Ocean Class AGOR Acquisition Update

Prepared by PEO Ships/PMS325Q, and ONR Code 32

For UNOLS Fleet Improvement Committee and Annual Meeting

24-26 October 2011

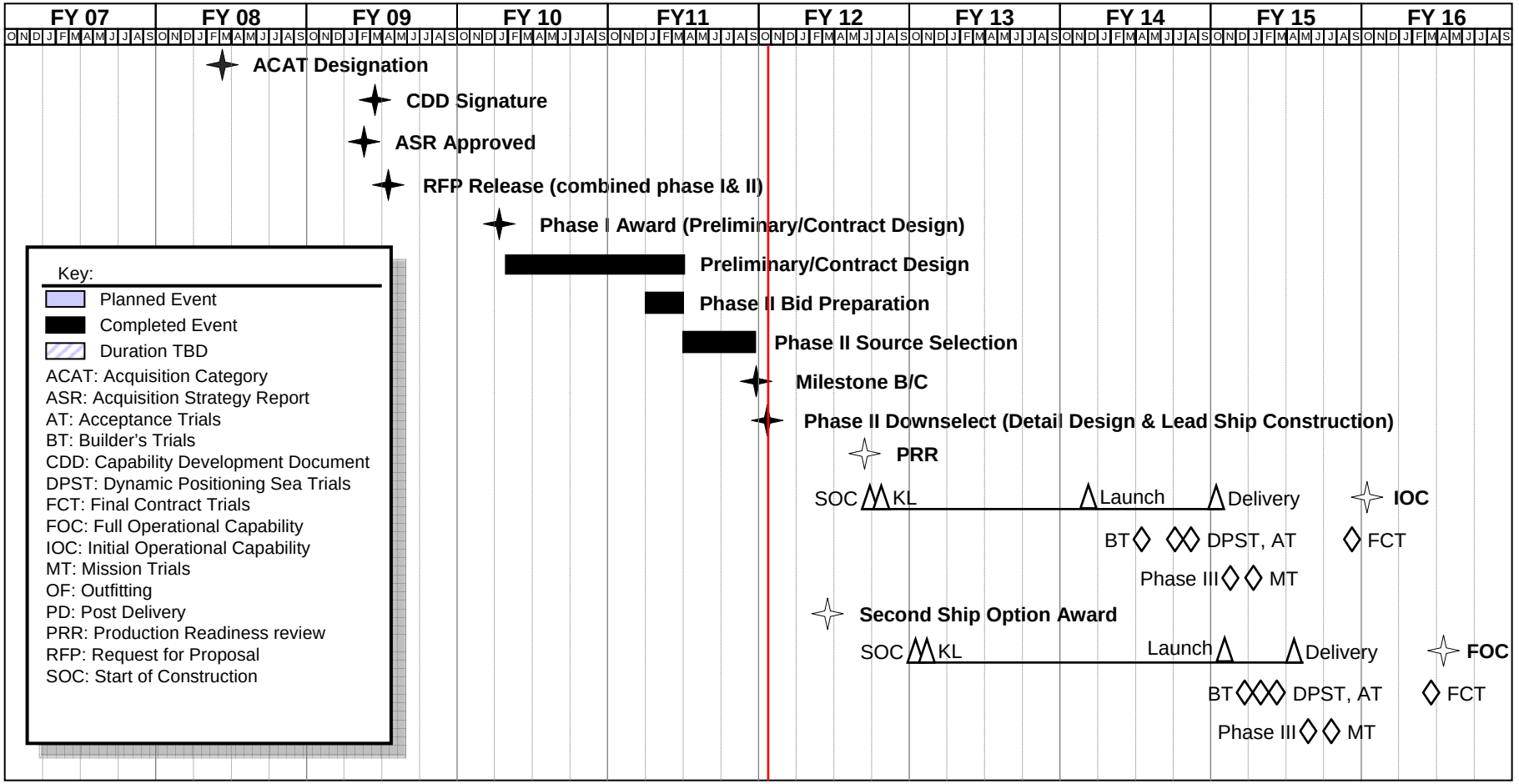
Ocean Class AGOR
Contract Award
to Dakota Creek Industries
Anacortes, WA

Design Agent
Guido Perla & Associates
Seattle, WA

Ocean Class AGOR Phase II Schedule

- Phase II: Detailed Design & Construction
  - Contract award (AGOR 27) – 14 October 2011
  - Scheduled contract events
    - Post award conference 7 & 8 November 2011
    - First design review 13 & 14 December 2011
    - Logistics Guidance Conference TBD January 2012
    - Start of Construction Spring/Summer 2012
    - Option for AGOR 28 TBD Spring/Summer 2012
- Deliveries:
  - Early FY 2015, Mid FY 2015

Ocean Class AGOR Acquisition Schedule



Ocean Class AGOR
Ship Design Overview

for UNOLS Fleet Improvement Committee

and Annual Meeting

24-26 October 2011

Joe Mackes
AGOR Ship Design Manager
NAVSEA 05D4
joseph.mackes@navy.mil
202-741-0334

Unique/Novel Features

- Hull form to divert bubbles from sonar area
- Controllable Pitch Propellers (CPP's) with variable speed motors for improved efficiency over varying modes of operation
- Cranes, CTD Handling and Starboard Side Handling Systems reach to waterline for improved safety and load control
- Condition based monitoring system for main propulsion, major auxiliaries and ship control equipment
- Centralized fresh water cooling system
- HVAC variable air volume and regenerative heat

General Characteristics

Length overall	238’-0”
Waterline length	230’-0”
Maximum breadth (molded)	50’-0”
Depth to Main Deck	22’-0”
Draft	15’-0”
Sustained speed	12 knots
Max speed (estimated)	12.8 knots
Installed brake horsepower	2,324 hp
Installed total power	3,952 kw

General Characteristics

Lightship weight (with 5.5% design and build margin)	2,058 LT
Full load displacement (with SLA)	3,024 LT
Range (at sustained speed)	11,500 nm
Endurance	40 days
Accommodations	20 single crew staterooms 12 scientist double staterooms

Mission Systems

- **Ship has been designed with space, weight and power reservations for the following sonar systems:**

Equipment	Manufacturer [1]	Model [1]
Deep Water Multibeam Survey System	Kongsberg	EM-122
Mid Water Multibeam Survey System	Kongsberg	EM-710
Subbottom Profiler	Knudsen	Chirp 3260 with 16 Massa TR-1075 Array
Single Beam Survey System	Kongsberg	EA-600 (12, 38, 120, 200 kHz)
Acoustic Doppler Current Profiler	Teledyne RD Instruments	Ocean Surveyor 38 and 75 kHz Workhouse Mariner 300 kHz
Acoustic Navigation and Tracking System	-	Gantry

[1] from Mission Equipment Specification


NAVSEA
NAVAL SEA SYSTEMS COMMAND


SUPPORT SHIPS, BOATS, AND CRAFT
PMS325
PROGRAM OFFICE

Questions?

Agenda

- Requirements
- Comparison of Science Mission Requirements (SMR) to Design
- Unique/Novel Features
- General Characteristics
- Mission Systems
- Performance Characteristics

Requirements

Contractual

- System Specification
- Mission Equipment Specification

Regulatory

- ABS Under 90 meter rules (A1, Circle E, AMS, ACCU, NIBS, Ice Class D0, UWILD)
- 46 CFR Subchapter U (Oceanographic Vessels)
- MARPOL
- SOLAS

SMR/Design Comparison

SMR Parameter	Capability or Characteristic	Design
Accommodations	• 20 to 25 science berths (original SMR) • Target all single berths for crew	• Meets: 24 in 12 doubles • Meets target: 20 singles
Working deck area	• 1,500 – 1,800 sq ft aft of deckhouse • 2,000 – 2,600 sq ft total clear stern working area • 80 ft clear deck area on one side	• Exceeds: 1,873 sq ft • Meets: 2,557 sq ft • Meets: 80 ft
Laboratory Area	• Main lab 900 - 1,000 sq ft • Wet lab 350 - 400 sq ft • Computer lab 250 - 300 sq ft • Staging Bay 250 – 300 sq ft	• Exceeds: 1,023 sq ft • Meets: 398 sq ft • Exceeds: 311 sq ft • Exceeds: 303 sq ft
Science Storage	4,000 to 5,000 cu ft	Exceeds: 5,017 cu ft
Science payload	150 to 250 LT	Meets target: 250 LT

SMR/Design Comparison

SMR Parameter	Capability or Characteristic	Design
Vans	Two 8 ft by 20 ft deck vans with target of capability to carry additional vans	Meets target: 3 vans
Towing	• 10,000 lbs at 6 knots • 25,000 lbs at 4 knots	• Meets • Meets
Sustained Speed	10 to 11 knots through SS4 12 to12.5 kts at 80% MCR calm seas	Meets: 12 kts at 80% MCR in calm seas
Endurance	40 to 45 days	Meets: 40 days
Range	Up to 10,800 nm at optimal transit speeds	Exceeds: 11,500 nm at sustained speed
Seakeeping	Maximize ability to work in SS5 and higher	Meets: 86% (arrival load) and 88% (full load) in SS5

SMR/Design Comparison

SMR Parameter	Capability or Characteristic	Design
Station keeping	35 knot wind, SS5, and 2 knot current	Meets: ± 5 meters in SS5
Track line following	± 5 meters of intended track with a crab angle of less than 45 degrees with 30 knot wind, up to SS5 and 2 knots current	Meets: ± 5 meters in SS5
Handling Systems	Main crane; portable crane; 2 hydro winches; stern frame; CTD handling system, starboard side handing system; traction winch with 2 drums	Meets equipment requirements and capabilities
Ice strengthening	Work near 1st year ice	Meets: Ice Class D0

Ocean Class AGOR

Power Plant and Propulsion

- Integrated diesel electric drive
- Four diesel gensets
- Two AC propulsion motors and drives
- Two CPP’s
- Bow thruster, azimuthing
- Stern tunnel thruster

Performance: Bubble Sweepdown and Dynamic Positioning

Bubble Sweepdown

- Model tests have demonstrated favorable results.
  - System Spec requirement: *Flow streamlines originating at the ship's stem shall pass no closer than 2 meters, measured transversely, from the centerline of the Deep Water Multibeam Survey System sonar transducer receive array.*

Dynamic Positioning

- Analytical predictions meet requirements.
  - System Spec station keeping requirement: *Hold position within ± 5 meters in 35 knot wind and 2 knot beam current with ship headed into collinear wind and SS5 waves.*

Performance: Seakeeping and Maneuvering

Seakeeping

•Analytical predictions show 100% operability in SS4 and 86%/88% operability in SS5 for arrival load/full load, with roll stabilization tank.

- **System Spec defines operability as:**
  - ✓ **Roll < 3 degrees, pitch < 2 degrees**
  - ✓**Vertical acceleration < 0.15 g and lateral acceleration < 0.05 g at Main Deck amidships at deck edge**

Maneuvering

• Model tests demonstrate meeting System Spec requirements.

- **Directionally stable**
- **Turning diameter < 4 ship lengths**
- **Zig zag**

Performance: Noise

- Analytical predictions meet System Spec requirements:
  - Airborne noise in all interior spaces and topside locations at sustained speed and during station keeping
  - Sonar self-noise at sustained speed
  - Radiated noise goal at 8 knots