UT-BATTELLE

Mercury Nozzle Status

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Hg Jet Design Meeting

Princeton University

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OAK RIDGE NATIONAL LABORATORY
U. S. DEPARTMENT OF ENERGY

Nozzle Constraints

- **Tilted solenoid has imposed new geometry constraints on the nozzle**
  - **Up-beam windows are now at bottom of primary containment**
  - **Nozzle cannot penetrate primary on end flange, currently penetrates from sides**
  - **No interaction between beam & Hg until Hg exits nozzle**

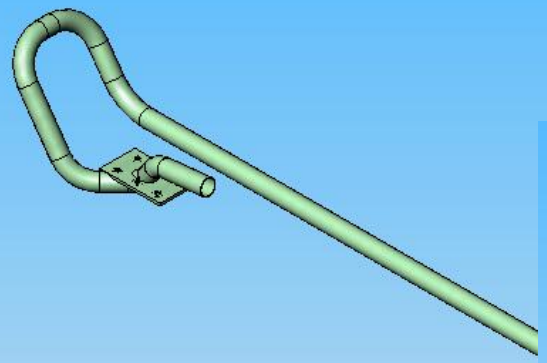
Flow Issues

- **High flow in small diameter thin-wall lines, tight flow path**
- **Direction changes cause several problems**
  - **Pressure drop**
  - **Vibration**
  - **Cavitation**
  - **Tube erosion**

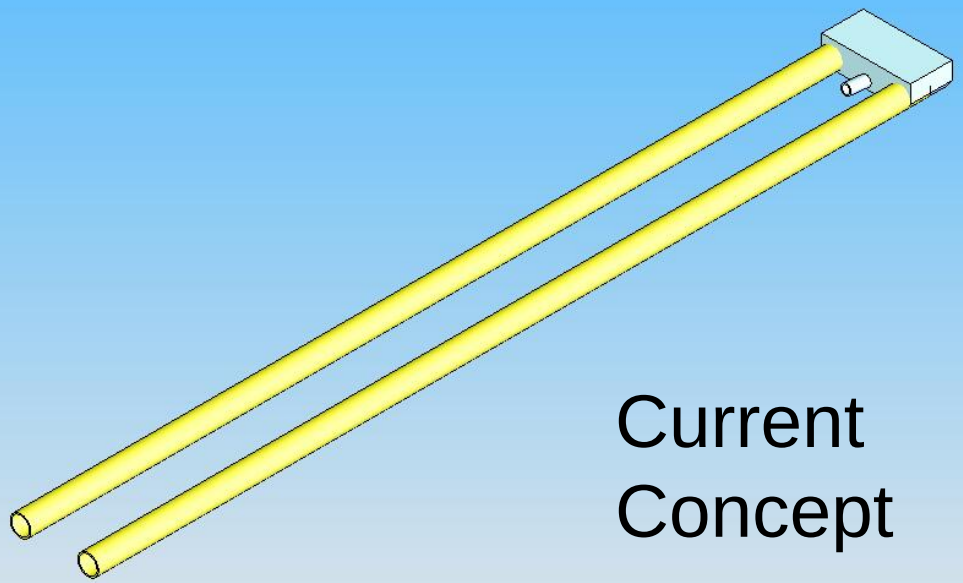
Design Issues

- **Desire mechanically attached nozzle for changeout during cold testing – in current concept manifold is welded in position**
- **Need to maximize pipe diameter to decrease velocity and minimize pressure drop**
  - **Two supply lines**
- **Structural requirements for piping restraints not yet investigated**
- **Possibly supply Hg outside of solenoid in double-wall pipe – a last resort**

Nozzle Designs



Initial
Concept



Current
Concept

Next Steps

- **Determine physical constraints**
  - **Beam cannot penetrate manifold**
- **Develop manifold internals for manufacturability**
- **Flow analysis**
- **Structural analysis**
- **Princeton tests**