



Alvin 6500 Project: Approach



Leverage Upgrade Project Momentum

- Vehicle documentation base
- Engineering staff knowledge of system
- Strong WHOI-NAVSEA working relationship

Define Scope First

- Key design studies
- System design phase
- Detailed planning of upgrade efforts

Incremental Upgrade Efforts – Reduce Risk

- Execute upgrade efforts as individual projects
- Work technical, certification challenges on extended timeline
- Reduce program risk
- Reduce schedule impact to system operations



Alvin 6500 Project: Phases



Key Design Studies – Now (existing *Alvin* Engineering funds)

- Upgrade Stage 1 validation/assessment
- Energy budget/battery trade study
- Arrangement and weight/balance design study

System Design – One Year (operational funds supplement)

- Systems engineering framework
- Top-level *Alvin* 6500m design
- Subsystem upgrades scope and planning

Subsystem Upgrades – Phased over next 2 overhauls

- Life support – scrubber and EBA
- Main battery – upgrades for increased power density
- Fixed buoyancy – upgrade remaining syntactic foam
- Main/variable ballast system – new VB/HP spheres
- Structures – modifications to main vehicle frame to support upgrades
- Propulsion – upgrade thrusters to 10 HP