

First PMEL Navis float: going strong at 41 profiles

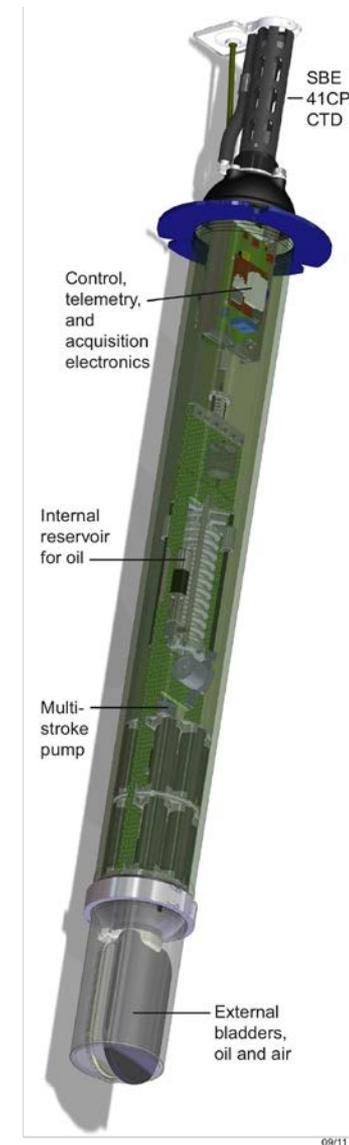


SBE Navis Technical Info

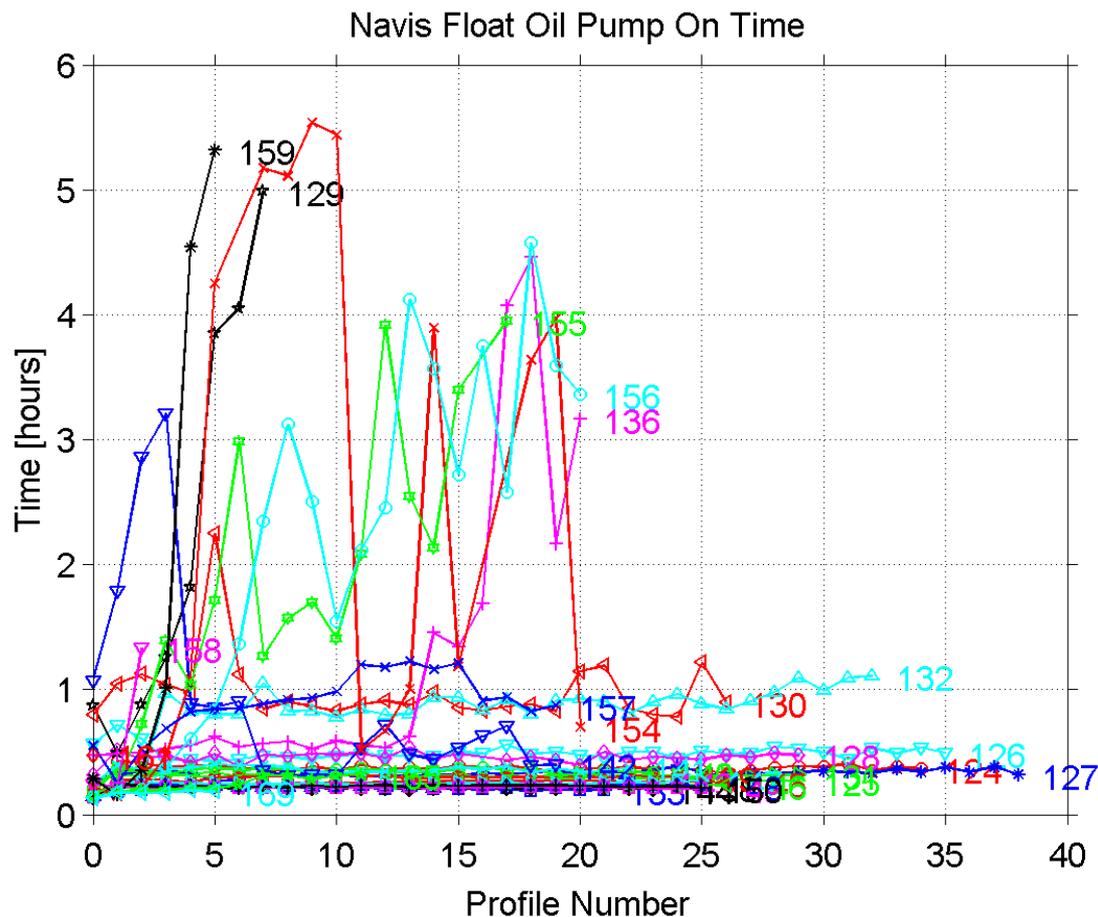


- Iridium/GPS float 95222B Rudics
- Firmware based on APF-9 (UW – Swift & Riser)
- SBE-41CP CTD
- Sufficient power for > 300 profiles to 2000 dbar
- Minimum fractional volume change 1.7%
- 300 ml oil reservoir
- 14 cm hull diameter, 24 cm ring diameter, 159 cm length
- Weight in air ~18.5 kg
- Rated to 2000 dbar
- Pressure activated

Please contact SBE for more details



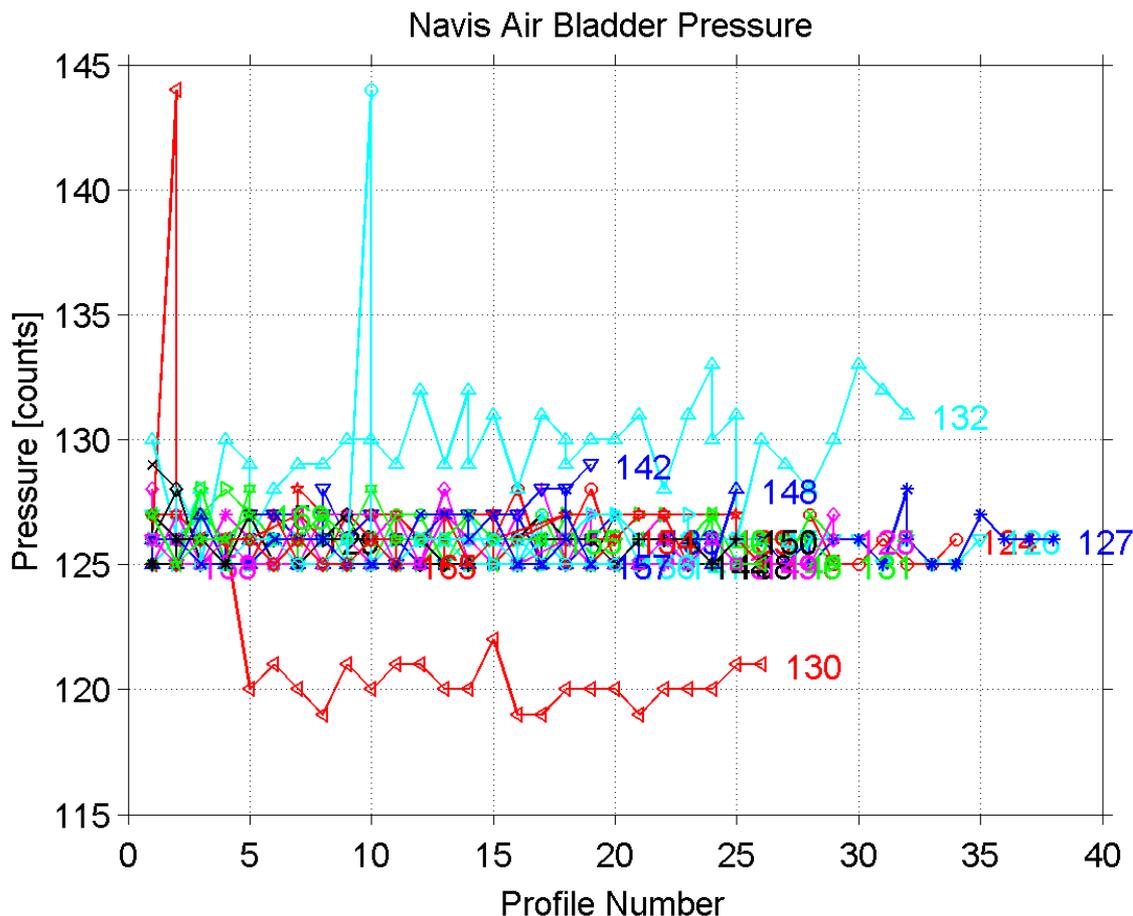
Navis Issues: Oil Pump



- Old reciprocating pump cavitation problem (air in the oil) raises its head again
- Most pronounced in “cold” near-surface conditions (high latitudes)
- Sea-Bird mitigation:
 - Leduc inlet redesign, reduced oil viscosity & float vacuum, testing new bladder
- Affecting 10 out of 42 floats deployed to some degree.
- Reduces lifetime and if really bad, float stops functioning.



Navis Issues: Air Valves?



- 130 solenoid valve permanently closed (“vacuum” count also near 120) – dead.
- SBE has replaced unit with one with a lower voltage set point (different coil winding)
- Also a check valve between air bladder and interior of float that can stick.
- Check valve sticking has affected at least 4 floats (130, 142, 150, 152).
- Makes it hard to leave the surface, killed 142. This can come and go or be permanent.
- SBE cleaned up parts tolerance & cleanliness, also removing redundant valve.



Navis Issues: Summary



- Quality control of delivered floats is excellent
- Advantages: small size, long life, buoyancy, warranty
- Out of 42 deployed floats, 10 are not currently reporting data
 - One never reported a profile
 - Seven stopped reporting after exhibiting oil cavitation
 - One stopped reporting after air valve stuck
 - One stopped reporting after oil & air symptoms
- SBE making progress on needed hardware improvements.
 - Implemented oil cavitation fixes (pump inlet, viscosity, vacuum)
 - Implemented air check valve fixes
 - Testing an impermeable oil bladder
- Data transmission efficiency still needs to be improved
- Ballasting could be improved
 - has required some parameter changes, but not impacted ability to reach target depth or surface

