

## UK Materials KTN Composites in ships group

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# What is the Materials Knowledge Transfer Network?

## Knowledge Transfer Networks

Accelerating business innovation:  
A Technology Strategy Board programme

### Materials KTN vision

*"To bring together the materials supply chain to improve industrial innovation and global competitiveness of UK business"*

- **Currently 15 KTN communities covering different sectors**
- **Networking activities, events**
- **Identify emerging technology and market needs, SOA reports**
- **Strengthen links between academia, RTOs and industry**
- **Finding partners, funding support**



# KTN activity in marine composites

**Knowledge Transfer Networks**

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**Feb 2008**

**Living with Composites: Fire resistance**

**July 2008**

**Boatbuilding: Competing Successfully**

**Nov 2008**

**Composites in Ships invited workshop**

**May 2009**

**Cruise ship scoping study**

**July 2010**

**Boatbuilding: Manufacturing for the Future**

**June 2011**

**Boatbuilding: Safe, Sustainable and Smart**

**Oct 2011**

**Fire Retardant Materials**

**June 2012**

**Launched Composites in Ships web group**

**Nov 2012**

**Composites in Ships networking event**

**July 2013**

**Boatbuilding: Efficiently with Composites**

**Also: Bio-derived, cores, recycling, thermoplastics, machining...**



Shipbuilders & Shiprepairers Association



# Workshop outcomes: Composites in Ships workshop, Nov 2008

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- **Primary concern: reducing cost**
- **Top driver at that time: Corrosion resistance (except mil.)**
- **Light weight: significant for stability and payload, not fuel**
- **“Use of composites will be limited until through life costs are taken into account”**
- **Demonstrators needed**

**Change: Now life cycle costing is increasingly recognised.**



*Cunard's MS Queen Victoria. Photo: Stella Job*



## Workshop outcomes: Cruise Ship Scoping Study, MS Queen Victoria, May 2009

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- **Primarily where fire regulations do not apply**
- **Already used: open decks, bathroom cubicles, deck lockers, lifeboats, radomes, pipework**

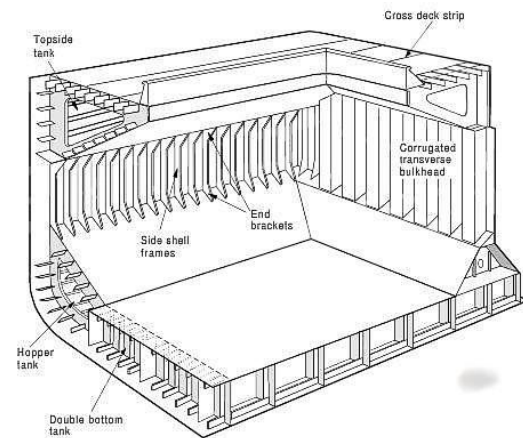


- **Best potential: guardrails, windscreen supports, lighting columns, staircases, swimming pools.**
- **Also davits, internal fire doors, structural trusses, internal architectural elements (fire regulated)**
- **Significant weight savings could be made as well as reduction in corrosion**

# Workshop outcomes: Composites in Ships Networking event Nov 2012

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- **Aim:**
  - bring together relevant players to develop composite products for ships
  - Provide knowledge transfer Shipbuilding <> Composites
- >80 people, mostly industry inc 30 SMEs, shipowners, trade associations, class / regulators, Franz. Strong interest
- **Workshops:**
  - Cabin modules in cruise ships
  - Multifunctional armour composites
  - Ballast tank spaces
- **Building collaborations**
- **Networking buzz – many B2B connections**



# Common themes Carnival & MOD

**Knowledge Transfer Networks**

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- **Corrosion resistance – handrails, lampstands (cruise), gratings (aircraft carriers), etc**
- **Weight – driver is payload – for Carnival, to add more cabins; for Navy, topside stability and flexibility of platform**
- **Cost reduction**
- **MOD: Type 26 superstructure**
- **Carnival: consortium received funding for project just started**



*T26 Global Combat Ship, concept image*

# UK Govt support and cohesion across composites industry

**Knowledge Transfer Networks**  
Accelerating business innovation:  
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## **Composites Strategy Dec 2009 led to:**

- **Significant funding at research council and industrial levels**
- **Formation of National Composites Centre**
  - **Open access, industrial scale (e.g. 3x10m), SOA facility**
  - **Part of HVM Catapult (£350M)**
  - **Co-ordination for various UK composites centres**
  - **Now started building phase II**
- **Studies of supply chain, opportunities and direction**
- **Composites Leadership Forum**
- **Composites Innovation Cluster (£23M)**

**There has never been a better time for the UK composites industry**



# Capability in UK

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- **Naval architecture capability**
- **Expertise in design of large composite structures**
- **Composites in construction, continuous process methods**
- **Naval shipbuilding**
- **Boatbuilding – leisure, WFSV, RNLI, workboats, small ferries**
- **Fire: test houses and universities**
- **Joining // Oil and gas**
- **Shipowners and operators**
- **Other areas...**



*Sandown class composite minehunter 'HMS Bangor' © Copyright Ross*

# Cost

## Knowledge Transfer Networks

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Photo: Huntington Ingalls

**DDG1000 Deckhouse -  
900t balsa-cored CFRP.  
Made at Gulfport Composite  
Center for Excellence with  
18,000 sq ft of flat panel  
moulds. Now closed.**

**Should we be thinking more  
like this?  
This facility produces GFRP  
sheet at 20m<sup>2</sup> / minute,  
allowing them to make 1.5M m<sup>2</sup>  
/year with 33 people.**



Photo: Hambleside Danelaw

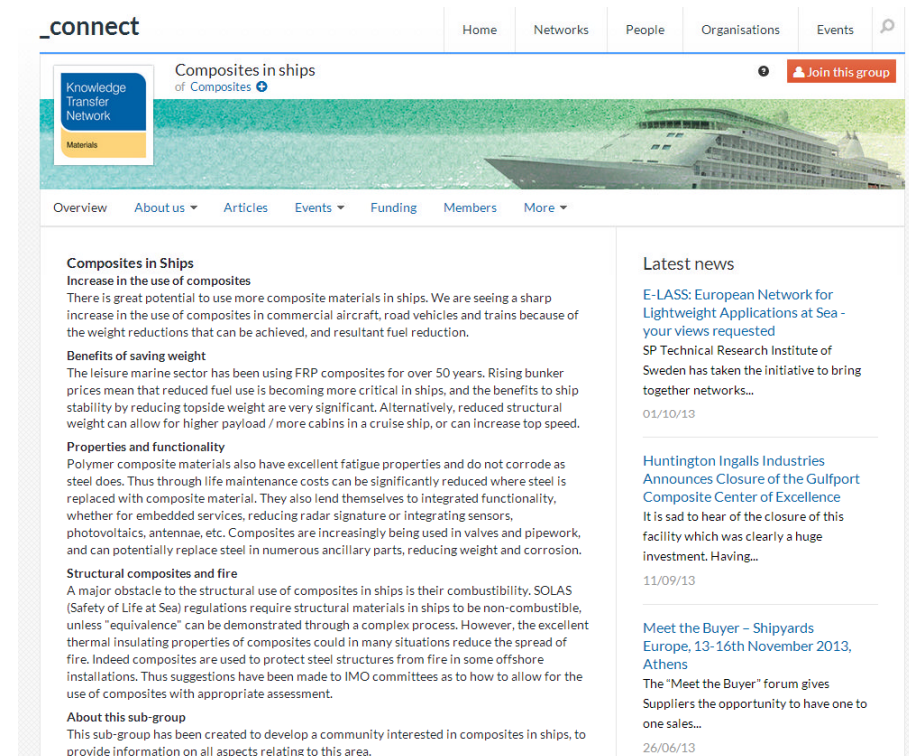
# What next?

- **Connect with European networks – here we are!**
- **Continue to use composites in Ships \_connect group to inform, provide a forum and develop community**  
**<https://connect.innovateuk.org/web/composites-in-ships>**
- **Develop specific technology areas, e.g:**
  - **Fire resistant composites: resins, additives, coatings, etc**
  - **low cost panel manufacture**
  - **ceramic matrix composites / geopolymers**
  - **Hybrid structures**
  - **integrated functionality, smart structures**
- **COLLABORATE**

Thank you

Comments / questions  
are welcome

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