

NAVAL DAMAGE CONTROL

23rd – 25th MAY 2023

Farnborough International Exhibition and Conference Centre, UK

CONFERENCE PRODUCER'S INTRODUCTION

I would like to extend a very warm welcome to Naval Damage Control (NDC) 2023, the only dedicated damage control conference in the world. It has been almost two years since Defence Leaders were last able to host this event but having the opportunity to meet and discuss issues face to face is crucial, which is why we are pleased to provide an opportunity bringing the damage control community back together this May.

As the event will be taking place alongside the prestigious Combined Naval Event (CNE), we will be maximising the benefits to our attendees by welcoming over 1,500 people, representing over 58 nations and over 200 companies over the three days. This will provide you with unparalleled networking opportunities throughout the course of the event.

The ability to respond to damage, whether through enemy action, mechanical failure or accident is a non-discretionary requirement for all those at sea. It might not catch the eye as much as other naval activity, but an ability to respond to fire, flood or other incidents is an essential precondition for any vessel and their ship's company.

As with other areas, the shift to automation, the exploitation of data and AI, and other new technologies offers huge potential. But equally responding remains a very human activity, especially the command and control of damage control. All these issues will be explored in depth.

Welcome to NDC23!



Abbie Butler, Conference Producer, **Defence Leaders**

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DAY 1, TUESDAY 23rd MAY - MORNING PLENARY

LOCATION: COMBINED NAVAL EVENT THEATRE - PLENARY THEATRE

0615 – 5km run from The Aviator Hotel

Harry Macleod, Defence Director, **Navy Leaders**

0800 – Registration and welcome coffee in the CNE and NDC exhibition areas



0845 – CNE Chairman's opening remarks in the CNE arena

Vice Admiral (Ret'd) Duncan Potts CB, Former Commander UK Maritime Forces, **Royal Navy**

ALIGNING NAVAL STRATEGY AROUND A GLOBAL FORCE

The importance of the maritime domain and consequently competition and potential confrontation at sea is growing. Whether it is freedom of access for power projection, the opening of shipping routes, mineral and fishing exploitation, the ability to dominate the domain is a growing priority for many countries. A particular focus is on domination of the undersea domain, both militarily and for commercial advantage. The opening session will review some of the strategies from around the globe.

–Enabling the vision for UK shipbuilding in 2030

- Procuring a formidable future fleet, the 30-year shipbuilding pipeline
- The UK's state-of-the-art shipbuilding industry, hulls, systems and subsystems
- Export opportunities and the role of the Maritime Capability Campaign Office

0900 – Enabling the vision for UK shipbuilding in 2030



- Procuring a formidable future fleet, the 30-year shipbuilding pipeline
- The UK's state-of-the-art shipbuilding industry, hulls, systems and subsystems
- Export opportunities and the role of the Maritime Capability Campaign Office

James Cartlidge MP, Minister for Defence Procurement, **UK Government**

0915 – The contribution of defence to development of a national enterprise

BAE SYSTEMS

- The contribution of Defence to the sustainment of skills enabling a national endeavour
- The importance of relationships with local communities to support defence programmes
- Workforce sustainment and the employee value proposition

Nicola Longland, HR Vice President, **BAE Systems Maritime and Land**

0945 – 2SL address: driving the Royal Navy's strategy in line with our allies



- The UK's national shipbuilding strategy in line with allied interoperability
- A global reinforced presence: where we see operations over the next decade
- The role of industry in moving the Royal Navy forward

Vice Admiral Martin Connell CBE, Second Sea Lord, **Royal Navy**

1015 – Morning coffee and networking in the CNE and NDC exhibition areas

REFORMING FOR DEPLOYMENT

The balance of blue water vs littoral activity is a key question for a Navy building its force. Whatever its activity, there is a technical evolution happening that can be embraced. This starts with partnerships, be it home grown industry or allied projects and these sessions will outline some of the key questions on how a Navy aligns its force.

1115 – Leveraging AI and autonomous systems to deliver multi-domain effects



- Outpacing the adversary and providing attribution
- Challenges; legal, international agreements, and data fusion
- Experimentation and technology transfer

Vice Admiral Mike Utley CB OBE RN, Commander, NATO Maritime Forces

1140 – Integrating industry innovations at a more rapid pace for operational effect

DIEManalytics

- What are the opportunities in working with SMEs
- Government and large-firm assumptions that help and hinder innovation exploitation
- Success stories and lessons learnt

Dr Darrell Jaya-Ratnam, Managing Director, DIEM Analytics Ltd

1210 – The Polish shipbuilding programme update



- How the planned Frigates are enhancing capacity in the region
- The challenge of constructing ships in the region
- Maintaining effective links with industry throughout the process

Rear Admiral Włodzimierz Kułagin, Chief of Armament Department, Inspectorate of Polish Navy, Polish Armed Forces

DAY 1, TUESDAY 23rd MAY - AFTERNOON SESSIONS

LOCATION: NAVAL DAMAGE CONTROL CONFERENCE - PIONEER ROOMS 1 & 2

1230 – Lunch in the NDC exhibition area

DESIGN AND OPERATION TECHNIQUES IN DAMAGE CONTROL

All shipbuilders and Navies seek innovative ideas to maximise a ship's strength, resistance and resilience to damage. This research is often driven by commercial interests, yet the military is capitalising on these applications and making their ships more efficient in preventing and controlling damage. A shipyard's role in designing a ship is to meet the demands of a navy while maintaining safety standards. The first day of NDC will focus on how we implement effective prevention methods and early detection in a ship's design phase to mitigate incidents and consequences.



1350 – NDC Chairman's opening remarks

Professor David Manley, Head of Specialism - Platform Survivability, UK MoD and University College London

SHIP DESIGN CONSIDERATIONS

As we develop new techniques and technologies to improve incident response, it is important to consider the impacts on design. As research evolves within shipbuilding, we are continuously looking into ways to prevent on board incidents but also ways we can reduce the time spent in response. During this session we will discuss some of the ways in which we can better understand how the materials used in shipbuilding could be adapted to have a damage control focus during the design phase.

1400 – The implications of fire insulation on firefighting tactics



- The effects of bulkhead insulation on firefighting
- How the RCN currently operates during an incident
- Computer simulation: Fire insulation and various different FF tactics adapted to different shipbuilding materials

Lieutenant Commander Peter O'Hagan, Director General Maritime Equipment Programme Manager, Royal Canadian Navy

1430 – Fire Safety and Damage Control Warship Design – Now and to the Future

BAE SYSTEMS

- Reflection on the step change in automated Fixed Firefighting systems on the Aircraft Carriers
- Lessons learned and a look at the near term visions for continued use of automation in Fire Safety Systems
- AE Systems Future Projects – Next Steps

Robert May, Engineering Manager Type 26, Naval Ships, BAE Systems Maritime

Neil Griffiths, Technical Authority Future Projects, Naval Ships, BAE Systems Maritime

1500 – Automation in effect: Imagine the impact of having automatic response watertight doors



- Reducing the impact of human factors in damage control
- Research into the operability of automatic doors
- What else should we be looking at within the automation field?

Robin López Griñón Hakkoer, SME General Naval Shipbuilding, Netherlands Defence Material Organization

1530 – Afternoon coffee in the NDC exhibition area

INNOVATION AND COLLABORATION TO IMPROVE SUPPRESSION SUCCESS RATES DURING A FIRE INCIDENT

Navies across the world are exploring techniques to fight complex fires more successfully through innovative methods and collaboration. This session is going to explain the benefits in collaborative training and operation with civilian firefighting experts and some of the innovative firefighting methods available to the maritime damage control community.

1615 – The undisputed benefits of civilian cooperation and utilisation of UAS in fire detection and suppression



- The integration of command and control challenges
- Merging fire teams together for safety and specialist equipment availability
- Innovation in firefighting systems and UAS being used in the detection process

David Meetze, Master Firefighter, Wilmington, US Fire Department

1645 – Only as strong as the weakest link: A holistic approach to a vessel's penetration sealing integrity



- Solutions to improve sealing safety of penetrations in newbuild & life extension projects
- Is the standard cellulose time vs temp curve sufficient? Product developments for hydrocarbon & jet fires
- Are your bulkheads watertight? Detailed penetration surveys and assurance including flow rates

Peter Litchfield, Technical Sales Director, CSD Sealing Systems

1715 – Operational FF on board Israeli naval vessels and collaborative DC training with Israel's Fire & Rescue authority



- An overview of damage control, fire detection and suppression on board the Israeli navy surface fleet
- Civilian cooperation: The benefits of training with firefighting units outside of the navy
- Innovations in DC&FF in the Israeli Navy

Lieutenant Commander Shahar Peled, Reshef Class Operational Officer, Israeli Navy



1745 – Chairman's summary and end of day 1

Professor David Manley, Head of Specialism - Platform Survivability, UK MoD and University College London

1800 – Event networking and drinks reception in the NDC exhibition area

1945 – Networking and drinks reception closes

2000 – Carriages

DAY 2, WEDNESDAY 24th MAY

OVERCOMING DETECTION AND SUPPRESSION CHALLENGES WITH EFFICIENT TRAINING AND AGILE EQUIPMENT

Navies have recognised that there is a requirement to examine procedures in damage control and firefighting in training and while onboard. This session will explore some of the training techniques and programmes but also some of the new innovative equipment used in suppression and the well practised tactics in which fire can be suppressed on board.

0615 – 5km run from The Aviator Hotel

Harry Macleod, Defence Director, **Navy Leaders**

0800 – Registration and morning coffee in the NDC exhibition area



0850 – Chairman's recap of day 1 and introduction

Professor David Manley, Head of Specialism - Platform Survivability, **UK MoD and University College London**

UNDERWATER DAMAGE CONTROL, SURVIVABILITY AND RESCUE PROCEDURES

With many countries upgrading subsurface capabilities, and several looking to acquire submarines for the first time, there has been a push to reinvigorate damage control procedures, capabilities and technologies underwater. Operations in contested areas mean an increased risk of incidents which is why it is important to consider whether technological improvements should be made. This section looks at silent service damage control considerations, the accompanying taskforce and a brief from the UK's Submarine Escape and Rescue Commander.

0900 – Submarine damage control and experiences on the Spanish Navy's S-80 Class



- Historical experiences on Spanish Navy submarines and why the S-80 is such an improvement
- Next generation submarine damage control systems, including details on the modern IPMS
- Damage control training and simulators used on the submarines

Lieutenant Commander Francisco Miguel Solano Gutiérrez, Submarine Marine Engineering Officer, **Spanish Navy**

0930 – De-risking the submarine programmes through risk analysis



- Using damage control analysis and learning to influence design and build
- Introduce common cause analysis and design tools
- The power of Computational Fluid Dynamics modelling

Richard Alker, Consultant Engineer, Submarines, **BAE Systems Maritime**

Euan Greenop, Senior Safety Engineer, Submarines, **BAE Systems Maritime**

1000 – UK Submarine escape and Rescue – an extremely niche capability



- Policy, governance and current capability
- Challenges facing SMERAS - the building blocks of "time to first rescue"
- SMERAS assurance

Commander Jeff Fillmore, Commander SMERAS, **Royal Navy**

1030 – Morning coffee and networking in the NDC exhibition area

DEVELOPMENTS IN CBRN AND FIRE DETECTION AND SUPPRESSION

To ensure operability is maintained you must detect a fire or CBRN incident before it has the chance to grow or spread. Whether this is with fixed fire alarms or alternative methods, the detection of a fire or CBRN incident allows the damage control team to plot a suitable response quickly and efficiently. This section will provide an update on Greece's improvement strategy and an insight into some up-and-coming damage control response technologies.

1115 – The Hellenic Navy's approach to improving Damage Control and CBRN Defence



- Current priorities within the Hellenic Navy
- The benefits of having specialised equipment for each intended purpose
- Detection and suppression experiences of fire and CBRN incidents within the Hellenic Navy

Commander Lefteris Bekatoros, Head of Damage Control and CBRN, Hellenic Navy

1145 – CBRN operational risks at sea and how to mitigate contamination



- Contamination risks and threats at sea
- Decontamination capabilities to mitigate CBRN threats onboard ships
- Additional measures to support aircraft, sensitive equipment, personnel onboard and contaminated surfaces

Grant Findlay, Sales and Business Development Manager, Cristanini

1215 – Damage Control: Malaysian Maritime Enforcement Agency issues and challenges



- Overview of the Malaysian Maritime Enforcement Agency (MMEA)
- The MMEAs current challenges
- Plans to integrate UAVs into the fleet

Commander Muhammad Zulkarnain Bin Abdullah, Executive Officer - OPV1, Malaysian Maritime Enforcement Agency

1245 – Lunch and networking in the NDC exhibition area

THE UK'S TRAINING APPROACH ABOVE AND BELOW THE SURFACE

Over previous years there have been a number of incidents within the maritime arena which have led navies to be adaptable to how they carry out damage control training. This includes lean manning, live fire training, simulator and training facility improvements. There is a real opportunity for industry and navies to work together to deliver solutions that are both practical for the military and realistic for the shipbuilders. This session will explore these opportunities used in the UK.

1400 – A FOST view on technology, modelling and simulation in training



- Current FOST damage control Training developments and challenges
- Delivering realistic collective training to a forward deployed Navy
- The need to move towards a 50/50 live/synthetic training model by 2030

Commander Jared Ward, Staff Logistics Officer and Surface Ship DC SME at FOST, Royal Navy

1430 – Next generation developments and innovations in training equipment



- Sensors and training evaluation
- Scenario based training for standardisation
- Innovative systems

Göksekin Tümer, Platform Simulators Director, METEKSAN SAVUNMA SANAYII A.Ş. Navy

1500 – How have US experiences impacted the US Navy's damage control training



- Recent US incidents and how training has been impacted
- Human factors and the continuous challenge in responding to an incident
- Revitalisation of training establishments - timelines and budget

Commander William Carr, Director of DC & FF, US Navy - Surface Warfare Schools Command

1530 – Afternoon coffee and networking in the NDC exhibition area

TRAINING AND EQUIPMENT UPDATES AND DEVELOPMENTS TAKING PLACE ACROSS THE GLOBE

Navies across the world are exploring ways to fight complex fires more successfully through innovative techniques. This session is going to explore some of the methods and programmes the US are executing to enhance abilities in responding to damage and a brief on the AFFF replacement which is an initiative most nations are following.

1615 – Impact of changing environmental legislation on firefighting capabilities on Naval Vessels



- PFAS restrictions: What is likely to be impacted and by what and when?
- What are the challenges in replacing AFFF?
- Organisations looking to support in the replacement of AFFF/FPAS equipment

Robert Thilthorpe, Technical Manager, Fire Industry Association (FIA)

1645 – Escaping ‘hard to breath’ environments



- Introduction into Semmco
- Emergency escape breathing device for the maritime environment
- Smoke filled area and chemically contested environment safe equipment

SEMMCO Life Protection Solutions

1715 – Challenges and prospects for the development of NATO ships



- A vision of the future ‘capital’ ship and what it means for damage control
- NSPAs role in strengthening capabilities and innovative approaches for delivery through commercial means
- NATO’s ‘Climate Change Agenda’ factor

Rafael Arcos, Deputy Director Operations, NATO Support and Procurement Agency (NSPA)



1745 – Chairman’s summary and end of day 2

Professor David Manley, Head of Specialism - Platform Survivability, UK MoD and University College London

1800 – Event networking and drinks reception in the NDC exhibition area

1945 – Networking and drinks reception closes

2000 – Carriages

DAY 3, THURSDAY 25th MAY

RESEARCH IN SURVIVABILITY AND SUBSEQUENT METHODS AND TECHNIQUES

The last two days have shown that damage control is a vitally important concept for modern fleets. With the number and diversity of threats and an increased reliance on automated systems to aid with the effects of lean manning there is a real push to further explore how naval damage control standards can be raised. The final day will explore some of these opportunities, including current research projects, new innovations and how we can continue to maintain but also improve the safety and welfare of our crew members.

0800 – Registration and morning coffee in the NDC exhibition area



0850 – Chairman's recap of day 2 and introduction

Professor David Manley, Head of Specialism - Platform Survivability, UK MoD and University College London

THE LANDSCAPE OF SUPPORT AT SEA: ASSISTANCE, SURVEILLANCE AND LEAN-MANNING OPERATION

Damage control teams have a plethora of systems, equipment, and resources to call upon to prepare their optimum response to an incident but sometimes additional support is required. This session will look at three areas of additional damage response and support - at sea assistance, surveillance from the air and uncrewed assets and the impact of lean-manning.

0915 – The damage control challenge: Royal Fleet Auxiliary VS Royal Navy



- Update on the Fleet Solid Support programme
- Current systems linking civilian experience with military requirements
- The damage control comparison explained

Captain Gareth Coomber, Chief Staff Officer Engineering, Royal Fleet Auxiliary

0945 – The use of consumer grade drones in naval damage control and maritime disaster management



- Past operations and lessons learnt
- A cost efficient force multiplier
- How the French Navy plan to move forward in DC&FF and disaster management

Commander Charles-Henri Thouaille, CO Channel and North Sea and Maritime Surveillance Network, French Navy

1015 – Lean-manning and the impact on damage control within the New Zealand Navy



- An overview of the New Zealand fleet programme
- Current damage control and firefighting issues and the requirements for emerging technologies
- Re-establishing relationships and how current training and assessments take place

Lieutenant Commander Raymond McLaughlin, Fleet Damage Control Officer, New Zealand Navy

1045 – Morning coffee and networking in the NDC exhibition area

FLOODING LESSONS AND PREVENTION

Combat experience and collisions have shown that ingress of water can severely impact the ability of a ship to return to operational effectiveness. How to plug the holes, whilst managing where the water can be expelled, results in a drain of manpower and damage control assets. This session will examine which tactics and technology will make the difference between a fighting ship and a wreck following lessons from the HNoMS Helge Ingstad incident and some recent innovations and research into sustainable technologies.

1145 – Naval ship dewatering requirements: A new review



- How ship design facilitates the removal of unwanted fluid from within a ship
- Dewatering elements of flood detection and drainage
- The new baseline of solutions for bilge and salvage systems for Naval ships

Steve Marshall, Ship Stability, Naval Authority Group, Submarine Delivery Agency, UK MoD

Simon Bartlett, Fire Safety, Naval Authority Group, Submarine Delivery Agency, UK MoD

1215 – Final report on major flooding investigation: HNoMS Helge Ingstad



- Flooding management and investigations
- What were the difficulties and solutions with the engine space dewatering methods
- Lessons learned from the incident and plans going forward

Commander SG John Hoddevik, Senior Staff Officer, Norwegian Defence Materiel Agency



1245 – Chairman's closing summary and close of Conference

Professor David Manley, Head of Specialism - Platform Survivability, UK MoD and University College London

1250 – Lunch and networking in the CNE and NDC exhibition areas

DAY 3, THURSDAY 25th MAY - CLOSING PLENARY
COMBINED NAVAL EVENT THEATRE

ACHIEVING AND MAINTAINING THE RIGHT FLEET BALANCE

This week has taught us the importance of building and sustaining a force mix that is ready and capable of dealing with an array of threats and tasks. This process takes time, and the event will conclude by addressing some of the most important considerations when it comes to ensuring Navies have the right balance of ship platforms, offset against commonality of parts and procedures to ensure maximum availability.

1345 – Evolving Maritime Environment: Challenges and Opportunities for the Pakistan Navy (PN)



- The PN's role dealing with emerging complex and dynamic security environments including hybrid warfare
- Jointness as a central concept to ensure success
- Modernising the fleet, enhancing operational capability with new warships

Vice Admiral Ovais Ahmed Bilgrami, Chief of Naval Staff Operations, Pakistan Navy

1415 – Combat cloud in multi domain scenarios



- Combat cloud principles and challenges
- Use case of the combat cloud in amphibious operations
- Disruptive technologies as force multiplier

Jose Espinal, Director of Technology Programs, Navantia S.A, S.M.E

1445 – Exploiting commercial activities in the underwater domain



- How energy is the new obstacle when looking at system development: Potential new sources
- Commercial off the shelf solutions for future Navy's needs: NSPA experience
- Next stage developments for undersea innovations

Rafael Arcos, Deputy Director Operations, NATO Support and Procurement Agency (NSPA)



1515 – Close of plenary day afternoon and CNE Chair's summary of key themes

Vice Admiral (Ret'd) Duncan Potts CB, Former Commander UK Maritime Forces, Royal Navy