Discussion of event monitor dosimetry for NLCTA wood-lead boxes atop accelerator enclosure.

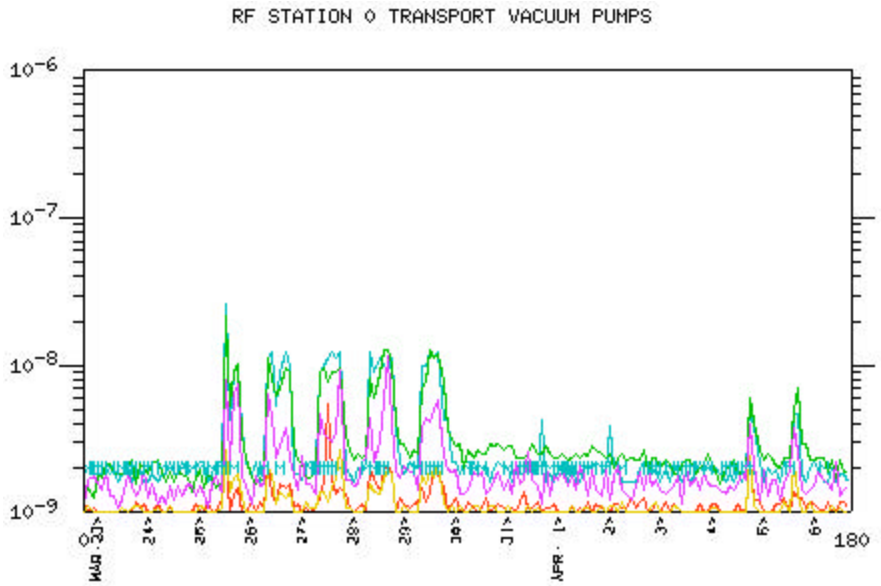
Keith Jobe
April 16, 2002

Event monitor data 3/22/2002 through 4/15/2002

Conditions:

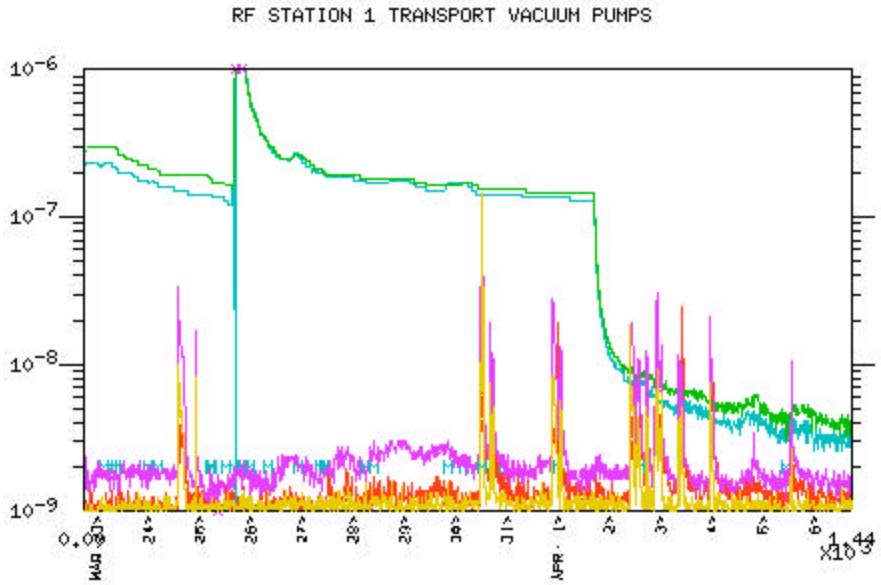
- Several days of long pulse running, March 25 – 29. This running was at higher rf power than typical for station 0. Excessive gas and rf faults observed.
- Few days of short pulse running April 4 and 5

Station 0



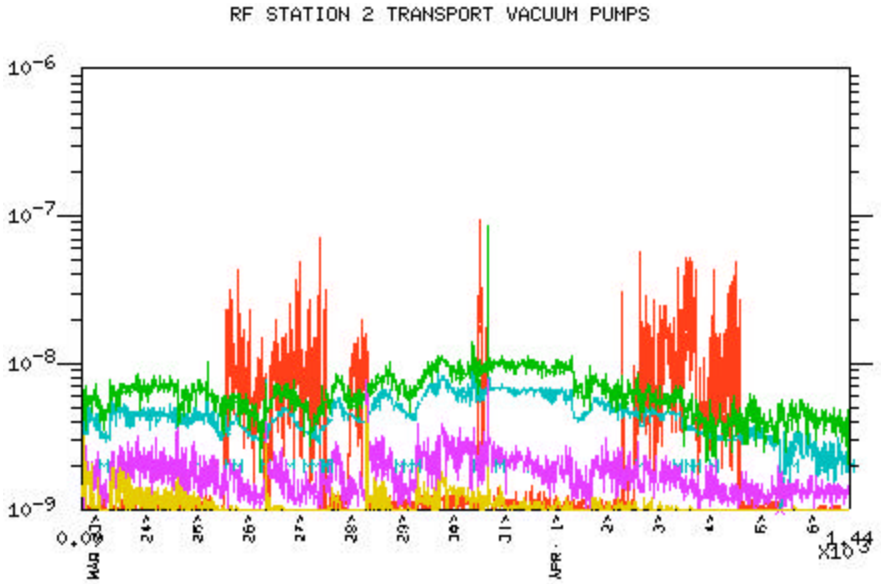
	Contact	Inside	Outside	Outside Mr/hr
SLED Head	5100	64	20	0.5
Bend 1	103	122	7	0.1
Bend 2	853	525	10	0.2

Station 1



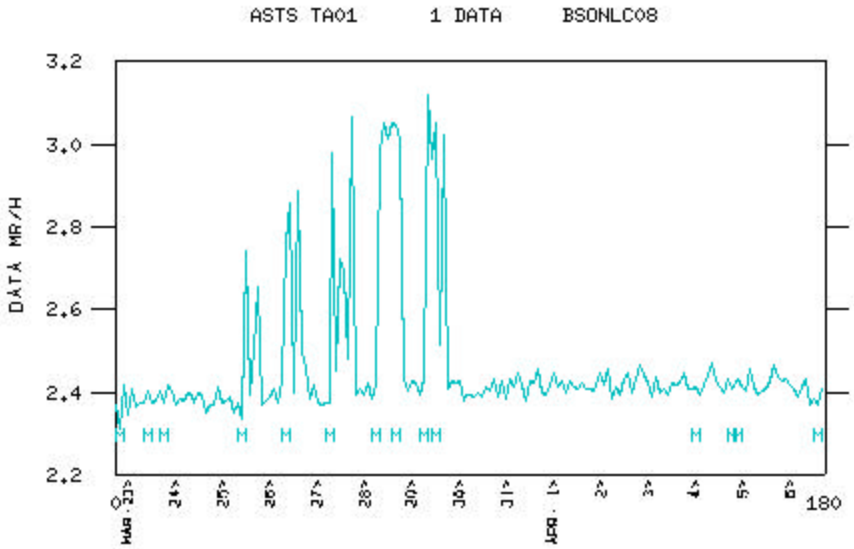
	Contact	Inside	Outside	Outside Mr/hr
SLED Head	29	0	10	0.4
Bend 1	6	0	10	0.4
Bend 2	8	0	0	0

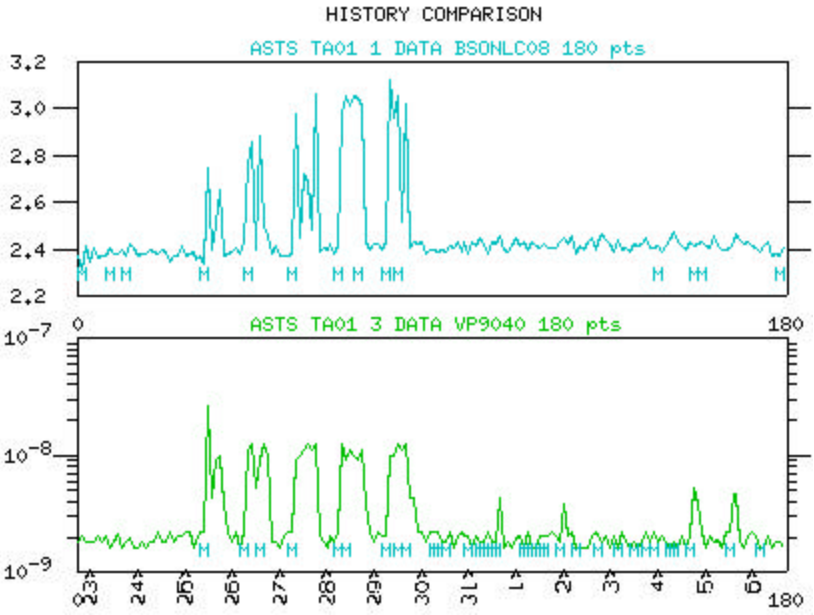
Station 2



	Contact	Inside	Outside	Outside Mr/hr
SLED Head	670	15	1	0
Bend 1	6	0	6	0
Bend 2	50	25	19	0.1

BSOIC # 8


ASTS TA01 1 DATA BSONLC08
DATA MR/H
3.2
3.0
2.8
2.6
2.4
2.2
180

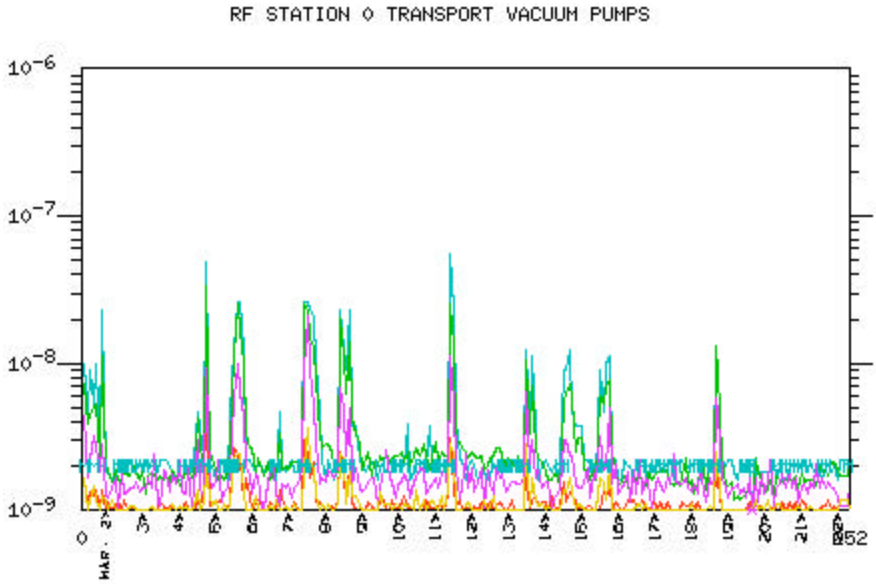

HISTORY COMPARISON
ASTS TA01 1 DATA BSONLC08 180 pts
3.2
3.0
2.8
2.6
2.4
2.2
0
180
ASTS TA01 3 DATA VP9040 180 pts
10-7
10-8
10-9
0
180

Event monitor data 11/2/2001 through 3/22/2002

Conditions:

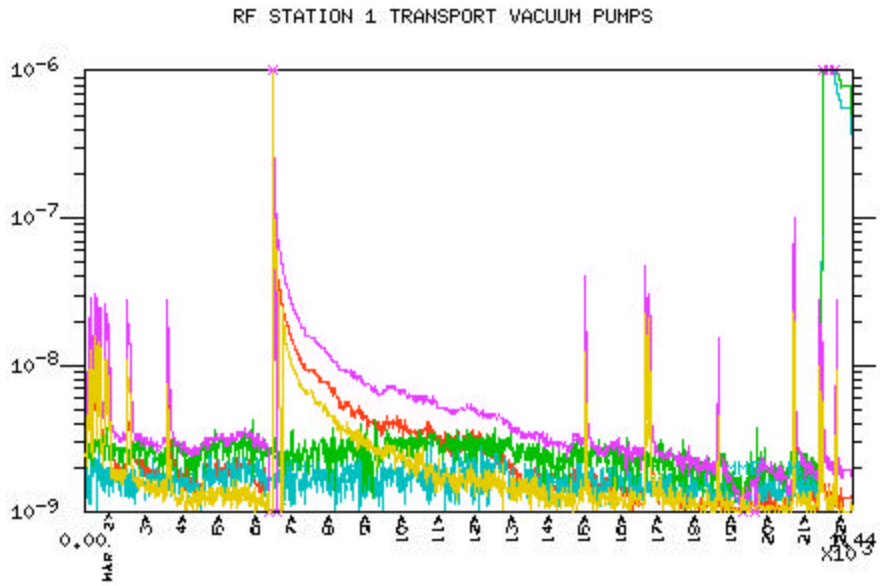
- More intense long pulse running. This running was at higher rf power than typical for station 0. Excessive gas and rf faults observed. Operation of rf source was technically difficult.
- Beam loss during this period was significant, concentrated near rf bunch length monitor on station 2 structure 1. Area near monitor was contaminated with ^{61}Cu made from ^{63}Cu. ^{61}Cu decays by electron capture to ^{61}Ni, emitting a 2.2 MeV photon with a half-life of 3.3 hrs. Several days of cooldown reduced contamination to below regulatory levels.

Station 0



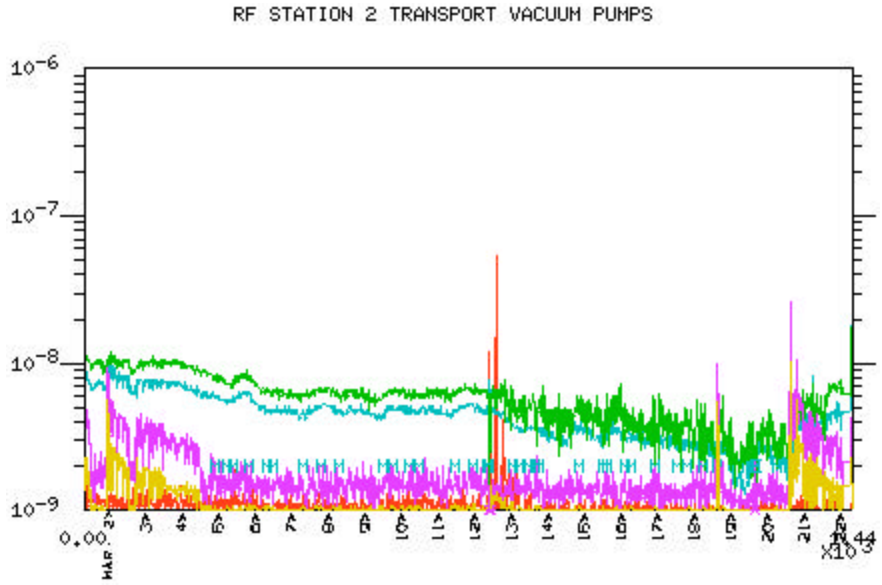
	Contact	Inside	Outside	Outside Mr/hr
SLED Head	22000			
Bend 1	166		36	0.5
Bend 2	1500		50	1

Station 1



	Contact	Inside	Outside	Outside Mr/hr
SLED Head	100		28	
Bend 1	30		24	
Bend 2	36		25	

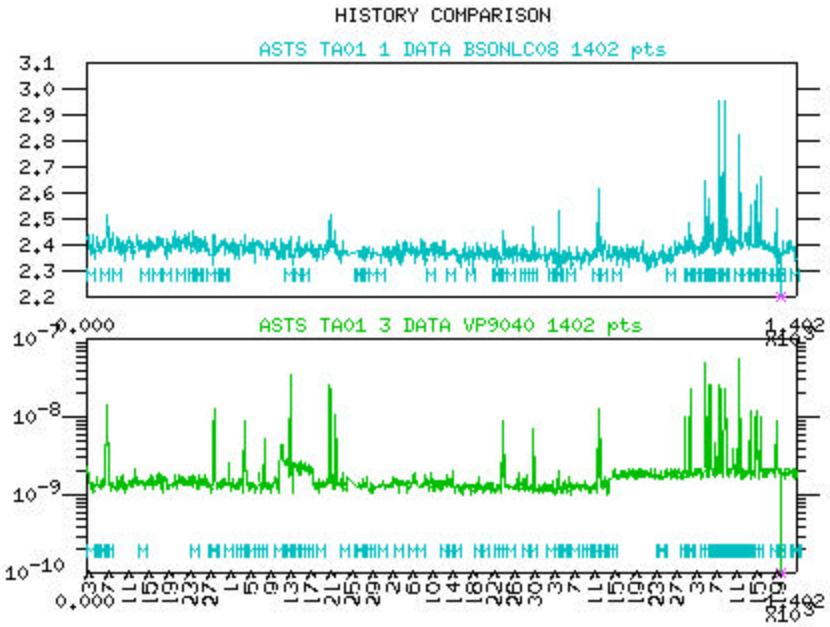
Station 2



	Contact	Inside	Outside	Outside Mr/hr
SLED Head	10000		28	
Bend 1	30		36	
Bend 2	77		21	

BSOIC # 8

Unit tripped rf sources off several times. Trip level is 10 mR/hr. Radiation levels were observed to be very inconsistent and fluctuated wildly.



EVENT TLD DOSE REPORT

Report Date: 4/15/2002
Reported by: Henry Tran
Filename: 20020411_1147

Requested by: K. Jobe/R. Nelson
General Location/Event: NLCTA Roof
Date of Request: 3/22/2002
Estimated Retrieval Date: 4/10/2002

FOR MODERATED TLD'S

Location Number	TLD Number	E1 [mR]	E2 [mR]	E3 [mR]	E4 [mR]	Photon* [mrem]	Neutron** [mrem]

* Photon dose based on the formula [E4/0.8]
The 0.8 factor is based on an E3/E4 signal ratio of about 1 to 2 (which is based on Cs-137 on phantom calibration)
** Neutron dose was based on the formula [(E2-E4*0.9)/2.9].
The 0.9 factor is the E2/E4 element ratio based on Cs-137 photons on phantom
The 2.9 factor is based on the perceived most prevalent neutron spectra (at FFTB)

FOR BARE TLD'S

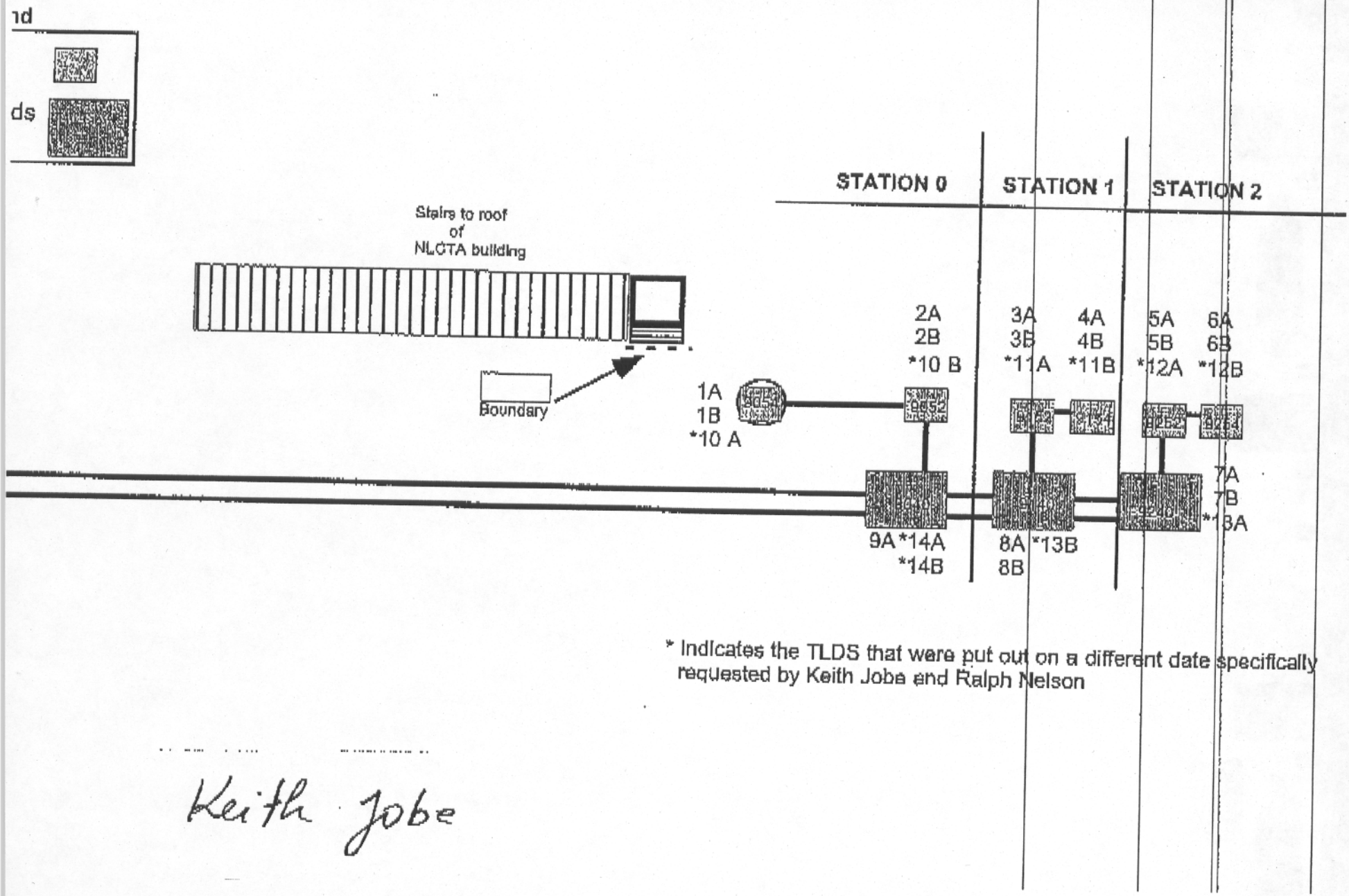
Location Number	TLD Number	E1 [mR]	E2 [mR]	E3 [mR]	E4 [mR]	Photon*** [mrem]	Neutron*** [mrem]
01A	4918	853.1	517.8	1320.8	845.1	**654.0**	**0.0**
01B	4916	9.7	4.1	14.7	10.7	**0.0**	**0.0**
02A	6001258	103.4	84.4	205.3	139.7	**95.0**	**0.0**
02B	6000279	6.9	0.4	12.6	11.1	**0.0**	**0.0**
03A	6001115	6.4	0.0	1.7	2.0	**0.0**	**0.0**
03B	6000147	10.7	0.0	2.9	4.1	**0.0**	**0.0**
04A	6000051	8.4	0.0	6.3	6.9	**0.0**	**0.0**
04B	6007189	0	0	2.2	2.2	**0.0**	**0.0**
05A	6001512	6.7	2.8	1.4	0.9	**0.0**	**0.0**
05B	6000146	5.8	0.0	4.5	4.1	**0.0**	**0.0**
06A	6000436	47.9	18.1	6.5	7.5	**0.0**	**14.0**
06B	6000959	19.0	14.0	5.6	6.3	**0.0**	**0.0**
07A	6005611	666.1	524	820.4	675.9	**587.0**	**0.0**
07B	20046	1.3	0.0	5.6	3.0	**0.0**	**0.0**
08A	6000687	29.1	26.1	45.6	29.8	**23.0**	**0.0**
08B	6006872	9.6	0	4.5	5.4	**0.0**	**0.0**
09A	6005610	5125.8	4600.0	7565.5	9133.7	**5395.0**	**0.0**
10A	32349	535.1	503.1	1243.0	524.0	**470.0**	**53.0**
10B	3226	122.2	114.4	305.5	139.7	**95.0**	**0.0**
11A	373	0.0	0.0	2.7	3.7	**0.0**	**0.0**
11B	2992	0.0	0.0	5.1	3.9	**0.0**	**0.0**
12A	197	0.0	0.0	0.5	1.2	**0.0**	**0.0**
12B	20263	25.0	9.9	16.2	19.6	**0.0**	**0.0**
13A	4288	15.4	18.4	51.9	25.2	**0.0**	**0.0**
13B	4212	0.0	0.0	4.6	3.1	**0.0**	**0.0**
14A	4065	64.0	48.7	159.2	91.3	**57.0**	**0.0**
14B	6000494	20.2	5.9	10.6	10.6	**0.0**	**0.0**

*** Calculations were based on the N-PH algorithms of the Panasonic.
A factor of 2 was NOT used to take into account undetectable high energy neutrons.

SLAC OHP Radiological Survey Form

SURFACE CONTAMINATION ☐ RADIATION SURVEY

AREA / ITEM SURVEY: **NLCTA Bldg. (outside)**



* Indicates the TLDS that were put out on a different date specifically requested by Keith Jobe and Ralph Nelson

Keith Jobe

EVENT TLD DOSE REPORT

Report Date: 4/3/02
Reported by: Henry Tran
Filename: 20020328_1019

Requested by: R. Nelson
General Location/Event: NLCTA Roof
Date of Request: 11/2/01
Estimated Retrieval Date: 3/22/02

FOR MODERATED TLD'S

Location Number	TLD Number	E1 [mR]	E2 [mR]	E3 [mR]	E4 [mR]	Photon* [mrem]	Neutron** [mrem]

* Photon dose based on the formula [E4/0.8]
The 0.8 factor is based on an E3/E4 signal ratio of about 1 to 2 (which is based on Cs-137 on phantom calibration)
** Neutron dose was based on the formula [(E2-E4*0.9)/2.9].
The 0.9 factor is the E2/E4 element ratio based on Cs-137 photons on phantom
The 2.9 factor is based on the perceived most prevalent neutron spectra (at FFTB)

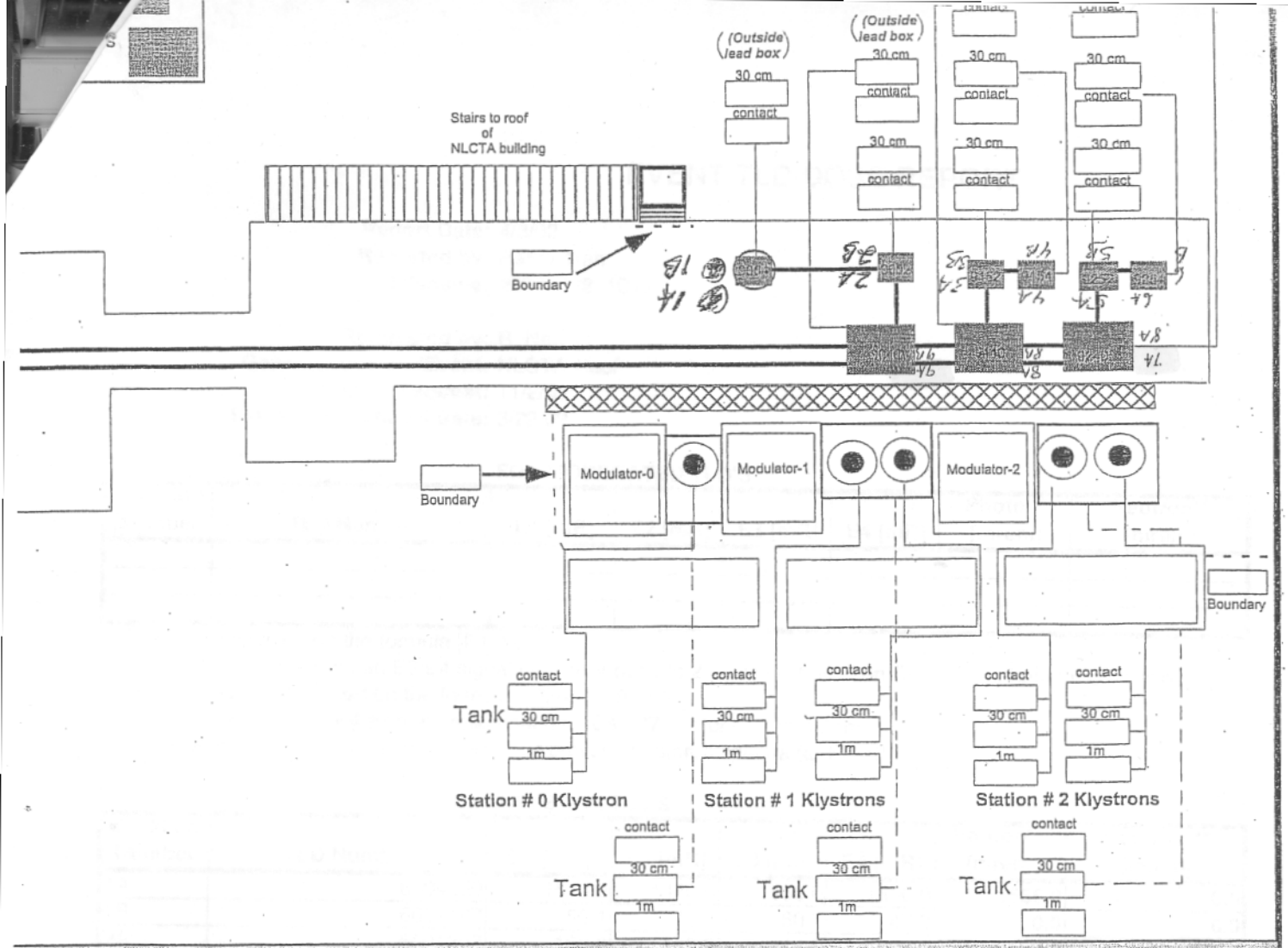
FOR BARE TLD'S

Location Number	TLD Number	E1 [mR]	E2 [mR]	E3 [mR]	E4 [mR]	Photon*** [mrem]	Neutron*** [mrem]
1A	6004460	1510.0	1470.0	1950.0	1890.0	**1555.0**	**0.0**
1B	6001167	50.1	45.9	60.3	47.3	**0.0**	**0.0**
2A	6001383	166.0	160.0	314.0	237.0	**168.0**	**0.0**
2B	6000600	36.0	26.7	27.5	28.5	**0.0**	**0.0**
3A	6001157	30.0	23.4	17.4	17.9	**0.0**	**0.0**
3B	6001411	24.6	20.4	20.4	21.3	**0.0**	**0.0**
4A	6001043	36.6	24.8	18.3	20.0	**0.0**	**0.0**
4B	6000450	25.9	25.3	21.9	20.8	**0.0**	**0.0**
5A	6007746	30.3	25.7	16.3	16.6	**15.0**	**12.0**
5B	6001930	35.7	25.0	30.6	30.3	**27.0**	**0.0**
6A	6001918	77.3	41.7	27.0	21.9	**0.0**	**12.0**
6B	6001931	21.1	21.8	24.1	25.5	**22.0**	**0.0**
7A	6001959	10000.0	7180.0	1560.0	11700.0	**8810.0**	**0.0**
7B	6001916	28.9	32.2	36	32.1	**0.0**	**0.0**
8A	6001104	100.7	62.8	99.5	72.1	**34.0**	**0.0**
8B	6008065	28.4	26.2	21.2	22.5	**20.0**	**0.0**
9A	6001159	22300.0	19800.0	43800.0	28900.0	**22429.0**	**0.0**
9B	6000990	N/A	N/A	N/A	N/A	N/A	N/A

*** Calculations were based on the N-PH algorithms of the Panasonic.
A factor of 2 was NOT used to take into account undetectable high energy neutrons.

7A WAS INSIDE SHIELDING ON STATION 2

9A WAS INSIDE SHIELDING ALSO ON STATION 2



Radiation Survey

INST TYPE:	SERIAL # :	HIGH RAD BOUNDARY -X-X-X-X-X-X-X-X-X-X	RAD BOUNDARY	Radiation Survey Points (expressed in mR/hr)
	CAL DUE:			

Contamination Survey

Inst TYPE:	SERIAL#:	Efficiency %:	AVG.BKG CPM	CONTAMINATION AREA ///////	RMMA ☐YES ☐NO	Contamination survey points expressed as loose surface contamination.
	CAL DUE:					

Survey data is for loose surface contamination unless otherwise stated.

Record DPM as <MDA if net cpm is < 100 cpm above background
MDA = 1000 dpm/100 cm^2 unless otherwise stated on back

Survey Point	cpm/100 cm^2	net dpm	Location
1			
2			
3			
4			

Additional information

	Klystron Rate	SLED PEAK PWR	SLED Pluse Length (ns)
STATION 0			
STATION 1			
STATION 2			

NO Beam ☐ Beam ☐

Rate	Pulse length	Beam current (A)