

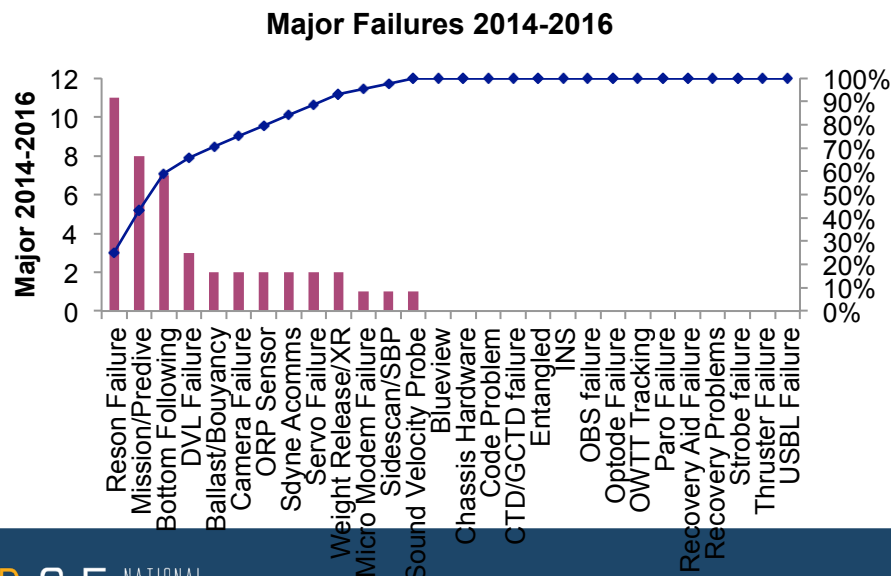
The Future of NDSF Multibeam

NDSF NATIONAL
DEEP SUBMERGENCE
FACILITY



- Jason currently has an “ROV version” Reson 7125 – it is used < 1 time per year
- Alvin currently has an “AUV 1” Reson 7125 – it is very rarely used
- Sentry currently has an “AUV 3” and an “AUV 1” Reson 7125. The AUV 3 is used nearly every cruise and the AUV 1 is the spare which is used rarely.
- AUV 1 and ROV version systems ca. 2008. AUV 3 system ca. 2013.

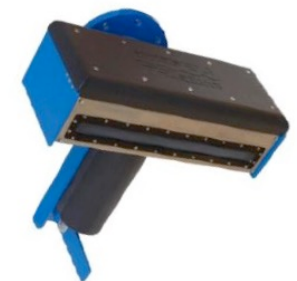
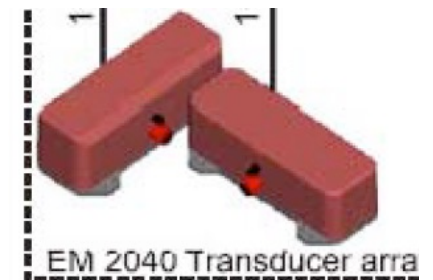
- Reson service and support has become untenable
 - Failure rates are very high
 - All US field offices closed
 - Equipment sent for repair has come back with new defects 3 out of last 4 times
 - Extended warranties have not been honored
 - In one case we were told “Normal Life” was ~3 years.
 - Only Sentry has enough use to ensure adequate staff training



- Three Possible Configurations:
 - Sentry has the only system
 - Each vehicle has a system
 - Sentry has a system and there is a “Fly-Away System”
 - Would be a basket payload that could be incorporated in any large HOV/ROV
 - Independent navigation system, computing, timing, and sound velocity
 - Just add power and add network pass through for operator
 - Could be tied into flight controls on a vehicle by vehicle basis.

- March 2018 – WHOI conducted a Multibeam Market Survey
 - Four vendors contacted (Kongsberg, Norbit, Blueview, R2Sonics)
 - Kongsberg and R2Sonics responded
 - Tradeoff is essentially installed base and proven operation vs slightly higher resolution.
 - Customer service tradeoffs are thought to both be good but more investigation is warranted. Kongsberg has a good reputation, R2 is more unknown.

| | Kongsberg | R2Sonics |
|----------------|------------------|-------------------------------|
| Max Coverage | ~450m wide @ 2m | Similar but no plots provided |
| Max Resolution | 140m wide @ 0.3m | Insufficient data provided |
| Frequencies | 200,300,400 kHz | 170-450,700 kHz |



- We recommend the Sentry system and the fly-away option
- Based on current user requests, we get more requests for higher coverage than for higher resolution – can DeSSC please weigh in to confirm or refute this perception?
- We need to proceed relatively quickly as obtaining new spares for the existing Reson units is expensive and difficult and we are consuming our existing inventory.