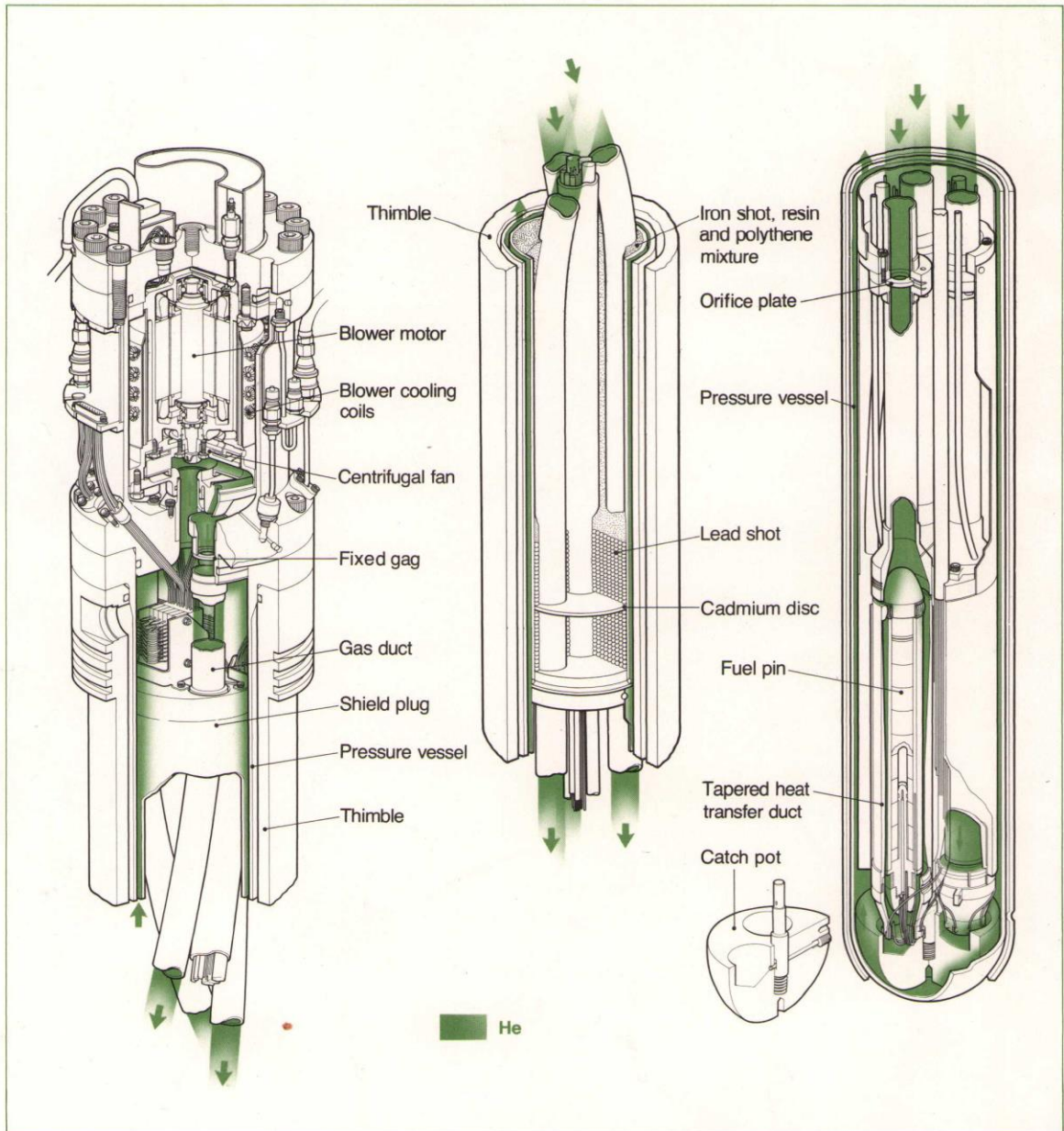


High-Temperature Reactor-Fuels Testing Loop

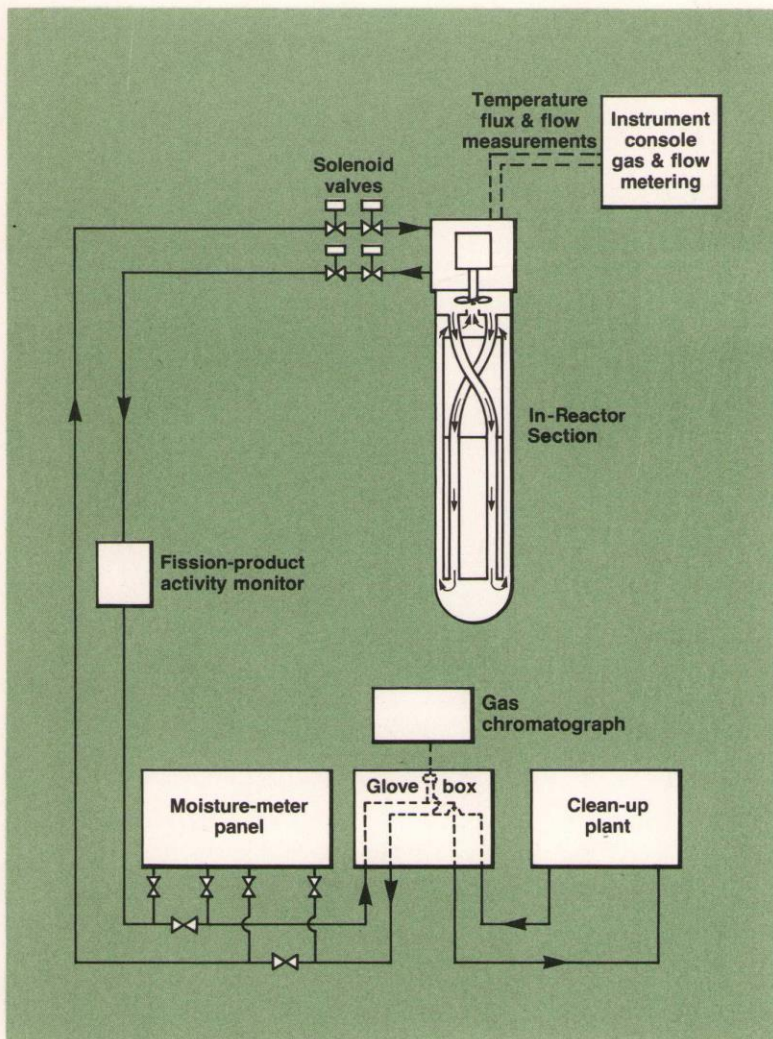


In-pile rig assembly

One of the more precise instruments developed and operated over the last few years for high-temperature reactor-fuel investigations is a helium-cooled loop which has operated for four years in the PLUTO materials-testing reactor.

It was designed to test three instrumented fuel pins in parallel under axial isothermal conditions at 70 bars helium pressure with pin-surface temperatures up to 1300°C and a maximum coolant flow of 60 g/s in a thermal-neutron flux of about 10^{13} n/cm²s.

A space 324 mm long by 42 mm diameter within the loop can be used to irradiate a number of fuel pins or fissile assemblies. The helium coolant may be sampled, monitored, doped, cleaned and subjected to fission-product injection and removal.



Schematic diagram of dispersed-fuels Loop 2

Comprehensive data-logging techniques enable the storage and display of pressure, flow, thermal-neutron flux, and various reactor operating conditions, for which data analysis has achieved a precise model fit.

The loop can be operated and the accumulated data analysed to meet customers' specifications for a wide variety of working conditions.

Fuel and cladding can be designed and fabricated to conform to customers' specifications. Comprehensive post-irradiation examination can be carried out.

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