



UNITED STATES
NUCLEAR REGULATORY COMMISSION

J. B. House

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

JAN 14 1994

MEMORANDUM FOR: John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial & Medical
Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

FROM: Dwight Chamberlain, Acting Director
Division of Radiation Safety and Safeguards
Region IV

SUBJECT: REVIEW OF LICENSE FILES FOR RECORDS TO RESEARCH
INVOLVING HUMAN SUBJECTS

This memorandum responds to your request for Region IV to conduct a review of license docket files selected by the licensing and inspection staff based on the criteria provided in your E-mail memo of January 10, 1994. The principal focus of our review was to determine if medical or scientific radiation effects research in humans, other than for radiopharmaceutical development, had been conducted prior to the dissolution of the Atomic Energy Commission (AEC) in 1975. The following licensees were selected from those licenses currently or previously authorized in the LAN data base for human research and in conjunction with the collective memories of our licensing and inspection staffs of their early respective licensed activities. All available licenses, license backup documents, and inspection reports were reviewed.

LICENSEE	LICENSE NO.
Department of Veterans Affairs	
Dallas, Texas	42-00220-06
Little Rock, Arkansas	03-01082-01
Houston, Texas	42-00084-06
Denver, Colorado	05-01401-02

9402230315 940204
PDR ORG NE ED
PDR

[Handwritten signature]

LICENSEE	LICENSE NO.
Department of the Army	
William Beaumont Army Medical Center	42-05255-07
Fitzsimmons Army Medical Center	05-00046-13
Brooke Army Medical Center	42-01368-01
State of Oklahoma	
University of Oklahoma Health Sciences Center	35-03176-01
Oklahoma Medical Research Foundation	35-07464-03
National Aeronautics & Space Administration	42-09388-03

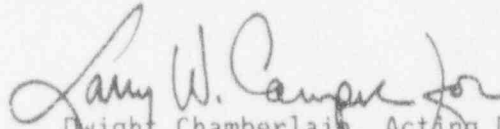
The attached enclosures provide a summary of the available information contained in each docket file reviewed. It should be noted that information reviewed was sketchy, large gaps of information appeared to be missing, and the compressed time scheduled for review increased the potential for oversight of other human research activities addressed in your memo. In addition, a number of these licensees were authorized for Atomic Number 3-83 for the broad category of human research and, therefore, all types of human research cannot be easily clarified through a limited file review. It is conceivable that additional review could reveal other interesting information.

In reviewing the docket files, no specific incidence of deliberate exposure to the public using special nuclear material or transuranics were noted. However, we noted specific instances in which informed volunteers from a penitentiary, mental health hospital, VA hospital, and a military facility were utilized in human research. Other uses of byproduct materials, other than in support of radiopharmaceutical research in humans, included metabolic studies, nutrition studies, and treatment or diagnosis of rare diseases.

John E. Glenn

-3-

If you wish to discuss the above comments or require additional information, please contact Mr. Jack Whitten of my staff at FTS (817)860-8197 or Ms. Vivian Campbell at FTS (817) 860-8143.



Larry W. Chamberlain, Acting Director
Division of Radiation Safety
and Safeguards

Enclosure:
As stated

Licensee: Department of Veterans Affairs
Dallas, Texas

License No.: 42-00220-06 issued 4/22/58

Supersedes License No. 42-220-2, issued 5/17/56

Docket No.: 030-03256

Amend No.	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
51	5/23/72	S-35	sulfate			Metabolism studies in 25 patients in accordance with protocol submitted in letter dated Nov. 2, 1971	11/2/71
36	3/1/68	Fe-55	Ferric chloride			Study iron absorption by double isotope labeling technique. Normal (volunteers) and patients with various problems of iron metabolism	11/8/67
32	1/4/67	I-131	Triiodothyronine			<u>Invivo</u> studies in thyroid function in 10 patients	11/3/66
		Cr-51	chloride			Cardiac output studies in 10 patients	
		S-35	sulphate			Determination of extracellular fluid volume in 10 patients	
		Hg-197	mercurihydroxypropane			Spleen scans on 20 adult patients	
31	6/7/66	Hg-197	Mercurihydroxypropane			Spleen scans on 20 adult patients.	6/7/66
27	4/22/65	S-35	sulphate			Evaluation of simultaneous red cell mass & extracellular fluid volume measurements as a useful clinical procedure before, during & after major surgery	

18	1/26/62	Cr-51	Labeled Albumin			Study gastrointestinal protein loss	12/28/61
12	10/17/60	I-131	Polyvinylpyrolidone			Plasma volume measurements	9/28/60
4	9/3/59	H-3	Water			Total body water determinations	8/17/59
2	2/9/59	I-131	Thyroxine or ACTH			Studies of thyroxine & ACTH binding in terminal cancer patients	1/21/59
0	4/22/58	I-131	Insulin			Studies of insulin binding and glucose uptake in terminal cancer patients	
		I-131	Triolein or Oleic acid			Studies of pancreatic function	
		Fe-59	chloride, citrate, or globulin complex			Studies of red cell production	
		Cr-51	Chromic chloride			Determination of blood volume & life of erythrocytes	
		C-14	Dextran			Determination of blood volumes	
		Na-24	chloride			Determination of sodium space	
		K-42	chloride			Determination of potassium space	

NOTE: Supporting documents not available for review.

Licensee: Department of Veterans Affairs
 Little Rock, Arkansas
 License No.: 03-01082-01, issued September 30, 1956
 Docket No.: 030-01212

Amend No. or other Documentation	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
0	9/30/56	H-3	Triated Water	100 mCi	Not specified	Water metabolism in normals and patients with congestive heart failure. Determine plasma iron turnover rates in normals and patients with various anemias and polycythemia.	None
		Fe-59	Citrate	2 mCi	Not specified		
Inspection Report 8/16/60		H-3	Water	50 mCi	Not specified	Water metabolism in normal patients and in patients with emphysema and congestive heart failure	None
		H-3	Cholesterol or Cholesteroles ters	100 mCi	Not specified	Cholesterol metabolism in normal patients and those with atherosclerosis	None
		H-3	Digoxin or digitoxin	100 mCi	Not specified	Metabolism of cardiac glycosides in normal patients and those with congestive heart failure	None
Inspection Report 4/20/66		H-3	Not specified	120-150 μ Ci	Dr. Doherty	Metabolism	None
		H-3	Collestrol	300 μ Ci	Not specified	Collestrol	None

17	9/9/66	3-83	Any	12 mCi	Not specified	Medical research, diagnosis, & therapy	None
23	5/5/72	S-35	Sodium sulfate	200 mCi Administered IV 8 times over 16 months	Not specified	Clinical diagnosis, therapy, & biomedical research. Therapy for chondrosarcoma	License renewal application dated 8/30/73

Licensee: Department of Veterans Affairs
Houston, Texas

License No.: 42-00084-06, issued 4/3/58

Amendment No. 01 supersedes License No. 42-84-3 issued 2/7/57, 42-84-4 issued 4/8/57, and
42-84-5 issued 12/24/57

Docket No.:

Amend No.	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
24	2/28/66	Cr-51	Labeled Human serum albumin			Gastrointestinal protein loss studies	
18	1/27/64	H-3	Cortisol or cortisone			Steroid metabolism studies in patients over 40 years of age with cirrhosis of the liver	
17	1/13/64	C-14	2-C-14-5-Hydroxy-DL-Tryptophan			Used in determinations of production rate & pool size of serotonin in patients with functioning & non-functioning malignant carcinoid tumors	11/18/63
16	4/15/63	Na-24	chloride			Sodium space studies	4/9/63
13	2/25/63	C-14	Uracil mustard			Metabolism studies in patients with disseminated cancer	11/21/62
12	12/27/62	C-14	Serotonin			Used to determine human platelet survival .	10/10/62
		C-14	Uric acid			Used to study uric acid body pools & turnover rate in leukemia	
10	8/30/62	Ba-131	Barium sulfate			As an inert indicator in intestinal absorption studies	6/7 and 8/6/62
9	5/8/62	H-3	Tritiated thymidine			Study of growth rates in neoplastic tissue	4/25/62

4	3/22/60	I-131	Renal function compounds		Renal function studies & renal scanning in 10 patients with known malignancies. Determination of circulation time.	3/4/60
3	8/21/59	I-131	Diodrast		Renal function studies & renal scanning studies in 10 patients with known malignancies	
1	1/29/59	Rb-86	chloride		Potassium exchange & red cell volume determinations	12/23/58
		K-42	chloride		Potassium exchangeable determinations	
		Fe-59	citrate		Iron plasma clearance and iron utilization	
		I-131	Triolein or Oleic acid		Fat absorption studies	
		I-131	L-thyroxine & homologs		L-thyroxine determinations following thyroidectomy	
0	4/3/58	I-131	Triolein or Oleic acid		Determination of pancreatic & intestinal function	
		Br-82	Bromide		Determination of extracellular fluid volume	

NOTE: 1) Amendment No. 26, issued 10/7/66: format change to broad authorization for medical research, diagnosis, & therapy. Unable to identify specific uses.

2) No supporting documentation available for review.

Licensee: Department of Veterans Affairs
Denver, Colorado

License No.: 05-01401-02, issued April 29, 1958

Supersede License No. 5-1401-1, issued March 21, 1956

Docket No.: No docket no. identified

Amend No.	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
18	6/4/65	H-3	Tritiated water	2mCi	H.Elrick, A.L.Daywitt, W.S.Keyting	Total body water determinations	4/7/65
13	10/25/62	Fe-59	Chloride, sulfate, citrate, globulin	2-5uCi	H.Elrick	For determining the mechanisms or estimating the status of erythropoiesis and/or iron metabolism in normal or diseased persons	10/10/62
12	12/21/61	Br-82	Potassium bromide	50uCi, orally	H.Elrick	APPLICATION REQUESTED HUMAN USE; HOWEVER LICENSE AUTHORIZED LABORATORY ANIMALS. For labeling of fat in fat absorption studies	10/10/62
11	11/28/61	Br-77	Potassium bromide	50uCi, orally	H.Elrick	APPLICATION REQUESTED HUMAN USE; HOWEVER LICENSE AUTHORIZED LABORATORY ANIMALS. For labeling of fat in fat absorption studies	11/14/61
6	8/31/60	Ca-47	chloride	50uCi	H.Elrick	To study metabolism of Ca-47 in man: absorption. Uptake in bones. Disappearance from blood & excretion in urine and feces	7/20&21/60
4	12/14/59	I-131	insulin	50uCi, parenterally	H.Elrick	Metabolism of insulin-I-131 in normal, thyroid, renal, liver and pancreatic diseases	11/25/59

3	12/8/58	I-131	Diodrast	25uCi, I V	H.Elrick	Study of dynamic function of individual kidneys in patients with hypertension	11/17/58
0	4/29/58	I-131	Trielein	50- 70uCi	H.Elrick	To study fat absorption	3/31/58
0	4/29/58	C-14	glucose	100uCi	H.Elrick	Study of effect of hormones on carbohydrate	3/31/58
0	4/29/58	Na-24	chloride	100uCi	H.Elrick	Determination of sodium space	3/31/58
0	4/29/58	K-42	carbonate	100uCi	H.Elrick	Determination of potassium	3/31/58
0	4/29/58	Fe-59	Ferric chloride	100uCi	H.Elrick	Determination of red cell formation	3/31/58
0	4/29/58	I-131	Glucagon	5mCi Maximum possess ion		Tracer studies with glucagon in patients with limited life expectancy	Apparently approved on 05- 1401-1, no supporting documentat ion available
0	4/29/58	Silver- 110	Any	20mCi Maximum possess ion		Determination of plasma chloride concentration	Apparently approved on 05- 1401-1, no supporting documentat ion available

NOTE: Based on review of file, it appears that VA-Denver buried radioactive waste in Denver Land Fill, 19 miles SE of hospital.

Licensee: Department of Army
 William Beaumont Medical Center
 El Paso, Texas
 License No.: 42-05255-07, issued September 24, 1964
 Docket No.: 030-03260

Amend No. or other Documentation	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
19	5/18/71	Ca-47	Chloride	30 μ Ci	Not specified	Calcium absorption studies in 1 patient in accordance with application dated 4/27/71	Application dated 4/27/71
22	10/1/71	F-18	Fluoride	0.5-4 mCi 25 patients	Not specified	Bone imaging	Application dated 7/29/71
25	3/7/72	F-18	Fluoride	0.5-4 mCi Additional 100 patients	Not specified	Bone imaging	Application dated 7/29/71
Inspection Report 3/10/67				30-40 μ Ci 2 studies each at the beginning/middle/end of each study	Not specified	Repetitive cardiac output determinations in normal volunteers. Ages 30-45.	None

Licensee: Department of the Army
 Fitzsimons Army Medical Center
 Aurora, Colorado

License No.: 05-00046-13, issued 2/3/64

Docket No.: 030-01233

Amend No.	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
23	5/28/71	Se-75	Selenite			Determine site & nature of selenium protein bond in 25 cancer patients plasma to evaluate nutritional liver disease	1/5/71
22	4/26/71	C-14	Glucose		CPT Raymond Burk	Study of glucose metabolism in 24 normal male volunteers at Fort Sam Houston, TX and at Summit of Pikes Peak, Colorado	1/5/71
16	5/15/69	C-14	Glucose		CPT Shafiek Sanbar	Study of glucose metabolism in 8 normal male volunteers at the summit of Pike's Peak, Colorado and in 8 normal male volunteers at Fort Sam Houston, TX	
11	9/15/67	C-14	4-C14-cortisol, 1,2-H3-aldosterone			Use in 10 volunteers to study effects of high altitude on man	7/13/67
9	3/24/67	C-14	Vitamins, carbohydrates, amino acids, lipids, acetate			Metabolic & physiological tracer studies in volunteers	11/18/66
		H-3	Vitamins, Water				

		Mg-28	Oxide, chloride, citrate			
		Ca-45	chloride			
		Ca-47	chloride			
1	7/31/64	C-14	Vitamins, amino acids, lipids, acetate, carbohydrates, mevalonic acid, bicarbonate or carbon dioxide		Nutrition & metabolism tracer studies	
		H-3	Vitamins			
		Mg-28	Oxide, chloride, citrate			
		Ca-47	chloride			
		Ca-45	chloride			
0	2/3/64	I-131	Triolein or Oleic acid		Determination of fat absorption	
		I-131	p-Toluidine polyvinylpyrrol idine		Determination of protein loss	
		I-125	Triolein or Oleic acid		Determination of fat absorption	
		I-125	Cholografin		Determination of liver & gallbladder function	
		Fe-59	Ferric chloride, Ferrous citrate		Determination of iron turnover	
		H-3	Water		Determination of total body water	
		Na-24	Sodium chloride		Determination of total exchangeable sodium	

NOTE: Supporting documentation not available for review.

Licensee: Department of the Army
 Brooke Army Medical Center
 Ft. Sam Houston, Texas
 License No.: 42-01368-01, issued Nov. 5, 1956
 Docket No.: 030-03258

Amend No.	Date Issued	Isotope	Chemical form	Maximum possession limit	PI*	Purpose	Date of supporting document**
23	3/6/68	S-35	Sodium sulfate	10mCi		Study of the influences of sodium chloride intake on mineral metabolism and adrenocortical function during acclimatization to heat in 18 volunteers	12/8/67
		K-42	chloride	25mCi		ditto	ditto
		H-3	Water	25mCi		ditto	ditto
		H-3	1,2-H3 aldosterone	25mCi		ditto	ditto
14	4/7/64	H-3	Water	25mCi		Determination of total body water	9/5/63
		Na-24	chloride	1mCi		Determination of total exchangeable sodium	ditto
		H-3	aldosterone	250mCi		Determination of aldosterone secretion rates	ditto
		C-14	hydrocortisone	50mCi		Determination of cortisol secretion rates and plasma cortisol clearance	ditto
10	11/9/62	K-42	Potassium chloride	50mCi		Measurement of extra-cellular fluid compartment	8/1/62
8	10/31/60	K-42	Any	50mCi		Iron metabolism studies	9/1/60
		I-131	Labelled Fat	10mCi		Study of pancreatic function & intestinal malabsorption	ditto
6	6/14/60	I-131	Hypaque	2uCi		Kidney function test	9/30/59
5	11/24/59	I-131	Diodrast	10mCi		Kidney function test	9/30/59
3	8/6/57	I-131	Triolein and/or Oleic acid	10mCi		Study of pancreatic function & intestinal malabsorption	7/2/57

2	1/2/57	Fe-59	Ferrous citrate	2mCi		Intravenous injection of ferrous citrate to study plasma iron clearance and red cell incorporation in humans	12/10/56
---	--------	-------	-----------------	------	--	--	----------

* - Principal investigators unknown.

** - No supporting documents available for review. Information gleaned from copies of the license. Licensing staff also attempted to retrieve old documents from NUDOCS; however, no success.

Licensee: The University of Oklahoma
 Health Sciences Center
 Oklahoma City, Oklahoma

License No.: 35-03176-01, issued November 5, 1956

Docket No.: 030-03258

Amend No. or other Documentation	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
<p>Letter July 1, 1957</p> <p>Letter specified: Due to rapid development of radioisotopes in medicine, the Oklahoma Medical School and University Hospital should be authorized unspecified quantities and multiple types of byproduct material</p>							
10	12/30/66	3-83	Any	500 mCi authorization		<p>Medical research, diagnosis, & therapy</p> <p>Byproduct material for diagnostic procedures and medical research with labeled compounds in tracer doses may also be used at Oklahoma State Penitentiary, McAlester, Oklahoma, and Central State Hospital, Norman, Oklahoma.</p> <p>Note: Central State Hospital is Oklahoma's Mental Health Hospital</p>	

<p>Letter June 3, 1964</p> <p>Question in letter to AEC:</p> <p>... "limitations whereby radioactive materials may be used in normal children less than 18-years of age as part of a research project. The question whether the AEC has any regulations or policy governing such use. We also wonder what maximum doses may be allowed in children by this use of radioactive material."</p> <p>No answer to these questions were found in the docket file.</p>				
<p>Letter March 11, 1966</p> <p>Request to broaden the scope of activities by working with radioactive tagged pharmacologic agents in an attempt to learn more about the metabolic fate of the compounds. Compounds to be ingested or injected</p>				Oklahoma State Penitentiary Inmate Volunteers
<p>Letter June 6, 1966</p> <p>Study of the absorption, distribution, and metabolic fate of new and old pharmacologic agents.</p> <p>Note: AEC representative telephone note requesting confirmation that informed consent would be received from all subjects.</p>				Oklahoma State Penitentiary Inmate

<p>Letter October 13, 1966</p> <p>Information specific to informed consent forms used at Oklahoma State Penitentiary and Oklahoma State Hospital.</p>				<p>Oklahoma State Penitentiary Inmate Volunteers</p> <p>Central State Hospital Volunteers</p>
<p>Letter June 14, 1974</p> <p>Letter provides information on the number and type of studies at the Oklahoma State Penitentiary.</p> <p>Seven projects in the clinical research lab unit."the work generally of these projects can all be classified as medical research, including some teaching activities."</p>				<p>Oklahoma State Penitentiary Inmate Volunteers</p> <p>Central State Hospital Volunteers</p>

Licensee: National Aeronautics & Space Administration
 Johnson Space Center
 Houston, Texas
 License No.: 42-09388-03
 Docket No.: 030-03264

Amend No.	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
9	1/22/74	Tc-99m	Pertechnetate & electrolytically labeled Human Serum Albumin	.025-.05mCi	Hoffler, Johnson	Cardiac studies on Skylab IV crew	1/3/74
7	7/27/72	S-35 H-3 Na-24 K-42				Modified authorization from Amendment # 5. Red cell mass, plasma volume, extracellular fluid volume, total body water and sodium and potassium space studies on volunteers over 21 years of age	6/15/72
		I-125				Modified authorization from Amendment # 6. Determine the occurrence & degree of bone mineral changes in volunteers over 21 years of age	
6	11/2/70	I-125	Sealed Source	4 sources @ 200mCi each	Vogel	Determine the occurrence & degree of bone mineral changes in the Apollo Crewman which might result from exposure to the weightless condition & short period of 1/6G alters these changes	9/24/70

5	7/9/70	S-35 H-3 Na-24 K-42	sulfate water chloride chloride	50uCi 150uCi 50uCi 100uCi	Fischer, Johnson	Study the effect of Apollo lunar missions & Tektite 100 foot ocean dive on red cell mass, plasma volume, extracellular fluid volume, total body water, and sodium and potassium space on volunteers over 21 years of age	5/14/70
1	9/11/68	C-14	glycine	50uCi	Fischer, Johnson	Measurements of selective age dependent erythrocyte destruction on volunteers	9/10/68
0	11/29/66	Cr-51	chromate	500uCi	Fischer, Johnson	Red blood cell mass & survival studies on volunteers	10/7/66
		Fe-59	Ferrous citrate	20uCi		Ferrokinetic studies on volunteers	
		I-125 /I-131	Human Serum Albumin	40uCi		Blood volume, plasma volume & cardiac output studies on volunteers	
		I-125 /I-131	Labeled Renal Function Compounds	200uCi		Renal function, and cardiac output studies on volunteers	

Licensee: Oklahoma Medical Research Foundation
Oklahoma City, Oklahoma

License No.: 35-07464-03, issued March 31, 1958

Superseded License No. 35-7464-1, issued February 28, 1956

Docket No.: 030-02898

Amend No.	Date Issued	Isotope	Chemical form	Dose	PI	Purpose	Date of supporting document
9	8/6/62	Ca-47	chloride	10-20uCi	Reagan Bradford	Authorized use at McAlester State Penitentiary. To evaluate the influence of several steroidal agents of the adrenal cortical type on the dynamics of calcium metabolism. Human subjects (prison volunteers) are maintained under balance conditions in the metabolic ward at McAlester	7/31/62
7	4/27/61	Ca-47	chloride	10-20uCi	Leonard Eliel	Study of calcium metabolism in patients with bone metastases from breast carcinoma.	4/12/61
4	6/2/60	Fe-59	Citrate globulinate	1mCi (possession limit)	Leonard Eliel	Iron turnover studies "Ferromagnetic studies in normal & diseased patients	4/26/60 & 2/29/60
3	3/28/60	Ca-45	chloride	10-30uCi	Leonard Eliel	Study of calcium metabolism in patients with bone metastases from breast cancer before & during administration of steroids & chemotherapeutic agents	2/29/60
		Mg-28	chloride	250-500 uCi		<u>In vitro</u> & lower animal studies and acute experiments in patients with bone cancer & leukemia to study magnesium & calcium removal from bone in response to parathyroid hormone	

2	11/10/59	C-14	Inulin-carbosylic acid	10mCi (possession limit)	Leonard Eliel	Measurement of glomerular filtration rate & extracellular fluid volume in normal & diseased patients	9/25/59 Approved by the AEC Medical Advisory Committee
		H-3	Water	100mCi (possession limit)		Measurement of total body water in normal & diseased patients.	
00	3/31/58	K-42	Chloride carbonate	250uCi	Leonard Eliel	To measure quantitatively tumor response from various medications and diet which are known to alter the growth rate of cancer tissue	2/14/58
		P-32	Soluble phosphate	250uCi		To determine the specific activity of P-32 in intracellular fractions & nucleic acids before & after administration of various agents	
		C-14	Sodium formate or Glycerine 2-C-14	1mCi		Metabolism studies in patients with leukemia or cancer	
		Rb-86	Chloride carbonate	200uCi		For use in patients with advanced breast carcinoma with known masses or metastases in order to find a reliable method of determining the effect of various drugs on the growth of cancer of the breast	
		Fe-59	Globulin complex	100uCi		Iron disappearance & reappearance rates are to be studied in human with leukemia and lymphosarcoma on various diets, and before & after chemotherapy determine the effects of these procedures on iron utilization & presumably hemoglobin synthesis	

NOTE: The format of the license changes in 1961 to a very broad authorization. We have been unable to identify any specific human research from that time forward. We have also been unable to locate the original license issued February 28, 1956 or the supporting documents from that time-frame.

Licensee Name	License # Application Date	Job#/Box#	Comments/Remarks
University of Cincinnati	34-6903-1 2-20-56	1722/094	2 entries (?2 files)
College of Medicine	34-6903-2 8-7-56	277/06	
	34-6903-3 11-19-56	277/06 1722/94	2 entries (?2 files)
College of Medicine	34-6903-4 6-4-57	0132/14 759/1	
	34-6903-5 3-28-58	227/12	A & B file in Oak Ridge, still listed as active license
	34-6903-6 4-21-59	1722/65	2 entries (?2 files)
	34-6903-7 5-25-59	1722/65 759/1	
	34-6903-8 6-19-70	277/13 759/1	sealed source - Cs-137
	34-6903-9 5-24-76		CO-60; found no info. on location - manual search or through database search done by Latravetta Lee (IRM)
Medical Center	34-6903-10 10-7-77	1193/12	teletherapy
	34-6903-11 12-04-80		found no info. on location - manual search or through database search done by Latravetta Lee
	34-6903-12 2-5-82	1659/11	
	34-6903-13 11-28-83		found no info. on location - manual search or through database search done by Latravetta Lee

Licensee Name	License # Application Date	Job#/Box#	Comments/Remarks
University of Cincinnati	34-725-1 6-27-56	1722/094	
Dept. of Chemistry	34-725-2 10-30-58	1722/047 759/1	
	34-725-3 2-9-59	1722/65 759/1	
	34-725-4 4-1-59	1722/65 759/1	
	34-725-5 7-15-59	1722/65 759/1	4 entries (?4 files)
	#10422	1722/047	denied - Warren F. Stubins, University of Cincinnati, College of Engineering
	#31170	1722/047	voided: Burnett Woods Park location
	#35989	1722/047	withdrawn - Nuclear Sciences and Engineering
	#40670 2/62	1722/065	withdrawn - Eugene L. Saenger