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PROJECT MEMORANDUM

IBRV Helideck Requirement *6 April 2020*

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FROM: Tim Leach
JOB/FILE NO. 19136.01

References

1. *Report of the Ad Hoc Subcommittee on the U.S. Antarctic Program's Research Vessel Procurement*, National Science Foundation - Office of Polar Programs Advisory, 14 August 2019
2. NSF ARV Capability Matrix and Scoring_13Mar2020_final.xlsx

Introduction

The original requirements for the IBRV (Reference 1) required the ability to support helicopter operations. This included landing and supporting two helicopters that can each make a 150 nm round trip with 3 passengers and 1200 lbs. of cargo, such as the Bell 214, Sikorsky S-70, or USCG HH60.

Reference 2 eliminated the requirement for the helideck. This memorandum discusses the pros and cons of requiring the vessel to support helicopter operations.

Helideck Description

Offshore vessel helideck size and strength requirements are defined by the intended helicopters to be used. These requirements also define acceptable clear approach paths to th helideck , which drives the design of the helideck arrangement. Acceptable locations are generally the bow area or aft of the house. The aft area on research vessels is prioritized for science and tends to have equipment such as cranes that could interfere with the requirements for clear air space, so recent vessels tend to locate the helideck forward. Some offshore supply vessels have helidecks elevated above the bridge. This is not practical for Arctic vessels due to icing concerns of the support structure and stability concerns. Therefore, the helideck would be located forward of the house. This approach has been used on both the R/V *Kronprins Haakon* and RSS *Sir David Attenborough*, as illustrated in Figure 1 below.

Figure 1 R/V Sir David Attenborough helideck arrangement

https://www.flickr.com/photos/rolls-royceplc/43268143642/in/photostream/

Helideck Pros

As discussed in Reference 1, a helideck could support transfer of personnel, vessel logistics, ice reconnaissance, expanded scientific reach with the vessel as a mobile science base, and emergency medical evacuations.

While these are all benefits, it is our understanding that the NBP helideck and hangar have only been used a few times in 20+ years of operation.

Helideck Cons

As shown in Figure 1, helidecks and associated hangars have a significant space requirement. The area required for the helideck tends to push the superstructure aft, reducing usable aft deck space. The hangars must be adjacent to the helideck and will reduce accommodations volume. To achieve the operational benefits of helicopter facilities, some accommodation space will need to be dedicated to pilots and mechanics.

Further space is required to accommodate firefighting and re-fueling tanks and systems that are beyond typical fixed systems on board.

A helideck, hangar, and supporting appurtenances would result in a small increase in capital cost of the vessel, primarily attributable to the firefighting and fueling systems. There will also be maintenance costs to certify and maintain the helicopter facilities.

Summary

The primary benefits of omitting the helideck from the IBRV design are significant space savings and added flexibility in arrangements. The increased flexibility will result in better aft working depth space to handle large loadouts and longer cores.