U.S. Department of Homeland Security

United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-ICA
Phone: (202) 366-4280
FAX: (202) 366-7124

5730

FEB 0 3 2006

The Honorable Jerry Lewis
Chairman, Committee on Appropriations
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

Conference Report 109-241 accompanying the Department of Homeland Security (DHS) Appropriations Bill, 2006, states "The conferees include a new provision directing the Coast Guard to submit a review of the Revised Deepwater Implementation Plan in conjunction with the President's fiscal year 2007 budget request. This report shall include: a detailed explanation of any changes to the plan for fiscal year 2007; a detailed, annual performance comparison of Deepwater assets to pre-Deepwater legacy assets in terms of operations and maintenance costs, operational availability (including mean time between failure and mean time to restore), mission performance, and crewing; a status report of legacy assets, including modernization progress, operational availability, and the projected, remaining service life of each class of legacy Deepwater asset; a comprehensive explanation of how the Coast Guard is accounting for the costs of legacy assets in the Deepwater program; an explanation of why many assets that are elements of the Integrated Deepwater System are not accounted for within Deepwater's appropriation (such as the missionization of the C-130Js, the 179-foot Cyclone class cutters, and the airborne use of force outfitting of the HH60s and HH65s); a description of the competitive process conducted in all contracts and subcontracts exceeding $5,000,000; a description of how the Coast Guard is planning for the human resource needs of Deepwater assets including rotational crewing for each asset utilizing such crewing and qualification training for commanding officers and petty officers in charge of Deepwater patrol boats; and the earned value management system gold card data, including data for all the factors in this system, for each asset being procured under Deepwater, including C4ISR and C-130J missionization."

The enclosed report responds to this request.

An identical letter has been sent to Chairman Cochran. I am happy to answer any further questions you may have, or your staff may contact my House Liaison Office at (202) 225-4775.

Sincerely,

T H Collins

Enclosure

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The Honorable Thad Cochran
Chairman, Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

Conference Report 109-241 accompanying the Department of Homeland Security (DHS) Appropriations Bill, 2006, states "The conferees include a new provision directing the Coast Guard to submit a review of the Revised Deepwater Implementation Plan in conjunction with the President's fiscal year 2007 budget request. This report shall include: a detailed explanation of any changes to the plan for fiscal year 2007; a detailed, annual performance comparison of Deepwater assets to pre-Deepwater legacy assets in terms of operations and maintenance costs, operational availability (including mean time between failure and mean time to restore), mission performance, and crewing; a status report of legacy assets, including modernization progress, operational availability, and the projected, remaining service life of each class of legacy Deepwater asset; a comprehensive explanation of how the Coast Guard is accounting for the costs of legacy assets in the Deepwater program; an explanation of why many assets that are elements of the Integrated Deepwater System are not accounted for within Deepwater's appropriation (such as the missionization of the C-130Js, the 179-foot Cyclone class cutters, and the airborne use of force outfitting of the HH60s and HH65s); a description of the competitive process conducted in all contracts and subcontracts exceeding $5,000,000; a description of how the Coast Guard is planning for the human resource needs of Deepwater assets including rotational crewing for each asset utilizing such crewing and qualification training for commanding officers and petty officers in charge of Deepwater patrol boats; and the earned value management system gold card data, including data for all the factors in this system, for each asset being procured under Deepwater, including C4ISR and C-130J missionization."

The enclosed report responds to this request.

An identical letter has been sent to Chairman Lewis. I am happy to answer any further questions you may have, or your staff may contact my Senate Liaison Office at (202) 224-2913.

Sincerely,

T H Collins

Enclosure

U. S. DEPARTMENT OF HOMELAND SECURITY

UNITED STATES COAST GUARD

DEEPWATER IMPLEMENTATION PLAN REVIEW

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Introduction

The fiscal year 2006 Deepwater Appropriations Conference and current authorization signify the commitment of Congress and the administration to equip Coast Guard men and women operating at sea with modern, more capable platforms and systems that are essential to improved operational performance, reliability, and safety.

In particular, the appropriation for fiscal year 2006 allows the Coast Guard to sustain momentum implementing the revised post-9/11 Deepwater implementation plan's progressive modernization, conversion, and recapitalization of aging legacy assets. The current year's appropriation provides for the purchase of construction of the third National Security Cutter, advanced delivery of the Fast Response Cutter, and additional Maritime Patrol Aircraft and equipment to equip a second CASA CN-235 air station. Manned and unmanned aircraft programs, and Deepwater's systems for integrated logistics support and C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance), also will move forward during the year ahead.

Beyond its new and significantly more-capable platforms, the Deepwater Program's conversion or modernization of legacy aircraft and cutters are beginning to make an impact *now*.

The operational benefits were apparent during the Coast Guard's response to Hurricane Katrina. Three more powerful re-engined HH-65C helicopters, for example, flew 85 sorties to save 305 lives. According to on-scene accounts, the modernized aircraft can hoist twice the number of people and remain on station for twice as long as older models of the helicopter. More powerful HC-130J long-range search aircraft, now under contract for full missionization as part of the Deepwater Program, also delivered critical support.

During these disaster-relief operations, Deepwater's command, control, and communication upgrades to high and medium endurance legacy cutters proved valuable in enabling more effective on-scene coordination of rescue operations in New Orleans and Gulfport with local first responders and federal agencies. We are seeing comparable synergies when our upgraded legacy cutters participate in law enforcement and counter-drug operations around the world.

The Deepwater Program will lead to a more ready and capable 21st-century Coast Guard. Funding for the program's assets will yield essential system-wide capability for maritime homeland security mission areas and sustain operational performance in the Coast Guard's multiple military and maritime responsibilities. The same assets that can protect our Nation's fisheries will also harden America's coastline against terrorists, drugs, and illegal migrants. In short, the Deepwater Program stands center stage at the Coast Guard's transformation.

The following document responds to the legislative requirements for a 2007 update to the Post-9/11 Deepwater Implementation Plan, as set forth in the conference report (109-241)

accompanying the Department of Homeland Security fiscal year 2006 appropriations (H.R. 2360). This report is divided into sections that comport with the legislative requests for

- Section A: "A detailed explanation of any changes to the plan for fiscal year 2007;"
- Section B: "A detailed, annual performance comparison of Deepwater assets to pre-Deepwater legacy assets in terms of operations and maintenance costs, operational availability (including mean time between failure and mean time to restore), mission performance, and crewing;"
- Section C: "A report on the efficiencies and effectiveness realized through the installation of C4ISR upgrades;"
- Section D: "A status report of legacy assets, including modernization progress, operational availability, and the projected, remaining service life of each class of legacy Deepwater asset;"
- Section E: "A comprehensive explanation of how the Coast Guard is accounting for the costs of legacy assets in the Deepwater program;"
- Section F: "An explanation of why many assets that are elements of the Integrated Deepwater System are not accounted for within Deepwater's appropriation;"
- Section G: "A description of the competitive process conducted in all contracts and subcontracts;"
- Section H: "A description of how the Coast Guard is planning for the human resource needs of Deepwater assets;"
- Section I: "The earned value management system gold card data."

Section A: FY07 Changes to the Revised Deepwater Implementation Plan

The Conference Report accompanying the FY 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide:

> *A review of the Revised Deepwater Implementation Plan that identifies any changes to the plan for the fiscal year.*

Fiscal Year 2007 Changes

The President's fiscal year 2007 budget request updates the Post 9/11 Deepwater Implementation Plan that was provided to Congress in 2005. This Deepwater 2007 Plan Update has been changed from the Post 9/11 Deepwater Implementation Plan of 2005 to adjust for the changes in the Deepwater fiscal year 2006 appropriation and provide the most value in terms of performance based on the actual appropriation. The Deepwater 2007 Plan Update has also been developed based on Congressional concerns for maintaining both the Deepwater Patrol Boat and the Maritime Patrol Aircraft mission hours. Other changes between the Post 9/11 Deepwater Implementation Plan and the Deepwater 2007 Plan Update were made to synchronize the acquisition and projected delivery of Deepwater end state assets so that assets, information systems and shore facilities were sequenced to provide operational capability as soon as practical. Useful segments were re-phased to complement this approach.

The formulation of the Deepwater 2007 Plan Update was accomplished based on the fiscal year 2006 changes between the President's Budget request and the enacted appropriation as shown below:

($ in M)

FY06 Deepwater Budget	President's Budget	Revised Enacted Appropriation	Changes	
Aviation				
Maritime Patrol Aircraft (MPA)	0.0	67.320	67.320	
VTOL Unmanned Aerial Vehicle (VUAV)	57.0	39.600		(17.400)
HH-60 Conversion Projects	37.2	36.630		(0.570)
HC-130H Conversion/Sustainment Projects	31.7	10.890		(20.810)
HH-65 Conversion/Sustainment Projects	133.1	131.769		(1.331)
Total	**259.0**	**286.209**		
Surface				
National Security Cutter (NSC)	368.0	364.320		(3.680)
Offshore Patrol Cutter (OPC)	108.0	106.920		(1.080)
Fast Response Cutter	7.5	7.425		(0.075)
IDS Small Boats	1.4	0.693		(0.707)
Medium Cutter Sustainment	37.5	24.750		(12.750)
Total	**522.4**	**504.108**		
Other				
Technology Obsolescence Prevention	0.0	0.000		
C4ISR	74.4	43.560		(30.840)
Logistics	25.2	18.612		(6.588)
Systems Engineering and Integration	45.0	36.630		(8.370)
Government Program Management	40.0	34.650		(5.350)
Total	**184.6**	**133.452**		
Total	**966.0**	**923.769**	**67.3**	**(109.551)**

Note: Although the total dollar difference caused by the changes is only -$42.2M the aggregate deviations from the plan add up to $176.851M

The Coast Guard is very appreciative of the Deepwater Appropriation for fiscal year 2006. With the changes to these budgeted line items, the Coast Guard needed to adjust the fiscal year 2007 budget in the Post 9/11 Deepwater Implementation Plan to synchronize the plan to align with Congressional intent and facilitate program execution. Fiscal year 2007 budget changes are displayed in the following table:

($ in M)

FY07 Deepwater Budget	FY07 Budget Estimate from Post 9/11 Deepwater Implementation Plan (Summer 2005)	Presidents FY07 Budget Request (February 2006)	Changes	
Aviation				
Maritime Patrol Aircraft (MPA)	0.0	77.616	77.616	
VTOL Unmanned Aerial Vehicle (VUAV)	0.0	4.950	4.950	
HH-60 Conversion Projects	60.2	49.302		(10.898)
HC-130H Conversion/Sustainment Projects	23.2	53.955	30.755	
HH-65 Conversion/Sustainment Projects	22.7	32.373	9.673	
Armed Helicopter Equipment (AUF)	0.0	25.740	25.740	
HC-130J Fleet Introduction	0.0	4.950	4.950	
Total	**106.1**	**248.886**		
Surface				
National Security Cutter (NSC)	398.2	417.780	19.580	
Offshore Patrol Cutter (OPC)	0.0	0.000		
Fast Response Cutter	42.0	41.580		(0.420)
IDS Small Boats	1.2	1.188		(0.012)
Medium Endurance Cutter Sustainment	38.5	37.818		(0.682)
Total	**479.9**	**498.366**		
Other				
Technology Obsolescence Prevention	2.1	0.000		(2.100)
C4ISR	59.3	60.786	1.486	
Logistics	12.6	42.273	29.673	
Systems Engineering and Integration	45.5	35.145		(10.355)
Government Program Management	46.5	48.975	2.475	
Total	**166.0**	**187.179**		
Total	**752.0**	**934.431**	**176.208**	**(24.467)**

Note: Although the total dollar difference caused by the changes is $151.741M the aggregate deviations from the plan add up to $200.675M.

The executable line items requested in the President's fiscal year 2007 budget request have been synchronized to provide increased operational performance when compared to what was projected in 2005. Additionally, the 2007 budget request reflects the Department of Homeland Security's Future Years Homeland Security Plan (FYHSP) funding stream for the Deepwater program. The FY07 budget estimate presented in the Summer 2005 post 9/11 Deepwater Implementation Plan reflected a lower Capital Investment Plan level of funding. The 2007 FYHSP funding stream is more consistent with the FY06 Deepwater appropriation and allows both a more predictable new asset funding level and a higher legacy asset funding stream. The FYHSP level converts and upgrades legacy assets more quickly facilitating their more immediate impact on operational effectiveness. This 2007 Plan Update also re-phases select budget items to meet the Department of Homeland Security's top priority to protect all Americans. Following are the specific line item adjustments and the reasons for them.

Maritime Patrol Aircraft (MPA)

Increase MPA budget by $77,616K due to the enacted fiscal year 2006 appropriation. The $67,320K provided in the fiscal year 2006 appropriation was congressionally intended for the procurement of two MPA aircraft in fiscal year 2006. However, the Deepwater Post 9/11 Implementation Plan did not plan for these two MPA aircraft in fiscal year 2006. The next MPA aircraft procurements were planned in fiscal year 2009 when three MPA aircraft would have been procured. Three MPA aircraft were planned for in fiscal year 2009 in order have sufficient aircraft to allow the aircraft to be fully deployed to the first MPA equipped air station (since the minimum number of aircraft required per air station is three). However, the $67,320K is not sufficient for even two CN-235 300M Maritime Patrol Aircraft in a configuration ready to fully execute Coast Guard missions. The$67,320K does not fund the second MPA Mission System Pallet and required logistics. An additional $41,500K is required for the procurement of one CN-235 300M Maritime Patrol Aircraft in a configuration ready to fully execute Coast Guard missions and to be used with the other two fiscal year 2006 aircraft for effective use at an operational air station. An additional $36,116K, above the amount required for the new MPA aircraft, is required in fiscal year 2007 for a second Mission System Pallet, Integrated Logistics Support, and required initial spare parts – all of which are necessary to make three aircraft "mission-ready" at a single air station.

Vertical Takeoff and Landing (VTOL) Unmanned Aerial Vehicle (VUAV)

Increase VUAV budget by $4,950K due to the enacted fiscal year 2006 appropriation. The $$39,600K provided in fiscal year 2006 is less than the $57,000K requested in the Deepwater Post 9/11 Implementation Plan. The $39,600K is insufficient to complete the assembly and test of three air vehicles. The VUAV project plan has been adjusted and one air vehicle, one ship control station, and one ground control station can be procured with the funds appropriated in fiscal year 2006. With this increase of $4,950K, additional testing will be conducted during fiscal year 2007 primarily between the air vehicle and the two control stations.

HH-65 Conversion to Multi-Mission Cutter Helicopter (MCH)

Increase HH-65/MCH budget by $9,673K to better sequence the MCH work. The $32,373K will complete the funding required for the HH-65 Re-Engining at $22,700K and fund $9,673K to start the phased replacement of the HH-65 Landing Gear and Tail Rotor which is the next phase of converting the HH-65 into a Deepwater end state asset. Future year funding will be used for the Radar Replacement and the Fuel Cell Project, as well as to complete the replacement of the HH-65 Landing Gear and Tail Rotor.

HH-60 Conversion and Sustainment

Decrease the previously projected HH-60 budget by $10,898K for fiscal year 2007. This reduction relates to the increase for the HH-65/MCH which was a higher operational priority. The $49,302K which remains will continue the funding required for the HH-60 Avionics replacement at $29,304K, continue the required funding for the HH-60 Service Life Extension Project (SLEP) at $3,366K, continue funding for the HH-60 Radar/FLIR replacement at $8,316K, and fund $8,316K to start the HH-60 Engine sustainment. Future year funding will be

used to start the HH-60 Post 9/11 Capability Upgrades, as well as complete the HH-60 Avionics replacement, HH-60 SLEP, HH-60 Radar/FLIR replacement, and HH-60 Engine sustainment.

HC-130H Conversion and Sustainment

Increase the HC-130H budget by $30,755K to begin conversion of the aircraft for long term use in the Deepwater system consistent with the Revised Deepwater Implementation Plan, but at a more rapid pace than initially planned to expedite improvements in operational effectiveness. The $53,955K for fiscal year 2007 will continue the funding required for the HC-130 Search Radar at $24,255K and fund $29,700K to start the first phase of the HC-130 Post 9/11 Upgrade, Satellite Communications Installation, Weather Radar Replacement, and Avionics Replacement. Future year funding will be used to continue the HC-130 Search Radar replacement, the first phase of the HC-130 Post 9/11 Upgrade, Satellite Communications Installation, Weather Radar Replacement, and Avionics Replacement.

HC-130J Fleet Introduction

Provide $4,950K for required logistics now that six HC-130J are in the Post 9/11 Deepwater Implementation Plan. These funds will position the Coast Guard to be able to use these aircraft for maritime patrol missions starting in 2008 instead of 2009.

Aviation Use of Force

Increase the Aviation Use of Force budget by $25,740K as one of the highest priorities and most important capabilities to be acquired based on the Post 9/11 Deepwater Implementation Plan.

National Security Cutter

Increase National Security Cutter budget by $19,580K to fund the Full Operating Capability for NSC's 1, 2, and 3 in fiscal year 2007, and for the purchase of materials and construction of NSC 4.

Technology Obsolescence Prevention

Decreases this funding by $2.1M and defers initiating this program of ensuring the technological viability of new Deepwater assets.

Logistics

Increase by $29,673K due to the enacted fiscal year 2006 appropriation and to synchronize the schedule with the fiscal year 2007 changes already discussed. The $18,612K provided in fiscal year 2006 for development of the Logistics Common Systems, Logistics Shore Site Upgrades, and Facilities Upgrades required for Future Asset Introduction was less than the $25,200K requested in the Deepwater Post 9/11 Implementation Plan. The $18,612K is insufficient to complete development of the Logistics Common Systems, Logistics Shore Site Upgrades, and Facilities Upgrades required for Future Asset Introduction. With this increase of $29,673K,, the Logistics project plans have been adjusted to complete the same amount of logistics work by the end of 2007 as originally planned for fiscal years 2006 and 2007.

Systems Engineering and Integration

Decrease the previously projected amount by $10,355K to align with the Congressional appropriation for fiscal year 2006.

Government Program Management

Increase Government Program Management budget by $2,475K for additional Government Program Management required by offsetting the reduction in System Engineering and Integration funding.

Section B: Deepwater Asset Performance Comparison

This section of the Deepwater Post-9/11 Implementation Plan FY07 Update complies with requirements set forth in the Conference report on H.R. 2360, Department of Homeland Security Appropriations Act, 2006, requesting:

> *a detailed, annual performance comparison of Deepwater assets to pre-Deepwater legacy assets in terms of operations and maintenance costs, operational availability (including mean time between failure and mean time to restore), mission performance, and crewing*

Introduction

This section responds to the congressional request for an annual comparison of cost, operational availability, mission performance, and crewing of Deepwater and pre-Deepwater assets. The Deepwater Program's platforms and systems currently deployed for Coast Guard operations are the 123-ft. patrol boat (WPB), re-engined HH-65C helicopters, and the command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) upgrades to legacy Coast Guard cutters.

At the time of this report, it is too early in the HH-65C upgrade program to perform statistically reliable cost, operational availability, or mission performance comparisons to HH-65A/B models. Additionally, the operational efficiencies and costs associated with the Deepwater Program's C4ISR upgrades to major legacy cutters are addressed in detail in a Section C.

It should be noted, however, that three re-engined HH-65C helicopters assigned to Hurricane Katrina rescue-and-relief operations in September 2005 performed superbly in a very austere and dangerous operating environment. These more powerful and reliable HH-65C helicopters, modernized and re-engined under the Deepwater Program over the past year, flew 85 sorties and saved 305 lives. Compared to the older legacy "B" model, the HH-65C can take off with 330 additional pounds of fuel (a total of 1,930 pounds), hoist twice as many people on a single mission (six), and remain on station for twice as long (2.5 hours). Regarding congressional interest in crewing, the HH-65Cs operate with the same sized crew as HH-65A/B models.

Deepwater's accelerated re-engining of HH-65B helicopters remains the Coast Guard's highest legacy asset priority until complete. Congressional support in correcting this critical safety and reliability issue, including transferring an additional $40 million into the Deepwater Program to accelerate this re-engining effort in fiscal year 2005, is greatly appreciated.

Based on the current situation as discussed, the HH-65 helicopters and the C4ISR upgrades to legacy Coast Guard cutters will not be discussed in this section. This report section will, however, compare the 110-ft. and 123-ft. patrol boats operating in the fleet.

Background

In May 2005, Deepwater's conversion of 110-ft. patrol boats was halted at eight hulls for several reasons. The advanced deterioration of the 110-ft. patrol boat hulls, increased costs associated with conversion, and technical difficulties were significant factors in making this decision. Also, the pre-9/11 design for the 123-ft. patrol boats did not provide needed homeland security capabilities called for in the revised Deepwater Mission Needs Statement.

For this reason, any informed comparison of operational availability and maintenance costs between 123-ft. and 110-ft. patrol boats must begin with a discussion of the conversion process that impacts 123-ft WPBs' return to operational status. This determination is based on two areas of concern. The first area of concern is whether the initially planned 123-ft. patrol boat conversion modifications and associated training have been completed. The second operational status review criteria is whether the structural upgrades that have been required since delivery of the first 123-ft. patrol boats have been completed.

The initially planned 123-ft. patrol boat modifications include:

- **Post-Delivery Availability (PDA)**: PDA involves a six-week training period to prepare each crew to operate the vessel.
- **Post-Delivery Maintenance Availability (PDMA)**: PDMA, which lasts 60 to 120 days, entails a renovation of systems not affected by the Deepwater conversion from a 110-ft. to a 123-ft. WPB.
- **C4 Systems Certification**: Over the course of approximately one month, each 123-ft. WPB must undergo software loading and certification of both Coast Guard-standard workstations and Integrated Coast Guard Systems (ICGS) upgrades for C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance).

The corrective 123-ft. patrol boat modifications include:

- **Structural Upgrade #1**: Following initial structural complications experienced by the CGC MATAGORDA, ICGS and the Coast Guard established a requirement for a structural upgrade to strengthen each 123-ft. hull's midsection to avoid buckling. The upgrade requires three to four weeks to complete.
- **Structural Upgrade #2**: In response to complications with the CGC NUNIVAK, the Coast Guard established a requirement to strengthen the side plating hull (above the waterline below deck) on each 123-ft. WPB. Three to four weeks are required to complete this work. Although the engineering analysis did not conclusively indicate that this was required, the Coast Guard decided that this additional safety investment was necessary to protect the crew in severe weather situations that might be encountered.

The following schedule indicates the induction, delivery, and operational status of the first seven 123-ft. WPBs:

Table 1

Cutter	Induction (to Bollinger)	Delivery (to USCG)	Returned to Operational Status (Per USCG D7)
MATAGORDA	February-03	March-04	February-05
METOMPKIN	June-03	May-04	March-05
PADRE	July-03	June-04	March-05
ATTU	September-03	August-04	May-05
NUNIVAK	March-04	February-05	Pending
MONHEGAN	June-04	November-05	Pending
MANITOU	July-04	January-06	Pending
VASHON	September-04	March-05	Pending

Patrol Boat Mission Performance

All operational 123-ft. WPBs are (or will be) homeported in the Coast Guard's 7th District, operating off the coasts of southern Florida and in the Caribbean. It is appropriate to evaluate their mission performance in the area of drug and migrant interdiction, a critical aspect of their homeland security mission area so important to securing the nation's maritime border. The tables below compare 110-ft. and 123-ft. patrol boat operational mission hours.

Patrol Boat Operations

Patrol boat operational hours, as recorded by the Coast Guard, include independent missions such as homeland security, drug, and migrant interdiction operations as well as other missions, which directly contribute to homeland security.

110-ft WPB Homeland Security Operating Hours (FY04-05)
Table 2

Fiscal Year	Total Cutters(1)	Total Homeland Security Operating Hours(1)	Average Homeland Security Hours Per Cutter(1)
FY04	39	48,584	1,245
FY05	35	36,116	1,031

(1) Excludes six 110-ft. WPBs deployed to support operations in Iraq

123-ft WPB Homeland Security Operating Hours (FY05) Table 3	
Hull	**Homeland Security Hours**
MATAGORDA:	2,067
METOMPKIN:	1,470
PADRE:	1,245
ATTU:	1,174
NUNIVAK	0
VASHON:	110
Total	6,066

Despite the lag between delivery of 123-ft. WPBs and their return to operational status, the converted patrol boats do contribute mission-specific patrol hours under restricted operations. For example, the METOMPKIN recorded 45.2 hours of homeland security operations even though it was in a restricted status in FY04, and the VASHON conducted 109 homeland security mission hours in FY05.

Although in various stages of post-delivery throughout the year, each of the four 123-ft. WPBs (MATAGORDA, METOMPKIN, PADRE, and ATTU) that returned to operational status between February and October 2005 conducted greater homeland security operational hours than the average 110-ft. WPB for FY05 (1,031 hours/year). This is partially a reflection of the disproportionately large volume of homeland security activity (particularly migrant trafficking) the in the southeastern area of operations. However, it also demonstrates the effectiveness of these assets once in operational status.

These mission hour statistics also support anecdotal evidence that the 123-ft. patrol boats – especially those certified as fully operational – contribute significant patrol hours and provide immediate impact upon fleet operations. During the first month in which the 123-ft. MATAGORDA and METOMPKIN were both fully operational, they used their upgraded, stern-launched small boats and boarding teams during a multiple-asset interdiction of 25 migrants. Their more-capable C4ISR also contributes significantly to improved operational performance.

Migrant Interdiction Operations

110-ft WPB Migrant Interdiction Operating Hours (FY04-05) Table 4			
Fiscal Year	Total Cutters[(1)]	Total Operating Hours for Migrant Mission[(1)]	Average Migrant Operating Hours Per Cutter[(1)]
FY04	39	20,883	535
FY05	35	19,326	552
[(1)] Excludes six 110-ft. WPBs deployed to support operations in Iraq			

123-ft. WPB Migrant Mission Hours (FY05) Table 5	
Hull	**Migrant Mission Hours**
ATTU	1,166
MATAGORDA	2,067
METOMPKIN	1,155
PADRE	1,245
WPB-123 Total*	5,632
* Excludes NUNIVAK and VASHON, which were delivered but not returned to operational status in FY05.	

Largely consistent with overall patrol boat operational mission performance and the fact that none of the 123-ft. WPBs were returned to operational status in FY04, 123-ft. patrol boats performed no migrant interdiction hours during that year's restricted operations. However, their operations in FY05 off the migrant-laden shores of District 7 led to drastic increases in that mission area. In fact, the migrant mission hours performed by the four 123s in operational service is more than a quarter of the hours performed on that mission by the 42 hulls of the 110-ft. WPB fleet in FY05.

Drug Interdiction Operations

110-ft. WPB Drug Interdiction Operating Hours (FY04-05) Table 6			
Fiscal Year	Total Cutters(1)	Total Operating Hours for Drug Mission(1)	Average Drug Operating Hours Per Cutter(1)
FY04	39	10,234	262
FY05	35	5,796	165
(1) Excludes six 110-ft. WPBs deployed to support operations in Iraq			

In FY05, the 123-ft. METOMPKIN was deployed for 315.4 hours of drug interdiction. Although not surprising for a patrol boat operating in an active drug trafficking area such as District 7, METOMPKIN's FY05 drug interdiction hours exceeded average drug interdiction hours for 110-ft. WPBs in the fleet for FY04 (262) and FY05 (165). The additional five 123-ft. WPBs that were either delivered or operational at some capacity in FY05 did not reflect dedicated drug interdiction hours.

Patrol Boat Operational Availability and Cost Data

The cutter's primary operational readiness measure is Percentage of Time Free (POTF) from a major casualty. Major equipment casualties are category 3 or 4, which are defined as "deficiency in mission critical equipment which caused a major degradation or loss of a primary mission." The Coast Guard's POTF goal is 72 percent with lower percentages indicating a decrease in operational readiness. None of the cutter legacy asset classes have met this readiness goal in the past five years, and the 110-ft. and 123-ft. WPBs are no exception.

The Coast Guard's naval engineering program also tracks scheduled, unscheduled, and total maintenance expenditure trends. An analysis of the expenditures is used to identify maintenance intensive and obsolete equipment sub-systems which disproportionably increase a cutter's total annual maintenance costs. FY05 POTF and maintenance cost information was not available at the time this report was submitted.

The cost and availability data used below does not incorporate all the direct and indirect costs incurred by the WPB fleet. However, these data were chosen in accordance with the audited measures examined by the General Accountability Office (GAO) in the July 2005 report on Coast Guard legacy asset conditions (GAO-05-757) and are intended to provide the most accurate and consistent information for Congress regarding 110-ft and 123-ft. WPBs availability and cost data.

110-ft. WPB Fleet Operational Availability & Maintenance Costs (FY02-FY04)
Table 7

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2002	47%	$21,406,754	$3,439,798	$24,846,552
2003	48%	$23,713,280	$5,149,335	$28,862,615
2004	45%	$16,734,221	$3,621,311	$20,355,532

123-ft. WPB Fleet Operational Availability & Maintenance Costs (FY04)
Table 8

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2004	37%	$2,116,229	$4,148	$2,120,337

In addition to the operational availability and cost data above, Table 9 below provides a direct comparison between the total and average operating hours of the 110-ft. and 123-ft. patrol boat classes, respectively.

WPB 110 to 123 Operating Hour Comparison Table 9				
WPB	Total Cutters	FY	Total Operating Hours	Average Operating Hours Per Cutter
WPB 110's	39[(1)]	FY04	74,686[(1)]	1,915[(1)]
WPB 123's	4[(2)]	FY04	251[(2)]	63[(2)]
WPB 110's	35[1)]	FY05	64,819[(1)]	1,852[(1)]
WPB 123's	6[(3)]	FY05	7,183[(3)]	1,197[(3)]
[(1)] Excludes six 110-ft. WPBs deployed to support operations in Iraq [(2)] Represents all delivered 123-ft. WPBs, although none were fully operational in FY04 [(3)] Represents all delivered 123-ft. WPBs, although two were in conversion and only four achieved fully operational status in Feb (1) March (2), and May (1) of FY05.				

As the data and discussion above indicate, assessing the operational effectiveness of the 123-ft. patrol boat is challenging given the limited period of time they have been in operations. Once all eight 123-ft. patrol boats are completed and fully engaged in operations and regular maintenance activity, a more complete assessment can be accomplished.

Patrol Boat Crewing

Crewing is only minimally impacted by the conversion of 110-ft. WPBs to 123-ft. patrol boats. Legacy 110-ft. WPBs have a crew size of two officers and 14 enlisted personnel, while 123-ft. patrol boats require an additional enlisted crew member per cutter to operate the installed technical equipment. The average cost of an enlisted Coast Guard sailor is $72,000 (in FY 2006 dollars), which is applied to each 123-ft. WPB.

Section C: Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

Executive Summary

This section of the report complies with reporting requirements set forth in the Conference report on H.R. 2360, Department of Homeland Security Appropriations Act, 2006, and also responds to House Report (109-79) which stated that the Coast Guard was directed to submit:

> *[A] report on the efficiencies and effectiveness realized through the installation of C4ISR upgrades. This report should include a detailed breakout of the associated operating costs of such upgrades and a comprehensive explanation of ''follow-on'' costs. This report should compare and contrast operations of legacy assets prior to the installation of modernized C4ISR equipment to that of the present state of operations, including the impact upon operating expenses both before and after installation of the C4ISR upgrades.*

Fully and adequately illustrating the operational importance and return on investment in C4ISR modernizing and recapitalizing equipment remains a constant challenge for the Deepwater Program. The image of a secure compartment outfitted with seemingly typical computer screens does not provide the visual impact delivered by footage of a hovering, re-engined HH-65C helicopter that can hoist more people to safety than its HH-65A/B predecessors. However, using improved C4ISR equipment enables operators to better assess and react to their environment – rather than flying blindly to locate operational targets.

Unfortunately, the difficulty in quantifying the value of C4ISR equipment often overshadows the end state this equipment delivers – a more efficient system of assets that can save more lives, interdict more drugs and migrants, harden our borders, and improve executions of traditional Coast Guard missions by working smarter. The recent tragedies of Hurricane Katrina and the immediate response to the 9/11 attacks have illustrated to the nation a reality faced daily by Coast Guard operators – better communication and more complete common operating and intelligence pictures save lives and improves mission performance.

This section of the report is intended to better articulate the vital importance of C4ISR. While it is inherently difficult of directly attribute mission performance (drugs seized, migrants interdicted) strictly to upgrades in communications and intelligence equipment, the results of building and enhancing those systems produce significant tangible results. C4ISR is a major force multiplier. The following text responds to the congressional reporting requirements by discussing the overall Deepwater C4ISR plan, the initial investment and "follow-on" costs of the upgrades, and the operational impact of the new systems on those executing Coast Guard missions in the field.

C4ISR installations onboard aviation and surface assets will greatly increase Maritime Domain Awareness (MDA) persistent surveillance and provide effective detection, classification, and identification of targets in the surveillance areas. C4ISR tactical planning, mission prosecution, and communications suites in aviation and surface platforms, and at IDS-upgraded command centers and communications stations ashore, will sharply increase their ability to surveil, detect, classify, identify, and prosecute suspect platforms. Improved coordination of IDS legacy assets has already begun to yield improved operational effectiveness as suspect vessels are far less likely to escape detection and avoid apprehension as documented in post-patrol summaries from IDS-upgraded legacy cutters and the IDS-converted 123-foot patrol boats (WPBs). Intelligence portions of the IDS C4ISR will provide more effective screening, analysis and information connectivity of ever-increasing data sources and data stores to guide IDS assets more astutely to intercept suspect platforms.

The Integrated Deepwater System (IDS) C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) Implementation Plan provides for the phased, architecturally-driven design, development, and deployment of a common, operationally critical, C4ISR design for all IDS assets. Aimed squarely at meeting the requirement of Maritime Domain Awareness (MDA), Maritime Transportation Safety Act (MTSA), the National Strategy for Maritime Security (NSMS), and Safety of Navigation, the IDS C4ISR is being fielded in four increments. Each increment reduces the capability gaps between the mission needs identified in the key references above (MDA, MTSA, NSMS, etc.), the IDS Mission Needs Statement (MNS), and the current state of Coast Guard Deepwater assets.

The four increments of IDS C4ISR upgrades consist of

- Increment 1 – Core capability for all IDS assets (surface, air, shore).
- Increment 2 – Improve interoperability for joint operations and decision support.
- Increment 3 – Extend Maritime Domain Awareness.
- Increment 4 – Complete the System.

Increment 1 (2005 – 2009)

<u>Core</u> capability for all Deepwater assets (surface, air, shore):

- Interoperable communications connectivity with Department of Defense (DOD), other government agencies, and other Coast Guard systems including classified, interoperable communications with DHS to be implemented to the extent technically feasible and within budget allowability.
- Common Coast Guard Command and Control (C2) system providing geographic tactical and strategic decision aids.
- Automated communication resource manager which allows for reduced manning of radio rooms by automating control and planning of radio frequency communications. Implemented across all assets afloat and ashore.
- Capability to exchange information quickly with on-scene assets via mission planning tools.

- A common case file system which enables information sharing and real time collaboration across multiple security levels from Top Secret/Special Compartmentalized Information (TS/SCI) to Sensitive but Unclassified. This will provide better situational awareness and actionable intelligence to the field operator. Integrated intelligence across multiple agencies and bridging the gap between law enforcement and national security intelligence.
- An enterprise-wide network backbone enabling more efficient communication, mission coordination, and multi-unit, near real-time collaboration and information exchange. Improvements to operational effectiveness are already being realized. As an example, a legacy cutter received a Statement of No Objection (SNO) in just six minutes to board foreign-flagged vessels suspected of illegal activities. Prior to the upgrades it could take 24 hours or longer to obtain a SNO.
- Systematic screening of vessels allowing analysis of threats, well off-shore.
- Fully integrating platform sensors into the command and control system [such as Radars, Electronic Support Measures (ESM), Automated Information System (AIS), electro-optical/infra-red (EO/IR) systems, HV-911 Eagle Eye tiltrotor vertical takeoff-and-landing unmanned aerial vehicle (VUAV) sensors] to provide improved and extended maritime situational awareness.
- Common data repository to record all tactically significant information to provide event reconstruction and legal prosecution capability.
- Single Coast Guard Common Operational Picture (COP) for effective "blue-force" tracking

Increment 2 (2008 – 2011)

Improved interoperability for joint operations, decision support:

- Fully integrated gun weapons system.
- Improved planning for pre-deployment.
- Search and rescue coordinated planning, pre-deployment planning and self-defense capabilities for IDS assets.
- C4ISR systems to enable mission readiness and effectiveness for the Multi-Mission Cutter Helicopter (MCH) and the International Ice Patrol.
- Automatic evaluation and update of tactical mission plans.
- Improved support and decision aids for boarding operations.
- Fully integrated the C4ISR suite on the MCH, providing extended tactical communications and link capability to other assets extending the effective range of VUAV and surface platforms.

Increment 3 (2010 – 2013)

Extends Maritime Domain Awareness:

- Enhanced Rescue-21 Interoperability.
- Integrated SARSAT enabling world wide search and rescue monitoring.
- Increased automation through automated task management reducing response time and operator workload and potentially reducing manning.
- Improved life-cycle logistical support, tactical sensor doctrines and improved operator usability features.

- Technology insertion.
- Emerging requirements implementation.

Extends Communications Capabilities:

- Integrated law enforcement radios

Increment 4 (2012 – 2017)

Completes the System:

- Installs on all Deepwater assets: shore, cutters and aircraft.
- Improved Maritime Domain and situational awareness.
- Integrated shore command systems such as Vessel Traffic Services, Global Maritime Distress and Safety System, and Vessel Monitoring System.
- Strategic and operational planning tools providing efficient use of assets and personnel.
- Automated Targets of Interest (TOIs) identification and classification.
- Automated EMCON (emission control) to enable quicker reaction and reduce workload on the crew.
- Technology insertion.

Additional capabilities approved in the revised Mission Needs Statement (Slated for incorporation after Increment 2 which is currently at Preliminary Design Review):

- Sector Command Center Integration to improve security in 37 tier-1 ports.
- Local and port level intelligence tools to improve threat identification and deterrence.
- DHS information and voice communications interoperability planned into the program.
- Shipboard Sensitive Compartmentalized Information Facility (S/SCIF) systems integrated into the core C4ISR capability.
- Merges national, regional, local level awareness improving threat identification and deterrence.
- Common intelligence incorporating all source information (national, USCG, open source). Conforms to the distributed common backbone architecture enabling shared use of National Intelligence Assets.
- CBRNE (chemical, biological, radiological, nuclear effects) standoff detection and tracking capability for containment and response.
- Embedded training to improve operator performance.
- Wider communication paths for increased mission planning, collaboration, coordination and information and knowledge exchange.

The Deepwater Program's network-centric system for C4ISR improvements harnesses the power of an interoperable network to improve maritime domain awareness and provide a Common Operational Picture (COP) — key to the Coast Guard's ability to lead the inter-agency effort to know and respond to maritime conditions, anomalies, vulnerabilities, and threats. Improvements to C4ISR enable earlier *awareness* of events through the more effective *gathering* and *fusing* of terrorism-related information, analysis, coordination, and response— all critical to detecting, deterring, and defeating terrorist attacks.

When Deepwater C4ISR upgrades are completed, cutters and aircraft will no longer operate as relatively independent platforms with only limited awareness of what surrounds them in the maritime domain. Instead, they will have the benefit of receiving information from a wide array of mission-capable platforms and sensors—enabling them to share a common operating picture as part of a network-centric force operating in tandem with other cutters, boats, and both manned aircraft and unmanned aerial vehicles.

A critically important factor in the enterprise-wide deployment of C4ISR capabilities is the use of Integrated Coast Guard Systems (ICGS) as the Deepwater Program's system integrator. ICGS, a joint venture between Lockheed Martin and Northrop Grumman, draws heavily on the wealth and breadth of experience of Lockheed Martin for the design and implementation of C4ISR architecture and systems. It is important to note that Lockheed Martin designs and builds not only C4ISR upgrades for legacy cutters, but all C4ISR work on *all* legacy and new IDS assets (air and surface). This systematic approach eliminates "stove-piped" development by class, ensures interoperability among all surface and air assets, and contributes to a more efficient COP among operational assets and command centers.

The synergy of Deepwater's approach to systems integration is illustrated by the missionization of the C-130J Long Range Search aircraft and the design of the new CASA 235 300M Medium Range Search aircraft. The system integrator has driven commonality between these two IDS assets, resulting in 100 percent identical symbology and COP, 90 percent commonality for C4ISR systems, and 80 percent re-use of workstation elements. With the consolidation of 22 disparate federal agencies into the Department of Homeland Security (DHS), and the valid concern about interoperability among agencies, no other major federal acquisition demonstrates a comparable degree of interoperability and leverages the benefits of an enterprise-wide development across all assets as much as the Coast Guard's IDS Program. This is directly attributable to the Deepwater Program's reliance on a single system integrator and a system-of-systems approach.

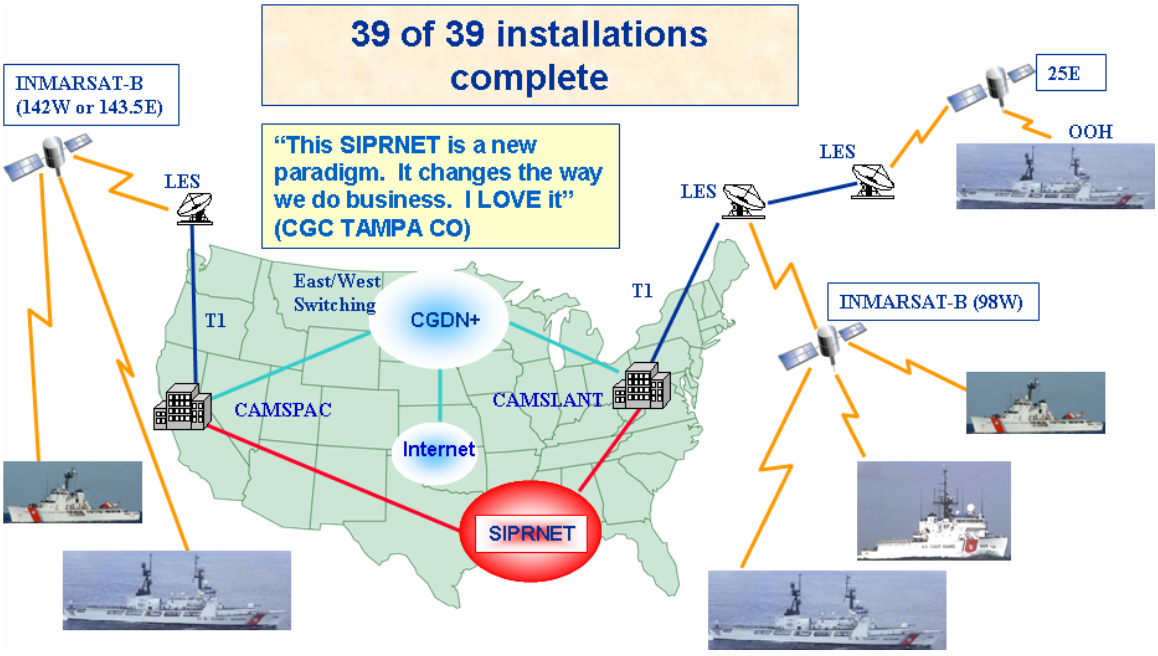
Improved C4ISR creates operational efficiencies by stretching operational dollars, increasing operational performance, and improving resource allocation. The use of more capable C4ISR systems to improve the quality and timeliness of sensor information and intelligence enhances Maritime Domain Awareness by providing effective detection and classification capabilities. Armed with more accurate and timely information, an operational commander of an air or surface asset does not necessarily have to patrol large areas looking for a suspect vessel. This permits more efficient use of all assets across the Deepwater system. Additionally, investment in Deepwater's interoperable C4ISR designs can lead to cost avoidances during asset design, development, and post-delivery. Additional asset-related C4ISR capability enhancements, for example, will support the Multi-mission Cutter Helicopter (MCH) and the International Ice Patrol. A given operational area can be patrolled with fewer air and surface assets (compared to legacy cutters and aircraft) when C4ISR improvements are installed. The C4ISR improvements become, in essence, a "capital asset" or force multiplier. The IDS C4ISR common design also promotes operational and equipment familiarity among Coast Guard personnel assigned to Deepwater assets. Reduced training costs for Coast Guard operators and maintenance personnel are obtained through common user interfaces across all Deepwater assets, ensuring personnel effectiveness despite regular crew turnover.

Deepwater C4ISR improvements give each cutter, aircraft, shore command, and intelligence center the command-and-control systems needed to fully receive, display, and share COP information. By becoming full COP participants, each unit will receive relevant information to directly increase its maritime domain awareness. Accurate and timely knowledge of maritime conditions, anomalies, vulnerabilities, and threats in the maritime domain, provided through the COP, will also ensure that an effective but efficient level of resources is allocated to identified threats so that they are contained and defeated as far from the U.S. homeland as possible.

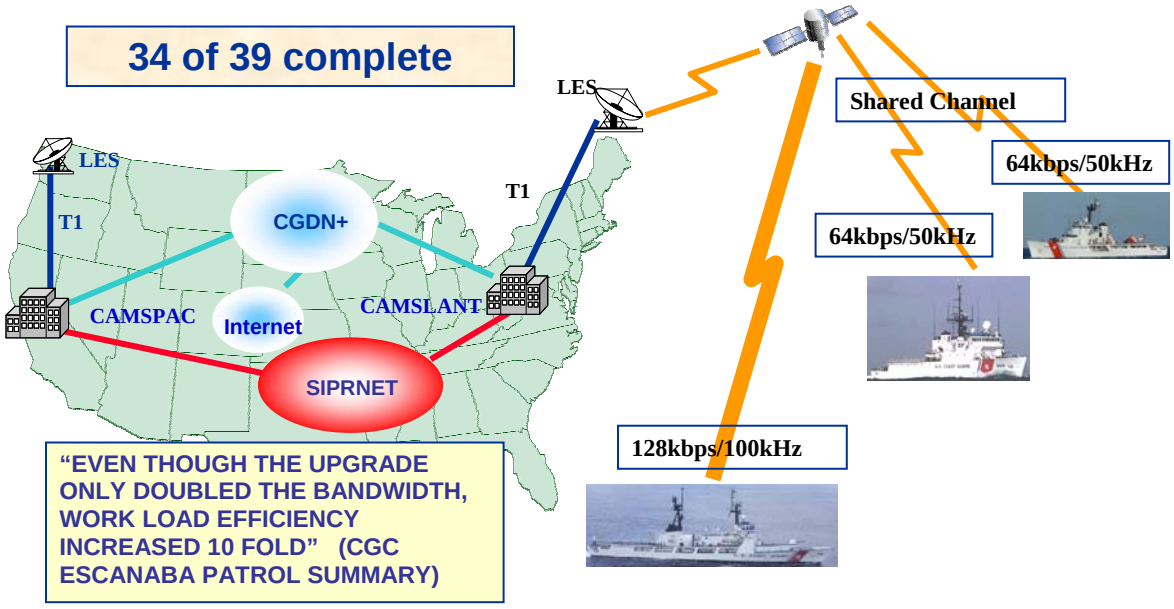
Background: The Integrated Deepwater System (IDS) is a $24-billion, 25-year acquisition that was awarded to Integrated Coast Guard Systems (ICGS) in June 2002. It will progressively modernize, convert, and recapitalize the Coast Guard's aging, legacy fleet with a new system composed of three classes of surface ships, manned and unmanned aircraft, and the advanced integrated logistics systems required for cost-effective lifetime support. Further, and central to the effectiveness of the IDS, is the integration of C4ISR elements among all the assets and shore-side command, communication, and intelligence centers that will provide an interoperable network-centric system. Because the IDS schedule spans 25 years, surface legacy assets will be phased out or decommissioned over a span of nearly 20 years. The last of the 270-ft. Medium Endurance Cutters (WMEC), for example, will remain in service until 2025. In order to maximize the operational effectiveness of these legacy cutters, C4ISR upgrades have been targeted for the three different classes of legacy cutters: the High Endurance (WHEC) 378-ft. cutters, Medium Endurance (WMEC) 270-ft. cutters, and Medium Endurance (WMEC) 210-ft. cutters.

Summary of Deepwater C4ISR Upgrades to 270-ft WMECs, 210-ft WMECs, and 378-ft WHECs.

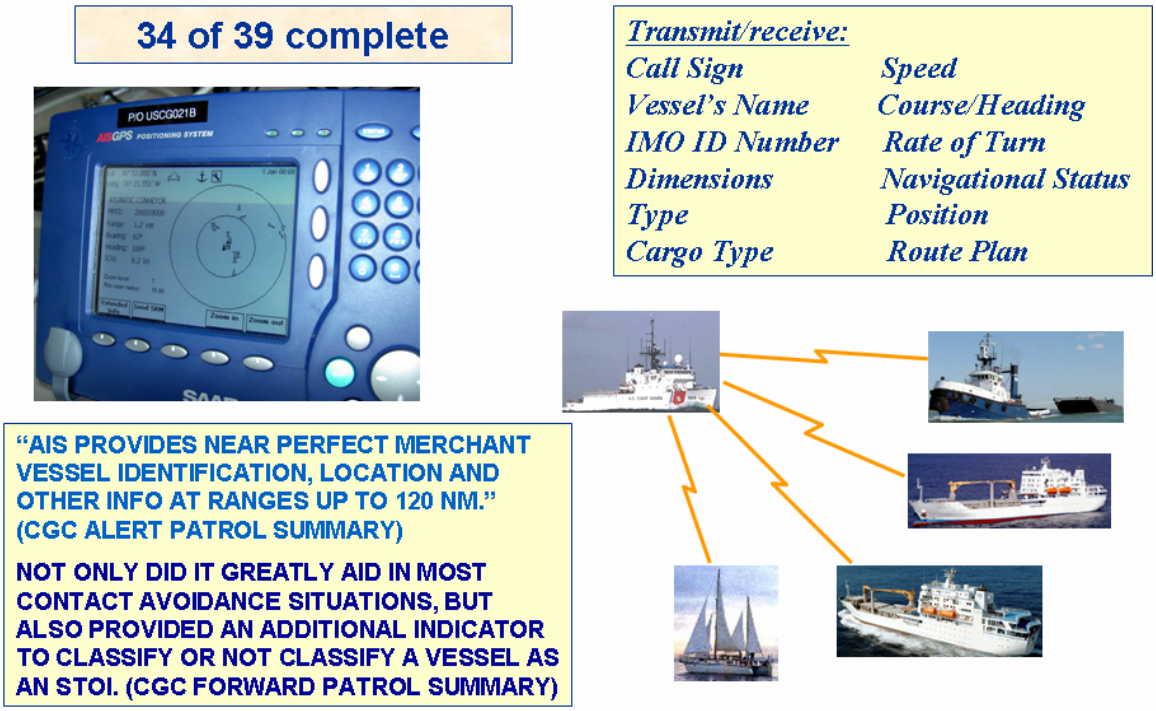
1. **Classified Network -** ***Enterprise Communications Wide Area Network (ECWAN)***



2. **Upgrade INMARSAT B –** ***Upgrades include doubling the bandwidth from 64kbps to 128kbps, Timeslot sharing, and Bandwidth Sharing.***



3. **Automatic Identification System – Enhances Maritime Situational Awareness and Navigation Safety.**



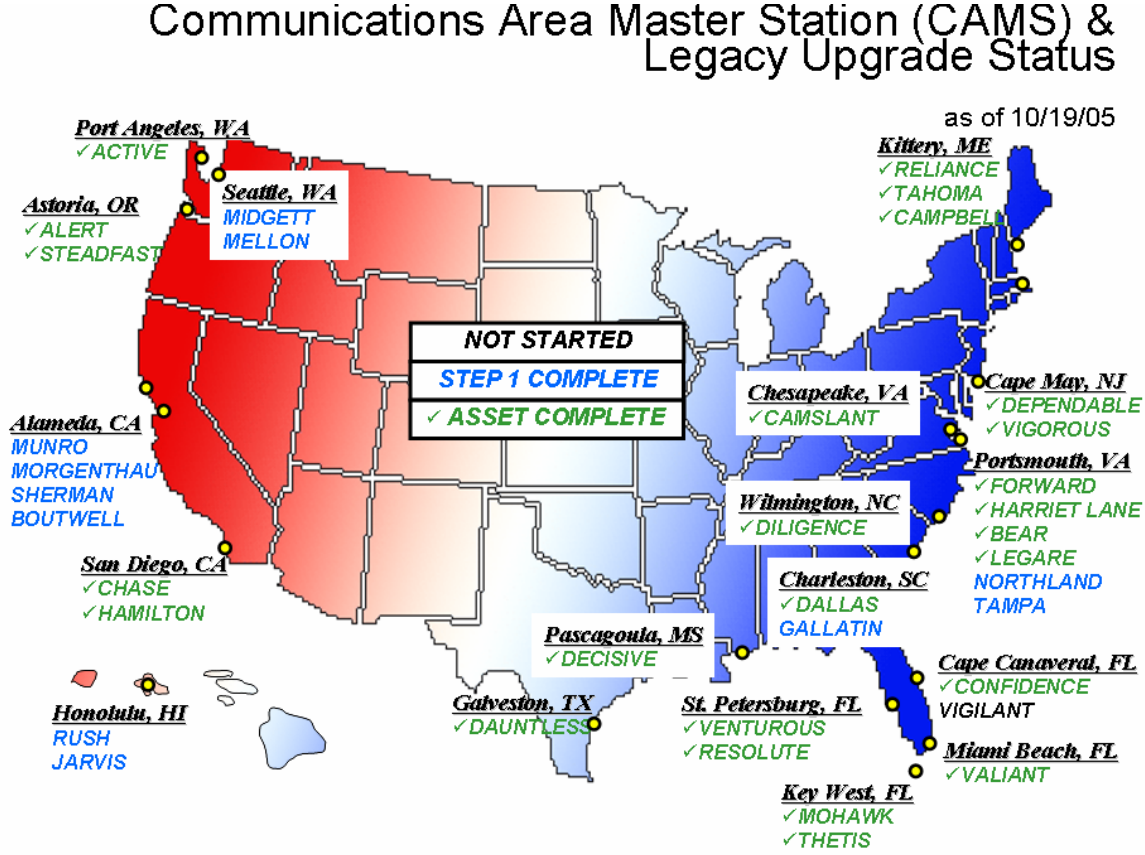
4. **Law Enforcement Radio (378-ft WHECs only) -** ***Law Enforcement/Digital Selective Calling Radios provides greater interoperability***

8 of 12 complete

VHF/UHF

- *TWO APCO-25 Compliant VHF/FM (146 - 174 MHZ)*
- *ONE APCO-25 Compliant UHF (403 - 433 MHZ)*
- *ONE DSC (155 - 165 MHZ)*

The following map shows the cutters and shore based communications stations that have been upgraded as of October 2005



C4ISR Legacy Investment: The following cost data is provided for the C4ISR installations on legacy Coast Guard cutters. It is presented by fiscal year, cutter class, and individual cutter cost.

By Fiscal Year - Contract Award dates		
24-02-2322DW091	FY2002	$16,890,478
21-03-2332DW321	FY2003	$7,911,891
Total		**$24,802,369**

By Cutter Class	
WMEC-270	$7,706,835
WMEC-210	$6,992,677
WHEC-378	$10,102,857
Total AC&I	**$24,802,369**

By Cutter	CLIN	Total Cost
CGC Northland (WMEC-904)	0035FA	$596,926
CGC Tampa (WMEC-902)	0035FA	$596,926
CGC Spencer (WMEC-905)	0035FA	$599,742
CGC Mohawk (WMEC-913)	0035FA	$596,926
CGC Seneca (WMEC-906)	0035FA	$596,926
CGC Thetis (WMEC-910)	0035FA	$596,926
CGC Harriet Lane (WMEC-903)	0035FA	$596,926
CGC Forward (WMEC-911)	0035FA	$596,926
CGC Bear (WMEC-901)	0035FA	$596,926
CGC Munro (WHEC-724)	0037FA	$874,353
CGC Tahoma (WMEC-908)	0035FB	$570,325
CGC Rush (WHEC-723)	0037FA	$874,353
CGC Legare (WMEC-912)	0035FA	$596,926
CGC Morgenthau (WHEC-722)	0037FA	$879,850
CGC Dallas (WHEC-716)	0037FA	$894,764
CGC Sherman (WHEC-720)	0037FB	$810,721
CGC Campbell (WMEC-909)	0035FB	$567,508
CGC Boutwell (WHEC-719)	0037FB	$780,013
CGC Gallatin (WHEC-721)	0037FA	$879,850
CGC Midgett (WHEC-726)	0037FB	$805,188
CGC Dependable (WMEC-12)	0036FB	$495,529
CGC Mellon (WHEC-717)	0037FA	$910,558
CGC Escanaba (WMEC-907)	0035FA	$596,926
CGC Jarvis (WHEC-725)	0037FB	$794,952
CGC Alert (WMEC-16)	0036FB	$495,528
CGC Chase (WHEC-718)	0037FB	$794,952
CGC Venturous (WMEC-11)	0036FA	$500,775
CGC Reliance (WMEC-01)	0036FA	$500,775
CGC Steadfast (WMEC-09)	0036FB	$495,528
CGC Confidence (WMEC-05)	0036FA	$500,775
CGC Vigorous (WMEC-13)	0036FA	$500,775
CGC Dauntless (WMEC-10)	0036FA	$500,775
CGC Valiant (WMEC-07)	0036FA	$500,775
CGC Hamilton (WHEC-715)	0037FB	$803,301
CGC Resolute (WMEC-06)	0036FA	$500,775
CGC Diligence (WMEC-02)	0036FA	$500,775
CGC Decisive (WMEC-15)	0036FA	$500,775
CGC Active (WMEC-04)	0036FB	$498,344
CGC Vigilant (WMEC-03)	0036FA	$500,775
	Total	**$24,802,369**

The Deepwater C4ISR Legacy Asset "Follow-On" Costs

Once the Deepwater C4ISR Legacy Asset investments discussed above are made, these new technologies need to be supported and maintained. In addition to the acquisition costs listed in the previous tables, there are also annual operating expenses (OE) or recurring costs associated with the C4ISR upgrades. These are listed in the following three tables.

The following are yearly **recurring** cost related to DEEPWATER upgrades for legacy cutters.

Service Provided	Unit Estimate	Qty	Estimated Annual Cost
Annual Router Hosting at LES	$14,400	3	$43,200
Annual Router Maintenance at LES	$5,400	3	$16,200
T1 Line from Hudson St New York to CAMSLANT Chesapeake, VA	$37,200	1	$37,200
T1 Line from Auckland, NZ to CAMSPAC PT Reyes, CA	$247,680	1	$247,680
T1 Line from Goonhilly, UK to Hudson Street in New York City	$103,773	1	$103,773
PRI Circuit	$6,000	1	$6,000
Total recurring Costs			**$454,053**

Cost of connectivity for INMARSAT-B services

	Pre DW	Post DW
INMARSAT-B leased channels (24)	$5,524,201	$5,524,201
Terrestrial lines	$284,880	$673,533
Totals	$5,809,081	$6,197,734

OE Support Costs

	FY04	FY05
WMEC 270 - CLIN 0035 (series)	$110,576.00	$150,427.00
WMEC 210 - CLIN 0036 (series)		$55,803.00
WHEC 378 - CLIN 0037 (series)	$95,693.00	$150,427.00
Total OE Support costs	$206,269.00	$356,657.00

Total "Follow-On" Operating Costs for FY2005 = $7,008,444

Operating Expense (OE) costs are projected to increase from $7M in FY2005 to $7.8M in FY2006. The reason for the increase is that more legacy cutters and shore sites have received C4ISR upgrades. The increased costs include Contract Line Item (CLIN) and personnel costs associated with follow-on support for: C2 Centers, Communications Area Master Stations, Legacy 210s, 270s, and 378s, District, HQ, and Section Command Centers, Proposal preparation, and C4ISR Non-Contract Government Incurred (NCGI) – connectivity maintenance with Coast Guard Area Master Stations and airtime for the International Maritime Satellite, or INMARSAT).

FY06 Deepwater OE Worksheet				
		Final FY06 Funding** ($15.45M)		
CLIN	Title	CLIN $	Pers $	Total
0014FE	ILS C2CEN Follow-on Support	$ 37		
0027ED	CAMS Follow-on Support	$ 50	$ 863	
0029ED	COMMSTA Follow-on Support	$ -		
0035AD	270 Follow-on Support	$ 100	$ 798	
0036AC	210 Follow-on Support	$ 22		
0036AD	210 Follow-on Support	$ 33		
0037AD	378 Follow-on Support	$ 54		
0079ED	District OPCEN Follow-on Support	$ 100	$ 428	
0080EE	HQ OPCEN Follow-on Support	$ 16		
0081ED	ICC Follow-on Support		$ 367	
0083ED	OPCEN Section Command Follow-on Support	$ 50		
tbd	Proposal prep costs for O&S DTOs	$ 75		
NCGI	Deepwater C4ISR NCGI	$ 4,800		
	TOTALS	$ 5,337	$ 2,456	**$ 7,793**

Total "Follow-On" Operating Costs for FY2006 = $7,793,000

The Operational Impact of the Deepwater C4ISR Legacy Asset Investment

The improved performance and greater operational effectiveness of legacy cutters has contributed to the record drug seizures and increases in alien migrant interdictions during the past year. The following tables summarize Coast Guard drug seizures and interdictions over the past 12 years.

Coast Guard Drug Seizure Statistics by Fiscal Year (updated 25 Oct 2005)

Fiscal Year	Events	Vessels	Arrests	Marijuana	Cocaine	Cocaine's Imported Value, in Billion USD
2006	3	1	16	0	1402	0.0
2005	87	66	364	10026	303,187	9.7
2004	104	71	326	25,915	242,435	7.7
2003	65	56	283	14,059	136,865	4.4
2002	58	40	207	40,316	117,780	3.5
2001	65	30	114	34,520	138,393	4.5
2000	92	56	204	50,463	132,480	4.4
1999	118	74	304	61,506	111,689	3.7
1998	129	75	297	31,390	82,623	3.0
1997	122	64	233	102,538	103,617	4.0
1996	36	41	112	42,063	44,462	1.1
1995	44	34	56	40,164	33,629	1.3
1994	67	28	73	33,895	47,333	1.8

Coast Guard Interdiction Statistics by Fiscal Year as of Monday December 5, 2005								
Fiscal Year	Haitian	Dominican	PRC	Cuban	Mexican	Other	Ecuador	Total
1994	25302	232	291	38560	0	58	0	64443
1995	909	3388	509	525	0	36	0	5367
1996	2295	6273	61	411	0	38	2	9080
1997	288	1200	240	421	0	45	0	2194
1998	1369	1097	212	903	30	37	0	3648
1999	1039	583	1092	1619	171	24	298	4826
2000	1113	499	261	1000	49	44	1244	4210
2001	1391	659	53	777	17	31	1020	3948
2002	1486	177	80	666	32	55	1608	4104
2003	2013	1748	15	1555	0	34	703	6068
2004	3229	5014	68	1225	86	88	1189	10899
2005	1850	3612	32	2712	55	45	1149	9455
2006	255	540	0	422	15	0	106	1338
Total	108799	30363	5772	58402	501	1259	7319	212415

While the increase in drug seizures cannot be exclusively attributed to the legacy cutter C4ISR upgrades, it is clear the upgrades have dramatically improved Maritime Domain Awareness. The installation of the Automatic Identification System, for example, permits early identification of surface contacts in the patrol area. This reduces the number of time-consuming boardings, thereby permitting the cutter to cover larger patrol areas. The use of the Secret Internet Protocol Router Network (SIPRNET) chat – essentially a system that enables secure, real-team on-line communications – permits improved coordination among multiple Coast Guard cutters and shore-side command centers, while also contributing to increased Maritime Domain Awareness and more effective command and control of available assets.

The value of the C4ISR upgrades is substantiated by post-patrol summaries. These summaries are routine reports submitted by cutters upon completion of their assigned patrols. They document lessons learned, difficulties with equipment, useful tactics and procedures, challenges and successes, etc. Patrol report summaries, while anecdotal and often representative of individual data points, nevertheless provides a presentation of increased effectiveness of the legacy cutter C4ISR upgrades. For example, several after-action reports provided by recently equipped cutters have described these C4ISR upgrades as having, “Revolutionized the way I do business.” Many additional summaries echo the sentiment that “SIPRNET is a leap forward in technological prowess,” and CGC ESCANABA’s credits bandwith increases through satellite communications upgrades with a 10-fold increased in work load efficiency.

The following are only a few of the real world examples of how recent C4ISR upgrades, SIPRNET, Automatic Identification System (AIS), and increased satellite communication bandwidth have impacted Coast Guard operations.

Increased Drug Seizures

April 2005 – A Navy ship USS DOYLE was unable to stop or pursue a high-speed suspicious vessel, and used SIPRNET chat to contact the better-positioned Coast Guard Cutter (CGC) FORWARD for assistance intercepting the go-fast chase. Before establishing visual contact, CGC FORWARD used SIPRNET chat to request and receive a Statement of No Objection (SNO) to employ warning shots and disabling fire on the vessel. In addition to the preemptive transfer of information on the go-fast, SIPRNET facilitated tactical and prosecution coordination discussions between DOYLE, FORWARD and Joint Inter-Agency Task Force (JIATF) South. FORWARD stopped the go-fast using warning shots before the go-fast could outrun her and six smugglers and 77 bales of cocaine were seized. The SIPRNET capabilities facilitated timely relay of information, ideas, and authority. FORWARD's commanding officer commented, "The time from granting SNO to rounds out of the barrel was six minutes. If the SNO had been 10 minutes later, the go-fast would have evaded us also." This level of more timely operational coordination was not possible before SIPRNET was installed.

December 2005 – Following a drug seizure of over 6.4 metric tons, CGC CHASE's operations officer reported the importance of using the increased bandwidth along with SIPRNET to receive and send digital photography in his prosecution of the case. In his report he stated, "I can't say enough about how much SIPRNET has aided me in my task of sorting through tactical data quickly and accurately to build and execute operations here … Thank you and your folks for helping make my job more effective out here."

Improved Situational Awareness

February 2005 – Using a newly installed AIS system, CGC ESCANABA covertly tracked a high interest vessel (HIV) to ensure that this vessel did not deviate from its projected voyage track. ESCANABA also reported using AIS to acquire detailed contact information for vessels out to 60 nautical miles, more than twice RADAR range. ESCANABA's commanding officer commented that AIS provided the ability "to maintain awareness of harbor entrances and early warning of HIVs approaching. Knowing the names of (vessels) and (their respective) location(s) enabled ESCANABA to easily contact commercial traffic for rules of the road situations as well as directing them to assist in (search and rescue) SAR cases or avoid search areas."

Increased Alien Migrant Interdiction

June 2005 – While searching for a migrant vessel, CGC CONFIDENCE used newly installed AIS to locate and contact a merchant ship within the large search area. The merchant vessel reported seeing a small, slow-moving vessel in the area. Using this information, CONFIDENCE arrived on-scene and rescued seven Cuban migrants from their sinking boat. As this example demonstrates, AIS not only provides detailed information, but also frequently provides information on vessels well beyond radar range; Without AIS capability, CONFIDENCE would not have known what vessels were in the search area, and therefore would not have known to contact the merchant ship for assistance in locating the migrants. Commenting on the outcome of this case, the Seventh Coast Guard District stated, "AIS was instrumental in interdiction of seven Cuban Migrants … (CONFIDENCE) was able to narrow the search area and ultimately save the lives of seven persons."

Effective Command and Control

October 2004 – CGC MOHAWK used AIS during covert law enforcement to sort out targets and later warned vessels in the area to stay clear in the interest of their own safety. MOHAWK reported that the"(a)bility to receive classified imagery and info on potential TOI's (Targets Of Interest) was invaluable. Use of SIPRNET reduced time required to complete boarding of fishing vessel … also used AIS in theatre to rule out merchant vessels during TOI filtering … sent (AIS) text messages to specific vessels informing them that ALERT (another cutter in the area) was towing astern. AIS will provide great advantages during domestic (homeland security) patrols."

Conclusion

Originally conceived as a classified internet service, SIPRNET has revolutionized the way Coast Guard cutters operate, by providing an extremely accurate and unambiguous communications path. The many benefits of SIPRNET include: increased collaboration; critical information sharing, such as imagery used to ensure proper identification and plan boarding team prosecution; and improved command and control.

While AIS was originally designed for collision avoidance, it is now helping Coast Guard cutters sort out what is frequently an extremely crowded radar picture without having to visually identify individual contacts. This capability dramatically increases the size of the cutter's surveillance/detection area and enables covert classification and tracking of high interest vessels.

These upgrades are powerful new tools that immediately and directly impact the efficiency of operators in the field. As these tools continue to be employed by the operational commander, the Concept of Operations will continue to evolve and mature, further increasing the operational effectiveness of Coast Guard assets.

COMPARISON OF PRE- AND POST-LEGACY CUTTER C4ISR UPGRADE OPERATIONS

The following table lists the equipment and associated capabilities of the legacy cutter C4ISR upgrades and contrasts with the pre-Deepwater legacy cutter.

	Before Deepwater Upgrade	After Deepwater Upgrade
ECWAN	No classsified LAN No connectivity off cutter to SIPRNET, except ADNS installations on 5 or 6 of 378s. Cutters with ADNS could only access SIPRNET while underway. No classified computing environment onboard the cutter except for stand-alone computers. No classified Chat Capability No classified E-mail Capability No classified Web Access	Classified LAN Connectivity to SIPRNET from all cutters both underway and inport. Connectivity to SIPRNET from all cutters both underway and inport. Classified computing environment with laptop drops in CIC and radio and desktop connections from CO, XO, and OPS staterooms. Classified Chat Capability Classified E-mail Capability Classified Web Access
AIS	No AIS	Ability to track by name and MMSI number. Ability to identify vessel's type, cargo, navigational status, speed, course, position, route plan, etc
INMARSAT-B Commercial Satellite System	64kbps data throughput over leased satellite channel. Ability to share leased channels by being assigned four hour time-slots (use channel 4 hours, no access for next 4 hours)	128kbps data throughput over leased satellite channel. Ability to share leased channels by being assigned one-half of the channel's bandwidth. This allows each cutter to use half of the channelf or 24/7 access. Data throughput is at 64kbps for each cutter. Newer modems provide much better forward-error correction, which greatly increases data throughput.
Law Enforcement and DSC Radio Systems	Wide-band VHF-FM marine band radios that are becoming increasingly hard to support. UHF frequency radios in 225 - 400 MHz band for communications over military frequencies. No Digital Selective Calling Capability Digital Encryption Standard (DES) only. This encryption will no longer be available in near future.	New VHF-FM radios that can operate either wide-band or narrow-band. In addition to existing UHF radios, added capability to communicate in 403-433 MHz UHF band where new DHS working frequencies are located. Ability to communicate with other law enforcement agencies in new UHF frequencies. Ability to communicate in VHF-FM band (155 - 165 MHz) using Digital Selective Calling features. DSC provides the capability to make ship-to-ship private calls to other DSC equipped ships (similar to a phone call). DSC provides the capability to send automatic "Mayday" calls. Increased interoperability with Rescue-21. New Advanced Encryption Standard (AES) encryption as well as ability to communicate with existing DES equipped radios. Radios are backward compatable with exisiting radios.

Conclusion

The Deepwater Program's incremental installation of C4ISR system upgrades to legacy platforms is already yielding noteworthy improvements in operational effectiveness, maritime domain awareness, and time-sensitive information and data exchange. Deepwater's progressive network-centric modernization is critical to the Coast Guard's successful accomplishment of its homeland security and other missions.

Unlike the platform-centric Coast Guard of the past, Deepwater's interoperable C4ISR system will provide the means to communicate information and data quickly and securely between all Coast Guard units and other agencies. This cost-effective transformation will see Coast Guard air and surface platforms serving as nodes for shared information and operational knowledge with command centers ashore—a potent force multiplier that will enable units to conduct their missions as a connected, distributed force that will be the hallmark of the 21st-century Coast Guard.

Section D: Legacy Asset Status

The Conference Report accompanying the fiscal year (FY) 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide a:

> *status report of legacy assets, including modernization progress, operational availability, and the projected, remaining service life of each class of legacy Deepwater asset.*

Executive Summary

This report provides the "status report of legacy assets, including modernization progress, operational availability, and the projected, remaining service life of each class of legacy Deepwater asset" required by the FY06 Congressional Appropriations Conference Report Requirements (109-241).

The projected service life of each class of legacy asset was reported to Congress May 31, 2005, in the Revised Deepwater Implementation Plan. The assets to be modernized as Deepwater platforms are the HC-130H Long Range Surveillance Aircraft, the HH-60J Medium Range Recovery Helicopter, and the HH-65 Short Range Recovery Helicopter. The assets to be decommissioned are the 378-ft high endurance cutter (WHEC), the 270-ft. and 210-ft. medium endurance cutters (WMECs), the 110-ft./123-ft. patrol boat (WPB), and the HU-25 Medium Range Utility/Surveillance Aircraft.

Legacy Asset Class (number of assets)	Decommissioning Schedule	Modernization Schedule
HC-130H (27)	2008-2012*	2008-2012**
HH-60J (41)	NA	2008-2013
HH-65 (95)	NA	2005-2013
HU-25 (20)	2009-2014	NA
378' WHEC (12)	2010-2015	NA
WMEC		
270' (13)	2020-2026	NA
210' (14)	2014-2022	NA
WPB		
110' WPB (41)	2008-2021	NA
123' WPB (8)	2023-2024	NA
** 11 HC-130H will be decommissioned*		
*** 16 HC-130H will be modernized*		

The operational availability measures chosen for this report were deemed the best readiness indicators. The cost information selected best shows the increased pressures on the Operating Expense (OE) budget. The operational availability measures in the aviation section include aircraft availability, Labor Hour per Flight Hour (LHPFH), and Cost per Flight Hour (CPFL). The cutter measures include the Percent of Time Free (POTF) from a "deficiency in mission critical equipment which caused a major degradation or loss of a primary mission," scheduled

maintenance, and unscheduled maintenance costs. These measures were cited in the GAO-05-757 report to Congress on legacy assets. The GAO-recommended improvements to the Coast Guard metrics are being validated and are not available for this report.

The report explains how the Coast Guard maintains its legacy assets using organic maintenance and repair infrastructure in conjunction with contracted depot-level maintenance activities. The operating expense (OE) funded maintenance efforts are complemented by Acquisition, Construction and Improvement (AC&I) projects undertaken in the Deepwater acquisition project. The projected service life and increased maintenance cost trends provide the return on investment justification for the AC&I expenditures, especially for the cutter Mission Effectiveness Project (MEP).

The following table lists the legacy asset sustainment projects detailed in this report:

Legacy Asset Class	**FY05 Availability Index**	**Project List**	**Timeline**	**Total Cost***
HC-130H	73.40%	Center Wing Box	unknown	TBD
		Surface Search Radar Replacement	FY05 - FY09	$78M
		Avionics Upgrade	FY07 – FY12	$260M
		Weather Radar Replacement	FY07 – FY12	$28M
HH-60J	68.60%	Avionics Upgrade	FY03-FY10	$142M
		Service Life Extension Project & Re-Wire	FY03-FY10	$18M
		Weather / Surface Radar Replacement	FY03-FY11	$43M
		Engine Upgrade	FY07-FY11	$37M
		Mission Needs Statement Capability Upgrade	FY08-FY12	$209M
HH-65	80.90%	MCH Conversion Phase I: Re-Engine Project	FY03-FY07	$355M
		MCH Conversion Phases II	FY07-FY13	$126M
		Weather / Surface Radar Replacement		
		Landing Gear Replacement		
		Tail Rotor Blade / Gearbox Replacement		
		MCH Conversion Phase III: Additional Fuel Cell	FY08-FY12	$96M
**Estimated costs are in nominal dollars.*				

Legacy Asset Class	FY04 POTF	Project List	Timeline	Total Cost**
378' WHEC	7%	None planned		
WMEC		Mission Effectiveness Project		
270'	42%		FY05-FY13	$222M
210'	41%		FY05-FY10	$114M
WPB		Mission Effectiveness Project	FY05-FY12	$49M*
110'	45%			
123'	37%			
*Total *WPB MEP costs under development. $49M provided in FYXX supplemental appropriations.*				
***Estimated costs are in nominal dollars.*				

Status Report of Deepwater Legacy Assets

The report shows the progress and summarizes the Deepwater legacy asset sustainment and modernization projects required to meet projected asset service life reported to Congress May 31, 2005, in the Revised Deepwater Implementation Plan's Capital Investment Plan (CIP).

Many Deepwater legacy asset aircraft are part of the final Deepwater mix and require a combination of sustainment and modernization projects. The sustainment projects are needed to replace obsolete or no-longer-supported Original Engine Manufacturer (OEM) parts. The Deepwater legacy asset aircraft scheduled for sustainment and modernization are the Long Range Surveillance Aircraft (HC-130H), the Medium Range Recovery Helicopter (HH-60J), and the Short Range Recovery Helicopter (HH-65). The Medium Range Utility/Surveillance Aircraft (HU-25) will be decommissioned.

The Deepwater legacy asset cutter sustainment programs are designed to maintain legacy asset capabilities until the cutter's Revised Deepwater Implementation Plan decommissioning date. The Deepwater legacy asset cutters scheduled for decommissioning are the 378-ft. High Endurance Cutter (WHEC), the 270-ft. and 210-ft. Medium Endurance Cutter (WMEC), and the 110/123-ft. Patrol Boat (WPB).

Aviation Maintenance Program Overview

The Revised Deepwater Implementation Plan requires 16 HC-130H, 42 HH-60J, and 95 HH-65 to remain operational until 2027. The Coast Guard plans to employ both fleet-wide programs and specific airframe projects to enable the platforms to meet the projected service life. In order to sustain these assets, the maintenance programs include the well-established, OE-funded Programmed Depot-Level Maintenance, Aircraft Structural Integrity Program, and aircraft standardization initiatives.

Programmed Depot-Level Maintenance (PDM)

PDM schedules every Coast Guard aircraft for planned maintenance on a four-year cycle. PDM is an extensive and intrusive corrosion and structural inspection of each aircraft that focuses on treating corrosion and repairing or replacing structural components. It also provides an opportunity to maximize aircraft operational availability by performing aircraft modifications in conjunction with PDM. PDM is conducted at the Coast Guard Aircraft Repair and Supply Center (ARSC), Elizabeth City, N.C. The ARSC process quality is highly regarded by many relevant industry and government experts such as the U.S. Air Force (USAF), which selected the Coast Guard as its MH-60G helicopter PDM facility. ARSC conducts PDM for the HH-60J and HH-65, and it will have local HC-130H PDM capability in fiscal year 2006.

Aircraft Structural Integrity Program (ASIP)

Structural component fatigue, high corrosion area data, and maintenance process improvements are all captured and integrated during PDM through the Aviation Logistics Management Information System (ALMIS). ASIP tracks all corrosion problem areas, and the preventative measures developed from this information are incorporated into unit level maintenance procedures. Historical corrosion mapping trends drive PDM focus and have created efficiencies through lessons learned and institutional knowledge. ASIP combined with the PDM process ensures critical maintenance demands are captured and proactively resolved.

Standardization Initiatives

The Coast Guard is migrating all legacy aviation platforms to commercial or Department of Defense (DOD) standard configurations. This not only leverages cost savings through economies of scale but, from a sustainment perspective, minimizes the risk of obsolescent

systems and ensures OEM support for long-term sustainment. Examples of these initiatives include

- HH-65 migration to MH-65C to closely match the AS365N4 Commercial standard;
- HH-60J avionics upgrade is a migration to the DOD Army avionics suite; and
- HC-130H avionics upgrade program leverages the same system destined for use within all DOD HC-130 variants.

Aircraft Operational Availability

The aviation program uses the aircraft availability index as the primary operational readiness measure. It reflects the percent of time aircraft assigned to air stations are mission ready. The Coast Guard's mission availability readiness goal is 71 percent. To meet the goal, those air stations assigned at least three aircraft must have at least one aircraft ready to launch within 30 minutes of a distress signal. Two cost measures, Labor Hours per Flight Hour (LHPFH) and Cost per Flight Hour (CPFH), are used to track performance. LHPFH provides the labor hours expended by field units versus the number of flight hours for each platform. CPFH represents the variable costs of spare parts and depot-level maintenance associated with operating each aircraft type per flight hour.

The aircraft cost and availability data used below does not incorporate all the direct and indirect costs incurred by the fleet. However, these data were chosen in accordance with the audited measures examined by the General Accountability Office (GAO) in the July 2005 report on Coast Guard legacy asset conditions (GAO-05-757), and are intended to provide the most accurate and consistent snapshot for Congress of availability and cost data regarding Coast Guard air assets.

HC-130H LONG-RANGE SURVEILLANCE AIRCRAFT

The Coast Guard maintains a mixed fleet of 27 HC-130H aircraft. Five of the HC-130H are 1500 series models while the remaining 22 are 1700 series. The Revised Deepwater Implementation Plan gradually reduces the "H" model fleet from 20 aircraft in 2009 to 16 in 2015. The remaining 16 HC-130H will undergo Deepwater modifications and capability improvements and are projected to remain operational until 2027.

HC-130H Operational Availability

	2000	2001	2002	2003	2004	2005
Availability Index	63.5 %	65.90 %	71.00 %	73.30 %	68.60 %	73.40 %
LHPFH	15.30	16.00	16.60	16.70	19.00	20.20
CPFH	$1,336	$1,636	$2,202	$2,078	$2,357	$2,275

HC-130H Sustainment and Modernization Plan

In order to meet the Revised Deepwater Implementation Plan's projected service life of 2027 for

16 HC-130H aircraft, the Coast Guard developed a plan that includes projects that will sustain current capability while also addressing structural integrity issues. The plan will optimize the use of the most structurally sound airframes, which will be chosen using ASIP tracking data and PDM assessments.

HC-130H Center Wing Box

The largest structural integrity problem impacting the HC-130H's projected service life is the Center Wing Box (CWB), the airframe's center wing structure. In partnership with the aircraft manufacturer, Lockheed Martin, the USAF has invested significant time and funding to validate the mathematical assumptions used in previous Damage Tolerance Assessment (DTA) calculations. USAF teardown inspections and wing static testing have identified numerous microscopic cracks that indicate multiple site damage and widespread fatigue damage. These are strong indicators that the original mathematical models used for damage assessments were inaccurate and are likely to result in a significant reduction to the expected fatigue life limit of the HC-130H CWB. The updated DTA calculations, provided by Lockheed Martin, use a more conservative 2.0 severity factor, which immediately reduced the CWB life limit. Lockheed Martin reported the new life limit calculations in February 2005. At that time, the 1500 series became operationally restricted. The Coast Guard is currently inspecting the 1500 series CWB in accordance with the Lockheed Martin service bulletin 2. The first aircraft to be inspected in October 2005, CGNR 1501, passed the service bulletin 2 inspection criteria. CGNR 1500 is currently being inspected. An aircraft that successfully passes the inspection will have its flight restrictions lifted, however, the CWB life limit remains.

The Coast Guard will inspect all HC-130H CWBs. If any CWB fail inspection, replacement or refurbishment is required. Regardless of the inspection outcome, the CWB are ultimately limited by a severity factor generated life limit. Once this life limit is reached, the CWB replacement or refurbishment is required. The Coast Guard has contracted with Lockheed Martin to reassess the data used for the mathematical modeling of CWB fatigue and provide a Damage Tolerance Assessment (DTA). The first contract deliverable in November 2005 provided a Coast Guard specific average DTA of 1.9 based on an evaluation of the various Coast Guard mission profiles. The final contract deliverable due in November 2006 will provide a DTA based on the mission profile and in-flight data collection. The updated DTA will dictate the timeline for CWB replacement or refurbishments and funding levels needed to sustain the fleet in order to meet the operational requirements of the Revised Deepwater Implementation Plan.

HC-130H Surface Search Radar Replacement

This project will replace an unreliable, unsupportable, and obsolete APS-137 Radar System with a Surface Search Radar which has an increased mean-time-between-failure rate and a fully supported Logistics Support Plan. The new system seeks to leverage radar technology improvements to obtain increased capability and operational availability and decrease the amount of work required by aircraft technicians to maintain the system.

In August 2005, a contract was awarded to the SELEX Corporation for this replacement radar, the SEASPRAY 7500.

This project is being funded under the Revised Deepwater Implementation Plan as an element of the HC-130H MNS Conversion. It has a total estimated cost of $78 million and is projected for funding from fiscal year 2005 through fiscal year 2009.

HC-130H: Avionics Upgrade

The HC-130H cockpit uses 1950s technology which is obsolete, costly, and quickly becoming unsupportable. The USAF, Marines, Navy, and NATO operators are committing to the USAF/Boeing Multifunction Digital Cockpit for their "H" model aircraft. This cockpit upgrade will allow the HC-130H to be highly capable, reliable, and supportable through 2027. The replacement cockpit will fully support operations in all domestic and international airspace structures (Communications Navigation Surveillance/Air Traffic Management and Global Air Traffic Management) enabling streamlined integration of future sensors and providing a framework for participation in the Common Operating Picture program.

This project is being funded under the Revised Deepwater Implementation Plan as an element of the HC-130H MNS Conversion. It has a total estimated cost of $260 million and is projected for funding from fiscal year 2007 through fiscal year 2012.

HC-130H Weather Radar Replacement

This project is designed to correct the high failure rate of the ARN-215 Radar system (RDR-1300C). In FY05, the radar system became one of the top 10 HC-130H systems contributing to mission degradation. A functional weather radar is an in-flight necessity for multi-mission capability. The current radar is a detriment to operational safety and effectiveness. Allied Signal is the sole source for the radar's high voltage transformer. If Allied Signal discontinues manufacturing this critical radar system component, every RDR-1300C will eventually become unserviceable and have to be replaced. In order to mitigate the negative mission impact of the radar system as parts become unsupportable, the HC-130H program will use excess common components from the HH-60J radar replacement project that is scheduled ahead of the HC-130H radar replacement.

This project is being funded under the Revised Deepwater Implementation Plan as an element of the HC-130H MNS Conversion. It has a total estimated cost of $28 million and is projected for funding from fiscal year 2007 through fiscal year 2012.

HH-60J MEDIUM RANGE RECOVERY HELICOPTER

The Coast Guard had a fleet of 42 HH-60J aircraft until a class “A” mishap in December 2004

destroyed one helicopter. The Revised Deepwater Implementation Plan HH-60J projected service life requires a fleet of 42 to remain in service until 2027.

HH-60J Operational Availability

	2000	2001	2002	2003	2004	2005
Availability Index	71.40%	70.80%	68.10%	72.40%	69.80%	68.60%
LHPFH	16.20	18.40	19.90	19.60	21.10	21.60
CPFH	$1,054	$1,294	$1,569	$1,517	$1,387	$1,463

HH-60J Sustainment and Modernization Plan

In order to meet the required service life of 2027, the Coast Guard sustainment and modernization plan calls for several projects to ensure that current capability is maintained while also addressing obsolescence and electrical wiring problems.

HH-60J Avionics Upgrade

The ASN-150 avionics suite has been plagued by poor performance and supportability problems that adversely impact HH-60J readiness and mission effectiveness. The system hardware and software were designed in the mid-1970s and will soon be unsupportable due to reliance on out-of-production components and obsolete manufacturing processes. The replacement avionics system will include high-resolution multifunction displays capable of producing video that can support the current and planned sensor systems (radar, electro-optical infra-red video).

The project is leveraging the Common Avionics Architecture System cockpit design implemented by DOD on all Army H-60s. Completion of the avionics upgrade on the HH-60J will change the "J" designator to "T."

This project is being funded under the Revised Deepwater Implementation Plan. It has a total estimated cost of $142 million and is projected for funding from fiscal year 2003 through fiscal year 2010.

HH-60J Service Life Extension Project and Re-Wire

The HH-60J Service Life Extension Project (SLEP) and Re-Wire program has two primary initiatives: (1) conduct comprehensive structural/operational analysis to identify and quantify specific causal factors of airframe cracks and the potential impact of new mission profiles, such as the AUF and Rotary Wing Air Intercept; and (2) replace approximately 60 percent of existing airframe wiring harnesses that are becoming an increasing maintenance liability as a result of age and corrosion. Results of the ongoing analysis will identify future structural upgrades and provide recommended changes to operating profile and/or limitations.

This project is being funded under the Revised Deepwater Implementation Plan. It has a total estimated cost of $18 million and is projected for funding from fiscal year 2003 through fiscal year 2010.

HH-60J Weather/Surface Radar Replacement

This project will replace the aging and obsolete weather/search radar (RDR-1300C) and Forward Looking Infrared (FLIR 2000) with sensors that meet the Coast Guard's Rotary Wing Multi-Sensor System Operational Requirements Document. Maintainability is further limited by an inadequate spare parts supply as the radar production has ceased. A September 1999 Manufacturing Technology Information Analysis Center study reported that the current RDR-1300C radar system would be unsupportable in 2006 due to obsolescence of this 20-plus-year-old system. The receiver and transmitter mean-time-between-failure has trended down from 919 hours to 626 hours over the last nine years. This obsolete system will decrease readiness as aircrews are unable to accomplish missions deemed too dangerous without a functioning radar.

The FLIR 2000 replacement is identified in the Coast Guard's Airborne Use of Force (AUF) project, which encompasses both the HH-60J and HH-65 Fleet. AUF was funded outside of Deepwater at $10 million for fiscal year 2006. Final outyear completion of funding of the AUF project within Deepwater is projected for fiscal year 2009.

This radar element of this project is being funded under the Revised Deepwater Implementation Plan. It has a total estimated cost of $43 million and is projected for funding from fiscal year 2003 through fiscal year 2011.

HH-60J T-700 Engine Upgrade

The HH-60J T-700 engine upgrade will increase the mean-time-between engine failures, thereby increasing current-engine availability by (1) implementing a targeted recapitalization of hot section components; (2) addressing obsolescence/support issues associated with the Digital Electronic Control Unit; and (3) initiating performance-based logistics support. Without this upgrade, the frequency of engine removals will require the purchase of additional spares in order to meet operational commitments. Additionally, unit maintenance labor-hours related to engine changes and troubleshooting will continue to increase, negatively affecting aircraft availability and unit readiness.

This project is being funded under the Revised Deepwater Implementation Plan as part of the HH-60 engine sustainment project. This project has a total estimated cost of $37 million and is projected for funding from fiscal year 2007 through fiscal year 2011.

HH-60J Mission Needs Statement (MNS) Upgrade

The HH-60J MNS upgrade will provide C4ISR technology to facilitate enhanced interoperable communications with other Coast Guard, DHS, and DoD assets. The result will be a shared Common Operational Picture/Maritime Domain Awareness data exchange capability that will increase coordination and efficiency in mission prosecution.

This project is being funded under the Revised Deepwater Implementation Plan as part of the

HH-60 conversion project. This project has a total estimated cost of $209 million and is projected for funding from fiscal year 2008 through fiscal year 2012.

HH-65 SHORT RANGE RECOVERY HELICOPTER (MULTI-MISSION CUTTER HELICOPTER)

The Coast Guard maintains a fleet of 95 HH-65 aircraft. The Revised Deepwater Implementation Plan HH-65 projected service life requires the entire fleet of 95 to remain in service until 2027. The modifications enabling the 95 HH-65 to remain in service will result in it being reclassified as a Multi-Mission Cutter Helicopter (MCH). The conversion of HH-65 aircraft into MCHs is being conducted in three phases. Phase I is the re-engining currently underway. Phase II includes radar, landing gear, and tail rotor replacement and is scheduled to begin in fiscal year 2007. MCH Phase III adds an additional fuel cell to the aircraft. Phase III is scheduled to begin with funding to be sought in fiscal year 2008.

HH-65 Operational Availability

	2000	2001	2002	2003	2004	2005
Availability Index	76.60%	75.00%	73.40%	75.50%	80.90%	80.90%
LHPFH	11.30	12.80	12.90	13.30	13.30	14.60
CPFH	$900	$976	$1,089	$1,108	$1,312	$1,249

HH-65 Sustainment Initiatives

MCH Phase I: HH-65 Re-Engine Project

The HH-65 engine upgrade with Turbomeca 2C2 engines is currently in progress. The helicopter's accelerated re-engining was necessitated by significant aircrew safety concerns based on increasing failure trends with the previous LTS-101 engine. In addition to the substantial flight safety improvements, the Turbomeca 2C2 provides substantial power margin gains. The project is being conducted at ARSC and at the American Eurocopter facility in Columbus, MS.

As of October 2005, 11 HH-65's have completed the re-engining process. Air Stations Atlantic City, NJ, and Savannah, GA, are at full operational capability with five assigned aircraft each. The Aviation Training Center in Mobile, AL, has one aircraft assigned for training and standardization. Air Station Miami, FL, will receive the next nine aircraft. All operational HH-65 conversions are scheduled for completion by February 2007.

This project has a total estimated cost of $355 million. The project has received $288 million, including fiscal year 2006 appropriated funds.

MCH Phase II Conversion Projects: total cost estimate for the following three projects contained in this phase of the MCH conversion total $126 million and are projected to be funded between for fiscal year 2007 through 2013.

HH-65 Weather/Surface Radar Replacement

A September 1999 Manufacturing Technology Information Analysis Center study concluded that the current RDR-1300C radar system would be unsupportable within six years due to obsolescence of this 20-plus-year-old system. Receiver/transmitter mean time-between-failure has trended down from 919 hours to 626 hours over the last nine years. Maintainability is severely constrained by an inadequate supply of spare parts no longer in production or available, which will result in a loss of readiness as aircrews are unable to accomplish missions deemed too dangerous without operational radar. Because this cross-platform project includes all aviation assets, it generates cost savings through commonality of systems.

HH-65 Landing Gear Replacement

The HH-65 landing gear will reach the end of its repair capacity in FY08 due to excessive wear on internal components. Landing gear overhaul records show that all landing gear assemblies coming into ARSC for overhaul require on-condition replacement. Twenty-three aircraft undergo PDM annually, requiring the replacement of 92 sets of landing gear in four years. Unserviceable landing gear will have an adverse impact on readiness/availability and overall mission performance, especially shipboard deployments.

HH-65 Tail Rotor Blade/Gearbox Replacement

The manufacturer of the HH-65's tail rotor blades (Eurocopter) has discontinued production as of 2005 due to toxicity issues with the resin used in their fabrication. The Coast Guard will have to replace the current 11-bladed HH-65 tail rotor and hub with the 10-bladed asymmetrical tail rotor technology that Eurocopter has developed and currently uses on the EC-155 helicopter. The Coast Guard has increased its inventory but those supplies will be exhausted by 2010.

Deepwater Legacy Asset Cutters

Cutter Maintenance Program Overview

The May 31, 2005, Revised Deepwater Implementation Plan provided an update of the cutter class decommissioning schedule and the projected service life for the 378-ft. high endurance cutter (WHEC, 12 cutters), 270-ft. medium endurance cutters (WMEC, 13 cutters), 210-ft. medium endurance cutters (WMEC, 14 cutters), and 110-ft./123-ft. patrol boats (WPB, 49 cutters).

In order to sustain the legacy assets to meet their projected service life, routine maintenance and sustainment projects are completed during the OE-funded dockside and dry-dock periods. However, as the assets age, AC&I-funded special efforts like Mission Effectiveness Project (MEP) are required to ensure cutter legacy asset operational availability.

A MEP is a class-wide capital improvement initiative designed to modernize or replace obsolete

and unsupportable Hull, Mechanical and Electrical (HM&E) equipment during extended maintenance availabilities. While the MEP will address the cutter's major hull and sub-system issues, consideration is given to the cutter's required service life to avoid over-investing in a particular asset, while maximizing return on investment. Specific tasks to be accomplished during a MEP are determined by the Coast Guard Naval Engineering program and prioritized based on safety, readiness, return on investment, and the potential for an increase in system casualties. The purpose of a MEP is to mitigate, but not eliminate, the escalation of maintenance hours and costs.

Cutter Operational Availability

The cutter's primary operational readiness measure is Percentage of Time Free (POTF) from a major casualty. Major equipment casualties are category 3 or 4, which are defined as "deficiency in mission critical equipment which caused a major degradation or loss of a primary mission." The Coast Guard's POTF goal is 72 percent with lower percentages indicating a decrease in operational readiness. None of the cutter legacy asset classes have met this performance goal in the past five years.

The Naval Engineering program also tracks scheduled, unscheduled, and total maintenance expenditure trends. An analysis of the expenditures is used to identify maintenance intensive and obsolete equipment sub-systems which disproportionably increase a cutter's total annual maintenance costs. FY05 POTF and maintenance cost information was not available at the time this report was submitted.

The cost and availability data used below does not incorporate all the direct and indirect costs incurred by the surface fleet. However, these data were chosen in accordance with the audited measures examined by the General Accountability Office (GAO) in the July 2005 report on Coast Guard legacy asset conditions (GAO-05-757), and are intended to provide the most accurate and consistent snapshot for Congress of availability and cost data regarding surface assets.

378-ft. WHEC HIGH ENDURANCE CUTTER

There are 12 378-ft. WHECs operated by a crew of 19 officers and 147 enlisted personnel. Ten of the Coast Guard's 378-ft. WHECs are stationed in the Pacific Area Command while two are assigned to the Atlantic Area Command. The 378-ft. WHEC typically operates 185 days a year away from home port per year. The 378-ft. WHEC is a multi-mission cutter supporting defense operations; maritime security/law enforcement; search and rescue; living marine resources; ports, waterway, and coastal security; alien-migrant interdiction; and drug interdiction. According to the Revised Deepwater Implementation Plan, the cutter's projected service life calls for gradual decommissioning between 2010 and 2015.

378-ft. WHEC Operational Availability

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2000	30%	$13,376,901	$2,641,025	$16,017,926
2001	22%	$19,842,996	$4,230,497	$24,073,493
2002	38%	$15,109,120	$3,416,032	$18,525,152
2003	26%	$15,523,775	$6,487,666	$22,011,441
2004	7%	$17,131,625	$4,686,052	$21,817,677

378-ft. WHEC Sustainment Plan

Although the 378-ft. WHEC fleet is aging and equipment obsolescence issues are degrading overall performance, the required service life of the 378-ft. WHEC fleet does not merit a Mission Effectiveness Project or other class-wide sustainment project. To ensure the capability and reliability of these cutters until their decommissioning the Coast Guard is dedicating OE funding to address specific sub-systems to avoid over-investing in any particular system. The Coast Guard uses a "new business rules and strategies" to maintain the 378-ft. WHEC fleet in an economical manner, while maximizing mission readiness. The strategy includes (1) ensure operations and maintenance commanders work closely together to determine priorities, (2) recognize that maintaining or enhancing cutter capabilities will involve trade-off determinations, while (3) accepting the proposition that limited funding will necessitate that not all cutters will be fully capable to perform all types of missions (GAO-05-65IT, page 16).

A list of the most critical engineering sub-systems was developed based upon equipment conditions and the operational availability impact of degraded or out-of-commission equipment. This list is routinely updated as system conditions change. In fiscal year 2005, there were 15 sub-systems identified as requiring immediate, near-term expenditure of resources. Examples include (1) water maker pump, (2) navigation equipment, (3) small boat davit, (4) air-conditioning and refrigeration systems, and (5) steam boilers. The most critical receive OE-funded support.

270-ft. WMEC MEDIUM ENDURANCE CUTTER

There are thirteen 270-ft. WMECs stationed in the Atlantic Area Command, operated with a crew of 13 officers and 85 enlisted personnel. The 270-ft. WMEC typically operates 185 days a year away from home port and supports maritime security/law enforcement; search and rescue; living marine resources; ports, waterway, and coastal security; alien-migrant interdiction; drug interdiction; and defense missions. According to the Revised Deepwater Implementation Plan, the projected service life calls for the cutter's gradual decommissioning between 2020 and 2026.

270-ft. WMEC Operational Availability

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2000	38%	$9,175,918	$1,419,443	$10,595,361
2001	35%	$10,253,382	$1,365,576	$11,618,958
2002	47%	$8,814,319	$1,527,919	$10,342,238
2003	32%	$15,744,978	$1,690,038	$17,435,016
2004	42%	$6,098,884	$1,620,389	$7,719,273

The 2003 increased expenditures were received from supplemental and redirected OE funds to perform deferred maintenance.

270-ft. WMEC Sustainment Plan

A July 1999 study on the condition of the WMEC fleet by Nichols Advance Marine engineers and ship surveyors determined that by 2009 extensive replacement of aging equipment will be necessary if the 270-ft. WMEC fleet is expected to reach the Revised Deepwater Implementation Plan service life. With that information, the 270-ft. WMEC MEP was developed as a sustainment project that will allow the Coast Guard to contain maintenance costs while ensuring operational availability for the remaining required service life. In FY05, the Coast Guard began a two phase Mission Effectiveness Project (MEP) on the 270-ft. WMEC fleet scheduled for completion in 2013.

Phase I of the 270 WMEC MEP will be conducted at the Coast Guard Yard in Baltimore, MD. It will include replacement of major systems, such as potable water maker, small boat davit, gyrocompasses, air conditioning system, pumps and motors, ventilation systems, oily water separators, engine room fire suppression system, tank level indicator system, berthing area renovations, auxiliary saltwater and sewage piping systems as well as other auxiliary systems The USCGC TAMPA entered the Yard in May 2005. USCGC HARRIET LANE and USCGC FORWARD will commence their Phase I MEP in 2006. The other ten 270-ft WMECs are scheduled to complete the Phase I MEP between fiscal years 2007 and 2010.

Phase II of the MEP will commence in 2010 and include replacement of the engine control system, anchor windlass, capstans, articulating crane, fuel and oil purifiers, refrigeration system, and flight support equipment.

This project is being funded under the Revised Deepwater Implementation Plan. It has a total estimated cost of $222 million and is projected for funding from fiscal year 2005 through fiscal year 2013.

210-ft. WMEC MEDIUM ENDURANCE CUTTER

There are fourteen 210-ft. WMECs operated with a crew of 12 officers and 63 enlisted personnel. Eleven 210-ft. WMEC are stationed in the Atlantic Area Command. The three

remaining cutters are based in the Pacific Area Command. The 210-ft. WMEC typically operates 185 days a year away from home port and supports maritime security/law enforcement; search and rescue; living marine resources; ports, waterway, and coastal security; alien-migrant interdiction; and drug interdiction. According to the Revised Deepwater Implementation Plan, the projected service life calls for gradual decommissioning between 2014 and 2022.

210' WMEC Operational Availability

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2000	52%	$9,994,463	$1,899,895	$11,894,358
2001	48%	$8,801,109	$1,783,393	$10,584,502
2002	40%	$6,168,837	$1,443,401	$7,612,238
2003	37%	$15,209,055	$1,541,610	$16,750,665
2004	41%	$6,362,468	$1,176,492	$7,538,960

The 2003 increased expenditures were received from supplemental and redirected OE funds to perform deferred maintenance.

210-ft. WMEC Sustainment Plan

A 210-ft. WMEC MEP began in FY05 as a class-wide recapitalization project designed to modernize or replace obsolete and unsupportable Hull, Mechanical and Electrical (HM&E) equipment during a single extended maintenance availability. Modernizations include replacement of major systems such as; air conditioning, refrigeration, davit, anchor windlass, capstans, emergency generator, life-rafts, fuel-oil purifier, ventilation systems, windows, galley and scullery renovation, flight support systems, structural repairs, pilot house repairs, as well as other auxiliary systems. The 210-ft. WMEC MEP will allow the Coast Guard to contain maintenance expenditures while ensuring operational availability for the remaining service life.

The 210-ft. WMEC MEP began in September 2005 with USCGC DEPENDABLE entering the Coast Guard Yard. USCGC CONFIDENCE will begin the 210-ft. WMEC MEP in FY06. The other ten 210-ft. WMEC MEPs are scheduled to be completed by 2011.

This project is being funded under the Revised Deepwater Implementation Plan. It has a total estimated cost of $114 million and is projected for funding from fiscal year 2005 through fiscal year 2011.

110-ft./123-ft. WPB PATROL BOATS

There are currently 49 Patrol Boats (WPBs) operated with a crew of two officers and 14 enlisted personnel. Forty-one WPBs are 110 feet in length, with 29 of those stationed in the Atlantic Area Command; the remaining 12 stationed in the Pacific Area Command. Six of the Atlantic Area Command's 110-ft. WPBs are currently serving in the Persian Gulf. The 110-ft. WPBs typically operate at 1,800 hours per year. The 110-ft. WPBs support a variety of missions, such as defense operations; maritime security/law enforcement; search and rescue; living marine

resources; ports, waterway, and coastal security; alien-migrant interdiction; and drug interdiction. According to the Revised Deepwater Implementation Plan, the projected service life calls for gradual decommissioning between 2008 and 2022.

The remaining 8 WPBs either have completed or are in the 123-ft. WPBs conversion process. The first converted 123-ft. WPB, USCGC MATAGORDA, became operational in February 2005. The other 123-ft. WPBs will also be stationed in the Atlantic Area Command and will continue to have the same manning as the 110-ft. WPB. The 123-ft. WPBs will continue to perform the same missions as the 110-ft. but will programmed for 2,500 hours per year.

110-ft. WPB Fleet Operational Availability

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2000	67%	$12,713,001	$1,650,862	$14,363,863
2001	57%	$12,891,098	$2,445,161	$15,336,259
2002	47%	$21,406,754	$3,439,798	$24,846,552
2003	48%	$23,713,280	$5,149,335	$28,862,615
2004	45%	$16,734,221	$3,621,311	$20,355,532

123-ft. WPB Fleet Operational Availability

Fiscal Year	POTF	Scheduled Maintenance	Unscheduled Maintenance	Total Maintenance
2004	37%	$2,116,229	$4,148	$2,120,337

110/123-ft. WPB Sustainment Plan

WPB Hull Sustainment Program and 110/123-ft, Conversion Project

110-ft. WPBs have experienced significant hull deterioration. To combat these corrosion problems and add other capabilities to the 110-ft. WPB, the Coast Guard developed the Hull Sustainment Project (HSP) and the 123-ft. WPB conversion program. The HSP replaced all deteriorated hull plates and structural members that showed 15 percent or more degradation. The selected patrol boats were gutted, sandblasted, and thoroughly inspected. Ten of the 49 110-ft. WPBs completed the HSP. In addition to the HSP, those WPBs deemed to be in the worst condition were placed in the 123-ft. WPB conversion program. Six of the eight 123-ft. conversions have been completed. The final 123-ft. WPB conversions are scheduled to be completed in December 2005.

110-ft. Mission Effectiveness Project

The 110/123-ft. WPB MEP will complete approximately 100 work items that include the renewal of hull plating and underwater appendages, the renewal of pumps, motors and piping, upgrading the generators and power distribution equipment as well as the small boat crane. The work will also replace 28 obsolete and unsupportable systems. These systems include the gyrocompass, autopilot, fire detection and suppression systems, engine control system, and the ship's alarm systems. The USCGC TYBEE will report to the Coast Guard Yard in March 2006

to begin the first 110/123-ft. WPB MEP. USCGC OCRACOKE will enter the 110/123-ft. WPB MEP in fiscal year 2006 with four other WPB entering in fiscal year 2007.

The project has received $49.2 million from the Operation Iraqi Freedom to remain available until FY07. As the results of the MEP program are achieved, additional ships will be planned for service through the program.

Section E: Legacy Asset Cost Accounting in IDS

The following section is intended to Conference Report accompanying the FY 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide:

> *A comprehensive explanation of how the Coast Guard is accounting for the costs of legacy assets in the Deepwater program.*

Deepwater Accounting of Legacy Asset Costs

Legacy asset costs, such as those discussed at length in the previous sections as well as additional direct and indirect costs associated with platforms and operations not yet evaluated in this report, are monitored and recorded by the Coast Guard. The comprehensive raw cost data are, when appropriate, calculated and then validated through the Coast Guard Chief Financial Officer.

Once these legacy asset cost data are validated, the Deepwater Program extracts all relevant obligation or expenditure data, and incorporates the data into calculations of total ownership cost (TOC) of the Integrated Deepwater System (IDS).

The separation of reported Coast Guard cost data, and the measurement of Deepwater TOC seek to maintain the integrity of the financial data upon which the program's TOC is constructed. Thus, the financial source data used within Deepwater TOC analyses is verifiable and resistant to inappropriate data manipulation.[1] If source data must altered in any way for the purpose of TOC reporting, the assumptions, methods and results of the manipulation will be noted to provide reproducible results.

TOC is composed of both Operating Expenses (OE), and Acquisition, Construction, and Improvements (AC&I). All Operating Expenses (OE) for legacy assets are captured within the Cost Allocation Model (CAM), from which the Standard Rate and User Fee (SRUF) and Master Data Set (MDS) are developed. The CAM captures all costs which include, maintenance, fuel, asset operations, and salaries and benefits. Any significant service life or mid-life extensions or capabilities upgrades for legacy assets have been budgeted for within the Acquisition, Construction, and Improvement (AC&I) baseline. AC&I costs are captured, as incurred, within the Coast Guard's Core Accounting System (CAS). Data extracts from the CAM and the CAS are then used to document the cost of the Deepwater system, on an annual basis. The "Total Ownership Cost Annual Statement for Fiscal Year 2004" follows, and illustrates the results of this accounting process.

[1] As an example, costs associated with the execution of Contract Line Item Numbers (CLINs), as Delivery Task Orders (DTO), were collected from the Coast Guard's Large Unit Financial System (LUFS), rather than the responsible program managers within Deepwater. OE costs are certified by the Coast Guard CFO in the annual Cost Allocation Model (CAM), from which the Standard Rate and User Fee (SRUF) and Master Data Set (MDS) are developed.

United States Coast Guard
Integrated Deepwater System Program

Total Ownership Cost

2004 Annual Statement

Deepwater Program Office
Commandant (G-D)
U.S. Coast Guard
2100 2nd Street SW
Washington, DC 20593

Written By:

12/15/05

Mr. Greg Cohen — Date

DRM / Performance Measurement Lead

12/14/2005

LCDR Sherman Lacey — Date

DRM / Total Ownership Cost Lead

12/12/05

Mr. Michael Leathe — Date

DRM / Total Ownership Cost Staff

12/13/05

LT George Bixler — Date

DRM / Total Ownership Cost Staff

12/12/05

LT Michael Mendoza — Date

DRM / Total Ownership Cost Staff

12/13/05

Mr. Rick Willigan — Date

Support Contractor / Performance Management Consulting

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1.0 INTRODUCTION

The Integrated Deepwater System (IDS) Program[1] was established to recapitalize the Coast Guard's aging and obsolete inventory of cutters and aircraft[2]. Beyond the introduction of new ships and planes, IDS seeks to modernize the command, control, communications, computer, intelligence, surveillance, reconnaissance (C4ISR) and logistics functions that enable Coast Guard assets to successfully execute Deepwater missions. The system acquired by IDS was required to exceed the operational effectiveness of the legacy Deepwater assets, while minimizing total ownership cost.

In June 2002, Integrated Coast Guard Systems (ICGS), a joint venture between Lockheed Martin and Northrop-Grumman, won a contract from the Coast Guard to serve as the system integrator for IDS. The first award term, also referred to as the base period, will extend for the first five years of a twenty-year time period, which was the planned life of the IDS acquisition.

1.1 Document Overview

This document presents the total ownership cost (TOC) of the IDS for fiscal year (FY) 2004. This is the third such report presented by the IDS Program, and this iteration documents the efforts of the second, full fiscal year of the program. A number of changes and improvements were made since the statement of TOC for 2003. DRM-1 has acquired greater insight into the cost collected by the Coast Guard financial system and has driven these costs to the lowest levels of the IDS Work Breakdown Structure (DWBS), wherever possible. This movement of costs downward provides greater specificity and with it the opportunity for the identification and isolation of cost drivers, while also facilitating evaluation of ICGS at the lowest levels of the DWBS.

This annual statement of TOC includes only those costs realized by the Coast Guard. Inclusion of solely those costs incurred, attributed or induced by the Deepwater Coast Guard resulted in the exclusion of the notional annual expenditures necessary to improve and expand the Coast Guard's existing facilities and infrastructure.[3]

Included in the forty-year TOC estimate was a per annum value of $83M, which represented the annualized amount of effort envisioned necessary to upgrade Coast Guard Deepwater facilities, between 2002 and 2022. While this remains a valid estimating assumption, for purposes of the forty-year TOC estimate, notional or estimated values are not included in this statement of annual IDS TOC. The annual value for rebuilding facilities and infrastructure was included in the first statement of TOC for 2002. TOC 2002 has since been restated to reflect those costs that were incurred during FY2002.

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[1] Throughout this document the IDS and the "Deepwater Program" are used interchangeably. ICGS is the prime contractor and systems integrator to the IDS.

[2] The surface and air assets in the Coast Guard's inventory at the time the Deepwater contract was awarded in June 2002 are referred to as legacy assets throughout this document.

[3] A number of costs were estimated to generate the forty-year TOC value of $78B (FY2002). In addition to the costs expected to upgrade existing facilities, notional values were developed to estimate the cost of ongoing legacy asset sustainment, and a ten percent Government program management reserve. These costs were considered necessary to execute the IDS.

1.2 Objective

At the initiation of the Deepwater Program, the TOC projection provided an estimation of those costs that would be incurred between 2002 and 2041. Since that time, DRM-1 has collected, on an annual basis, actual Coast Guard Operating Expenses (OE) and either the obligation or expenditure of Acquisition, Construction, and Improvement (AC&I) funds. From this effort, DRM-1 calculates TOC for each fiscal year. The annual calculation and presentation of TOC serves the following purposes:

1. To accurately account for Deepwater expenditures and obligations within the framework of the TOC definition;
2. To establish and reinforce transparency within the cost accounting and cost controls of the Program;
3. To serve as a source document for the refinement of the TOC projection through the incorporation of annual expenditures;
4. To serve as a source document, facilitating measurement and analysis of both IDS and ICGS cost performance.

1.3 Financial Data Sources and Presentation

DRM-1 has used, wherever possible, Coast Guard obligation or expenditure data collected and reported by entities outside of the IDS. The separation of reporting and the measurement of TOC seek to maintain the integrity of the financial data upon which TOC is constructed. Thus, the financial source data used within this, and subsequent reports, is verifiable and resistant to inappropriate data manipulation.[4] If source data was altered in any way for the purpose of TOC reporting, the assumptions, methods and results of the manipulation will be noted to provide reproducible results.

Within this document, a summary of annual TOC is presented according to the major cost categories noted in Section 1.4. In keeping with the reporting standards of the Program, the annual results are discounted to 2002 dollars.[5] Detailed costs, included in Section 3.0, are reported in the real dollars of the year, in which the expenditures were realized.

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[4] As an example, costs associated with the execution of Contract Line Item Numbers (CLINs), as Delivery Task Orders (DTO), were collected from the Coast Guard's Finance & Procurement Desktop (FPD), rather than the responsible program managers within Deepwater. OE costs are certified by the Coast Guard CFO in the annual Cost Allocation Model (CAM), from which the Standard Rate and User Fee (SRUF) and Master Data Set (MDS) are developed.

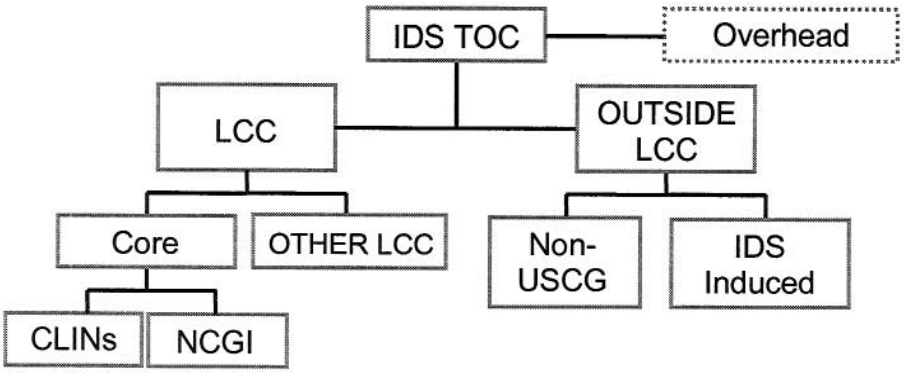
[5] The base year for all TOC estimates is 2002. All actual costs were reported to DRM-1 in FY2004 dollars, which were then discounted to FY2002 dollars using the direction of the IDS Decision Memo, TREATMENT OF INFLATION IN INTEGRATED DEEPWATER SYSTEM TOTAL OWNERSHIP COST (TOC) ESTIMATES, dated 7 Dec 05. The following discount rates, from the IDS Decision Memo, were applied:

Military Pay	1.0973
Civilian Pay	1.0849
Fuel	.9097
OE (less pay & fuel)	1.0360
AC&I	1.0577

Definition of Total Ownership Cost

TOC is the sum of all costs associated with the research, development, procurement, personnel, training, operation, logistical support and disposal of the entire Integrated Deepwater System (IDS). This cost includes the total supporting infrastructure that plans, manages, and executes the IDS program over its full forty-year life, as well as the cost of requirements for common support items and systems that are incurred because of introducing this system into the Coast Guard. TOC excludes "non-linked" Coast Guard infrastructure costs that are not affected by the systems' development, introduction, deployment or operations. Deepwater TOC is the sum of the Life Cycle Costs (LCC) of IDS and those costs considered to be outside of IDS that are either induced because of IDS or incurred as a result of Deepwater operations. These costs are further composed of Contract Line Item Number (CLIN) costs, Non-Contract Government Incurred (NCGI) costs, Other Life Cycle Costs (LCC), non-USCG costs, and IDS induced costs. The relationship of these costs is illustrated in **figure 1**.

Figure 1, TOC Definition



Life Cycle Costs (LCC): LCC is the sum of the Core LCC and Other LCC. In general, these costs are those Coast Guard expenditures necessary to carry out the proposed IDS.

Core Life Cycle Cost: Core LCC is the sum of CLINs and NCGI. IDS LCC is subject to the core funding streams per Section L of the Deepwater contract.

Contract Line Item Number: These are costs incurred via the System Integrator's (SI) prime contract. All CLIN costs are subject to the core funding stream.

Non-Contract Government Incurred Costs: These are IDS costs subject to the core funding stream, incurred under a vehicle other than the SI's prime contract. Non-SI implementation plan costs would include follow-on costs for assets and capabilities not covered within the proposal or incorporated within the SI's purview of IDS. An example of a NCGI cost is the OE expenditures associated with legacy Deepwater assets.

Other Life Cycle Costs: IDS costs that are included within the IDS LCC but not contained within the Core LCC funding stream. These costs include Government program management; acquisition costs of assets not

included within the IDS proposal, but later determined to be part of IDS, such as the C-130J; and deferred maintenance.

Outside LCC: Cost considered Outside LCC are the sum of non-Coast Guard and IDS induced costs. These are IDS costs that are realized as Deepwater costs but are either not funded by the Coast Guard or are Coast Guard costs that are induced to the non-Deepwater Coast Guard due to the execution of IDS.

Non-USCG Costs: These costs include IDS assets acquired or funded by other Government agencies and transferred to the Coast Guard. These costs are realized as components of IDS TOC, but are not subject to the notional funding stream. Non-USCG costs would include weapon systems and ammunition provided by the U.S. Navy.

IDS Induced Costs: IDS induced costs are incurred by non-Deepwater assets due to the execution of IDS, but are not required for the IDS to operate as proposed. These costs are not subject to the IDS notional funding stream. IDS has not yet recognized an IDS induced cost.[6]

Overhead Costs: Costs associated with such facilities as the Coast Guard Academy, Training Centers (TRACEN), the Coast Guard Financial Center (FINCEN), and the Personnel Service Center (PSC). These costs are captured in the Coast Guard Cost Allocation Model (CAM), but not included in the IDS.

[6] Examples of IDS induced costs would include modifications to the flight decks of the icebreakers to remain compatible with the capture and traversing system of IDS helicopters. While IDS has not yet realized an IDS induced costs, DRM-1 recognizes the significant impact that IDS decisions may have upon the non-Deepwater Coast Guard. DRM-1 also recognizes that induced costs may come from outside of Deepwater. For example, there may develop the need for additional non-Deepwater specific training or increased educational requirements across the entire Coast Guard or Department of Homeland Security. These would be realized as IDS induced costs.

2.0 IDS TOC RESULTS

DRM-1 determined the actual cost of executing of the Integrated Deepwater System by applying realized costs to the various categories that make up the full definition of TOC. All costs were reported to the IDS in a 2004 fiscal year dollar, which was then discounted to a 2002 value. A detail of each major cost category follows in Section 3.0.

Table 1
Integrated Deepwater System Ownership Cost
For fiscal year 2004 as of Oct 2005
These Costs are in base-year FY2002

Life Cycle Costs	
Notional Funding Stream Life Cycle Costs	
CLIN Costs	
AC&I Contract Line Item Numbers	503,954,272
OE Contract Line Numbers	21,272,275
Total ICGS Costs	$525,226,547
Non-contract Government incurred	
Contract GFE	49,120,113
Resource Proposals	9,610,908
Training Costs for Initial Crews 123' WPBs	575,769
Direct IDS Costs	825,649,892
Support IDS Costs	294,364,411
Total NCGI Costs	$1,179,321,093
Other Life Cycle Costs	
Government Program Management	27,230,233
Government Program Management Personnel Costs	30,770,541
Deferred Maintenance	100,573,645
Total Other Life Cycle Costs	$158,574,419
Total Life Cycle Costs	**$1,863,122,060**
Outside Life Cycle Costs	
Total Outside Life Cycle Costs	10,868,529
Total IDS TOC FY04 in FY02$	$1,873,990,588

3.0 DETAILS OF TOC RESULTS

This section provides a detailed presentation of those costs that are aggregated within the various categories that compose the full definition of TOC. All values within this section are in FY2004 then-year dollars.

Detail of CLIN Costs. Tables 2 and **3**, below, provide a summary of those CLINs that were exercised during FY2004. The tables below note the obligation of funds during FY2004 and are not intended to track the outlay of funds.

AC&I CLINs Executed as Delivery Task Orders

Table 2

0003	42,916,978
0014C	16,904,237
0030BA	7,897,595
0030BC	140,530,106
0031EB	450,000
0033B	7,712,970
0035FB	575,956
0036FA	2,092,542
0036FB	991,056
0037FA	70,424
0037FB	3,237,351
0040BA	32,900,000
0041BA	49,700,000
0047A	60,000,000
0049AA	47,024,794
0055EA	459,034
0055EB	456,535
0055FA	14,689,997
0056C	56,110,000
0061AA	-1,746,716
0061AB	-1,652,342
0061AC	19,235,235
0061AX	2,530,510
0061AZ	2,745,944
0065D	34,569
0067EA	34,770
0073C	21,544
0077C	23,975
0079DA	11,223,646
0080CB	878,121
0081C	3,689,243
0083C	2,005,058
0085B	-565,815
Total	$523,177,317

OE Contract Line Item Numbers Executed as DTOs

Table 3

0027EB	225,427
0031FC	24,864
0035AB	110,576
0037AB	95,693
0055AB	325,810
0055FA	915,000
0061BB	-61,345
0061BC	6,146,680
0084AA	-57,568
0084AB	14,233,582
Total	$21,958,719

Detail of Non-Contract Government Incurred Costs. The Government, in support of work contracted to ICGS, incurred the following costs.

Table 4

	Contract Government Furnished Equipment	
Domain	**Description**	
Surface	Funding to SPAWAR for 3ea NSC TACANs	1,125,000
Surface	Funding to SPAWAR for 1ea NSC TACAN	490,000
ILS	Fund NSC Pier Upgrade at ISC Alameda	280,000
ILS	Fund NSC OCCSU Bldg at ISC Alameda	700,000
ILS	Fund ATC Mobile DW Hangar Design	2,000,000
ILS	Fund ATC Mobile DW Simulator Bldg Design	540,000
C4ISR	Fund 210/270 SCCS Upgrades	2,819,000
C4ISR	Fund GFE Nav Sys Tech Dev, Support & Trng.	400,000
C4ISR	Stratos Land Earth Station (LES) Upgrade Support	48,750
Surface	Funding for 270' Class Mission Effectiveness Project (MEP)	6,958,700
Air	GFE for HH-65 Re-engining and Prod.Line Cert.	347,000
C4ISR	Equip.	1,000,000
ILS	Quick Look Study by PAC FDCC for OPC	25,000
C4ISR	Update 210', 270' & 378' class drawings for C4ISR MODs	100,000
Air	Fund the cost of HH-65 Technical Pubs at AR&SC.	562,779
Surface	MIPR for the design, development, install & certification of MK 160 GF	6,080,415
Surface	Add'l funding for MK160 GFCS; MIPR 42DW235	397,859
C4ISR	TISCOM IDS Certification and Accreditation Processing & Testing	400,000
C4ISR	Commercial SATCOM	3,000,000
C4ISR	Specific Emitter ID	3,500,000
C4ISR	Funding for the Digital Selective Calling (DSC)	1,800,000
C4ISR	Add'l 210' & 270' Class Cutter SCCS upgrade	900,000
Air	Sdd'l funding for the HH-65 Re-engining Project at AR&SC	500,000
C4ISR	Fund 210' SIPRNET prototype installation	70,000
C4ISR	Add'l to fund 210' SIPRNET prototype installation	45,000
C4ISR	Fund CAMS Legacy Cutter upgrade support by G2 Satellite Solutions	64,002
Surface	Fund NAVSEA MIPR for RADIAC Equip (WMSL 750 & 751)	57,970
Air	LTS101 funds to HH-65 Re-engine Project	5,700,000
C4ISR	GFE (COMDAC) Software Trng, Dev & Integration	738,000
C4ISR	Fund SPAWAR MOD (also see 58C500)	82,200
C4ISR	Fund SPAWAR MOD (also see 58C400)	328,910
Surface	Fund WMSL Visual Landing Aids	1,095,075
Surface	MIPR MOD for GFE Flt Deck Signal Status System for WMSL 750/751	122,500
Surface	Certification & Accreditation for Shore Site DTOs	835,000
ILS	Fund ATC Mobile Hangar Project Construction Phase I	460,000
C4ISR	(MIPR) Integ C4ISR Components w/ design & Construction of the WM	137,465
Surface	MIPR for Independent Cost Estimation Analysis of the OPC	200,000
Surface	MIPR for Independent Cost Estimation Analysis of the FRC	220,000
Surface	MIPR for Independent Cost Estimation Analysis of the NSC	240,000
C4ISR	Certification & Accreditation for Cutter Upgrades	175,344
C4ISR	Certification & Accreditation for Shore Site	175,344
ILS	Naval Base Ventura County (NBVC) Facility Assesment	250,000
Air	HH-65 re-engine Fleet Support Equipment	700,000
Surface	SSR-1 fleet broadcast equipment for ExComms (opt 1) ECP	186,000
Surface	Shipment of 110/123 Conversion Items	1,215
ILS	Alameda Environmental Assessment	40,000
C4ISR	Reduce Specific Emitter ID Project funding	-500,000
C4ISR	CGC ALEX HALEY SCCS Upgrade	500,000
Air	Funding for AR&SC Infrastructure cost for MPA Missionization	500,000
Air	Add'l HH-65 Reengine Funding	2,285,997
Surface	MK 160 GFCS Equipment for WMSL-751	1,520,266
ILS	EADS Radar Maintenance Training	26,000
C4ISR	Fund Link-11 Software Upgrades	150,000
Surface	Structural upgrade and dry-dock for CGCs NUNIVAK & VASHON	145,137
Surface	Vehls/per-deim for upgrades on CGCs NUNIVAK/VASHON	50,262
Surface	Add'l Structural upgrade and dry-dock for CGCs NUNIVAK & VASHON	95,000
Surface	Add'l Vehls/per-deim for upgrades on CGCs NUNIVAK/VASHON	34,000
		$50,705,190

Table 5

Non-Contract Government Incurred Resource Proposals

Domain	Description		
Air	HH-60 Avionics Upgrade		10,000,000
		Total	$10,000,000

Table 6

Initial Crew Training Costs

Domain	Description	
Surface	Costs of 06 Vehls at Bollinger for 110/123 crews	60,802
Surface	110/123 Crew Temporary Housing at Bollinger (3ea BPAs ISC NOLAS);	160,078
Surface	Bollinger Housing;CGCs NUNIVAK, VASHON, MOHEGAN, & MANITOU (Hul	30,014
Surface	110/123 Crew Temporary Housing at Bollinger (PR to ISC NOLA)	22,440
Surface	TONOs for CGC MATAGORDA Crew	78,913
Surface	TONOs for CGC NUNIVAK Crew	10,417
Surface	Fund a block of TONOs for 110/123 Crews	127,924
Surface	TONOs for CGC NUNIVAK Crew	63,576
Surface	TONOs for CGC MATAGORDA Crew	40,836
Surface	Crew GTR costs	4,198
	Total	$599,198

Non-Contract Government Incurred Costs – Direct and Support Costs

Direct Cost Summary

All costs were exported from the FY2004 version of the Standard Rate and User Fee (SRUF) or the Master Data Set (MDS) model, both of which are produced and maintained by CG-832. SRUF is developed in the Cognos PowerPlay Business Intelligence software suite, which allows the user to conduct queries and reporting on databases, in this case the direct and support costs of the Coast Guard.

Table 7

Military Pay	408,061,327
Civilian Pay	35,770,300
Deepwater Fuel Costs	47,124,937
AFC-30 Operations and Maintenance	57,090,208
AFC-4X Depot Level Maintenance	77,401,891
AFC-57 Medical	3,192,152
AR&SC	231,379,925
Total Direct Costs	$860,020,739

Direct Cost Details

Military and Civilian Pay:

Table 8

Civilian Pay	Cutters		0
	Aircraft		35,770,300
		Total Civilian Pay	$35,770,300
Military Pay	Cutters		228,780,126
	Aircraft		179,281,201
		Total Military Pay	$408,061,327
		Total IDS Pay	$443,831,627

IDS Fuel Costs:

Table 9

		Operating and Maintenance (30)
Cutter Energy Costs	110 Island Class Patrol Boat	3,444,333
	210 Reliance Class Medium Endurance Cutter	3,399,531
	270 Famous Class Medium Endurance Cutter	4,731,783
	378 Secretary Class High Endurance Cutter	10,287,976
	Other Cutters	2,587,729
	Total by Energy Category	
	Energy - Aircraft Fuel	19,015
	Energy - Automotive Gasoline and Diesel	9,485
	Energy - Marine Fuels & Lubricants - Small Boats	268,619
	Energy - Ships & Cutters	24,131,906
	Energy - Shore Units	22,327
	Total Cutter Fuel and Energy Costs	24,451,352

	Cost	Operating and Maintenance (30)
Aircraft Energy Costs	CC - 20115 - CAPE COD	1,291,172
	CC - 20121 - ATLANTIC CITY	314,415
	CC - 20130 - ELIZABETH CITY	3,306,125
	CC - 20135 - SAVANNAH	375,210
	CC - 20140 - MIAMI	1,774,207
	CC - 20150 - CLEARWATER	2,263
	CC - 20155 - HOUSTON	188,273
	CC - 20158 - DETROIT	292,514
	CC - 20160 - TRAVERSE CITY	356,955
	CC - 20170 - SAN DIEGO	282,212
	CC - 20180 - SAN FRANCISCO	199,827
	CC - 20190 - PORT ANGELES	156,626
	CC - 20195 - ASTORIA	301,232
	CC - 20210 - WASHINGTON	476,807
	CC - 20235 - BORINQUEN	1,096,935
	CC - 20245 - CORPUS CHRISTI	860,373
	CC - 20250 - NEW ORLEANS	1,144
	CC - 20253 - LOS ANGELES	254,740
	CC - 20255 - BARBERS PT	2,867,424
	CC - 20270 - KODIAK	3,403,639
	CC - 20276 - NORTH BEND	227,029
	CC - 20280 - SITKA	534,664
	CC - 20285 - HUMBOLDT BAY	136,410
	CC - 20290 - SACRAMENTO	3,698,259
	Total by Energy Category	
	Energy - Aircraft Fuel	22,398,454
	Energy - Automotive Gasoline and Diesel	50,920
	Energy - Marine Fuels & Lubricants - Small Boats	105,697
	Energy - Ships & Cutters	27,658
	Energy - Shore Units	90,856
	Total Aircraft Fuel and Energy Costs $	22,673,585
	Total IDS Fuel and Energy Costs $	**47,124,937**

Direct Costs Attributed by Allotment Fund Control Code (AFC):[7]

Table 10

AFC-30 Operations and Maintenance

Cutters

Cutters 110 Patrol Boat (OP)	4,364,076
Cutters 210 (OP)	7,694,974
Cutters 270 (OP)	9,974,523
Cutters 378 (OP)	14,233,248
Other Cutters	740,590
	$37,007,411

Aircraft	$20,082,797
	$57,090,208

AFC 4X - Depot Level Maintenance

	AFC 42	AFC 43	AFC 45
Cutters 110 Patrol Boat (OP)	26,005	96,876	20,852,328
Cutters 210 (OP)	63,026	0	12,155,445
Cutters 213 USCGC Acushnet	35,543	0	1,236,439
Cutters 230 USCGC Storis	1,638	0	110,106
Cutters 270 (OP)	-36,199	0	11,587,886
Cutters 282 USCGC Alex Haley	0	0	1,978,944
Cutters 378 (OP)	102,696	0	19,520,545
	192,708	96,876	67,441,693
	$67,731,276		

Total Costs

	AFC 41	AFC 42	AFC 43
HC-130 Hercules	0	89,746	1,796,422
HH-60 Jayhawk	0	126,799	2,538,084
HH-65 Dolphin	0	168,083	3,364,451
HU-25 Guardian	0	43,436	869,452
J-4 Commandant's Aircraft	674,141	0	0
MH-68 HITRON	0	0	0
VC-4 Vice-Commandant's Aircraft	0	0	0
Aircraft	674,141	428,064	8,568,409
	$9,670,615		
Total	**$77,401,891**		

AFC-57 Medical

HC-130 Hercules	649,407
HH-60 Jayhawk	902,731
HH-65 Dolphin	1,278,365
HU-25 Guardian	323,537
J-4 Commandant's Aircraft	4,043
MH-68 HITRON	34,060
VC-4 Vice-Commandant's Aircraft	10
Total	**$3,192,152**

[7] AFC 30 costs represent those costs captured within this particular AFC, less charges for fuel. At the time of this report, Coast Guard aviation reported AFC 30 and 4X accounts as fuel costs attributed to each air station and operating costs to each class of airframe. Without the ability to attribute fuel costs to a class of airframe or operating costs, less fuel, to an air station, the AFC 30 and 4X costs remain aggregated for all Coast Guard aviation.

Direct Costs Attributed to the Aviation Repair and Supply Center (AR&SC):[8]

Table 11

HC-130 Hercules	55,469,170
HH-60 Jayhawk	47,752,954
HH-65 Dolphin	76,215,965
HU-25 Guardian	51,897,443
VC-4 Vice-Commandant's Aircraft	44,392
Total	$231,379,925

Support Cost Components

Support Cost Summary

All costs were exported from the FY2004 version of the Standard Rate and User Fee (SRUF), which is produced and maintained by CG-832. SRUF is developed in the Cognos PowerPlay Business Intelligence software suite, which allows the user to conduct queries and reporting on databases, in this case the direct and support costs of the Coast Guard.

Table 12

Civilian Pay		59,891,449
Military Pay		63,281,466
AFC 30 - Operations and Maintenance		100,959,222
AFC 4X - Depot Level Maintenance		72,779,983
AFC 56 - Training		5,665,864
AFC 57 - Medical		4,279,548
	Total	$306,857,531

Support Cost Details

Military and Civilian Pay:

Table 13

Civilian Pay	Cutters		39,122,749
	Aircraft		20,768,700
			59,891,449
Military Pay	Cutters		35,512,027
	Aircraft		27,769,439
			63,281,466
		Total Support Pay	$123,172,915

[8] All labor costs for AR&SC were excluded, as these were captured within IDS Military and Civilian Pay.

Support Costs Attributed by Allotment Fund Control Code (AFC):

Table 14

AFC-30 Operations and Maintenance	Cutters	Aircraft
30000 - Boat Stations, Bases, COMMSTAs, MSOs, Groups, Other	3,337,733	5,844,831
40000 - LORAN, OMSTAs, LTSTAs, VTS, ANTS, ISCs, Other	10,942,086	19,110,578
50000 - NESU, CEU, ESU/ESD/DETAIL, C2CEN, Other	7,004,154	969,356
60000 - Academy, Governors Island, TRACENs, CG Institute, HRSIC	244,338	43,784
70000 - HQ, District, MLC LANT/PAC, Housing, Area LANT/PAC, Oth	36,629,697	16,832,666
	58,158,009	42,801,214
	$100,959,222	

AFC 4X Depot level Maintenance	AFC 42	AFC 43	AFC 45	
Cutters 110 Patrol Boat (OP)	2,116,690	4,033,858		4,482,109
Cutters 210 (OP)	3,267,860	1,311,872		3,864,663
Cutters 213 USCGC Acushnet	630,677	178,008		1,793,567
Cutters 230 USCGC Storis	507,476	536,464		831,127
Cutters 270 (OP)	3,925,644	1,335,641		4,254,086
Cutters 282 USCGC Alex Haley	495,661	609,183		1,133,668
Cutters 378 (OP)	6,213,269	5,163,049		8,445,084
	17,157,277	13,168,076		24,804,304
	$55,129,657			

	AFC 41	AFC 42	AFC 43	
HC-130 Hercules	466,639	973,533		3,984,627
HH-60 Jayhawk	362,942	729,939		3,455,103
HH-65 Dolphin	622,186	812,782		3,826,263
HU-25 Guardian	241,961	192,333		1,152,030
J-4 Commandant's Aircraft	34,566	52,046		402,563
MH-68 HITRON	0	109,426		44,601
VC-4 Vice-Commandant's Aircraft	0	38,552		6,941
	1,728,294	2,908,610		12,872,128
	$17,650,325			
	$72,779,983			

AFC-56			
Total Costs			
Cutters 110 Patrol Boat (OP)			82,929
Cutters 210 (OP)			92,069
Cutters 213 USCGC Acushnet			12,708
Cutters 230 USCGC Storis			16,015
Cutters 270 (OP)			84,579
Cutters 282 USCGC Alex Haley			20,184
Cutters 378 (OP)			188,404
			$496,888
Aircraft			$5,168,976
		Total	$5,665,864

AFC-57 Medical			
Cutters 110 Patrol Boat (OP)			478,213
Cutters 210 (OP)			410,182
Cutters 213 USCGC Acushnet			32,116
Cutters 230 USCGC Storis			58,677
Cutters 270 (OP)			408,754
Cutters 282 USCGC Alex Haley			66,215
Cutters 378 (OP)			801,137
			$2,255,293
AFC-57 Medical			
HC-130 Hercules			519066.63
HH-60 Jayhawk			632078.64
HH-65 Dolphin			609570.88
HU-25 Guardian			217248.83
J-4 Commandant's Aircraft			33340.24
MH-68 HITRON			12464.67
VC-4 Vice-Commandant's Aircraft			484.97
			$2,024,255
	Total		$4,279,548

Other Life Cycle Cost Components

Other Life Cycle Cost Summary

The following table presents the other life cycle costs of IDS in FY2004 dollars.

Table 15

Government Program Management	60,296,638
Deferred Maintenance	104,743,141
	$165,039,779

Other Life Cycle Cost Details[9]

Government Program Management (PM):[10]

Table 16

Program Management	28,268,915
Military Pay	24,120,496
Civilian Pay	7,907,226
	$60,296,638

Deferred Maintenance: [11]

Table 17

	AFC 41	AFC 42	AFC 43	AFC 45
Financially Slipped:				
Availabilities & Overhauls	24,560,845	2,041,897	0	19,000,000
Emergency Repairs	0	0	0	0
Inventory Reorders	221,423	1,991,375	0	8,668,246
Inventory Repairs	507,421	0	0	1,707,319
Depot Level Projects	0	0	40,367,000	0
Replacement and Replenishment	0	5,677,615	0	0
	25,289,689	9,710,887	40,367,000	29,375,565
	$104,743,141			

[9] The values from Table 16 were compiled from the funding execution files of financial managers with G-DRM, which were reconciled with LUFS. Table 17 represents the ongoing efforts by G-SEN and G-SDW to track deferred maintenance as it applies to Deepwater assets.

[10] Costs for Government PM represent those costs incurred by the PEO, which were funded through AC&I appropriations.

[11] Deferred Maintenance represents those maintenance actions or events that did not occur due to funding constraints.

Outside Life Cycle Cost Components

Outside Life Cycle Cost Details

All costs were the result of IDS assets acquired or funded by other Government agencies and transferred to the USCG. All values were reported from FPD.

Table 18

Naval Electronics Systems (NAVELEX)	2,317,033
Naval Ordnance Systems (NAVORD)	6,441,116
Naval Ordnance Electronics Systems (NAVORD ELEX)	25,097
Naval Sea Systems (NAVSEA)	460,489
Space and Naval Warfare Systems (SPAWAR)	1,975,515
Total	11,219,250

Section F: Asset Line-Items Outside IDS
In the President's Fiscal Year 2006 Budget Request

The Conference Report accompanying the fiscal year 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide:

> *An explanation of why many assets that are elements of the Integrated Deepwater System are not accounted for within Deepwater's appropriation (such as the missionization of the C-130Js, the 179-foot Cyclone class cutters, and the airborne use of force outfitting of the HH60s and HH65s.)*

Projects Not in the FY-2006 Deepwater Appropriation

The Deepwater Program entails the progressive modernization, conversion, and recapitalization of the Coast Guard's aging legacy assets. Now projected as a $24-billion/25-year acquisition, the fully implemented Integrated Deepwater System will consist of three classes of new cutters and their associated small boats, a combination of manned and unmanned aircraft, a network-centric system for C4ISR and integrated logistics support.

The projects noted in the conference report initially evolved independently of the Deepwater acquisition, but they are subsequently being incorporated into the revised post-9/11 Deepwater implementation plan in different ways appropriate to their impact on the Deepwater system and its acquisition plan. The decision to insert new projects into the Deepwater acquisition is made following a determination if the proposed new project fits within the characterization of Deepwater assets as defined in the program's Mission Needs Statement. It also depends upon whether the project is acquiring an asset that will be part of the final Deepwater system of systems. Also, the timing of each of these projects' development and the nature of each project's funding also impact their status in the Deepwater acquisition.

Missionization of the C-130J long-range search aircraft, the 179-foot Cyclone class cutter (PC-179), and airborne use of force (AUF) outfitting of HH60 and HH65 helicopters were not a part of the fiscal year 2006 Deepwater appropriation because of the timing of these projects' development and the nature of their funding. These projects were not part of the Deepwater acquisition plan when the fiscal year 2006 budget request was developed. This report describes the background and funding requirements associated with each project.

The Deepwater acquisition was designed to be flexible enough to accommodate changes in Coast Guard mission and operational requirements over time. While the C-130J and AUF projects both require acquisition funding, the PC-179 project does not. For this reason, the Coast Guard plans to include both the C-130J and AUF projects in its funding plan for the Deepwater appropriation in FY07 and out years. The PC-179 project, however, will not be folded into Deepwater acquisition planning for a variety of reasons.

C-130J Missionization

The Coast Guard has six C-130J aircraft in its inventory. These currently unmissionized aircraft were acquired following a series of Department of Defense appropriations beginning in 2001, as outlined below:

Total AC&I Funds Appropriated for the C-130J Program

Fiscal Year	Appropriation	Funding Adjustments	Total (Cumulative)	Comment	APO Portion (Total obligated in fiscal year)
2001	$468M	($2.3M)	$465.7M	DoD Appropriation. Rescission in FY 2003	$1.5M
2002	$0.5M	$0.2M	$466.4M	DoD Appropriation. Reprogram from FY 2001-C37A Project	$7.1M
2003	$0				$2.2M
2004	$60M		$526.4M	DoD Appropriation	$0.8M
2005	$34M		$560.4M	DoD Appropriation	$3.8M
Total	$562.5M	($2.1M)	$560.4M		$15.4M

The original Deepwater acquisition planned to retain six HC-130H aircraft through the final system build out. The C-130J acquisition was not part of the original Deepwater acquisition plan. The Coast Guard originally planned to missionize the C-130J outside of Deepwater by relying Department of Defense (DoD) appropriations. Once the C-130J acquisition began, the Deepwater plan was modified to provide for the replacement of HC-130H aircraft with the more capable HC-130J model as a legacy asset following missionization. This initial approach kept the J acquisition separate and distinct from the Deepwater acquisition. This plan changed, however, during the development of the revised post-9/11 Deepwater implementation plan and the Coast Guard's decision to rely on Integrated Coast Guard Systems (ICGS), the Deepwater Program's systems integrator, to missionize the C-130J aircraft. Both unmissionized C-130Js and missionized HC-130Hs are now part of the Deepwater system.

In September 2004, after consulting with Congress, the Coast Guard moved the C-130J into the Deepwater acquisition program to accomplish their missionization. This transfer, unfortunately, occurred after the Coast Guard submitted its fiscal year 2006 budget request. This plan relied on an integrated missionization solution from the original equipment manufacturer (OEM). Unfortunately, as the OEM missionization package matured it became cost prohibitive. The Coast Guard directed ICGS to develop a missionization solution with a cost ceiling of $120 million, the amount of C-130J missionization funding then available from prior-year DoD appropriations as highlighted below:

Funding Transferred to Deepwater program for $120M (AC&I) Missionization Delivery Task Order (DTO)

FUNDING	AMOUNT	(TYPE)	OBLIGATED YET AGAINST MISSIONIZATION DTO?	
FY 2001	$26M	(No-year money)		No
FY 2004	$60M	(One-year money)	Yes	
FY 2005	$34M	(One-year money)		No
Total	$120M		$60M	$60M

Moving the C-130J into the Deepwater Program also allowed the Coast Guard to ensure interoperability and commonality with other Deepwater assets. The Coast Guard plans to have

all six C-130J aircraft missionized and available for maritime patrol aircraft work by the end of 2008 at a cost not to exceed $120 million.

The Coast Guard's use of ICGS as a systems integrator allowed the HC-130J modernization project to move forward with minimum delay. ICGS is required to deliver, install, and test the necessary mission equipment for HC-130Js so that they can meet the performance requirements identified in the Coast Guard's Aviation Asset Performance Specification. As part of the Deepwater Program, this process will ensure integration and interoperability with all new and existing aviation assets, including the Coast Guard's legacy fleet of HC-130H aircraft.

Modifications to the HC-130J will result in approximately 90 percent commonality in C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance) systems planned for the Coast Guard's CASA CN235-300M maritime patrol aircraft. Sensors shared by both aircraft will include the electro-optical/infrared-FLIR Systems Star Safire III, DF-430 UHF/VHF Direction Finder System, and SAAB Transponder Tech AB R4A Airborne Automatic Identification System (AIS). The HC-130J's radar systems will feature the proven multimode EDO EL/M 2022A(V)3 maritime surface search radar, mounted beneath the plane's fuselage, and a nose-mounted APN-241 weather radar.

As noted above, this missionization cost was previously funded outside of Deepwater. Additional electronic missionization costs within Deepwater are not currently anticipated. There are, however, costs remaining for their fleet introduction.

The President's fiscal year 2006 budget request also included $4.95 million to fund the Aircraft Project Office which manages the C-130J pilot and air crew training, logistics use, and missionization oversight while the aircraft are transitioning to full operational use. As indicated in the Coast Guard's fiscal year 2006-2010 Capital Investment Plan, the Aircraft Project Office requires $5 million per year through project completion in fiscal year 2007, as outlined below.

FY07 AC&I funding request breakout of APO funding

ACTIVITY	FUNDING REQUEST PER YEAR
C-130J APO Elizabeth City, NC	
APO contract support	$1.4M
C-130J fuel in support of OT&E flight hours	$0.8M
Facility support costs	$0.6M
C-130J type 3&5 parts in support of OT&E flight hours/associated GSE	$0.6M
C-130 type 2&4 part consumables/Repair of Repairables contract for OT&E flight hours	$0.6M
Administration/Travel costs	$0.3M
Training	$0.2M
Subtotal	**$4.6M**
CGHQ G-ACJ	
Program Management Support/Administrative Support/Travel	$0.4M
TOTAL	**$4.9M**

This fleet introduction funding provides for the Aircraft Project Office's operation and ensures the successful integration of the missionized HC-130J into the fleet as a maritime patrol asset. The APO is considered to be an integral expense associated with the acquisition of C-130Js. It will be disestablished once the C-130s are missionized as maritime patrol aircraft; it requires acquisition funding rather than operational funding. In fiscal year 2006 this funding request was made outside of Deepwater because the decision to bring the unmissionized C-130J into

Deepwater had not yet been made. Now that the C-130J has been incorporated into the Deepwater Program, the fleet introduction acquisition funding will be sought by the Coast Guard as part of its Deepwater legacy aircraft budget request in fiscal years 2007 and 2008.

179-ft. Cyclone Class Cutters

The Cyclone class patrol boats (PC-179s) entered the Coast Guard inventory as the result of a July 2004 Memorandum of Agreement (MOA) between the Navy and the Coast Guard that permits the Coast Guard's use of these assets through fiscal year 2008 and, potentially, longer if both services agree. The five PC-179s now in the Coast Guard inventory are a valued addition to the Coast Guard patrol boat mix and serve as an essential bridging strategy to meet the patrol boat mission-hour gap caused in part by the deployment of five 110' cutters to the Persian Gulf, and projected to continue until the Fast Response Cutters enter service to fill the gap. Since there are no government acquisition actions associated with the transfer of the PC-179s to the Coast Guard, they have not been made a part of the Deepwater acquisition program baseline. The continued use and maintenance of the PC-179s is managed by the Coast Guard's Office of Cutter Forces using Coast Guard operational funds and Navy maintenance funds. There is no need to seek PC-179 funding as part of the Deepwater appropriation.

Airborne Use of Force Outfitting of HH65s and HH60s

The AUF project developed outside of Deepwater as a new counter-drug initiative as part of the Coast Guard's mission for maritime drug interdictions. In 2001, the Coast Guard's Office of Aviation Forces developed the use of armed helicopters able to interdict and disable small, high-speed boats ("go fasts") transporting narcotics and other illegal drugs into the United States. Armed helicopters, in the form of the Helicopter Interdiction Tactical Squadron (HITRON) AB-139 aircraft, rapidly became an essential tool in the counter-drug arsenal. These successes lead to the development of the AUF project. The AUF project will arm all of the Coast Guard's existing helicopters and obviate the need for the more expensive, single mission HITRON capability. The importance of AUF capability to the Coast Guard assumed added dimensions with the introduction of the Ports, Waterways, and Coastal Security (PWCS) mission after 9/11. Armed helicopters are now a required element of the PWCS mission response.

In fiscal year 2003, the Office of Aviation Forces used $2.2 million in operational funds to develop a prototype and proof of concept for the AUF project. The successes of this "out-of-hide" prototype led to requests for acquisition funding in fiscal years 2005 and 2006 to implement a thorough, fleet-wide AUF project plan.

All of this project work occurred independently of the Deepwater acquisition for two reasons. First, it began as an initiative of the Office of Aviation Forces and has remained that office's responsibility following its highly successful prototype stage. Second, AUF capability was not an element of the original Deepwater system proposal. The original Deepwater acquisition plan replaced assets and capabilities in use in 1998. AUF was not then a capability, and there was no provision for it in the original program's Mission Needs Statement.

The revised post-9/11Deepwater Mission Needs Statement (MNS) and implementation plan integrated the AUF capability into the Deepwater acquisition and made it a Deepwater system-performance requirement. Final administration approval of the revised post-9/11 Deepwater

MNS and implementation plan occurred in early 2005after the Coast Guard's 2006 budget request had been submitted to Congress. Hence, because of this timing, the fiscal year 2006 AUF acquisition funding request was made outside of the Deepwater appropriation. The fiscal year 2007 and out-year requests are projected to be made as part of the Deepwater legacy aviation budget request.

Completing the Deepwater acquisition Program's plan to modernize and recapitalize the Coast Guard's ships, aircraft, command and control, and logistics infrastructure is now scheduled to take 25 years. The Deepwater acquisition plan was designed to be flexible enough to adapt to changing requirements over that time span. For this reason, inclusion of the C-130Js and AUF project in the Deepwater Program makes sense from both an acquisition and operational perspective as the program continues to evolve.

Section G: Deepwater Competition

The Conference Report accompanying the FY 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide:

> *A description of the competitive process conducted in all contracts and subcontracts exceeding $5,000,000 within the Deepwater program.*

The competitive process conducted in all contracts and subcontracts exceeding $5,000,000 is discussed below in two parts. The first part reflects contract and subcontracts planned to be awarded at the time of base contract award in June 2002. These contracts and subcontracts were competed as part of the initial contract award process. The second part reflects those contracts awarded that were not planned at the time of contract award. The process used for those awards are addressed in an Acquisitions Solutions, Inc., study of the amount of second-tier competition conducted by ICGS and the tier one subcontractors based on its review over the period January 1, 2004, through December 31, 2004, attached as an appendix to this report.

Deepwater Competition

The principle of competition has been central to the Deepwater Program since inception. The Concept and Development Phase started with four industry teams competing to be selected to prepare a Functional Design and Proposal to build the Deepwater System. From these four teams, there was a down-select to three teams. These three teams were then paid approximately $8 million each to complete their design and proposal for Deepwater. It is important to note that each of the teams indicated that they spent two to three times as much as the Coast Guard paid them to complete their proposals. This was not an insignificant amount of money and part of the acquisition strategy to focus the three teams on competition. The proposals identified who would be designated to complete the task orders (e.g., Integrated Coast Guard Systems partners or the next level subcontractors) with full cost and pricing data for the first five years.

Based on that background, the Government Accountability Office (GAO), in its Report 04-380 dated March 2004, concluded that:

> "Competition is a key component for controlling costs in the Deepwater program and a guiding principle for DHS's major acquisitions. The benefits of competition may be viewed as sufficient in the contract's early years because, for the initial 5-year contract period, prices proposed by ICGS for equipment and software were based on competitions held among various subcontractors."

However, GAO also recommended in the same report that the following two actions should be taken to facilitate controlling future costs through competition:

- Develop a comprehensive plan for holding the system integrator accountable for ensuring an adequate degree of competition among second-tier suppliers in future program years. This plan should include metrics to measure outcomes and consideration of how these outcomes will be taken into account in future award fee decisions.
- For subcontracts over $5 million awarded by Integrated Coast Guard Systems (ICGS) to Lockheed Martin and Northrop Grumman, require Lockheed Martin and Northrop

Grumman to notify the Coast Guard of a decision to perform the work themselves rather than contracting it out. The documentation should include an evaluation of the alternatives considered.

The Coast Guard has embraced the GAO's recommendations and has plans to incorporate these recommendations into future award-term contracts. In fact, in testimony before the House Committee on Transportation and Infrastructure, Coast Guard and Maritime Transportation Subcommittee, GAO opined that the Coast Guard has taken steps to hold the System Integrator accountable for competition.

In the interim, and in the spirit of attempting to achieve the same objective without incurring additional costs, the Coast Guard negotiated with the prime contractor to provide, at no cost to the government, notification if any work over $10 million designated for a subcontractor was shifted to one of the two major contractors during the first five years of program execution. The Coast Guard reviewed the Federal Acquisition Regulations (FAR) and determined that, for a program comparable to the size and scope of the Deepwater prime contract, applicable sections of the FAR dealing with this type of review have a threshold of $10 million. Second, the Coast Guard realized that the prime contractor had already identified which organization would be accomplishing the work in its competitive proposal. Since the competitive proposal met the criteria for competition, the Coast Guard's focus centered on changes from a competition perspective relating to work that was going to be accomplished by a firm other than one of the major contractors. If the major contractors were now going to perform the work in-house, this would be a competitive concern. A preliminary review indicates that no work meeting these criteria had been shifted from subcontracting to being accomplished by one of the major contractors. Equally important is that no work shift of this type was planned.

In addition, the current award term evaluation criteria will consider the contractor's performance in controlling costs. This evaluation may include assessments of system integrator-fostered competition at the major subcontractor level.

Finally, the Coast Guard also recently contracted with Acquisition Solutions, Inc. (ASI) to assess the amount of second-tier competition conducted by ICGS and the tier-one subcontractors over the period January 1, 2004, through December 31, 2004. This assessment, which included a review of the competitive procedures the purchasing and/or contracting departments of both contractors had in place, determined that competitive procedures were being followed. The ASI review is attached as an enclosure to this report. The Coast Guard plans to accomplish reviews of this type on a recurring basis. This review is in addition to regularly scheduled Defense Contract Audit Agency monitoring of both major contractors purchasing and/or contracting departments. The status of each of the recommendations listed in the ASI report follow:

- **Status of Recommendation 1: Implemented** – Coast Guard personnel have been invited to participate as observers for any competitive awards involving technical evaluations of multiple proposals at both Lockheed Martin Maritime Systems and Sensors (LM MS2) and Northrop Grumman Ship Systems (NGSS) to ensure their insight into decision making is maintained.

- **Recommendation 2: Implemented** – Documentation requirements for contract files at LM MS2 have been strengthened to ensure market research efforts under the open-business model are properly recorded.

- **Recommendation 3: Pending** – NGSS has developed plans to incorporate the open-business model with assistance from ICGS. However, hurricanes Katrina and Rita have interrupted this process and implementation may be delayed into calendar year 2006.

- **Recommendation 4: Pending** – NGSS has developed plans to implement the necessary mechanisms to monitor the amount of competition employed by Halter-Bollinger and United Defense, Limited Partnership. However, hurricanes Katrina and Rita have interrupted this process and implementation may be delayed into calendar year 2006.

- **Recommendation 5: Pending** – NGSS has developed plans to identify all ICGS procurement policies that have been flowed to NGSS and to incorporate them into NGSS procurement manuals and corporate guidance. However, hurricanes Katrina and Rita have interrupted this process and implementation may be delayed until late calendar year 2006.

- **Recommendation 6: Pending** – ICGS has plans to develop the required system that would notify them of any potential issues regarding competition at the first-tier subcontractor level. System is currently planned for implementation in early calendar year 2006.

- **Recommendation 7: Implemented** – ICGS has established a formal corporate policy regarding the adoption and use of the OBM by both first-tier subcontractors.

- **Recommendation 8: Pending** – The Coast Guard Deepwater Program, in conjunction with ICGS, is formulating a comprehensive plan for monitoring ICGS activities and performance related to competition on the Deepwater program. Publication of the plan is currently planned for early calendar year 2006.

- **Status of Recommendation 9: Implemented** – A responsible party has been designated to develop objective criteria related to the use of competition in support of the Deepwater program for incorporation into the evaluation criteria for future award term and award fee plans. Such criteria will be based on data obtained as a result of the establishment of the recommended comprehensive monitoring plan.

Given this background and Coast Guard actions to date, adequate competition was obtained for the first five years and will be obtained in the future for any Deepwater subcontracts.

U.S. Coast Guard
Program Executive Office
Integrated Deepwater System Program
Order HSCG23-05-F-2DWO96

Competition Assessment

May 27, 2005

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1. Executive Overview

In June 2002, the U.S. Coast Guard competitively awarded a performance-based contract to Integrated Coast Guard Systems, Limited Liability Company (ICGS), a joint venture between Northrop Grumman and Lockheed Martin, for Phase 2 of the Deepwater program. ICGS, in turn, contracted with Lockheed Martin Maritime Systems and Sensors (LM MS2) and Northrop Grumman Ship Systems (NGSS), its first-tier subcontractors. The Government Accountability Office (GAO) has criticized the Coast Guard for not placing sufficient emphasis on competition as a way to control costs at the second- and lower-tier subcontract levels. Given the performance-based nature of the Deepwater program, as well as the inevitable privity of contract issues, the Coast Guard faces significant challenges in fostering greater competition.

For assistance with addressing this concern, the Coast Guard engaged Acquisition Solutions, Inc. (Acquisition Solutions), to assess the extent of competition sought by ICGS for its second- and lower-tier subcontracts.

Acquisition Solutions found competition to be adequate at the second-tier subcontractor level of the program. While both subcontractors are using competition to control costs, each could take better advantage of competition opportunities and implement better means of documenting their results. Acquisition Solutions also found that while both ICGS and the Coast Guard have taken progressive action to encourage competition, both could do more to foster competition and to measure its effectiveness.

2. Tasking

On February 16, 2005, the Coast Guard issued Order HSCG23-05-F-2DWO96 against Contract GS-10-F-0308N, directing Acquisition Solutions, Inc., to "assess the amount of second-tier competition conducted by ICGS and the tier one subcontractors over the period Jan. 1, 2004, through Dec. 31, 2004," and report (Deliverable #2) significant findings. This report constitutes compliance with that task order.

3. Methodology

Acquisition Solutions used a combination of public and privately held document research, site visits, file reviews, and interviews in the conduct of this study.

First, Acquisition Solutions obtained and reviewed background studies related to the U.S. Coast Guard and, more specifically, to the Deepwater program. These included but were not limited to government and contractor policies and procedures, as well as studies and assessments of similar (work and scope) programs. The analysis team then visited both first-tier subcontractors and conducted file reviews and interviews to validate the data from the background studies. Acquisition Solutions then conducted further research and investigated issues that had arisen during the site visits but remain unresolved.

Finally, the team conducted internal quality checks to verify its findings and methodology and to ensure it had covered all appropriate research areas and best practices currently being used in both industry and government.

In the interest of ensuring the most accurate evaluation possible (see details below), the team elected to review all files of awards accounting for at least 90 percent of the subcontracted dollars at each first-tier subcontractor site, rather than the more standard random-sample approach.

4. BACKGROUND

As noted in the Acquisition Directions *Advisory* of March 2003, the Coast Guard's innovative Integrated Deepwater System is "one of the most comprehensive acquisition programs in the federal government . . . and . . . is at the core of the Coast Guard's future ability to meet its mission." In June 2002, the Coast Guard awarded a contract for Phase 2 of its Integrated Deepwater System program to ICGS, LLC. ICGS, in turn, awarded subcontracts to each of the two firms that make up the prime team (see attachment 1).

The Coast Guard's current assets—cutters, patrol boats, helicopters, aircraft, and systems—rapidly are approaching the ends of their service lives, at a time when the service's mission is both expanding and intensifying. The Deepwater program is the Coast Guard's effort to refurbish and replace virtually all assets required to operate 50 nautical miles and farther from U.S. coastal shores. Since this is a massive undertaking, the Coast Guard has adopted a performance-based acquisition approach, providing its prime contractor a comprehensive statement of the full extent of the service's needed capability and then requiring that contractor to devise a mix of assets that will enable the Coast Guard to accomplish the mission in the most efficient and cost-effective manner. That approach still is comparatively rare in government acquisition and exceedingly rare among programs on the scale of Deepwater.

In performance-based acquisition, the contracting parties must establish a close working relationship if the strategy is to work. The contractor must understand completely the functional needs of its customer, and the government must be prepared to trust its contractor team to satisfy those needs. Although nothing in this kind of relationship requires the government to adopt a "hands off" approach to managing its own program, it does mean the government must rely on its contractor partners to devise cost-effective solutions and must adopt a policy of monitoring the program's progress rather than seeking to impose oversight and day-to-day control of contractor activities.

This approach is relatively new, particularly for systems acquisition, and many within both the executive and legislative branches, while willing to try it, remain uncomfortable with the government's new role. That discomfort is evident in the March 2004 Government Accountability Office (GAO) report on the Deepwater program.[1] The scope of that report is much broader than that of this assessment, and no attempt is made here to address the full range of concerns raised by GAO. With regard to competition, however, GAO found that three years after an initial GAO study of the Deepwater program, "the Coast Guard has neither measured the extent of competition among suppliers of Deepwater assets nor held the system integrator accountable for taking steps to achieve competition. Deepwater's acquisition structure is such that the two first-tier subcontractors have responsibility for determining whether to hold competitions for assets or to provide these assets themselves based on 'best value.' The Coast Guard has taken a hands-off approach to 'make or buy' decisions made at the subcontractor level." While its concern is understandable, GAO probably overstates the problem. In fact, ICGS provides the Coast Guard quarterly reviews on the status of major subcontract awards,

[1] *Contract Management: Coast Guard's Deepwater Program Needs Increased Attention to Management and Contractor Oversight*, GAO-04-380, March 2004.

including whether they were competed, not competed, or not competed because the Coast Guard directed the source. The focus of Acquisition Solutions' assessment is whether GAO's conclusion is valid one year later.

5. COMPETITION OVERVIEW

To understand the role of competition in government contracting, one must understand how competition is measured and reported. In light of GAO's concerns and the contractual structure of the Deepwater program, this review focuses on competition at the subcontractor level. This approach is different from most competition studies, which focus on either the government's or the prime contractor's use of competition, and means that we are necessarily concerned with two sets of reporting rules for competition—one set for the government and one set for the contractors. The differences between those rules in large part drive how competition is reported.

Deepwater Phase 2 is a competitive program, with three other consortiums along with the eventual winner having competed for the award. The competition was conducted as a performance-based acquisition to obtain a best-value solution for the government. Three primary considerations, in order of importance to the Coast Guard, structured the competition: (1) maximize operational effectiveness; (2) minimize total ownership cost; and (3) satisfy the needs of the customer.

Since the basic contract award was made competitively, all awards of delivery/task orders (DTOs) to ICGS also are properly coded as competitive in the Federal Procurement Data System (FPDS), in keeping with federal guidelines.[2]

As a prime contractor with only two major first-tier subcontractors responsible for nearly all the work on the program, ICGS awards virtually all the work for which it is responsible to either Northrop Grumman Ship Systems or Lockheed Martin Maritime Systems and Sensors. Therefore, no competition statistics exist for the ICGS level of the program. ICGS does maintain competition statistics for both Lockheed Martin Maritime Systems and Sensors and Northrop Grumman Ship Systems, however, and they are reported on a semiannual basis.

The analysis team found that both the Coast Guard and ICGS are following their established rules regarding the conduct of competition and how they decide what is and what is not competitive for reporting purposes. Similarly, when delivery/task orders are awarded by the Coast Guard to ICGS under a competitively coded document, on receipt of the orders from ICGS, both Northrop Grumman Ship Systems and Lockheed Martin Maritime Systems and Sensors must apply their own rules and procedures. As a result, the same dollars the government codes as competitive might be awarded by LM MS2 and NGSS on a sole source basis to lower-tier subcontractors.

When the Coast Guard evaluated the ICGS proposal for the Deepwater system during source selection, not all the subcontracts were in place to support the proposal. Following the award to ICGS, and in accordance with their separate corporate guidelines, both Northrop Grumman Ship Systems and Lockheed Martin Maritime Systems and Sensors had to make several second-tier subcontract awards under their own respective contracts. The decision to compete

[2] *Department of Homeland Security Acquisition Manual*, Part 3004.602, Federal Procurement Data System, provides guidance for coding of procurement actions by DHS agencies, including U.S. Coast Guard.

or not to compete in each instance was based on market conditions, levels of existing technology, and other factors. While the Coast Guard might have coded DTOs awarded to ICGS "competitive," the first-tier subcontractors were not necessarily facing competitive environments. At that point, Lockheed Martin Maritime Systems and Sensors' and Northrop Grumman Ship Systems' rules determined whether the item or service would be coded competitive. If a teaming arrangement was in place (i.e., Halter-Bollinger's teaming agreement with NGSS for length extension of the 110-foot cutters), that became the foundation document for the sole source justification.

Lockheed Martin Maritime Systems and Sensors and Northrop Grumman Ship Systems both have rules that require competition whenever possible, and both have followed these rules in the case of Deepwater. Comparing the government's reported level of competition with the contractors' is problematic, however, since they are not following the same rules for identifying what is "competitive." In most respects, LM MS2 and NGSS benefit more from their "competitions" than does the government from its "competitions." In each case of a competitively coded competition by the two subcontractors, an actual competition was held. The government, on the other hand, correctly codes virtually all the money it currently provides to ICGS as "competitive" on the basis of its initial competitive award to that company at the end of the Phase 2 competition nearly three years ago.

A key concept and practice for ensuring ongoing competition at the subcontractor level on the Deepwater program is the use of the open business model (OBM) introduced by Lockheed Martin and adopted by ICGS. The basic tenets of the OBM are:

- Use and embrace the Federal Acquisition Regulation (FAR)-compliant and government-audited sourcing procedures of the tier one subcontractors, including make/buy and competitive sourcing requirements.
- Avoid the use of teaming agreements in general, and prohibit teaming agreements based on a guaranteed percentage work share. Teaming agreements must be based on sound best-value decisions and demonstrated business necessity and must convey specific work scope.
- Defer down-select decisions on specific components and subsystems as long as practicable, consistent with sound program management practices as determined by the respective program managers. ICGS tier one subcontractors must be cognizant of the state of the market, using market analysis, trade studies, and/or competitive procedures, prior to component and subsystem selection.
- Actively solicit market information and new component and subsystem suppliers through various media, including, but not limited to, providing a means for electronic registration by potential suppliers and holding regular industry days at which selected suppliers can make ICGS aware of their products and services.
- Take measures to encourage second- and third-tier suppliers to promote competition.
- Provide semiannual reports identifying OBM activities and results.

One practice the analysis team identified was the use of trade studies as a market research tool. Several of these studies included pricing information from potential vendors. In each case, the contractor chosen for the original award still was considered to offer the best value, and no formal competition was held. We believe, however, that trade studies offer many of the benefits of formal competition, including reapplying competitive pressure on existing suppliers.

5.1 Lockheed Martin Maritime Systems and Sensors, Moorestown

5.1.1 Lockheed Martin Maritime Systems and Sensors Competition Performance

In May 2004, the purchasing system of the Lockheed Martin Material Acquisition Center – Mid-Atlantic Region (MACMAR), of which the ICGS purchasing organization is a part, was evaluated and approved by the Defense Contract Management Agency. From January 1 to December 31, 2004, Lockheed Martin's Deepwater procurement organization placed subcontracts and purchase orders with 179 firms in support of the Deepwater program. The files for the 30 largest of those orders, constituting approximately 97 percent of the dollars awarded, were reviewed by the Acquisition Solutions team with the assistance of Lockheed Martin procurement personnel.

A total of $109,429,208 was awarded during calendar year 2004. Of this amount, $18,772,078, or approximately 17 percent, was awarded on the basis of formal competition. On the surface, the percentage of subcontract dollars awarded through competition does not appear to be substantial. We should note, however, that the 17 percent is the amount formally competed through source selection procedures at the subcontract level, but it does not reflect the full extent of competition. A large portion of the nearly $91 million not competed at the subcontract level in 2004 was competitively evaluated by the Coast Guard as part of Lockheed Martin's proposal to ICGS, which was then selected by the Coast Guard in the Phase 2 competition in June 2002. The GAO report acknowledges this consideration: "The benefits of competition may be viewed as sufficient in the contract's early years because, for the initial 5-year contract period, prices proposed by ICGS for equipment and software were based on competitions held among various subcontractors." Combining this with the additional competitions/recompetitions for the nearly $19 million noted above suggests the benefits of competition on the Deepwater program might have been quite substantial to date.

These two considerations do not, however, reflect the full extent of competition during the period assessed. As GAO acknowledges on page 24 of its report, competition employed by a prime contractor or a subcontractor need not meet the requirement for "full and open competition" generally demanded of the government by the FAR. Instead, contractors may engage in a variety of practices that, while not satisfying the FAR definition of "full and open" competition, are sufficient to ensure the government receives the benefits and protections provided by competition in the open marketplace.

Lockheed Martin Maritime Systems and Sensors showed the assessment team substantial file documentation related to trade studies performed by its procurement and technical personnel. Although these trade studies do not meet the criteria of "full and open," and are not considered by LM MS2 as constituting competitive source selections, they use many of the tools and evaluation methods employed in formal competitive source selections. For example, in two of the documentation presentations provided, offerors were evaluated on the basis of their abilities to satisfy critical technical requirements and then were evaluated on the basis of their proposed costs to LM MS2. When the dollars awarded in 2004 on the basis of these competitive trade studies are added to those awarded on the basis of formal source selection competition, the total comes to $63,793,758, or 58 percent of the $109.4 million awarded, leaving $45,635,450 as noncompetitively awarded subcontract dollars. Thus, the dollars awarded through application of some form of competition are significantly greater than the 17 percent of all 2004 subcontract dollars awarded through formal competitive procedures alone.

Even this figure leaves room for improvement; but how much room is left for additional subcontracting competition is not clear. This is because the possibilities for competition on the Integrated Deepwater System program are constrained by the same dynamics found in every

acquisition, public or private—that is, as decisions are made over the course of the program, the range of possible future decisions becomes more limited. Design decisions are the most obvious examples of this. As a design develops, form, fit, and function become increasingly "locked in," and the possibilities for competition become increasingly restricted. That is not to say aspects cannot be redesigned to permit competition, but programs cannot be managed cost-effectively if that is the routine approach. To ease the impact of this consideration, the ICGS OBM defers down-select decisions as long as possible; eventually, however, such decisions must be made, and their consequences for competition must be acknowledged.

To illustrate the constraints on subcontracting competition, in the case of Deepwater, $21,682,857 of the total 2004 subcontracted amount was awarded to the original helicopter engine manufacturer for parts kits to refurbish aged engines. Because the kits were procured for reasons of flight safety, the possibility of competition was virtually nonexistent, and the award was made on a sole source basis. This means the amount of subcontract dollars open to competition in 2004 actually was much lower than the difference between $109.4 million and $63.8 million. Indeed, when the $21,682,857 for engine parts kits is deducted from the $45,635,450 not subjected to competition in any form, the total is $23,952,593, or 22 percent of the subcontract dollars awarded during 2004. That 22 percent represents all the calendar 2004 dollars awarded that were, in fact, potentially available for additional competition opportunities. It probably should be assumed that an award of such magnitude to the original equipment manufacturer under urgent circumstances is an exceptional event. Therefore, a larger percentage of subcontracting dollars normally will be available for competitive award by Lockheed Martin Maritime Systems and Sensors.

Table 1 shows the buildup of all competitively awarded subcontracting dollars plus the noncompetitively awarded subcontract dollars for 2004, based on our report to this point. Table 2 summarizes the impact of the most likely one-time award to American Eurocopter for the engine rework parts kits.

Table 1 – Subcontract Awards (January 2004 – December 2004)

Dollars & Percentage of Total Subcontract Awards Using Formal Competition	Dollars & Percentage of Total Subcontract Awards Using Trade Studies	Dollars & Percentage of Total Subcontract Awards Using Noncompetitive Procedures	Total Subcontract Awards
$18,772,078	$45,021,680	$45,635,450	$109,429,208
17%	41%	42%	100%

Table 2 – Impact of Award to OEM For Flight Safety Parts on the Basis of Urgency

Dollars & Percentage of Total Subcontract Awards Using Noncompetitive Procedures	Dollars & Percentage of Total Subcontract Awards for Award to OEM on "Urgent" Basis	Dollars & Percentage of Total Subcontract Awards Potentially Available for Additional Competition
$45,635,450	$21,682,857	23,952,593
42%	20%	22%

As these figures show, Lockheed Martin Maritime Systems and Sensors subcontracted $109,429,208 in 2004. Of that amount, all but $45,635,450 was either formally competed or subjected to a qualified competition in the form of a trade study. While $45,635,450 is a significant sum, as a percentage of the total subcontract dollars awarded (42 percent) on a complex systems program such as Deepwater, it is not atypical and does not suggest a problem, to date, in competition at LM MS2 on the Integrated Deepwater System program. It also should be noted that, of the 30 largest purchases made during 2004, only 2 were placed with Lockheed Martin affiliates, for a total cost of $6,047,483. GAO's principal concern with regard to competition on the Deepwater program, however, was focused on the future.

5.1.2 Lockheed Martin Maritime Systems and Sensors Competition Planning

In its March 2004 report, GAO stated three times that the ICGS OBM was not so much a policy as a "philosophy."[3] As a result, the GAO report suggests, the OBM "encourages competition but does not require it" and "a formal process involving specific actions" needs to be put in place. The assessment team was informed that the ICGS board of directors had formally adopted the OBM as corporate policy (ICGS Procedure No. ICGS-402) in October 2003. Although this predates the GAO report by approximately five months, the report makes no reference to this action or its potential implications. This is particularly interesting because the corporate decision also requires establishment of reporting requirements by the first-tier subcontractors to ICGS, as well as establishment of an ICGS competition advocate/ombudsman.[4]

During the assessment of competition at Lockheed Martin Maritime Systems and Sensors it became clear to the assessment team that the Lockheed Martin procurement organization has taken to heart the corporate policy regarding the OBM and is using it on a recurring, if not continuous, basis. For example, LM MS2 had put forward as part of its Phase 2 proposal to ICGS the purchase of electro-optical/infrared cameras from a West Coast manufacturer. That proposal was evaluated by ICGS and subsequently by the Coast Guard and found to be acceptable. As a result of inquiries through the OBM website, however, LM MS2 sent invitations to a planned industry day to a second and third camera manufacturer. Following several discussions with the prospective offerors, LM MS2 requested formal presentations and demonstrations from both the original offeror and one of the more recent potential offerors. Then, based on the information gathered, the company made a side-by-side trade study

[3] This assertion is made on pages 5, 21, and 24 of the March report.
[4] This shift from "philosophy" to "policy" by ICGS is documented in a Coast Guard document entitled "Oversight & Management of the U.S. Coast Guard's Integrated Deepwater System," 16 March 2004.

comparison. As part of its revised quote, the original West Coast offeror indicated a willingness to provide two newer and enhanced versions of the required cameras at no increase in cost. LM MS2 accepted that offer and placed orders of more than $3 million. At the time of the assessment, however, still another trade study was ongoing for the same camera requirement, in light of technical developments in the field.

Another instance of the OBM in action involved the elimination of a Northrop Grumman subcontract proposal that was part of the original Lockheed Martin Maritime Systems and Sensors proposal in the Phase 2 competition. In light of developments in the radar field, the subcontracts manager responsible for supporting the vertical unmanned aerial vehicle (VUAV) decided the Northrop Grumman proposal was technically weaker than potential alternatives, some of which had been identified through the OBM website, and very likely higher priced than its competition. A request for information (RFI) was released in early 2003, and nine suppliers responded; Northrop Grumman, however, was not among them. Based on a preliminary review of the responses, the subcontracts manager sent out eight solicitations, and proposals were received from two teams, each comprised of two of the original nine respondents. A side-by-side evaluation was done in accordance with the criteria—technical, management, and cost—contained in the solicitation. Although they were not permitted to "vote" in connection with selection of the proposal and had no access to cost data, two Coast Guard personnel did participate in this evaluation (and others). As a result, an award was made for $10,854,713, the third-largest award of the year.

Obviously, one or two successes do not mean a policy is in place and being followed. Since June 2002, however, when the Phase 2 contract was awarded, nearly 500 interviews with potential suppliers have been conducted as a result of contacts stemming from the OBM website, and more than 100 follow-up actions have been taken. In addition, the Lockheed Martin Deepwater procurement organization advises all potential offerors from whom it receives calls or other contacts regarding possible business opportunities—including contacts by other Lockheed Martin divisions—to register on the OBM website as the only route to further possible discussions. Another indication of its reliance on the OBM policy is the fact that, since the Phase 2 contract award, Lockheed Martin Maritime Systems and Sensors has signed no teaming agreements with any other corporation in support of the Integrated Deepwater System program.

The assessment team finds the open business model has become, at least at the Moorestown facility of Lockheed Martin, considerably more than a philosophy. There, the ICGS policy regarding OBM appears to have taken hold as an operating model and is guiding many, though not all, of the subcontract actions on behalf of the Deepwater program.

What is not happening is the formal documentation of all applications of OBM. Many of the files for the subcontract efforts that constituted the $45,635,450 of 2004 purchases that seemingly were eligible for competition but not competed contained no documentation that the OBM was employed as part of the acquisition. This was in spite of the fact that several subcontracts managers stated they had, in fact, consulted the website and/or made other efforts to identify potential competition sources prior to placing the sole source buy.

The assessment team sees the OBM as a prime example of sustained market research aimed at maximizing opportunities for competition in support of the Deepwater program. But until its use and documentation are fully institutionalized, the Deepwater program and the Coast Guard likely will continue to be criticized in connection with competition at the subcontract level. It is clear ICGS has given serious thought to this question and to establishing a formal corporate policy regarding adoption of the OBM by its two subcontractors. It even has gone so far as to

draft a white paper on the subject,[5] calling for the reporting of "statistics such as: total dollars spent on procurements, percentage competed vs. sole sourced, Make vs. Buy decisions, planned procurements for the next period, assessment of competition opportunities, and planned competitions in future periods." Given the significance of subcontracting to the Deepwater Program, that kind of information would be extremely useful to both ICGS and the Coast Guard in the management of the program, and it is unfortunate that ICGS policy action has not occurred to date. If not corrected, the lack of such information leaves the Coast Guard vulnerable to criticism with regard to both the use of competition on Deepwater and its overall management of the program. Such criticism is all the more unfortunate in the case of Lockheed Martin Maritime Systems and Sensors, since MACMAR clearly has emphasized competition and has achieved a reasonable degree of success in its pursuit.

5.2 Northrop Grumman Ship Systems, Pascagoula

5.2.1 Northrop Grumman Ship Systems Competition Performance

In April 2004, the Gulf Coast Office of the U.S. Navy's Supervisor of Shipbuilding, Conversion, and Repair (SupShip), located in Pascagoula, MS, reviewed the Northrop Grumman Ship Systems purchasing system. The findings of that review conveyed to Northrop Grumman Ship Systems stated, in part, that NGSS was satisfactory in all areas of the audit that covered polices and procedures, organization, finance, and inventory control. The contractor purchasing system review (CPSR) audit did point out, however, deficiencies in the areas of "a. Competition and Sole/Single and Directed source justification; b. Case File Documentation; c. Late Bids; and d. Awarding purchase orders prior to approvals." It is important to note, however, that the NGSS purchasing system has been approved by SupShip since 1974 and continues to be an approved system.

NGSS, under the direction of SupShip, did not provide a copy of the SupShip review and its accompanying Defense Contract Audit Agency (DCAA) audit to the Acquisition Solutions review team, since the audit was not closed. NGSS did provide a copy of the SupShip cover letter that summarized the results of the CPSR audit and a copy of the company training briefing intended to address the deficiencies reported. A final determination of the contractor's purchasing system status by SupShip was set for 90 days after December 2, 2004, per its letter conveying the initial findings. NGSS completed the training on February 22, 2005, and SupShip agreed to defer the follow-up audit until the last week of April 2005 to allow for the accrual of approximately 45 days of purchase order history from the date of training. The final report is due in late June.

From January 1 to December 31, 2004, Northrop Grumman Ship Systems made 201 subcontract awards for a total of $100,781,677.[6] The Acquisition Solutions review team examined 43 award files representing $90,570,645, or approximately 90 percent of the total 2004 subcontracted dollars.

Of the $101 million in subcontract awards during the period under study, approximately 44 percent, or $44 million, was awarded competitively. We should note, however, that $41,467,015, or 41 percent of the subcontract dollars awarded by NGSS is tied to awards to two firms: Halter-Bollinger, Joint Venture, and United Defense, Limited Partnership (UDLP). These

[5] ICGS Policy Statement (undated) on "Integrated Deepwater System Program: The Open Business Model."
[6] Subsequent to the team visit to NGSS, requests were made by the evaluation team for information regarding the extent of competition in connection with commodity purchases at NGSS and the extent of competition employed by the two teaming arrangement partners, Halter-Bollinger and United Defense, Limited Partnership. Halter-Bollinger information was not available in time to be included in this report. However, the Halter-Bollinger information should be available by late June 2005.

awards are the direct result of two teaming agreements entered into by NGSS in 1998 (with Halter-Bollinger) and 2001 (with UDLP). It is therefore important to understand why NGSS chose to establish the two teaming agreements in question.

Halter-Bollinger is the original shipbuilder of the 110-foot Coast Guard cutter. One of the principal undertakings of the Integrated Deepwater System program is the upgrade and extension of 49 such cutters from 110 to 123 feet. As a part of its original competitive proposal to the Coast Guard, ICGS included a teaming arrangement between NGSS and Halter-Bollinger. In the case of UDLP, the teaming agreement requires that UDLP perform a "weapons alternatives analysis for three classes of cutters." In conversations with NGSS program management personnel, the Acquisition Solutions team was advised that the 57-mm naval gun to be provided by Bofors (a Swedish subsidiary of UDLP) was selected as a result of a UDLP trade study of both technical and cost data from a number of contractors. Because the trade study was conducted by the third-tier subcontractor, the Acquisition Solutions team was unable to review the study itself and therefore cannot comment on its quality.

Table 3 shows the buildup of all subcontracting dollars awarded during 2004, based on the discussion to this point. Table 4 shows the impact of the teaming agreements at NGSS and the availability of subcontract dollars for potential competitive subcontract awards.

Table 3 – Subcontract Awards (January 2004 – December 2004)

Dollars & Percentage of Total Subcontract Awards Using Formal Competition	Dollars & Percentage of Total Subcontract Awards Using Noncompetitive Procedures	Total Subcontract Awards
$43,924,038	$56,857,639	$100,781,677
43.6%	56.4%	100%

Table 4 – Impact of Teaming Agreements on Competition Availability

Dollars & Percentage of Total Subcontract Awards Using Noncompetitive Procedures	Dollars & Percentage of Noncompetitive Subcontract Awards Going to Halter-Bollinger and UDLP	Dollars & Percentage of Total Subcontract Awards Potentially Available for Additional Competition
$56,857,639	$41,467,015	$15,390,624
56.4%	41.1%	15.3%

In summary, although neither teaming arrangement was technically unavoidable, both made good sense from an NGSS strategic business perspective. Both agreements were in place at

the time of the Phase 2 contract award, and both were therefore subject to the competitive circumstances of that award. Because Halter-Bollinger was the original equipment manufacturer of the 110-foot cutter, NGSS could easily conclude that the teaming agreement provided a reduction in the technical risks involved in the 13-foot extension. Moreover, nearly three-quarters of the noncompetitively awarded subcontract dollars at NGSS are tied up in the two teaming arrangements. This means that, if all the noncompetitive dollars not awarded to Halter-Bollinger or UDLP had been competitively awarded, the total dollar figure in the first column of Table 3 would be $59,314,662. In that case, the percentage of competitively awarded subcontract dollars would have been 58.9 percent, just 15.3 percent greater than the actual figure. Although, as noted earlier, no evidence was available for review by the Acquisition Solutions team, NGSS program personnel are convinced the program did realize, by way of the UDLP trade study and selection of Bofors, many of the benefits of a formal competition. Thus, several factors suggest the full picture of competition to date at NGSS may not be adequately presented by the current competitive and noncompetitive figures. Again, however, GAO's principal concern with regard to competition on the Deepwater program had to do with the future.

5.2.2 Northrop Grumman Ship Systems Competition Planning

The prospects for future subcontracting competition at Northrop Grumman Ship Systems are somewhat mixed. Given the existence of the teaming arrangements with Halter-Bollinger and UDLP, NGSS cannot be expected to achieve a substantially greater percentage of competitively awarded subcontract dollars during most fiscal years. It is possible, of course, that in any one fiscal year the percentage of awards on a competitive basis could go up, if, during that fiscal year, there were no additional awards to the two teaming partners. However, that circumstance is unlikely and, in any case, would not reflect a genuine change in the competitive picture. The teaming agreements with Halter-Bollinger and UDLP are established at this point, and little is to be gained from further consideration of them.[7]

The figure that should be the focus of future attention is the $59,314,662 in 2004 subcontracting dollars awarded independently of the two teaming agreements. In discussions with various members of the NGSS procurement organization, it was clear to the members of the evaluation team that a genuine commitment to competition exists. Concern on the part of the evaluation team members stems from the apparent lack of appreciation of the open business model at NGSS. Many of the procurement professionals the evaluation team questioned were unaware the OBM is an ICGS policy for the Deepwater program.

The OBM originated at Lockheed Martin, and that may account, in large part, for its obvious acceptance at the Moorestown facility. In addition, the Integrated Deepwater System purchasing organization is a separate team dedicated to the Integrated Deepwater System program. The NGSS procurement organization, on the other hand, is supporting not only Deepwater but also all U.S. Navy shipbuilding programs at Pascagoula. . While nothing is inherently wrong with this organizational arrangement—and, in fact, ICGS and the Coast Guard may benefit from NGSS combining the Navy and Coast Guard purchase volume to achieve lower costs and possibly lower overhead—it does mean the implementation of ICGS policies and procedures, particularly when those are in some way at odds with parent NGSS policies and procedures, is likely to pose a greater challenge at Pascagoula than at Moorestown. It is possible, therefore, that an additional reason for the lack of embrace by NGSS of the open business model is this organizational difference. Combined with Lockheed Martin being the

[7] It should be noted that NGSS has not entered into any additional teaming agreements subsequent to the award of the Phase 2 contract to ICGS.

origin of OBM, this difference makes the absence of understanding of OBM at NGSS understandable, even if not acceptable.

Notwithstanding the different degrees of acceptance of OBM at the two first-tier subcontractor facilities, NGSS frequently manifests the principles of OBM as a result of its long-standing involvement in defense acquisition. For example:

- NGSS policies and procedures, codified in its on-line document retrieval tools and corporate purchasing guidelines, appear to be fully FAR compliant. As noted earlier, NGSS has just undergone a contractor purchasing system review, is actively responding to deficiencies arising from that, and is routinely subject to reviews by DCAA and the Supervisor of Shipbuilding, Gulf Coast. All this strongly suggests that NGSS is, in practice, conducting its procurement activities fully in accord with the first principle of OBM.
- NGSS firmly believes the two teaming agreements it put in place as part of its competitive proposal prior to receiving the award in connection with Phase 2 of the Deepwater program are, in fact, in the government's best interest and represent a genuine "best-value" arrangement for accomplishing the efforts to which they are applicable. Moreover, these teaming arrangements are in accord with long-standing NGSS corporate policy. As such, NGSS believes these particular teaming agreements satisfy the requirement of the second OBM principle.
- NGSS regularly sponsors small business seminars and supplier open houses and has established a supplier base Internet site through which NGSS's buyers can be contacted directly for information regarding planned component and commodity purchases. It also has established an automated supplier database for use by its buyers during the solicitation process. NGSS contends that such activities constitute a recognition and acknowledgment of the fourth OBM principle.

Thus, while NGSS has not made a conscious move to embrace OBM, it argues that, as a result of its extended participation in defense acquisition, it has policies and practices in place that apply the concepts of the OBM.

Nonetheless, during the file reviews by the evaluation team, it became apparent that Northrop Grumman Ship Systems was consistently missing opportunities to employ best-value competition. It has become fairly standard practice at NGSS to conduct low-cost technically acceptable competitions. Nothing is wrong with this approach in principle, and it complies with established corporate policies, but NGSS has come to limit itself to that method or, when price is not the most important consideration, to a noncompetitive procedure to facilitate reaching the technically most qualified provider. While much of what NGSS acquires lends itself to low-cost technically acceptable procedures, failure to employ the more challenging, but at times more appropriate, best-value approach helps drive NGSS away from competition and deprives its clients of the cost and performance benefits a best-value competition would provide.

5.3 Integrated Coast Guard Systems

When ICGS receives delivery/task orders and DTO modifications from the Coast Guard, ICGS, in turn, awards DTOs and DTO modifications to Lockheed Martin Maritime Systems and Sensors and Northrop Grumman Ship Systems. ICGS considers the contractual relationship between itself and its two subcontractors to be at "arm's length." ICGS sends separate requests for proposals (RFPs) to each of the tier one subcontractors, and they send ICGS their proposals for evaluation and submission to the Coast Guard. ICGS has business operations policies and procedures (BOPP) that provide the necessary business framework to govern daily

activities. It also has a board of directors to oversee operations. The ICGS board meets approximately every six weeks.

ICGS's role in competition as the Deepwater prime contractor includes:

- Implementing the ICGS OBM business approach
- Ensuring the OBM business approach is conveyed to the ICGS first-tier subcontractors
- Monitoring implementation of the OBM business approach
- Designating the ICGS competition advocate and ombudsman, who ensure that any questions or concerns from the Coast Guard or private industry related to the OBM business approach are answered/handled in a timely, responsive manner
- Sponsoring the OBM website and making sure that information concerning the companies that register is provided to LM MS2 and NGSS, who alternately sponsor the annual Deepwater Program Industry Days
- Ensuring LM MS2 and NGSS:
  - Use and embrace FAR-compliant and government-audited sourcing procedures, including make/buy and competitive sourcing requirements
  - Avoid the use of teaming agreements whenever possible
  - Defer down-select decisions on specific components and subsystems as long as practicable
  - Actively solicit market information and new component and subsystem suppliers through various media, including an electronic registration by potential suppliers and regular industry days at which selected suppliers can make ICGS aware of their products and services
  - Encourage second- and third-tier suppliers to promote competition
  - Provide semiannual reports identifying OBM activities and results

In accordance with ICGS policy, both Northrop Grumman Ship Systems and Lockheed Martin Maritime Systems and Sensors have provided semiannual reports of competition. There remains room for improvement for both contractors in implementation of the OBM policy. Over the course of this study, the ICGS competition advocate provided additional policy guidance reinforcing the open business model to both contractors.

During our visit to and review of NGSS, we uncovered many of the issues identified by the cognizant contract administration office (SupShip, Gulf Coast) in its review of the NGSS purchasing system. In our follow-up with ICGS, we learned that both ICGS and the Coast Guard were unaware of the CPSR or its findings. We believe the performance-based nature of this program imposes on the prime contractor a greater responsibility for subcontractor oversight than does the more traditional contracting approach. ICGS should have been aware, at a minimum, that SupShip highlighted competition-related issues in its initial review. Ideally, those findings and any action planned by ICGS to either monitor or correct the situation would have been communicated to the Coast Guard to provide necessary insight into the program and its execution.

While the Coast Guard has responsibility for maintaining insight and some degree of oversight regarding the processes ICGS employs to ensure the continued application of competition by its subcontractors, we believe that ICGS, as the prime contractor and in the spirit of teaming, should take responsibility for ensuring the adequacy and effectiveness of competition by its

subcontractors. This means, in part, that ICGS should take the lead in efforts to both monitor and measure competition and its effects at the subcontractor level on the Deepwater program.

5.4 PEO Deepwater

The Deepwater Program Office is engaged in an enormous undertaking. A recent GAO report characterized the situation that prompted the initiation of Deepwater as follows:

> Available Coast Guard condition measures indicate that the Coast Guard's deepwater legacy aircraft and cutters are generally declining, but these measures are inadequate to capture the full extent of the decline in the condition of deepwater assets with any degree of precision. GAO's field visits and interviews with Coast Guard staff, as well as reviews of other evidence, showed significant problems in a variety of the assets' systems and equipment.[8]

Years of funding shortfalls meant the majority of its legacy assets rapidly were approaching the ends of their useful lives. The terrorist attacks of September 11, 2001, however, transformed a difficult situation into one of extreme urgency, as the Coast Guard became the principal player in maritime homeland security. That same sense of urgency quickly permeated its acquisition strategy.

As noted throughout this report, the performance-based strategy of the Deepwater program is a leading-edge effort in major systems acquisition. The Coast Guard is not part of the Department of Defense, but it shares many of the responsibilities and challenges of its "sister" services, and it confronted, even before September 11, a genuinely daunting task. Virtually all its deep-water assets required replacement over a relatively short period, and its in-house technical resources were both small and largely inexperienced in major systems acquisition. Given these limitations and the magnitude of the task before it, the Coast Guard concluded that an innovative, if relatively risky, acquisition approach was the only genuine possibility for success. It chose, therefore, to initiate the largest performance-based system acquisition yet attempted by any federal agency. That choice has produced both positive and negative consequences.

On the positive side, the Coast Guard has been extraordinarily open to the criticism and recommendations of numerous observers and overseers. GAO has issued dozens of reports and statements before various committees of Congress devoted, in whole or in part, to Deepwater. In many of these reports, it has noted the efforts of Deepwater program officials to implement, with varying degrees of success, the growing list of recommendations. For example, in the March 2004 report cited previously, GAO auditors wrote:

> The concerns we raised in 2001 about the Coast Guard's ability to control costs in future years remain valid today. Without a mechanism to hold the system integrator accountable for ensuring adequate competition, the Coast Guard cannot be sure that competition will be used to guard against cost increases that could jeopardize the program. This situation is especially risky given the acquisition structure of Deepwater, whereby the subcontractors, not the system integrator or the Coast Guard, are responsible for determining whether competition will occur for Deepwater assets.[9]

[8] "Coast Guard: Preliminary Observations on the Condition of Deepwater Legacy Assets and Acquisition Management Challenges," statement of Margaret Wrightson, Director, Homeland Security and Justice Issues, Government Accountability Office, 20 April 2005, GAO-05-307T.
[9] GAO-04-380, op.cit., p. 27.

But in her recent prepared statement before the House Committee on Transportation and Infrastructure, Coast Guard and Maritime Transportation Subcommittee, Margaret Wrightson, Director, Homeland Security and Justice Issues, at GAO, stated, "The Coast Guard reported taking steps to address our recommendations concerning cost control through competition."[10]

This same spirit is clear at the Lockheed Martin and Northrop Grumman facilities visited by the evaluation team and at the prime contractor facility as well. When it learned, for example, that the OBM was being viewed differently at its two first-tier subcontractors, ICGS immediately issued a formal policy statement, reiterating its commitment to OBM and reminding the subcontractors of their contractual responsibilities for reporting competition statistics. When the evaluation team expressed concerns regarding the lack of file documentation in connection with the use of OBM, procurement officials at Lockheed Martin Maritime Systems and Sensors recognized this oversight and took on the responsibility to capture the missing information. Finally, when coding problems related to distinguishing competitive from noncompetitive awards at NGSS were pointed out, procurement officials took immediate action to alter the automated coding software, ensuring future actions are properly identified. None of these actions was required by either the circumstances of the reviews or the roles of the Acquisition Solutions evaluators, but rather reflected a genuine commitment on the parts of the contractor and subcontractor personnel to improve their procurement processes.

At the same time, the Coast Guard has yet to implement a systematic plan or procedure for monitoring ICGS efforts to ensure the use of competition, whenever practicable, at the first-tier subcontractor level. Given the nature of the acquisition strategy and the level of resources available to the Coast Guard program management office, established and enforced monitoring mechanisms are essential if the Coast Guard is going to manage competition on the Deepwater program, in part through ICGS, rather than simply observe it, however it unfolds.

As noted earlier, no comprehensive plan has been developed for monitoring ICGS's efforts with regard to competition. Currently, the award term criteria the Coast Guard will use to determine whether to extend its contract with ICGS include only very limited coverage of competition at the ICGS, Lockheed Martin Maritime Systems and Sensors, and Northrop Grumman Ship Systems levels.[11] Inserting clear guidelines related to competition into those criteria would increase the focus on competition by the prime contractor and its first-tier subcontractors.

The first time the award term plan for this contract will be brought to bear on ICGS, however, is in June 2006, when the first extension option is to be determined. In support of the award term decision, ICGS must provide a self-assessment of its competition performance in March 2006.

We believe another opportunity presents itself to bring greater focus on competition now, using the award fee process for systems engineering and integration and program management. A new award fee period begins in several months, and this period could have new/different criteria, if the Coast Guard acts quickly to develop it and incorporate it into the award fee plan.

[10] GAO-05-307T, op.cit., p. 23.

[11] Paragraph 5.2(c), "Cost Control Measures" states, in part: "This evaluation may include assessments of Systems Integrator-fostered competition at the major subcontractor level." The use of the word "may" is more likely to create ambiguity than motivation for ICGS, and provides no clear guidance or expectations. Recent GAO testimony (GAO-05-307T, p.23) includes the following: "Coast Guard officials told us that in making the decision about whether to award the first contract option, the government will specifically examine the system integrator's ability to control costs by assessing the degree to which competition is fostered at the major subcontractor level." How this information has been communicated to ICGS remains unclear, and, in the absence of such communication, it fails to serve as a motivator of the contractor's actions.

The Coast Guard could, at a minimum, insert language into the plan tying the award fee to how well ICGS and its subcontractors use OBM to ensure competition.

At the same time, we must acknowledge that any and all of these efforts would be aimed at *improving* competition on the Deepwater program, not creating it. Competition already exists on Deepwater, as indicated in the discussions concerning the Lockheed Martin Maritime Systems and Sensors and Northrop Grumman Ship Systems procurement programs. Is it adequate? One way to begin to answer that question is through the following comparison:

In 2004, Lockheed Martin Maritime Systems and Sensors and Northrop Grumman Ship Systems competed, either formally or through a qualified competition using trade studies, 58.3 percent and 43.6 percent of their subcontract awards, respectively. In fiscal year (FY) 2004, Naval Air Systems Command, that portion of the U.S. Navy with acquisitions that most closely resemble the effort by LM MS2 on behalf of the Coast Guard, competed 41.6 percent of its awards. For the same period, Naval Sea Systems Command, the organization in the Navy concerned with the acquisition of ships, awarded 53.6 percent of its contracts on a competitive basis. The overall Navy figure for FY2004 was 56.4 percent.[12] Clearly, differences are substantial between all these figures and those of LM MS2 and NGSS. For one thing, the Navy figures are prime contract awards, while the two sets of corporate figures are subcontract awards. At the same time, the kinds of awards the Navy makes, supporting as they do both ships and aircraft programs, as well as electronic and information technology programs, probably are as close a comparison as possible to the kinds of awards being made by the two first-tier subcontractors in support of the Deepwater program. To the extent the numbers are comparable, competition on Deepwater at the subcontract level compares favorably in the case of LM MS2, but much less so in the case of NGSS.

The comparable U.S. Army competition figure, calculated in the same manner as that of the Navy, for FY04 was 68.1 percent, and the comparable Air Force figure for the same period was 62.1 percent. These numbers clearly are superior not only to those of the two first-tier subcontractors but also to those of the Navy, and that fact might actually reinforce the legitimacy of the comparison of the Navy figures to those of LM MS2 and NGSS—that is, the fact that the Navy figures are closer to the subcontractor figures than to the figures of its sister services could simply reflect the nature of naval procurement and its differences.

In addition, it is important to remember that the rules followed in coding competition will drive the competitive performance statistics. The Navy, like all the federal government, follows the rules as laid out in FAR part 10 and further delineated in the Federal Procurement Data System-Next Generation (FPDS-NG). Contractors, on the other hand, follow their own rules based on their approved purchasing systems. So, again, comparing government competition statistics to those of contractors is somewhat like comparing apples to oranges. As we have seen in Deepwater, however, the contractor's statistics often are more accurate indications of real competition.

Finally, we return to the acknowledgment with which this report began: a performance-based acquisition must avoid the natural tendency on the part of the government to direct the contractor in its efforts to satisfy its performance requirements. At the same time, the government must ensure it has sufficient insight to protect its legitimate interests and those of the general public. With each set of added recommendations by different reviewers and

[12]The fiscal year runs from 1 October through 30 September. Thus, while the majority of the two 12-month periods overlap, they are not identical. U.S. Navy data for FY04 is taken from FPDS-NG and includes the following categories in the "competed" figure: competed new awards; follow-on awards to initially competed awards; full and open competition, following exclusion. Incremental obligation amounts not connected with a new award or modification of an existing contract or order were excluded from the total dollar figure against which competitive awards were compared, as were amounts for awards for amounts not subject to competition, such as those for which a source is directed by statue.

auditors, maintaining that balance between government management and the requirements of a performance-based acquisition strategy becomes harder. It is to those ends, and with attention to that need for balance, that the following findings and recommendations are directed.

6. FINDINGS

Finding 1 – Lockheed Martin Maritime Systems and Sensors has invited Coast Guard personnel on a recurring basis to participate as nonvoting members of technical evaluation boards for subcontracts. This allows them insight into the process without imposing costly oversight of the contractor. In the view of the evaluation team, this is a performance-based acquisition best practice.

Finding 2 – Documentation for some of the files at LM MS2 reflected no information regarding use of the open business model, even though interviews with the cognizant buyer indicated there had been OBM-related steps taken.

Finding 3 – ICGS policy 402 (the open business model) is acknowledged but not yet operational at Northrop Grumman Ship Systems.

Finding 4 – A number of the sole-source purchases made by NGSS lent themselves to a best-value source selection (versus low-cost technically acceptable). The use of this approach in those instances would have improved competition statistics and may have lowered costs and improved performance.

Finding 5 – Documentation of competition efforts and results in the contract files at NGSS could be improved. This finding also was identified during the contractor's purchasing system review and is being addressed by the contractor.

Finding 6 – A substantial portion (41 percent) of the subcontract dollars awarded by NGSS went to either Halter-Bollinger or United Defense, Limited Partnership, the two firms with which NGSS has established teaming agreements.

Finding 7 – The NGSS acquisition organizational structure (one procurement office supporting both Navy programs and Deepwater) makes the incorporation of ICGS policies peculiar to Deepwater more difficult than might otherwise be the case. While separating the Deepwater program personnel from those acquisition personnel largely concerned with support of U.S. Navy programs is not a requirement, the combined organization does impose on NGSS an added responsibility to ensure proper attention to ICGS-imposed Deepwater program requirements, such as OBM.

Finding 8 - No procedures have been established to ensure the prompt notification of ICGS and the Coast Guard of developments at the first-tier subcontractor level that have the potential to adversely affect the subcontractor's ability to carry out its procurement activities. Specifically, both ICGS and the Coast Guard were unaware of the findings of the Supervisor of Shipbuilding during the contractor's purchasing system review at NGSS.

Finding 9 – No formal ICGS policy on the OBM, along the lines expressed in the white paper cited above, has been established. The absence of such policy has deprived both ICGS and

the Coast Guard of information necessary for the effective management of competition on the Deepwater program and the ability to demonstrate the true extent of the use of competition by the first-tier subcontractors.

Finding 10 – While ICGS obtains limited OBM competition information from its first-tier subcontractors semiannually, neither the Coast Guard nor ICGS has yet established a comprehensive plan for monitoring and measuring competition within the Deepwater program at the subcontractor level.

Finding 11 – No method currently is in place to hold ICGS accountable for competition performance within Deepwater as an award fee requirement.

7. RECOMMENDATIONS

Recommendation 1 – *Best Practice*. For any competitive awards involving technical evaluations of multiple proposals at both Lockheed Martin Maritime Systems and Sensors and Northrop Grumman Ship Systems, Coast Guard personnel should be invited to participate as nonvoting members of the evaluation teams to ensure their insight into decision making is maintained.

Recommendation 2 - Documentation requirements for contract files at LM MS2 should be strengthened to ensure market research efforts under the open business model are properly recorded.

Recommendation 3 – NGSS should begin immediately to incorporate the open business model in its procurement organization and should increase buyer and engineering personnel training in best-value acquisition as one way to increase the amount of competition on the Deepwater program. If necessary, ICGS should provide assistance to NGSS in adopting this model.

Recommendation 4 – NGSS should monitor the amount of competition employed by Halter-Bollinger and United Defense, Limited Partnership, and report those figures to ICGS as a subset of its own competition report.

Recommendation 5 – NGSS should identify all ICGS procurement policies that have been flowed to NGSS, and those should be incorporated into NGSS procurement manuals and corporate guidance. If necessary, NGSS procurement personnel should be alerted to and trained on all such ICGS procurement requirements.

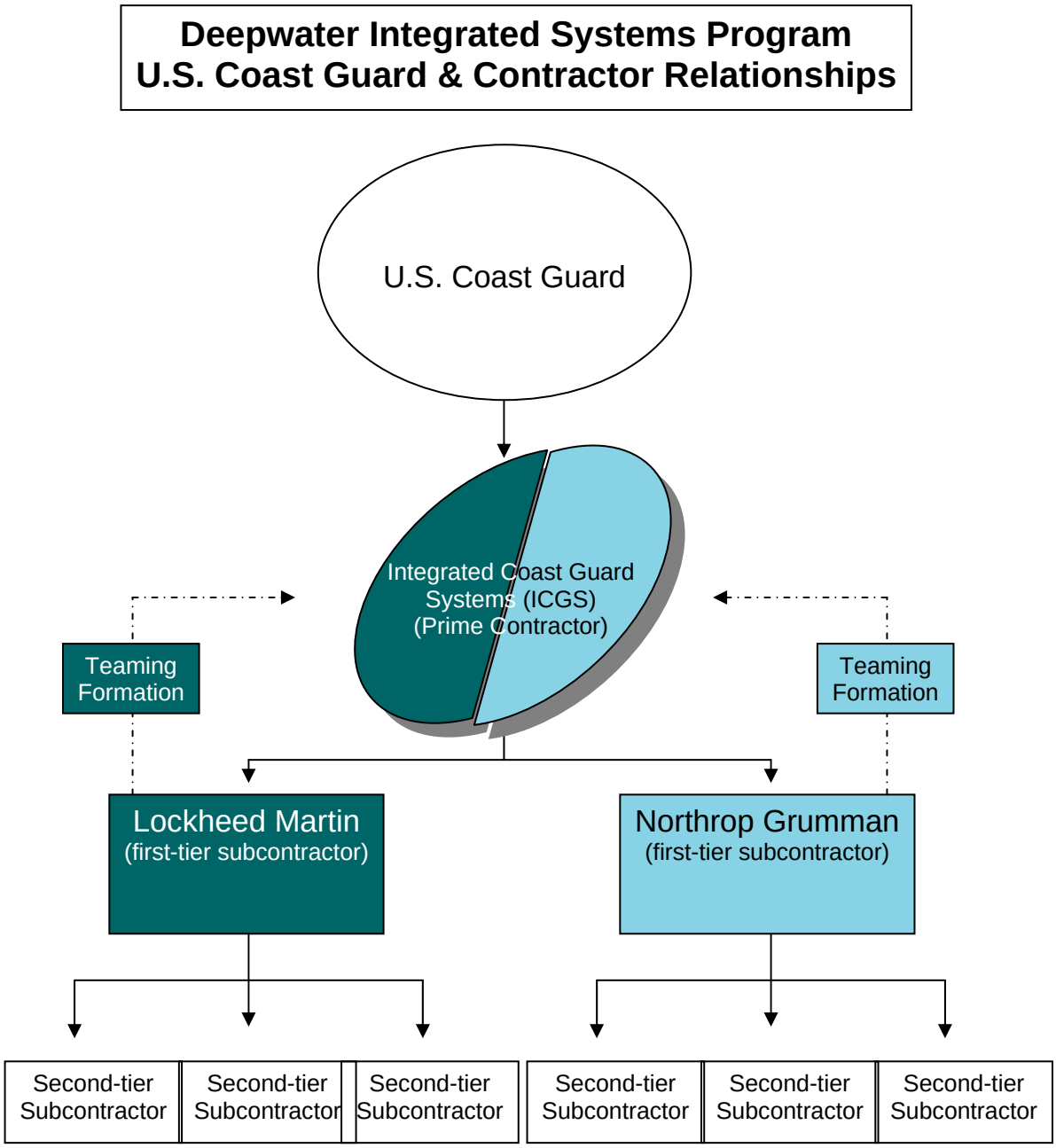
Recommendation 6 – ICGS, through its subcontractors, and the Coast Guard, through the cognizant contract administration office, should put in place systems that would notify them of any potential issues regarding competition at the first-tier subcontractor level.

Recommendation 7 – ICGS should establish a formal corporate policy, based on the white paper cited above, regarding the adoption and use of the OBM by both first-tier subcontractors. Such a policy should include reporting the following information at a minimum: total dollars spent on procurements, percentage competed versus sole sourced, changes to make vs. buy decisions, planned procurements for the next period, assessment of competition opportunities, and planned competitions in future periods.

Recommendation 8 – As recommended by GAO, the PEO for the Coast Guard Deepwater program should, in conjunction with ICGS, formulate and publish a comprehensive plan for monitoring ICGS activities and performance related to competition on the Deepwater program, to include the extent of competition employed by the first-tier subcontractors in connection with commodity purchases, as well as competition efforts of major teaming partners such as Halter-Bollinger. This plan should include, but not be limited to, ICGS monitoring and reporting to the Coast Guard developments at the first-tier subcontractors that have potential impact, both positive and negative, on competition at those facilities.

Recommendation 9 – The PEO for the Coast Guard Deepwater program should immediately designate a responsible party within the Coast Guard to develop objective criteria related to the use of competition in support of the Deepwater program for incorporation into the award term plan, the award fee plan, or both evaluation criteria. Such criteria should be based on data obtained as a result of the establishment of the comprehensive monitoring plan recommended above.

ATTACHMENT 1



Prepared by:
Rick Dowling
Tom Siemsen

Peer Review by:
Shaw Cohe
Shirl Nelson
Karen Sorber

Edited by:
Julie Olver
Fred Schultz

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POST OFFICE BOX 3948 OAKTON, VA 22124
703-378-3226

Section H: Human Capital Planning

Executive Summary

The Conference Report accompanying the FY 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide:

> *a description of how the Coast Guard is planning for the human resource needs of Deepwater assets including rotational crewing for each asset utilizing such crewing and qualification training for commanding officers and petty officers in charge of Deepwater patrol boats*

This section of the report addresses the Coast Guard organization for planning human resource needs, the rotational crewing concept, and the training plan for commanding officers of Deepwater patrol boats. The Coast Guard does not currently plan to use petty officers in charge for Deepwater patrol boats.

The Coast Guard, in order to meet the Deepwater Program's multifaceted requirements, established a dedicated staff under the Human Resources Directorate to partner with the Program Executive Officer (PEO), Sponsor, Support Directorates including the Office of the Judge Advocate General (JAG), and Integrated Coast Guard Systems (ICGS) to implement effective Human Systems Integration (HSI) for all facets of the Integrated Deepwater Systems (IDS). This system of systems includes cutters and associated small boats, aircraft, systems for C4ISR (command, control, communications, intelligence, surveillance, and reconnaissance), integrated logistics, and the associated workforce. This implementation must be accomplished while retaining overall responsibility for human resource policies and procedures.

Rotational crewing is a product of Deepwater human resource planning applied to maximize operational effectiveness. The deliberate and dynamic tension between the overarching IDS program objectives of improving operational performance while managing Total Ownership Cost (TOC) resulted in a system that required the Coast Guard to continue its pursuit of more effective and efficient service to the public.

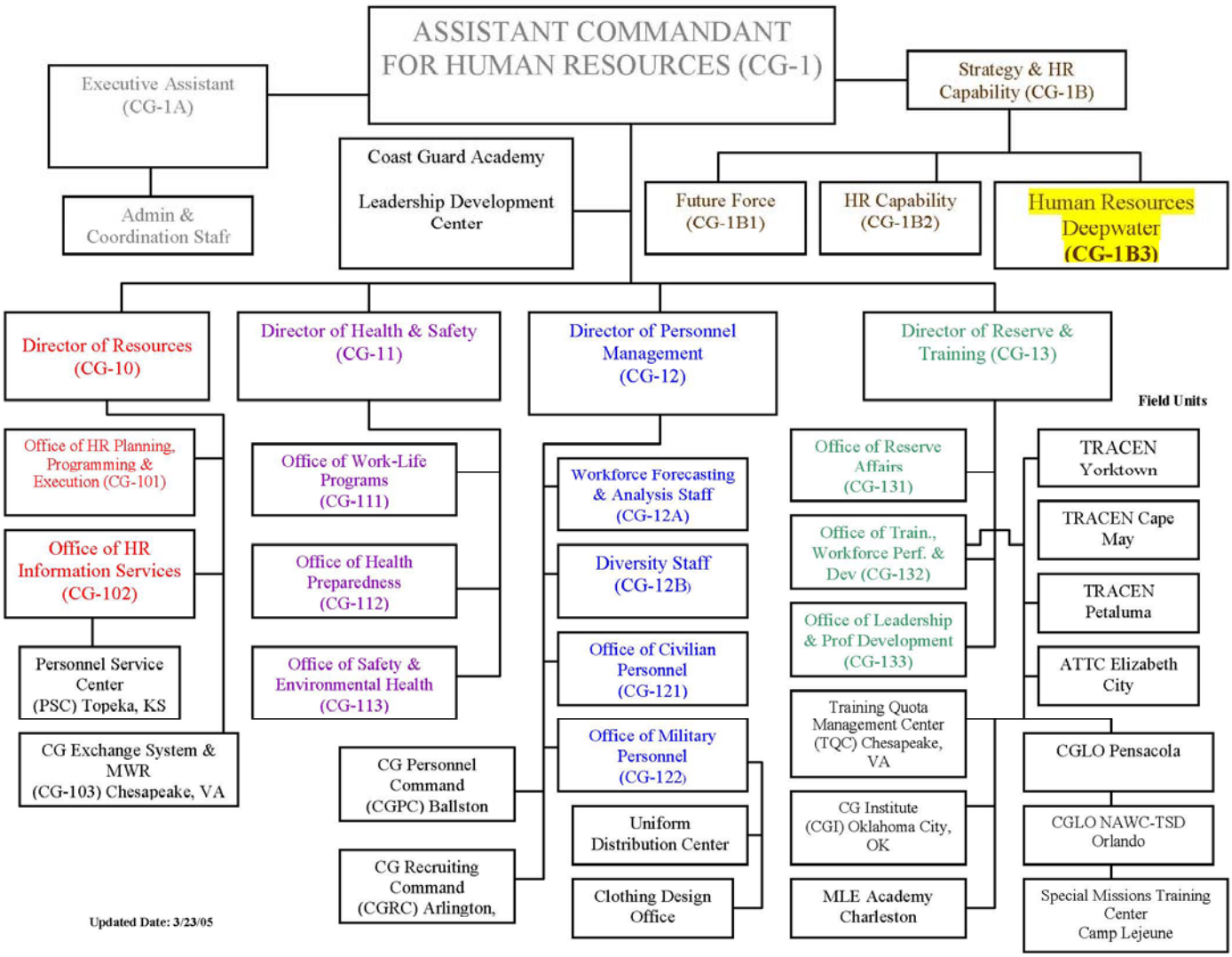
The Coast Guard has a time-tested method for shaping the careers and skill sets of its senior operational leaders. Training these leaders to command new Deepwater cutters requires the application of traditional training and career growth management to a new technology. By partnering with industry, the Coast Guard is confident that it can effectively prepare future Deepwater commanding officers and petty officers in charge for their duties.

Deepwater Human Resource Planning Structure

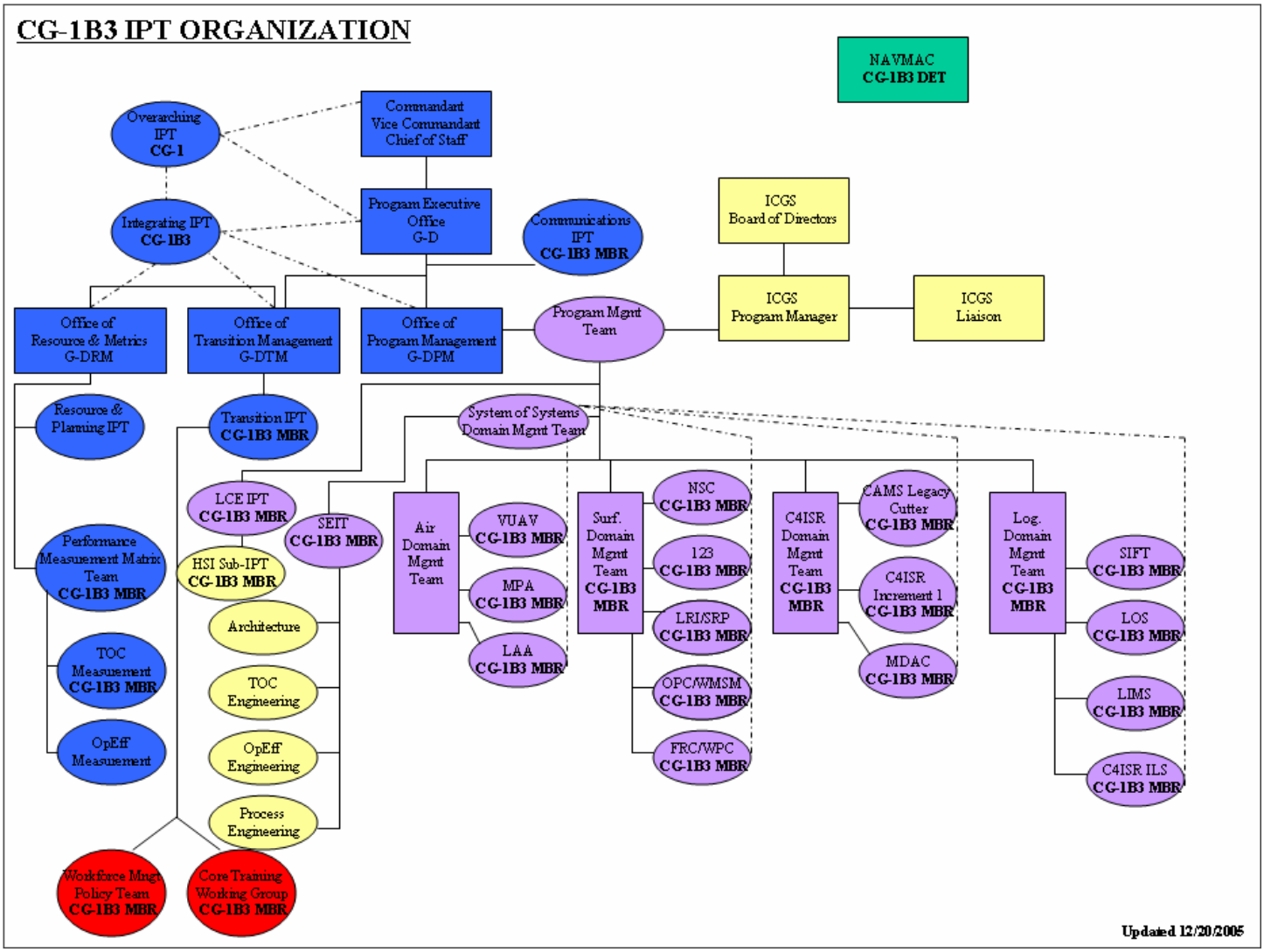
The IDS program management structure is composed of a core acquisition staff, the Deepwater Program Office (G-D), and various "functional" staffs that report to other Coast Guard Headquarters directorates but are embedded within the Deepwater Integrated Product and Process Design (IPPD) organizational structure. These functional staffs include the Office of Human Resources Deepwater (CG-1B3), which is resourced with G-D AC&I personnel funding

but which reports to and represents the Assistant Commandant for Human Resources (CG-1). The IDS Program Management Plan explicitly charges CG-1B3 to "Partner with the PEO, Sponsor, Support Directorates, including the JAG, and ICGS in implementing effective Human Systems Integration (HSI) for all facets of the IDS including ships, aircraft, C4ISR, logistics systems, and the associated workforce, while retaining responsibility for human resource policies and procedures."

Attached below are two organizational charts. The first organizational chart below highlights the organizational relationship of the Office of Human Resources Deepwater (CG-1B3) within the Office of the Assistant Commandant for Human Resources (CG-1).



The second organizational chart highlights the involvement of CG-1B3 personnel in the Deepwater Integrated Product Team (IPT) management structure.



Within the ICGS corporate organization, HSI began as a decentralized effort consisting of the individual application of HSI elements (e.g., human factors engineering, manpower, personnel, and training) under the Integrated Logistics Support (ILS) Domain organization. Although HSI encompasses several of the traditional ILS elements, the need for HSI to be applied as a systems engineering discipline in accordance with the IDS Systems Engineering Management Plan led to the establishment of an HSI sub-Integrated Product Team (IPT) within the System of Systems (SOS) domain.

The HSI sub-IPT is chartered under the Life Cycle Engineering (LCE) IPT. The HSI sub-IPT has members from both ICGS and Coast Guard. Human factors engineering (HFE), manpower, training, safety, and workforce management representatives serve as core members at the system level. Habitability and survivability are dealt with at the asset levels with representative serving

as adjunct members. The LCE IPT provides the HSI sub-IPT with the connectivity to both the ILS and System of Systems (SoS) Domains. Within the LCE IPT, HSI members work closely with the ILS lead representatives assigned to other Deepwater domains (surface, air, C4ISR).

It is critical that HSI maintains a connection with the other ILS elements. This is supported through membership linkages to the ILS Domain Management Team (DMT), and the ILS/HSI sub-IPTs and working groups under the asset IPTs.

The HSI sub-IPT is the primary forum for integrating HSI elements and addressing the human resources needs of the Deepwater Program by interacting with the design community and properly influencing the asset design early in the design process. The HSI sub-IPT will identify the processes, methods, and activities needed to ensure that the IDS HSI program and associated deliverables incorporate the key principles and objectives of HFE, manpower, personnel, training, safety, habitability, and personnel survivability. The HSI sub-IPT provides mechanisms for identifying and resolving issues efficiently and collaboratively between the customer and contractor, and across HSI elements seeking outcomes that contribute to improved performance while managing TOC.

The HSI sub-IPT is chartered to provide the system integrator (ICGS) and the government an environment in which they can partner to leverage the combined expertise and synergy of the team to develop a product that meets the Deepwater Program's performance requirements. The team is responsible for promptly identifying and resolving HSI problems at the lowest possible organizational level, resolving potential disputes to the maximum extent practicable, addressing challenges to successful program execution, identifying and addressing areas of concern, exploring topics of mutual interest, and disseminating information as appropriate. The HSI sub-IPT ensures that HSI issues are identified, scoped, and resolved in an expeditious manner giving due consideration to the current and evolving missions of the Coast Guard and the complexities of the IDS.

Discussion of the Decoupling of PERSTEMPO and OPTEMPO

The most significant Deepwater impact on Coast Guard human resources was the decision to separate the operational tempo (OPTEMPO) of the National Security and Offshore Patrol Cutters (NSC and OPC) from the personnel tempo (PERSTEMPO) of crew members. That is, Deepwater plans that the cutters will be operational for 230 days a year, while cutter crewmembers will only be operational for 185 days. This will enable the Coast Guard to fully use available asset OPTEMPO that has heretofore been tied to the crew PERSTEMPO. By decoupling PERSTEMPO and OPTEMPO the assets will be employed more efficiently permitting IDS to leverage fewer ships to provide the same or higher overall performance than the Coast Guard's existing legacy force. This requires a new cutter crewing concept which generates several human resource (HR) impacts.

Initially, ICGS proposed an Augmented Crewing Concept (ACC) to achieve an operations tempo OPTEMPO of 230 Days Away From Home Port (DAFHP) per year while maintaining a PERSTEMPO of no greater than 185 DAFHP per year. The ICGS ACC concept adds personnel to a cutter's permanent crew so that the total crew size is approximately 35 percent higher than

that needed to staff the cutter while underway. The cutter would rotate crew members as necessary while maintaining 230 day OPTEMPO and 185 day PERSTEMPO. Under the ACC an Off-Cycle Cutter Support Unit (OCCSU) is established to manage the crew that is not underway as maintenance support for in port cutters.

The Deepwater Integrated Product Team (IPT) structure developed an alternative, the Crew Rotation Concept (CRC), to be deployed in lieu of ACC. Under CRC, additional crews are created and rotated as an alternative to the augmented ACC crews. For every three cutters there would be four crews, providing 230 day OPTEMPO per cutter, while maintaining the 185 day PERSTEMPO. The CRC concept does not rely on an OCCSU, but instead relies upon a Squadron. Where the OCCSU assists the cutters with maintenance and oversees members of different cutters off-cycle crews, the Squadron "owns" the hulls and is responsible their maintenance and crewing.

CRC will be fully analyzed when it is implemented and refined as necessary to meet the IDS system-wide objectives. To fully address IDS HR impacts, the Coast Guard established several working groups to identify, analyze, and solve issues affecting cutter crews. The working groups identified numerous workforce management issues inherent in maintaining equity of personnel benefits between legacy and future Deepwater fleets. These issues are being addressed through proposed legislative and policy changes to reconcile the organizational changes brought about by the Deepwater Program. Human resource solutions and optimization are being implemented to provide the highly qualified personnel necessary for mission accomplishment, while building on the time-tested procedures, processes, and traditions that have successfully served the Coast Guard's legacy crews.

The Deepwater Program, with its performance-based system-of-systems (SoS) approach in lieu of a traditional asset-for-asset acquisition strategy, demands significant personnel-related changes by its very nature. In particular, the dynamic tension between IDS program objectives had direct ramifications for the "people" component of the SoS. Traditionally, a single crew operates and maintains a single cutter in the U.S. Coast Guard. This crewing approach has significant merit; the crew and cutter are inseparable, every aspect reflected on each other. Legacy cutter crewing practices were a proven formula for successful military maritime performance in the most demanding of environments and tasks, but they do not best meet the objectives of IDS because they cause cutter employment to be constrained by personnel limitations rather than by maintenance limitations, thus resulting in forfeiture of some portion of the cutter's maximum operational days. PERSTEMPO standards have long been recognized, both in the Coast Guard and by Congress, as essential limits to the sacrifice we can expect of our people in leaving behind their families and homes for extended periods of time.

For this reason, a fundamental concept of the Integrated Deepwater Systems (IDS) program is the decoupling of OPTEMPO and PERSTEMPO on the National Security Cutters (NSCs) and Offshore Patrol Cutters (OPCs) to achieve an OPTEMPO of 230 days away from homeport (DAFHP) while retaining a PERSTEMPO of 185 DAFHP. This concept allows asset availability to be maximized without sacrificing crew deployment standards. The increased asset OPTEMPO enables IDS to achieve improve operational performance with fewer assets within acquisition and Operating Expense (OE) funding limits. Based on the combination of: (1) the

current state of ship design, construction and maintenance practices; (2) Coast Guard experience; and (3) analyses conducted by ICGS (subsequent to its original proposal), the OPTEMPO that best balances the goals of service life, maintenance availability, and operations is 230 DAFHP.

Implementation of Deepwater concepts, especially the decoupling of OPTEMPO and PERSTEMPO, significantly impacts the workforce and human resources system. The most difficult issue to be addressed is the necessary and profound cultural shift in the current operational culture and practice. The major cutter fleet will no longer have one crew for one ship. However, the Coast Guard must continue to instill in its crews and their commanding officers a sense of team cohesion and stewardship of their assigned cutter, even though their tenure on a particular ship will be less than a year once the new Deepwater cutters are fully operational. Operational and support commanders must change how they traditionally look at and manage cutter fleets to a manner more akin to how air stations manage their air crews and aircraft.

As previously discussed, a fundamental concept of the IDS program is the decoupling of OPTEMPO and PERSTEMPO on major cutters. While this is a cost-efficient, effective use of resources, the concept has significant impacts on the Coast Guard workforce and requires an in-depth review of human resources doctrine. In order to facilitate this fundamental shift in crewing practices, several teams were tasked with analyzing information, and recommending and implementing solutions.

One team is currently developing proposed changes to pertinent human resource legislation, policies, procedures, and processes to ensure the Coast Guard retains equitable benefits for legacy crews and avoids unintended consequences for off-cycle crews. This team has recommended changes to compensation, housing, and assignment policies, procedures and practices. Some of the compensation changes will require the Coast Guard to work in conjunction with the Department of Defense to seek modifications to the National Defense Authorization Act to ensure continuous career sea pay for the off-cycle crews of new cutters. Other changes will require the Coast Guard to change its human resource policies and procedures to implement Deepwater concepts while still retaining a good quality of life for our members and equitable benefits with members attached to legacy assets.

For example, under the CRC, housing would be required for junior enlisted members as they can not live onboard the cutter all year. The solutions to some of these issues do not require changing policy, but ensuring the new cutters and crews are covered by the current policies. For instance, the new cutters and their associated rotational crews will be added to the list of unusually arduous duty units. This will allow crew members to pick alternate locations for their dependents to live, a benefit currently provided to the Coast Guard's legacy major cutter crews.

Another team is addressing enterprise-wide issues related to dissociating crews from their cutters. This team is taking on the tough cultural issues as well as the shift required in Coast Guard doctrine to implement the decoupling. This tasking includes decisions on what organizational level will be responsible for what Coast Guard equipment. This team is looking closely at lessons learned from other Coast Guard and Navy multi-crewing efforts for

applicability to this Deepwater implementation. It will also examine the way assets and crews are managed within the Coast Guard's aviation community.

Comparison of Crewing Concepts

To achieve the objectives of a sustainable PERSTEMPO and full use of available asset OPTEMPO, a non-traditional crewing scheme must be employed. The employment of an alternative crewing scheme is fundamental to optimizing improved asset performance with managing TOC. This change represents a significant shift in the seagoing culture of a sailor's identification with a ship and requires resolve at every level from the deck plates to the highest levels of leadership to embrace the much-needed change. Variations of alternative crewing concepts have been employed, very successfully, in both military and commercial vessels. The common factor for success was careful, thoughtful planning that focused on developing doctrine and policy in preparation of the implementation of this alternative crewing scheme.

Foremost, the Coast Guard, as both a law-enforcement agency and military service, must be judicious in applying commercial standards. Good ideas and best practices are considered fully, but always through the lens of meeting Coast Guard statutory missions. A fundamental tenet of the Deepwater acquisition is that the Coast Guard must change its crewing concepts for major IDS cutters the NSC and the OPC. The Fast Response Cutter (FRC), owing to its Concept of Operations (CONOPS), will remain traditionally crewed at this time.

ICGS originally proposed a crewing scheme called the Augmented Crewing Concept (ACC). ACC would provide a single crew to each cutter, but one that is larger than that required to meet typical Coast Guard operational requirements. From this augmented crew, the Coast Guard would increase the cutter's OPTEMPO without exceeding an individual's PERSTEMPO limit. The benefits of this approach included a traditional one crew, one ship concept. Further examination of the ACC identified significant challenges to implementing this concept.

- Lack of continuity in command cadre- The command cadre would sail together only, approximately, 50 out of 230 days, less than 25 percent of the time.
- Lack of team cohesion- The concept would result in excessive position turnover (35 percent to 60 percent) each patrol. It is a well established tenet that the success of any military organization is grounded in the training and cohesiveness of the team. Whether a tank crew, a Marine rifle squad or a Coast Guard cutter crew, it is the team that executes the mission and succeeds, not the tools they use.
- Additional training requirements- The concept does not provide a replacement for each individual which generates the requirement for extensive cross-training of crew members and complicates the ability to manage PERSTEMPO at the individual level while maintaining the proper skill set for each deployment.
- Limited patrol lengths- ACC limits patrol lengths to manage PERSTEMPO. The NSC would be limited to four patrols of approximately 57 days while the OPC would be limited to five patrols of approximately 46 days to manage the PERSTEMPO of the crew. This would significantly impact the flexibility of the Operational Commander to respond the dynamic nature of Coast Guard missions, an organizational competency of the Coast

Guard that provides significant value to the nation as demonstrated in the Coast Guard's response to recent events.

For these key concerns, and other associated reasons, alternate crewing schemes were examined with our industry partners and field activities. The most promising alternative is the Crew Rotation Concept (CRC). This concept provides for a number of multiple crews that is greater than the number of vessels operated. Crews would be rotated between the cutters to achieve the maximum operational capability without violating PERSTEMPO. It is the Coast Guard's preferred crewing concept and, while unquestionably challenging to achieve, it is the solution most likely to succeed because it recognizes and capitalizes on the unity of effort as a team rather than treating crew members as interchangeable parts.

CRC provides sufficient numbers of crews to sustain the class OPTEMPO while not exceeding their PERSTEMPO and maintaining alignment with TOC goals. This concept also provides the operational commander with patrol schedule flexibility without violating PERSTEMPO, best optimizes personnel costs, makes full use of capital assets, and positions Coast Guard men and women who go to sea for our nation to overcome the many challenges they face. Additionally, CRC requires and drives consistent standardized configuration management, a key tenet for reducing the cost of logistics. This standardization, long employed in the aviation community, enables increased flexibility among crews, a notable factor in the Coast Guard's success during response and recovery operations resulting from Hurricanes Katrina and Rita.

Training Support for Deepwater Assets and Commanding Officers

Crewing Deepwater cutters provides new and challenging human resource issues. Overcoming these challenges will call upon the flexibility and expertise that the Coast Guard has traditionally exhibited in ensuring it cutters are responsibly and effectively overseen.

Personnel reductions, combined with Deepwater's cost-constrained imperative to recapitalize obsolete legacy assets and introduce new technologies and capabilities, suggested that smaller crew complements will be called upon to operate and maintain fewer, but more technologically sophisticated platforms. Indeed, the drive toward measurable increases in operational performance within specific affordability targets leads to greater interoperability of assets, more complex systems for C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance), and discrete accountability and responsibility for allocated mission accomplishment assigned to each platform crew to achieve the greatest system effect per asset. In short, relatively low-tech and largely independent legacy assets will be replaced by a much more complex and prescriptive interdependent system consisting of advanced, more-capable assets operated by fewer personnel. At the asset level, shrinking the operational crew while minimizing support (overhead) crew translates into a greater mission "share" per billet with an accompanying higher skill demand per person; continuing a trend away from a relatively larger labor-based crew toward a smaller skill-based crew.

The new Deepwater assets and crews will have training plans in place to provide the requisite knowledge and skill sets for safe and efficient operation and mission accomplishment. Specifically, the pre-commissioning training for the NSC crews consists of two phases: pre-arrival (pipeline) training and familiarization and indoctrination training.

Phase One: Pre-arrival training

The pre-arrival training consists of existing Coast Guard and Navy courses, which are primarily schoolhouse courses. For crew of the first NSC, USCGC BERTHOLF (WMSL 750), pre-arrival training will start as early as February and April 2006 for two electronics technicians (ETs). The rest of the crew will start its phased training in the summer and autumn of 2006 and continue until early 2007.

As part of the pipeline for C4ISR courses, ICGS is developing approximately 10 new courses, most of which will are planned for the Training Center at Petaluma, Calif. The tentative date for completion of the C4IST training facility at Petaluma (Bldg 500) is April 2006; its "ready-to-teach" date is slated for August 2006.

Also new hull and engineering courses will be developed following ICGS coordination with the vendors who will produce them. Given the limited student throughput early in the Deepwater Program, some courses will be conducted at vendor facilities and then transitioned to Coast Guard training centers and other training delivery methods, as appropriate. The vendor-provided training courses will need to be developed this year as they are part of the pipeline that starts in calendar year 2006.

Phase Two: Familiarization and Indoctrination Training

USCGC BERTHOLF's familiarization and indoctrination training will start in April 2007 at the Northrop Grumman Ship Systems shipyard in Pascagoula, Miss., and consists of two parts:

Part 1: Classroom courses with some hands-on activity. This will be taught by NGSS engineers in the Crew Training Department. Crewmembers' positions on board the NSC will determine how many courses they will need to take. Courses range in length from three to seven days.

Part 2: Counterpart training. This training is hands-on training of ship's systems including operation and lighting off/shut down procedures. This will be taught by the technicians who developed or installed the systems and know its full functionality as well as NGSS Crew Training subject matter experts.

ICGS has provided a 90-day schedule to ensure all crew members complete various aspects of the training program. Crew members will be phased in based on the number and types of courses needed for their billet on board the NSC.

Patrol Boat Commanding Officers

Assignment to command at sea represents the highest degree of trust and confidence that the Coast Guard can place in an individual. The command selection process maintains the highest standards of conduct, character, capability, attitude, military bearing, and command professionalism. All prospective commanding officers are reviewed by a panel of experienced officers who embody the desired traits of performance, professionalism, leadership and education that are the basis of selection. Candidates must meet a minimum set of requirements to be eligible for the panel, including recent afloat experience and at least two previously completed successful tours afloat.

Training and qualifications requirements for commanding officers of the Fast Response Cutter (FRC) will be as rigorous as that of current 110-ft. Patrol Boat commanding officers. After selection by the panel, commanding officers will be required to attend the Prospective Commanding Officer Afloat course. As Deepwater continues to introduce new technical systems and capabilities, commanding officers will be required to attend courses that will provide them an overview of these systems and how they integrate with mission accomplishment. For example the 123-ft. Patrol Boat commanding officers will be required to attend courses for C4ISR Bridge Watchstanders, CG Command & Control (C2) Operation, Logistic Information Management (LIMS), and the Common Operating Picture (COP).

Section I: Earned Value Management System (EVMS) Gold Card Data

The Conference Report accompanying the FY 2006 Department of Homeland Security Appropriations requires the Coast Guard to provide:

> *[T]he earned value management system gold card data, including data for all the factors in this system, for each asset being procured under Deepwater, including C4ISR and C-130J missionization.*

The following spreadsheet provides the earned value management system (EVMS) gold card data for all the assets being procured under Deepwater with the exception of the C-130J. The C-130J project EVMS gold card data is not anticipated to be available until March 2006. The C-130J Missionization contract was definitized and awarded in late September 2005. In accordance with the Deepwater EVMS implementation plan ICGS has 6 months to develop their integrated cost and schedule baseline. The Coast Guard will hold an Integrated Baseline Review (IBR) before the six-month point to understand/accept the contractor's cost and schedule baseline. Following the IBR, ICGS will begin submitted EVMS gold card data for the C-130J missionization project.

Deepwater

Gold Card Data Points

Note: Data from September 2005 CPRs

Description	BAC	PV (BCWS)	EV (BCWP)	AC (ACWP)	EAC	VAC	CV	SV	CV%	SV%	SPI	CPI	$TCPI_{EAC}$	EAC_{cpi}	VAC_{cpi}	EAC composite	VAC composite	% Schedule	% Complete	% Spent
Air	335.98	239.07	228.36	220.87	335.60	0.38	7.48	-10.71	3.28%	-4.48%	0.96	1.03	0.93	326.20	9.79	329.72	6.27	71%	68%	66%
HH65-REENGINING	125.85	90.74	87.46	87.43	125.85	0.00	0.03	-3.29	0.04%	-3.62%	0.96	1.00	1.00	125.85	0.00	127.41	-1.57	72%	69%	69%
HITRON	12.83	8.52	8.53	8.51	12.83	0.00	0.02	0.00	0.21%	0.06%	1.00	1.00	1.00	12.83	0.00	12.82	0.02	66%	66%	66%
MPA	139.83	85.04	80.16	80.16	139.83	0.00	0.00	-4.87	0.00%	-5.73%	0.94	1.00	1.00	139.83	0.00	143.64	-3.81	61%	57%	57%
Vertical Unmanned Aerial Vehicle	57.47	54.76	52.21	44.77	57.09	0.38	7.43	-2.55	14.24%	-4.66%	0.95	1.17	0.40	49.12	8.35	49.51	7.96	95%	91%	78%
C4ISR	226.03	148.68	143.22	146.22	226.82	-0.80	-2.99	-5.46	-2.09%	-3.67%	0.96	0.98	1.04	230.64	-4.61	234.23	-8.21	66%	63%	65%
Common Operation Picture	146.64	105.26	103.78	107.41	147.44	-0.80	-3.63	-1.48	-3.50%	-1.40%	0.99	0.97	1.09	151.17	-4.54	152.04	-5.41	72%	71%	73%
Legacy CAMS	5.72	1.69	1.69	1.63	5.72	0.00	0.06	0.00	3.42%	0.00%	1.00	1.04	0.99	5.50	0.22	5.51	0.21	30%	30%	29%
Legacy Asset Mod 270/378/210	21.59	15.64	15.22	15.22	21.59	0.00	0.00	-0.42	0.00%	-2.68%	0.97	1.00	1.00	21.59	0.00	21.79	-0.20	72%	70%	70%
Maritime Domain Awareness Center	31.63	23.48	20.09	19.59	31.63	0.00	0.50	-3.39	2.47%	-14.43%	0.86	1.03	0.96	30.71	0.92	32.62	-0.99	74%	64%	62%
Shore Upgrades	20.44	2.61	2.44	2.36	20.44	0.00	0.08	-0.17	3.46%	-6.63%	0.93	1.04	1.00	19.66	0.79	20.97	-0.53	13%	12%	12%
Logistics	65.20	42.15	41.76	40.06	64.88	0.32	1.70	-0.38	4.08%	-0.91%	0.99	1.04	0.93	62.69	2.51	62.82	2.38	65%	64%	61%
ILS Common Systems	35.83	31.40	31.40	30.11	35.44	0.40	1.29	0.00	4.12%	0.00%	1.00	1.04	0.76	34.46	1.38	34.37	1.46	88%	88%	84%
ILS Common Systems O&S	12.86	5.87	5.87	6.08	12.94	-0.08	-0.21	0.00	-3.58%	0.04%	1.00	0.97	1.03	13.26	-0.40	13.29	-0.43	46%	46%	47%
ILS Trainer	16.50	4.87	4.49	3.87	16.50	0.00	0.62	-0.39	13.82%	-7.95%	0.92	1.16	0.95	14.23	2.28	15.13	1.38	30%	27%	23%
LIMS Prod & Deployment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%	0%	0%
PM & Sys Eng. Int.	39.76	22.71	22.06	22.28	43.50	-3.75	-0.22	-0.65	-0.99%	-2.87%	0.97	0.99	1.01	40.16	-0.40	40.71	-0.95	57%	55%	56%
PM & Sys Eng. Int.	39.76	22.71	22.06	22.28	43.50	-3.75	-0.22	-0.65	-0.99%	-2.87%	0.97	0.99	1.01	40.16	-0.40	40.71	-0.95	57%	55%	56%
Surface	531.12	259.20	217.57	258.15	706.08	-174.95	-40.58	-41.63	-18.65%	-16.06%	0.84	0.84	1.09	632.29	-101.17	702.54	-171.41	49%	41%	49%
Maritime Patrol Boat (WPB)	45.24	41.29	40.04	40.04	45.24	0.00	0.00	-1.25	0.00%	-3.02%	0.97	1.00	1.00	45.24	0.00	45.40	-0.16	91%	89%	89%
Maritime Security Cutter Large MSL	474.60	208.03	167.70	209.86	649.55	-174.95	-42.15	-40.32	-25.14%	-19.38%	0.81	0.80	1.10	593.25	-118.65	683.46	-208.86	44%	35%	44%
Maritime Security Cutter Medium MSM	9.39	7.98	8.00	6.43	9.39	0.00	1.57	0.02	19.62%	0.22%	1.00	1.24	0.47	7.57	1.82	7.55	1.84	85%	85%	69%
Short Range Prosecutor	1.90	1.90	1.82	1.82	1.90	0.00	0.00	-0.08	0.00%	-4.20%	0.96	1.00	1.00	1.90	0.00	1.90	0.00	100%	96%	96%

TERMINOLOGY: Definitions and Formulas

BAC	Budget At Completion - total budget for total contract thru any given level
PV (BCWS)	Planned Value or Budgeted Cost for Work Scheduled -- Value of work planned to be accomplished
EV (BCWP)	Earned Value or Budgeted Cost for Work Performed -- Value of work accomplished
AC (ACWP)	Actual Cost or Actual Cost of Work Performed -- Cost of work accomplished
EAC	Estimate At Completion - Estimate of total cost for total contract thru any given level;
VAC	Variance at Complete
CV	Cost Variance (in $Millions)
SV	Schedule Variance (in $Millions)
CV%	Cost Variance: Percent of total performance (EV) that is a variance (i.e. 1K CV on 10K EV = 10%)
SV%	Schedule Variance: Percent of the total BCWS to date that is a variance (i.e. 1K SV on 10K PV = 10%)
SPI	Schedule Performance Index: Measures Schedule Effeciency (<1.00 = behind schedule, >1.00 = Ahead); SPI = EV/PV
CPI	Cost Performance Index: Measures Cost Effeciency (<1.00 = Overrun, >1.00 = Underrun); CPI = EV/AC
TCPI eac	To Complete Performance Index - Efficiency needed from 'time now' to achieve an EAC
EAC cpi	Estimate at complete if current efficiency level continues through remainder of program (BAC/CPI)
VAC cpi	= BAC - EAC cpi (i.e. Air is 335.98 - 326.2)
EAC comp	= AC+(BAC-EV)/(SPI*CPI)
VAC comp	= BAC-EACcomposite
% Schedule	= PV to date/BAC
% Complete	= EV to date/BAC
% Spent	= AC to date/BAC