Zr Recycle Installation of Out-of-Cell Accessory Facilities

Fuel Cycle Research & Development

Prepared for
U.S. Department of Energy
Fuel Cycle Research and Development

D. E. Keener, N. M. Sullivan, H. M. Goranflo, J. Glover, P. Mihealsick, D. E. Clark, D. A. Caquelin, B. L. Woody, M. A. Neal, C. W. Irvine, R. R. Brunson, J. A. Johnson, G. D. Del Cul, B. B. Spencer, and E. D. Collins
Oak Ridge National Laboratory

06-September-2016
FCRD-MRWFD-2016-ooo281
ORNL/LTR-2016/483

CONTENTS

LIST OF FIGURES

Zr Recycle: Install Out-of-Cell Accessory Facilities

SUMMARY

Design, fabrication, and installation of the out-of-cell accessory equipment for the Zr Recycle Project tests with actual used nuclear fuel (UNF) cladding was completed on September 9, 2016, shortly before installation of the hot cell equipment. As indicated in Figures 1 and 2, the out-of-cell equipment includes (1) a gas cabinet for a chlorine cylinder, (2) piping and valves, (3) flow control valves, and (4) two shielded plugs in the hot cell walls, one for gas flow piping from the Charging Area and one for electric power and thermocouple instrumentation from the Operating Area. In addition, wiring for flow control signals and piping for Argon gas transfer were run through the existing pass-through tube underneath the hot cell to enable operation of flow controller signals in the Operating Area to the control valves and piping located in the Charging Area. The shielded plug from the Charging Area into the hot cell contains spare lines that can be used in the future for transferring off-gas from the test equipment to tritium traps located in the Charging Area, and then back into the hot cell for caustic scrubbing and venting.

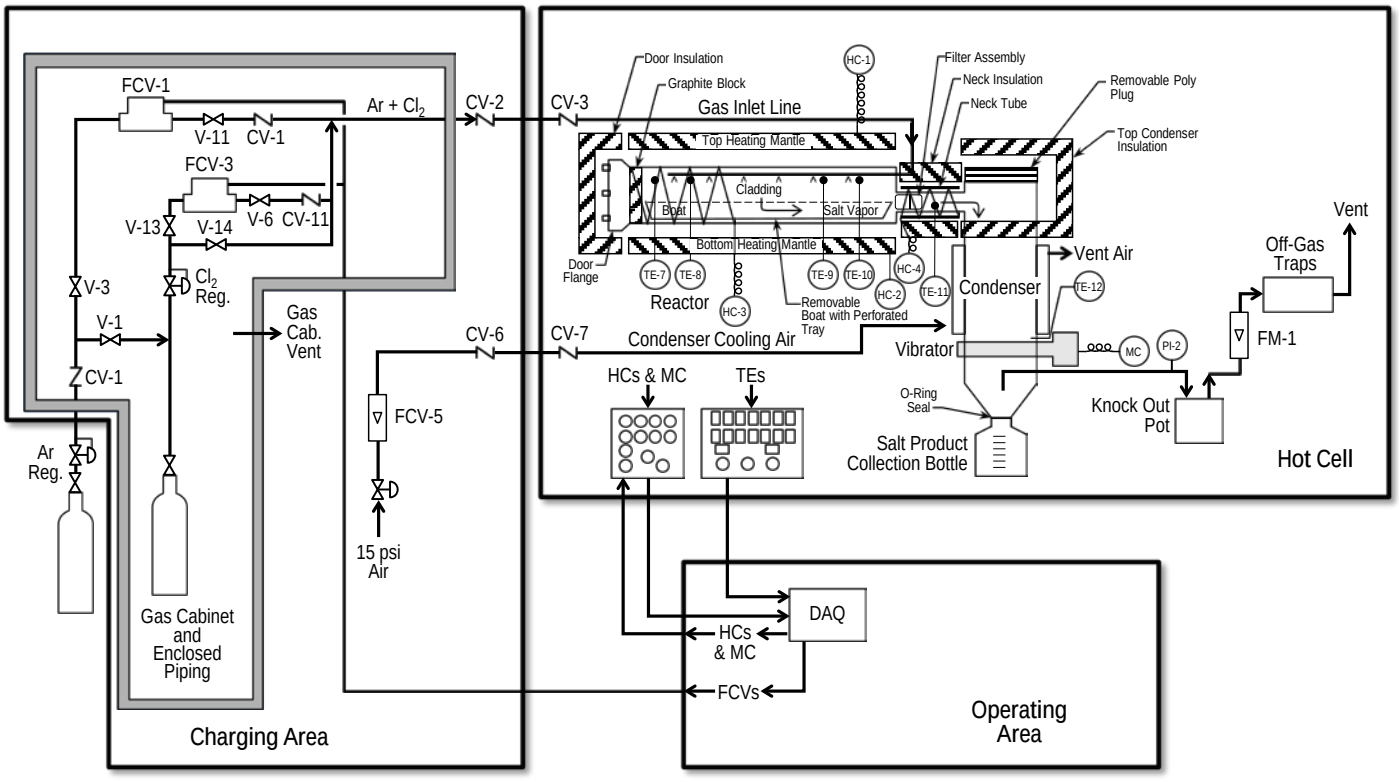

Fig. 1. Zr recycle hot cell and out-of-cell equipment diagram.

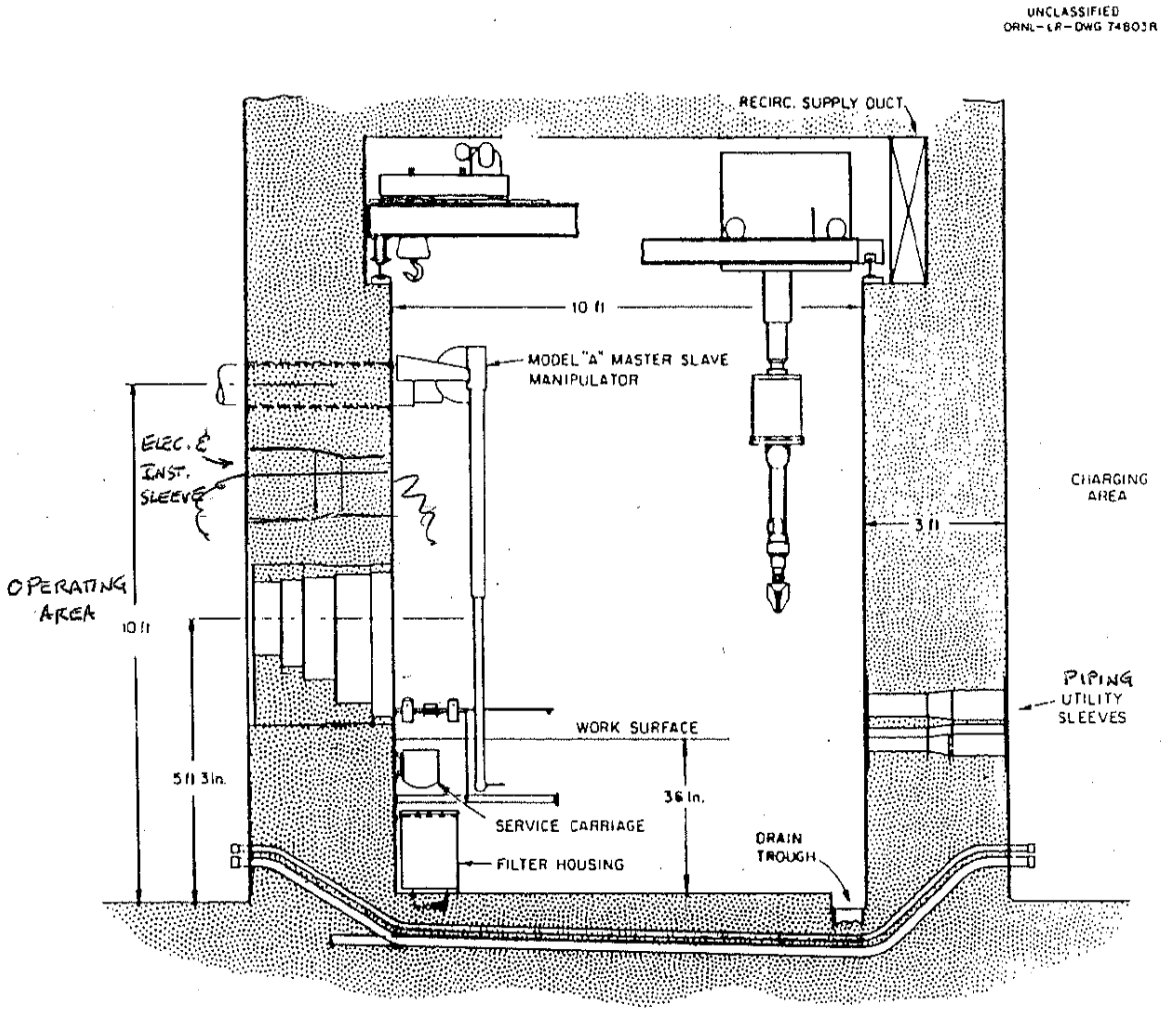

Fig. 2. Vertical section through cell wall.

Fig. 3. Picture of equipment in charging area.

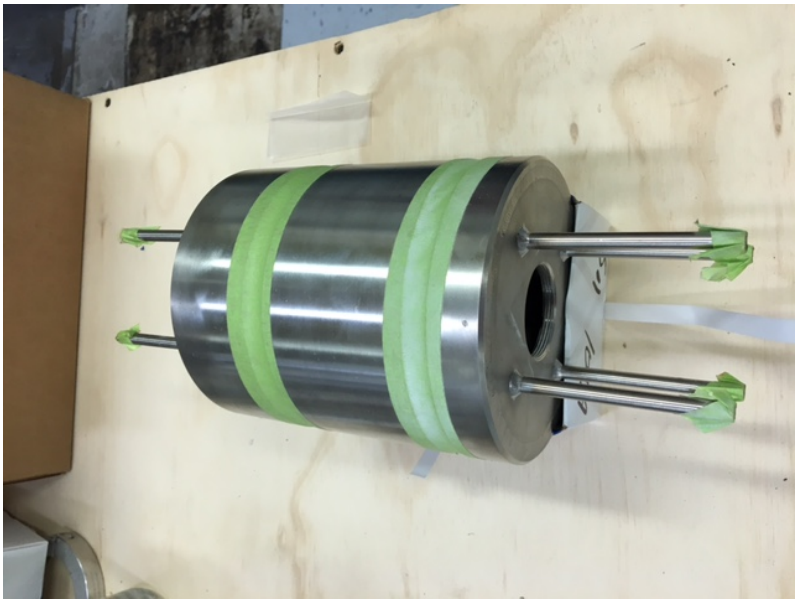

Fig. 4. Picture of piping shield plug before installation.

Fig. 5. Picture of electrical/instrumentation shielding plug before installation.