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Docket No. 50-192

Dr. T. L. Bauer
Reactor Supervisor
University of Texas
College of Engineering
Austin, Texas 78712

Dear Dr. Bauer:

Following receipt of your August 11, 1982 letter to H. Bernard, the staff reviewed the ramifications of the proposed extensive modifications and construction to the building housing your TRIGA reactor. The staff concludes that the license renewal application package must reconsider any effects due to the changes expected from the proposed program, both during as well as after construction, such as, the ventillation system, meteorology, the definition and physical boundaries of restricted and unrestricted areas, dose calculations from stack releases and accident considerations, plus any deviations from your current physical security plan.

In all likelihood, your license renewal will include a condition requiring an environmental survey program that can record effects of atmospheric discharges due to reactor operation. To aid you in developing such a program, we have included a section of a recent amendment to the UCLA license renewal application.

As your license renewal application is scheduled for review early in 1983, we would appreciate receiving the above mentioned SAR amendments by January 15, 1983.

If you have any questions, please contact H. Bernard, the Project Manager at (301) 492-9799.

Sincerely,

Original Signed by:

Cecil O. Thomas, Acting Chief
Standardization & Special
Projects Branch
Division of Licensing

Enclosure:
As Stated

OFFICE	DL:SSPB	DL:SSPB					
SURNAME	HBernard:cc	CThomas					
DATE	9/7/82	9/3/82					

UPDATE OF ENVIRONMENTAL MEASUREMENTS

Several developments have occurred subsequent to submittal of the Renewal Application dated February 1980. Firstly, as a result of Question 8 posed by the Nuclear Regulatory Commission on July 31, 1980, UCLA performed a theoretical analysis of plume dispersion based on a Gaussian plume model and showed that such analysis correlated with the previously described dispersion measurements of Rubin. (Analytical results forwarded to the NRC on 9-5-80). Using this dispersion model, the Commission performed calculations of the attendant radiation levels on the roof of the Mathematical Sciences building assuming (conservatively) that the prevailing wind would be realized 100% of the time. These calculations resulted in an estimated dose of 1.4 mRem per year, and hence lead the Commission to respond negatively (on September 24, 1980) to a petition to shutdown the UCLA Research Reactor (Director's Decision under 10 CFR 2.206, DD-80-30).

In addition to these calculations, UCLA initiated a new environmental measurement program utilizing Thermoluminescent Dosimetry (TLD), beginning on August 20, 1980. As a result of what was learned in the 1976-79 monitoring program, dosimeter locations were chosen to minimize the effect of the natural radioactivity of concrete. In general, all dosimeters were placed on non-concrete structures (wood or metal); however, two dosimeters were located in concrete parking structures remote from the reactor to assess radiation levels attributable to concrete. All dosimeters are changed and read quarterly (every three months). Commencing with the second quarter of the study and thereafter, four dosimeters were transferred from raingutters to lead bricks with the bricks interposed between the TLD and the nearest proximate concrete.

The results of the six quarters of TLD observations are shown in Table II/A-1. The geometrical locations of the TLD's specified in that table are graphically illustrated in Figure II/A-3. Starting in the second quarter, lead bricks, 4 x 4 x 2 (inches) were used at locations A, B, D, and E. The bricks were placed on the top surface of the flat roof structure with the TLD fastened to the top of the brick, The brick orientation provided 2 inches of lead shielding between the TLD and the concrete structure. Dosimeters in locations C, G, H, I, J, K, L, and M were fastened to, respectively: the sheet metal of ventilation systems (C, J, M); telescope and planetarium domes (H, K); a wooden housing for meterological equipment (I); and cooling tower windscreens (G, L). TLD F was placed within the exhaust fan inlet plenum chamber and is analagous to TLD No.3 mounted on the stack top in the 1976-79 series.

This monitoring program was initially designed to use thirteen (13) dosimeters at locations A through M. The vendor pricing policy favored using sixteen (16) dosimeters, hence locations O and P were added for the specific purpose of assessing radiation from concrete. Location N

Table II/A-1

TLD Readings (mRem)

# - LOCATION		8-26-80 12-01-80	12-01-80 3-05-81	3-05-81 5-26-81	5-26-81 8-28-81	8-28-81 11-24-81	11-24-81 2-26-82
A	ROOF TOP, 47'N OF STACK	6	0**	0**	0**	0**	0**
B	ROOF TOP, 50' @ 20°N	5	0**	0**	0**	0**	0**
C	MSA VENTILATION INTAKE, 74' @ 20°N	4	4	4	3	5	5
D	ROOF TOP, 111' @ 51°N	5	0**	0**	0**	0**	0**
E	ROOF TOP, 102' @ 58°N	6	NR*	0**	0**	0**	0**
F	EXHAUST FAN INTAKE PLENUM	12	12	10	14	12	16
G	WINDSCREEN, 38'S OF STACK	3	4	3	2	0	3
H	ROOF TOP, 98' @ 70°N	3	4	4	1	1	0
I	ROOF TOP, 183' @ 68°N	2	5	5	0	3	5
J	ROOF TOP, 353' @ 86°N	0	3	2	0	0	4
K	ROOF TOP, 166' @ 92°N	5	5	4	5	6	3
L	COOLING TOWER, 165' @ 110°N	4	4	3	4	2	3
M	ROOF TOP, 84' @ 148°N	6	6	4	6	6	5
N	VARIOUS	0	LOST	7**	16**	5	5
O	PARKING STRUCTURES	20	16	15	21	17	18
P	PARKING STRUCTURES	21	18	16	15	9	13

**ON LEAD BRICKS

*NOT REPORTED

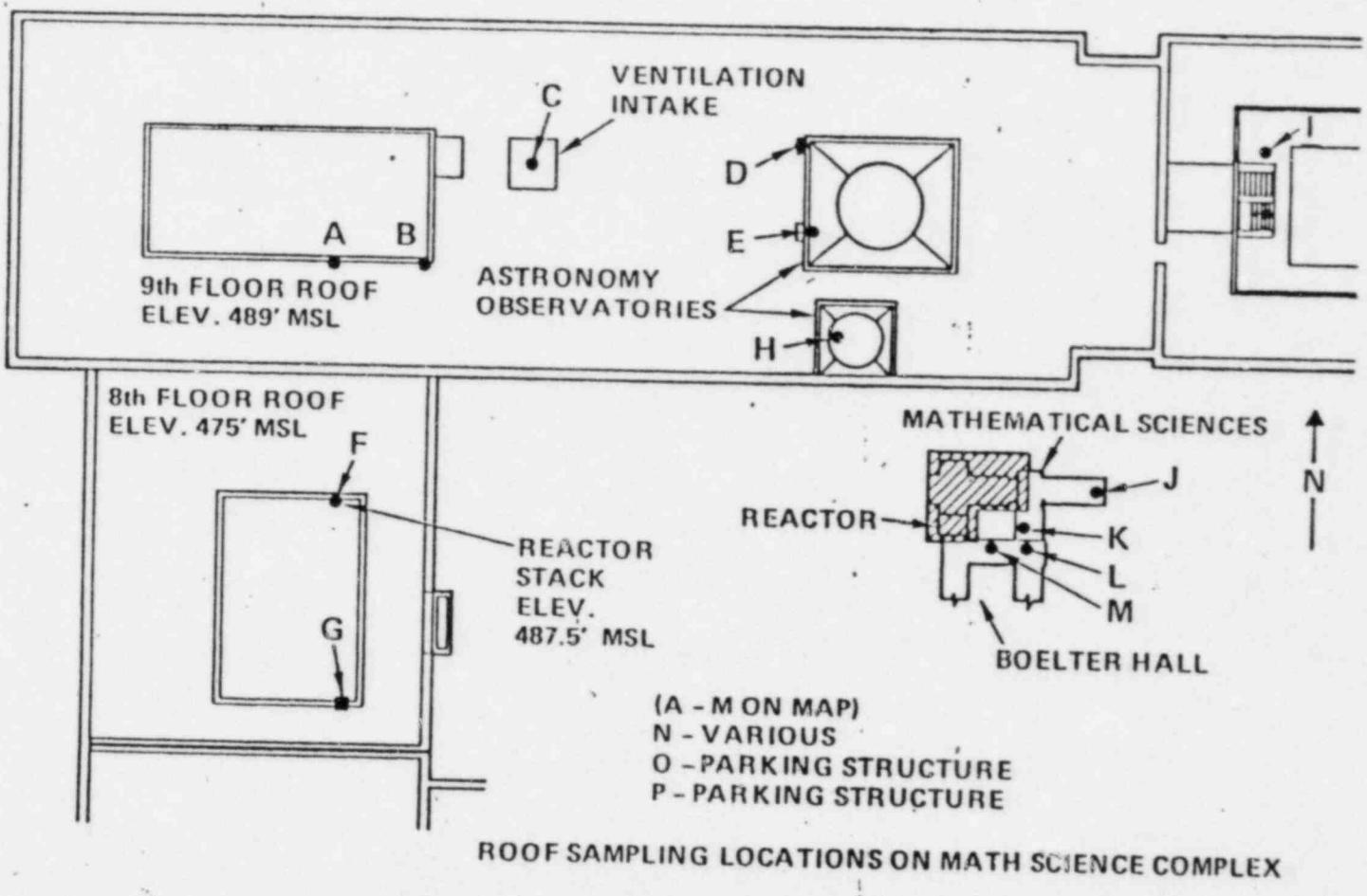

Figure II/A-3. TLD Locations

was chosen to replicate an earlier location where the average measured dose of 8.4 mRem per quarter was somewhat intermediate between values typical of concrete-mounted dosimeters and non-concrete mounted dosimeters. It was the only dosimeter mounted on a lead brick in the first quarter. The value for the first quarter was very low, but successive thefts of the lead bricks in the second and third quarters discouraged the continued use of that location. Therefore, dosimeter N was relocated on a wooden tower; however, it was somehow displaced during the quarter and the reading for the fourth quarter was compromised. Although this badge remained on the tower during the fifth quarter, a decision was made to move the dosimeter to an entirely different location. For the sixth (and current) quarter, the dosimeter has been mounted on the windscreen surrounding the stack. The location is symmetrical relative to concrete walls and parapets, and relative to the TLD in the exhaust fan intake plenum. The objective has been to distinguish between an immersion dose and a background dose in otherwise similar locations.

TLDs O and P were placed in parking structures north of the reactor building for the first three quarters and then placed in parking structures generally west of the reactor for the next three quarters. The location change was made to broaden the sample base.

The radiation levels seen by the TLDs in parking structures (12 readings) averaged 66 mRem per year whereas the TLD in the exhaust fan intake plenum averaged 51 mRem per year. The conclusion that concrete is a source of radiation is inescapable, but the quantitative contribution of this radiation source to arbitrarily placed TLDs is not readily estimated. The TLDs placed on lead bricks showed zero or slightly negative background values even though these locations were in the general downwind direction of the plume. The zero or negative background values are to be expected in that the lead bricks shield out the normal terrestrial component of the natural background radiation, and the reactor exhaust plume contributes no measurable increase in the background downwind from the stack. The average value of all other dosimeters (8 in number, 48 observations) in the roof top vicinity of the stack is 13.6 mRem per year.

The results of this second TLD program indicate that radiation from the plume is low, but that individual observations are probably sensitive to geometry, proximity of concrete, and shielding. A complete separation of the low level plume radiation from natural and man-enhanced (concrete) radiations does not appear to be feasible using TLDs.