



**Product Line: Multiphase Flow Simulation for the Fluid Level in the Reservoir with Different Accelerations of the Vehicle.**

**Challenges:**

First principles of the fluid mechanics reveal that the fluid will occupy the shape of the contour and the resistance to the shear is very low.

This was a development project to have a good baffle system for reducing the sloshing problem in the reservoir.

Hexahedral mesh for the given cad model has to be carried in ICEMCFD 11.0 and simulations should be carried out in commercial coupled solver ANSYS CFX 11.0

**Inputs Provided:**

- 3D CAD model in Pro E.
- SOW (Statement of the Work) and boundary details for understanding the stages of the project.
- Experimental result of first case as reference.

**Methodology:**

AES team at Onsite worked closely with the Engineering Team by performing Competitor Benchmark study and evaluating the current design for test requirements to qualify for production.

Our Engineers conducted Brainstorming and Generated Ideas to satisfy the Design needs. Based on the Reviews, DFMEA was prepared for the short listed Solutions.

Prototypes were made after Tolerance Analysis and new Clamps were tested at the Clients facility to check the feasibility of improved solution.

**Tools Used:**

CAD ProEngineer Wildfire V2.0; Modules Modeling, Assembly & Drafting  
Brainstorming & Tolerance stack up analysis.

**Solutions Provided:**

- Base tank without baffles were carried out and compared with experimental data for 2 different accelerations.
- Series of simulations were carried out for the optimal baffle configuration.
- Detailed post processed data, observations along with suggestions for each simulation.

**Benefits:**

- Continuous interactions and ideas exchange results in early finish of the project.
- Cost effective as the client could finish the design in less number of simulations than expected.
- Best insight of fluid behavior for each design of baffles made us to judge the design of few baffle systems without any simulations.
- The design enhancement on these aspects helped customer to finalize the product in lesser time.