

**BAE SYSTEMS**

**Expression of Interest: Pipe GRE**

**Hunter Class Frigate Program**

**Including:**

**HCFP – Pipe GRE**

**Capability SOW & Questionnaire**

**BAE SYSTEMS – IN – CONFIDENCE**

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## Acronyms and Definitions

<b>BAE</b>	BAE Systems Australia Limited
<b>EOI</b>	Expressions Of Interest
<b>HCFP</b>	Hunter Class Frigate Program
<b>RAN</b>	Royal Australian Navy
<b>GCS-A</b>	Global Combat Ship-Australia
<b>T26</b>	British Type 26 Global Combat Ship
<b>RAP</b>	Reconciliation Action Plan
<b>AUD</b>	Australian Dollars
<b>GRE</b>	Glass Reinforced Epoxy

Including Capability SOW / Questionnaire



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Including

Capability SOW / Questionnaire

**BAE SYSTEMS****1. SCOPE**

BAE Systems are seeking Expressions of Interest (EOI) to supply ships with Pipe GRE for the Hunter Class Frigate Program (HCFP).

BAE has recently been down selected to design and build the Royal Australian Navy's (RAN) future frigates.

The BAE Systems Future Frigate offering, also known as the Hunter Class GCS-A (Global Combat Ship – Australia) is a variant of the British Type 26 GCS (T26).

The Hunter Class Frigates will be built at the ASC Shipbuilding Facility at Osborne, Adelaide, SA.

The purpose of the Capability Questionnaire is to establish the feasibility of prospective industrial partners to provide Pipe GRE to BAE Systems for the HCFP.

The Hunter Class Program will require maximisation of local content in Australia.

**Suppliers will be required to supply Pipe GRE with the below specifications:**

- The scope of supply is for various different types and sizes of GRE Pipe and Fittings for use on the GCS-A.
- The majority of GRE pipework to be supplied will be made up of GRE pipe and fittings in spool form that are to be constructed by the Contractor and delivered to the build site for installation on the ship.
- The spools will be produced by the Detail Design Engineering Team within the GCS-A Project, and will utilise the GRE pipe and fittings. These drawings will be sent to the Contractor in hard or soft copy and are to be approved by the Contractor before the spool is constructed.
- The GRE Pipe and Fittings supplied are to be Type Approved for use for the intended application on Naval Ships, in accordance with Lloyd's Register Rules and Regulations for the Classification of Naval Ships.
- The Supplier shall provide an Acceptance letter from the relevant Defence Authority, stating that the GRE Pipework System offered is acceptable for use on Royal Australian Navy ships.

**Shock requirements**

- The GRE Pipe & Fittings shall be in shock grade zone AB, C and D.
- The Manufacturer shall declare the maximum accelerations levels (e.g.  $\text{m/s}^2$ ), in the vertical and horizontal direction, that the equipment shall remain fully captive, not release any projectiles or hazardous substances and function without degradation in performance under.
- Shock qualification shall be achieved by test for Class 1 GRE Pipe & Fittings, unless the Purchaser notifies the Contractor that the equipment is exempt from testing. For the shock test, a selection of fittings sizes would be acceptable as agreed between the supplier and the shock team prior to testing. If evidence detailing the results of previous shock tests can be submitted, the GCS-A Shock Team will review this and

verify whether this qualifies the equipment for use on GCS-A CGS without the need for further testing.

- The GRE Pipe & Fittings materials shall be selected to withstand the acceleration levels declared by the Manufacturer and shall not be made of brittle materials likely to shatter when subjected to those acceleration levels.
- The GRE Pipework Systems shock class is vital for maintaining watertight integrity, lifesaving, damage control and fire-fighting, and escape and evacuation.

### Noise and Vibration requirements

- For GRE pipe systems, a range of elbow fittings shall be made available to satisfy the URN requirement. For elbows with an angle of 45° and below, a standard 1.5D fitting is acceptable for all systems.
- For 60° and 90° elbows a 3D fitting is required for all pressurised systems. For non-pressurised systems (drains, air escapes and soundings) a standard 1.5D fitting is acceptable.
- Noise will be minimised by the minimisation of turbulence within the GRE pipe systems and where the pipe ends join. Turbulence is increased through parallel and angular misalignment and through sharp edges protruding into the flow.
- The GRE pipe systems will allow tight tolerances of alignment and spacing to be achieved.
- The GRE pipe systems should constrain the parallel misalignment between the pipe ends to be a maximum of one percent of the pipe diameter.
- The GRE pipe systems should constrain the distance between the pipe ends within the coupling to be a maximum of the pipe wall thickness.

### Functional requirements

- All GRE Pipe and Fittings supplied shall be compatible with the operating conditions defined in the table below (Design pressure is the system maximum working pressure):

System	System Fluid	Pipe Sizes	System Pressure Bar	Design	Working Temperature °C
Air escape and Vents (from tanks: Fresh and Tech. water, Grey water, Ballast water, Urea, Bio sludge, Sea inlets, Sewage treat. plants, Chilled water plants and from cofferdams and void spaces)	Air	50-200	Static pressure max 1 Bar		-2 to 55
Sea Inlets and Overboard Discharge (sh4)	Sea Water	50-200	4		-2 to 55
Fresh Water Filling and transfer	Fresh Water	80	4		0 to 80
Chilled Water	Fresh Water	80-150	7		-2 to 55

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Chilled Water Sea Water	Sea Water	80-200	4	-2 to 55
External scuppers and drains	Sea Water	50-	Static pressure max 1 Bar	-2 to 55
Magazine and Internal deck drains	Sea Water	50-	Manufacturer to declare	Manufacturer to declare
Prewetting	Sea Water	50	11	-2 to 55
Propulsion Sea Water Cooling	Sea Water	80-125	3.5	-2 to -55
Low Pressure Sea Water Cooling	Sea Water	80-150	4	-2 to 55
Grey Water	Gray Water	50-125	Static pressure max1Bar	-2 to 55

- The Purchaser has selected Glass Reinforced Epoxy Pipe which shall be manufactured in accordance with BS EN ISO 14692-2.
- In accordance with Lloyd’s Register Rules and Regulations for the Classification of Naval Ships Part 2 – Rules for the Manufacture, Testing, and Certification of Materials Chapter 14, Section 4.3.1, GRE Pipe and Fittings shall be manufactured at a facilities approved by Lloyd’s Register, using materials approved by Lloyd’s Register.
- Every consignment of GRE Pipe and Fittings shall be supplied with a Type 3.1 manufacturer’s material certificate in hard copy. This is to be either an original or red stamped copy.
- All flanges on GRE Fittings shall be compatible with BS EN 1092-1 flanges of PN16 designation.
- All metallic threads on GRE Fittings shall be compatible with BS EN ISO 228-1 and bronze bush to be composed of Aluminium Bronze alloy CuAl10Ni5Fe4 designation CW307G to BS EN 1653 or equivalent.
- The Contractor shall supply an approval letter from Lloyd’s Register, or equivalent classification society, stating that axial grip type couplings are approved to connect the GRE pipe offered.
- Pipe and fittings tolerances shall conform to ASTM D-2310. Spool Tolerances shall conform to ISO 14692 – part 4, section 5.5.4.3 Tolerances.

## 2. PRE-QUALIFICATION QUESTIONNAIRE

1. *Provide full details of previous major defence, maritime or commercial projects in which your company has delivered pipe GRE.*
2. *Do you have previous experience supplying pipe GRE in Australia?*
3. *Does your product have the required certification specified in the above SOW?*
4. *What State/s do you have these capabilities in?*
5. *Have you worked on defence contracts before?*

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6. *Provide details of the company's management organisation structure.*
7. *Are you an Australian-owned company?*
8. *Are you an Indigenous company?*
9. *Please provide the number of Indigenous/Aboriginal/Torres Islander employees your organisation has? (Stipulate Full Time and Part Time)*
10. *Do you have a Reconciliation Action Plan (RAP) in place?*
11. *State acquired company certification and accreditations.*
12. *Stipulate any further competitive discriminators that have not been identified in the answers to previous questions*
13. *Have you updated your ICN company profile with the your trading name, contact details, website, ABN, number of employees, annual turnover, export details (if applicable) and ANZSIC codes? This information will be used in assessing this EOI.*

## **Closing date for Expression of interest:**

**4.00 PM on the 19<sup>th</sup> July 2019**