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WANL-TMI-1258

Engineering Mechanics

September 22, 1964

EML-1 Reactor Assembly
Axial Vibration Test Con-
ditions & Transducer Summary
- Nozzle Excitation

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WESTINGHOUSE ASTRONUCLEAR LABORATORY

Mr. W. J. Rowan, Manager
Engineering Mechanics

cc:	Arnold, W. H.	Henning, F. W.	Spurrier, F. R.
	Bifano, N. J.	Manjoine, M. J.	Tauch, F. G.
	Bounia, A.	McCreary, H. S.	Thompson, D. C.
	Brussalis, W. G.	Miller, D. F.	Tully, J. P.
	Cernie, S.	Price, J. L.	Warner, P. C.
	DeZubay, E. A.	Retallick, F. D.	Watjen, E. A.
	Esselman, W. H.	Rieke, K. L.	Wisniewski, E. J.
	Fought, H. F.	Roman, W. G.	Library
	Gallagher, J. G.	Selz, A.	File

The nozzle flange excitation tests were concluded on August 28th with the monitoring of Series 37 set of transducers.

The bearing chattering, reported in EE-3709, was greatly reduced with the installation of the control drum bearing preload springs. The modification is defined on Dwg. 909E361. A Belleville spring was installed between the control drum coupling and the outer race of the thrust bearing. The resulting load simulated the pressure drop across the control drums. Tests 1 and 2 were performed with this installation. Although the chattering was greatly reduced, acceleration spikes were still in evidence. In order to investigate the effects of chattering on the outer reactor transducers, the control drums were clamped to the outer reflector for Test 3. The clamping was accomplished by replacing the actual ball bearing with solid rings. An end plate replaced the Belleville spring, thereby, clamping the control drum assembly against the coupling. The modification is shown on Drawing 387D148.

Test conditions and transducers monitored are shown on Table 1 and 2. Control drum chattering was completely eliminated during Test 3.

INFORMATION CATEGORY -

unclassified
W. J. Rowan 7-23-64
Authorized Classifier (Date)

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At the conclusion of Series 37, the reactor was rotated 180° into an up-firing position. Three thrusters will be used to vibrate the reactor at the dome end flange. The control drums will remain clamped.

Test conditions will be the same as for the nozzle excitation.

M. J. Ettenson
Reactor Assembly & Dynamics Experiments

Approved:

D. F. Miller, Supervisor
Reactor Assembly & Dynamics Experiments

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TABLE 1

REACTOR ASSEMBLY AXIAL VIBRATION
SERIES 37

DOWNFIRING NOZZLE FLANGE
EXCITATION

SERIES	TEST	RUN	FREQUENCY	ACCELERATION	DATE	TRANSDUCER SELECTION
37	1	1	2000 to 1000	0.3	8/14	Control Drum
		2	2000 to 70	0.3		
		3	10 to 67	0.3		
		4	2000 to 150	1.0		
		5	2000 to 162	2.0		
37	2	1	62	0.3		Pressure Vessel In- vestigation
		2	62	0.3		
		3	62	0.3		
		4	62	0.3		
		5	62	0.3		
37	3	1	2000 to 1000	0.3	8/28	Control Drum in Clamped Condition
		2	2000 to 85	0.3		
		3	10 to 60	0.3		
		4	2000 to 140	1.0 G		
		5	2000 to 170	2.0 G		
		6	10 to 30	0.3 G		

TABLE 2

TRANSDUCERS MONITORED DURING SERIES 37

S157	Tie Rod 2H5-T1	Strain
S155	Tie Rod 2H5-T2	Strain
A200	Pressure Vessel	Radial Acceleration
A202	Pressure Vessel	Radial Acceleration
A212	Pressure Vessel	Axial Acceleration
A230	Outer Reflector	Axial Acceleration
A240	Control Drum	Radial Acceleration
A242	Control Drum	Radial Acceleration
A254	Control Drum Shaft	Axial Acceleration
A255	Control Drum Shaft	Radial Acceleration
S293	Drive Rod	Force
S295	Drive Rod	Force
S297	Drive Rod	Force
A355	Support Block 631	Axial Acceleration
A371	Support Plate Centerline	Axial Acceleration
S452	Tie Bolt	Strain
S502	Core Support Ring	Longitudinal Strain
S503	Core Support Ring	Circumferential Strain
S504	Core Support Ring	Longitudinal Strain
S508	Core Support Ring	Longitudinal Strain
S552	Dome End Support Ring	Axial Strain
S570	Core Support Ring bolt	Strain
A600	Nozzle Flange (Control)	Axial Acceleration
A606	Pressure Vessel Probe	Acceleration
A250*	Bearing Housing	Axial Acceleration

* Monitored during Test 3 only.