UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98105

College of Engineering
Nuclear Reactor Laboratories
Nuclear Reactor Building

January 14, 1988

Dr. Thomas E. Murley
Director
Office of Nuclear Reactor Regulation
U.S.N.R.C.
Washington, D.C. 20555

Docket No. 50-139

Dear Dr. Murley:

This letter is to formally notify the N.R.C. of our plan to amend the Technical Specifications of the UWNR so that the drop time limit for shim rod No. 3 will be 2 seconds. We will, in the near future, submit this request together with the required safety analysis showing that this amendment does not represent any safety problem. The drop time of shim rod number 3 was observed on January 4, 1988 to fall in greater than the one second drop time currently specified in the Technical Specification of the University of Washington Nuclear Reactor (Docket No. 50-139). This failure was reported to Region V by telephone on January 4, 1988. In addition, a gradual loss in excess reactivity due to leakage of water from the fuel box gasket(s) was also verbally reported.

Our interpretation of the rod drop time delay is that during any extended period without operation, the grease lubricating the bearings hardens somewhat. During the prestartup checkout, it is observed that after some rod drops, the drop time invariably decreases significantly. To correct the problem, we will exercise the rod every working day to maintain its freedom of action. We will measure the drop time of Shim Rod No. 3 before each reactor run. As an operational procedure, we will not operate unless the rod drop time is below one second, our current technical specification limit.

Our interpretation of the gradual loss of excess reactivity is that a small leak in one or more of the fuel boxs' lower gaskets is allowing some water to contact the graphite moderator during operation when the core boxes are filled with water. The water is absorbed into the graphite. The rate of reactivity loss is very slow and poses no particular safety concern. The enclosed graph shows our record of the excess reactivity of the core at cold clean critical. As can be seen, the excess reactivity has

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changed very little during the last two years. We will continue to monitor the excess reactivity. If the loss of excess reactivity continues through June 30, 1988, we will not operate further without fixing the leaks. The data show that, during periods of no operation, the increase in excess reactivity is also very slow. Thus, it is not possible for the water in the graphite to be removed suddenly. Therefore, the slow loss of excess reactivity does not represent a safety problem.

Table I shows our data giving the readings from meters of the safety channels along with the thermal heat balance obtained from the coolant flow rate and temperature rise. Table II shows that the relative reading (current generated per unit power) is essentially unchanged from February 1983 to the present. Thus, the slow leakage of water into the graphite has not affected the readings of any of the sensors in the core.

Sincerely,

Maurice A Robkin

Maurica A. Robkin
Professor and Director
Nuclear Engineering Laboratories

c.c. John B. Martin
Regional Administrator
U.S.N.R.C. Region V

A.L. Babb
Chairman
U.W.N.R. Advisory Committee
University of Washington

K.L. Garlid
Chairman
Department of Nuclear Engineering
University of Washington

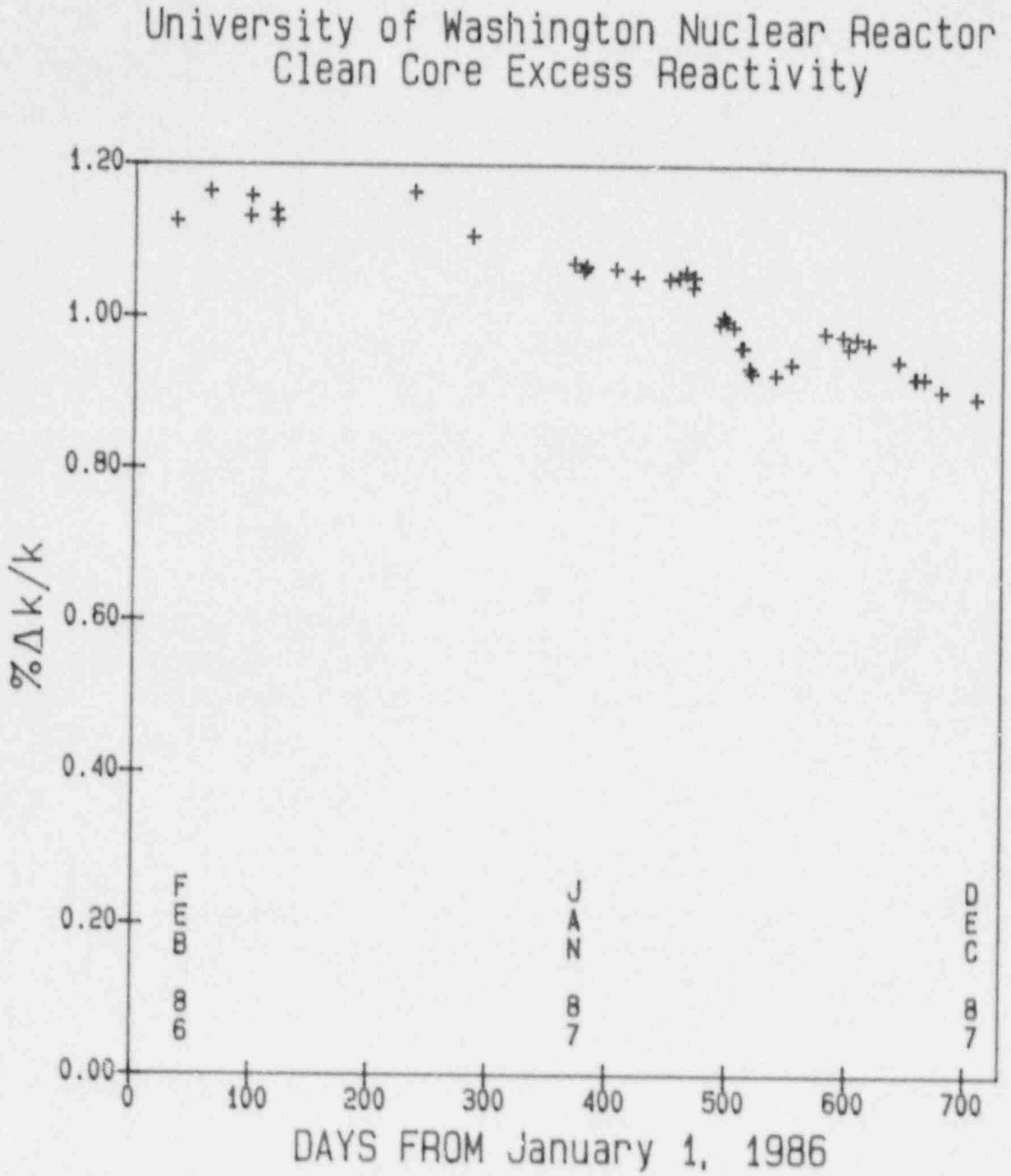
Summary of Thermal Calibrations for UWNR

TABLE I: Operations Data Record

Date	Hours at Power	Linear uamp	Safety Amp #1	Safety Amp #2	Log N uamp	Primary Flow GPM	Delta Temp Cent	KW Thermal
2 22 83	1.6	440	65.5	63.5	55	21.94	16.65	96.1
3 1 84	1.8	440	65.0	63.0	50	22.10	16.31	94.8
5 2 84	1.8	440	65.5	64.0	50	22.10	16.26	94.5
10 19 84	1.7	430	63.0	61.5	50	21.94	16.27	93.9
2 19 85	1+2	435	64.0	62.0	50	22.10	16.25	94.0
7 26 85	1.9	440	64.0	63.0	50	21.85	16.64	95.6
3 26 86	1.9	440	64.0	62.5	50	21.81	16.48	94.5
5 30 86	1.9	440	65.0	63.0	50	22.04	16.58	96.1
6 5 86	1.9	440	65.0	63.0	50	22.06	16.60	96.3
12 6 86	0.9	435	64.5	63.0	50	22.12	16.27	94.6
3 11 87	1.3	440	64.0	63.0	50	22.34	16.06	94.4
6 1 87	1.83	230	34.0	33.0	28	22.31	8.62	50.6
6 4 87	1.7	435	64.0	63.0	50	22.21	16.34	95.5
8 4 87	1.85	435	64.0	63.0	50	22.34	16.12	94.7
12 15 87	2.7	430	63.5	61.5	55	22.30	16.05	94.1

Table II: Ratio of Meter Reading to Heat Balance Thermal Power

Date	Safety Amp #1 uamp/KW	Safety Amp #2 uamp/KW	Log N uamp/KW	Linear Amp uamp/KW
2 22 83	0.682	0.661	0.57	4.58
3 1 84	0.686	0.665	0.53	4.64
5 2 84	0.693	0.677	0.53	4.66
10 19 84	0.671	0.655	0.53	4.58
2 19 85	0.681	0.660	0.53	4.63
7 26 85	0.669	0.659	0.52	4.60
3 26 86	0.677	0.661	0.53	4.66
5 30 86	0.676	0.656	0.52	4.58
6 5 86	0.675	0.654	0.52	4.57
12 6 86	0.682	0.666	0.53	4.60
3 11 87	0.678	0.667	0.53	4.66
6 1 87	0.672	0.652	0.55	4.55
6 4 87	0.670	0.660	0.52	4.55
8 4 87	0.676	0.665	0.53	4.59
12 15 87	0.675	0.654	0.58	4.57


University of Washington Nuclear Reactor
Clean Core Excess Reactivity
%Δk/k
1.20
1.00
0.80
0.60
0.40
0.20
0.00
FEB 86
JAN 87
DEC 87
0
100
200
300
400
500
600
700
DAYS FROM January 1, 1986