

SUBMARINE TACTICAL DEVELOPMENT



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Submarine perspective

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What has changed?

- The proliferation of quieting technology has resulted in a significant decrease on target signal strength – L_s
- Processing has helped recognition differential, yet improvements have not kept up with lowering L_s
- Current threat operate in the Littorals, Transmission Loss is harder to model; bottom types, slope and bathometric data is limited
- Therefore, detection ranges and ability to predict with some accuracy detection ranges has also decreased
 - Initial Range is determined by TMA (IDM) not ROD
 - Sensitivity is unknown
 - Confidence in results has been lost

Nrd vs. lower Ls

- The variability of Ls has significant effects on FOM calculations. Aspect, understanding of acoustic health and engineering improvements (AIP and sound mounts), create significant variability on each platform and within each class
- Although, with some improvements in processing we have seen limited improvements in Nrd
 - Nrd is highly variable, line-up, intelligence, operator, and state of readiness
- Ls values have lowered at a faster rate than Nrd has increased. The net result is a drastic drop in detection ranges

Other affects of lower Ls

- Using fixed values of L_e and TL , a larger variance in a smaller number (L_s) results in predicted ranges being possibly very short or somewhat longer.
- In exercises and non-structured events, when predicted detection ranges normally 4000 yards we are gaining contact at 500 to 8000 yards. The usefulness of calculating FOM ranges is questionable.
- Now, IAW tactical guidance, range is determined by bearing rate and own ship movement.

Current Sonar TDAs

- SFMPL up to Release 6.1- PCIMAT and CASS/GRAB
- SDTA FY 2001 not yet release—soon.
 - PCIMAT and CASS/GRAB, MINERAY III for HF Active
 - FY 2002 will add automatic environmental input, MF/HF active planning
 - FY 2003 will add MEDAL for UUV and Mine Hunting

STRG Requested Improvements in *Sonar Employment Planning*

- Automation
 - Environmental Inputs
 - STED-like Onboard Sensors
 - Search planning for active
- STDA Improvements
 - UUV search planning
 - HF sonar planning

Other fleet concerns for modeling uncertainties

The Fleet needs to understand effect of uncertainties in the areas that we operate.

- ***Can ROD with uncertainties, provide Tactical Information?***
- Accurate, with enough granularity, understanding bottom type and interactions
- Expand data base, integrate more into data base
- Predicting internal waves. Knowing when your sonar system will have the best detection range is important.
 - Can ensure TA steady when performance is best, improves Nrd
 - Can plan and conduct noise evolutions when environment does support detections