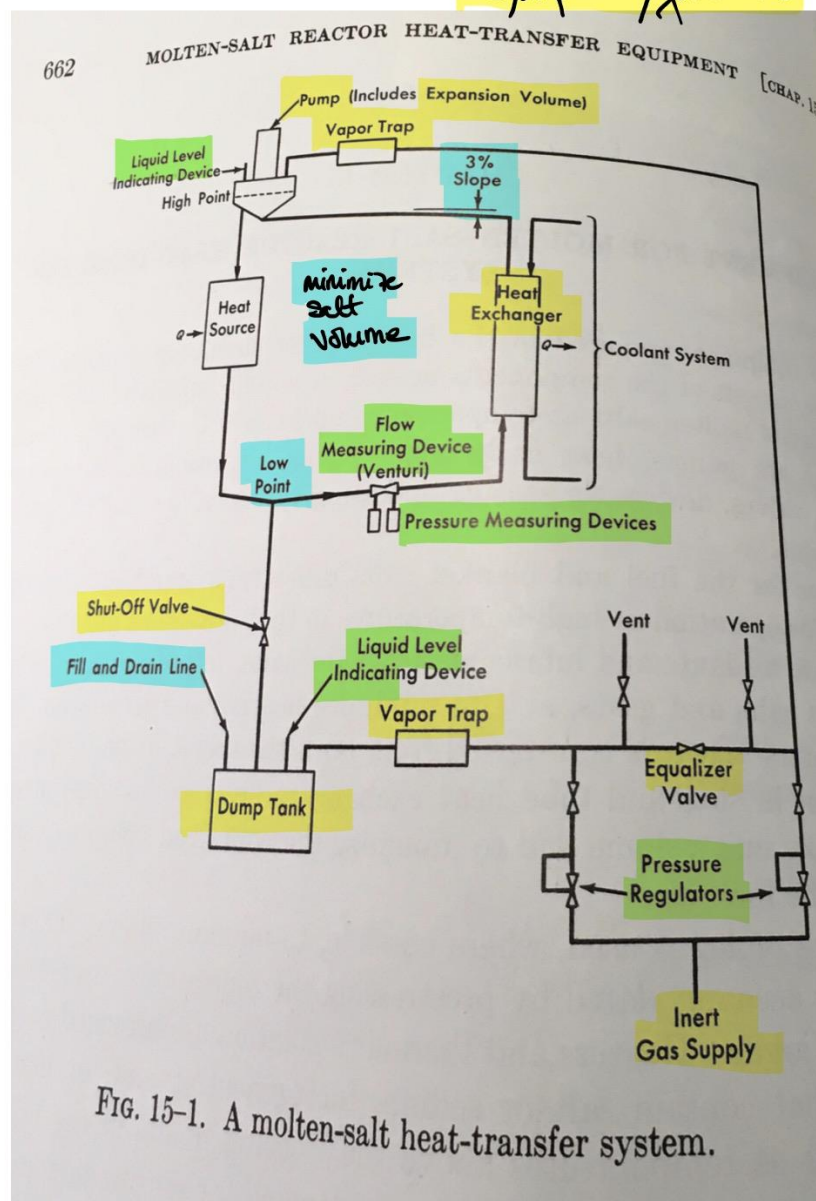


L3b: Equipment & Heat-Transfer Systems

25 Jan. 2017

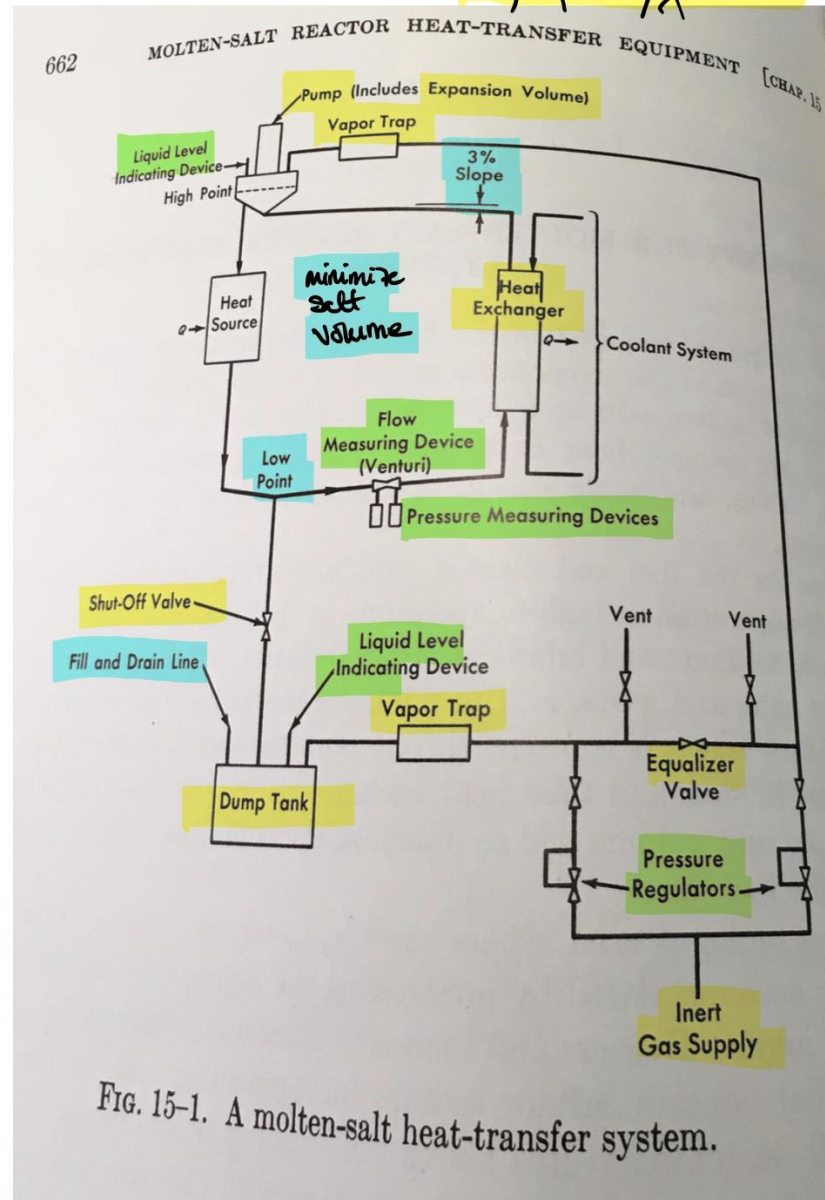
features/design considerations

instruments
equipment/functions

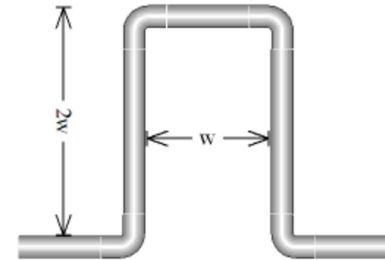


features/design considerations

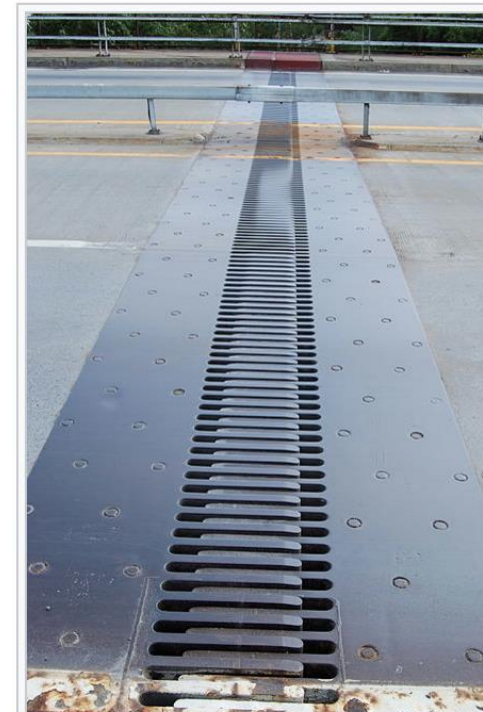
instruments
equipment/functions



The expansion loop is a common way to absorb temperature expansion and contraction in steel pipes. Expansion loops can be fabricated from standard pipes and elbows.

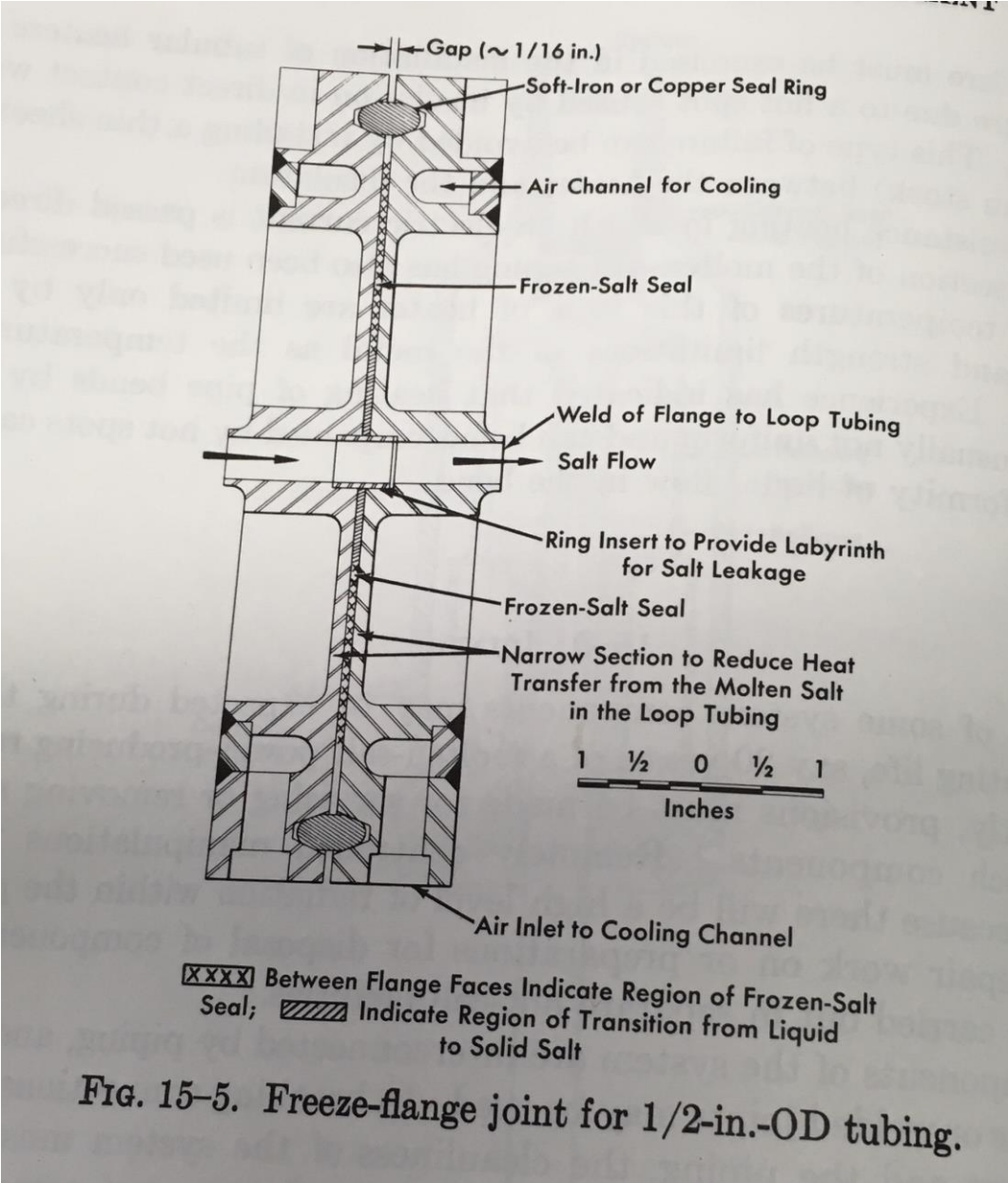
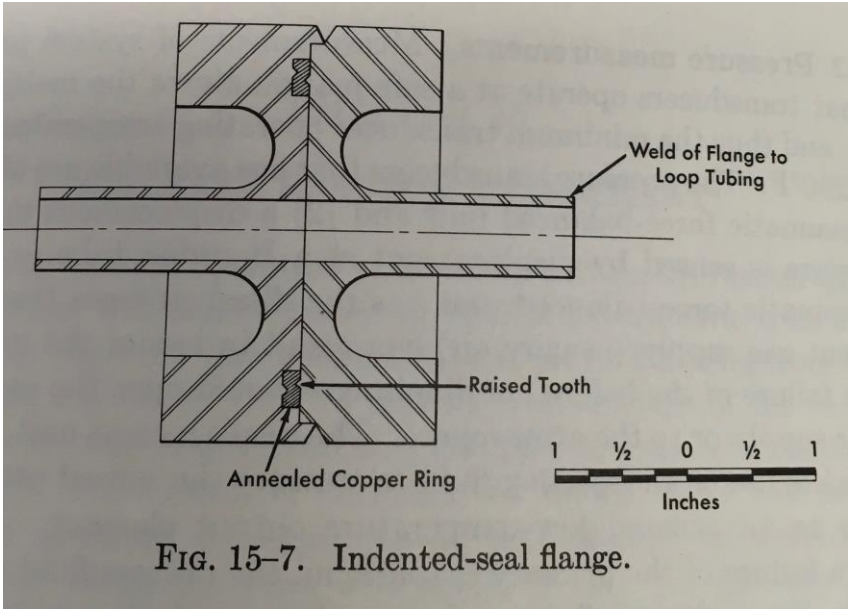
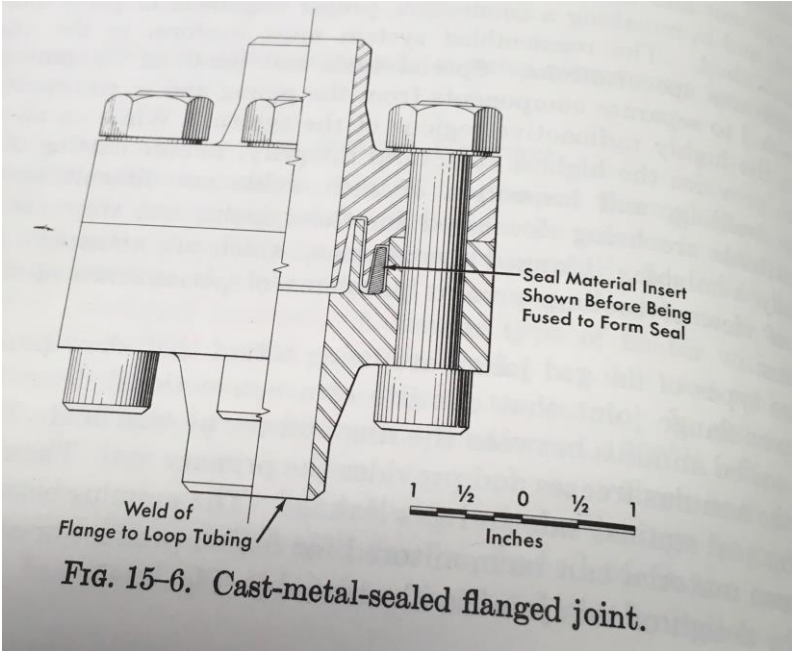


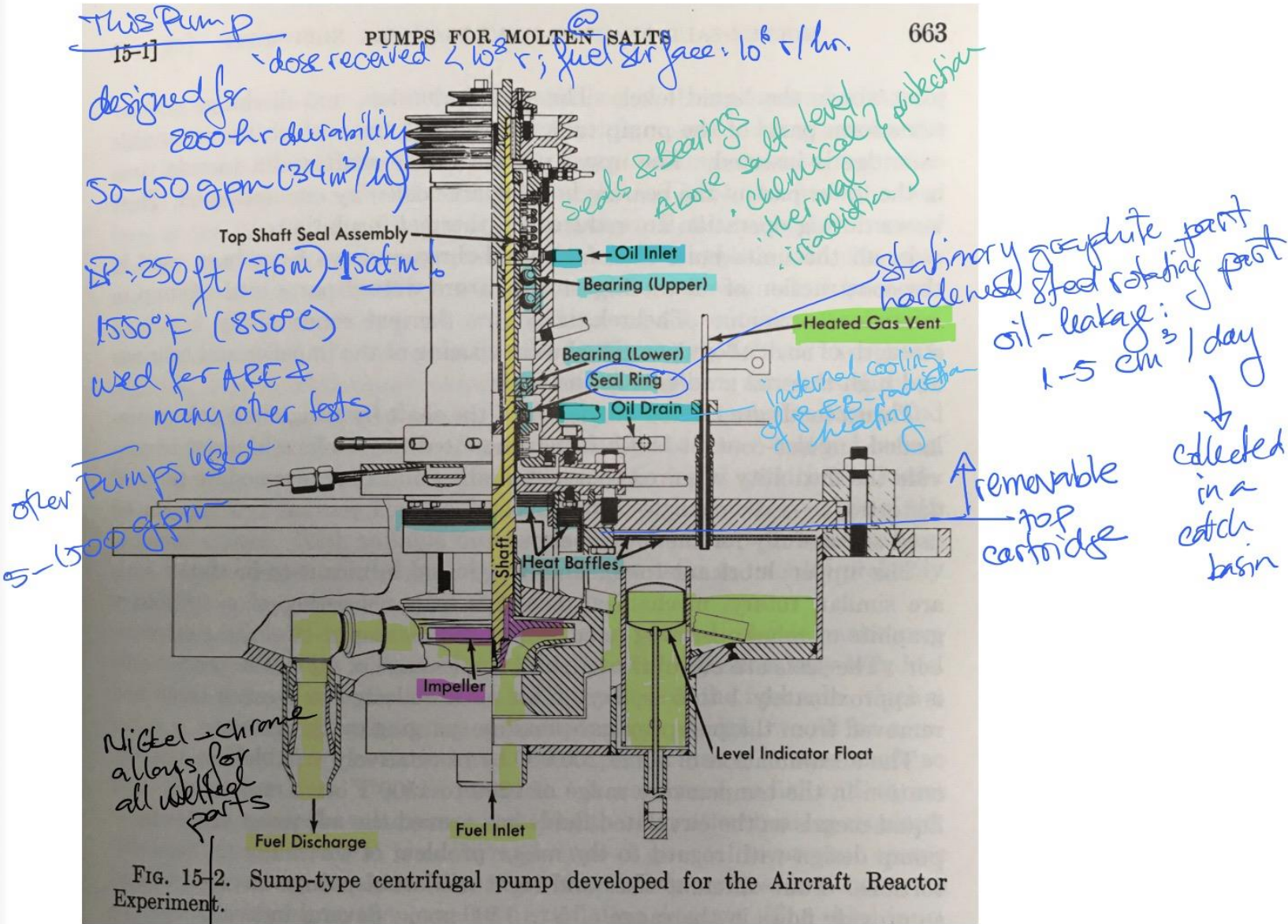
engineeringtoolbox.com



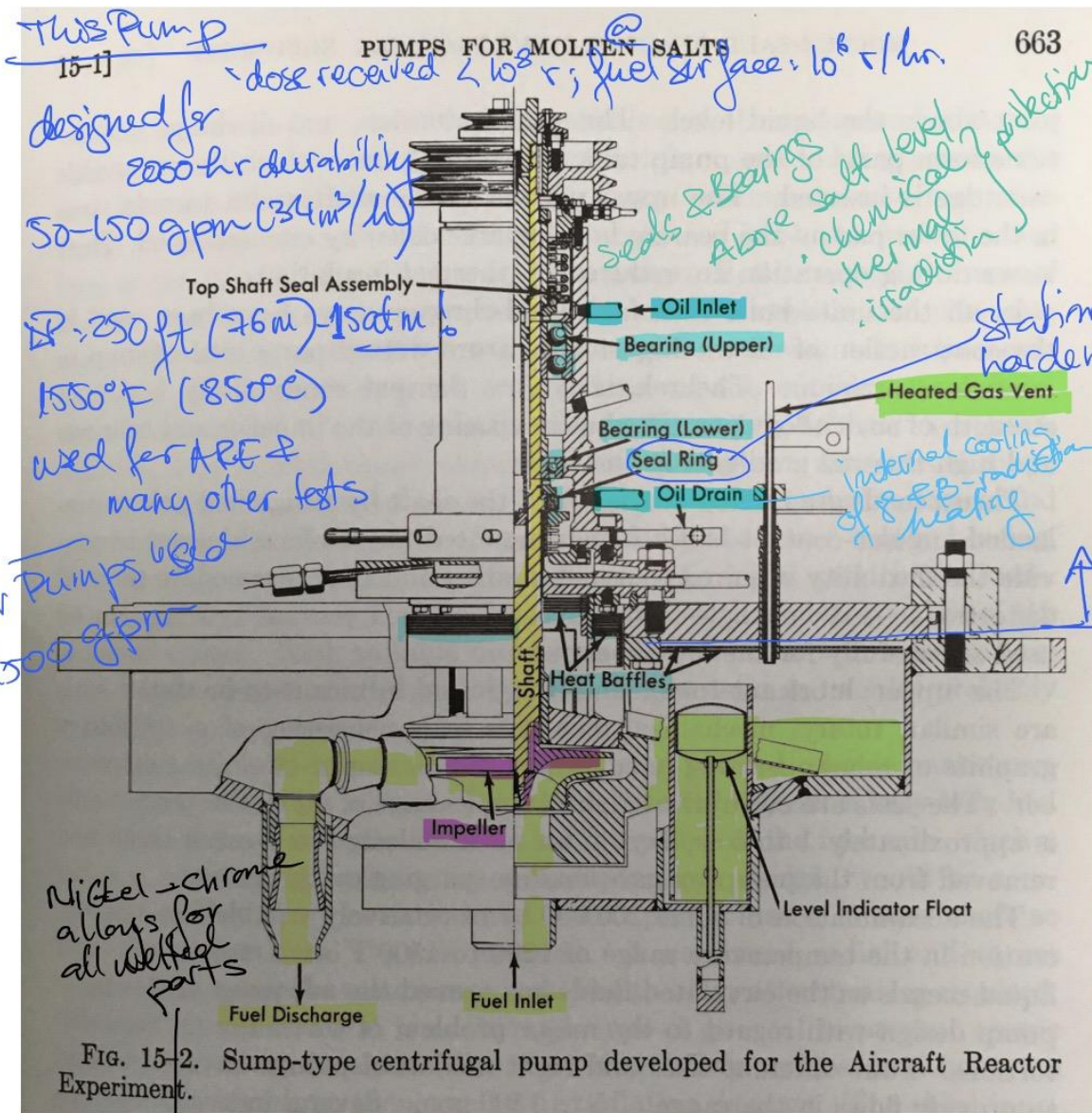
Expansion joint on a bridge

Flange seals

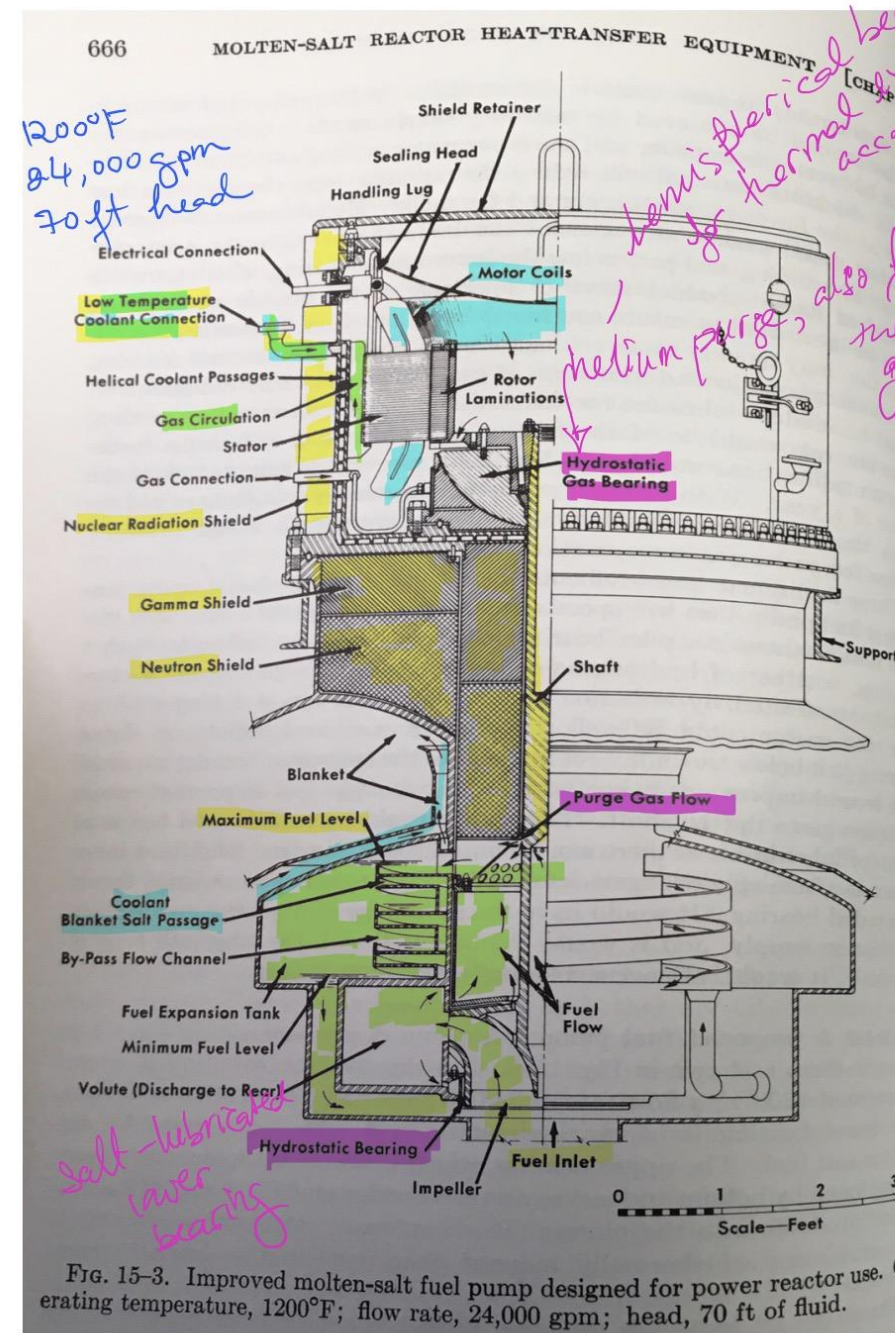




thermal conductivity is low \Rightarrow ok thermally to locate bearings not too far from impeller



thermal conductivity is low \Rightarrow ok thermally to locate bearings not too far from impeller



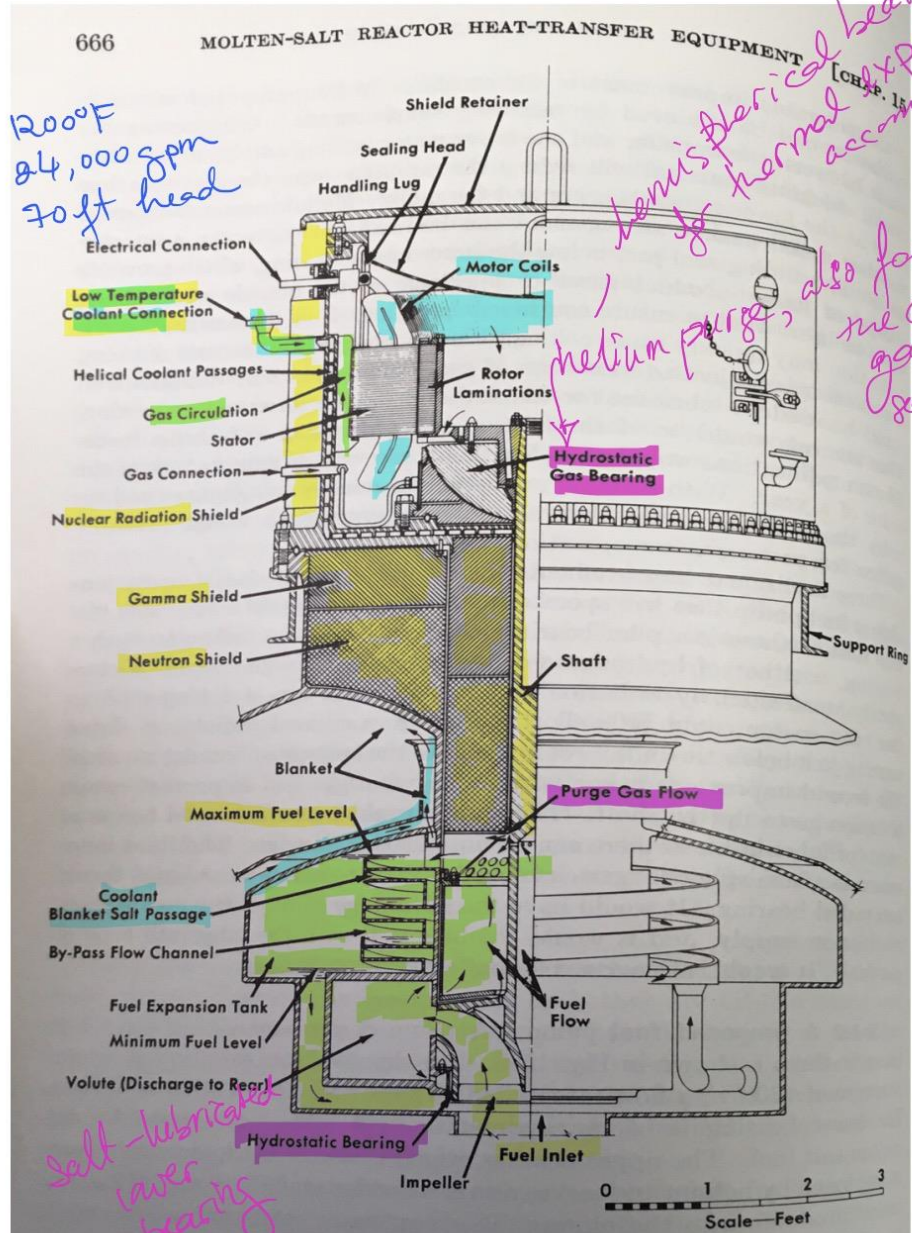
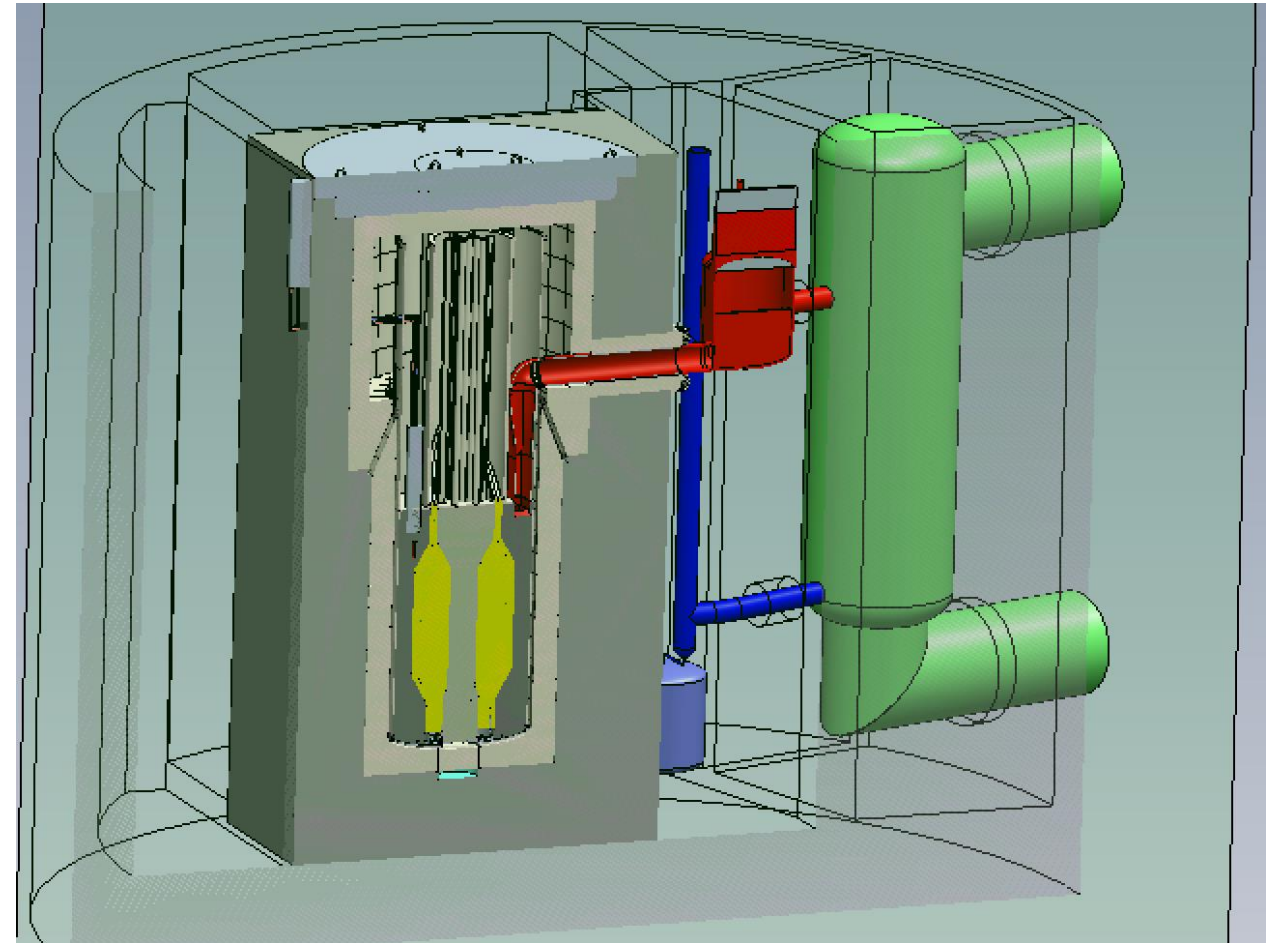
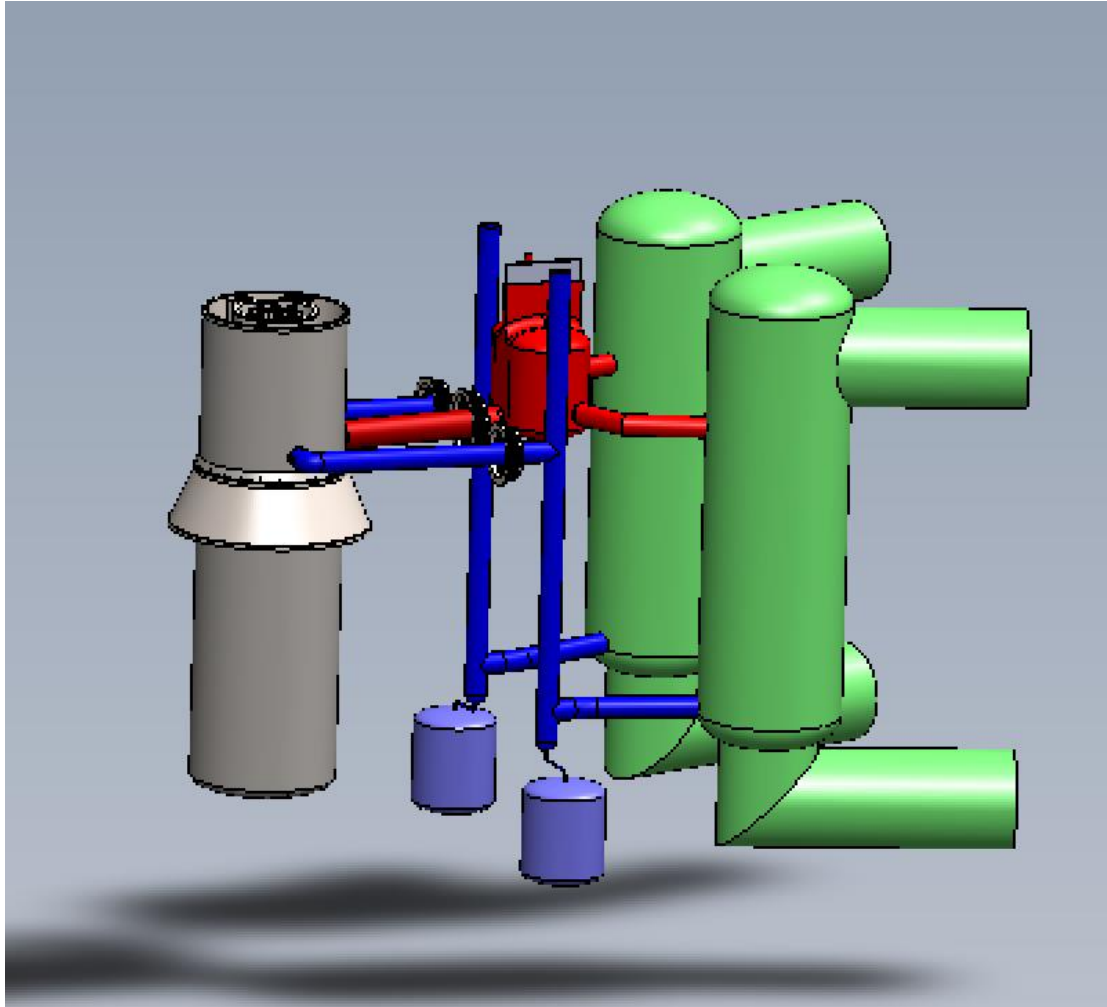


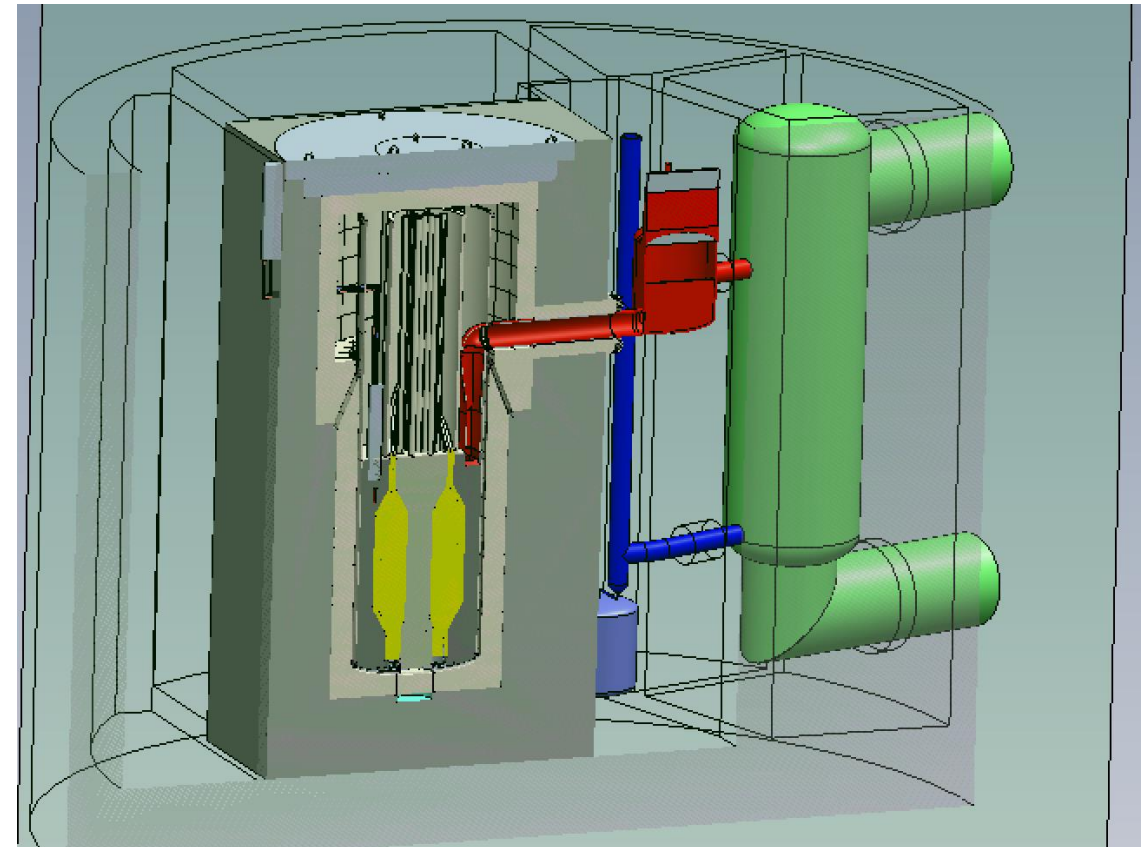
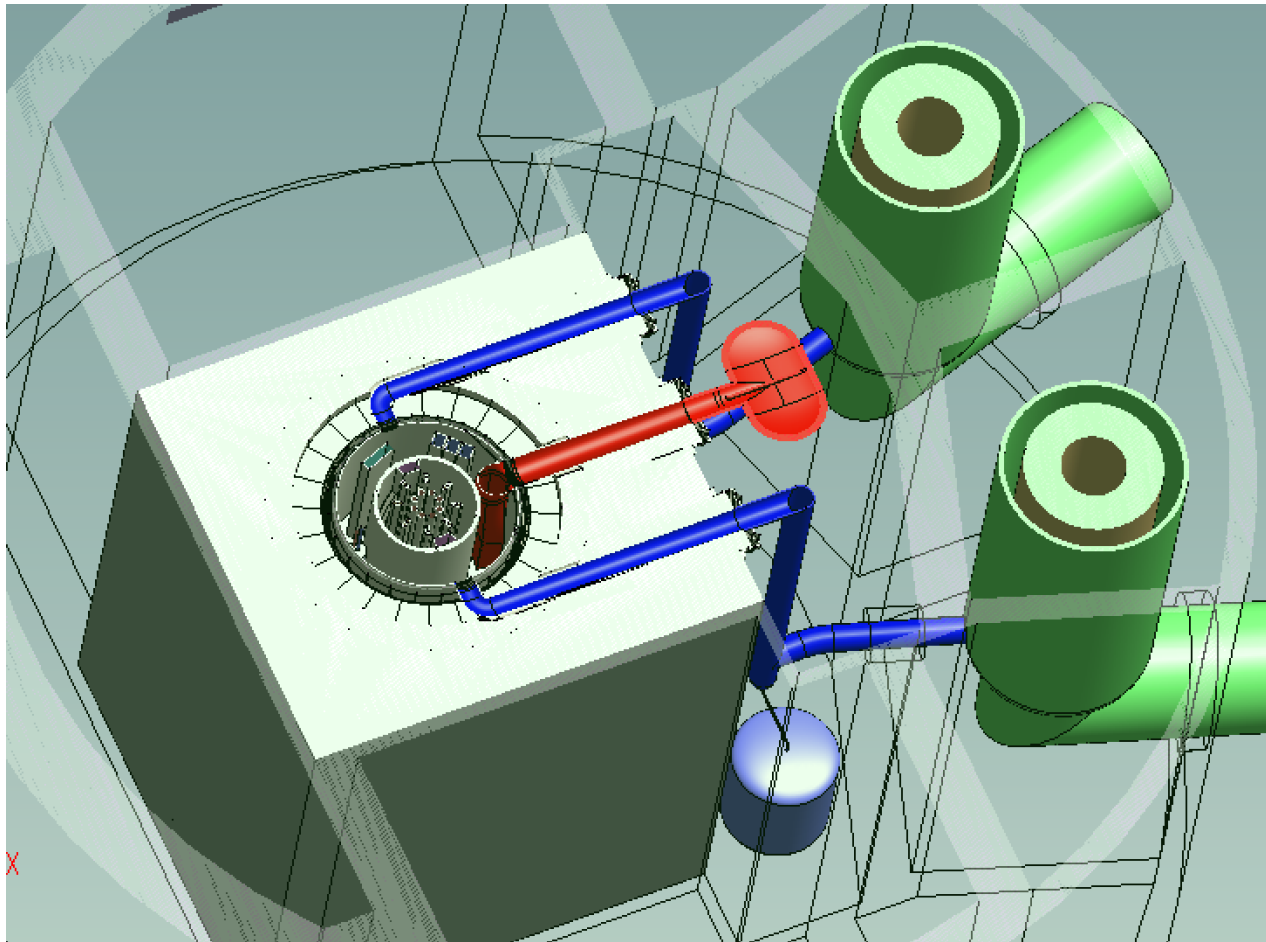
FIG. 15-3. Improved molten-salt fuel pump designed for power reactor use. Operating temperature, 1200°F; flow rate, 24,000 gpm; head, 70 ft of fluid.

FHR Mark 1 - notice the relative elevation of the pump, core, and heat exchangers



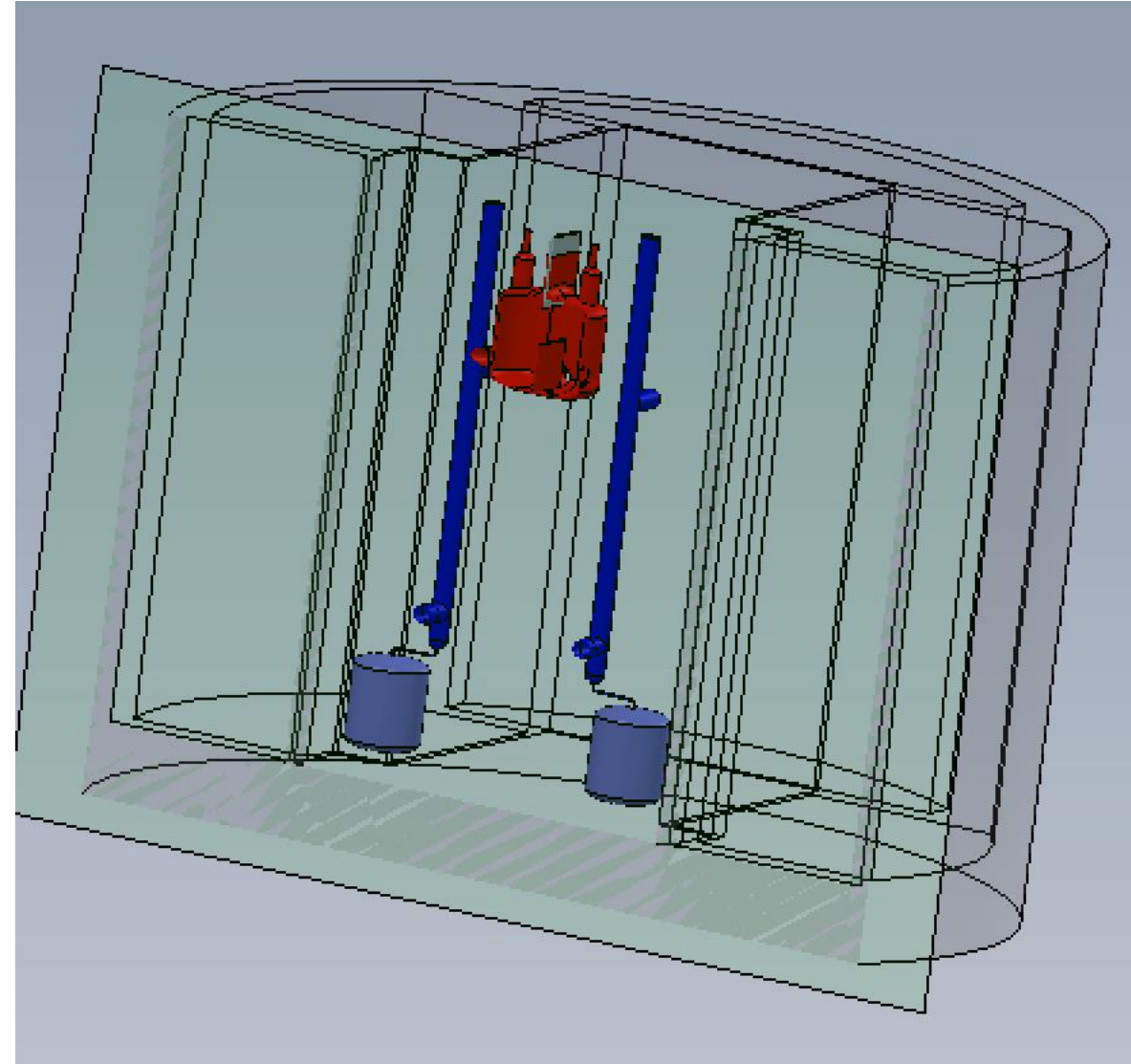
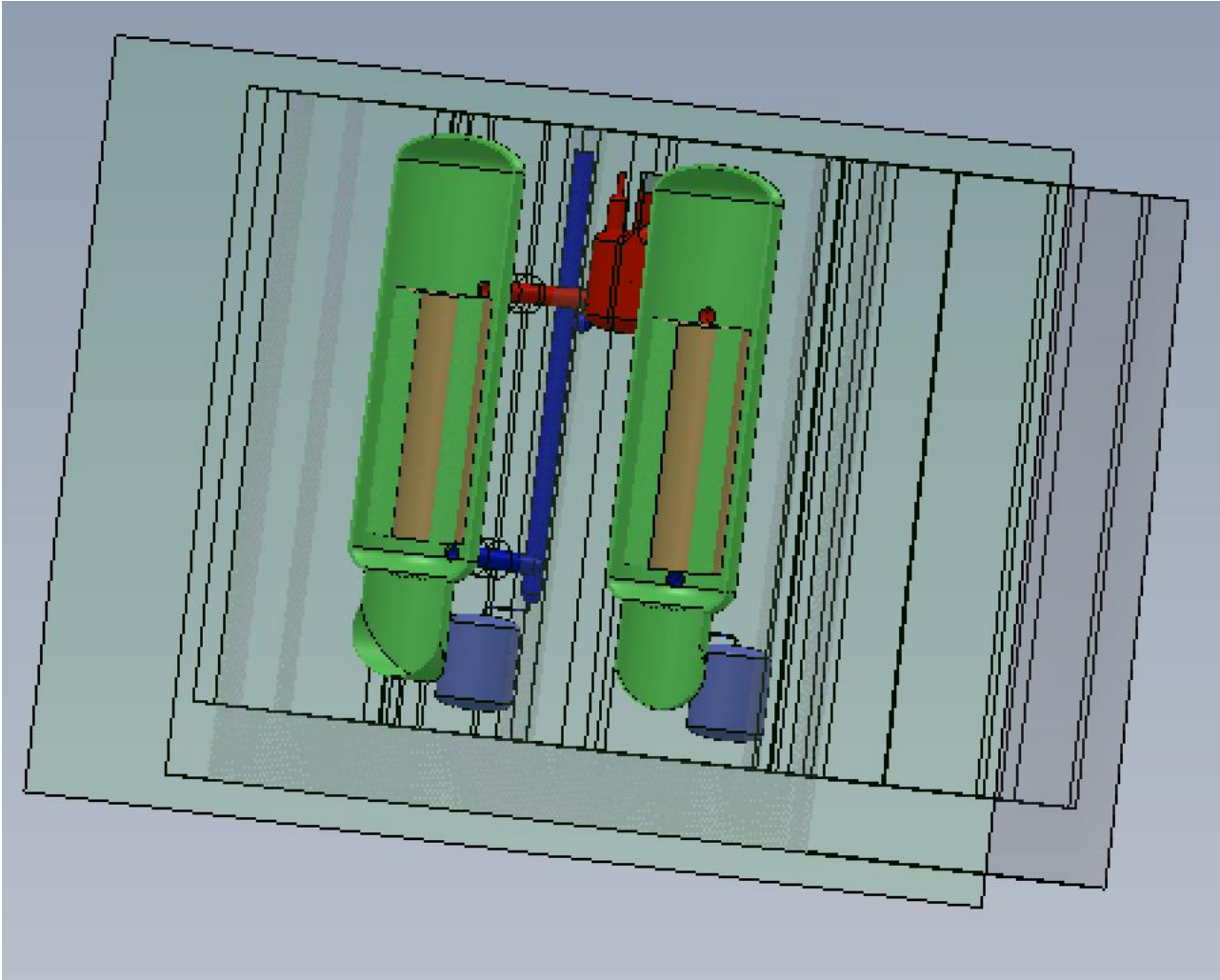
FHR Mark 1

- Notice the relative elevation of the pump, core, and heat exchangers
- Notice that the two pumps share a common pump bowl, to avoid the problem of level equalization, and fluctuating levels in two pump bowls, without additional piping or instrumentation.
- Notice that the join pump bowl can also be separated by a divider, for individual operation of the two pumps, to allow for in-service maintenance and inspection on one of the HX, while the other circuit continues to operate.



FHR Mark 1

- Cross-section view of HX, and cross-section view of pumps in a common pump bowl.



FHR Mark 1

- showing the hot leg and cold leg connections to the reactor vessel
- Showing also the building walls partitioning the reactor vessel, pump and drain tanks, and HX in three separate compartments
- notice also the cold leg stand pipes for access to cold traps located above the drain tanks.

