JUN 12 1996 <i>Sta. 21 (20)</i>	ENGINEERING DATA TRANSMITTAL	Page 1 of <u>1</u> 1. EDT 616553
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2. To: (Receiving Organization) Solid Waste Engineering	3. From: (Originating Organization) Criticality and Shielding	4. Related EDT No.: 616553
5. Proj./Prog./Dept./Div.: W-151	6. Cog. Engr.: S. F. Kessler	7. Purchase Order No.: NA
8. Originator Remarks: This work was done to support the removal of long length equipment from T101-AZ		9. Equip./Component No.: NA
11. Receiver Remarks:		10. System/Bldg./Facility:
		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date:

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-W151-CN-001		0	Radioisotope Inventory of the T101AZ Thermocouple Tree from Riser 13D	N/A	3	1	

16. KEY					
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)			
E, S, O, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment	4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged	

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
(G)	(H)	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Cog.Eng. S. F. Kessler	<i>[Signature]</i>	6/10/96					
1	1	Cog. Mgr. J. Greenberg	<i>[Signature]</i>	6/10/96					
		QA							
		Safety							
		Env.							

18. S. F. Kessler <i>[Signature]</i> 6/10/96 Signature of EDT Originator Date	19. _____ Authorized Representative Date for Receiving Organization	20. J. Greenberg <i>[Signature]</i> 6/10/96 Cognizant Manager Date	21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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Radioisotope Inventory of the T101AZ Thermocouple Tree from Riser 13D

S. F. Kessler

Westinghouse Hanford Company, Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-87RL10930

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Key Words: Thermocouple tree, T-101AZ, Long Length Contaminated Equipment, LLCE

Abstract: The radionuclide inventory for the thermocouple tree removed from tank T101-AZ riser 13D was estimated using measured ^{137}Cs activity. This activity was measured by detectors as the tree was removed from the tank. Other radionuclide activities were estimated using the results of tank samples.

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Release Approval

Date

Jamie Bishop 6-12-96

Release Stamp

Approved for Public Release

CHECKLIST FOR INDEPENDENT TECHNICAL REVIEW

DOCUMENT REVIEWED WHC-SD-W151-CN-001 RADIOISOTOPE ACTIVITY FOR THE T101A2
THERMOCOUPLE TREE REMOVED FROM RISER 13D
AUTHOR(s) S. F. Kessler

I. Method(s) of Review

- ☒ Input data checked for accuracy
- ☒ Independent calculation performed
 - ☒ Hand calculation
 - ☐ Alternate computer code: _____
- ☐ Comparison to experiment or previous results
- ☐ Alternate method (define) _____

II. Checklist (either check or enter NA if not applied)

- ☒ Task completely defined
- ☒ Activity consistent with task specification
- ☒ Necessary assumptions explicitly stated and supported
- ☒ Resources properly identified and referenced
- ☒ Resource documentation appropriate for this application
- ☒ Input data explicitly stated
- ☒ Input data verified to be consistent with original source
- ☒ Geometric model adequate representation of actual geometry
- ☒ Material properties appropriate and reasonable
- ☒ Mathematical derivations checked including dimensional consistency
- ☒ Hand calculations checked for errors
- ☒ Assumptions explicitly stated and justified
- ☒ Computer software appropriate for task and used within range of validity
- ☒ Use of resource outside range of established validity is justified
- ☒ Software runstreams correct and consistent with results
- ☒ Software output consistent with input
- ☒ Results consistent with applicable previous experimental or analytical findings
- ☒ Results and conclusions address all points and are consistent with task requirements and/or established limits or criteria
- ☒ Conclusions consistent with analytical results and established limits
- ☒ Uncertainty assesment appropriate and reasonable
- ☐ Other (define) _____

III. Comments:

A spreadsheet was used for these calculations. Input
was checked. Random hand-calculations were made to verify spreadsheet calcs.

IV. REVIEWER: R.F. Richard DATE: June 3, 1996

RADIOISOTOPE INVENTORY OF THE T101AZ THERMOCOUPLE TREE FROM RISER 13D

1.0 PURPOSE

The purpose of this calculation is to estimate the radionuclide inventory on the profile thermocouple tree removed from riser 13D on T101AZ. These data are used by Solid Waste Engineering to classify the thermocouple tree for disposal.

2.0 METHODOLOGY

Data are collected by the Flexible Receiver Detection System (FRRDS) as the thermocouple tree is removed from the tank and transmitted to "Criticality and Shielding".

Crane position and ^{137}Cs contamination levels are input to a WINGZ[™] spreadsheet to correct for geometry, calibration, create graphs for all three detectors and to calculate the inventory of the isotopes on the thermocouple tree. Results of tank waste samples have been used to calculate the ratio of each isotope with respect to ^{137}Cs for the liquid phase and sludge phase of material in the tank. A set of average ratios has also been calculated and are used to compare to the sludge and liquid phases.

Because the thermocouple tree is washed as it is removed to lower contamination levels, it may partially reinserted and removed several times for rewashing. When this happens, the activity recorded after the final wash is used to calculate the inventory.

The data are also averaged over all operable detectors.

3.0 ASSUMPTIONS

- 3.1 Because ^{137}Cs is soluble in water, it may be detected along the length of the thermocouple tree that has been in both the liquid or the sludge.
- 3.2 The liquid waste is not stratified and the ratio's of radionuclides to ^{137}Cs is constant.
- 3.3 The radionuclide distribution in the saltcake buildup on spacers or between profile thermocouple tubes is identical to that of the liquid.
- 3.4 The counting intervals of 1 minute represent 30.48 cm (1ft) of thermocouple tree movement.

4.0 INPUT DATA

Input data are provided by Radioanalytical chemistry² as shown in Table 4.1.

[™] Wingz is a trademark of Informix Software, Inc.

TABLE 4.1: DETECTOR INPUT DATA

Detector A1			Crane			Nuclide	Activity	Error
Spectrum	Count	Start Time	Date	Time	Position			
A1650807360	50896	07:36:17	60.	8-MAY-1996	7:37:17	-893.		
					55CS 137	-3.798E-02	77.3%	
A1650807370	50896	07:37:24	60.	8-MAY-1996	7:38:26	-1954.		
					55CS 137	-1.149E-01	22.6%	
A1650807380	50896	07:38:32	60.	8-MAY-1996	7:39:32	-3031.		
					27CO 57	2.316E-02	72.2%	
					55CS 137	-5.836E-02	73.5%	
A1650807390	50896	07:39:34	60.	8-MAY-1996	7:40:35	-4057.		
					55CS 137	-7.597E-02	45.5%	
A1650807400	50896	07:40:37	60.	8-MAY-1996	7:41:38	-5079.		
					55CS 137	-1.165E-01	19.7%	
A1650807420	50896	07:42:00	60.	8-MAY-1996	7:43:02	-6087.		
					11NA 22	-2.495E-03	546.7%	
					55CS 137	-1.077E-01	26.5%	
					63EU 154	-7.025E-03	546.7%	
A1650807440	50896	07:44:15	60.	8-MAY-1996	7:45:15	-6087.		
					11NA 22	-1.016E-02	132.0%	
					63EU 154	-2.860E-02	132.0%	
A1650807450	50896	07:45:22	60.	8-MAY-1996	7:46:22	-6087.		
					45RHM 105	2.457E-01	29.5%	
					55CS 137	-8.667E-02	35.6%	
A1650808000	50896	08:00:33	60.	8-MAY-1996	8:01:34	-7817.		
					55CS 137	-1.070E-01	23.8%	
					82PB 210	1.908E-04	50.5%	
A1650808010	50896	08:01:40	60.	8-MAY-1996	8:02:43	-7817.		
					55CS 137	-1.286E-01	20.2%	
A1650808020	50896	08:02:48	60.	8-MAY-1996	8:03:49	-7817.		
					55CS 137	-1.115E-01	28.7%	
A1650808140	50896	08:14:32	60.	8-MAY-1996	8:15:34	-10940.		
					55CS 137	1.148E+02	0.5%	
					54XE 139	4.880E-01	26.6%	
A1650808150	50896	08:15:41	60.	8-MAY-1996	8:16:43	11187.		
					55CS 137	2.112E+01	1.4%	
A1650808160	50896	08:16:49	60.	8-MAY-1996	8:17:49	-11187.		
					11NA 22	3.038E-02	48.1%	
					55CS 137	2.153E+01	1.6%	
					63EU 154	8.554E-02	48.1%	
A1650808170	50896	08:17:57	60.	8-MAY-1996	8:18:58	-11187.		
					11NA 22	2.137E-02	103.2%	
					55CS 137	2.127E+01	1.6%	
					63EU 154	6.017E-02	103.2%	
A1650808180	50896	08:18:05	60.	8-MAY-1996	8:20:07	-11187.		
					55CS 137	2.074E+01	2.2%	
A1650808200	50896	08:20:12	60.	8-MAY-1996	8:21:13	-11187.		
					55CS 137	2.132E+01	1.6%	
A1650808210	50896	08:21:21	60.	8-MAY-1996	8:22:22	-11187.		
					11NA 22	3.245E-04	4905.1%	
					55CS 137	2.223E+01	1.1%	
					63EU 154	9.138E-04	4905.1%	
A1650808220	50896	08:22:25	60.	8-MAY-1996	8:23:28	-11187.		
					55CS 137	2.139E+01	1.8%	
A1650808230	50896	08:23:30	60.	8-MAY-1996	8:24:31	-11187.		
					55CS 137	2.181E+01	1.1%	
A1650808240	50896	08:24:35	60.	8-MAY-1996	8:25:36	-11187.		
					55CS 137	2.129E+01	1.2%	
A1650808250	50896	08:25:40	60.	8-MAY-1996	8:26:42	-11187.		
					55CS 137	2.166E+01	1.2%	
A1650808260	50896	08:26:45	60.	8-MAY-1996	8:27:46	-11187.		
					40ZR 95	2.549E-02	67.5%	
					55CS 137	2.198E+01	1.9%	
A1650808300	50896	08:30:51	60.	8-MAY-1996	8:31:52	-11930.		

			11NA 22 6.467E-03 217.3%
			55CS 137 2.593E+01 1.9%
			63EU 154 1.821E-02 217.3%
A1650808310	50896 08:31:58	60. 8-MAY-1996 8:32:58	-13011.
			53I 128 9.377E-01 25.4%
			55CS 137 4.471E+01 0.9%
			90THTH232 3.043E+01 21.1%
A1650808330	50896 08:33:06	60. 8-MAY-1996 8:34:07	-14135.
			11NA 22 4.708E-02 42.1%
			55CS 137 3.724E+01 0.9%
			63EU 154 1.326E-01 42.1%
A1650808340	50896 08:34:08	60. 8-MAY-1996 8:35:10	-15162.
			11NA 22 2.057E-02 82.3%
			55CS 137 1.558E+01 1.3%
			63EU 154 5.791E-02 82.3%
A1650808350	50896 08:35:10	60. 8-MAY-1996 8:36:10	-16141.
			11NA 22 -3.367E-03 443.5%
			55CS 137 9.172E+00 1.8%
			63EU 154 -9.481E-03 443.5%
			69TM 170 3.023E+00 27.9%
			90TH 228 8.065E+00 27.9%
			90THTH232 8.065E+00 27.9%
A1650808360	50896 08:36:33	60. 8-MAY-1996 8:37:34	-17509.
			55CS 137 3.529E+01 1.2%
A1650808370	50896 08:37:40	60. 8-MAY-1996 8:38:40	-17754.
			55CS 137 5.608E+01 1.0%
A1650808380	50896 08:38:41	60. 8-MAY-1996 8:39:43	-17784.
			11NA 22 1.464E-02 104.3%
			27CO 60 1.830E-02 49.9%
			55CS 137 5.398E+01 1.0%
			63EU 154 4.121E-02 104.3%
A1650808410	50896 08:41:22	60. 8-MAY-1996 8:42:22	-18876.
			55CS 137 4.973E+01 0.8%
A1650808420	50896 08:42:30	60. 8-MAY-1996 8:43:31	-19998.
			55CS 137 4.928E+01 0.8%
			90THTH232 2.595E+01 16.2%
A1650808430	50896 08:43:36	60. 8-MAY-1996 8:44:37	-21082.
			55CS 137 6.820E+01 0.7%
A1650808440	50896 08:44:45	60. 8-MAY-1996 8:45:46	-22203.
			11NA 22 2.019E-02 97.4%
			55CS 137 9.692E+01 0.6%
			63EU 154 5.685E-02 97.4%
A1650808450	50896 08:45:54	60. 8-MAY-1996 8:46:55	-23333.
			55CS 137 2.032E+02 0.6%
A1650808470	50896 08:47:00	60. 8-MAY-1996 8:48:01	-24405.
			28NI 65 5.297E-01 42.9%
			55CS 137 7.847E+02 0.7%
			55CS 138 2.018E-01 51.5%
A1650808480	50896 08:48:07	60. 8-MAY-1996 8:49:07	-25489.
			55CS 134 3.287E+00 25.2%
			55CS 137 1.820E+03 1.0%
			69TM 170 3.811E+02 6.4%
			90TH 228 1.017E+03 6.4%
			90THTH232 1.017E+03 6.4%
A1650808500	50896 08:50:22	60. 8-MAY-1996 8:51:23	-27700.
			55CS 137 2.059E+03 1.8%
			90THTH232 1.281E+03 8.6%
A1650808510	50896 08:51:30	60. 8-MAY-1996 8:52:30	-28795.
			55CS 137 1.189E+03 0.5%
A1650808520	50896 08:52:37	80. 8-MAY-1996 8:53:39	-29924.
			13AL 28 2.249E-01 60.3%
			53I 134 1.972E+00 80.5%
			55CS 137 1.442E+03 0.8%
			69TM 170 3.957E+02 6.4%
			90TH 228 8.955E+02 6.4%
			90THTH232 8.955E+02 6.4%

A1650808530	50896 08:53:43	60.	8-MAY-1996 8:54:45	-30998.	
			11NA	22	6.501E+00 21.8%
			55CS	137	2.005E+03 1.1%
			63EU	154	1.831E+01 21.8%
			69TM	170	6.887E+02 7.5%
			90TH	228	1.837E+03 7.5%
			90THTH232		1.837E+03 7.5%
A1650808590	50896 08:58:03	60.	8-MAY-1996 8:59:03	-30030.	
			27CO	60	2.554E+00 48.2%
			55CS	137	1.863E+03 1.5%
			69TM	170	7.115E+02 7.4%
			90TH	228	1.898E+03 7.4%
			90THTH232		1.898E+03 7.4%
A1650808590	50896 08:58:19	60.	8-MAY-1996 9:00:21	-29472.	
			55CS	137	1.559E+03 0.7%
			90TH	228	1.096E+03 5.2%
			90THTH232		1.096E+03 5.2%
A1650809000	50896 09:00:26	60.	8-MAY-1996 9:01:27	-30542.	
			27CO	56	1.692E+00 63.7%
			41NB	95	2.176E+00 56.1%
			51SB	125	1.302E+01 22.8%
			55CS	137	1.701E+03 1.0%
			69TM	170	5.728E+02 6.0%
			90TH	228	1.528E+03 6.0%
			90THTH232		1.528E+03 6.0%
A1650809110	50896 09:11:47	60.	8-MAY-1996 9:12:48	-38322.	
			11NA	22	6.491E+00 41.5%
			37RB	89	7.007E+00 40.5%
			45RH	106	1.872E+02 16.4%
			51SB	122	1.023E+01 38.1%
			51SB	125	1.832E+01 13.7%
			55CS	137	1.674E+03 1.8%
			63EU	154	1.546E+01 41.5%
			69TM	170	1.003E+03 11.5%
			90TH	228	2.676E+03 11.5%
			90THTH232		2.676E+03 11.5%
A1650809120	50896 09:12:56	60.	8-MAY-1996 9:13:57	-39527.	
			11NA	22	8.472E+00 14.5%
			27CO	60	7.480E+00 11.2%
			45RH	106	2.145E+02 7.8%
			47AGM	108	8.967E+00 21.0%
			51SB	125	6.854E+01 8.5%
			55CS	137	1.350E+03 2.1%
			63EU	154	2.456E+01 12.6%
			69TM	170	8.314E+02 5.8%
			90TH	228	2.219E+03 5.8%
			90THTH232		2.219E+03 5.8%
A1650809140	50896 09:14:04	60.	8-MAY-1996 9:15:06	-40737.	
			11NA	22	6.746E+00 25.7%
			23V	52	3.027E+00 56.2%
			27CO	57	7.951E+00 22.5%
			27CO	60	4.364E+00 58.9%
			36KRM	85	4.767E+00 56.0%
			39Y	91	2.478E+03 33.0%
			45RH	106	1.952E+02 14.0%
			51SB	125	8.264E+01 10.8%
			55CS	137	1.709E+03 2.9%
			63EU	154	1.899E+01 25.7%
			69TM	170	7.586E+02 11.2%
			90TH	228	2.024E+03 11.2%
			90THTH232		2.024E+03 11.2%
A1650809150	50896 09:15:11	60.	8-MAY-1996 9:16:12	-41889.	
			23V	52	1.813E+00 112.4%
			27CO	60	2.649E+00 95.5%
			30ZN	65	9.899E+00 40.6%
			38SR	92	4.341E+00 58.8%

			45RH 106 2.620E+02 16.5%
			51SB 125 7.470E+01 16.8%
			55CS 137 1.609E+03 1.4%
			59PRM 144 9.239E+03 43.7%
			69TM 170 9.687E+02 9.2%
			90TH 228 2.584E+03 9.2%
			90THTH232 2.584E+03 9.2%
			95AM 241 1.935E+01 43.7%
A1650809170	50896 09:17:15	60. 8-MAY-1996 9:18:15	-44038.
			12MG 27 1.102E+01 52.2%
			27CO 60 4.880E+00 48.3%
			40ZR 95 1.315E+01 69.6%
			45RH 106 3.267E+02 17.8%
			51SB 125 5.066E+01 24.8%
			55CS 134 1.452E+01 56.2%
			55CS 137 1.237E+03 1.7%
			69TM 170 1.145E+03 11.8%
			90TH 228 3.055E+03 11.8%
			90THTH232 3.055E+03 11.8%
A1650809190	50896 09:19:43	60. 8-MAY-1996 9:20:45	-43328.
			11NA 22 5.669E+00 70.3%
			44RU 105 2.118E+01 68.0%
			45RH 106 2.188E+02 19.1%
			48CDM 115 3.004E+02 77.5%
			51SB 125 6.921E+01 17.0%
			55CS 134 9.286E+00 55.5%
			55CS 137 1.231E+03 2.2%
			63EU 154 1.596E+01 70.3%
			69TM 170 9.804E+02 8.1%
			90TH 228 2.616E+03 8.1%
			90THTH232 2.616E+03 8.1%
			94PU 240 2.577E+00 65.7%
A1650809200	50896 09:20:52	60. 8-MAY-1996 9:21:54	-42154.
			45RH 106 1.541E+02 22.4%
			54XE 135 4.273E+00 68.9%
			55CS 137 1.490E+03 1.4%
			69TM 170 1.086E+03 11.5%
			90TH 228 2.897E+03 11.5%
			90THTH232 2.897E+03 11.5%
			94PU 239 2.562E+05 123.7%
A1650809210	50896 09:21:59	60. 8-MAY-1996 9:23:00	-42506.
			45RH 106 2.159E+02 17.4%
			51SB 125 5.925E+01 16.9%
			55CS 137 1.473E+03 2.8%
			58CE 141 9.825E+00 54.0%
			69TM 170 1.075E+03 7.9%
			90TH 228 2.869E+03 7.9%
			90THTH232 2.869E+03 7.9%
A1650809230	50896 09:23:05	60. 8-MAY-1996 9:24:06	-43663.
			18AR 41 1.518E+01 168.9%
			27CO 60 5.886E+00 42.1%
			40ZR 97 2.335E+02 47.5%
			45RH 106 1.509E+02 21.6%
			49INM 116 1.790E+01 168.9%
			51SB 125 8.791E+01 11.6%
			55CS 137 1.379E+03 1.5%
			64GD 153 2.053E+01 54.8%
			69TM 170 1.279E+03 13.0%
			90TH 228 3.413E+03 13.0%
			90THTH232 3.413E+03 13.0%
A1650809240	50896 09:24:11	60. 8-MAY-1996 9:25:12	-44812.
			38SR 85 2.857E-01 957.2%
			36KR 85 6.535E+01 957.2%
			51SB 125 5.154E+01 20.1%
			55CS 137 1.200E+03 2.0%
			69TM 170 1.170E+03 8.6%

			90TH 228 3.122E+03 8.6%
			90THTH232 3.122E+03 8.6%
A1650809280	50896 09:28:44	60. 8-MAY-1996 9:29:45	-43240.
			27CO 60 7.852E+00 26.2%
			42MO 101 1.623E+01 148.8%
			45RH 106 2.575E+02 11.9%
			51SB 125 7.237E+01 12.0%
			52TEM 127 1.106E+03 56.6%
			55CS 137 1.099E+03 1.8%
			57LA 140 2.199E+00 61.8%
			69TM 170 9.040E+02 11.9%
			72HF 175 6.531E+00 45.5%
			90TH 228 2.412E+03 11.9%
			92U 232 2.813E+03 56.6%
			90THTH232 2.412E+03 11.9%
A1650809290	50896 09:29:51	60. 8-MAY-1996 9:30:52	-42277.
			14SI 31 9.785E+03 44.5%
			45RH 106 2.434E+02 16.1%
			51SB 125 1.000E+02 16.6%
			55CS 137 1.501E+03 2.2%
			69TM 170 1.087E+03 10.0%
			83BI 214 1.862E+01 68.8%
			88RAB1226 1.830E+01 68.8%
			90TH 228 2.900E+03 10.0%
			90THTH232 2.900E+03 10.0%
A1650809330	50896 09:33:15	60. 8-MAY-1996 9:34:16	-44478.
			36KR 85 3.321E+03 30.7%
			38SR 85 1.451E+01 30.7%
			45RH 106 1.653E+02 23.3%
			51SB 125 8.174E+01 15.8%
			55CS 137 1.266E+03 1.2%
			69TM 170 1.298E+03 12.2%
			90TH 228 3.462E+03 12.2%
			90THTH232 3.462E+03 12.2%
A1650809440	50896 09:44:42	60. 8-MAY-1996 9:45:43	-44377.
			36SR 85 8.796E+00 39.9%
			38KR 85 2.012E+03 39.9%
			51SB 125 7.137E+01 17.3%
			53I 130 8.328E+00 55.9%
			55CS 137 1.237E+03 1.6%
			56BA 140 3.440E+01 55.9%
			69TM 170 1.232E+03 9.4%
			83BI 212 7.229E+01 91.6%
			90TH 228 3.286E+03 9.4%
			90THTH232 3.286E+03 9.4%
			90THBI232 7.229E+01 91.6%
A1650810010	50896 10:01:03	60. 8-MAY-1996 10:02:05	-54000.
			22TI 51 7.066E+00 31.9%
			37RB 86 4.132E+01 49.3%
			45RH 105 3.249E+01 31.9%
			45RH 106 9.883E+01 20.2%
			52TE 127 8.141E+02 31.7%
			55CS 137 9.391E+01 19.7%
			69TM 170 1.157E+03 7.1%
			90TH 228 3.088E+03 7.1%
			90THTH232 3.088E+03 7.1%
A1650810020	50896 10:02:10	60. 8-MAY-1996 10:03:11	-55294.
			13AL 28 6.399E+00 36.5%
			39YM 90 6.078E+00 73.0%
			51SB 125 5.335E+01 30.9%
			55CS 137 9.917E+02 2.4%
			69TM 170 1.412E+03 10.5%
			90TH 228 3.766E+03 10.5%
			90THTH232 3.766E+03 10.5%
A1650810040	50896 10:04:22	60. 8-MAY-1996 10:05:23	-57598.
			45RH 106 2.254E+02 7.7%

				51SB 125	4.250E+01	13.7%
				55CS 137	1.110E+03	1.9%
				69TM 170	9.931E+02	5.2%
				90TH 228	2.649E+03	5.2%
				90THTH232	2.649E+03	5.2%
A1650810050	50896 10:05:31	60.	8-MAY-1996 10:06:33	-57854.		
				45RH 106	1.796E+02	9.3%
				51SB 125	4.441E+01	12.4%
				53I 131	3.592E+00	56.2%
				55CS 137	9.841E+02	1.5%
				54XE 139	7.816E+00	55.6%
				69TM 170	1.054E+03	4.9%
				90TH 228	2.811E+03	4.9%
				90THTH232	2.811E+03	4.9%
A1650810060	50896 10:06:39	60.	8-MAY-1996 10:07:39	-57854.		
				11NA 22	3.446E+00	25.3%
				29CU 66	3.291E+01	44.6%
				36KR 85	8.895E+02	30.1%
				38SR 85	3.888E+00	30.1%
				45RH 106	1.624E+02	10.1%
				51SB 125	3.923E+01	14.5%
				55CS 137	9.183E+02	1.5%
				55CS 138	6.206E-01	120.5%
				63EU 154	1.006E+01	24.2%
				69TM 170	1.004E+03	4.6%
				90TH 228	2.679E+03	4.6%
				90THTH232	2.679E+03	4.6%
				91PA 234	3.074E+02	55.2%
A1650810070	50896 10:07:49	60.	8-MAY-1996 10:08:51	-57854.		
				27CO 60	2.562E+00	27.3%
				45RH 106	1.796E+02	9.3%
				51SB 125	3.753E+01	11.4%
				55CS 137	9.906E+02	2.0%
				69TM 170	1.152E+03	6.4%
				90TH 228	3.073E+03	6.4%
				90THTH232	3.073E+03	6.4%
A1650810100	50896 10:10:05	60.	8-MAY-1996 10:11:06	-56708.		
				27CO 60	2.717E+00	24.7%
				45RH 106	1.909E+02	10.0%
				51SB 125	4.611E+01	11.9%
				55CS 137	9.901E+02	1.2%
				69TM 170	9.446E+02	4.5%
				90TH 228	2.520E+03	4.5%
				90THTH232	2.520E+03	4.5%
A1650810130	50896 10:13:28	60.	8-MAY-1996 10:14:30	-56345.		
				29CU 66	5.113E+01	51.4%
				45RH 106	1.710E+02	18.2%
				51SB 125	2.526E+01	22.1%
				55CS 137	1.069E+03	1.5%
				69TM 170	1.111E+03	5.7%
				90TH 228	2.965E+03	5.7%
				90THTH232	2.965E+03	5.7%
A1650810140	50896 10:14:32	60.	8-MAY-1996 10:15:33	-57455.		
				40ZR 95	4.551E+00	61.0%
				45RH 106	2.195E+02	7.3%
				51SB 125	3.717E+01	11.2%
				55CS 137	1.044E+03	2.1%
				69TM 170	8.657E+02	5.1%
				90TH 228	2.310E+03	5.1%
				90THTH232	2.310E+03	5.1%
A1650810150	50896 10:15:36	60.	8-MAY-1996 10:16:36	-58547.		
				11NA 22	2.498E+00	23.4%
				27CO 60	2.231E+00	23.5%
				55CS 137	7.976E+02	1.5%
				63EU 154	7.038E+00	23.4%
				69TM 170	8.841E+02	4.7%

			90TH 228	2.359E+03	4.7%
			90THTH232	2.359E+03	4.7%
A1650810170	50896 10:17:02	60.	8-MAY-1996 10:18:04	-60085.	
			47AGM 108	1.411E+01	39.5%
			53I 135	1.822E+01	63.4%
			69TM 170	1.621E+03	7.2%
			90TH 228	4.324E+03	7.2%
			90THTH232	4.324E+03	7.2%

Detector A2

A2650808450	50896 08:45:54	60.	8-MAY-1996 8:46:55 -23333. 55CS 137 3.658E+00	35.8%
A2650808470	50896 08:47:00	60.	8-MAY-1996 8:48:01 -24405. 55CS 137 1.047E+01	16.9%
A2650808480	50896 08:48:07	60.	8-MAY-1996 8:49:07 -25489. 55CS 137 3.243E+01	12.6%
A2650808490	50896 08:49:15	60.	8-MAY-1996 8:50:17 -26627. 51SB 126 4.604E+00 55CS 137 5.998E+01	29.8% 9.5%
A2650808500	50896 08:50:22	60.	8-MAY-1996 8:51:23 -27700. 55CS 137 4.838E+01	10.6%
A2650808510	50896 08:51:30	60.	8-MAY-1996 8:52:30 -28795. 55CS 137 2.051E+01	16.6%
A2650808520	50896 08:52:37	60.	8-MAY-1996 8:53:39 -29924. 55CS 137 3.170E+01	12.8%
A2650808530	50896 08:53:43	60.	8-MAY-1996 8:54:45 -30998. 11NA 22 2.758E+00 27CO 60 6.688E-01 55CS 137 5.504E+01 63EU 154 7.765E+00	18.1% 45.5% 10.7% 18.1%
A2650808550	50896 08:55:55	60.	8-MAY-1996 8:56:57 -31930. 11NA 22 5.087E+01 27CO 60 2.360E+01 55CS 137 1.792E+02 57LA 140 3.188E+00 63EU 154 1.436E+02	4.2% 6.1% 9.3% 17.3% 4.1%
A2650808570	50896 08:57:01	60.	8-MAY-1996 8:58:03 -30879. 11NA 22 2.082E+01 27CO 60 6.566E+00 55CS 137 8.820E+01 57LA 140 9.685E-01 63EU 154 5.848E+01	6.5% 9.9% 8.3% 32.8% 6.4%
A2650808580	50896 08:58:06	60.	8-MAY-1996 8:59:06 -30079. 11NA 22 2.196E+00 27CO 60 7.902E-01 55CS 137 5.276E+01 63EU 154 6.183E+00	23.2% 40.3% 10.0% 23.2%
A2650808590	50896 08:59:19	60.	8-MAY-1996 9:00:21 -29472. 55CS 137 3.746E+01	11.6%
A2650809000	50896 09:00:26	60.	8-MAY-1996 9:01:27 -30542. 11NA 22 1.719E+00 55CS 137 3.976E+01 63EU 154 4.841E+00	25.1% 11.9% 25.1%
A2650809010	50896 09:01:32	60.	8-MAY-1996 9:02:33 -31620. 11NA 22 1.091E+01 27CO 60 4.530E+00 55CS 137 8.148E+01 63EU 154 3.072E+01	8.8% 12.1% 8.2% 8.8%
A2650809020	50896 09:02:40	60.	8-MAY-1996 9:03:42 -32729. 11NA 22 4.871E+01 27CO 60 1.823E+01 55CS 137 1.688E+02 57LA 140 3.394E+00 63EU 154 1.350E+02	4.3% 5.5% 6.2% 25.0% 4.2%
A2650809030	50896 09:03:49	60.	8-MAY-1996 9:04:51 -33860. 11NA 22 2.268E+02 27CO 60 7.675E+01 55CS 137 5.115E+02 57LA 140 1.379E+01 63EU 154 5.408E+02	2.5% 3.2% 4.6% 7.8% 2.4%
A2650809040	50896 09:04:58	60.	8-MAY-1996 9:06:00 -35029. 11NA 22 9.902E+01 27CO 60 4.221E+01 55CS 137 2.368E+02	4.0% 4.6% 6.8%

				57LA 140 5.281E+00 14.6%
				63EU 154 2.703E+02 3.7%
A2650809060	50896 09:06:07	60.	8-MAY-1996 9:07:09	-35299.
				11NA 22 1.190E+02 3.5%
				27CO 60 4.641E+01 4.2%
				55CS 137 2.264E+02 6.3%
				57LA 140 8.179E+00 10.4%
				63EU 154 3.372E+02 3.5%
A2650809070	50896 09:07:15	60.	8-MAY-1996 9:08:15	-35299.
				11NA 22 1.237E+02 2.7%
				27CO 60 4.476E+01 4.3%
				55CS 137 2.130E+02 6.0%
				57LA 140 9.014E+00 12.5%
				63EU 154 3.495E+02 2.7%
A2650809080	50896 09:08:23	60.	8-MAY-1996 9:09:24	-35299.
				11NA 22 1.132E+02 2.8%
				27CO 60 4.148E+01 3.7%
				55CS 137 2.246E+02 6.2%
				57LA 140 8.720E+00 12.6%
				63EU 154 3.198E+02 2.8%
				80HG 197 8.680E+03 60.8%
A2650809090	50896 09:09:30	60.	8-MAY-1996 9:10:30	-35924.
				11NA 22 9.130E+01 3.2%
				27CO 60 2.947E+01 4.2%
				55CS 137 1.531E+02 6.8%
				57LA 140 6.584E+00 11.3%
				63EU 154 2.583E+02 3.1%
A2650809100	50896 09:10:41	60.	8-MAY-1996 9:11:42	37168.
				11NA 22 4.593E+00 17.5%
				21SC 46 3.030E-01 176.2%
				27CO 60 2.171E+00 16.9%
				63EU 154 1.293E+01 17.5%
A2650809110	50896 09:11:47	60.	8-MAY-1996 9:12:48	-38322.
				11NA 22 1.852E+00 23.2%
				55CS 137 3.956E+01 11.6%
				63EU 154 5.216E+00 23.2%
A2650809120	50896 09:12:56	60.	8-MAY-1996 9:13:57	-39527.
				11NA 22 1.361E+00 27.2%
				27CO 60 1.191E+00 22.1%
				55CS 137 2.888E+01 14.1%
				63EU 154 3.831E+00 27.2%
A2650809140	50896 09:14:04	60.	8-MAY-1996 9:15:06	-40737.
				11NA 22 1.212E+00 31.3%
				55CS 137 4.092E+01 12.0%
				63EU 154 3.411E+00 31.3%
A2650809150	50896 09:15:11	60.	8-MAY-1996 9:16:12	-41889.
				11NA 22 1.107E+00 28.7%
				27CO 60 1.426E+00 19.5%
				55CS 137 3.244E+01 13.1%
				63EU 154 3.115E+00 28.7%
A2650809160	50896 09:16:20	60.	8-MAY-1996 9:17:21	-43085.
				11NA 22 1.138E+00 31.3%
				27CO 60 1.018E+00 25.5%
				55CS 137 2.584E+01 15.1%
				63EU 154 3.205E+00 31.3%
				80HG 197 -3.503E+03 210.3%
A2650809170	50896 09:17:26	60.	8-MAY-1996 9:18:27	-44246.
				11NA 22 1.350E+00 35.7%
				27CO 60 1.329E+00 22.4%
				46PD 109 8.151E+04 54.3%
				63EU 154 3.802E+00 35.7%
A2650809180	50896 09:18:36	60.	8-MAY-1996 9:19:36	-44495.
				11NA 22 2.427E+00 23.1%
				27CO 60 9.174E-01 24.9%
				55CS 137 3.271E+01 13.7%
				63EU 154 6.834E+00 23.1%

A2650809190	50896 09:19:44	60.	8-MAY-1996 9:20:45	-43328.	
			11NA 22	1.933E+00	22.1%
			27CO 60	1.480E+00	26.0%
			55CS 137	2.935E+01	14.5%
			63EU 154	5.442E+00	22.1%
A2650809200	50896 09:20:52	60.	8-MAY-1996 9:21:54	-42154.	
			11NA 22	1.333E+00	28.0%
			27CO 60	1.228E+00	27.4%
			63EU 154	3.753E+00	28.0%
A2650809210	50896 09:21:59	60.	8-MAY-1996 9:23:00	-42506.	
			11NA 22	1.098E+00	28.3%
			27CO 60	1.379E+00	24.6%
			51SB 126	5.954E+00	34.7%
			55CS 137	2.560E+01	15.8%
			63EU 154	3.091E+00	28.3%
A2650809230	50896 09:23:05	60.	8-MAY-1996 9:24:06	-43663.	
			11NA 22	1.852E+00	24.5%
			27CO 60	1.364E+00	25.4%
			55CS 137	3.251E+01	19.0%
			63EU 154	5.216E+00	24.5%
A2650809240	50896 09:24:11	60.	8-MAY-1996 9:25:12	-44812.	
			27CO 60	1.177E+00	28.3%
A2650809250	50896 09:25:18	60.	8-MAY-1996 9:26:18	-45973.	
			11NA 22	2.100E+01	6.5%
			19K 42	2.124E+00	59.9%
			27CO 60	8.837E+00	10.8%
			46PD 109	2.186E+05	43.6%
			55CS 137	5.007E+01	14.4%
			57LA 140	1.589E+00	33.0%
			63EU 154	5.930E+01	6.5%
A2650809260	50896 09:26:27	60.	8-MAY-1996 9:27:27	-45583.	
			11NA 22	7.548E+01	3.5%
			27CO 60	2.928E+01	5.4%
			55CS 137	1.884E+02	12.6%
			57LA 140	6.141E+00	14.2%
			63EU 154	2.135E+02	3.5%
A2650809270	50896 09:27:38	60.	8-MAY-1996 9:28:39	-44357.	
			11NA 22	2.577E+00	20.8%
			55CS 137	1.939E+01	20.9%
			63EU 154	7.257E+00	20.8%
A2650809280	50896 09:28:44	60.	8-MAY-1996 9:29:45	-43240.	
			11NA 22	1.724E+00	22.5%
			63EU 154	4.654E+00	22.5%
A2650809290	50896 09:29:51	60.	8-MAY-1996 9:30:52	-42277.	
			11NA 22	1.760E+00	23.8%
			27CO 60	1.615E+00	26.3%
			55CS 137	4.111E+01	14.5%
			63EU 154	4.928E+00	23.8%
A2650809300	50896 09:30:57	60.	8-MAY-1996 9:31:58	-42277.	
			11NA 22	1.247E+00	28.1%
			27CO 60	9.945E-01	25.1%
			55CS 137	3.603E+01	15.5%
			63EU 154	3.510E+00	28.1%
A2650809320	50896 09:32:06	60.	8-MAY-1996 9:33:07	-43274.	
			27CO 60	7.136E-01	41.6%
A2650809330	50896 09:33:15	60.	8-MAY-1996 9:34:16	-44478.	
			11NA 22	1.868E+00	27.2%
			27CO 60	1.342E+00	28.8%
			55CS 137	2.461E+01	15.7%
			63EU 154	5.259E+00	27.2%
A2650809340	50896 09:34:23	60.	8-MAY-1996 9:35:25	-45688.	
			11NA 22	4.791E+00	15.8%
			27CO 60	2.769E+00	13.7%
			55CS 137	3.503E+01	18.4%
			57LA 140	6.791E-01	35.8%
			63EU 154	1.370E+01	15.5%

A2650809350	50896 09:35:32	60.	8-MAY-1996 9:36:34 -46596,
			11NA 22 8.537E+01 3.3%
			18AR 41 8.026E-01 81.3%
			27CO 60 3.287E+01 6.6%
			49INM 116 9.461E-01 81.3%
			55CS 137 1.919E+02 6.0%
			57LA 140 4.839E+00 13.4%
			63EU 154 2.407E+02 3.2%
A2650809360	50896 09:36:41	60.	8-MAY-1996 9:37:43 -46596,
			11NA 22 8.712E+01 3.1%
			27CO 60 2.696E+01 5.7%
			55CS 137 1.460E+02 6.8%
			57LA 140 6.404E+00 12.1%
			63EU 154 2.463E+02 3.1%
A2650809370	50896 09:37:49	60.	8-MAY-1996 9:38:51 -46596,
			11NA 22 8.519E+01 3.3%
			27CO 60 3.116E+01 5.6%
			55CS 137 1.319E+02 11.5%
			57LA 140 5.681E+00 12.5%
			59PR 144 1.864E+02 63.4%
			63EU 154 2.407E+02 3.3%
A2650809380	50896 09:38:57	60.	8-MAY-1996 9:39:58 -47080,
			11NA 22 7.512E+01 3.9%
			27CO 60 2.683E+01 5.5%
			55CS 137 1.350E+02 7.6%
			57LA 140 6.192E+00 11.6%
			63EU 154 2.115E+02 3.9%
A2650809400	50896 09:40:03	60.	8-MAY-1996 9:41:04 -47100,
			11NA 22 5.193E+02 1.4%
			27CO 60 1.771E+02 2.4%
			29CU 64 5.174E+02 49.3%
			55CS 137 8.002E+02 3.5%
			57LA 140 3.564E+01 5.8%
			63EU 154 1.462E+03 1.4%
A2650809410	50896 09:41:08	60.	8-MAY-1996 9:42:10 -47188,
			11NA 22 5.452E+02 1.4%
			27CO 60 1.848E+02 3.4%
			55CS 137 1.047E+03 4.6%
			57LA 140 3.993E+01 5.0%
			63EU 154 1.535E+03 1.4%
A2650809420	50896 09:42:24	60.	8-MAY-1996 9:43:25 -45927,
			80 19 2.161E+00 66.3%
			11NA 22 8.803E+01 4.0%
			27CO 60 3.383E+01 5.1%
			46PD 109 6.899E+04 85.2%
			55CS 137 1.762E+02 6.9%
			57LA 140 7.278E+00 11.3%
			63EU 154 2.479E+02 4.0%
A2650809430	50896 09:43:33	60.	8-MAY-1996 9:44:34 -44750,
			11NA 22 9.634E+00 10.1%
			27CO 60 3.265E+00 14.9%
			55CS 137 4.866E+01 11.6%
			57LA 140 9.545E-01 32.6%
			63EU 154 2.734E+01 9.9%
A2650809440	50896 09:44:42	60.	8-MAY-1996 9:45:43 -44377,
			11NA 22 1.569E+00 23.4%
			27CO 60 1.284E+00 22.1%
			55CS 137 2.443E+01 16.7%
			63EU 154 4.418E+00 23.4%
A2650809450	50896 09:45:51	60.	8-MAY-1996 9:46:53 -45603,
			11NA 22 4.698E+00 15.9%
			18AR 41 5.068E-01 52.9%
			27CO 60 2.240E+00 19.7%
			49INM 116 5.975E-01 52.9%
			55CS 137 2.853E+01 15.6%
			57LA 140 3.667E-01 41.4%

A2650809460	50896 09:46:58	60.	8-MAY-1996 9:47:59	63EU 154 1.336E+01 15.4%
				-46723.
				11NA 22 8.817E+01 4.2%
				27CO 60 3.040E+01 4.5%
				55CS 137 1.769E+02 6.8%
A2650809490	50896 09:49:13	60.	8-MAY-1996 9:50:14	57LA 140 5.369E+00 12.9%
				63EU 154 2.491E+02 4.1%
				-48177.
				11NA 22 4.822E+02 1.5%
				27CO 60 1.574E+02 2.8%
A2650809500	50896 09:50:18	60.	8-MAY-1996 9:51:20	55CS 137 7.767E+02 3.5%
				57LA 140 3.405E+01 6.4%
				63EU 154 1.358E+03 1.5%
				-49323.
				11NA 22 6.497E+02 1.5%
A2650809510	50896 09:51:57	60.	8-MAY-1996 9:52:59	27CO 60 2.079E+02 2.3%
				55CS 137 8.292E+02 4.5%
				57LA 140 4.517E+01 5.8%
				63EU 154 1.629E+03 1.5%
				-50017.
A2650809530	50896 09:53:07	60.	8-MAY-1996 9:54:08	11NA 22 8.695E+00 10.7%
				27CO 60 3.971E+00 12.3%
				55CS 137 4.939E+01 12.1%
				57LA 140 4.341E+01 68.4%
				63EU 154 2.448E+01 10.7%
A2650809540	50896 09:54:16	60.	8-MAY-1996 9:55:17	-48849.
				11NA 22 1.272E+02 3.5%
				27CO 60 3.765E+01 4.8%
				55CS 137 1.348E+02 9.9%
				57LA 140 8.783E+00 10.1%
A2650809550	50896 09:55:22	60.	8-MAY-1996 9:56:23	63EU 154 3.606E+02 3.4%
				-47685.
				11NA 22 7.213E+02 5.3%
				27CO 60 2.460E+02 3.0%
				47AGM 108 7.250E+01 16.8%
A2650809560	50896 09:56:31	60.	8-MAY-1996 9:57:32	55CS 137 1.106E+03 3.9%
				57LA 140 5.175E+01 4.5%
				63EU 154 2.031E+03 5.3%
				80HG 197 5.022E+04 25.1%
				-48179.
A2650809570	50896 09:57:38	60.	8-MAY-1996 9:58:38	11NA 22 4.239E+02 2.2%
				27CO 60 1.500E+02 2.5%
				55CS 137 6.426E+02 3.8%
				57LA 140 2.899E+01 5.3%
				63EU 154 1.193E+03 2.2%
A2650809580	50896 09:58:46	60.	8-MAY-1996 9:59:47	-49379.
				11NA 22 4.732E+02 1.6%
				27CO 60 1.594E+02 2.8%
				47AGM 108 7.875E+01 15.0%
				55CS 137 6.029E+02 4.1%
A2650809590	50896 09:59:55	60.	8-MAY-1996 10:00:56	57LA 140 3.209E+01 7.1%
				59PR 144 1.977E+02 100.7%
				63EU 154 1.332E+03 1.6%
				-50535.
				11NA 22 1.150E+01 9.1%
A2650809590	50896 09:59:55	60.	8-MAY-1996 10:00:56	27CO 60 3.943E+00 12.4%
				55CS 137 4.114E+01 14.4%
				63EU 154 3.266E+01 9.1%
				-51730.
				11NA 22 8.099E+01 3.2%
A2650809590	50896 09:59:55	60.	8-MAY-1996 10:00:56	27CO 60 2.569E+01 5.4%
				55CS 137 1.270E+02 8.8%
				57LA 140 1.246E+00 56.2%
				63EU 154 2.245E+02 3.1%
				-52939.
A2650809590	50896 09:59:55	60.	8-MAY-1996 10:00:56	11NA 22 1.170E+02 3.2%
				-52939.
				11NA 22 1.170E+02 3.2%
				-52939.
				11NA 22 1.170E+02 3.2%

			27CO	60	3.507E+01	4.6%
			35BR	84	2.240E+00	83.3%
			55CS	137	1.707E+02	8.7%
			57LA	140	6.465E+00	16.5%
			63EU	154	3.296E+02	3.1%
			93NP	239	9.469E+05	9.8%
A2650810010	50896	10:01:03	60.	8-MAY-1996	10:02:05	-54000.
			11NA	22	3.644E+00	16.0%
			27CO	60	1.356E+00	21.0%
			63EU	154	1.026E+01	16.0%
A2650810020	50896	10:02:10	60.	8-MAY-1996	10:03:11	-55294.
			27CO	60	1.323E+00	23.3%
			80HG	197	9.851E+03	61.5%
A2650810030	50896	10:03:16	60.	8-MAY-1996	10:04:17	-56437.
			11NA	22	2.414E+00	36.6%
			55CS	137	2.192E+01	17.1%
			63EU	154	6.798E+00	36.6%
A2650810040	50896	10:04:23	60.	8-MAY-1996	10:05:23	-57598.
			11NA	22	3.075E+00	24.5%
			55CS	137	2.641E+01	15.3%
			63EU	154	8.657E+00	24.5%
A2650810050	50896	10:05:31	60.	8-MAY-1996	10:06:33	-57854.
			11NA	22	3.605E+00	16.8%
			27CO	60	1.610E+00	19.3%
			63EU	154	1.015E+01	16.9%
A2650810060	50896	10:06:39	60.	8-MAY-1996	10:07:39	-57854.
			11NA	22	3.376E+00	16.6%
			27CO	60	1.417E+00	20.9%
			46PD	109	2.201E+04	127.0%
			48CD	109	2.176E+04	127.0%
			55CS	137	1.660E+01	20.8%
			63EU	154	9.507E+00	16.6%
A2650810070	50896	10:07:49	60.	8-MAY-1996	10:08:51	-57854.
			11NA	22	3.396E+00	16.6%
			27CO	60	2.470E+00	18.5%
			55CS	137	2.096E+01	17.5%
			63EU	154	9.561E+00	16.6%
A2650810100	50896	10:10:05	60.	8-MAY-1996	10:11:06	-56708.
			27CO	60	1.087E+00	33.4%
			39Y	91	2.252E+02	43.6%
			55CS	137	1.759E+01	20.2%
A2650810110	50896	10:11:14	60.	8-MAY-1996	10:12:15	-55548.
			11NA	22	2.893E+00	17.5%
			27CO	60	1.393E+00	25.0%
			55CS	137	3.288E+01	13.2%
			63EU	154	8.062E+00	17.5%
A2650810120	50896	10:12:21	60.	8-MAY-1996	10:13:21	-55147.
			11NA	22	3.129E+00	20.8%
			27CO	60	1.788E+00	25.3%
			55CS	137	3.035E+01	16.5%
			63EU	154	8.811E+00	20.8%
A2650810130	50896	10:13:28	60.	8-MAY-1996	10:14:30	-56345.
			11NA	22	2.316E+00	25.6%
			27CO	60	1.571E+00	23.0%
			40ZR	97	1.988E+01	63.8%
			55CS	137	2.494E+01	15.9%
			63EU	154	6.522E+00	25.6%
A2650810140	50896	10:14:32	60.	8-MAY-1996	10:15:33	-57455.
			11NA	22	2.007E+00	23.0%
			27CO	60	1.596E+00	22.9%
			55CS	137	2.499E+01	15.9%
			63EU	154	5.650E+00	23.0%
A2650810150	50896	10:15:36	60.	8-MAY-1996	10:16:36	-58547.
			11NA	22	2.643E+00	18.7%
			27CO	60	9.895E-01	30.0%
			63EU	154	7.442E+00	18.7%

A2650810170 50896 10:17:02 60. 8-MAY-1996 10:18:04 -60085.
11NA 22 3.251E+01 5.2%
20CA 47 9.832E-01 44.3%
27CO 60 1.169E+01 8.4%
55CS 137 4.711E+01 13.0%
57LA 140 1.747E+00 24.3%
63EU 154 9.154E+01 5.1%

Detector A3

A3650808140	50896 08:14:32	60. 8-MAY-1996 8:15:34 -10940. 55CS 137 1.753E-04	5.7%
A3650808150	50896 08:15:41	60. 8-MAY-1996 8:16:43 11187. 55CS 137 2.768E-05	16.4%
A3650808160	50896 08:16:50	60. 8-MAY-1996 8:17:52 -11187. 55CS 137 2.258E-05	18.5%
A3650808170	50896 08:17:57	60. 8-MAY-1996 8:18:58 -11187. 55CS 137 1.694E-05	19.7%
A3650808190	50896 08:19:06	60. 8-MAY-1996 8:20:07 -11187. 55CS 137 2.506E-05	16.3%
A3650808200	50896 08:20:13	60. 8-MAY-1996 8:21:13 -11187. 55CS 137 2.543E-05	16.0%
A3650808210	50896 08:21:21	60. 8-MAY-1996 8:22:22 -11187. 55CS 137 2.268E-05	17.4%
A3650808220	50896 08:22:31	60. 8-MAY-1996 8:23:31 -11187. 55CS 137 3.370E-05	14.7%
A3650808230	50896 08:23:34	60. 8-MAY-1996 8:24:34 -11187. 55CS 137 2.416E-05	16.3%
A3650808240	50896 08:24:40	60. 8-MAY-1996 8:25:42 -11187. 55CS 137 2.282E-05	20.4%
A3650808260	50896 08:26:49	60. 8-MAY-1996 8:27:49 -11187. 55CS 137 2.242E-05	17.6%
A3650808300	50896 08:30:51	60. 8-MAY-1996 8:31:52 -11930. 55CS 137 3.733E-05	13.2%
A3650808310	50896 08:31:58	60. 8-MAY-1996 8:32:58 -13011. 55CS 137 5.627E-05	10.4%
A3650808360	50896 08:36:33	60. 8-MAY-1996 8:37:34 -17509. 55CS 137 2.843E-05	15.4%
A3650808370	50896 08:37:40	60. 8-MAY-1996 8:38:40 -17784. 55CS 137 6.011E-05	10.6%
A3650808380	50896 08:38:48	60. 8-MAY-1996 8:39:48 -17784. 55CS 137 7.388E-05	9.3%
A3650808410	50896 08:41:23	60. 8-MAY-1996 8:42:25 18926. 55CS 137 3.674E-05	13.3%
A3650808420	50896 08:42:30	60. 8-MAY-1996 8:43:31 -19998. 55CS 137 4.592E-05	11.9%
A3650808430	50896 08:43:36	60. 8-MAY-1996 8:44:37 -21082. 55CS 137 5.044E-05	11.4%
A3650808440	50896 08:44:45	60. 8-MAY-1996 8:45:46 -22203. 55CS 137 7.372E-05	9.0%
A3650808450	50896 08:45:54	60. 8-MAY-1996 8:46:55 -23333. 55CS 137 1.542E-04	6.1%
A3650808470	50896 08:47:00	60. 8-MAY-1996 8:48:01 -24405. 55CS 137 8.937E-04	2.5%
A3650808480	50896 08:48:07	60. 8-MAY-1996 8:49:07 -25489. 55CS 134 4.756E+00	26.0%
A3650808490	50896 08:49:15	60. 8-MAY-1996 8:50:17 -26827. 55CS 134 6.224E+00	22.7%
A3650808500	50896 08:50:22	60. 8-MAY-1996 8:51:23 -27700. 55CS 134 5.507E+00	30.9%
A3650808510	50896 08:51:30	60. 8-MAY-1996 8:52:30 -28795. 55CS 137 1.129E-03	2.2%
A3650808520	50896 08:52:38	60. 8-MAY-1996 8:53:39 -29924. 11NA 22 3.871E+00	30.4%
		52TEM 127 7.197E-03	33.7%
		55CS 134 2.751E+00	38.9%
		55CS 137 1.318E-03	3.4%
		63EU 154 1.090E+01	30.4%
		92U 232 1.835E-02	33.7%
A3650808530	50896 08:53:47	60. 8-MAY-1996 8:54:48 -31046. 11NA 22 6.167E+01	6.8%

				27CO	60	1.645E+01	11.0%
				55CS	134	6.438E+00	88.6%
				55CS	137	2.329E-03	2.1%
				57LA	140	3.684E+00	28.1%
				63EU	154	1.680E+02	6.4%
A3650808540	50896 08:54:53	60.	8-MAY-1996 8:55:54	-32123.			
				11NA	22	5.827E+02.	2.3%
				27CO	60	2.563E+02	3.6%
				46PD	109	3.895E-04	139.5%
				48CD	109	3.851E-04	139.5%
				55CS	137	4.683E-03	1.2%
				57LA	140	4.253E+01	11.0%
				63EU	154	1.645E+03	2.3%
A3650808550	50896 08:55:59	60.	8-MAY-1996 8:57:00	-31881.			
				11NA	22	1.102E+03	1.8%
				27CO	60	4.590E+02	2.7%
				402R	95	1.367E+03	25.0%
				41NB	95	5.332E+02	45.0%
				55CS	137	6.929E-03	1.4%
				57LA	140	7.202E+01	7.2%
				63EU	154	3.113E+03	1.8%
A3650808570	50896 08:57:05	60.	8-MAY-1996 8:58:06	-30832.			
				11NA	22	3.203E+02	3.4%
				27CO	60	1.069E+02	4.4%
				55CS	137	3.913E-03	1.3%
				57LA	140	2.012E+01	15.1%
				63EU	154	9.036E+02	3.3%
A3650808580	50896 08:58:11	60.	8-MAY-1996 8:59:12	-30091.			
				11NA	22	2.808E+01	11.1%
				27CO	60	9.000E+00	14.7%
				52TEM	127	1.086E-02	30.5%
				55CS	137	1.814E-03	3.1%
				63EU	154	6.824E+01	9.6%
				92U	232	2.770E-02	30.5%
A3650808590	50896 08:59:19	60.	8-MAY-1996 9:00:21	-29472.			
				11NA	22	3.645E+00	33.9%
				55CS	134	5.047E+00	29.8%
				55CS	137	1.403E-03	2.5%
				63EU	154	1.026E+01	33.9%
A3650809000	50896 09:00:26	60.	8-MAY-1996 9:01:27	-30542.			
				11NA	22	1.570E+01	13.6%
				27CO	60	4.312E+00	22.6%
				52TEM	127	9.205E-03	32.8%
				55CS	134	3.615E+00	62.2%
				55CS	137	1.529E-03	1.9%
				63EU	154	4.377E+01	11.8%
				92U	232	2.347E-02	32.8%
A3650809010	50896 09:01:32	60.	8-MAY-1996 9:02:33	-31620.			
				11NA	22	2.187E+02	4.9%
				27CO	60	6.737E+01	5.2%
				52TEM	127	1.818E-02	44.7%
				53I	135	2.474E+01	168.9%
				55CS	137	3.696E-03	1.6%
				57LA	140	1.694E+01	18.9%
				63EU	154	6.186E+02	4.8%
				92U	232	4.637E-02	44.7%
A3650809020	50896 09:02:41	60.	8-MAY-1996 9:03:42	-32729.			
				11NA	22	1.005E+03	2.8%
				27CO	60	4.259E+02	3.2%
				55CS	137	5.815E-03	1.2%
				57LA	140	6.538E+01	7.9%
				63EU	154	2.846E+03	2.7%
A3650809030	50896 09:03:49	60.	8-MAY-1996 9:04:51	-33860.			
				54XEM	135	1.387E-04	41.5%
				55CS	137	1.481E-02	2.3%
				69TM	170	1.602E-02	10.1%

			90TH 228 4.274E-02 10.1%	
			90THTH232 4.274E-02 10.1%	
A3650809040	50896 09:04:59	60. 8-MAY-1996 9:06:00	-35029.	
			11NA 22 1.964E+03 2.0%	
			27CO 60 8.779E+02 2.2%	
			55CS 137 9.814E+03 1.6%	
			57LA 140 1.317E+02 8.1%	
			63EU 154 5.546E+03 1.9%	
			69TM 170 9.953E-03 11.1%	
			90TH 228 2.656E-02 11.1%	
			90THTH232 2.656E-02 11.1%	
A3650809060	50896 09:06:07	60. 8-MAY-1996 9:07:09	-35299.	
			11NA 22 3.239E+03 1.5%	
			27CO 60 1.151E+03 2.1%	
			40ZR 95 3.371E+03 18.0%	
			55CS 137 1.054E-02 2.2%	
			63EU 154 9.121E+03 1.5%	
			69TM 170 1.333E-02 11.1%	
			90TH 228 3.556E-02 11.1%	
			90THTH232 3.556E-02 11.1%	
A3650809070	50896 09:07:15	60. 8-MAY-1996 9:08:15	-35299.	
			27CO 56 5.431E+01 26.1%	
			40ZR 95 3.366E+03 18.4%	
			44RU 105 2.004E+04 6.5%	
			55CS 137 1.104E-02 2.0%	
			69TM 170 1.351E-02 11.8%	
			90TH 228 3.605E-02 11.8%	
			90THTH232 3.605E-02 11.8%	
A3650809080	50896 09:08:23	60. 8-MAY-1996 9:09:24	-35299.	
			11NA 22 3.382E+03 2.0%	
			27CO 60 1.109E+03 2.4%	
			40ZR 95 3.241E+03 14.6%	
			55CS 137 1.055E-02 2.4%	
			63EUM 152 2.095E+02 40.2%	
			63EU 154 9.524E+03 2.0%	
			69TM 170 1.306E-02 9.2%	
			90TH 228 3.484E-02 9.2%	
			90THTH232 3.484E-02 9.2%	
A3650809090	50896 09:09:30	60. 8-MAY-1996 9:10:30	-35924.	
			11NA 22 2.207E+03 2.4%	
			27CO 60 7.679E+02 3.0%	
			40ZR 95 2.071E+03 22.0%	
			47AGM 108 6.644E+03 6.1%	
			55CS 137 6.691E-03 2.2%	
			57LA 140 1.372E+02 5.7%	
			63EU 154 6.215E+03 2.4%	
A3650809100	50896 09:10:41	60. 8-MAY-1996 9:11:42	37168.	
			11NA 22 4.558E+01 8.6%	
			27CO 60 4.296E+01 6.6%	
			55CS 137 1.128E-03 3.0%	
			63EU 154 1.171E+02 8.0%	
A3650809110	50896 09:11:47	60. 8-MAY-1996 9:12:48	-38322.	
			11NA 22 2.643E+01 11.8%	
			27CO 60 2.284E+01 9.1%	
			52TEM 127 1.268E-02 82.2%	
			55CS 137 1.398E-03 2.7%	
			57LA 140 3.133E+00 31.5%	
			63EU 154 7.526E+01 11.6%	
			92U 232 3.228E-02 82.2%	
A3650809120	50896 09:12:56	60. 8-MAY-1996 9:13:57	-39527.	
			11NA 22 2.073E+01 13.3%	
			27CO 60 2.350E+01 8.7%	
			55CS 137 1.117E-03 2.3%	
			57LA 140 2.392E+00 50.6%	
			63EU 154 5.837E+01 13.3%	
A3650809140	50896 09:14:04	60. 8-MAY-1996 9:15:06	-40737.	

				11NA	22	2.351E+01	12.0%
				27CO	60	2.091E+01	9.7%
				55CS	137	1.456E-03	2.0%
				57LA	140	2.149E+00	53.3%
				63EU	154	6.662E+01	10.4%
A3650809150	50896 09:15:11	60.	8-MAY-1996 9:16:12	-41989.			
				11NA	22	2.439E+01	13.8%
				20CA	47	3.441E+00	97.5%
				27CO	60	1.740E+01	10.7%
				55CS	137	1.252E-03	2.2%
				57LA	140	3.719E+00	35.3%
				63EU	154	6.696E+01	11.5%
A3650809160	50896 09:16:20	60.	8-MAY-1996 9:17:21	-43095.			
				11NA	22	2.372E+01	12.0%
				27CO	60	2.433E+01	9.5%
				55CS	137	1.223E-03	2.2%
				63EU	154	6.679E+01	12.0%
A3650809170	50896 09:17:26	60.	8-MAY-1996 9:18:27	-44246.			
				11NA	22	2.184E+01	15.4%
				27CO	60	2.392E+01	10.5%
				55CS	137	1.022E-03	2.4%
				57LA	140	2.781E+00	34.3%
				63EU	154	6.272E+01	14.2%
A3650809180	50896 09:18:36	60.	8-MAY-1996 9:19:36	-44495.			
				11NA	22	2.404E+01	16.5%
				27CO	60	1.967E+01	10.0%
				55CS	137	1.171E-03	2.3%
				63EU	154	5.985E+01	14.1%
A3650809190	50896 09:19:44	60.	8-MAY-1996 9:20:45	-43328.			
				11NA	22	1.905E+01	13.6%
				27CO	60	1.970E+01	11.6%
				39Y	95	2.620E+01	51.6%
				55CS	137	9.363E-04	2.5%
				63EU	154	5.363E+01	13.6%
A3650809200	50896 09:20:52	60.	8-MAY-1996 9:21:54	-42154.			
				11NA	22	2.244E+01	12.2%
				27CO	60	2.138E+01	9.9%
				52TEM	127	1.155E-02	37.9%
				55CS	137	1.297E-03	3.4%
				63EU	154	5.895E+01	11.5%
				92U	232	2.944E-02	37.9%
A3650809210	50896 09:21:59	60.	8-MAY-1996 9:23:00	-42506.			
				11NA	22	2.933E+01	12.6%
				27CO	60	2.315E+01	9.4%
				52TEM	127	1.153E-02	33.2%
				55CS	137	1.257E-03	2.2%
				63EU	154	7.061E+01	11.1%
				92U	232	2.941E-02	33.2%
A3650809230	50896 09:23:05	60.	8-MAY-1996 9:24:06	-43663.			
				11NA	22	2.498E+01	14.5%
				27CO	60	2.033E+01	9.9%
				55CS	137	1.236E-03	2.2%
				63EU	154	7.033E+01	14.5%
A3650809240	50896 09:24:11	60.	8-MAY-1996 9:25:12	-44812.			
				11NA	22	1.982E+01	16.0%
				27CO	60	2.153E+01	9.6%
				55CS	137	9.730E-04	2.8%
				63EU	154	5.580E+01	16.0%
A3650809250	50896 09:25:18	60.	8-MAY-1996 9:26:18	-46973.			
				11NA	22	3.101E+02	3.9%
				27CO	60	1.193E+02	4.6%
				55CS	137	2.236E-03	2.2%
				57LA	140	2.279E+01	12.5%
				59PR	144	7.323E+02	65.7%
				63EU	154	8.785E+02	3.8%
A3650809260	50896 09:26:27	60.	8-MAY-1996 9:27:27	-45583.			

				11NA	22	1.448E+03	2.2%
				27CO	60	5.562E+02	3.3%
				40ZR	95	1.329E+03	23.4%
				47AGM	108	4.172E+03	10.6%
				55CS	137	7.194E-03	2.1%
				57LA	140	9.826E+01	7.4%
				63EU	154	4.096E+03	2.2%
				80HG	197	4.381E-04	30.9%
A3650809270	50896 09:27:38	60.	8-MAY-1996 9:28:39	-44357.			
				11NA	22	3.030E+01	10.7%
				27CO	60	2.726E+01	11.9%
				55CS	137	1.104E-03	3.2%
				63EU	154	8.525E+01	10.3%
A3650809280	50896 09:28:44	60.	8-MAY-1996 9:29:45	-43240.			
				11NA	22	2.200E+01	13.9%
				27CO	60	2.535E+01	9.5%
				55CS	137	1.113E-03	2.4%
				63EU	154	5.595E+01	12.8%
A3650809290	50896 09:29:51	60.	8-MAY-1996 9:30:52	-42277.			
				11NA	22	2.408E+01	11.8%
				27CO	60	2.193E+01	10.0%
				55CS	137	1.297E-03	2.2%
				63EU	154	6.781E+01	11.8%
A3650809300	50896 09:30:58	60.	8-MAY-1996 9:31:58	-42277.			
				11NA	22	2.155E+01	13.8%
				27CO	60	1.933E+01	10.0%
				55CS	137	1.209E-03	2.2%
				63EU	154	5.507E+01	12.7%
A3650809320	50896 09:32:06	60.	8-MAY-1996 9:33:07	-43274.			
				11NA	22	2.224E+01	14.1%
				23V	52	2.465E+00	47.9%
				27CO	60	2.227E+01	9.5%
				52TEM	127	7.530E-03	137.4%
				55CS	137	1.268E-03	2.2%
				63EUM	152	2.852E+01	56.7%
				63EU	154	6.320E+01	13.2%
				92U	232	1.920E-02	137.4%
A3650809330	50896 09:33:15	60.	8-MAY-1996 9:34:16	-44478.			
				11NA	22	2.136E+01	13.9%
				27CO	60	2.003E+01	9.7%
				55CS	137	1.053E-03	2.4%
				63EU	154	5.870E+01	13.1%
A3650809340	50896 09:34:23	60.	8-MAY-1996 9:35:25	-45688.			
				11NA	22	4.264E+01	9.3%
				27CO	60	3.016E+01	8.0%
				29CU	66	4.284E+01	76.9%
				52TEM	131	2.177E+01	58.5%
				55CS	137	1.106E-03	3.1%
				63EU	154	1.133E+02	8.9%
A3650809350	50896 09:35:33	60.	8-MAY-1996 9:36:34	-46596.			
				11NA	22	1.543E+03	2.0%
				27CO	60	5.389E+02	3.6%
				40ZR	95	1.430E+03	25.5%
				47AGM	108	4.255E+03	8.4%
				53I	135	3.443E+01	51.3%
				55CS	137	6.245E-03	2.5%
				57LA	140	1.051E+02	6.0%
				63EU	154	4.343E+03	2.0%
A3650809360	50896 09:36:41	60.	8-MAY-1996 9:37:43	-46596.			
				11NA	22	1.215E+03	2.2%
				27CO	60	4.389E+02	4.0%
				29CU	66	3.775E+02	30.4%
				35BR	82	3.390E+02	47.6%
				41NBM	92	2.005E+01	45.4%
				39Y	92	1.430E+02	45.4%
				40ZR	95	9.454E+02	28.8%

				47AGM 108	2.699E+03	10.4%
				55CS 137	4.168E-03	1.9%
				57LA 140	7.951E+01	7.1%
				63EU 154	3.436E+03	2.1%
A3650809370	50896 09:37:49	60.	8-MAY-1996 9:38:51	-46596.		
				11NA 22	1.266E+03	2.2%
				27CO 60	4.496E+02	3.6%
				47AGM 108	3.312E+03	8.7%
				46PD 109	2.968E-03	28.9%
				55CS 137	4.187E-03	1.4%
				57LA 140	8.652E+01	8.0%
				63EU 154	3.550E+03	2.2%
				90TH 228	3.051E-02	10.7%
				90THTH232	3.051E-02	10.7%
A3650809380	50896 09:38:57	60.	8-MAY-1996 9:39:58	-47080.		
				11NA 22	1.211E+03	2.8%
				27CO 60	4.511E+02	2.8%
				47AGM 108	3.822E+03	8.4%
				55CS 137	4.179E-03	1.8%
				57LA 140	8.975E+01	6.6%
				63EU 154	3.409E+03	2.6%
A3650809400	50896 09:40:07	60.	8-MAY-1996 9:41:07	-48101.		
				44RU 105	4.448E+04	6.8%
				45RH 106	2.088E-03	45.1%
				54XEM 135	3.153E-04	36.1%
				55CS 137	2.588E-02	3.2%
				83BI 212	5.209E+03	287.7%
				90THTH232	7.970E-02	10.5%
				90THBI232	5.209E+03	287.7%
A3650809410	50896 09:41:12	60.	8-MAY-1996 9:42:13	-47139.		
				55CS 137	2.181E-02	3.4%
				69TM 170	2.522E-02	12.8%
				90TH 228	6.730E-02	12.8%
				90THTH232	6.730E-02	12.8%
A3650809420	50896 09:42:24	60.	8-MAY-1996 9:43:25	-45927.		
				9F 20	-2.832E+00	195.7%
				11NA 22	1.451E+03	2.0%
				27CO 60	5.134E+02	2.9%
				40ZR 95	1.031E+03	27.9%
				47AGM 108	3.752E+03	8.7%
				55CS 137	5.578E-03	1.6%
				57LA 140	9.604E+01	6.2%
				63EU 154	4.089E+03	2.0%
A3650809430	50896 09:43:33	60.	8-MAY-1996 9:44:34	-44750.		
				11NA 22	1.443E+02	4.7%
				27CO 60	7.672E+01	6.7%
				55CS 137	1.635E-03	2.3%
				57LA 140	1.123E+01	17.6%
				63EU 154	4.084E+02	4.6%
A3650809440	50896 09:44:42	60.	8-MAY-1996 9:45:43	-44377.		
				11NA 22	2.255E+01	12.9%
				27CO 60	1.799E+01	11.0%
				52TEM 127	1.115E-02	45.7%
				55CS 137	9.381E-04	2.5%
				63EU 154	6.348E+01	12.9%
				92U 232	2.845E-02	45.7%
A3650809450	50896 09:45:51	60.	8-MAY-1996 9:46:53	-45603.		
				11NA 22	3.378E+01	10.1%
				27CO 60	2.520E+01	10.0%
				55CS 137	1.086E-03	2.4%
				63EU 154	9.069E+01	9.3%
A3650809460	50896 09:46:58	60.	8-MAY-1996 9:47:59	-46723.		
				11NA 22	1.472E+03	3.0%
				27CO 60	5.573E+02	3.4%
				40ZR 95	1.303E+03	27.2%
				47AGM 108	3.680E+03	8.2%

			55CS 137 6.896E-03 2.3%
			57LA 140 9.088E+01 6.5%
			63EU 154 4.179E+03 2.8%
			80HG 197 1.593E+04 94.8%
			90THTH232 2.635E-02 13.3%
A3650809480	50896 09:48:07	60, 8-MAY-1996 9:49:08	47018.
			11NA 22 1.214E+03 1.7%
			27CO 60 4.440E+02 4.0%
			40ZR 95 1.157E+03 24.0%
			47AGM 108 3.213E+03 9.6%
			55CS 137 3.935E-03 2.3%
			57LA 140 7.716E+01 9.5%
			63EU 154 3.423E+03 1.7%
A3650809490	50896 09:49:13	60, 8-MAY-1996 9:50:14	-48177.
			11NA 24 3.820E-06 117.1%
			40ZR 95 6.669E+03 16.3%
			44RU 105 3.976E+04 5.6%
			55CS 137 1.993E-02 3.4%
A3650809500	50896 09:50:18	60, 8-MAY-1996 9:51:20	-49323.
			80 19 1.495E+02 57.0%
			23V 52 8.315E+01 39.0%
			40ZR 95 1.084E+04 18.6%
			55CS 137 1.872E-02 2.8%
			90THTH232 6.695E-02 12.0%
A3650809510	50896 09:51:58	60, 8-MAY-1996 9:52:59	-50017.
			11NA 22 4.854E+01 8.1%
			27CO 60 3.190E+01 10.5%
			46PD 109 2.387E-03 32.8%
			48CD 109 2.360E-03 32.8%
			52TEM 127 4.432E-03 118.4%
			55CS 137 1.516E-03 2.0%
			57LA 140 4.997E+00 31.4%
			63EU 154 1.374E+02 8.0%
			92U 232 1.130E-02 118.4%
A3650809530	50896 09:53:07	60, 8-MAY-1996 9:54:08	-48849.
			11NA 22 1.500E+03 2.3%
			27CO 60 5.246E+02 2.9%
			47AGM 108 3.750E+03 9.5%
			52TEM 127 4.818E-02 99.5%
			55CS 137 3.382E-03 2.5%
			57LA 140 1.020E+02 7.8%
			63EU 154 4.224E+03 2.3%
			92U 232 1.254E-01 99.5%
A3650809540	50896 09:54:16	60, 8-MAY-1996 9:55:17	-47685.
			11NA 22 1.891E+04 4.2%
			25MN 56 1.488E+02 152.9%
			27CO 60 6.024E+03 4.3%
			40ZR 95 1.528E+04 33.3%
			52TEM 127 2.150E+00 79.4%
			52TE 129 2.183E-03 156.2%
			55CS 137 5.225E-02 5.6%
			63EU 154 5.325E+04 4.2%
			69TM 170 4.401E-02 19.4%
			90TH 228 1.174E-01 19.4%
			92U 232 5.483E+00 79.4%
			90TH 232 5.772E+00 79.4%
			90THTH232 1.174E-01 19.4%
A3650809550	50896 09:55:22	60, 8-MAY-1996 9:56:23	-48179.
			21SC 48 4.489E+01 79.6%
			40ZR 95 1.083E+04 18.8%
			52TEM 127 4.206E-01 68.3%
			56BA 133 6.686E-04 45.1%
			55CS 137 2.612E-02 5.4%
			69TM 170 3.168E-02 13.4%
			90TH 228 8.452E-02 13.4%
			92U 232 1.072E+00 68.3%

			90THTH232	8.452E-02	13.4%
A3650809560	50896 09:56:31	60.	8-MAY-1996 9:57:32	-49379.	
			11NA	22 6.151E+03	1.5%
			27CO	60 2.008E+03	3.0%
			47AGM	108 1.968E+04	7.5%
			55CS	137 1.395E-02	2.0%
			57LA	140 4.127E+02	7.6%
			63EU	154 1.735E+04	1.5%
			69TM	170 2.145E-02	11.7%
			90TH	228 5.723E-02	11.7%
			90THTH232	5.723E-02	11.7%
A3650809570	50896 09:57:38	60.	8-MAY-1996 9:58:38	-50535.	
			11NA	22 4.974E+01	8.0%
			27CO	60 2.261E+01	10.0%
			55CS	137 1.364E-03	2.7%
			63EU	154 1.401E+02	8.0%
A3650809580	50896 09:58:46	60.	8-MAY-1996 9:59:47	-51730.	
			11NA	22 1.662E+03	2.8%
			27CO	60 5.929E+02	2.8%
			40ZR	95 1.077E+03	32.3%
			47AGM	108 4.365E+03	8.0%
			55CS	134 2.956E+01	41.7%
			55CS	137 4.436E-03	2.0%
			57LA	140 1.185E+02	5.9%
			63EU	154 4.683E+03	2.6%
			90THTH232	2.114E-02	11.8%
A3650809590	50896 09:59:55	60.	8-MAY-1996 10:00:56	-52939.	
			11NA	22 1.757E+03	2.5%
			27CO	60 6.286E+02	2.6%
			47AGM	108 5.093E+03	7.8%
			55CS	137 5.048E-03	2.4%
			57LA	140 1.217E+02	6.0%
			63EU	154 4.948E+03	2.5%
A3650810010	50896 10:01:04	60.	8-MAY-1996 10:02:05	-54000.	
			11NA	22 1.890E+01	13.8%
			27CO	60 1.448E+01	15.3%
			55CS	137 7.369E-04	2.9%
			63EU	154 5.605E+01	13.9%
A3650810020	50896 10:02:10	60.	8-MAY-1996 10:03:11	-55294.	
			11NA	22 1.807E+01	16.1%
			20CA	47 3.053E+00	71.3%
			27CO	60 1.442E+01	18.2%
			53I	135 8.772E+00	59.9%
			55CS	137 8.210E-04	2.8%
			63EU	154 4.685E+01	15.2%
A3650810030	50896 10:03:16	60.	8-MAY-1996 10:04:17	-56437.	
			11NA	22 1.682E+01	18.0%
			18AR	41 2.244E+00	57.2%
			27CO	60 1.386E+01	13.9%
			49INM	116 2.645E+00	57.2%
			55CS	137 8.463E-04	3.1%
			63EU	154 4.737E+01	18.0%
A3650810040	50896 10:04:23	60.	8-MAY-1996 10:05:23	-57598.	
			11NA	22 1.963E+01	15.1%
			27CO	60 1.050E+01	14.1%
			55CS	137 7.575E-04	2.8%
			63EU	154 5.528E+01	15.1%
A3650810050	50896 10:05:31	60.	8-MAY-1996 10:06:33	-57854.	
			11NA	22 1.755E+01	16.2%
			27CO	60 1.319E+01	13.4%
			55CS	137 6.532E-04	3.0%
			63EU	154 4.716E+01	14.7%
			65TB	160 5.588E+00	55.8%
A3650810060	50896 10:06:39	60.	8-MAY-1996 10:07:39	-57854.	
			11NA	22 2.293E+01	13.9%
			27CO	60 1.306E+01	15.8%

				55CS	137	7.153E-04	2.8%
				63EU	154	6.457E+01	13.9%
A3650810070	50896	10:07:49	60.	8-MAY-1996	10:08:51	-57854.	
				11NA	22	1.365E+01	17.1%
				27CO	60	1.712E+01	10.5%
				55CS	137	6.647E-04	3.5%
				57LA	140	2.060E+00	53.2%
				63EU	154	3.845E+01	17.1%
A3650810100	50896	10:10:05	60.	8-MAY-1996	10:11:06	-56708.	
				11NA	22	1.815E+01	14.8%
				27CO	60	9.776E+00	17.2%
				55CS	137	7.624E-04	2.8%
				63EU	154	5.112E+01	14.8%
A3650810110	50896	10:11:14	60.	8-MAY-1996	10:12:15	-55548.	
				11NA	22	1.767E+01	17.2%
				27CO	60	1.547E+01	11.4%
				52TEM	127	1.519E-02	39.5%
				55CS	137	8.572E-04	3.7%
				63EU	154	4.974E+01	17.2%
				92U	232	3.674E-02	39.5%
A3650810120	50896	10:12:21	60.	8-MAY-1996	10:13:21	-55147.	
				11NA	22	1.625E+01	15.4%
				27CO	60	1.865E+01	12.2%
				55CS	137	8.423E-04	2.7%
				63EU	154	4.574E+01	15.4%
				90THTH232		9.328E-03	15.6%
A3650810130	50896	10:13:29	60.	8-MAY-1996	10:14:30	-56345.	
				11NA	22	1.390E+01	17.3%
				27CO	60	1.584E+01	11.3%
				55CS	137	8.250E-04	3.0%
				63EU	154	3.844E+01	15.6%
A3650810140	50896	10:14:38	60.	8-MAY-1996	10:15:39	-57559.	
				11NA	22	1.407E+01	16.0%
				27CO	60	1.438E+01	12.8%
				55CS	137	7.656E-04	4.0%
				63EU	154	3.616E+01	15.1%
A3650810150	50896	10:15:45	60.	8-MAY-1996	10:16:45	-58704.	
				11NA	22	1.854E+01	16.7%
				27CO	60	1.155E+01	13.7%
				53I	135	5.390E+00	60.0%
				55CS	137	5.706E-04	3.5%
				63EU	154	5.221E+01	16.7%
A3650810170	50896	10:17:02	60.	8-MAY-1996	10:18:04	-60085.	
				11NA	22	7.155E+02	2.1%
				27CO	60	2.739E+02	3.4%
				38SR	92	2.893E+00	46.9%
				47AGM	108	2.304E+03	9.1%
				52TEM	127	2.367E-02	87.8%
				55CS	137	1.985E-03	1.9%
				57LA	140	4.740E+01	8.5%
				63EU	154	2.021E+03	2.0%
				92U	232	6.036E-02	87.8%

5.0 CALCULATION

All calculations are performed by the spread sheet. The ^{137}Cs activity for every counting interval is calculated by equation:

$$A = MA \times GF \times C_F$$

where

A is the calculated ^{137}Cs activity in mCi.

MA is the activity of ^{137}Cs measured by the FRRDS.

GF is the geometry correction factor³.

CF is the detector calibration factor provided by Radioanalytical Chemistry².

Table 5.1 lists the correction factors for each detector.

TABLE 5.1: DETECTOR CORRECTION FACTORS

Detector	GF	CF
A1	1.481	1
A2	1.934	46
A3	1.957	1097000

The total ^{137}Cs activity is obtained by summing the ^{137}Cs activity for all the individual segments. Because the thermocouple tree is long enough to extend into the sludge in the bottom of the tank, three values of ^{137}Cs activity are provided: ^{137}Cs activity for the liquid phase, ^{137}Cs activity for the sludge phase, and ^{137}Cs activity for the entire thermocouple tree length. These values are used to calculate the inventory of the other radioisotopes using the distribution provided by Solid Waste Engineering¹.

Solid Waste Engineering requires the data be reported in two ways. First, the activity of each isotope is divided by the volume of the shipping container, 3.624m³, and given in curies per cubic meter. Then the activity of each isotope is divided by the mass of the thermocouple tree, 133,930 grams, and given in nanocuries per gram.

6.0 RESULTS

The results are reported in tables 6.1 and 6.2

TABLE 6.1: TOTAL RADIONUCLIDE INVENTORY BASED ON LIQUID AND SLUDGE DISTRIBUTIONS

Calculation of Isotopes in the Liquid Phase			Sludge Phase			
nuclide	ratio nuclide/Cs-137	Curies	ratio nuclide/Cs-137	Curies	curies/m ³	nCi/gm
H-3	1.78E-05	5.17E-06	8.88E-06	3.21E-08	1.44E-06	3.89E-02
C-14	1.01E-06	2.94E-07	1.35E-06	4.89E-09	8.24E-08	2.23E-03
Co-60	7.11E-04	2.07E-04	3.01E-03	1.09E-05	6.00E-05	1.62E+00
Se-79	1.68E-06	4.88E-07	2.76E-06	9.99E-09	1.38E-07	3.72E-03
Y-90	8.01E-04	2.33E-04	3.50E+01	1.27E-01	3.50E-02	9.48E+02
Sr-90	8.01E-04	2.33E-04	3.50E+01	1.27E-01	3.50E-02	9.48E+02
Tc-99	2.49E-04	7.24E-05	3.28E-03	1.19E-05	2.33E-05	6.29E-01
Ru-106	7.07E-04	2.06E-04	4.28E-02	1.53E-04	9.95E-05	2.69E+00
Sb-125	6.83E-03	1.99E-03	1.44E-01	5.21E-04	6.92E-04	1.87E+01
I-129	4.68E-07	1.36E-07	4.75E-05	1.72E-07	8.50E-08	2.30E-03
Cs-134	3.14E-03	9.13E-04	2.49E-03	9.01E-06	2.54E-04	6.88E+00
Cs-137	1.00E+00	2.91E-01	1.00E+00	3.62E-03	8.12E-02	2.20E+03
Ba-137m	9.46E-01	2.75E-01	9.46E-01	3.42E-03	7.68E-02	2.08E+03
Ce-144	6.42E-05	1.87E-05	2.21E-02	8.00E-05	2.72E-05	7.37E-01
Eu-154	2.67E-03	7.76E-04	1.13E-01	4.09E-04	3.27E-04	8.85E+00
U-234	4.03E-07	1.17E-07	3.81E-06	1.38E-08	3.61E-08	9.78E-04
U-235	1.34E-08	3.90E-09	1.27E-07	4.60E-10	1.20E-09	3.25E-05
U-236	3.38E-08	9.83E-09	3.22E-07	1.17E-09	3.03E-09	8.21E-05
U-238	2.37E-07	6.89E-08	2.26E-06	8.18E-09	2.13E-08	5.76E-04
Np-237	4.60E-08	1.34E-08	6.97E-05	2.52E-07	7.33E-08	1.98E-03
Pu-238	4.03E-08	1.17E-08	4.72E-04	1.71E-06	4.75E-07	1.28E-02
Pu-239	4.04E-08	1.17E-08	3.12E-03	1.13E-05	3.12E-06	8.44E-02
Pu-240	4.04E-08	1.17E-08	8.78E-04	3.18E-06	8.80E-07	2.38E-02
Pu-241	2.65E-08	7.70E-09	3.22E-02	1.17E-04	3.22E-05	8.70E-01
Am-241	3.15E-05	9.16E-06	3.16E-01	1.14E-03	3.18E-04	8.61E+00
Cm-242	2.52E-12	7.33E-13	6.56E-09	2.37E-11	6.75E-12	1.83E-07
Cm-243	2.47E-08	7.18E-09	4.31E-05	1.56E-07	4.50E-08	1.22E-03
Cm-244	3.99E-07	1.16E-07	7.00E-04	2.53E-06	7.31E-07	1.98E-02

TABLE 6.2: TOTAL RADIONUCLIDE INVENTORY BASED ON AVERAGE DISTRIBUTION

nuclide	ratio nuclide/Cs-137	Curies	curies/m ³	nCi/gm
H-3	1.73E-05	5.09E-06	1.41E-06	3.80E-02
C-14	1.03E-06	3.03E-07	8.37E-08	2.26E-03
Co-60	8.39E-04	2.47E-04	6.81E-05	1.84E+00
Se-79	1.74E-06	5.12E-07	1.41E-07	3.82E-03
Y-90	1.96E+00	5.77E-01	1.59E-01	4.31E+03
Sr-90	1.96E+00	5.77E-01	1.59E-01	4.31E+03
Tc-99	4.19E-04	1.23E-04	3.40E-05	9.21E-01
Ru-106	3.06E-03	9.01E-04	2.49E-04	6.72E+00
Sb-125	1.45E-02	4.27E-03	1.18E-03	3.19E+01
I-129	3.10E-06	9.12E-07	2.52E-07	6.81E-03
Cs-134	3.10E-03	9.12E-04	2.52E-04	6.81E+00
Cs-137	1.00E+00	2.94E-01	8.12E-02	2.20E+03
Ba-137m	9.46E-01	2.78E-01	7.68E-02	2.08E+03
Co-144	1.30E-03	3.83E-04	1.06E-04	2.86E+00
Eu-154	8.84E-03	2.60E-03	7.18E-04	1.94E+01
U-234	5.94E-07	1.75E-07	4.82E-08	1.31E-03
U-235	1.98E-08	5.83E-09	1.61E-09	4.35E-05
U-236	4.99E-08	1.47E-08	4.05E-09	1.10E-04
U-238	3.50E-07	1.03E-07	2.84E-08	7.69E-04
Np-237	3.94E-06	1.16E-06	3.20E-07	8.66E-03
Pu-238	2.64E-05	7.77E-06	2.14E-06	5.80E-02
Pu-239	1.75E-04	5.15E-05	1.42E-05	3.85E-01
Pu-240	4.92E-05	1.45E-05	4.00E-06	1.08E-01
Pu-241	1.80E-03	5.30E-04	1.46E-04	3.96E+00
Am-241	1.77E-02	5.21E-03	1.44E-03	3.89E+01
Cm-242	3.70E-10	1.09E-10	3.01E-11	8.13E-07
Cm-243	2.43E-06	7.15E-07	1.97E-07	5.34E-03
Cm-244	3.96E-05	1.17E-05	3.22E-06	8.70E-02

7.0 CONCLUSIONS

- 7.1 Solid Waste Engineering is provided with the results to determine the waste classification.
- 7.2 The three detectors operated as expected providing good correlation of ¹³⁷Cs activity along the length of the thermocouple tree.

8.0 REFERENCES

1. Memo, D. C. Hetzer to P. A. Gagnon, "Radionuclide Distribution for the 101-AZ Waste Tank W-151 Disposal Project", 77520-95-073, dated August 29, 1995.
2. cc:Mail, G. L. Troyer to S. F. Kessler, "Thermocouple 13D Gamma Assay Data - Final", dated February 15, 1995, 9:18 a.m.
3. Memo, J. V. Nelson to E. M. Nordquist, "Recommendation on Configuring the Flexible Receiver Radiation Detection Assessing Residual Contamination on Thermocouple Instrument Trees Pulled from Tank 101-AZ", dated November 15, 1995.

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	Criticality and Shielding	Date 05/23/96
Project Title/Work Order		EDT No. 616553
Radioisotope Inventory of the T101AZ Thermocouple Tree From Riser 13D		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
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M. D. Ellefson	S6-30	X			
P. A. Gagnon	S6-31	X			
J. G. Greenborg	H0-35	X			
D. C. Hetzer	S6-31	X			
S. F. Kessler	H0-35	X			
E. M. Nordquist	S2-48	X			
A. L. Ramble	A3-38	X			
H. L. Roach	H5-57	X			
G. L. Troyer	T6-50	X			
Project Files	H6-08	X			
Central Files (Original + 3)	A3-88	X			