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TITLE

HIGH TESTS OF J-NIGHTL ASSEMBLIES

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Hw-6303

HANFORD LABORATORIES OPERATION
GENERAL ELECTRIC
 RICHLAND, WASHINGTON

November 11, 1959

W. W. Porter
 Plant and Industrial Engineering Operation
 Irradiation Processing Department

FLOW TESTS OF J-PIGTAIL ASSEMBLIES FOR H-REACTOR

Experiments have been conducted in the Hydraulics Laboratory to determine the relative flow characteristics of J-pigtail adapters which were supplied by Lampson Products Company of Seattle. This vendor was having trouble holding tolerance on concentricity between the inlet and outlet end bores; thus, the flow tests were conducted to determine the effect of eccentricity on flow characteristics.

Using the laboratory prototype H-Reactor process tube and outlet fitting assembly, data were obtained to show rear nozzle barrel pressure requirements versus flow rate through a process tube for two different outlet temperatures. Data were obtained for four different pigtail assemblies as identified on the attached graph. The data are nearly identical for the four assemblies and thus show that the two assemblies supplied by yourself (Adapter #4 and Adapter #1) not only are the same as each other but also are the same as the old style helical (Du Pont) pigtail and the same as an early prototype J-pigtail adapter secured from J. W. Hedges as far as hydraulic resistance is concerned.

The curve with the large negative slope on the figure represents a rear nozzle barrel pressure supply curve; this curve shows the pressure available at the rear nozzle barrel as a function of flow rate for a constant front header pressure (550 psig with 3/4 - I&E slugs). The intersection of this supply curve with the temperature parameter lines represents a potential tube operating flow rate. It is then apparent that a relatively large difference in hydraulic resistance of the pigtail assembly would be necessary to cause an appreciable change in the tube operating flow rate. Thus, the data obtained for the four test assemblies show that there would be essentially no effect on operating flow rate due to eccentricity in the pigtail adapter fitting for eccentricity values as great as that represented by your assemblies #1 and #4.

Although I have no data concerning cavitation damage characteristics versus eccentricity, it is my opinion that the eccentricity represented by assemblies #1 and #4 would not appreciably affect cavitation damage.

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D. Waters

INTERNAL HYDRAULICS OPERATION

EDWaters:ag
 1707-D Building

Attachment

cc: 2 J. W. Hedges
 3 J. M. Batch
 4 R. M. Fryar

5 M. A. Clinton
 6 L. P. Reing
 7 R. E. Trumble

8 P. B. McCarthy
 9 E. T. Hubbard
 10 E. D. Waters

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By Authority of SEGundersen,

HLO-CG-4, 1-19-94

By Dik Hanson, 4-21-94

Verified By J. E. Savely 4-21-94

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Flow Rate - GPM @ 15°C

30 35 40 45 50 55

PRESSURE AT REAR NOZZLE BARREL - PSIG

80 100 120 140 160 180 200 220 240 260 280

REAR NOZZLE ADAPTER - 30 to 35 PSIG
 ADAPTER
 J-PIGTAIL - ADAPTER #1
 J-PIGTAIL - ADAPTER #2
 J-PIGTAIL - ADAPTER #3
 STD. METAL PIGTAIL

H-Reactor Neck-up with J-Pigtail Assemblies

140-63023

- 2 -

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