

UPDATE ON HOV ALVIN OVERHAUL AND 6500M UPGRADE COMPLETION

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BACKGROUND

- Alvin overhaul occurs nominally every 5 years. This overhaul, which began in March 2020, was timed with the R/V Atlantis midlife at ~6.5 years.
- The standard overhaul activities this year are supplemented by the replacement of several end-of-life systems that enable completion of upgrade to 6500m depth rating.

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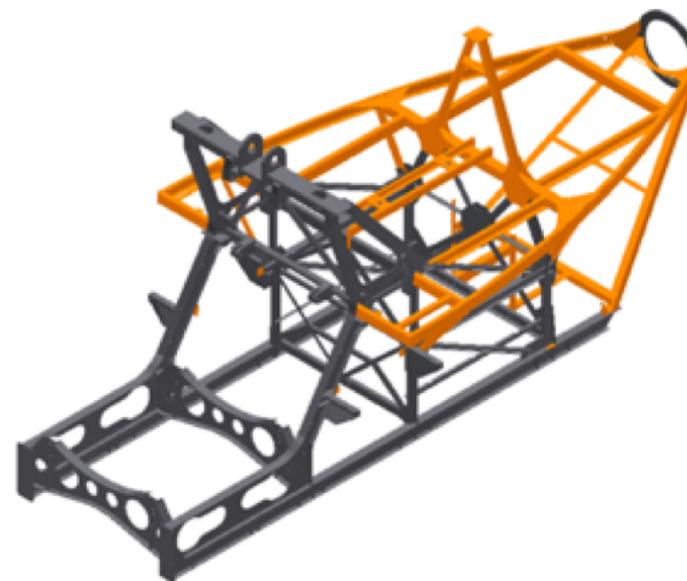


OVERHAUL PHASES

<i>Disassembly phase</i>	<i>May 2020 - Jun 2020</i>
<i>Maintenance & mods phase</i>	<i>Jun 2020 - Jul 2021</i>
<i>Reassembly phase</i>	<i>Mar 2021 - Jul 2021</i>
<i>Testing phase</i>	<i>Jul 2021 - Aug 2021</i>

OVERHAUL MILESTONES

<i>Atlantis mid-life refit</i>	<i>Jul 2020 - Jul 2021*</i>
<i>Atlantis transit to WHOI</i>	<i>Jul 2021 - Aug 2021</i>
<i>Alvin post-overhaul testing</i>	<i>Jul 2021 - Aug 2021</i>
<i>Alvin on-load</i>	<i>Aug 2021 - Aug 2021</i>
<i>Alvin dockside testing</i>	<i>Aug 2021 - Aug 2021</i>
<i>Alvin Sea Trials</i>	<i>Aug 2021 - Sep 2021</i>
<i>Alvin Science Verification</i>	<i>Sep 2021 - Oct 2021</i>



Modified Frame



- Systematic disassembly completed June 19th
- Primary maintenance work underway
 - Stress testing of components
 - Modifications to frame
- Ongoing collaboration with NAVSEA (cognizant certification body) for validating designs and best practices.

ALVIN SYSTEM UPGRADES

- Sub hardware (6500m)
Main/variable-ballast system, replace foam, modify frame, motor controllers, hydraulics.
- Imaging systems (standard overhaul + 6500m)
Integrate 4K video, improve lighting, controllers, display & recording
- Data systems (standard overhaul)
Improve post-drive transfer speeds, complete adoption of in-hull event logger/frame grabber, upgrade shipboard hardware, implement metadata & data product standards.
- Comms (standard overhaul)
Further develop acoustic image/data transmission for participation by shipboard science observers.

BALLAST SPHERE MILESTONES

<i>Ballast sphere machining/welding</i>	<i>Jun 2020 - Nov 2020</i>
<i>Post weld heat treat</i>	<i>Nov 2020 - Nov 2020</i>
<i>Final machine</i>	<i>Nov 2020 - Dec 2020</i>
<i>Tech Readiness Review</i>	<i>Jan 2021 - Jan 2021</i>
<i>Hydro test</i>	<i>Jan 2021 - Jan 2021</i>
<i>Post hydro NDT</i>	<i>Jan 2021 - Feb 2021</i>
<i>Ship spheres to WHOI</i>	<i>Feb 2021 - Feb 2021</i>



6,500 Meter H.P. Ballast Sphere

ALVIN SEA TRIALS & SCIENCE VERIFICATION

- Sea trials (NAVSEA 6500m certification) planned for Puerto Rico
- Science Verification Expedition in development
 - Guided by community workshop: *Expanding Deep Sea Horizons: Priorities in Abyssal Research*
 - Potential activities: New conops (e.g., extended dive days), testing new science systems, evaluating abyssal sample recovery & novel in-situ methods.
 - Dives tentatively planned for PR and Mid Cayman Rise

