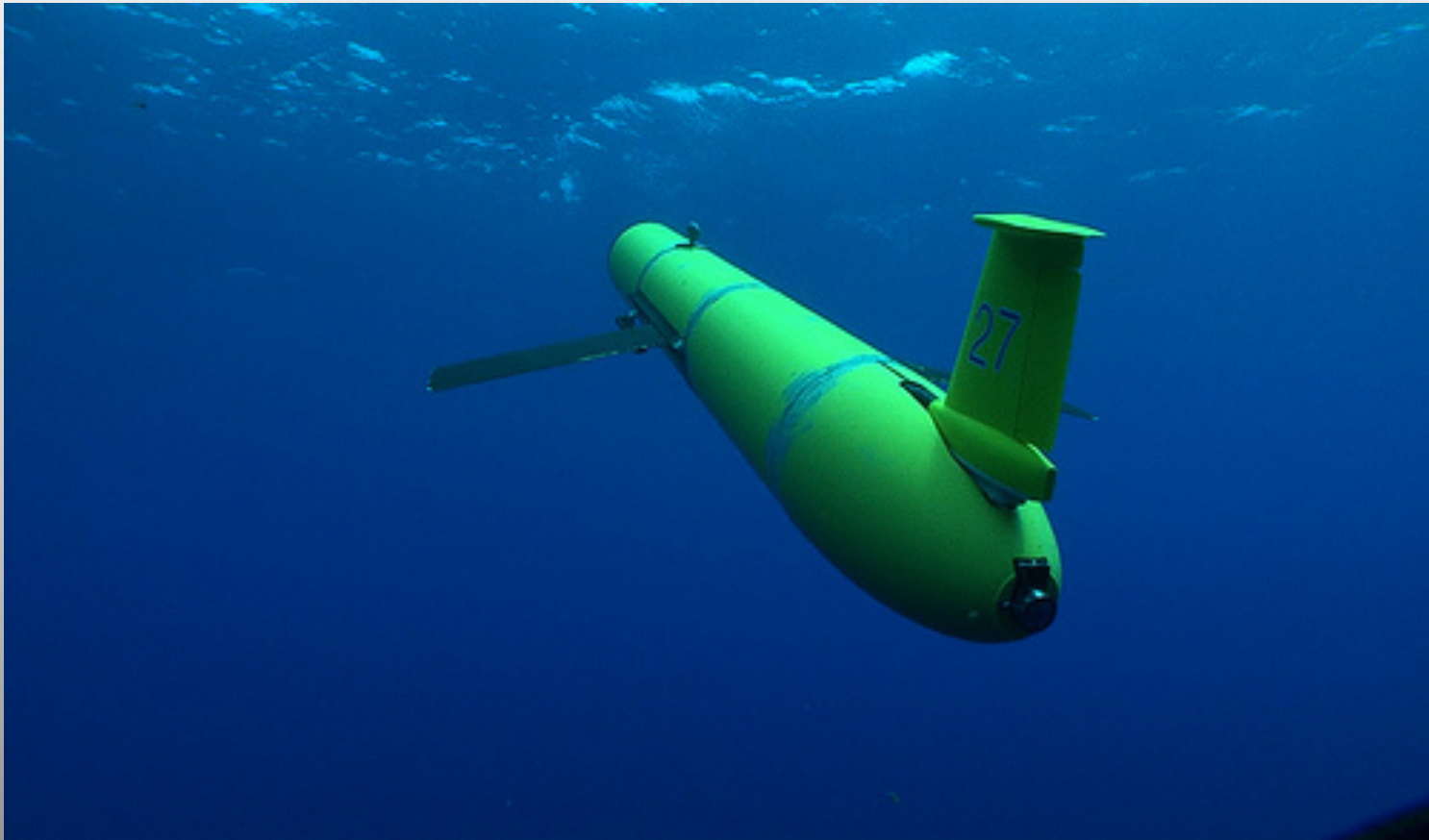


Biofouling Control Solutions

Lessons Learned



Problem



Solution

- **Choice of Biofouling Protection – Biocide, Foul Release, other**
- **Foul Release Coating (ClearSignal)**
- **Performance Requirements – long term, constant ballast**
- **Hydrodynamic streamlining**

Description

Accumulation of Fouling Organisms

Reduced Propulsion

Degradation of Data

Increased Maintenance

Increased Cost

Loss of Mission

Reduction of Autonomy

Best practice

Foul Release Coating

Streamlining

Case History - Problem

Fouling of Gliders, Platforms and other Instruments



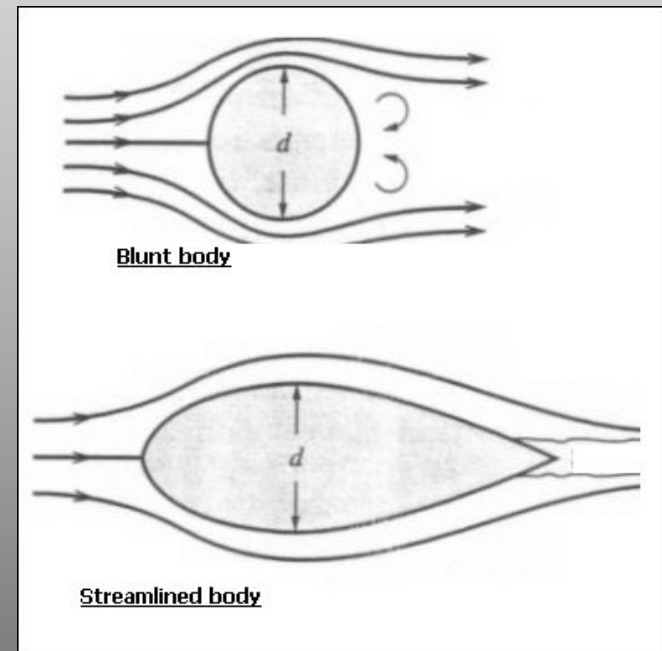
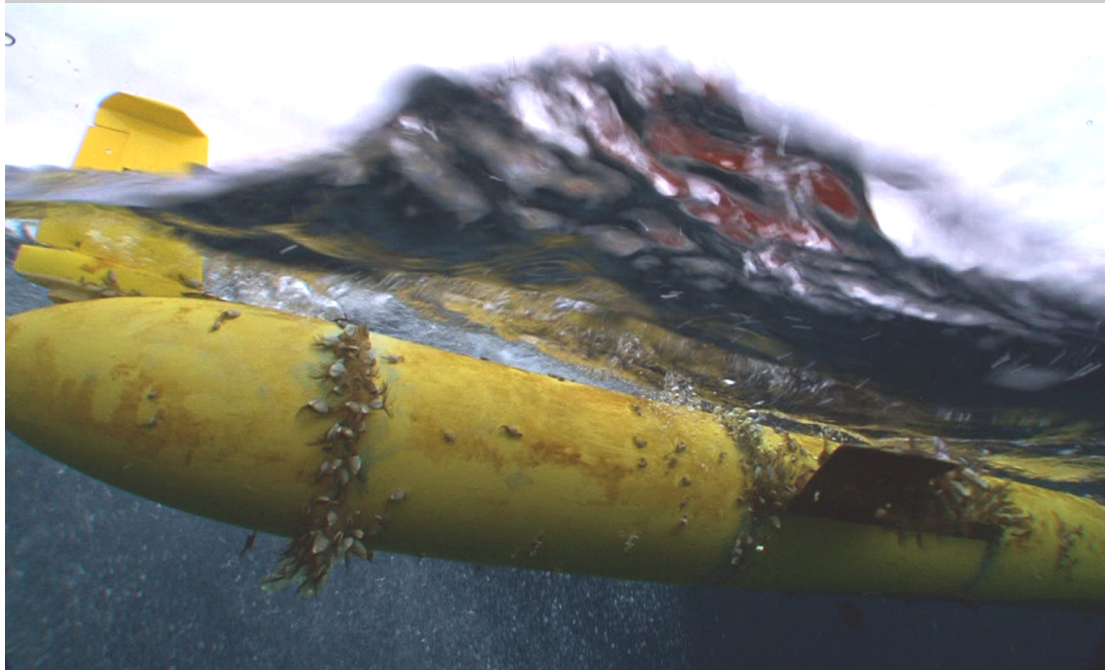
Case History - Description

Fouling of Gliders, Platforms and other Instruments

- **Accumulation of Fouling Organisms**
- **Reduced Propulsion**
- **Degradation of Data**
- **Increased Maintenance**
- **Increased Cost**
- **Loss of Mission**
- **Reduction of Autonomy**

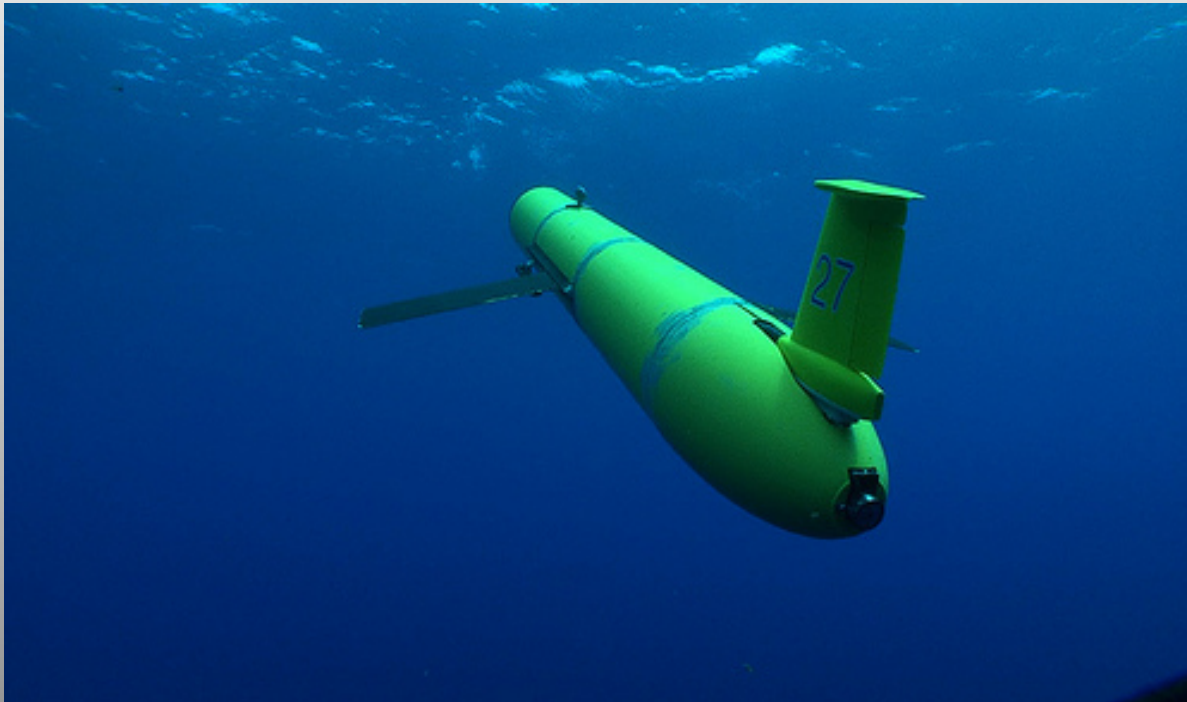
Case History – Solution

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- **Foul Release Coating (ClearSignal)**
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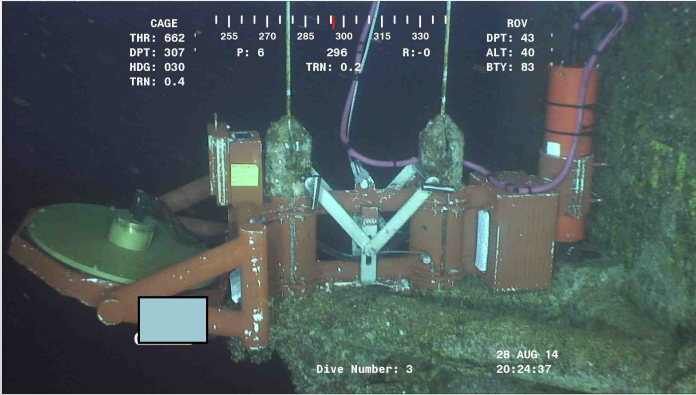
Case History - Best Practice

- **Foul Release Coating**
- **Streamlining**



Problem

Coating Adhesion in UV



Solution

Testing of Material

Redesign of Coating

Confirmation of new chemistry for substrate

Description

Top of Instrument poor adhesion

Bottom of instrument excellent

Streamlining Considerations

Best practice

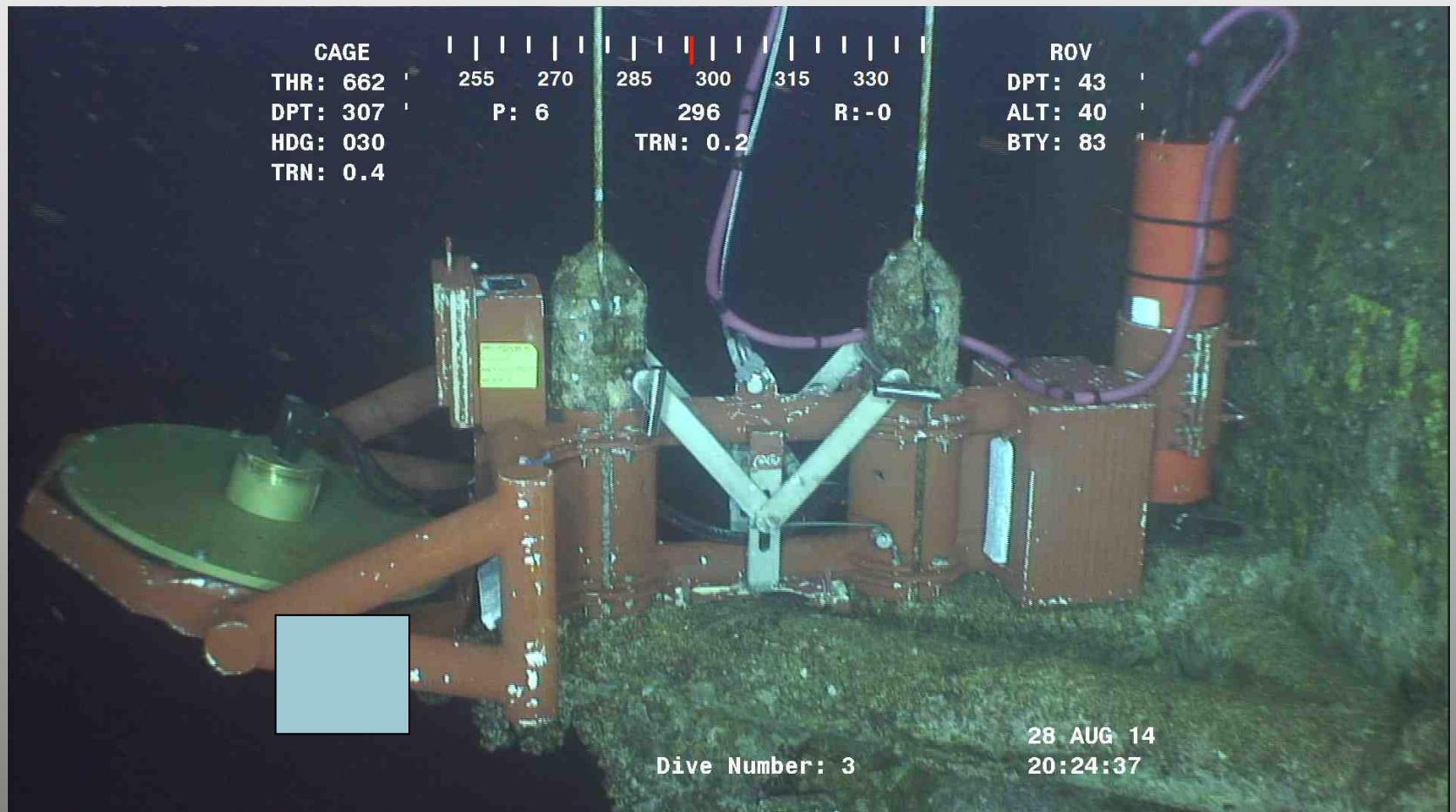
Rigorous Testing and Qualification

Foul Release Coating

Streamlining

Case History-Problem

- Delamination of ClearSignal from Top Portion of ADCP



Case History – Description

Top of Instrument poor adhesion

Bottom of instrument excellent

Streamlining Considerations

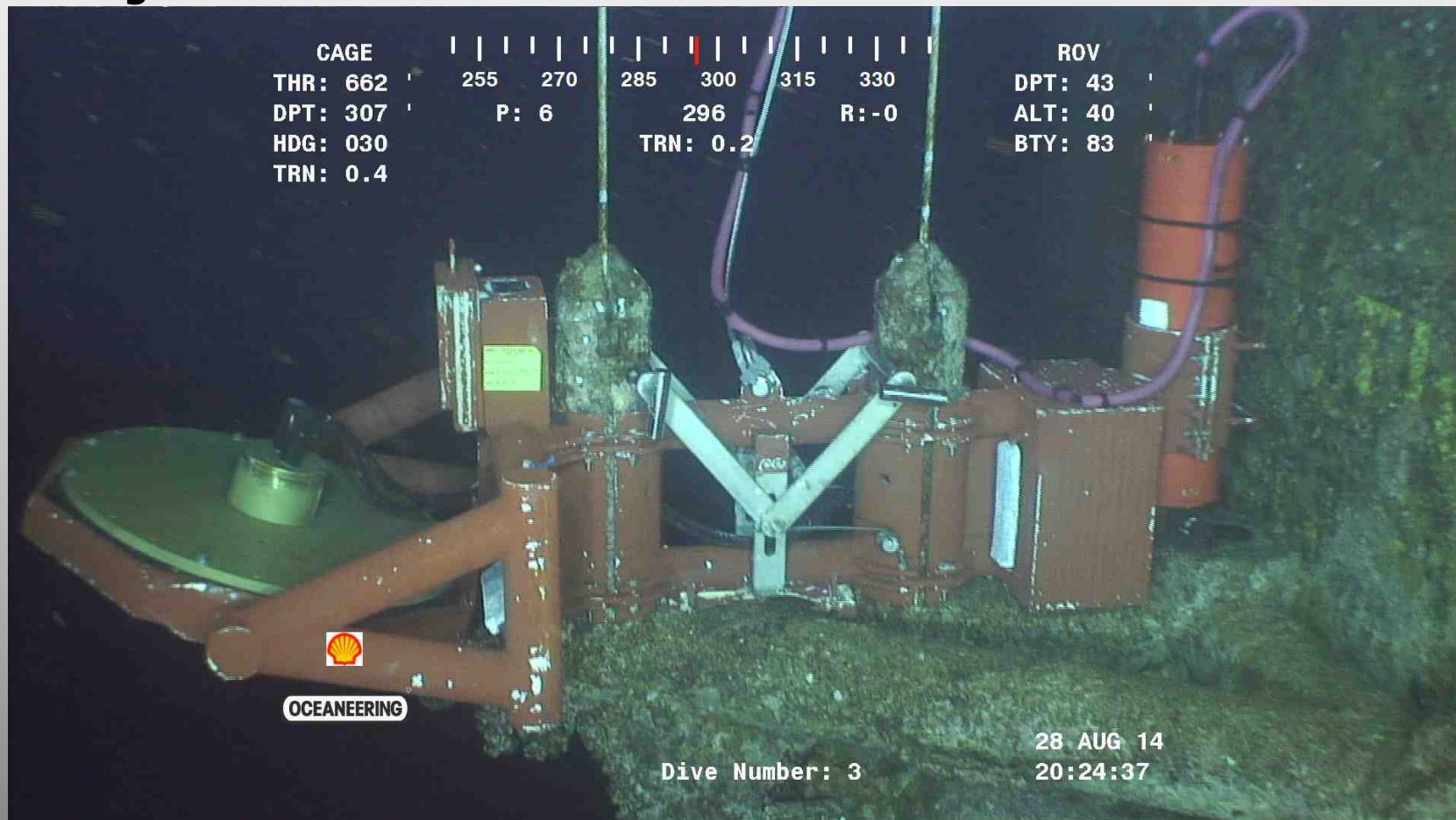


Case History – Best Practice

Rigorous Pre Testing and Qualification

New Formulation Used

Streamlining



Case History - Wiper



Liquid Immersion (Probe Guard)



UV Light Generation



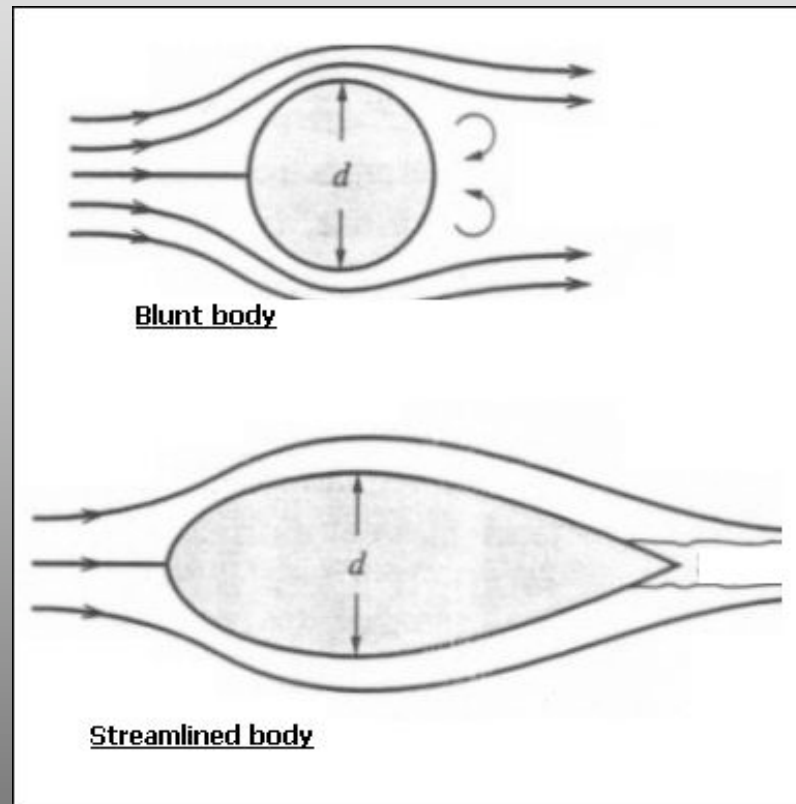
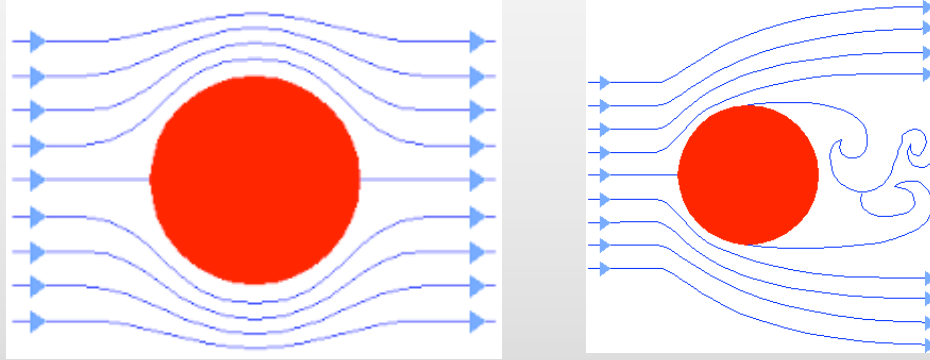
Case History



Case History



Flow Considerations



Biocide Paint



Topography (Sharklet)



Conclusions

Integrated Solutions

Implement Streamlining for Low Flow Separation

Best Practices Yield Large Results - Reductions of maintenance by 2X to 10X

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