UNCLASSIFIED

EXTERNAL TRANSMITTAL AUTHORIZED

OAK RIDGE NATIONAL LABORATORY

Operated By

UNION CARBIDE NUCLEAR COMPANY

POST OFFICE BOX P
OAK RIDGE, TENNESSEEORNL
CENTRAL FILES NUMBER

56-4-102

~~For Internal Use Only~~

COPY NO. 49

DATE: April 17, 1956

SUBJECT: Procedure for Testing Fission Product Adsorbers
HRT Engineering Test Procedure II A, 10a,b,c,d

TO: R. Van Winkle

FROM: W. D. Burch

Distribution

1. HRP Director's Office, 9204-1	25. D. M. Johnson
2. S. E. Beall	26. R. W. Jurgensen
3. E. G. Bohlmann	27. S. I. Kaplan
4. R. E. Brooksbank	28. P. R. Kasten
5. W. D. Burch	29. J. O. Kolb
6. C. C. Cardwell	30. J. A. Lane
7. E. L. Compere	31. R. B. Lindauer
8. H. N. Culver	32. M. I. Lundin
9. J. S. Culver	33. R. N. Lyon
10. N. W. Curtis	34. D. M. Richardson
11. W. K. Eister	35. J. D. Perret, Jr.
12. J. R. Engel	36. H. K. Search
13. K. E. Estes	37. I. Spiewak
14. J. D. Flynn	38. J. A. Swartout
15. W. R. Gall	39. W. Terry
16. T. H. Gladney	40. T. H. Thomas
17. H. E. Goeller	41. D. S. Toomb
18. J. L. Gory	42. W. E. Unger
19. C. B. Graham	43. K. W. West
20. J. J. Hairston	44. R. Van Winkle
21. B. H. Hamling	45. C. E. Winters
22. P. N. Haubenreich	46. H. E. Williamson
23. J. W. Hill, Jr.	47-48. REED Library
24. H. K. Jackson	49-51. Laboratory Records
	52. Laboratory Records-RC

NOTICE

This document contains information of a preliminary nature and was prepared primarily for internal use at the Oak Ridge National Laboratory. It is subject to revision or correction and therefore does not represent a final report.

UNCLASSIFIED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

To: R. Van Winkle

From: W. D. Burch

Submitted herewith is a proposed test procedure for preparing the charcoal adsorber beds for HRT operation.

W. D. Burch
W. D. Burch

WDB:be

Procedure for Testing Fission Product Adsorbers
HRT Engineering Test Procedure II A, 10a,b,c,d

Purpose of Tests

The fission product adsorbers for the HRT consist of four identical charcoal adsorber beds. Three of the units, in parallel, are designed to remove radioactive gases from the 1000 cc/min O_2 flow vented from the reactor low-pressure assemblies. These units are preceded by a 160-ft section of empty 3-in. pipe as a holdup volume to allow sufficient decay of the short-lived isotopes, mainly Kr^{88} , to prevent overheating in the charcoal beds. These adsorbers are designed for operation with two beds in parallel on stream and the third as a standby.

The fourth bed will adsorb gases from the chemical processing plant vent system.

The beds are designed for continuous use, having sufficient hold-up time to permit decay of all the short-lived isotopes. Approximately 6 curies per day of activity, essentially all 10.3 year Kr^{85} will be discharged up the stack.

The purposes of these tests are:

1. To measure pressure-drop across each of the beds as a function of flow rate.
2. To leak test the completed assembly.

Pressure-Drop Tests

The flow rate pressure-drop curve will be determined for each bed for oxygen flows of 0.1 to 1 liter per minute by installing a manometer just upstream of the beds at HV-729 at which point a temporary connection from the O_2 supply system should be made (see Fig. 1).

Pressure-drop should be essentially independent of the condition of the charcoal surface, so no special precautions need to be made at this time to insure the beds are free of water vapor.

For each measurement, the desired flow should be set by means of FCV-315. To assure equilibrium flow conditions have been reached, the exit flow should be measured by means of a flow meter installed at the gas sample point, HV-741.

Record data in the table on the next page.

Figure 1
Charcoal Beds & Adjacent Piping

Leak Test

All four adsorber units may be leak tested as a unit. The test is to be performed by pressurizing to 100 psig with helium and sniffing all welds, flanges, valves, etc., with a helium leak detector.

- _____ 1. Using vacuum pump, Item 11, if in working order, or a portable pump if required, pull a vacuum on the four beds down to a pressure of about 2 inches of Hg. Include piping through the hand valves 738, 739, and 740 back to the air-operated valves in the cell just beyond the cold traps. Valve off adsorber 10d at HV-742 and HV-730.

_____ Vent the vacuum with helium and raise the pressure to 10 psig.

_____ Flood the pit and check for leaks. Repair any found. If none, raise pressure to 100 pounds and again check and repair any leaks.

_____ Pump the pit empty and check all flanges, welds, valves, etc., with a helium leak detector. Repair any leaks. Recheck.

_____ Again pull system down to a pressure of about 2 in. of Hg.

_____ Vent the beds with dry oxygen.

_____ To insure complete removal of helium and water vapor, pull the beds down to a pressure of 1 mm Hg and vent with oxygen.

_____ Valve off system to keep out air and moisture. The beds will then be ready for operation.