

The RRS *Sir David Attenborough*: Capability and Update

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NEW POLAR RESEARCH VESSEL

The UK is Building a New £225 million Ship

The RRS Sir David Attenborough will be:

The UK's largest ever investment in polar science since the 1980s

The largest civil ship to be built in the UK since the 1980s

The UK's (and one of the world's) most advanced research vessel

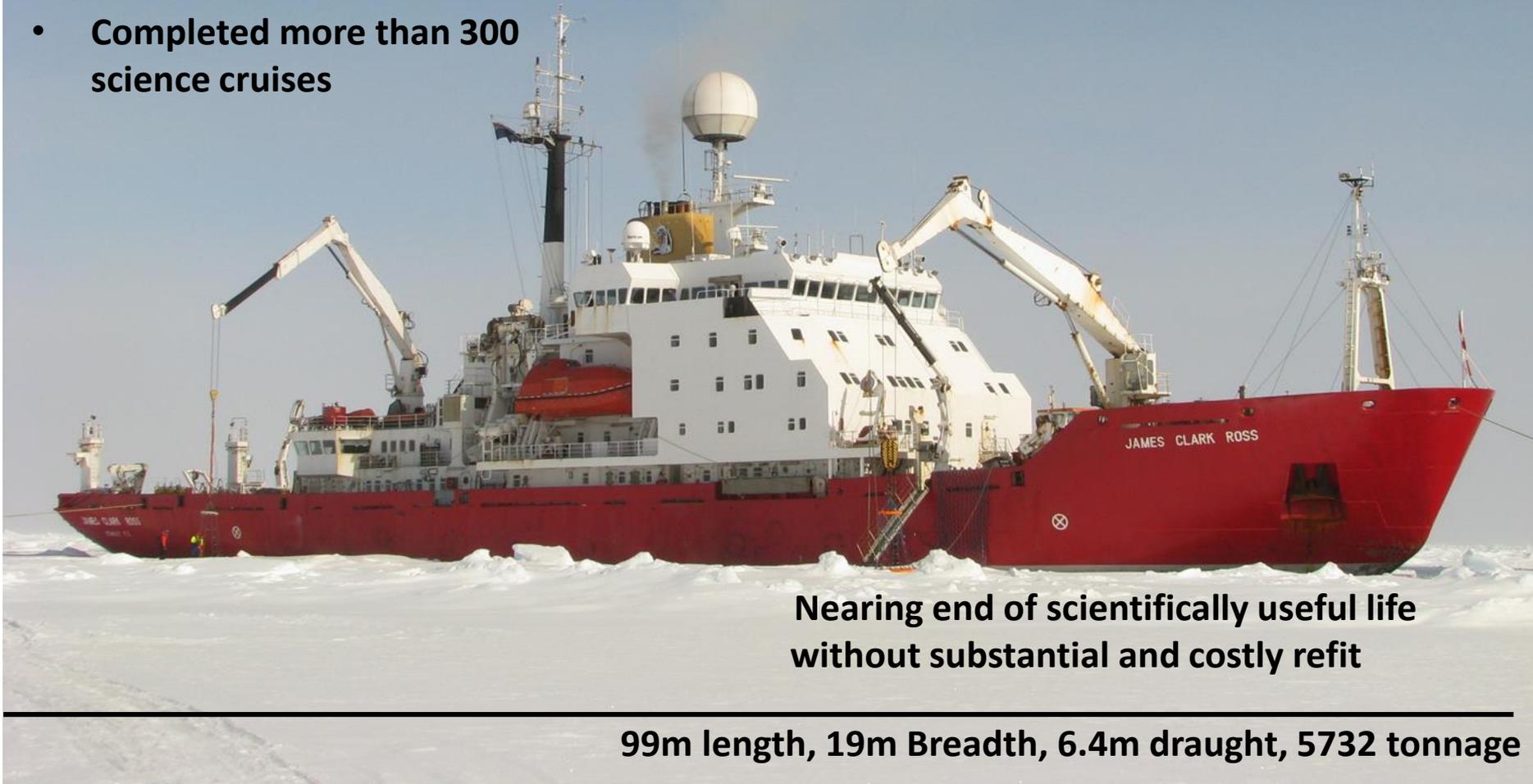
This presentation will summarise:

- **Science capability and capacity**
- **Design and build progress**
- **Implications for marine science**



RRS James Clark Ross

- **Launched 1991**
- **World class polar science platform**
- **Completed more than 300 science cruises**

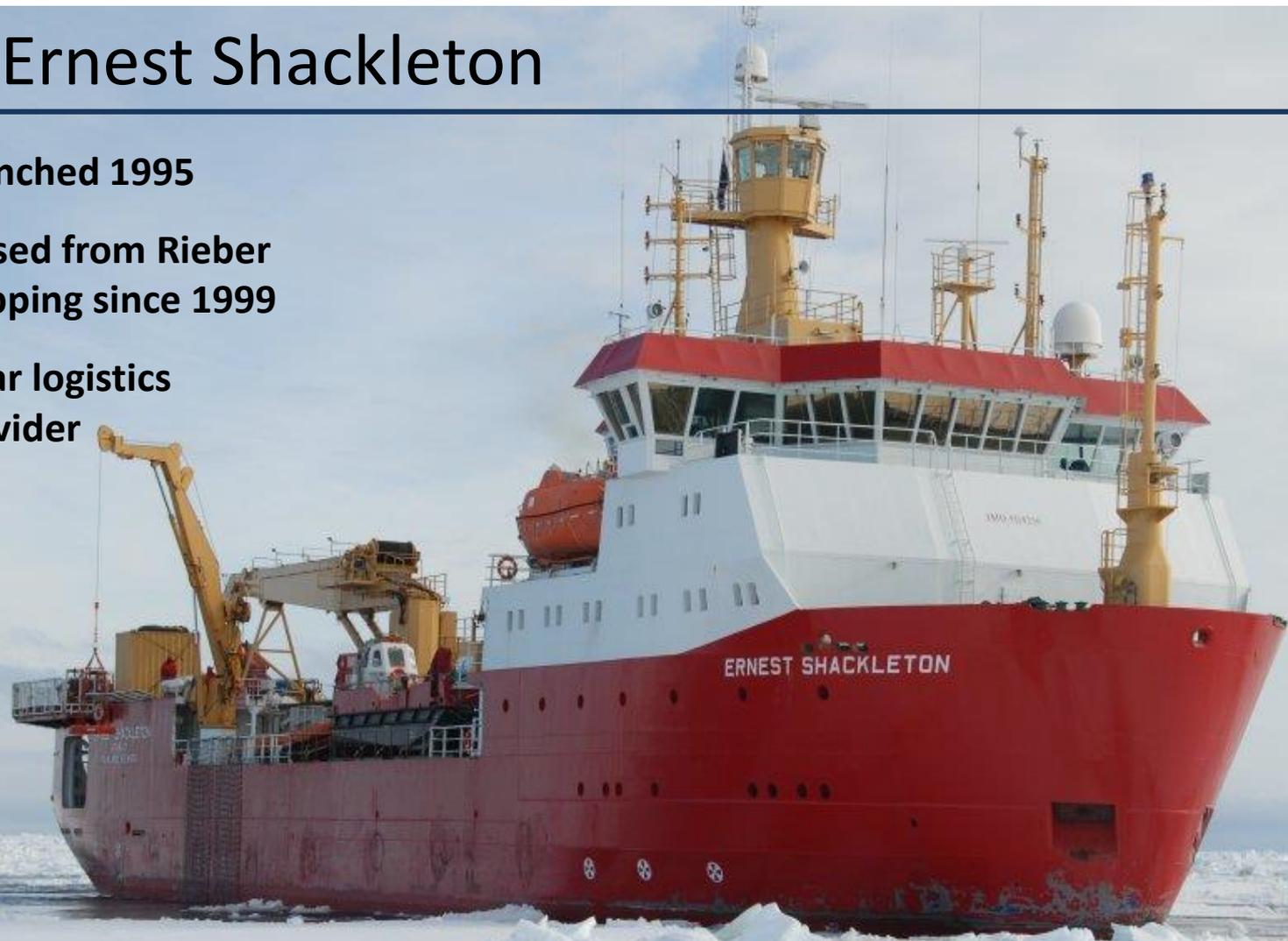


**Nearing end of scientifically useful life
without substantial and costly refit**

99m length, 19m Breadth, 6.4m draught, 5732 tonnage

RRS Ernest Shackleton

- Launched 1995
- Leased from Rieber Shipping since 1999
- Polar logistics provider



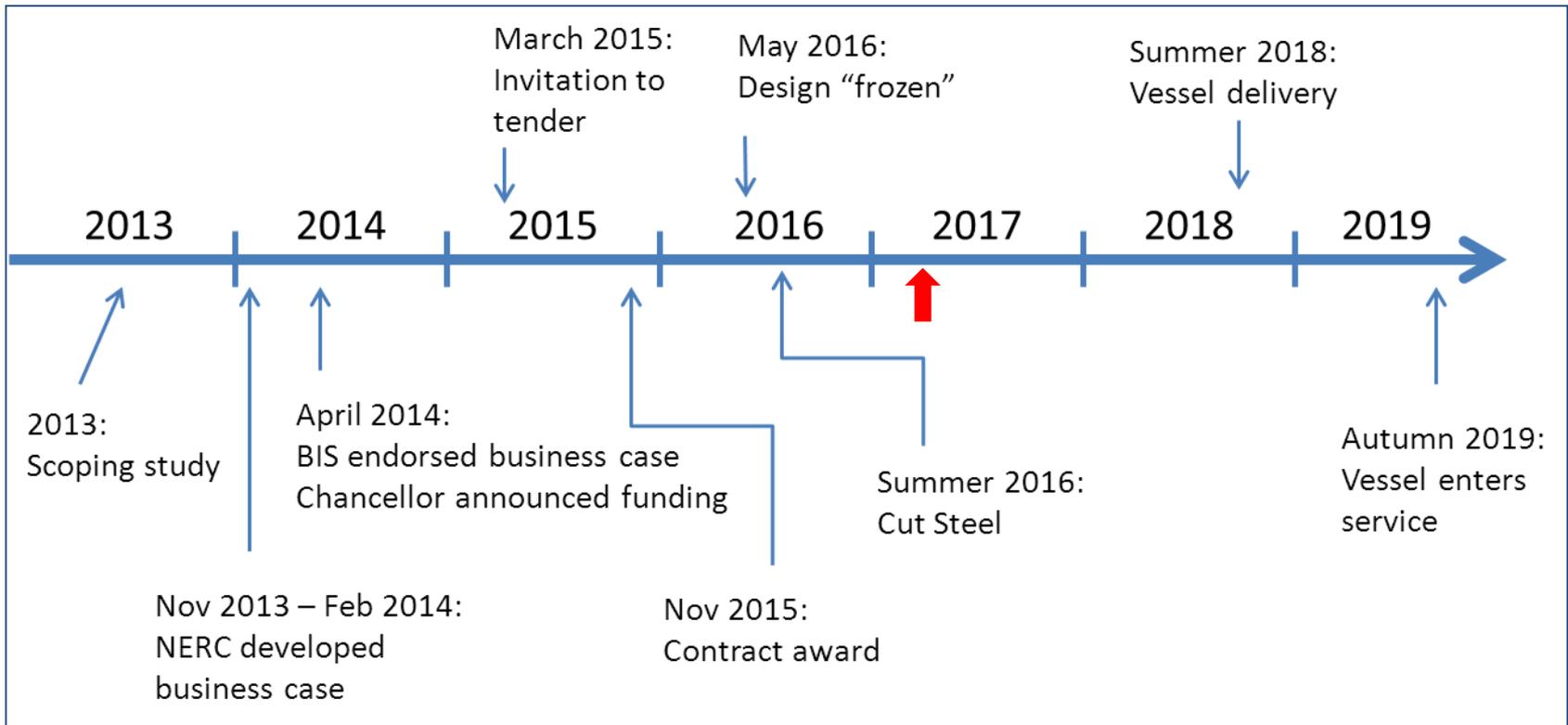
80m length, 11m Breadth, 6.85m draught, 4028 tonnage

The New Polar Ship

- **In April 2014, BIS announced £225 million funding for a single dual purpose new polar research vessel to replace *JCR* and *Shackleton*.**
- **Ship to be owned by NERC and operated by BAS on behalf of the UK science community**
- **Includes enabling works to modernise some of the UK Antarctic research bases to support a one ship operational model.**



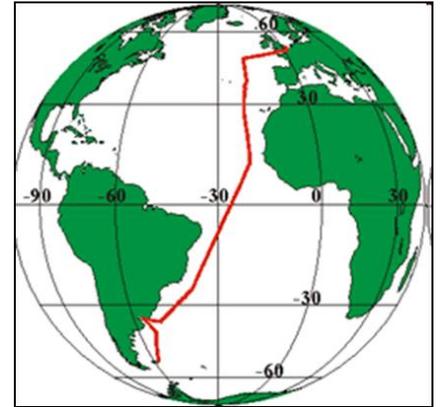
Project Timeline



Capability and Capacity 1

The new ship will:

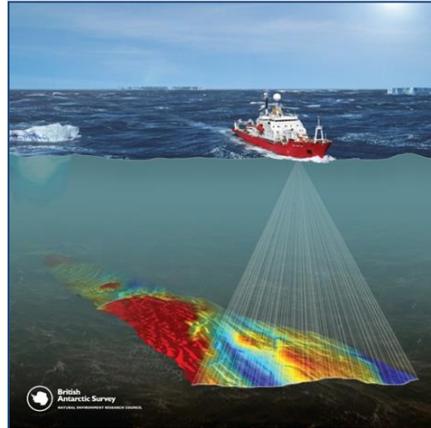
- **Have long endurance at sea: pole to pole**
- **Resupply all UK Antarctic stations**
- **Be safe and seaworthy (habitable)**



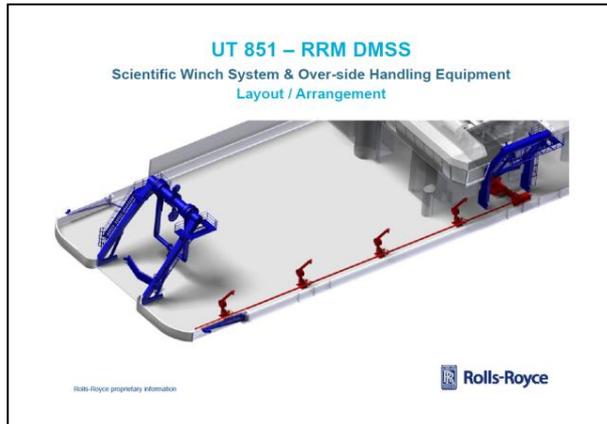
Capability and Capacity 2

The new ship will:

- **Provide a multi-disciplinary research platform able to support a wide range of science**
- **Carry up to 60 scientists for up to 60 days at sea**
- **Be very quiet for environmental monitoring**
- **Have good dynamic positioning for instrument deployment**
- **Support all equipment currently deployed by NERC vessels**



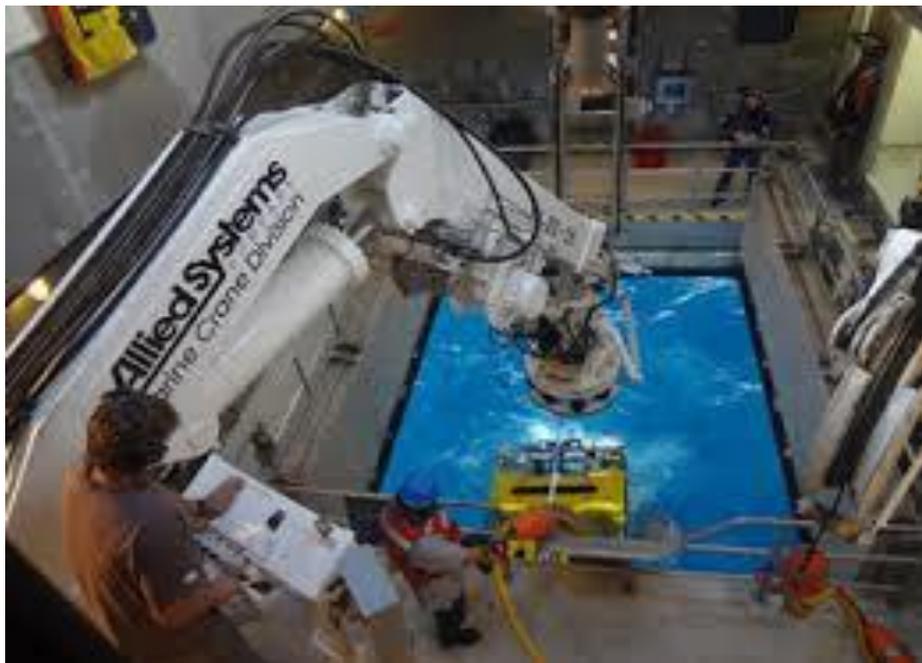
New Capability - Giant (42m) Piston Corer



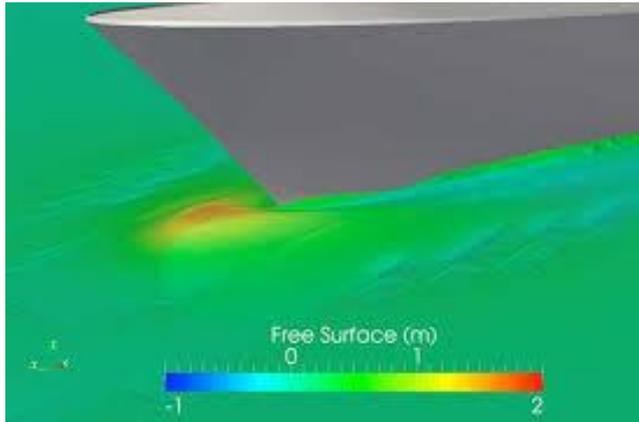
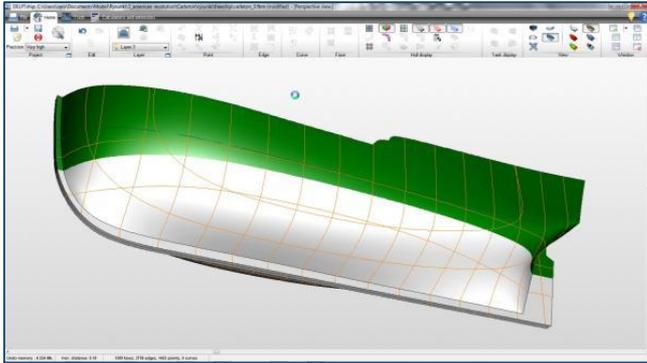
New Capability - Helideck and Helicopters



New Capability - Moonpool



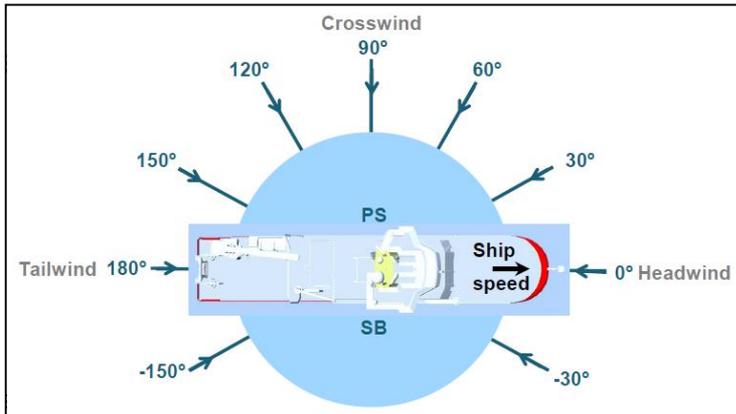
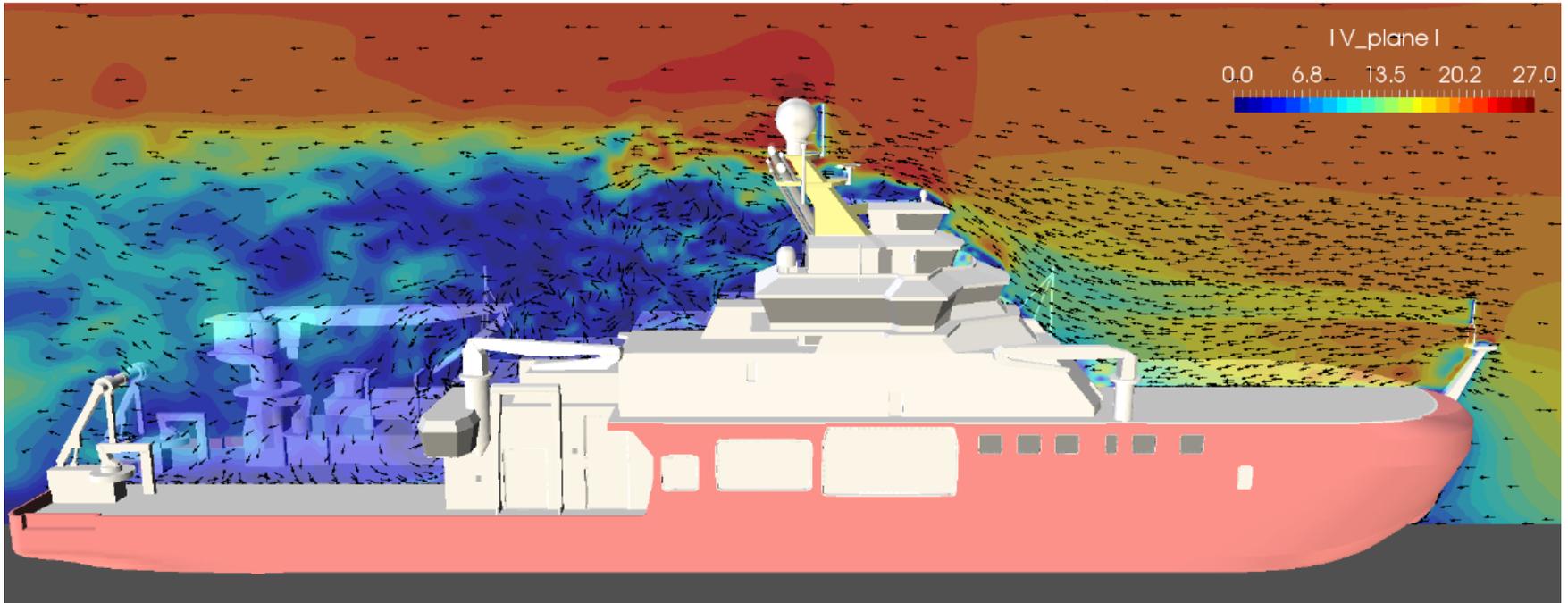
Hull Design and Model Test



Optimal “sweet-spot” for:

- Fuel efficiency**
- Reduced noise/bubbles**
- Ice breaking**
- Dynamic position holding**

Superstructure Design and Aerodynamic Model Test



Capability and Capacity 3

The new ship will:

- **Be fuel efficient and easy to maintain.**
- **Have minimum environmental impact – “Green” ship**
- **Be flexible, adaptable and future-proof - for the next 30 years**



Container Labs



22 Science Containers: 6 in science hangar
8 on aft deck
4 in helicopter hangar
4 on foredeck

Remotely Operated and Autonomous Instruments



Technical Specification

- **Length 128.9 m, breadth 24m, draught 7m**
- **~15,000 tonnage with cargo**
- **Scientific cargo volume of approximately 900 cu metres**
- **Endurance for up to 60 days (Polar Regions)**
- **Range 19,000nm (35,000 km) at 13 knots transit**
- **Ice breaking capability – up to 1m thick at 3 knots (PC5)**
- **30 crew and officers**
- **60 scientists and support staff**



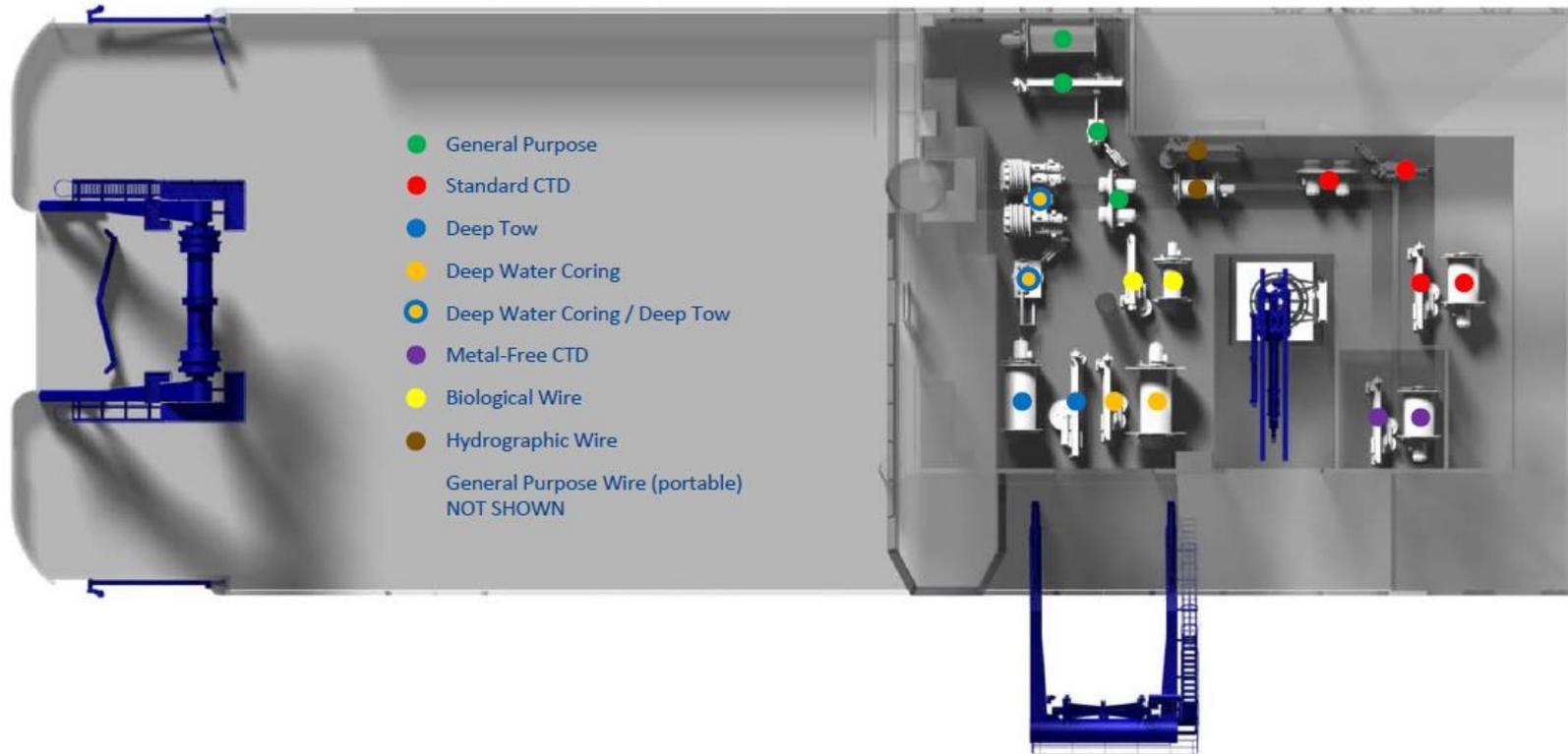
***JCR = length 99m, breadth 19m, draught 6.4m, 5732 tonnes**

Design and Build



UT 851 – RRM DMSS

Scientific Winch System & Over-side Handling Equipment Layout / Arrangement



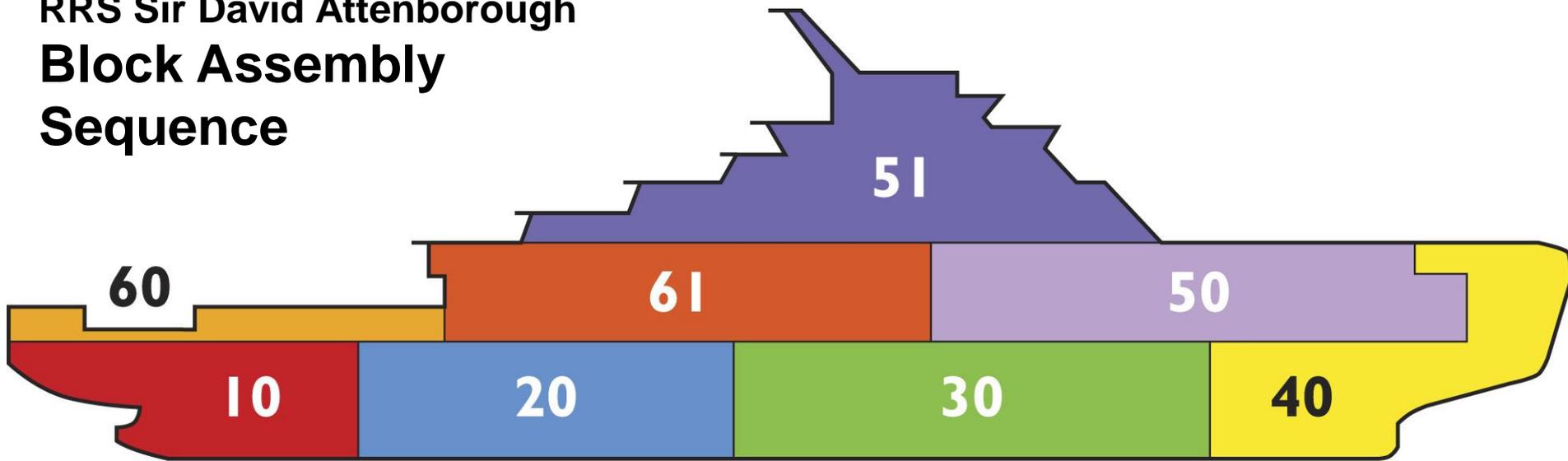
Cammell Laird Shipyard Liverpool



Construction Hall



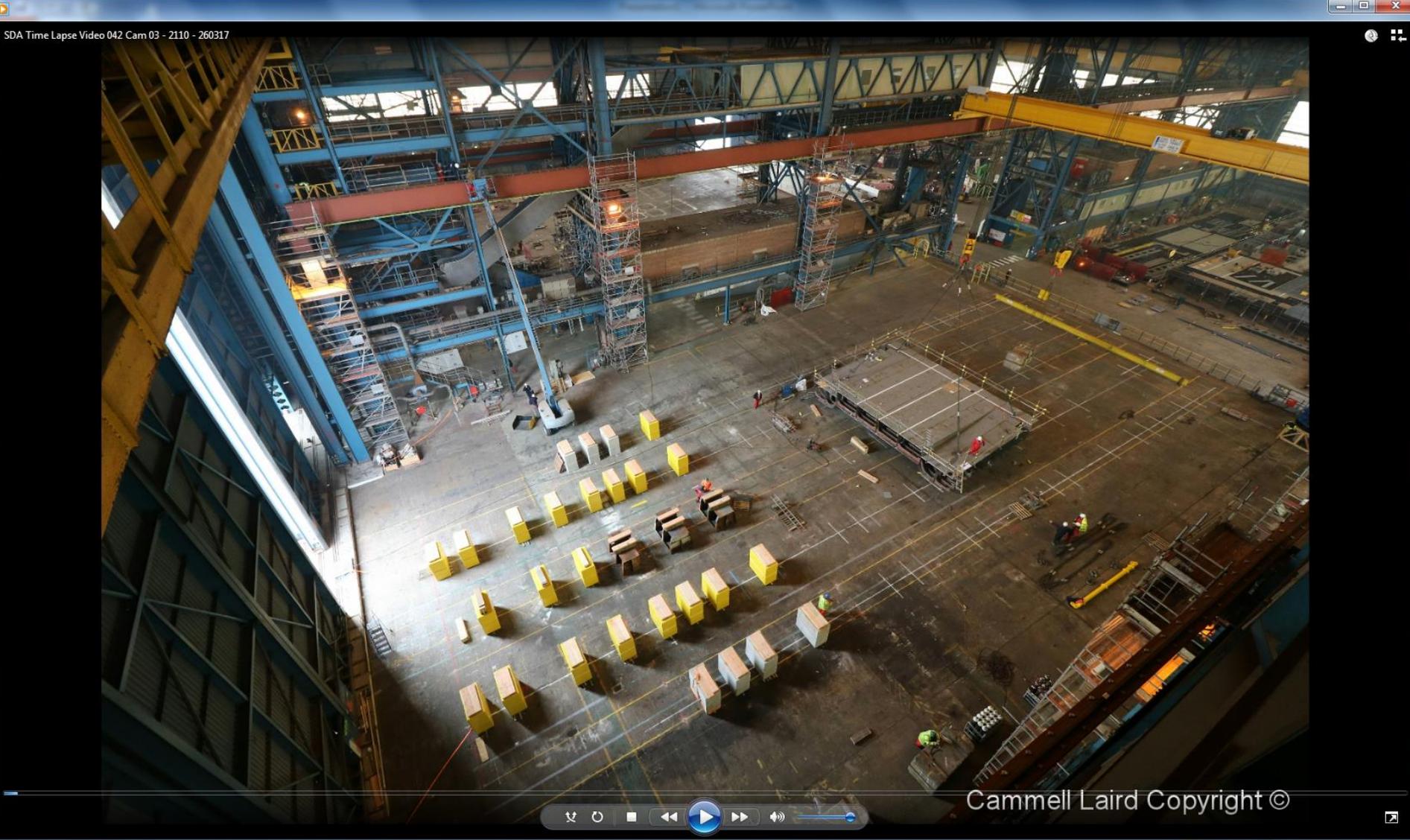
RRS Sir David Attenborough Block Assembly Sequence



- 20 June 2016 - August 2016
- 50 December 2016 - January 2017
- 30 August 2016 - October 2016
- 61 January 2017 - February 2017
- 10 October 2016 - November 2016
- 51 February 2017 - March 2017
- 40 November 2016 (top section March 2017)
- 60 March 2017

2016								2017				
May	June	July	August	September	October	November	December	January	February	March	April	

Construction 1



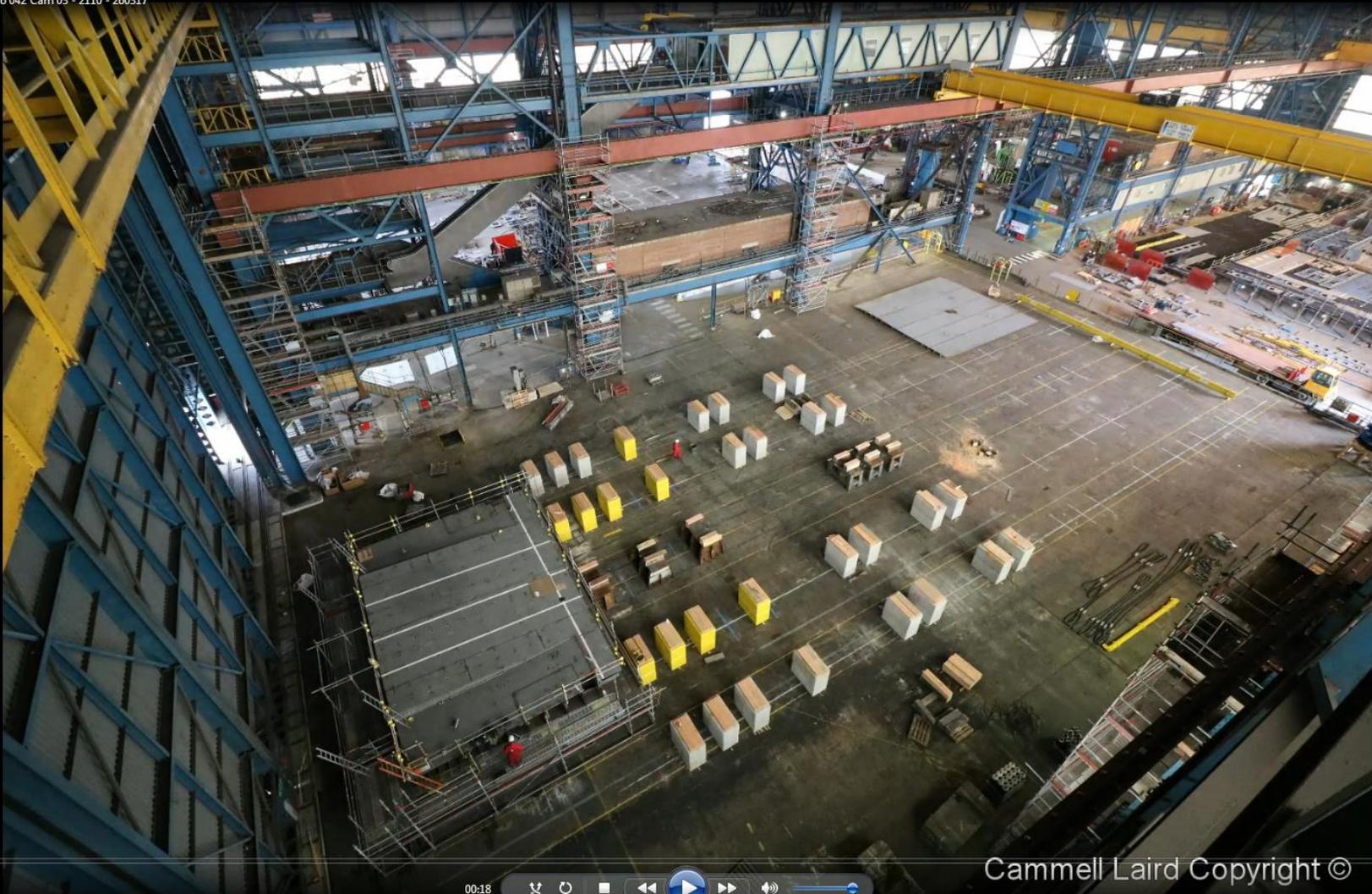
SDA Time Lapse Video 042 Cam 03 - 2110 - 260317



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Construction 2

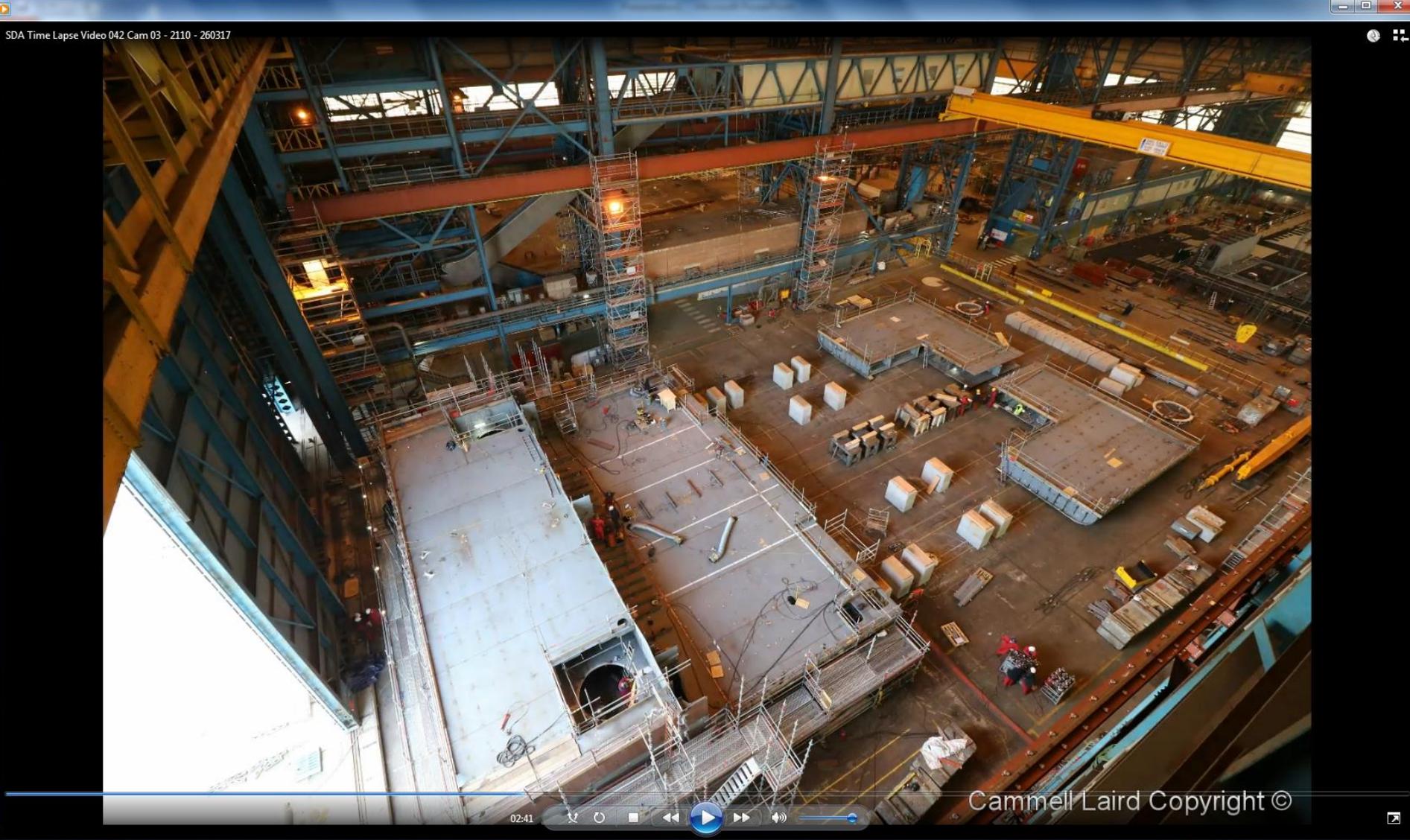
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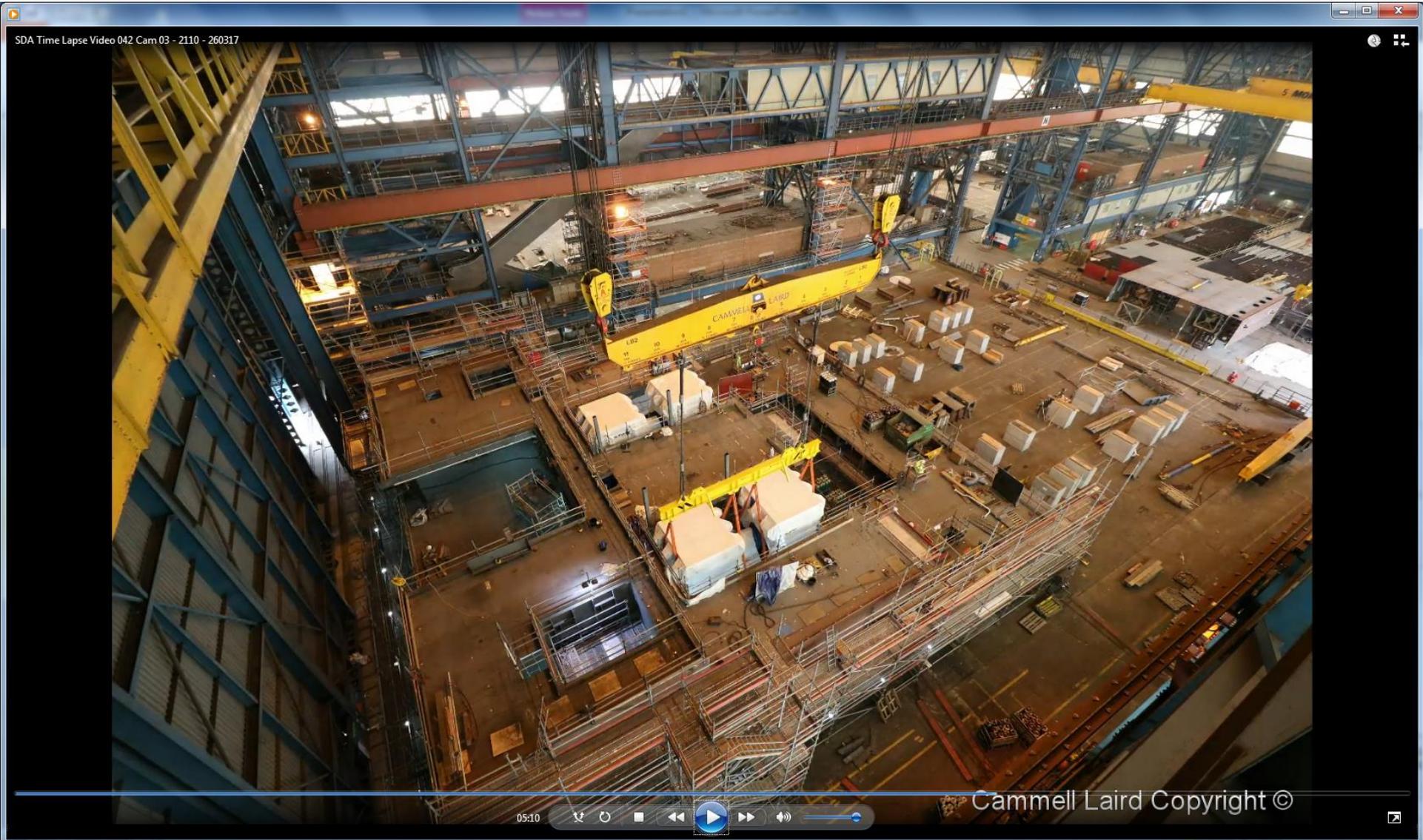
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Construction 3



Construction 4



SDA Time Lapse Video 042 Cam 03 - 2110 - 260317

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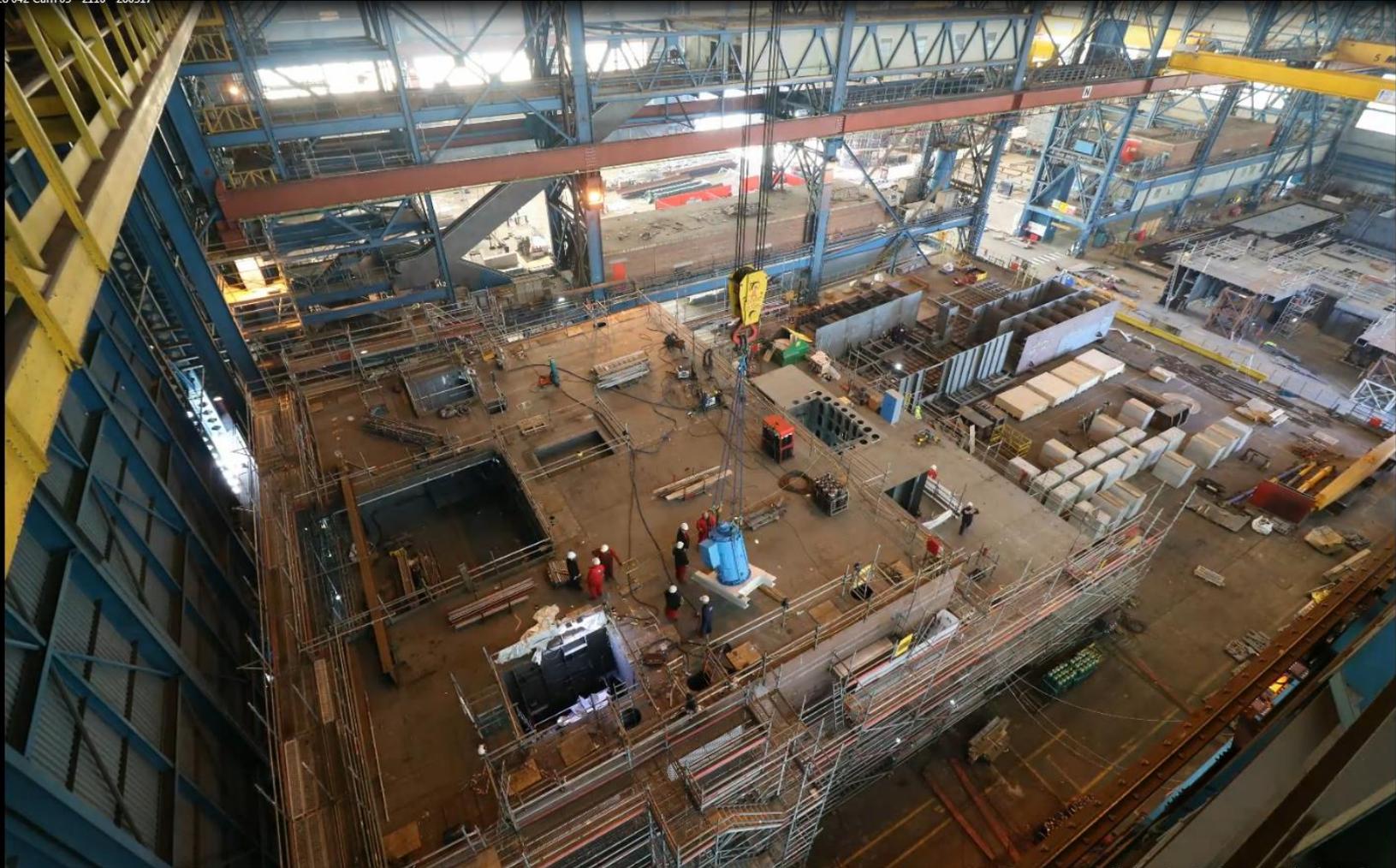


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Construction 5

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100%

Implications for Conducting Marine Science

Implications:

- **Enhanced capability for multi-disciplinary polar science.**
- **Greater endurance for longer cruises to remoter regions.**
- **More scientists on ship – 35 in single cabins but max 60.**
- **More ship-fitted lab space (~50%) and lab containers.**
- **Greater demand for technical support.**
- **~15% reduction in science days at sea from 180 to 154 yr⁻¹.**
- **~45% increase in “scientist at sea” days.**

Recommendations:

- **Community must protect 154 science days yr⁻¹!**
- **Optimise science: longer, larger, multi-disciplinary cruises?**
- **Optimise science: can new science questions be addressed?**



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Further information:
<https://www.bas.ac.uk/polar-operations/sites-and-facilities/facility/rrs-sir-david-attenborough/>