De-aeration Phenomenon And SE Position Clarification

NRC/NEI Industry GSI-191 Meeting

Presented By:

Shanlai Lu, NRC/NRR/SPLB

Vesselin Palazov, ISL

April 13, 2005

SE Position

Licensee's questions from January NRC/NEI meeting

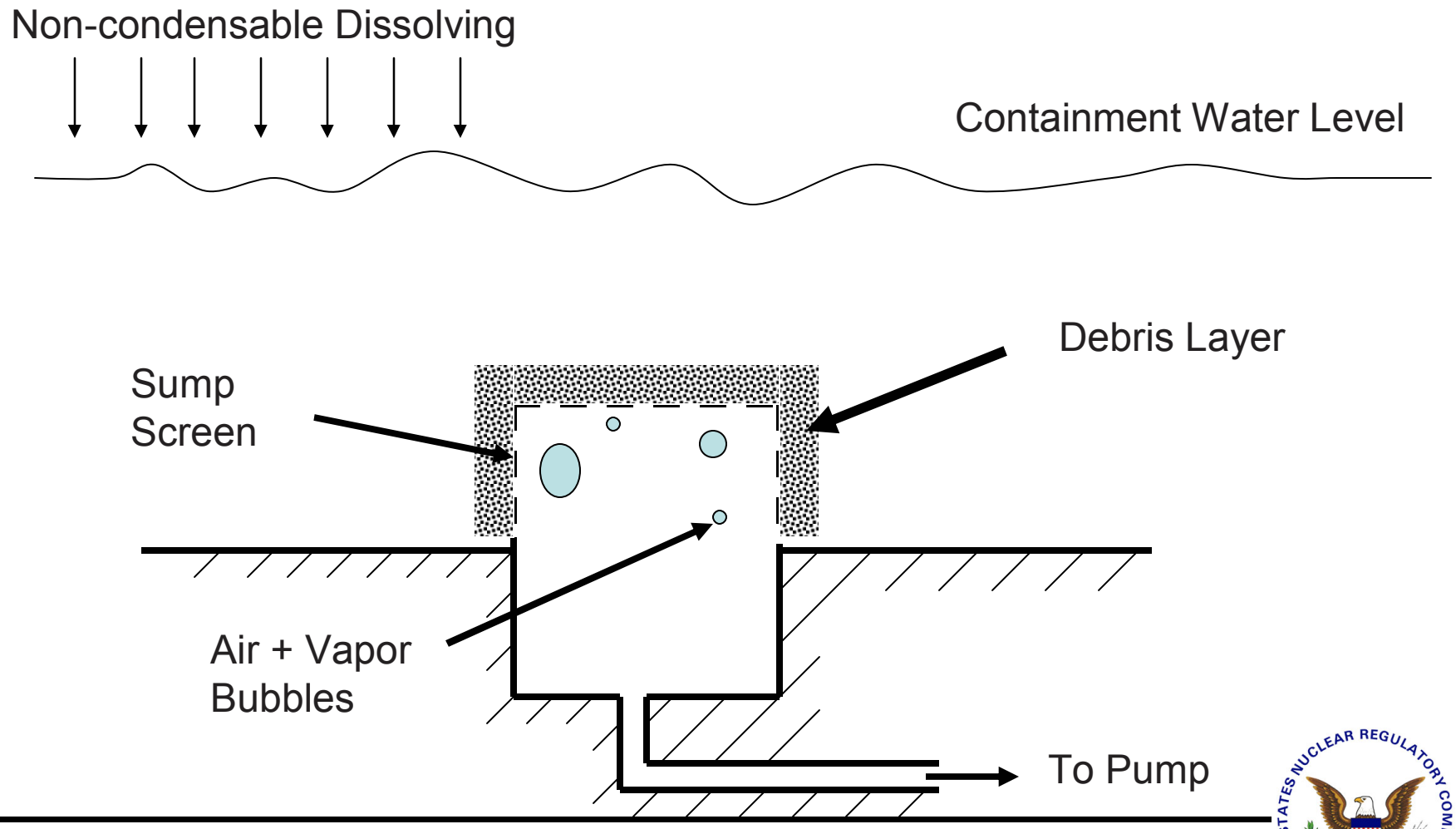
What is de-aeration phenomenon?
What is NRC's position?

SE requires:

- Debris bed exit void fraction < 3% for applying head loss correlation based on single phase assumption;
  Example:
  NUREG/CR-6224 correlation temperature limitation.

- Pump inlet void fraction < 3%.

De-aeration Phenomenon



Staff Confirmatory Calculations

Major Assumptions:

1. Saturated non-condensable concentration in the water before entering the sump;

2. Gas phase released in sump water is saturated with water vapors.

Examples:

Case 1. DP=1.36 ft, T=205 ^{o}F, Alpha=3.0%

Case 2. DP=2.34 ft, T=205 ^{o}F, Alpha=4.3%