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#### **Review of ECCS Suction Strainer Hydrodynamic Load Methods**

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21 August, 2001



#### **Issues – Why are we here?**

- Keulegan-Carpenter Number
  - Range in the plant
  - Applicability of existing GE test data
  - Need for additional testing
- "inertia coefficient"/"added mass coefficient"/"acceleration drag volume"
  - What is the design approach
  - What are the values used
  - Why it's adequate for design

### **Introductory Comments**

- ✓ The subject is technically complex
  - The documentation is contradictory and sometimes incorrect
    - "Personal communications"
    - Values quoted out of context
    - Inconsistent nomenclature and reference dimensions
    - LTR content subject to misinterpretation
  - There seems to be a general misunderstanding of the process and values used for suction strainer load evaluation

#### Problems are more Communication Related than Technology Related

#### Nomenclature

- C<sub>a</sub> Inertia Coefficient (non-dimensional)
- $C_{a0}$  Inertia Coefficient at Keulegan-Carpenter Number = 0 (non-dimensional)
- C<sub>m</sub> Added Mass Coefficient (non-dimensional)
- $V_a$  Acceleration Drag Volume (ft<sup>3</sup>)
- $V_s$  Volume of Strainer Structure (ft<sup>3</sup>)
- V<sub>0</sub> Actual Strainer Volume (ft<sup>3</sup>)

## **Contributions from the the Sarpkaya Report**

- Physics provides rational basis for comparison of results
- Provides the Osgood data (key to issue resolution)
  - Conclusively demonstrates the Keulegan-Carpenter effect
  - Validates the design values for porosity effect
  - Supports the use of GE test data
- Expert opinion on value of inertia coefficient,  $C_{a0}$  is consistent with GE design

## **Discussion Topics**

- Test and Plant Keulegan-Carpenter Numbers
  - Review of GE calculations
  - Expected pool accelerations
- Existing Test Data & Applicability to GE Strainer Design
- Range of Design Inertia Coefficients (C<sub>a0</sub>)
- Comparison to Sarpkaya Conjecture
- Quantification of Margin Estimates

Test and Design Basis is Adequate

# End of Non-Proprietary Presentation

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