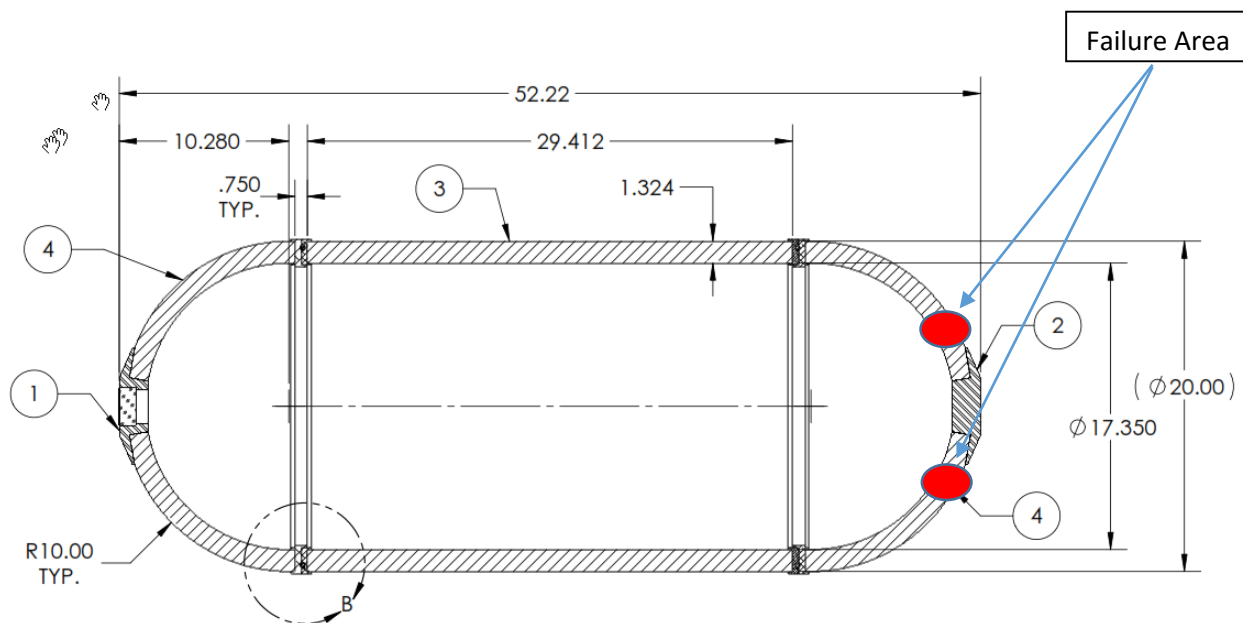




December 23, 2015

Dear OceanGate Stakeholder:

As many of you already know, we conducted a pressure test of a 1/3rd scale model of our Filament Wound Carbon Fiber (FWCF) hull. At a pressure of 4,285 psi (the pressure at approximately 10,000ft depth) one of the hemispherical endcaps failed just outboard of one of the large stainless steel inserts. While the failure was unexpected at this depth, it was well short of the design operating depth of 20,000 feet, a FWCF hemisphere was always viewed as an extreme technical challenge. Even Boeing with all their supercomputer capacity admitted they were unable to analyze such a structure. Fortunately, there was no damage to the main cylindrical section which is the critical part and a shape that is far better understood.



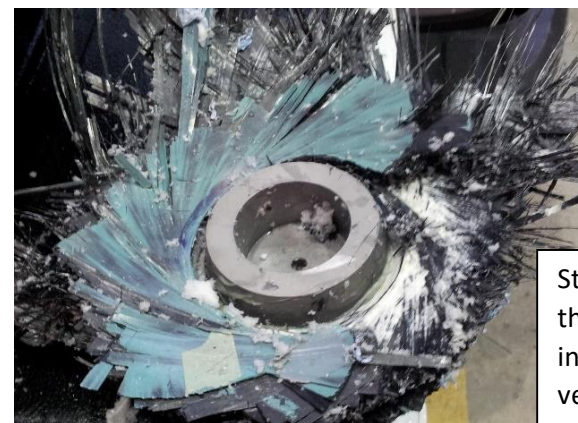
After an initial review yesterday by Spencer Composites (fortunately [REDACTED], our new Board member, was able to fly the failed components to them within 5 hours of the failure), it is believed that the hemisphere buckled which was the reason our strain gauges did not give us warning of the failure. For the next test we will include acoustic monitoring which should give a better warning of this type of failure. Being able to consistently predict a pressure vessel failure is a key to ensuring we have a safe system that can operate for many years in varied conditions.



Loading entire pressure vessel for test



Endcap after implosion
Blue bag was hanging
below and full of
styrofoam cups to
show effects of high
pressure



Stainless Steel Plug
that was launched
into the pressure
vessel after

Major Successes

1. We overcame a number of challenges just to get to this test. Solving several design and manufacturing issues with the hull was more complicated and time consuming than expected.
2. We overcame many issues which arose right before the test. These included: low pressure leaks, data acquisition system failures, communications challenges to the internal computers, and weighting, lifting and handling the test specimen. The OceanGate and APL/UW team deserves special praise for their efforts.
3. We achieved a depth that only 8 government owned subs can operate at and a depth that has great commercial and military value as it is deeper than the deepest oil well and greater than the continental shelf maximum depth.

The Path Forward

Our decision tree now leads us to reconsider the original concept of using titanium or a similar metal for our endcaps. This is a far more expensive approach than FWCF, but metals are much better understood and predictable materials. Early next year we plan to use very thick flat steel plates in place of the hemispheres to test the main cylinder to its design capacity. With a successful test of that component, we can proceed to manufacture the full sized hull and use titanium, aluminum or steel hemispheres (or FWCF if we prove that system in time).

In all “unsuccessful” tests you get useful data. As you have seen in our past operations, and should expect in the future, we will continue to have unpredicted setbacks because we are pushing the envelope of materials science and operational efficiency. Our business approach is also based on a model of extreme efficiency. Our development budget is 1/10 of the just the “upgrade” cost of Alvin. What we have achieved, and continue to develop, is the creation of an integrated system of equipment, personnel, and processes that can be extremely profitable with essentially unlimited growth potential and protection provided by large barriers to entry.

In one of a growing number of coincidences, when I returned from the test I found the latest copy of Aviation Week and Space Technology which arrived that afternoon and contained the attached article. The article, “Innovation’s Understanding Gap”, directly addresses the development process we have undertaken and reminds us all that these setbacks challenge us to learn from the questions raised and find the best possible means to reach our goals. I have great confidence in this process because many off the systems and procedures we are using are directly lifted from the aviation industry, the preeminent example of how to manage many complex systems operating in dynamic environments.

Argus Expeditions

We have just begun soft marketing of the May 7-14 Cyclops 1 mission to the Andrea Doria. Broader sales efforts are on hold until we lock down a support vessel and formally incorporate Argus Expeditions. Both of these items will be done by the end of January. On a very positive note the first potential client we contacted has committed to the \$20,000 fee to join us for 2 days (including just one 3 hour dive) and has also secured two more individuals at \$20,000 each despite our lack of significant supporting information (vessels, cancellation policies, exact timing etc.). As we only have 12 positions available for this expedition the quick uptake is encouraging and a good initial validation of the unique Argus Expeditions business model.

Have a Merry Christmas,

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