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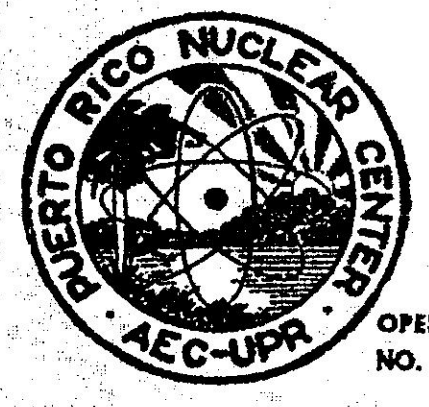
PUERTO RICO NUCLEAR CENTER

OPERATING LIMITS
for
L-77 REACTOR



OPERATED BY UNIVERSITY OF PUERTO RICO UNDER CONTRACT
NO. AT (40-1)-1823 FOR U. S. ATOMIC ENERGY COMMISSION

PUERTO RICO NUCLEAR CENTER
OPERATED BY
UNIVERSITY OF PUERTO RICO
FOR
U. S. ATOMIC ENERGY COMMISSION

AUTHORIZATION

These are the Operating Limits of the L-77 Reactor that have been revised by the Technical Committee. They are hereby approved and put into effect as of January 2, 1964.

Dr. Henry J. Gomberg
Deputy Director

PUERTO RICO NUCLEAR CENTER

OPERATING LIMITS
for
L-77 REACTOR

January 2, 1964

Operated by University of Puerto Rico under contract
No. AT(40-1)-1833 for U. S. Atomic Energy Commission

OPERATING LIMITS
P.R.N.C. L-77 REACTOR

A. Reactor Building

Air conditioned, controlled access.

B. Primary Coolant

None

C. Secondary Coolant

None

D. Core

1. Maximum permissible reactivity above cold clean critical	0.5% Δ K/K
2. Maximum power level	10 watts
3. Maximum burnup	Negligible
4. Maximum fuel temperature	Ambient
5. Maximum moderator temperature	"
6. Maximum permissible fuel loading	That amount which results in no more than 0.5% excess reactivity (1392 grams U_{235} actual)
7. Maximum reactivity to be held in experiments	Not more than 0.5% ΔK/K
8. Maximum peak to average flux ratio	1.60

E. Control & Safety System

1. Minimum shutdown ratio, (safety $\Delta\rho$/ core $\Delta\rho$)	5.2
2. Minimum shutdown margin, (safety $\Delta\rho$- core $\Delta\rho$)	2.1% Δ K/K
3. Maximum reactivity addition rates	0.0075% Δ K/K /sec
4. Minimum reactivity reduction rate	0.007% Δ K/K /sec average for normal control

5. Minimum source rate for start-up — 1.0×10^6 N/sec

6. Maximum scram settings

   a. power — 150% of rated power

   b. period — 5 sec.

7. Minimum frequency of scram test — one month

8. Minimum number and kinds of instrument channels for operation — two

   a. Linear micromicroammeter circuit with U.I.C. and scram contacts at either end of scale.

   b. Seven decade logarithmic micromicroammeter and period meter combination circuit with U.I.C. and adjustable high-power-level scram setting. Period meter has adjustable short period scram setting.

F. Monitoring System

1. Minimum number and kinds of monitoring channels — three

   a. Twin recording area radiation monitor with gamma and beta-gamma detectors.

   b. Constant air monitor.

G. Experimental Facilities

1. Maximum total allowance for experimental facilities — 0.5%Δ K/K

2. No allowance made for X_e poisening, fuel burnup, or temperature coefficient.

3. Insertion of new experiments must be approved by Reactor Division Head. He may request consultation from the Technical Committee and may postpone initiation of the experiment until adequate consultation is accomplished.

H. Administrative and Procedural Safeguards

1. Minimum personnel qualifications

   a. Reactor Division Head

      i. suitable technical degree

ii at least one year of graduate work

iii adequate nuclear science experience

b. Reactor Supervisor

i technical degree

ii background in nuclear science and/or engineering

iii adequate experience in reactor operation supervision

c. Reactor Operators

i high school diploma

ii successful completion of a six month theoretical and practical course in reactor operation

2. Minimum operating personnel requirements

a. Normal operation — one reactor operator

b. Operations involving fuel loading, new experimental setups, nuclear instrumentation and control maintenance — at least one operator, one reactor supervisor and other personnel as required.

3. Minimum records to be kept

a. P.R.N.C. form 400, Check List - Start-up

b. " " 401, Check List - Operations and Shut Down

c. " " 402, Weekly Report

d. " " 411, Weekly and Monthly Check List

4. Minimum loading steps

No deviation from the procedures set forth by the manual, "Procedures for Installation and Reloading of L-77 Reactor" is to be allowed.