



U.S. House of Representatives
Committee on Transportation and Infrastructure
Washington, DC 20515

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September 14, 2012

MEMORANDUM

TO: Members, Subcommittee on Coast Guard and Maritime Transportation

FROM: Staff, Subcommittee on Coast Guard and Maritime Transportation

RE: Hearing on “The Challenges of Maintaining Legacy Assets Pose to United States Coast Guard Mission Performance”.

PURPOSE

On Thursday, September 20, 2012, at 2:00 p.m., in 2167 Rayburn House Office Building, the Subcommittee on Coast Guard and Maritime Transportation will hold a hearing to examine the challenges the Coast Guard faces maintaining its legacy assets and how those challenges impact the Service’s mission performance.

BACKGROUND

The Coast Guard began a process of replacing its aging vessels and aircraft in the late 1990’s. The program’s focus was those assets that carry out missions farther than 50 miles from shore, as well as the modernization of the information technology systems that the Service relies upon to coordinate its operations. The program was known as the Integrated Deepwater System (Deepwater). To manage the acquisition program, the Coast Guard contracted with a Lockheed Martin/Northrop Grumman team, called the Integrated Coast Guard System (ICGS).

Deepwater encountered significant quality and cost issues. It was the subject of several hearings and an investigation by the Committee. It was also the subject of review by the Government Accountability Office (GAO) and the Department of Homeland

Security’s Inspector General. Accordingly, the Coast Guard terminated the Deepwater contract with ICGS and is now performing the acquisition functions in-house.

The problems with Deepwater led to considerable delays in the delivery of new and refurbished assets. The Service does not expect to complete its recapitalization of legacy assets until the mid-2030’s, approximately ten years behind the 2004 Deepwater baseline schedule. In the meantime, the Service’s legacy vessels and aircraft are either approaching, or have exceeded, their intended service lives. The age of the legacy assets, coupled with increased operations tempos, have led to increased rates of failure among the assets’ parts and major systems. This, in turn, has increased scheduled and unscheduled maintenance costs and reduced patrol hours which have negatively impacted operational readiness and mission performance.

Legacy Vessels

The Coast Guard currently operates a total of 77 legacy vessels. This includes:

- 9 378’ High Endurance Cutters (HEC) with an average age of 42.8 years and an estimated service life of 40 years;
- 13 270’ Medium Endurance Cutters (MEC) with an average age of 25 years and an estimated service life of 30 years;
- 14 210’ MECs with an average age of 45.3 years and an estimated service life of 47 years;
- 41 110’ Patrol Boats (PB) with an average age of 23.1 years and an estimated service life of 20 years.

Condition of Legacy Vessels

The Coast Guard regularly conducts a variety of inspections and assessments of the condition of its legacy vessel fleet. In its report entitled “Legacy Vessels’ Declining Conditions Reinforce Need for More Realistic Operational Targets” (GAO 12-741), the GAO reviewed these assessments and found systems critical to the operation of the legacy vessels has been increasingly prone to mission-degrading casualties. The most common mission degrading casualty for the legacy vessel fleet in fiscal years 2010 and 2011 were the main diesel engines.

Legacy Vessel	FY 2010 Top Mission Degrading Casualty	FY 2011 Top Mission Degrading Casualty
378’ HEC	Main Diesel Engines	Main Diesel Engines
270’ MEC	Diesel Generators	Main Propulsion Control
210’ MEC	Main Diesel Engines	Main Propulsion Control
110’ PB	Main Diesel Engines	Main Diesel Engines

Coast Guard maintenance managers for the HEC and MEC fleets reported to the GAO that with the vessels nearing the end, or exceeding, their services lives, the

performance of critical systems have been increasingly unpredictable. The GAO also noted that repairs to these systems have a relatively high rate of failure. For instance, in fiscal years 2009 and 2010, the Service spent approximately \$200,000 to rebuild several HEC main diesel engines. However, some of the engines broke down within a short period of time because other parts of the engines, not included in the rebuild, failed.

Increasing Maintenance Costs

The Coast Guard uses two metrics to track annual depot level maintenance expenditures: scheduled and unscheduled maintenance. Scheduled maintenance denotes planned activities based on historical maintenance needs of the vessel class. Unscheduled maintenance specifies unplanned, episodic activities conducted in response to part or system failures which adversely affect the asset's ability to conduct missions. The Service also tracks deferred maintenance. Deferred maintenance is the value of any planned depot level maintenance that did not start on schedule and did not commence before the last day of the fiscal year.

The GAO found that scheduled maintenance expenditures generally rose for the legacy vessel fleet from fiscal years 2007 through 2011. From fiscal years 2008 to 2011, scheduled maintenance costs increased from \$46.1 million to \$61 million, a 32 percent increase. The GAO found that unscheduled maintenance costs varied by legacy vessel class from fiscal years 2007 through 2011. However, with the exception of the PBs, unscheduled maintenance represented at least 20 percent of the total maintenance expenditures for the rest of the legacy fleet in fiscal year 2011. Finally, while the total value of deferred maintenance for the legacy fleet has fallen in recent years, – largely due to Congress appropriating more than was requested by the administration – it continues to grow for the PBs (by 68 percent from fiscal years 2010 to 2011) and for the MECs (by 112 percent from fiscal years 2010 to 2011).

Increases in maintenance expenditures for the legacy fleet are largely the result of the age of the vessels. In addition to the increased frequency of part or system failures which comes with age, many parts are obsolete and need to be reengineered by the Coast Guard or remanufactured by a supplier at considerable cost.

Operating Below Target Levels

The Coast Guard uses several metrics to track and assess whether its assets are operating at planned levels.

Operational Percent of Time Free of Major Casualty:

The Coast Guard primarily uses the operational percent of time free of major casualties (OpPOTF) as a measure of the physical condition of its legacy vessel fleet. After reviewing OpPOTF data for fiscal years 2005 through 2011, the GAO found the legacy fleet as a whole generally remained well below target levels.

The Coast Guard has an annual OpPOTF performance target of 72 percent for HEC and MEC fleets, and a performance target of 86 percent for the PB fleet. From fiscal years 2005 through 2011, the HECs only averaged 44 percent OpPOTF, while the MECs averaged 59 percent OpPOTF. The OpPOTF for the PB fleet from fiscal years 2005 through 2011 never exceeded 63 percent.

Lost Cutter Days:

Each year, the Coast Guard tracks lost cutter days, which are the number of planned operational days that the HEC and MEC fleets are unavailable to conduct operations, typically due to unscheduled maintenance. Lost cutter days are a primary indicator of operational readiness. The GAO found that the HECs and MECs collectively lost 3,710 cutter days from fiscal years 2006 through 2011, an average of approximately 618 lost cutter days per year. Specifically, the HEC fleet lost 2,791 cutter days from fiscal years 2006 to 2011. For fiscal years 2009 through 2011, the HEC fleet lost 1,895 cutter days, the equivalent of three HECs being out of service each of those fiscal years. The MEC fleet lost 919 cutter days from fiscal years 2006 through 2011.

Operational Hours:

The Coast Guard sets targets for the number of hours each asset is expected to be operational on an annual basis. The GAO found the operational hours for the HEC, MEC, and PB fleets have generally declined since fiscal year 2005. For instance, in fiscal year 2011, the legacy fleet's cumulative target for operational hours was 222,740, yet the actual number of operational hours achieved was 180,202, about 23 percent less. Specifically, the HEC fleet did not meet the Coast Guard's operational hour target in any year from fiscal year 2005 through 2011, declining by about 32 percent from fiscal year 2008 to 2011. The MEC fleet also generally did not meet its operational hour targets, with only the 270-foot MECs meeting their targets in fiscal year 2008, and the total operational hours of the 270-foot and 210-foot MEC classes combined declining nearly 21 percent from fiscal year 2007 to fiscal year 2011. The 110-foot PB fleet did not meet operational hour targets in five of the last seven fiscal years, averaging 16 percent below targets.

Impact on Operations

Coast Guard officials reported to the GAO that the declining ability of its legacy fleet to meet operational performance targets has been the prime contributor to the Service's diminishing ability to meet its mission needs, including the interception of threats, such as illegal narcotics before they reach U.S. waters. The Coast Guard has noted that the failure of the HEC fleet to fulfill planned cutter days and meet its OpPOTF targets has reduced the Service's ability to conduct operations in Alaska and has reduced the hours spent conducting drug interdiction activities by 65 percent from fiscal years 2007 through 2010. The Service also noted that the decline in the MEC fleet's operational hours has undermined its alien interdiction mission. From fiscal years 2007 through 2010, the number of operational hours spent conducting alien interdiction activities declined by 40 percent and the number of migrants interdicted dropped by 1,000.

There has also been a growing amount of anecdotal evidence of the extent to which failing legacy assets are impacting operations. For example, in the aftermath of the Haiti earthquake in 2010, the Coast Guard reported that 10 of the 12 legacy vessels deployed to Haiti to assist in humanitarian relief operations suffered severe failures of parts or systems, which diminished their availability to deliver emergency aid and perform medical evacuations.

Coast Guard Actions to Address the Situation

The Coast Guard has implemented several strategies to improve the condition of its legacy fleet, reduce maintenance costs, and mitigate the impact lost operational capacity is having on its missions.

New Maintenance Command Structure:

In 2009, the Coast Guard reorganized its maintenance command structure with a focus on standardization of practices. Under the reorganization, the Service eliminated two commands which managed the maintenance and logistic for its legacy vessels and replaced them with a centralized command structure, the Surface Forces Logistics Center (SFLC). Under the SFLC, a single manager oversees the maintenance of an entire class of vessels. This has improved the oversight of the condition of the vessels, provided unified support to procure parts, and centralized maintenance plans and schedules for the fleets. Having better understanding of the conditions and status of the entire fleet enables the Service to prioritize preventive maintenance and identify maintenance trends.

Mission Effectiveness Projects:

The Coast Guard is nearing completion of Mission Effectiveness Projects (MEP) for the MECs and PBs which began in fiscal year 2005 and cost \$450 million. The MEPs are sustainment projects intended to improve the legacy vessels' operating and cost performance by replacing obsolete, unsupportable, or maintenance-intensive equipment that had been key sources of degraded performance.

The Coast Guard completed the MEP on the PBs in September 2010. The scope of the MEP for the PBs was considerable, but not all vessels in the fleet underwent sustainment work. The Coast Guard refurbished only 17 of the 41 PBs in the fleet. The Service replaced significant areas of hull plate and internal structures where corrosion is present, overhauled the engines, upgraded the propulsion control systems, and installed new generators, air conditioners, water makers, and fire suppression systems. The Service planned to conduct a MEP on 21 PBs, but scaled back the program in response to budget concerns and the acceleration of the Fast Response Cutter (FRC) acquisition (see below).

The scope of the MEP for the MECs focuses on upgrading selected systems, rather than the almost complete overhaul that the PBs received. MEC work includes replacement of primary sources of degraded equipment, such as the main propulsion control and monitoring system, small boat davits, and air conditioning systems, but does not involve the replacement of main diesel engines. As of July 2012, the Service had

completed work on all 14 210' MECs and six of the 13 270' MECs. The project is scheduled to be complete in fiscal year 2014.

Fast Response Cutter Acceleration:

Under the Deepwater program, ICGS proposed to extend the service life of the PB fleet by conducting an overhaul of the vessels, and improve the PB's capability by lengthening its hull by 13 feet and adding a stern launch system for small boats. The conversion of the PBs was supposed to extend its service life through 2020 when ICGS would begin fielding a replacement vessel made from a composite hull. In May 2007, the Coast Guard was forced to abandon the project and decommission the eight converted PBs after the hulls buckled in operational testing. The U.S. government is still trying to recover from ICGS the \$96 million spent on the project.

With the failure of the conversion project and the loss of eight PBs, the operational hours of the PB fleet suffered. In June 2007, the Coast Guard solicited industry for a replacement vessel for the PB. To reduce the time it would take to acquire the new asset, the Service stipulated that the design for the replacement would have to be a "parent-craft", meaning a vessel design already tested and in production somewhere in the world. In September 2008, the Coast Guard awarded a contract to Bollinger Shipyards of Lockport, LA, to build up to 34 FRCs based on a patrol boat design in use by the Netherlands. To date, three FRCs are in service.

The President's fiscal year 2013 budget request proposes to withhold up to \$139 million provided by Congress in fiscal year 2012 to construct six new Fast Response Cutters (FRC), opting instead to construct four FRCs in fiscal year 2012. The Service then proposes to combine the withheld \$139 million from the fiscal year 2012 appropriations with an additional \$139 million requested in fiscal year 2013 to construct four FRCs in fiscal year 2013. H.R. 5855, the Homeland Security Appropriations Act for fiscal year 2013 rejects the Administration's request to delay the acquisition of the FRC by directing the Coast Guard to build six FRCs in fiscal year 2012. The bill also provides funding to acquire an additional four FRCs in fiscal year 2013.

High Tempo High Maintenance Operations:

In response to growing operational hour shortfalls in the PB fleet, the Coast Guard began the High Tempo High Maintenance (HTHM) operations in February 2007. Under HTHM, eight PBs were double crewed and received increased maintenance evolutions to keep the vessels operational for double the programmed operational hours (approximately 14,000 hours). The President's fiscal year 2013 budget request proposes to terminate the HTHM program and return the eight PBs to pre-HTHM operational hours, which will exacerbate the growing gap in operational capacity.

Accelerated Asset Decommissionings:

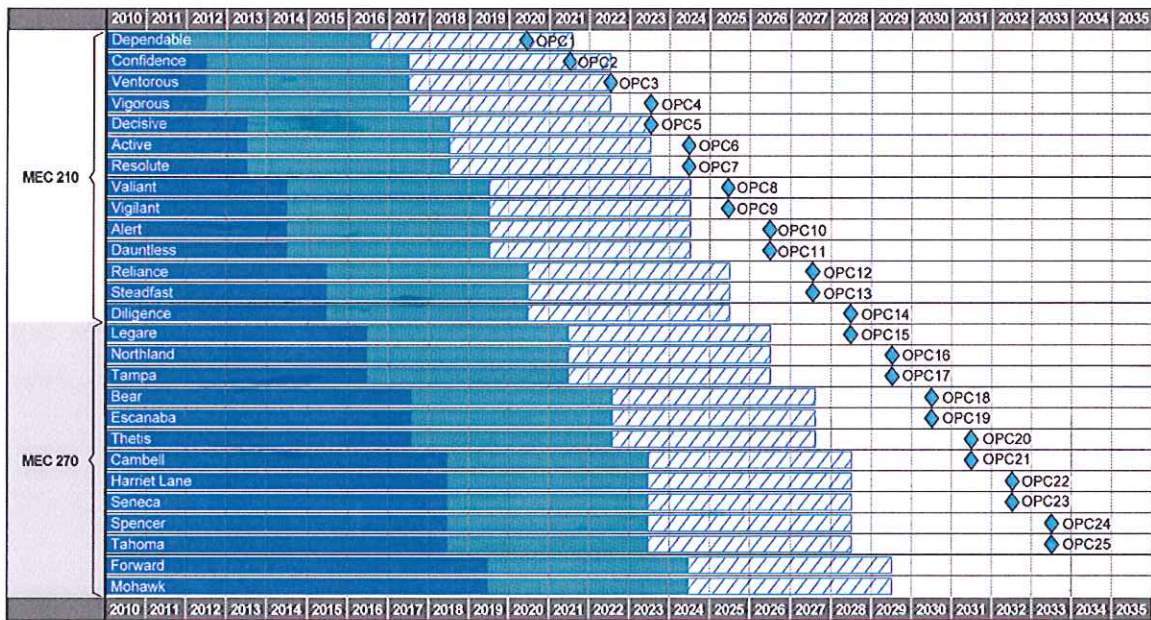
In fiscal year 2011, in an effort to reduce growing maintenance expenditures, the Coast Guard began accelerating the decommissioning of certain legacy vessels before all of their replacements were delivered. To date, the Service has decommissioned 3 HECs,

1 MEC, and 3 Navy-owned 179' patrol boats the Service had operated. The decommissionings saved the Service approximately \$13 million in maintenance costs.

The President's fiscal year 2013 budget request proposes to decommission an additional 2 HECs, as well as 3 PBs. These decommissionings would save the Service approximately \$5 million in maintenance costs.

Future Operational Capacity Gaps

Delays in the delivery of replacement vessels, the accelerated pace of legacy asset decommissionings, and the growing rate of legacy asset failures is exacerbating the operational capacity gap. The problem is especially acute in the MEC fleet. Under the Coast Guard's current recapitalization plans, the MECs will be in service into the mid-2030's before the fleet will be fully replaced by the new Offshore Patrol Cutter (OPC). However, the MEP for the MECs will not extend the service life of the MECs until that time. The Coast Guard has informed staff it is convening a Ship Structure Machinery Engineering Board later this year to begin the process of evaluating the current condition of the MEC fleet and examine ways to extend the fleet's service life. H.R. 5855, the Homeland Security Appropriations Act for fiscal year 2013, includes \$5 million to survey the condition of the MEC fleet in anticipation of an additional MEP.



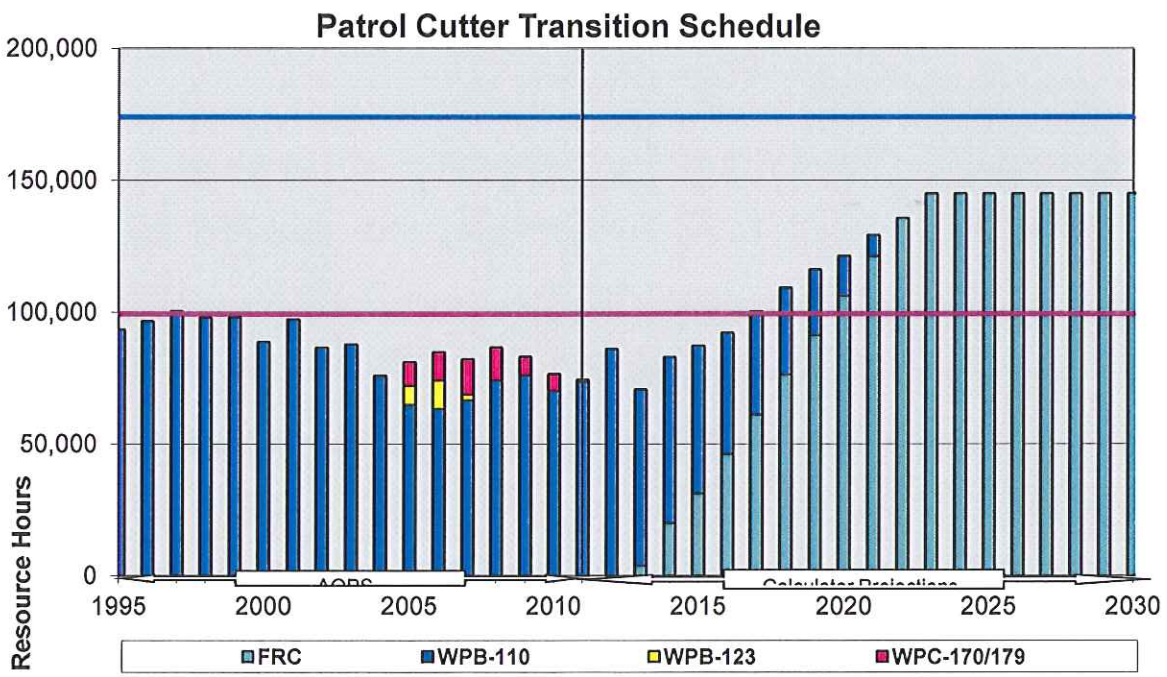
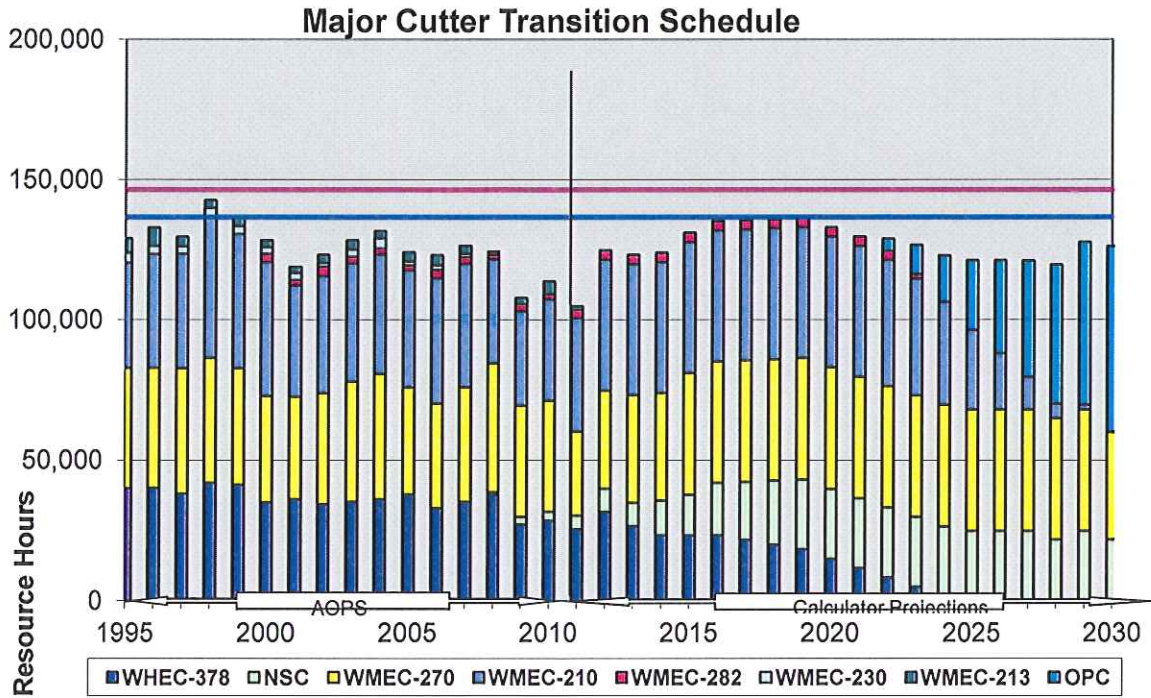
Years of potential MEC capacity gap

- End of extended service life if MEP provides up to 5 additional years
- End of extended service life if MEP provides up to 10 additional years
- End of extended service life if MEP provides up to 15 additional years
- Projected delivery date of OPC

Source: GAO analysis of Coast Guard documents

Other factors are affecting the operational capacity gap include: uncertain future funding levels for new and refurbished assets; the final numbers of new and refurbished assets that will be acquired; as well as whether the Coast Guard will proceed with plans to implement a crew rotation system for the HEC's replacement, the National Security Cutters (NSC). The Service's five year Capital Investment Plan (CIP) does not include funding to acquire the planned 7th and 8th NSCs. If these NSCs are not acquired or their deliveries are delayed, it is unclear how that would affect the decommissioning schedule for the HECs, and whether the Service would need to increase the planned buy of OPCs to cover the operational capacity gap. Furthermore, the program of record governing the acquisition of the NSC assumes eight NSCs will achieve more operational capacity than the 12 HECs they are replacing, but this is predicated on the Coast Guard operating the NSCs for 230 days a year. The only way to achieve 230 days away from homeport is to rotate the NSCs' crews on a regular basis. However, the Coast Guard is now reevaluating this concept over concerns about cost and impact on servicemembers' morale.

The Coast Guard tracks the impact on operational capacity of the transition from legacy assets to new and refurbished assets in the Transition Schedule charts below. The chart includes two horizontal lines which represent the operational hour goals for the assets based on a mission needs statement (MNS). The MNS helps the Service determine the amount of capability, including operational hours, it needs to get out of its assets to successfully conduct its 11 statutory missions. The red horizontal line represents the number of hours needed to meet the Service's mission demands in 1998. The blue horizontal line represents the number of hours needed to meet the post-September 11th mission demands. Both charts assume steady maintenance and acquisition funding for new assets, as well as the acquisition of all eight NSCs and the implementation of the NSC crew rotation concept. Even under those scenarios, the Service will fall tens of thousands of hours short of the operational hours needed to meet its post-September 11th mission demands.



GAO Recommendations

The GAO report produced two recommendations for the Coast Guard. The first recommendation was for the Service to adopt the GAO's best practices for cost estimating its annual depot-level maintenance expenditures. The Coast Guard concurred

with this recommendation and states it has already begun implementing these best practices with the use of its Fleet Logistics System and Asset Logistics Management Information System.

The GAO also recommended the Coast Guard adjust legacy vessel fleet operational hour targets to levels that reflect actual capacity. The GAO contends this would ensure the Service can more efficiently allocate available resources and enable them to set achievable performance goals. The Coast Guard does not concur with this recommendation. The Service states that reducing the operational hour targets would fail to fully utilize those assets not impacted by maintenance issues. The Service further argues that from an operational planning perspective, reducing the operational target would result in a “lost opportunity” for capital assets that are fully able to conduct Coast Guard missions.

WITNESSES

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