 | OK |

Attachment 4.
Licenses Found in General Files,
But Not Having Separate Folders

| <u>License No.</u> | <u>Company</u> | <u>Box. No.</u> |
|--------------------------------|--|-----------------|
| 10-0960-04 | Emory University School of Medicine Atlanta, GA 1958 General File | 91 |
| 37-7458-01 | Douglas Aircraft Co., Inc. 2000 N. Memorial Dr. Tulsa, OK 1963 General File | 90 |
| 30-0692-02 | Eberline Instrument Division Reynolds Electrical and Engineering Santa Fe, New Mexico 1957 General File | 90 |
| 24-3248-02A60 24-3248-01A60 | University of Missouri Rolla, MO 1958-61 General Files | 102 |
| GL-106 | Moss-Gordin Lint Cleaner Co. Lubbock, TX 1961 General File | 102 |
| 20-1823-Gz | W.R. Grace & Co. Dewey and Almy Chemical Co. Cambridge, MA 1958 General File | 89 |
| GL-112 37-0030-02H60 | U.S. Radium Corp. Bloomsburg, PA 1960 General File | 66 |
| 37-0314-03 37-0314-06 | Philadelphia Naval Shipyard Philadelphia, PA 1959-60 General Files | 66 |
| | U.S. Radium Corporation Morristown, NJ 1957 General File | 66 |
| 35-0161-04 | Well Surveys, Inc. Tulsa, OK 1961 General File | 90 |
| 12-4932-01 | American Potash & Chemical Corp. West Chicago, IL 1962 General File | 85 |

Attachment 4. (continued)

| | | |
|---------------|---|----|
| 12-3066-02 | Union Starch & Refining Co., Inc. Granite City, IL 1959 General File | 61 |
| 12-2631-02 | Union Tank Car Co. Chicago, IL 1959 General File | 61 |
| C-4382 | United Tool and Die Co. West Hartford, CT 1956, 1961 General Files | 61 |
| 19-0915-07A63 | U.S. Dept. of Agriculture West Hartford, CT 1956, 1961 General Files | 61 |
| 19-0915-07A63 | U.S. Dept. of Agriculture Beltsville, MD 1959 General File | 61 |
| 19-0915-03 | U.S. Dept. of Agriculture Beltsville, MD 1958 General File | 61 |
| 31-2012-02 | U.S. Dept. of Agriculture Beltsville, MD 1959 General File | 61 |
| SNM-15 | McClellan Air Force Base McClellan, CA 1956 General File | 61 |
| 45-0034-09 | University of Virginia Charlottesville, VA 1956 General File | 69 |
| 14-3501-01 | Dr. Roger K. Wallace Riley County Hospital Manhattan, KS 1958 General File | 69 |

Attachment 4. (continued)

20-0297-02
20-0297-10
20-0297-11
20-0297-12
20-0297-13
20-0297-16
20-0297-17
20-0551-02
20-0551-03
20-0551-04
20-0551-05
20-0551-06
20-2147-01
20-3717-05
20-3717-10
20-3717-12
20-3717-13
20-3717-14
20-3717-15
20-3717-17
20-3717-18
20-3717-20
20-3717-21
20-3717-23
20-3717-24
20-3717-25
20-3717-27
20-3717-29
20-3720-03
20-3720-04

Harvard University and
Associated Hospitals
Cambridge, MA
1957-1958 General File

94

DISTRIBUTION

ORNL/HASRD-92

INTERNAL DISTRIBUTION

1. C. F. Holoway
2. S. V. Kaye
3. F. R. Mynatt
4. P. S. Rohwer
5. J. P. Witherspoon
6. ORNL Laboratory Records Department, R.C.

EXTERNAL DISTRIBUTION

- 7-8. DOE Technical Information (DOE-TIC)
9. T. F. Carter, Jr., Deputy Director, Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission, 7915 Eastern Avenue, Silver Spring, Maryland 20910
- 10-11. W. T. Crow, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 7915 Eastern Avenue, Silver Spring, Maryland 20910
12. R. E. Cunningham, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 7915 Eastern Avenue, Silver Spring, Maryland 20910
13. Mr. W. J. Dircks, Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 7915 Eastern Avenue, Silver Spring, Maryland 20910
- 14-15. D. A. Nussbaumer, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 7902 Norfolk Avenue, Bethesda, Maryland 20014
16. R. G. Page, Chief, Uranium Fuel Licensing Branch, U.S. Nuclear Regulatory Commission, 7915 Eastern Avenue, Silver Spring, Maryland 20910
- 17-18. Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, 7902 Norfolk Avenue, Bethesda, Maryland 20014
19. Joann Epler, Evaluation Research Corporation, 25 Tennessee Avenue, Oak Ridge, Tennessee 37830
20. Assistant Manager, Office of Energy Research and Development, Department of Energy, Oak Ridge Operations, Oak Ridge, Tennessee 37830