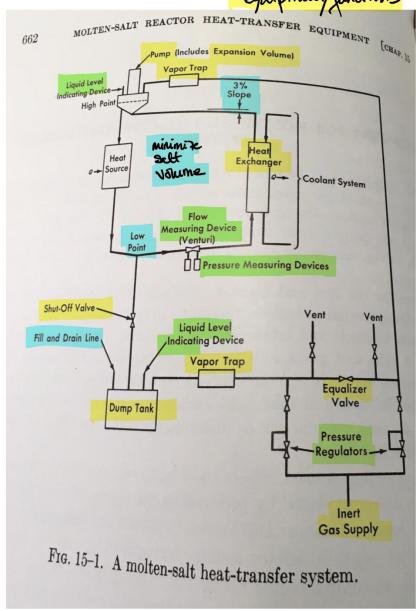
L3b: Equipment & Heat-Transfer Systems 25 Jan. 2017

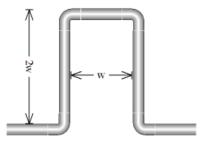
instruments equipment/functions Jeahures I design considerations MOLTEN-SALT REACTOR HEAT-TRANSFER EQUIPMENT [CRAP.] 662 Vapor Trap Liquid Level Indicating Device-3% Slope High Point minimize self Heat Exchanger Q- Source volume Coolant System Flow Measuring Device Low (Venturi) Pressure Measuring Devices Shut-Off Valve-Vent Vent Liquid Level Fill and Drain Line Indicating Device Vapor Trap Equalizer Valve Dump Tank Pressure -Regulators -Inert Gas Supply Fig. 15-1. A molten-salt heat-transfer system.

Jeatures/design considerations

instruments quipment/function



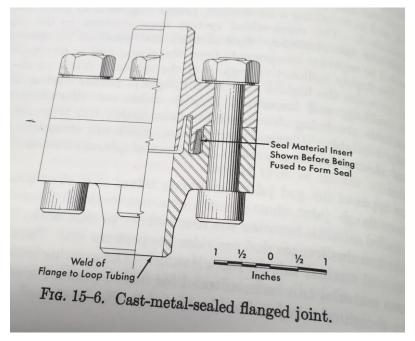
The expansion loop is a common way to absorb temperature expansion and contraction in steel pipes. Expansion loops can be fabricated from standard pipes and elbows.

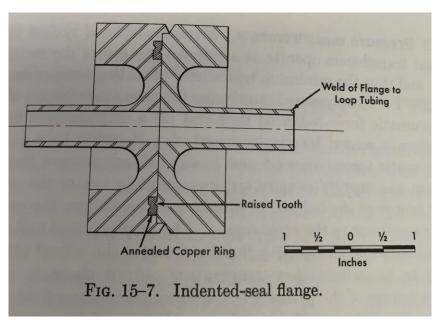


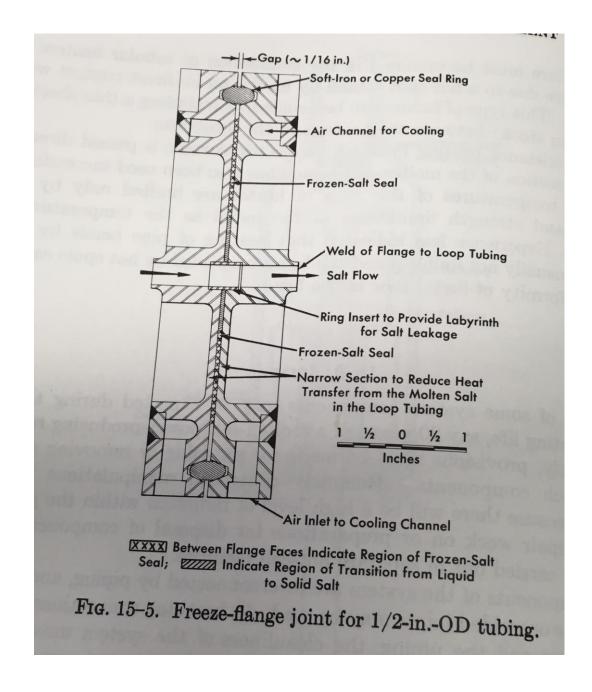
engineeringtoolbox.com

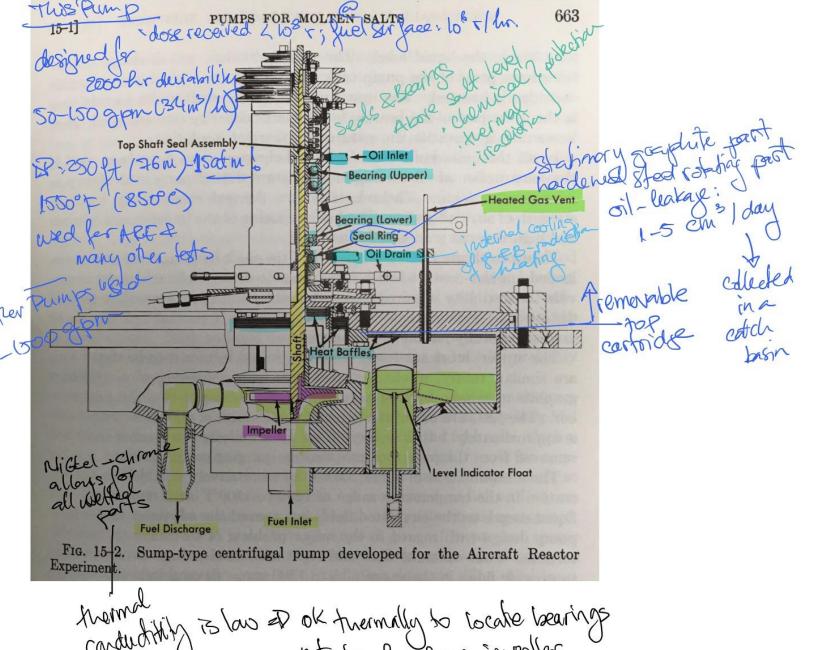


Flange seals









thermal is low at ok thermally to locate bearings not too for from impoller

dose received 2 108 7; Jue Sir Jace 1 108 7/hr. This Pump designed for sevability 50-150 gpm (34 m2/1) -Heated Gas Vent

Stahmary grandute faith

hordered Stood cothing past

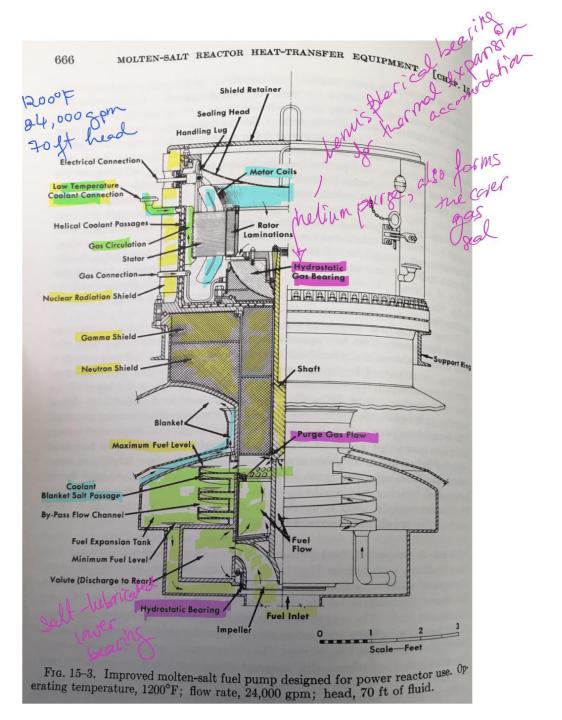
Lakay:

1-5 cm; day

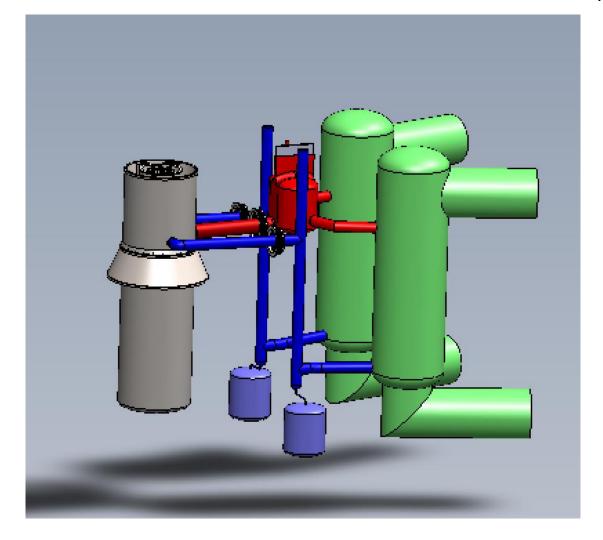
1-5 cm; Top Shaft Seal Assembly-8-250 ft (76m)-150tm Bearing (Upper) Bearing (Lower) Tremevable basin Impelle Level Indicator Float Fuel Inlet Fuel Discharge Fig. 15-2. Sump-type centrifugal pump developed for the Aircraft Reactor Experiment. thermal is low at ok thermally to locate bearings not too for from impoller

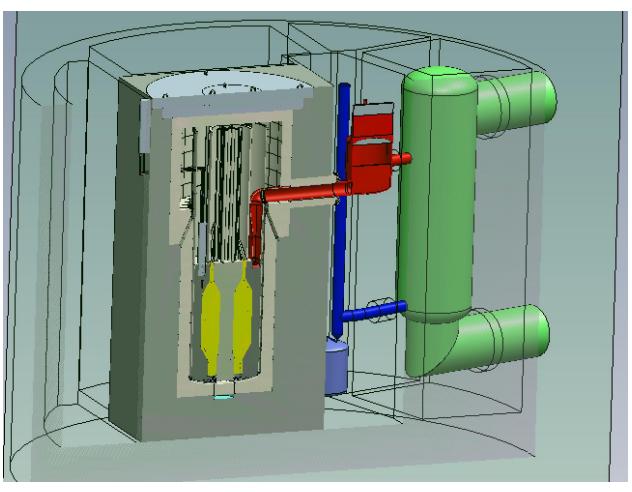
Shield Retainer Helical Coolant Passages Maximum Fuel Level Blanket Salt Passag By-Pass Flow Channel **Fuel Expansion Tank** Minimum Fuel Leve Volute (Discharge to Rear) Hydrostatic Bearing **Fuel Inlet**

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



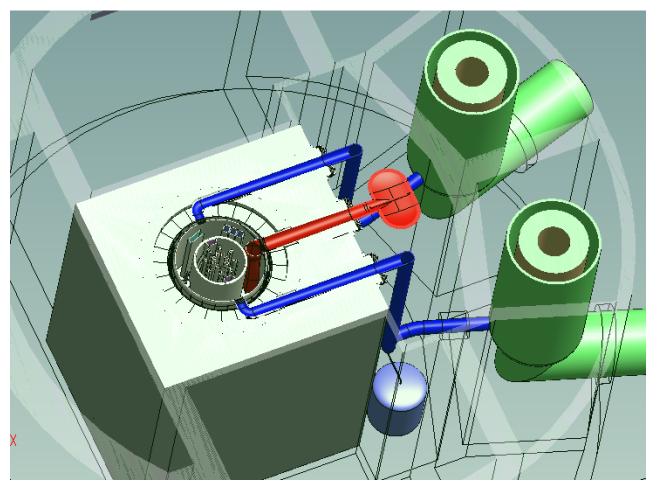
FHR Mark 1 - notice the relative elevation of the pump, core, and heat exchangers

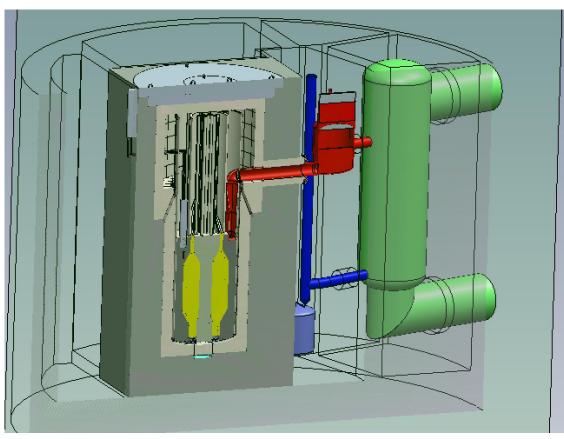




FHR Mark 1

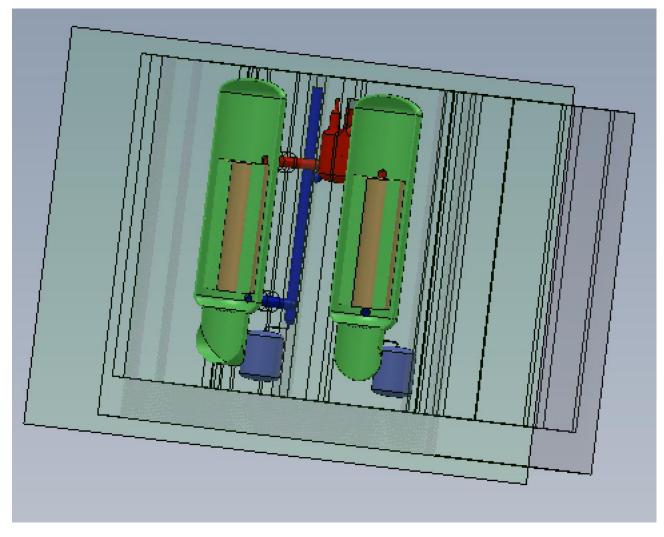
- Notice the relative elevation of the pump, core, and heat exchangers
- Notice that the two pumps share a common pump bowl, to avoid the problem of level equalization, and fluctuating levels in two pump bowls, without additional piping or instrumentation.
- Notice that the join pump bowl can also be 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.

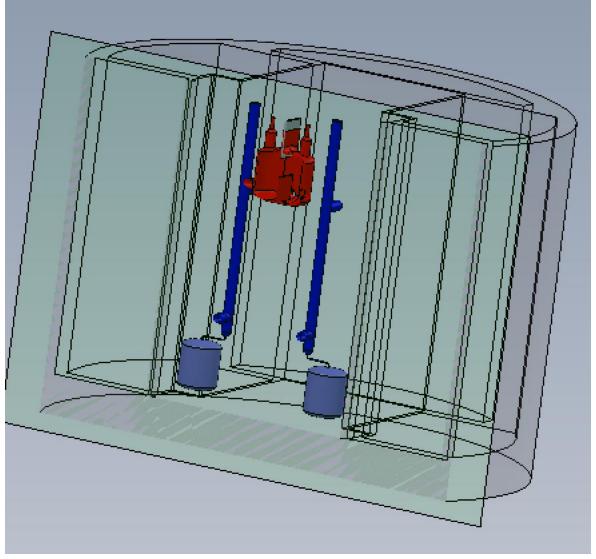




FHR Mark 1

- 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 rector 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.

