To: Radiation Physics June 12, 2003

From: Keith Jobe, NLCTA Safety Officer

Subject: Special Monitors at NLCTA February 2003 through June 2003

Cc: OHP (Frey, Tran), NLCTA Operations

The following graphical maps indicate the locations of the Special Monitors installed at NLCTA over the period February 10, 2003 through June 3 2003. (Special Monitors are identical to the traditional "Event Monitors").

This set of data has no unpleasant surprises and contains a few pleasant ones.

Most reassuring is the low dosage of the monitors near the 8-Pack rf processing operations. The 8-Pack operation has been plagued with bursts of radiation believed to be small, but frequently large enough to exceed the local BSOIC monitor's threshold of 10 μR[1]. This dosimetery program is a lagging indicator which indicates that the occupational radiation exposure from 8-Pack operations has been low.

Normal operation of the NLCTA has occurred during this period. The current program for the 8-Pack is the processing of rf loads. In this phase, 7 of the required 10 and possible 12 loads have undergone rf processing.

- The largest doses were on the flower pedal mode converters that launch the SLED compressed rf from into the over-moded high power transport lines for Stations 0 and 2. Dosimetery recorded contact doses of around 6 R. These sources are inside the lead shielding enclosures. The contact doses recorded on the outside of the shielding enclosures were negligible.
- Flower pedal mode converters are also used in the Station 0 rf transport system. The "bend 2" location also recorded anonymously high doses, with a 1 R dose recorded on the inside of the lead shielding enclosure. The contact dose recorded on the outside of the local shielding enclosure was 35 mR.
- The doses recorded on the outside of all of the other the lead shielding enclosures were all negligible.
- Area readings for the 8-Pack (located at typical and closest locations for operating personnel) were all quite low. The dosimeter closest to the emission area recorded 21 mR integrated dose, while the others read 5, 7, 17, and 3 mR (closest -> furthest). Square law extrapolation based on the closest dosimeter alone would suggest an occupational exposure of 2-5 mR.[2] which is consistent with the readings of the other monitors.

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[1] The BSOIC is set to trip at 4 mR/hr above background. With the pigtail installed, the response time is approximately 10 seconds. The detector will thus trip with a 10 μR near-instantaneous rf breakdown exposure.

[2] The dosimeter near Klystron 8 is (depending on the presumed radiation source) 2-4 times closer to the source than the location that operators normally congregate. This naively predicts an occupational exposure of 4-16 times less than the 21 mR reported.

- Contact readings on the 8-Pack rf devices are not an accurate assessment of the radiological exposure, since they were not installed for 40% of the operational activities (they were removed for a vacuum processing bake cycle and not reinstalled). These readings were nonetheless surprisingly low, peaking at 27 mR. One detector was installed for the entire period (klystron 8 window) reported 13 mR. All of these devices are within a posted Radiation Area.
- Contact readings on the NLCTA klystrons and on the first mode converters in the sequence (long pulse length, uncompressed rf) were reasonable. The 3 monitors on the klystron modulators recorded less than 400 mR each and the contact doses were less than 500 mR each. These are in low occupancy areas and are in a posted Radiation Area.

For the next cycle of measurements, a small number of the Luxel optically stimulated luminescence dosimeters are supplementing the Panasonic TLDs for the low-dose locations near the 8-Pack and at some additional areas. These may provide more useful data, owing to their lower detectable reading thresholds. Also, a few Luxels have been located at higher dose locations to gain experience with this newer technology.

OHP has established a new Area Monitor location (F34-01) near and above the 8-Pack. The NLCTA dosimetery program has added this location to our surveillance program as well.

Luxel dosimeters do not have an appropriate background subtraction method available. Thus, two additional monitoring locations have been established to determine environmental background levels.

All of the data quoted were based on the average of the corrected E1 through E4 readings provided by dosimetery group of ES&H. The table of values and their mean is attached.

print size: 1:24

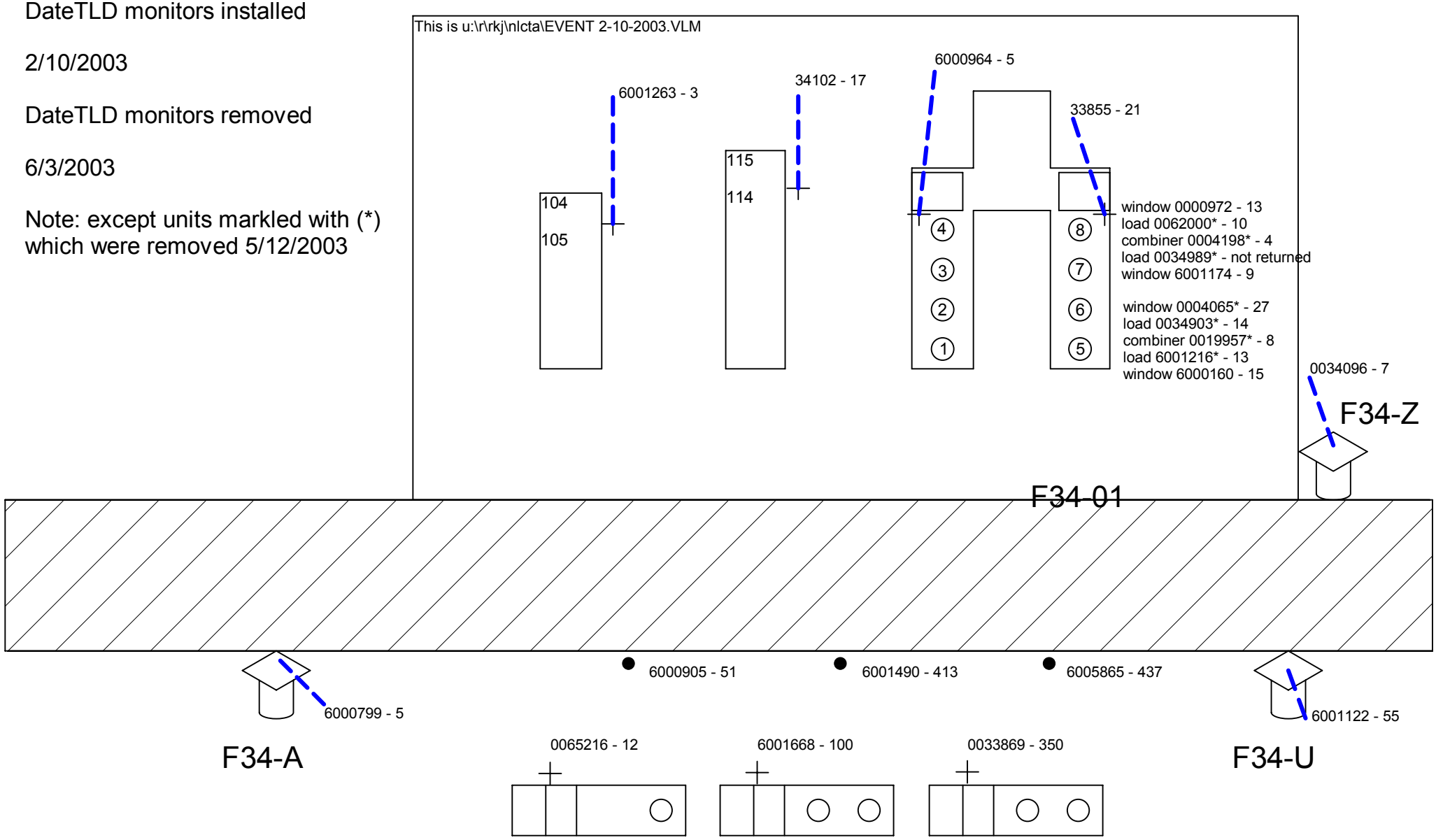
DateTLD monitors installed

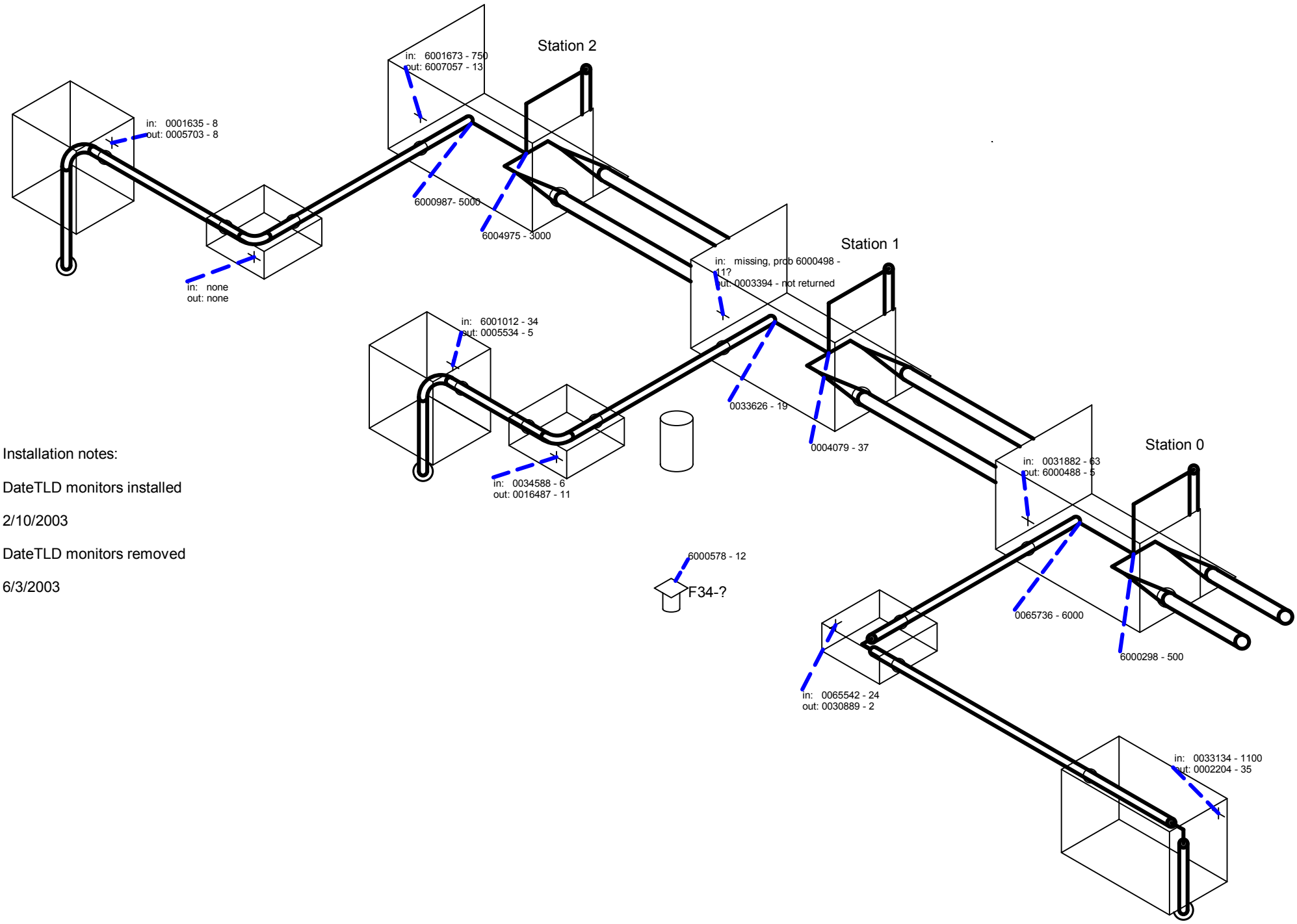
2/10/2003

DateTLD monitors removed

6/3/2003

Note: except units markled with (*) which were removed 5/12/2003





Installation notes:

DateTLD monitors installed

2/10/2003

DateTLD monitors removed

6/3/2003

Event dosimetery for NLCTA from 2/10/2003 to 6/3/2003
Second column is average(MrE1:MrE4), unite of mR for 1/3 calendar year

BadgeId	average	MrE1	MrE2	MrE3	MrE4	Bday
*0000972	13	33	13	4	1	175
*0001635	8	27	2	1	1	175
*0002204	35	39	52	28	20	175
*0002452	1	0	4	0	0	6
*0002916	1	0	5	0	0	6
*0003589	2	0	0	7	0	6
*0004065	27	97	3	4	2	175
*0004079	37	50	38	45	17	175
*0004198	4	15	0	2	0	175
*0005534	5	9	6	6	1	175
*0005703	8	17	4	5	5	175
*0016487	11	30	13	0	0	175
*0019957	8	28	0	2	0	175
*0030889	2	1	0	2	7	175
*0031882	63	62	50	89	50	175
*0033134	1,187	914	790	2,094	948	175
*0033394	24	54	36	1	5	175
*0033626	19	35	21	13	7	175
*0033855	21	50	27	2	6	175
*0033869	353	193	174	686	360	175
*0034096	7	10	10	1	6	175
*0034102	17	44	11	0	12	175
*0034251	11	43	3	0	0	6
*0034566	13	45	6	0	0	6
*0034588	6	23	0	0	2	175
*0034709	32	0	0	1	128	6
*0034903	14	32	6	11	8	175
*0034904	10	41	0	0	0	6
*0062000	10	26	13	0	0	175
*0065216	12	23	15	7	6	175
*0065446	10	34	7	0	0	6
*0065542	24	29	22	34	12	175
*0065643	4	10	2	2	1	6
*0065736	5,777	2,763	4,398	10,445	5,502	175
*6000160	15	36	16	7	3	175
*6000298	474	302	306	764	524	175
*6000488	5	11	10	0	0	175
*6000498	11	24	12	10	0	175
*6000573	5	7	0	8	4	6
*6000578	12	24	19	4	1	175
*6000638	16	60	5	0	0	6
*6000799	5	4	6	8	4	175
*6000905	51	41	38	73	54	175
*6000964	5	17	5	0	0	175
*6000987	5,138	2,957	4,627	9,874	3,093	175
*6001012	34	85	53	0	0	175
*6001122	55	52	33	76	59	175
*6001174	9	29	8	0	0	175
*6001216	13	36	13	4	0	175
*6001263	3	12	0	0	0	175
*6001463	4	16	0	0	0	6
*6001490	413	274	213	859	305	175
*6001668	95	44	32	225	77	175
*6001673	759	645	523	1,289	579	175
*6004273	0	0	0	1	0	6
*6004274	0	0	0	0	0	6
*6004975	3,140	2,120	1,926	6,318	2,197	175
*6005865	437	272	222	1,036	217	175
*6006430	1	0	0	5	0	6
*6007057	13	14	18	12	7	175
*6007967	2	0	0	7	2	6