



# ***BRIEFING ON GSI-191 FLUME TESTING***

**FRAMATOME-ANP**

**ALDEN RESEARCH LABORATORY, INC.**

**PERFORMANCE CONTRACTING, INC.**

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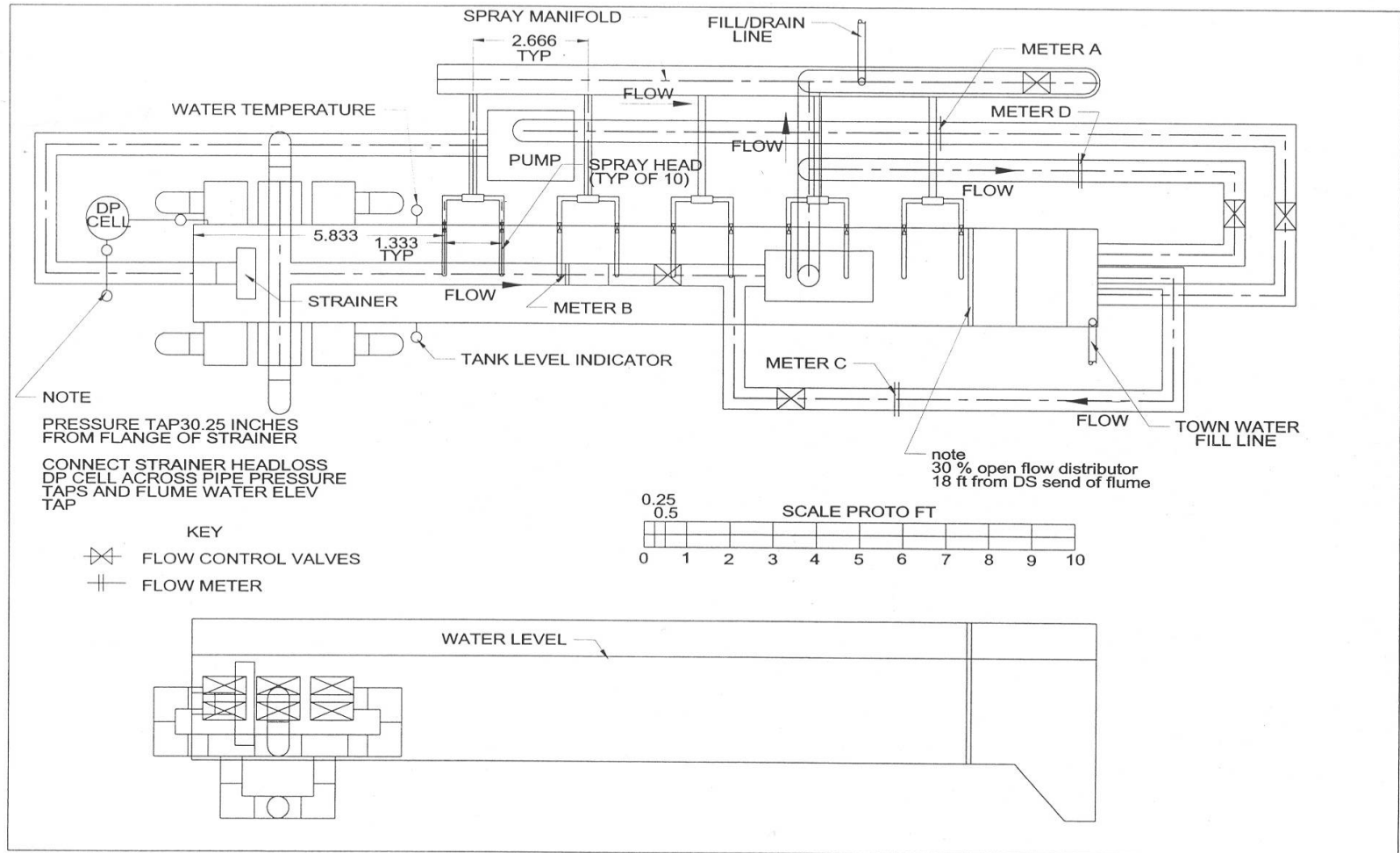


➤ Purpose of Test

- Outline test series to evaluate PCI Sure-Flow™ performance with various debris mixes
- Establish basis to take advantage of lower actual head loss resulting with very low approach velocities in PWRs
- Define “Near-Field” effect on head loss

➤ Testing Conducted as Safety Related

- Approved test plan
- Oversight by Framatome-ANP QA



27 INCH WIDE BY 39 INCHES DEEP BY 20 FT 9 IN LONG TEST FLUME

## BASIC SCALING FACTORS

- Strainer Size: 13.2 ft<sup>2</sup>
- Test Flows: 30, 60, 90, 120 gpm  
(equates to 0.005 ft/s – 0.02 ft/s approach velocity)
- Overhead Sprays Simulate Pool Disturbance From Break
- Example:
  - Scaled Strainer (13.2 ft<sup>2</sup>) @ 30 gpm  
Represents 0.005 ft/sec Approach Velocity
  - Corresponds to 2,500 ft<sup>2</sup> Strainer  
Flow Rate 5,680 gpm

## RESULTS OVERVIEW

- Low strainer approach velocity displays much lower head loss than NUREG 6224 calculations
- “Near-Field” effect:
  - Debris Transport in Vicinity of Strainer
  - Debris Loading on Strainer
- Results in more reasonable passive strainer arrangements
- Extreme amounts of fiber and particulate do not significantly increase head loss until much higher approach velocities introduced
- Testing for Solutions... *Not* Developing Alternative Methodology or Correlation at this Time

# **Sure-Flow™ Strainer Features**

***In general, the tests at ARL in March demonstrated the following:***

- > The “Near-Field” effect involves:**
  - ◆ The Debris Transport in the Vicinity of Strainer**
  - ◆ The Debris Porosity & Loading on the Strainer**
- > The SFS4 strainer was tested at approach velocities through the screen surface area of 0.005 fps through 0.020 fps.**
- > The measured head loss of the SFS4 strainer was significantly lower through the mixed fibrous / particulate laden debris bed than is predicted using the NEI 04-07 (Reference 2) methodology, which applies head loss correlations of NUREG/CR-6224 (Reference 3).**
- > At the tested flow approach velocities, the SFS4 strainer did not form a dense debris bed. In consequence, the head loss across the debris was significantly lower than predicted using the NEI 04-07 (Reference 2) methodology.**

## WHAT IS BEING TESTED TODAY

<i>Test 1:</i>	<i>Thin Bed Effect - Particulate Loading As Noted</i>	<i>30 gpm</i>	<i>No Sprays</i>
<i>Test 2:</i>	<i>Thin Bed - Same Particulate Loading</i>	<i>30 gpm 60 gpm</i>	<i>Sprays Running</i>
<i>Test 3:</i>	<i>High Fiber Content - Add Fiber ; Same Particulate Loading</i>	<i>30 gpm</i>	<i>No Sprays</i>
<i>Test 4:</i>	<i>High Fiber Content - Same Particulate Loading</i>	<i>30 gpm 60 gpm</i>	<i>Sprays Running</i>

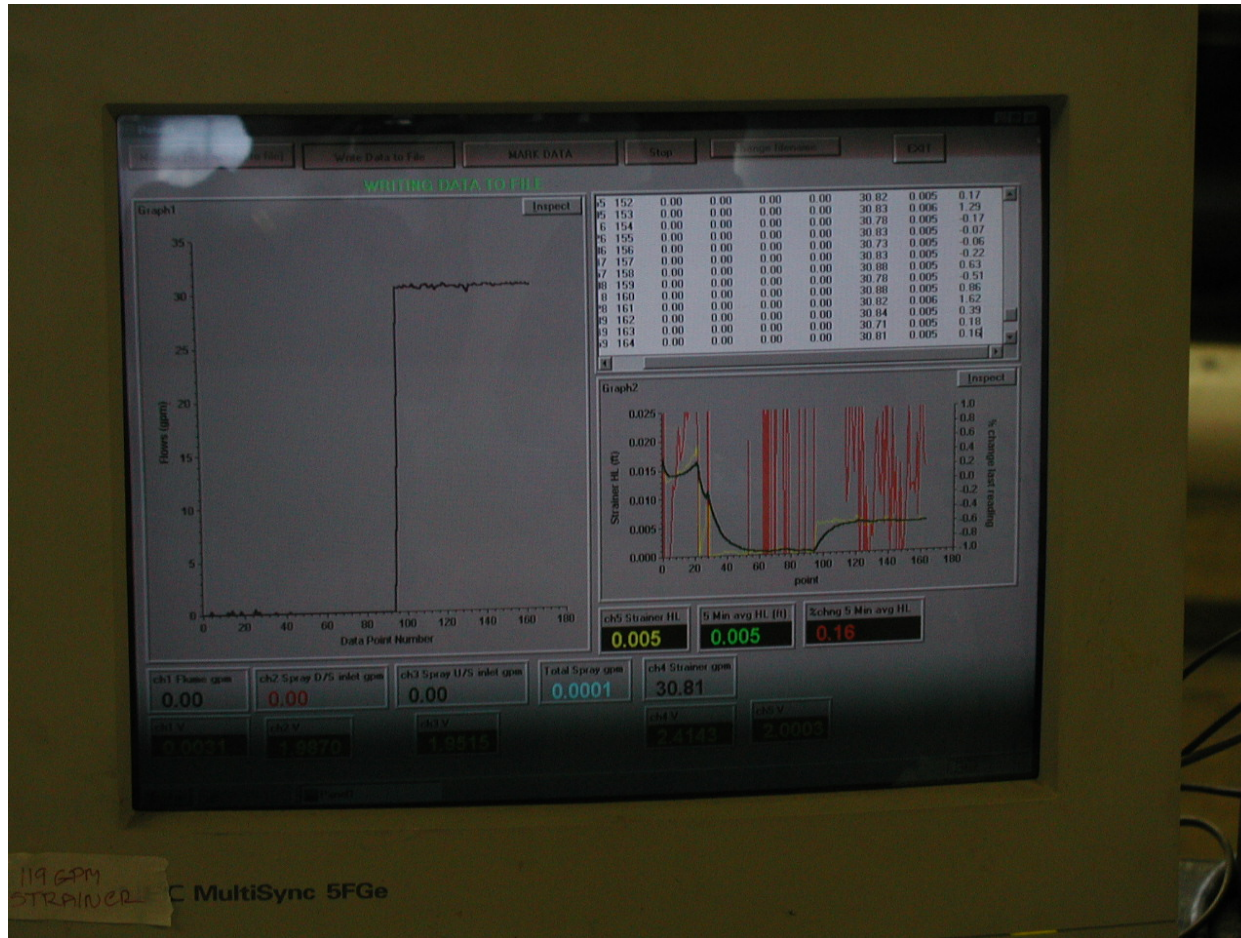


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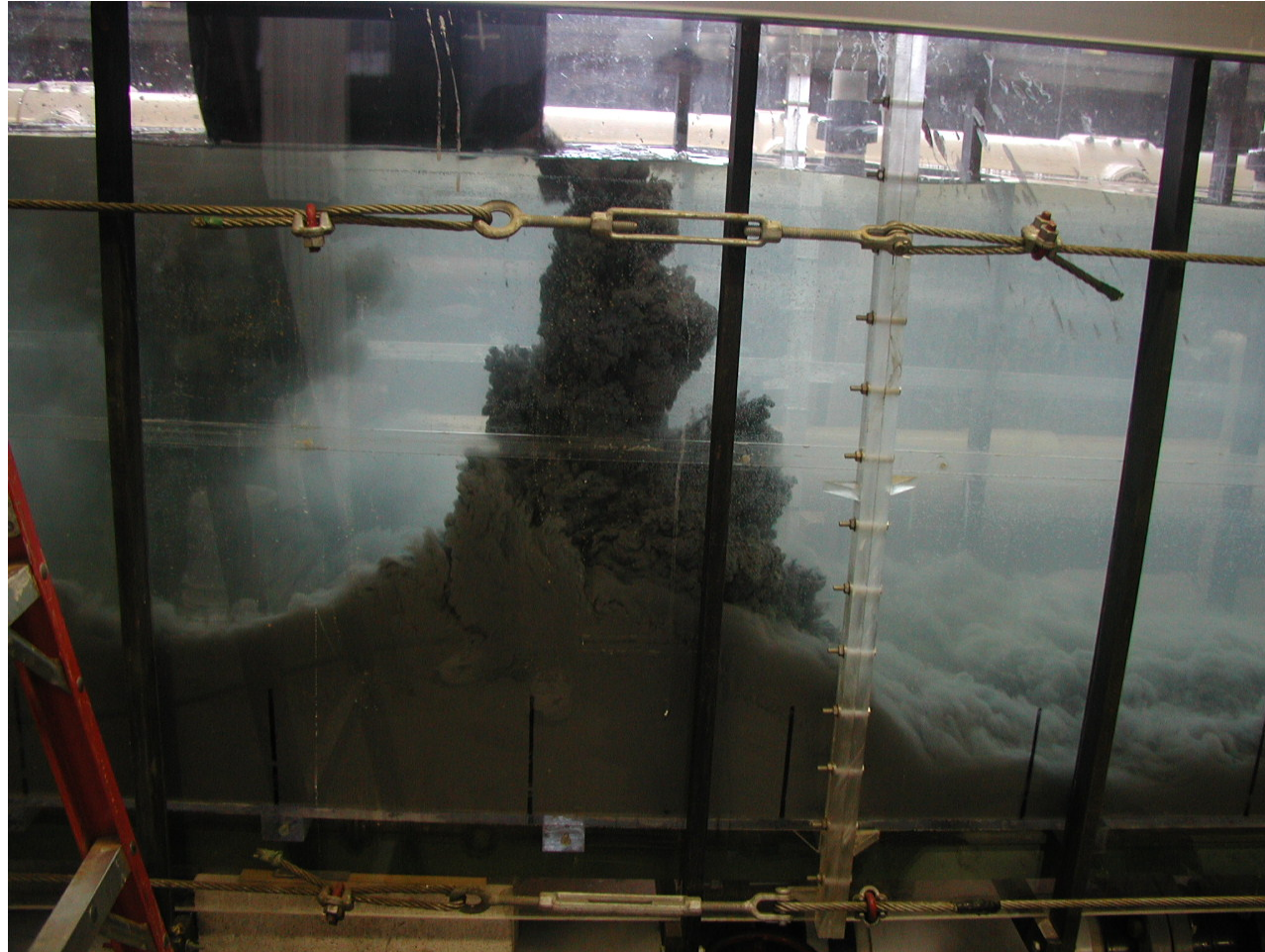




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