



Antarctic Research Vessel (ARV)

Engineering Report: 3D Rendering of Whooship Exterior

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Revision History

Revision #	Date	Section (if applicable)	Author/Editor	Change Details
P0	October 4, 2022	All	P. Cox	Initial draft for ASC peer review
P1	January 5, 2023	All	P. Cox	Updated 3D model to match current GA and completed six new exterior renderings.
P2	July 21, 2023	All	P. Cox	Updated 3D model to match current GA and completed five new exterior renderings.

Preliminary Design, @IDR5

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1. Executive Summary

The Antarctic Research Vessel (ARV) “3D Rendering of Wholeship Exterior” consists of five exterior renderings that depict the vessel at its current design stage. The 3D model was developed in Rhinoceros 3D (Rhino) using the ARV Hull Form 3D Model (Reference 1) and the 2D General Arrangement (Reference 2). The 3D Rhinoceros model was used to render with the V-Ray Rendering Software and then post-production was completed in Adobe Photoshop. Images were created with 4K resolution for clear display on larger formats. The selected images are appended in Section 6.

1.1. Acronyms

2D	Two dimensional
3D	Three dimensional
ARV	Antarctic Research Vessel
ASC	Antarctic Support Contractor
G&C	Gibbs & Cox, a division of Leidos
NSF	National Science Foundation

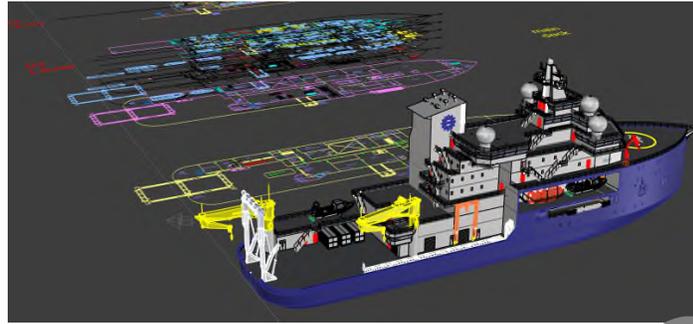
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2. Analysis Methodology

2.1. Modeling Approach

The ARV 3D hull form and ARV 2D arrangement were placed in Rhino and used to develop 3D forms.

Figure 1: ARV 3D Hull Form and 2D General Arrangement



2.2. Rendering Approach

In Rhino, a 3D environment, surfaces, and materials were created; a representative rendering is illustrated in Figure 2. Then using the V-Ray rendering software, each of the established perspective views were rendered to 4K resolution. Each of these images were then brought into Photoshop for post-production final editing. The completed renderings are listed in Table 1.

Figure 2: ARV 3D Model Prior to Rendering Using V-Ray

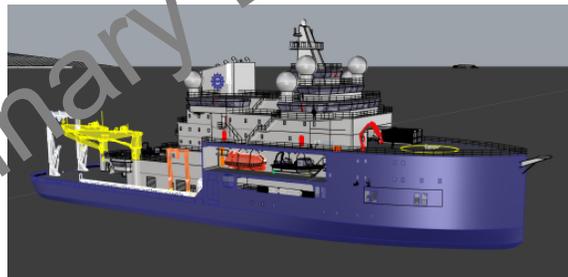


Table 1: Renderings

Image Title	Image Size	Description
ARV Perspective 1	32" x 18"	Starboard fwd perspective camera view at Level 01 height
ARV Perspective 2	32" x 18"	Starboard aft perspective camera view at Level 02 height
ARV Perspective 3	32" x 18"	Starboard midship perspective camera view at Level 03 height
ARV Perspective 4	32" x 18"	Starboard aft perspective camera view at aerial view height

ARV Perspective 5	32" x 18"	Port midship perspective camera view at level 03 height
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3. Software

The software programs used for these renderings are listed in Table 2.

Table 2: Software Programs

Program	Use
Rhinoceros 3D version 7	3D modeling and preparing for rendering
V-Ray	Rendering
Photoshop	Post-production editing

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4. Conclusions and Recommendations

This document details the “3D Rendering of Wholeship Exterior” renderings and processes. These renderings serve to present the current ARV design in a realistic manner to allow viewers the means to visualize how the final product could look.

5. References

- 1) *ARV_Hullform_DR2_V6_9.1* (Rhinoceros 3dm file)
- 2) *5E1-001-D001 General Arrangement Rev P4 PDF* (AutoCAD DWG file)

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6. Appendix 1: Exterior Renderings

Figure 3: ARV Perspective 1 – Starboard fwd perspective camera view at Level 01 height



Figure 4: ARV Perspective 2 – Starboard aft perspective camera view at Level 02 height



Figure 5: ARV Perspective 3 – Starboard midship perspective camera view at Level 03 height



Figure 6: ARV Perspective 4 – Starboard aft perspective camera view at aerial view height



Figure 7: ARV Perspective 5 – Port midship perspective camera view at level 03 height

