



700 Broadway
Fort Wayne, IN 46802
(219) 425-3000

St. Joseph Medical Center

North Central Indiana Health System Affiliate

August 8, 1990

Mr. William Reichhold
U.S. Nuclear Regulatory Commission, Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Reichhold,

This letter is in response to the N.R.C. inspection you performed on our teletherapy department (license #13-00418-04) on July 23, 1990. Enclosed please find the additional information you requested. Below I have addressed the two violations which we received and the corrective actions that will be implemented. I have also addressed your other recommendations.

VIOLATIONS:

1. Missing film of April, 1990 - light/radiation beam check.

The enclosed film is the June, 1990 beam check. This is the original film of the check, please return if you see it necessary, otherwise this letter will serve as documentation that the film was sent to the N.R.C. Dr. Agnew assured me that the April, 1990 check was performed. We have gone through our records and are unable to find it. Therefore, the film must have been misplaced. To assure that no further records will be misplaced, the supervisor of the area or a person they delegate will review records on a monthly basis with the consulting physicist. A check list will be kept with the physicist's and the review person's initials on it.

2. Physicists need to perform timer linearity check.

Dr. Agnew informed me that they will start performing this check with their August inspection. To assure that this is completed it will be placed on the check list mentioned in the item 1 corrective action.

RECOMMENDATIONS:

Below is the list of your recommendation and what actions we plan to take towards them.

1. Dr. Gates and Dr. Trenkner.

Enclosed you will find a copy of Caylor-Nickel Hospital's license in which they appear. Also please find an updated letter from our C.O.O. stating that they may treat patients at the Medical Center. This topic will be discussed at the August Radiation Safety Meeting.

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REG3 LIC30
13-00418-04 FDC

AUG 13 1990

IE 07 11

2. Training Program for Housekeeping, Security, and Radiology Associates on Cobalt Room Precautions.
John Colvin from Nuclear Medicine is responsible for the training ancillary personnel on the hazards of radiation. He will compose a training checklist specifically for the cobalt area. Everyone in Housekeeping, Security, or Radiology who will have access to the cobalt room will be required to review this checklist on an annual basis. Records of this will be kept in the Radiation Therapy area.
3. Radiation Oncologist present at quarterly Radiation Safety Meeting.
Every effort will be made to have an radiation oncologist present at the meetings. If one is not able to attend the meeting, they will be responsible to read and sign the minutes of the program. A copy of the signed meeting minutes will be kept in the Radiation Therapy Department.
4. Film Badges.
Attached please find copies of the film badge reports you requested.
5. Calibration Check.
Attached is a copy of a memorandum from Dr. Agnew and his calibrations check on Keithley 35060.

I hope the above information and responses answer all your questions. If you require further information, please feel free to contact me at 219-425-3980. We look forward to seeing you next year.

Sincerely,

Thomas T. Earnest

Thomas T. Earnest, Operations Manager

cc:

Rick Trego, Director, Diagnostic & Therapeutic Services
Jim Wilmer, V.P., Professional & Support Services
John Farrell, Sr. V.P. and C.O.O.
Dr. Agnew
Radiation Therapy Department



St. Joseph Medical Center
700 Broadway
Fort Wayne, Indiana 46802
ANCILLA SYSTEMS AFFILIATE

Department of Radiology
Radiologists
Allen County Radiology

July 24, 1990

Dr. David Trenkner and Dr. James Gates, although not on our NRC license at this time, have the permission of St. Joseph Medical Center to practice in our facility because of their affiliation with our Oncology group. A copy of the NRC license from Parkview Memorial Hospital and Caylor Nickle Clinic are on file to prove that they are authorized to practice in those facilities.

A handwritten signature in cursive script, likely belonging to the Chief Executive Officer mentioned in the text below.

Chief Executive Officer



St. Joseph Medical Center
700 Broadway
Fort Wayne, Indiana 46802
ANCILLA SYSTEMS AFFILIATE

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number	13-01629-04
Docket or Reference number	030-00192
Amendment No. 07	

Caylor-Nickel Hospital, Inc.
309 South Main Street
Bluffton, IN 46714

In accordance with letter dated May 4, 1987, License Number 13-01629-04 is amended as follows:

Items 6., 7. and 8. are amended to read:

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Cobalt-60	A. Sealed teletherapy sources (Neutron Products, Inc, Model NPTT Series or AECL Models C-146 or C-151)	A. 14,000 curies (2 sources not to exceed 7,000 curies each)

Condition 12. is amended to read:

- 12. A. Authorized Users: John N. Crawford, M.D., Deep C. Bajpai, M.D., Rao Mantravadi, M.D., James O. Gates, M.D. and David A. Trenkner, M.D.
- B. Radiation Safety Officer John (Jack) P. Smith, M.D.
- C. Teletherapy Physicist: John F. Agnew, Ph.D.

For the U.S. Nuclear Regulatory Commission

Date August 24, 1987

Original Signed
By Kathy J. Graden
Materials Licensing Section, Region III

8301280061
1P

COPY

Memorandum

TO: Tom Earnest, R.T.
Nuclear Medicine Department
St Joseph Medical Center

FROM: John F. Agnew, Ph.D. *JFA*
Radiation Physicist

Date: July 30, 1990

SUBJECT: Cobalt teletherapy data

I received a list indirectly from Kathy Bailey about some data and records needed for the Nuclear Regulatory Commission.

1. Light/radiation coincidence film from April, 1990. I do not have the film.

2. Light/radiation film from the annual calibration in June is enclosed.

3. Cross calibration data for the routine calibration check instrument (the Keithley 35060). The relevant data was on three pages of my data, all taken the same afternoon. I pieced them together and photocopied them. I also transcribed them to a new form I made up today. I will use the new form in the future to include the intercalibration data with future annual calibrations.

4. A copy of Caylor-Nickel's teletherapy license, which lists Dr. Gates and Dr. David Trenkner as authorized users, is enclosed.

DOSIMETRY EQUIPMENT INTERCOMPARISON

Intercomparison of routine dosimetry instrument against the ADCL calibrated equipment.

Date 6-29-90 . By John F. O'neal .

Beam: Cobalt teletherapy at St. Joseph Med. Ctr.
10x10 cm field. Trim bars retracted.

Air temp. 24.4 .

Pressure 738.8 .

T&p factor = 1.03706 .

ADCL Calibrated equipment: Capintec 192A Electrometer SN 73F366
High-Normal range; Electrometer mode. Full bias is
(-)300 V bias. Compensation factor knob at 1.0 (detent).
Capintec PR06C ion chamber SN 1138 with buildup cap.
Last calibrated at Wisconsin ADCL on Aug 11, 1989.

Chamber centered at nominal 80cm in air with cobalt buildup
cap. Exposure times are each 2 minutes.

I.R.:	initial	+1.2	+1.2	+1.2	
	final	-22.5	-22.35	-22.4	
	net	<u>22.7</u>	<u>22.55</u>	<u>22.6</u>	<u>Avg 22.617 nC</u>

3 interruptions:	initial	+1.2	+1.2	+1.2	
	final	-21.8	-22.0	-21.7	
	net	<u>22.0</u>	<u>22.2</u>	<u>21.9</u>	<u>Avg 22.033</u>

$$\text{End-error} = \frac{\text{time} \times (R2 - R1)}{(n+1) \times R1 - R2} = \frac{(2 \text{ min}) (22.033 - 22.617)}{4(22.617 - 22.033)} = \underline{-0.017 \text{ min}}$$

Half-voltage bias (first reading not recorded):

initial	+1.2	+1.2		
final	-22.3	-22.3		
net	<u>22.5</u>	<u>22.5</u>		

$$R1/R3 = (22.617) / (22.5) = \underline{1.005}$$

From figure 4 of 1984 AAPM protocol, $P_{\text{ion}} = \underline{1.0025}$

Calculations:

$$\begin{aligned} R/\text{min} @ 80 &= \frac{R1 \times T\&p \times f_{\text{cham}} \times f_{\text{electrode}} \times A_{\text{ion}} \times P_{\text{ion}}}{(\text{time} + \text{end-error})} \\ &= \frac{(22.617)(1.03706)(4.878)(.992)(.9995)(1.0025)}{(2 \text{ min} + (-.017))} \\ &= \underline{57.35} \end{aligned}$$

DOSIMETRY SYSTEMS INTERCOMPARISON, pg 2.

$$\begin{aligned} \text{rad/min @ 80} &= R/\text{min@80} \times A_{\text{eq}} \times f_{\text{R-rad}} \times f_{\text{#usc}} \\ \text{in air} &= (57.35) (.989) (.967) (.99) = \underline{54.30} \end{aligned}$$

$$\begin{aligned} \text{rad/min @ 80} &= \text{rad/min@80}(\text{air}) \times 1/r^2 \times \text{BSF} \\ \text{for patient} &= (54.30) (.9875) (1.035) = \boxed{55.497} \end{aligned}$$

Routine dosimetry instrument: Keithley 35060 SN 21341.

10x10 cm field centered on instrument surface at nominal 80cm distance.

I.R.:	initial	0.0	0.0	
	final	<u>109.3</u>	<u>109.5</u>	
	net	109.3	109.5	<u>Avg 109.4</u>

$$\text{Avg net IR} \times \text{T\&p factor} = (109.4) (1.03706) = \underline{113.5}$$

$$\begin{aligned} \text{True output} &= \text{rad/min@80}(\text{patient}) \times (\text{time} + \text{end-error}) \\ &= (55.497) (2\text{mi} + (-.017)) = \underline{110.05} \end{aligned}$$

$$\text{Calibration factor, rad/IR} = \frac{(110.05)}{(113.5)} = \boxed{.969}$$

John F. Agnew
 John F. Agnew, Ph.D.
 Radiation Physicist

1-29-90

Setup 10x10 - ion chamber 1138 Capintec (92A) warmup: 1 hr
 Air T = 24.4
 P = 741.2 - 2.4
 TAP factor = 1.03706
 10x10 at 80cm SSD by pointer & lasers
 electron. mode Hi normal (-) 300V bias. 2 min

IR: $i = +0.2$ $+0.2$ $+0.2$ Avg 22.617 $\frac{1}{2}$ bias $i = +0.2$ $+0.2$
 $f = -22.5$ -22.35 -22.4 $f = -22.3$ -22.3
 net: $\frac{22.7}{22.55}$ $\frac{22.4}{22.6}$ net = 22.5

3 interruptions $i = +0.2$ $+0.2$ $+0.2$ \rightarrow irradiated at $\frac{1}{2}$ bias for 1 min before
 $f = -21.8$ -22.0 -21.7
 net = 22.0 $\frac{22.2}{21.9}$
 $\frac{Q_1}{Q_2} = \frac{22.617}{22.5} = 1.005$

OK 2 min instr leakage - $i = +0.2$; 1 min $i = +0.2$; 2 min $i = +0.2 \rightarrow$ No LEAKAGE $P_{10H} = 1.0025$

Output calc End error = $\frac{22.033 - 22.617}{4(22.617)(22.033)} \times 2 \text{ min} = \frac{-0.0170}{\text{min}}$ OK

$$R/\text{min in air} = \left(\frac{I R}{2 \text{ min} + \alpha}\right) (TAP) (f_{\text{bias}}) (f_{\text{electron}}) (P_{10H}) (A_{10H})$$

$$= \left(\frac{22.617}{2 - 0.0170}\right) (1.03706) \left(\frac{4.878 \times 10^7 \times 992}{41159210}\right) (1.0025) (4495) = 57.35$$

$$\text{rad/min in air} = R/\text{min} \times f_{\text{R}} \times f_{\text{water}} = 57.35 \times 0.989 \times 0.967 \times 0.99 = 54.30$$

$$\text{rad/min @ 80SSD} = \text{rad/min} \times ISL \times BSF = 54.30 \times (9875) \times (1.035) = 55.497$$

Expected output = avg of June + July outputs = $\frac{56.11 + 55.5}{2} = 55.8$ - 0.5% lower OK

26

Pat Keithly 35060 in beam 10x10, 80cm by ODI

2 minutes IR = 109.3 ; 109.7
 Avg 109.5 \xrightarrow{TAP} 113.56
 $T = 24.4$
 $P = 741.2 - 2.4$
 factor = 1.03706

$$\text{Output} = (2 - 0.0170) \times (55.497) = 110.05$$

$$\text{rads/IR} = 110.05 / 113.56 = \underline{0.969}$$

This factor is \downarrow 2% from January, but is mostly consistent w/ readings of last 6 mo at both institutions.

I changed the calibration factor we use for the instr. to 0.969.

ST JOSEPH HOSPITAL
ATTN RADIOLOGY DEPT
700 BROADWAY
FT WAYNE IN 46802

ACCOUNT NO 45828
SERIES CODE RAD

PROCESS NO 04023
REPORT DATE 40690
DOSIMETER RECEIVED 40290
REPORTING PERIOD IN WORK DAYS 4
PAGE NO 1

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RADIATION DOSIMETRY REPORT

Tech/Ops Landauer, Inc.
2 Science Road, Glenwood, Illinois 60425-1588
(312) 755-7100

1 - PR 4357 - 62704

PARTICIPANT ID NUMBER	NAME	SOCIAL SECURITY NUMBER	EXPOSURE TO BATHING	EXPOSURE TO SHOWER	EXPOSURE TO BADGE (MILLIREMS) FOR PERIODS INDICATED BELOW		CURRATIVE TOTALS (MILLIREMS)						GROUP PART OF PERIODS ACCUMULATED OVER PERIODS	BIRTH DATE			NUMBER BADGE REPORTS	RECEPTION DATE OF PERMANENT TOTAL	SEQUENCE NUMBER	REFERENCE NUMBER				
					DEEP	SHALLOW	CALENDAR QUARTER		YEAR TO DATE		PERMANENT			MO	DA	YR					TO DATE	DTR	MO	YR
							1st	2nd	DEEP	SHALLOW	DEEP	SHALLOW												
	FOR EXPOSURE PERIOD 01/10/90 TO 02/09/90				FIRST		1990																	
00RAD	CONTROL		GI		M	M	M	M	M	M	M	M				95	2	385	686	0519541				
00RAD	TLD CONTROL															62	2	385	7093	9248936				
00021	DEARMOND M	308605615	GI		M	M	M	M	M	M	M	7960	8140	F 82040	F 82553	82	1	383	807	0519566				
00021	DEARMOND M	308605615	CGB		M	M	M	M	M	M	M	1820	2080	F 82553	40	11	1086	806	0519567					
00061	STONE KRISTEN	313601995	GI		M	M	M	M	M	M	M	300	310	F 72152	78	1	583	802	0519594					
00061	STONE KRISTEN	313601995	CGB		M	M	M	M	M	M	M	510	620	F 72152	39	11	1086	804	0519595					
00151	EARNST TOM	309748743	UB		M	M	M	M	M	M	M		1180	F 50460	32	1	387	7095	9248939					
00188	BECK LORA	309766263	GI		M	M	M	M	M	M	M	20	20	F 21965	9	1	489	803	0519639					
00188	BECK LORA	309766263	CGB		M	M	M	M	M	M	M	150	190	F 21965	9	1	489	805	0519640					
	FOR EXPOSURE PERIOD 02/10/90 TO 03/09/90				FIRST		1990																	
00002	***** NO CONTROL DOSIMETER OR AN INVALID CONTROL DOSIMETER WAS RETURNED WITH THE FOLLOWING PERSONNEL DOSIMETERS.																							
00002	BAILEY K	312522963	GI		M	M	M	M	M	M	M	5520	5520	F 109480	F 111348	82	2	383	794	6994229				
00003	MILLER M	305368118	GI		M	M	M	M	M	M	M	11460	11470	F 163540	F 51206	82	2	383	818	6994230				
00004	BRUNS J	308445289	GI P		30	30	50	50	50	50	50	15730	15750	F 129270	F 12142	85	2	383	755	6994231				
00004	BRUNS J	308445289	UB			260		350		350		15390	15390	F 112142	85	2	383	7094	9385837					
00006	JOHNSON S	314547076	GI		M	M	M	M	M	M	M	13960	13970	F 81040	F 10152	80	2	383	714	6994232				
00006	JOHNSON S	314547076	CGB		M	M	M	M	M	M	M	30	30	F 10152	39	2	1086	744	6994233					
00007	BROTHMUELLER C		GI		M	M	10	10	10	10	10	6900	6910	F 78100	F 101564	85	2	383	746	6994234				
00007	BROTHMUELLER C		CGB P		40	40	60	60	60	60	60	7680	8730	F 101564	41	2	1086	745	6994235					
00008	BAILEY M	316502929	GI		M	M	M	M	M	M	M	8310	8310	F 111690	F 62047	85	2	383	747	6994236				
00009	EHINGER S	316641095	GI		M	M	M	M	M	M	M	6460	6460	F 68540	F 40156	84	2	383	732	6994237				
00009	EHINGER S	316641095	CGB		M	M	M	M	M	M	M	70	70	F 40156	41	2	1086	692	6994238					
00011	HORSTMAYER G	305586981	GI P		20	20	20	20	20	20	20	4300	4300	F 95700	F 21852	86	2	383	750	6994239				
00012	USRNDRAN P	308540905	GI		M	M	M	M	M	M	M	3190	3190	F 106810	F 50649	85	2	383	723	6994240				
00013	EAGLESON M	306586411	GI		M	M	M	M	M	M	M	2980	2990	F 97020	F 11252	84	2	383	773	6994241				
00013	EAGLESON M	306586411	CGB		M	M	20	20	20	20	20	110	110	F 11252	40	2	1086	737	6994242					

PSC 848-7338 PROCESSED BY ENDATA, INC

1-NO CONTROL 2-RIGHT CHEST 3-OTHER EXTREMITY 4-OTHER WHOLE BODY
5-LEFT CHEST 6-LEFT WRIST 7-OTHER

8-1/2" SHIP ENERGY INDICATED WHEN ONLY LOW ENERGY EXPOSURE IS POSSIBLE. ONLY INDICATE THAT THE PAPER PACKET WAS EXPOSED OUT OF THE 14 NEEDLES.

IMPORTANT: SEE REVERSE SIDE FOR ADDITIONAL EXPLANATIONS

ACCOUNT NO. 45828
SERIES CODE RAD

PROCESS NO. 04023
REPORT DATE 40680
DOSIMETER RECEIVED 40280
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PAGE NO. 3

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Tech/Ops Landauer, Inc.
2 Science Road, Glenwood, Illinois 60425-1586
13121 755-7100

L - PR 4357 - 62704

PARTICIPANT ID NUMBER	NAME	SOCIAL SECURITY NUMBER	EXPOSURE TO BADGE (MILLIREMS) FOR PERIODS INDICATED BELOW	CUMULATIVE TOTALS (MILLIREMS)						UNLADDED PART (% PERMISSIBLE ACCUMULATED DOSE MILLIREMS)	BIRTH DATE	NUMBER OF DOSE REPORTS	RECEPTION DATE OF PERMANENT REPORT	SEQUENCE NUMBER	REFERENCE NUMBER	
				CALENDAR QUARTER		YEAR TO DATE		PERMANENT								
				DEEP	SHALLOW	DEEP	SHALLOW	DEEP	SHALLOW							
FOR EXPOSURE PERIOD 02/10/90 TO 03/05/90				FIRST		1990										
00050	RODY M K	308702912	M	M	M	M	M	M	400	400	F 59600	F 31259	85	2	383	702 6994273
00052	HOAGLAND B	090283130	M	M	30	30	30	30	5940	5980	F 209060	F 21329	86	2	383	820 6994274
00052	HOAGLAND B	090283130	M	M		280		280		14720		F 21329	83	2	383	7097 9385888
00056	KAMMEYER G	314546250	M	M	M	M	M	M	3120	3180	F 116880	F 12848	85	2	383	764 6994275
00056	KAMMEYER G	314546250	M	M	10	10	10	10	360	380		F 12848	41	2	1086	779 6994276
00058	HALABY F	462544943	M	M	50	50	50	50	11330	11510	F 173670	M 10235	85	2	383	721 6994277
00058	HALABY F	462544943	M	M	M	M	M	M	310	320		M 10235	41	2	1086	716 6994278
00059	PHILLIPP STEVEN	303504934	M	M	M	M	M	M	270	310		M 92650	70	2	383	731 6994279
00059	PHILLIPP STEVEN	303504934	M	M	M	M	M	M	M	M		M 92650	40	2	1086	730 6994280
00061	STONE KRISTEN	313601995	M	M	M	M	M	M	300	310		F 72152	79	2	583	821 6994281
00061	STONE KRISTEN	313601995	M	M	M	M	M	M	510	620		F 72152	40	2	1086	822 6994282
00066	SAALFRANK M	311866894	M	M	M	M	M	M	1080	1230	F 28920	F 41365	73	1	883	789 6994283
00066	SAALFRANK M	311866894	M	M	M	M	M	M	450	470		F 41365	38	1	1086	788 6994284
00068	THOMAS MARC	120429787	M	M	M	M	M	M	1400	1500		M 92951	79	2	883	792 6994285
00068	THOMAS MARC	120429787	M	M	M	M	M	M	1980	2070		M 92951	40	2	1086	796 6994286
00069	LINDAHL NAOMI	511561238	M	M	80	80	80	80	120	120		F 80453	72	2	384	776 6994287
00078	SUMNEY CINDY	312681153	M	M	M	M	M	M	100	120		F 10357	61	2	285	770 6994288
00078	SUMNEY CINDY	312681153	M	M	M	M	M	M	80	120		F 10357	41	2	1086	801 6994289
00120	SCHERER KATHY	307508661	M	M	M	M	M	M	20	20		F 32757	60	2	485	748 6994290
00131	KANNING JILL	312868829	M	M	M	M	M	M	130	130		F 111865	55	2	885	783 6994291
00131	KANNING JILL	312868829	M	M	M	M	M	M	260	280		F 111865	41	2	1086	708 6994292
00133	LAND MARY	207809541	M	M	20	20	20	20	340	360		F 50265	54	2	885	762 6994293
00133	LAND MARY	207809541	M	M	20	20	20	20	590	690		F 50265	40	2	1086	760 6994294
00151	EARNEST TOM	309748743	M	M	M	M	M	M	640	650		M 50460	36	2	387	814 6994295
00151	EARNEST TOM	309748743	M	M	M	M	M	M	M	1180		M 50460	33	2	387	7096 9385889
00155	BRANDENBERGER D	307645567	M	M	10	10	10	10	20	50		F 32955	32	2	687	711 6994298
00155	BRANDENBERGER D	307645567	M	M	50	60	50	60	870	970		F 32955	33	2	687	739 6994299
00161	BEARD SHERRY	305888516	M	M	M	M	M	M	30	40		F 61869	31	2	887	756 6994302
00161	BEARD SHERRY	305888516	M	M	20	30	30	30	190	210		F 61869	31	2	887	734 6994303

PSC 88-7338 Processed by ENDATA, INC

1) USE COSE KETUBIN B
2) 1 (WALL) BODY
3) 2 (RIGHT) FACE
4) 3 (LEFT) FACE
5) OTHER (EXTREMITY)
6) OTHER (SHOULDER)
7) OTHER (NECK)
8) OTHER (HAND)
9) OTHER (FOOT)

10) IF THIS REPORT DESIGNATES ONLY ONE EXPOSURE (EXPOSURE IS POSSIBLE), INDICATE THAT THE FACE WAS EXPOSED ON ONE OF THE 14 FACES (1-14)

IMPORTANT: SEE REVERSE SIDE FOR ADDITIONAL EXPLANATIONS

ACCOUNT NO. 45828
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Tech/Ops Landauer, Inc.
 2 Science Road, Glenwood, Illinois 60425-1588
 (312) 755-7000

I - PR 4357 - 2704

PARTICIPANT ID NUMBER	NAME	SOCIAL SECURITY NUMBER	SEX	AGE	RADIATION QUALITY	EXPOSURE TO BADGE (MILLIREMS) FOR PERIOD(S) INDICATED BELOW		CUMULATIVE TOTALS (MILLIREMS)						ADJUSTMENTS	UNRECORDED PART OF ACCUMULATED DOSE (MILLIREMS)	BIRTH DATE	NUMBER BADGE REPORTS	ACCEPTED DATE OF PERM- ANENT TOTAL	HOURS NUMBER	REFERENCE NUMBER		
						CALENDAR QUARTER		YEAR TO DATE		PERMANENT		DEEP	SHALLOW								DEEP	SHALLOW
						DEEP	SHALLOW	DEEP	SHALLOW	DEEP	SHALLOW											
						03/09/90		FIRST		1990												
						02/10/90																
00162	GAGE LINDA	549234044	GI			M	M	M	M	M	M	M	M									
00162	GAGE LINDA	549234044	GB			M	M	M	M	M	M	M	M									
00163	GRUBAUGH DEBORAH	293622402	GI			M	M	M	M	M	M	M	M									
00163	GRUBAUGH DEBORAH	293622402	GB			M	M	M	M	M	M	M	M									
00164	HUBLEY SHANNON	304944853	GI			M	M	M	M	M	M	M	M									
00164	HUBLEY SHANNON	304944853	GB			M	M	M	M	M	M	M	M									
00165	RAUNER SUE	306743300	GI			M	M	M	M	M	M	M	M									
00165	RAUNER SUE	306743300	GB			M	M	M	M	M	M	M	M									
00167	BREHM KAREN	310744435	GI			M	M	M	M	M	M	M	M									
00167	BREHM KAREN	310744435	GB	P		20	20	90	90	90	90	1000	1150									
00170	GRENINGER J	498869236	GI	P		10	10	10	10	10	10	10	10									
00170	GRENINGER J	498869236	GB	P		30	40	50	60	50	60	240	280									
00174	JENKINS AMY	314900560	GI			M	M	M	M	M	M	M	M									
00174	JENKINS AMY	314900560	GB	P		20	20	50	50	50	50	210	230									
00175	HYUNEN DIANE	393524144	GI	P		10	10	20	20	20	20	120	140									
00175	HYUNEN DIANE	393524144	GB	P		20	30	60	70	60	70	190	230									
00177	HOU LIHAN R	525905834	GI			M	M	M	M	M	M	M	M									
00177	HOU LIHAN R	525905834	GB			M	M	M	M	M	M	M	M									
00185	TREGO RICK	295546615	GI			M	M	M	M	M	M	M	M									
00185	TREGO RICK	295546615	GB			M	M	M	M	M	M	M	M									
00186	SCHIEBEL PATTI	307508659	GI			M	M	M	M	M	M	M	M									
00187	PHILLIPS DIANE	36962657	GI	P		20	20	90	110	90	110	200	250									
00187	PHILLIPS DIANE	369626562	GB			M	M	20	30	20	30	170	210									
00188	BECK LORA	309766263	GI			M	M	M	M	M	M	M	M									
00188	BECK LORA	309766263	GB			M	M	M	M	M	M	M	M									
00189	GETTINGER TAMMY	307662445	GI			M	M	M	M	M	M	M	M									
00189	GETTINGER TAMMY	307662445	GB			M	M	20	20	20	20	1370	1530									
00190	MCKINNEY L	316826913	GI			M	M	M	M	M	M	M	M									
00190	MCKINNEY L	316826913	GB			M	M	M	M	M	M	M	M									

PSC 88A-7338 PROCESSING BY ENDDATA, INC.

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AS A HIGH ENERGY ISOTOPES, WHEN ONLY LOW ENERGY
 EXPOSURE IS POSSIBLE, MAY INDICATE THAT THE FAN FOLDED
 WAS EXPOSED OUT OF THE FILTER HOLDER

IMPORTANT: SEE REVERSE SIDE FOR ADDITIONAL EXPLANATIONS

ACCOUNT NO	SERIES CODE
45828	RAD

PROCESS NO	REPORT DATE	DOSIMETER RECEIVED	REPORTING PERIOD IN WORK DAYS	PAGE NO
04023	40680	40290	4	5

QUALITY CONTROL RELEASE
RAH

Landauer

Accredited by the
National Bureau of Standards
through

RADIATION DOSIMETRY REPORT

Tech/Ops Landauer, Inc.
2 Science Road, Glenwood, Illinois 60425-1586
(312) 755-7100

1 - PR 4357 - 62704

PARTICIPANT ID NUMBER	NAME	SOCIAL SECURITY NUMBER	EXPOSURE TO BADGE (MILLIREMS) FOR PERIOD(S) INDICATED BELOW	CUMULATIVE TOTALS (MILLIREMS)						ADJUSTMENT	UNLDED PART OF PERMISSIBLE ACCUMULATED DOSE (MILLIREMS)	BIRTH DATE			RECEPTION DATE OF PERM. IDENT. ICAL			SECURITY NUMBER	REFERENCE NUMBER	
				CALENDAR QUARTER		YEAR TO DATE		PERMANENT				MO	DA	YR	TO DATE	MO	DA			YR
				DEEP	SHALLOW	DEEP	SHALLOW	DEEP	SHALLOW			DEEP	SHALLOW							
			FOR EXPOSURE PERIOD 02/10/90 TO 03/09/90	FIRST		1990														
00191	BRYAN REBECCA	306769765	M	M	M	M	M	M	M	40	40	F	61062	10	27	589	782	6994333		
00191	BRYAN REBECCA	306769765	M	M	M	M	M	M	M	30	30	F	61062	10	27	589	749	5994334		
00192	COLVIN JOHN	314501919	20	20	50	50	50	50	50	190	200	M	30961	9	20	689	763	6994335		
00193	EHRLHARDT LORI	314809428	M	M	M	M	M	M	M	40	40	F	61163	9	20	689	784	6994336		
00204	BERGER SHARON	292603001	M	M	M	M	M	M	M	10	10	F	10666	9	20	689	759	6994337		
00204	BERGER SHARON	292603001	40	50	60	70	60	70	70	210	240	F	10666	9	20	689	690	6994338		
00205	FONNER TERRY	316822506	M	M	M	M	M	M	M	M	M	F	113064	9	20	689	720	6994339		
00205	FONNER TERRY	316822506	M	M	40	50	40	50	50	630	730	M	113064	9	20	689	719	6994340		
00206	DALY DIANE	310581607	M	M	M	M	M	M	M	80	80	F	31958	8	20	789	774	6994341		
00206	DALY DIANE	310581607	10	20	40	50	40	50	50	180	220	F	31958	8	20	789	693	6994342		
00207	VANDEMAN FRED	530362011	M	M	M	M	M	M	M	50	50	M	92050	8	20	789	696	6994343		
00207	VANDEMAN FRED	530362011	M	M	M	M	M	M	M	M	M	M	92050	8	20	789	771	6994344		
00208	DESCOTEAUX G	534982013	M	M	M	M	M	M	M	10	10	M	12570	7	20	889	742	6994345		
00208	DESCOTEAUX G	534982013	M	M	10	20	10	20	50	60	60	M	12570	7	20	889	743	6994346		
00209	HERZ KATHRYN	304760120	M	M	M	M	M	M	M	M	M	F	70665	7	20	889	825	6994347		
00209	HERZ KATHRYN	304760120	M	M	20	30	20	30	50	60	60	F	70665	7	20	889	824	6994348		
00210	TEEPLE CHARLOTTE	304760807	M	M	M	M	M	M	M	M	M	F	32871	7	20	889	810	6994349		
00210	TEEPLE CHARLOTTE	304760807	20	30	30	50	30	50	90	120	120	F	32871	7	20	889	768	6994350		
00211	ZAVALA CHERYL	308760250	M	M	M	M	M	M	M	M	M	F	22159	7	20	889	707	6994351		
00211	ZAVALA CHERYL	308760250	M	M	M	M	M	M	M	20	20	F	22159	7	20	889	706	6994352		
00212	GALLOWAY AMY	306887916	M	M	M	M	M	M	M	10	10	F	51366	7	20	889	826	6994353		
00212	GALLOWAY AMY	306887916	M	M	M	M	M	M	M	10	10	F	51366	6	20	889	817	6994354		
00213	ANGSTROM WANDA	303582947	M	M	M	M	M	M	M	M	M	F	110256	7	20	889	827	6994355		
00213	ANGSTROM WANDA	303582947	M	M	10	20	10	20	30	40	40	F	110256	7	20	889	698	6994356		
00215	EVINGER GALE	303662893	M	M	M	M	M	M	M	M	M	F	100955	6	20	989	710	6994357		
00215	EVINGER GALE	303662893	M	M	50	50	50	50	90	90	90	F	100955	6	20	989	688	6994358		
00216	TOMLINSON GREG	154386495	M	M	M	M	M	M	M	M	M	M	72549	6	20	989	786	6994359		
00216	TOMLINSON GREG	154386495	M	M	30	30	30	30	60	60	60	M	72549	6	20	989	738	6994360		
00217	COBURN LARRY	367761758	M	M	M	M	M	M	M	M	M	M	42165	3	20	189	757	6994361		

PSC 788-7338 Processed by ENDA DATA, INC

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IMPORTANT: SEE REVERSE SIDE FOR ADDITIONAL EXPLANATIONS

ACCOUNT NO 45828 RAD

PROCESS NO 04023
 REPORT DATE 40690
 ORDER RECEIVED DATE 40290
 ORDER NO 4
 PAGE NO 6

QUALITY CONTROL R149
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RADIATION DOSIMETRY REPORT

Accredited by the
 National Bureau of Standards
 through

Tech/Dos Landauer, Inc.
 2 Science Road, Greenwood, Mass 01925-1586
 (508) 752-7100

PR 4357 - 62704

PARTICIPANT ID NUMBER	NAME	SOCIAL SECURITY NUMBER	EXPOSURE TO BADGE (MILLIREMS) FOR PERIODS INDICATED BELOW	CALENDAR QUARTER		CUMULATIVE TOTALS (MILLIREMS)		PERMANENT	EXPOSURE TO BADGE (MILLIREMS) FOR PERIODS INDICATED BELOW	BIRTH DATE	NUMBER OF REPORTS	DATE OF FINAL REPORT	REFERENCE NUMBER
				DEEP	SHALLOW	DEEP	SHALLOW						
00218	HARRISON KEVIN	308862159	03/09/90	H	H	1990	H	H	H	4/21/89	4	21/89	761 6994 362
00219	HARRISON KEVIN	308862159		H	H		H	30	H	4/21/89	4	21/89	761 6994 362
00219	LOBACZ JILL	311648117		H	H		H	30	H	4/21/89	3	21/89	689 6994 364
00219	LOBACZ JILL	311648117		H	H		H	10	H	4/21/89	3	21/89	687 6994 365
00220	SANDERS MARI	311820418		H	H		H	10	H	5/10/83	3	21/89	753 6994 366
00220	SANDERS MARI	311820418		H	H		H	30	H	5/10/83	3	21/89	751 6994 367

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