

# ROGER REVELLE MIDLIFE REFIT OVERHAUL

FIC

9 JULY 2018



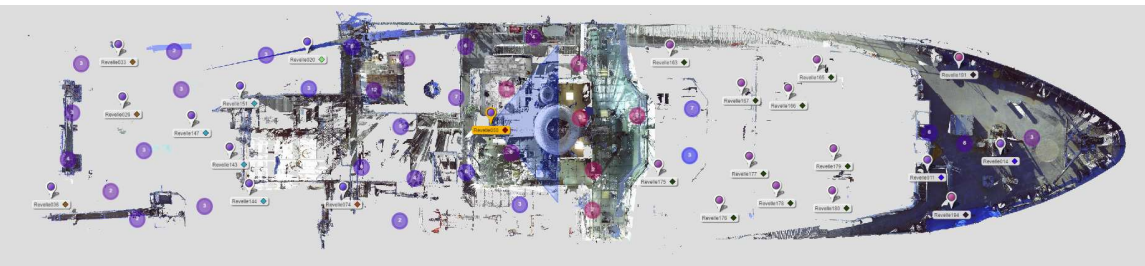
# Ship Check: 3D Scanning

For specialized project sites that either lack sufficiently detailed plans or require a high level of layout accuracy. Scans provide the basis for development of the virtual model for unparalleled accuracy.

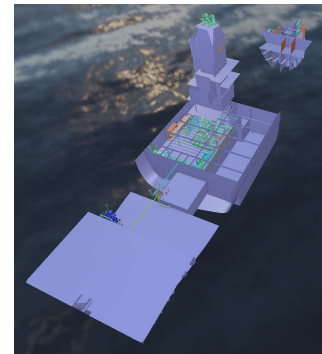
## Scanning



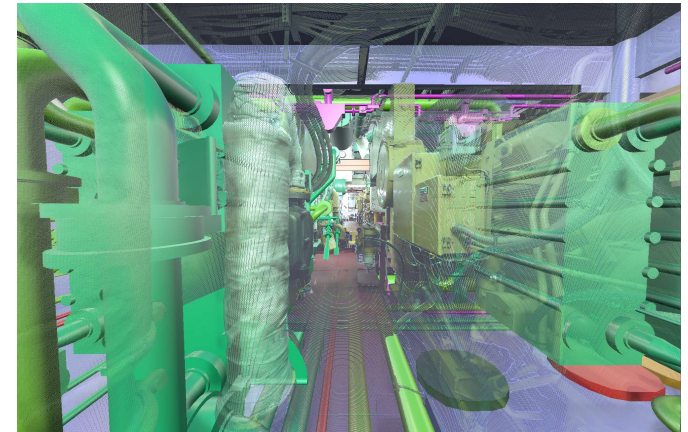
- Infrared laser scanner with 2mm accuracy at a range of 330m
- Multiple scans are combined creating encompassing scan of ship spaces



## Modeling



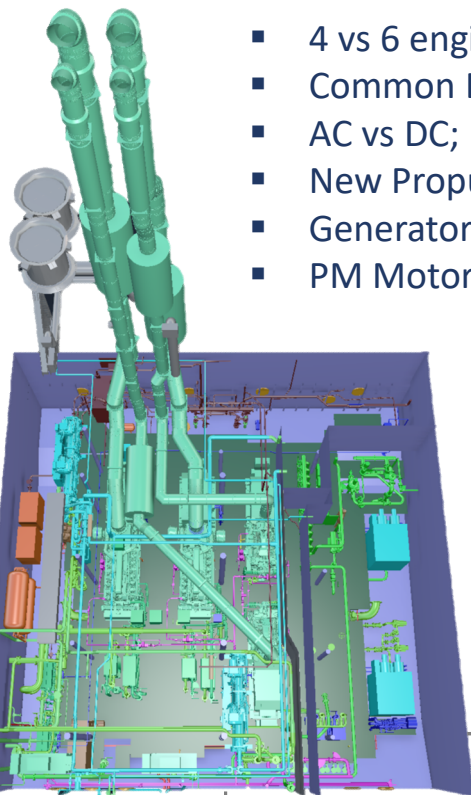
- 3D models reference scan data creating precise representations
- Actual scan data overlays 3D model data showing as-is and to-be conditions



## Roger Revelle Three Major Changes

### Repower

- 4 vs 6 engines
- Common Bus vs. Split Bus
- AC vs DC; Drives and Motors
- New Propulsion Transformers
- Generator Freshwater Cooling
- PM Motor Freshwater Cooling

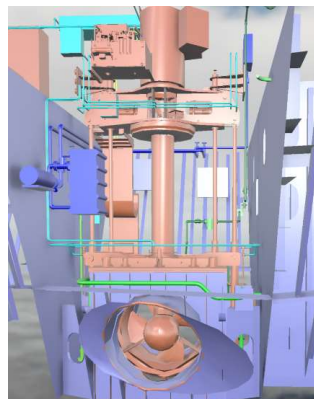


To SWBD Room

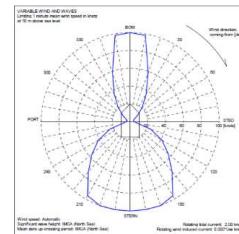
To PM Room

### Bow Thruster Replacement

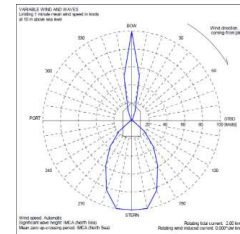
- ZF Marine vs Tees White Gill



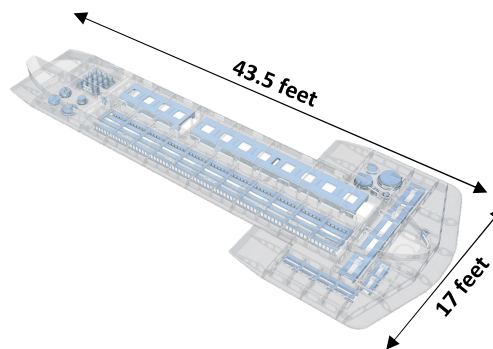
to this...



...from this



### Gondola



Suspended sensor housing vs hull mounted. Improved performance via reduced bubble over arrays.

# Scope of Work

## 15 WPs. Criteria:

1. Considered critical to extending life
2. Or required to facilitate work that is critical
3. Or directly traceable to “green” goals

## 9 WPs. Criteria:

1. Considered a major contributor life-extension
2. And best completed while other invasive work is ongoing

## 4 WPs. Criteria:

1. Reduces inspection risk
2. Or improves science capability

## 11 WPs. Criteria:

1. Considered a non-major contributor to life extension
2. And more easily completed during future maintenance windows

Priority	WP	Name
1	1	Repower
1	2	Bow Thruster Replacement
1	5	Z-Drive Inspection and Maintenance
1	6	Ballast System Piping
1	7	Ballast Treatment System Installation
1	8	Firemain System Piping Replacement
1	9	Potable Water System Modifications
1	12	Chiller Replacement
1	13	Sewage System and Drain Replacement
1	14	Ship Stores Refrigeration Equipment Replace
1	23	Ship Service Transformer Upgrades
1	30	Oily Water Separator (OWS) Replacement
1	34	Overhead Lighting Upgrades
1	36	Drydocking
1	38	Multibeam Gondola
2	16	Uncontaminated Seawater System Modifications
2	35	Steel Replacement
2	37	General Maintenance
2	10A	A/C Spaces General
2	10B	A/C Controls Upgrades
2	10C	AHU-5 Zone Redesign
2	10E	AHU-2 Makeup Air Upgrades
2	11A	HVAC Makeup Air Upgrades
2	32	Crane Replacement
3	15	Science Refrigeration System Modifications
3	27	Bridge Wing Console Maintenance
3	28	Exterior Ballast and Fuel Tank Vent Modifications
3	11C	Laundry Room Dryer Vent Modifications
4	17	Public Address System Modifications
4	18	Dial Telephone System Modifications
4	20	Navigation Lighting System Modifications
4	21	Fire Detection System Modifications
4	24	Aft Control Station Console Removal
4	25	Computer Lab Console Modifications
4	29	Hydraulic Oil Transfer Pump Installation
4	31	Bosun Stores Access Modifications
4	33	Anchor and Chain Maintenance
4	10D	Bow Thruster Room Air Conditioning
4	11B	Generator Room Supply Fan Noise Mitigation

Not shown in table is the Contract Technical Specification, S-01 (different from a Work Package).

It directs the contractor on general administrative, technical and testing requirements related to the project.