# Ocean Class AGOR

## Baseline and Priorities

## Mission Equipment Specification (MES)

13 October 2010

# Baseline MES Strategy

- Ocean Class AGOR designs are being developed based on the MES contract attachment. This Mission Equipment Specification was based on SMRs and Navy/ONR requirements. Ships will be designed and built to accommodate all items in the MES as modified by any changes.
- MES acquisition strategy is being developed consistent with agreement between PEO Ships and ONR and the available budget in order to prioritize the actual equipment to be purchased and installed when the ship is delivered. Budget realities will limit the actual equipment initially installed.
- Navy has developed a proposed Baseline Mission Equipment Specification consistent with known available AGOR Program budget.
- Actual ship construction costs and availability of additional funding sources will determine to what extent equipment beyond the Baseline can be provided.
- Input is requested from UNOLS community, via FIC, on this approach and specific equipment selections as we rapidly move forward with design/construction.

# Mission Equipment Prioritization

| System | Priority Level | Notes |
|---|---|---|
| Deep Water Multi-Beam System | Baseline | EM122, considering EM302 |
| Echosounder/Sub-bottom profiler 12, 38, 120 & 200 kHz / 3.5 kHz | Baseline | Knudsen 3260 in lieu of Kongsberg SBP 120 |
| Attitude, Heading, Reference System | Baseline | POS MV or IXSEA system |
| Broadband Satellite Communications | Baseline | FBB/Ka Band and/or C-Band |
| ADCP – 38 kHz | Baseline | New capability for deep water |
| Acoustic Monitoring System | Baseline | Needed to verify and monitor Acoustic performance |
| Uncontaminated Seawater system | Baseline | Low cost but required to meet basic science missions |
| Sound Velocity Measurement | Baseline | Calculated from SeaBird TSG |

# Mission Equipment Prioritization

| System | Priority Level | Notes |
|---|---|---|
| Mid-water Multi-Beam System | One | EM 710 |
| SONAR Synchronization Unit | One | Kongsberg system |
| ADCP – 300 kHz | One | Possible Cross-Deck Item |
| Acoustic Transponder Navigation System Transducer and Electronics | Two | SONARDYNE USBL or IXSEA GAPS |
| Printing/plotting Equipment | Two | To be defined later |
| UW Acoustic Comms System | Three | Benthos Telesonar system |
| ADCP – 75 kHz | Four | Possible Cross-Deck Item, 150 kHz may also be available and could be used in place of the 75 kHz as needed. |
| Scientific Echo-sounder for mid-water/fisheries work | Four | EK60 multi-frequency unit, using many of the same transducers |

Note: Equipment over and above the baseline is rank ordered as Priority One, Two, Three or Four

# From SMR to MES

| SMR | Mission Equipment Specification | Possible Alternate Mission Equipment Selection |
|---|---|---|
| 12 kHz Single beam echosounder that meets IHOs standards | EA600 multi-frequency echosounder (12, 38, 120 and 200 kHz) | Knudsen 3260 12 kHz and potential for additional frequencies. Also EK60 multi-frequency biological echosounder. |
| 2 to 8 kHz sub-bottom profiler at 10 kw, chirp system. | Knudsen SBP 120 | Knudsen 3260 and 4x4 array of Massa TR 1075 transducers |
| 1 degree Multi-beam Swath Mapping system capable of deep water and with reasonable data at depths as shallow as 50 meters | EM 122 deep water 1 x 2 degree system<br><br>EM 710 mid water 0.5 x 1 degree system | EM 302 system |

# From SMR to MES

| SMR | Mission Equipment Specification | Possible Alternate Mission Equipment Selection |
|---|---|---|
| ADCP with transducer wells for multiple frequencies that would provide a combined capacity from 1,000 meters to fine scale at | 3 ADCP transducer wells and ADCP systems at 38, 75 and 300 kHz. Possible to mount 150 kHz transducer in the 38 or 75 well | 150 kHz system as a cross-deck item |
| Acoustic Navigation and Tracking System | HiPAP 500 with gantry system to lower transducer below hull and change/service transducer while in the water. | SONARDYNE USBL IXSEA GAPS |
| Acoustic Comms system | Benthos Telesonar system | |
| Provision for additional transducers | 3 scientific sea chests for additional systems | |

# From SMR to MES

| SMR | Mission Equipment Specification | Possible Alternate Mission Equipment Selection |
|---|---|---|
| Acoustic quietness and operation | Bubble sweep down and sonar self noise requirements as well as an acoustic monitoring | |
| Voice and Data Communications through the best available systems | C-Band Satellite system | Fleet Broadband combined with Ka Band AND C-Band Satellite |
| Uncontaminated Seawater System designed by experts users and operators | Seawater system to be designed and installed per Operator institution and community guidance | |
| Science network and computing systems | Designed and installed per Operator institution and community guidance | |

# Alternate MES Equipment

- MBES Deepwater –
  - MES has a EM 122 1x2 degree
  - Navy is debating benefits of a EM 302 0.5 x 1 degree as an alternative
  - Minimal impact to Ship Design – the EM 302 is smaller than the EM 122
  - Can be accommodated within budget
- SSVS (Sound Velocity)
  - MES has a Kongsberg SSVS which uses a AML Smart Probe
  - Preliminary feedback indicates Seabird Thermosalinograph may be acceptable
  - Minimal impact to Ship Design
  - Can be accommodated within budget
- SBES/SBP – Sub-bottom profiler
  - MES has a Kongsberg EA 600 SBES and a Kongsberg 120 6x6 degree SBP
  - Preliminary feedback indicates Knudsen 3260 with 16 Massa TR-1075 array may be acceptable
  - Potential impact to Ship Design to be investigated
  - Can be accommodated within budget

# Alternate MES Equipment (cont.)

- AHRS – Attitude, Heading Reference System
  - MES has a PosMV
  - Preliminary feedback indicates Ixsea Hydrins may be acceptable
  - No impact to Ship Design
  - Can be accommodated within budget
- Broadband Satellite Communications
  - MES has a C-Band
  - Preliminary feedback indicates Fleet Broad Band with Ka Band may be acceptable in addition to or in lieu of C-Band
  - Minimal impact to Ship Design
  - Can be accommodated within budget

# Alternate MES Equipment (cont.)

- ANTS – Acoustic Navigation and Tracking System
  - MES has a Kongsberg HiPAP 500
  - Preliminary feedback indicates both Sonardyne USBL and Ixsea GAPS may be acceptable
  - Potential impact to Ship Design
    - May be possible to use either system with HiPAP 500 Gantry system
  - Can be accommodated within budget

- SBES – Single-beam echo sounder system
  - MES has a Kongsberg EA 600 12 kHz & 38 kHz,
    - Also includes 120kHz and 200kHz
  - Preliminary feedback indicates EK 60 may provide valuable mid-water science
  - No impact to Ship Design
  - Can be accommodated within budget if there are other trade-offs
  - Could be a possible addition to the MES with outside funding

# Funding Options

- ONR, WHOI and SIO are investigating cross-deck opportunities; dispositions of R/V KNORR, R/V OCEANUS and R/V MELVILLE are relevant to this discussion
- WHOI and SIO are both investigating DURIP and other funding opportunities; availability of DURIP funds can not be guaranteed
- Acquisition and installation cost estimates are being developed

# MES Acquisition Strategy

- Navy is seeking consensus on the Proposed Baseline Mission Equipment and prioritization of the remaining mission equipment (Navy, NSF, UNOLS (Operators and FIC))
  - FIC feedback requested NLT November 15, 2010
- Feedback and recommendations from FIC and NSF requested at the same time on the potential alternative equipment specifications.
- Budget strategies will take into account opportunities for cross-decking equipment from existing vessels and funding sources outside the Navy ship construction funds.
- MES Acquisition management and installation support costs are included in the budget strategies and these costs will be refined as we move forward.