

Orion's Force Class Ship

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ABSTRACT

The United States Navy submitted a request for proposals (RFP) for a new class of surface ships titled Force Class Ship. Orion Industries submitted a proposal for their design which they have titled Orion Force Class Ship. In Orion's proposal they have detailed how their proposed design provides all the capabilities categorized as "NEEDED" by the Navy in the RFP, as well as how their design contains the capabilities listed as "LIKES" that they have deemed provide the most value and lethality to their design. Orion's design provides all the expected technical features from a deep water surface ship and exceeds by providing all but one of the "LIKES" the Navy defined in the RFP.



PROBLEM

In response to a congressional inquiry into the current operational capabilities of the Navy it was determined that the Navy needs to increase from 308 vessels in 2014 to 355 in the next 30 years [1]. As part of this inquiry it was determined that the major surface ship force protection gap falls in the large, multi-mission, surface combatants as shown on Table 1.

Table 1
2016 Navy Nation Needs [1]

| Type / Class | 2014 FSA | 2016 NNN |
|---|------------|------------|
| Ballistic Missile Submarines ¹ | 12 | 12 |
| Aircraft Carriers ² | 11 | 12 |
| Attack Submarines | 48 | 66 |
| Guided Missile Submarines ³ | 0 | 0 |
| Large, Multi-Mission, Surface Combatants | 88 | 104 |
| Small, Multi-Role, Surface Combatants | 52 | 52 |
| Amphibious Warfare Ships | 34 | 38 |
| Combat Logistics Force | 29 | 32 |
| Command and Support | 34 | 39 |
| Total | 308 | 355 |

Understanding the capability gaps assessed by congress, the Navy produced an RFP for a new class of ship they have called Force Class Ship. The Navy intends to award the contract to the best value proposal for the design and build of the first 10 ships. In the RFP the Navy provided two categories of capabilities that they are looking for in the Force Class ships. The first category being the "NEEDED" capabilities which are the non-negotiable capabilities, meaning these are a must; and the second category being the "LIKES" capabilities which are nice to have but not technically needed to be the winning proposal.

In response to the Navy RFP, Orion Industries has decided to develop a proposal for their take at designing a Force Class Ship which they have called Orion's Force Class Ship. Orion Industries design will contain all the capabilities that the Navy has deemed as "NEEDED" and the "LIKES" they have determined provide the most value based on a trade-off analysis. This report contains the capabilities provided by Orion's Force Class Ship and proves how Orion's design provides the best value design for the Navy.

UNDERSTANDING THE NAVY RFP

Table 2
"NEEDED" Capabilities

| Functional Area | Capabilities | |
|---------------------|-----------------------------|---|
| General/Operational | Speed | 20 knots transit, 30 knots accelerate |
| | Manning Capacity | 150 Sailors |
| | Area of Operation | Deep water |
| Structural | Operating Life | 35 Years |
| Propulsion | Range (without refueling) | 500 nautical miles |
| | Firefighting | Spaces need to be compartmentalized so that fire does not transmit between spaces |
| Auxiliary | Ventilation | Ventilation and air conditioning needs to be supplied to sailor's quarters at 75 degrees F in the cooling season and 55 degrees in the heating season |
| | Galley | Food, potable water and sanitation services is to be provided to the crew |
| | Entertainment | Five lounge and recreation areas need to be provided in the ship. Each lounge area needs to provide the capacity of 15 sailors at a time |
| | Power | The entire ship needs to be provided with electrical and back electrical services. Back up electrical services need last for 3 hours |
| Electrical | | Capability to communicate with other ships in the squadron, land and satellite communications |
| Communication | Within the ship and outside | |
| | Defense | Air, land and underwater defense |
| Weapons | Attack | Air and land attack |

Table 3
"LIKES" Capabilities

| Functional Area | Capabilities | |
|-------------------------------|---|--|
| General/Operational | Manning Capacity | 150 Sailors + 50 additional sailors |
| Propulsion | Range (without refueling) | 500 + 1000 nautical miles |
| Auxiliary | Modify as required | |
| | Weapons | Provide space and weight reservation for 24 cells of vertical launch system (VLS) Provide space, weight and energy reservation for laser gun Provide space, weight and energy reservation for rail gun |
| Electronic Warfare and Decoys | AN/SLQ-32(V)2 Electronic warfare System | |
| | AN/SLW-25 Nixie Torpedo Countermeasures | |

ORION'S APPROACH

Orion Industries has been a government contractor for years and has provided services to the US Government such as engineering and administrative services. In preparation of the proposal, Orion has ensured to understand and analyze the expectations of preparing and submitting a government proposal by providing its employees with specialized proposal preparation training as a refresher [2]. Additional measures taken by Orion for the preparation of the RFP is studying current Navy ships and assessing the capabilities provided by the ships currently in the Navy fleet [3]-[4]. This information will be used as a baseline for the development of the capabilities the Navy has stated are "NEEDED" and the achievable "LIKES" that Orion is able to provide. Orion is able to do this because the Navy requested the capabilities but did not provide the means as to how the capabilities will be achieved. This falls completely on the agency developing the proposal.

HOW TO WIN THE NAVY CONTRACT

In an effort to ensure that the Orion design contained all the "NEEDED" and optimized the "LIKES" provided in the RFP, a systematic approach was taken at developing a solution. This approach entailed starting from the basics, such as defining the Orion Force Class Ship Team, to performing an in-depth analysis, such as the trade-off analysis performed to determine the "LIKES" that could be provided.

DEFINING THE TEAM

After getting the refresher in providing proposals and understanding the current capabilities of the Navy Fleet, the Orion Force Class Ship Team (hereinafter referred to as Team) first needed to ensure that the Team was properly staffed and divided to assess the functional areas of the proposal. At the time this meant performing a high level analysis of the "NEEDED" capabilities and determining which functional areas would require the most attention, hence the most capable staffing. Looking at Table 2, it can clearly be seen that a weighted average of the capabilities can be performed to determine how to properly staff the Team. Figure 1 details the weighted average of the capabilities detailed in the RFP and it can clearly be seen that the brunt of the work falls on the auxiliary division. This is the section of the Team that had to be staffed most robustly.

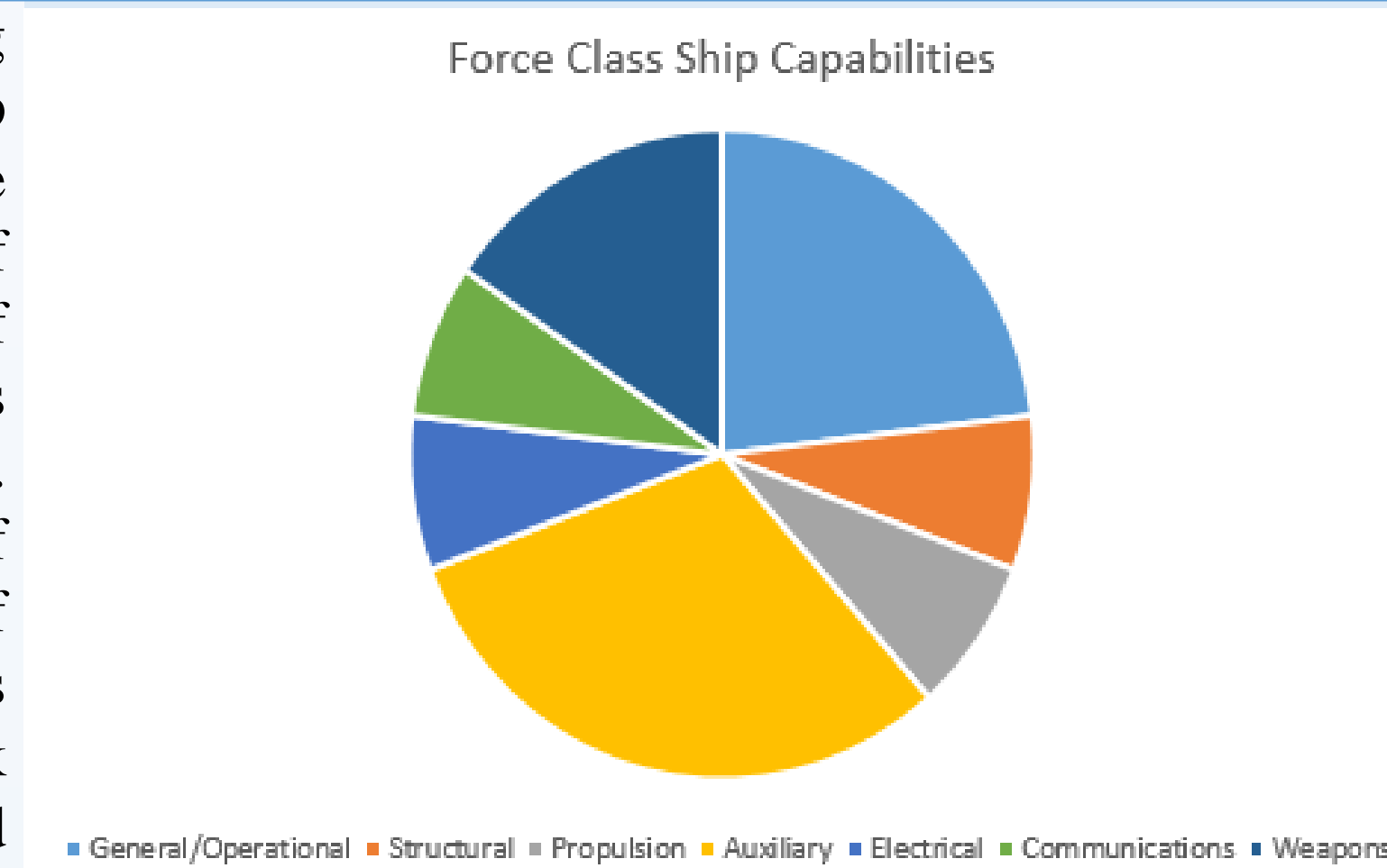


FIGURE 1
"Force Class Ship Capabilities Weighted Average"

PROVIDING THE "NEEDED" CAPABILITIES

Orion's approach to provide the "NEEDED" capabilities was to utilize Navy approved design and standards in as many systems as possible. In doing so proving that the Orion's Force Class Ship is a trusted design from its inception. Table 4 contains how Orion will be providing the "NEEDED" capabilities only.

Table 4
Orion's Design for "NEEDED" Capabilities

| Functional Area | Orion's Design |
|-----------------------------|---|
| Speed | Four LM 2500+ gas turbine |
| Manning Capacity | Navy approved berths will be used in the design |
| Area of Operation | Ship size: 32 ft. draft, 515 ft. length |
| Operating Life | Made of Steel |
| Within the ship and outside | Navy approved standards will be utilized for the design of the system. |
| Weapons for Defense | Short range air and land: 47 mm gun |
| | Long range air and land: SeaRAM anti-ship missile defense system Aegis Ballistic Missile Defense System |
| Weapons for Attack | Underwater: Unmanned underwater will be used to survey and defend the ship Tomahawk missiles Mark 32 torpedoes |
| | Air - tomahawk missiles |
| | Air and land - harpoon missiles |

PROVIDING THE "LIKES" CAPABILITIES

A trade-off analysis was performed by the Team and they analyzed which of the seven "LIKES" that the Navy provided in the RFP would provide the most value to the Orion Force Class ship. The Team analyzed current capabilities of Navy ships and current threats in the World and it was determined that all "LIKES" capabilities except one really provide a great value for the Orion Force Class ship while improving lethality which is something the Navy is always looking to improve. Table 5 provides the "LIKES" the Orion Force Class Ship will contain and how they will be provided. Table 5 also details how the Auxiliary systems capabilities will be provided including the "LIKES".

Table 5
Orion's Design for "LIKES" Capabilities

| Functional Area | Orion's Design |
|-------------------------------|---|
| Propulsion Range | Tanks will be sized for 1500 nautical miles of fuel |
| Auxiliary/Firefighting | The system will be designed and sized to include the higher demand required due to the "LIKES". The following Navy approved systems will be used: Aqueous film forming foam Water mist Sea water |
| Auxiliary/Ventilation | The system will be designed and sized to include the higher demand required due to the "LIKES" |
| Auxiliary/Galley | This auxiliary section was not affected due to the "LIKES" capabilities |
| Auxiliary/Entertainment | This auxiliary section was not affected due to the "LIKES" capabilities |
| Power | The system will be designed and sized to include the higher demand required due to the "LIKES" |
| Weapons for Defense/Attack | These affect the ventilation, power and firefighting "NEEDED" capabilities |
| Electronic Warfare and Decoys | These set of "LIKES" affect the ventilation, power and firefighting "NEEDED" capabilities |

MAINTENANCE

The Navy stated that the maintenance capabilities of the Force Class ship fall completely on the developing contractors but must strictly adhere to the Joint Fleet Maintenance Manual (JFMM) [5]. Orion will provide preventative, routine and emergency maintenance procedure developed in accordance with the JFMM and will be clearly detailed in the proposal sent to the Navy.

CONCLUSION

Orion truly believes that the Orion Force Class Ship provides the Navy with the best value proposal by providing all the "NEEDED" capabilities and all but one of the "LIKES" capabilities. Orion is providing these capabilities using tried and proven Navy technologies while keeping a ship size that can clearly operate in squadrons all throughout the world. Orion's design provides all the expected technical features from a deep water surface ship and exceeds by providing all but one of the "LIKES" the Navy defined in the RFP. Orion's design provides, tried, tested and approved Navy technology therefore reducing the risk of unknown complications; making this the best value design.

REFERENCES

- [1] Office of the Chief of Naval Operations. Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2019, February 2018.
- [2] Connor, JO. (February 2014) How to Prepare Government Contract Proposals [PDF file]. U.S. Small Business Administration.
- [3] Mizakami, K. (February 2019). Here's What All the Major Surface Warships of the US Navy Actually Do
- [4] Francis, P. (May 2018). A Look Inside the Most Powerful Ships in the US Navy
- [5] Joint Fleet Maintenance Manual, Revision C Change 7. Department of the Navy, Pearl Harbor, HI, 2018