# Innovation Challenge Digital Safety Statement of Work (SoW)

Hunter Class Frigate Program

24 November 2020

Innovation Research & Technology Hunter Class Frigate Program ASC Shipbuilding Pty Ltd.

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# Acronyms and Abbreviations

Acronym	Description
AGV	Autonomous Ground Vehicles
ASCS	ASC Shipbuilding
AUD	Australian Dollar
ВоМ	Bill of Materials
CBS	Cost Breakdown Structure
CSV	Comma-Separated Values
ED	Effective Date
EMF	Electromagnetic Fields
FOC	First of Class
GST	Goods and Services Tax
HCFP	Hunter Class Frigate Program
IC	Innovation Challenge
ICN	Industry Capability Network
MIG	Metal Inert Gas
MSA	Minor Services Agreement
MSDS	Material Safety Data Sheet
ODBC	Open Database Connectivity
РО	Purchase Order
POC	Proof of Concept
PPE	Personal Protective Equipment
R&T	Research and Technology
RA	Risk Assessment
REST	Representational State transfer
RFP	Request for Proposal
SOP	Safe Operating Procedure
SOAP	Simple Object Access Protocol

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Acronym	Description
SoW	Statement of Work
SQL	Structured Query Language
TIG	Tungsten Inert Gas
VOC	Volatile Organic Compound
WBS	Work Breakdown Structure
WLAN	Wireless Local Area Network
XML	Extensible Markup Language

# Definitions

Term	Definition
ASC Shipbuilding	ASC Shipbuilding Pty Ltd
Commonwealth	Commonwealth of Australia
Pilot Line Zero	Factory of the Future Pilot Line Zero
Tonsley Precinct	Tonsley Manufacturing Innovation Hub



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# 1 Introduction

The purpose of this document is to define the Statement of Work required to execute an Innovation Challenge for the Hunter Class Frigate Program (HCFP).

- The Commonwealth of Australia has progressed the Future Frigate Project, referred to as SEA 5000 Phase 1. Prior to commencing construction of the First of Class (FOC) Global Combat Ship Australia, the Commonwealth has specified that a period of Prototyping be undertaken to prepare and test the shipbuilding capability and infrastructure, commencing cut steel in December 2020. The Innovation Program runs alongside the Prototyping schedule and has a number of aims, including research into technologies that could be used in the future.
- The Research & Technology (R&T) team within the ASC Shipbuilding (ASCS) business are based at the Tonsley Innovation District in South Australia and serve an important part of the HCFP Innovation Program. One of the ways the Research team conducts Innovation is through Innovation Challenges.
  - The Innovation Challenge (IC) is a periodical call to engage and seek to collaborate with the Australian industry and research sector to create innovative and creative concepts, undertake experimentations and perform demonstrations of new products and processes which would be applicable to shipbuilding.
    - Phase 1 of the Innovation Challenge is to determine the Proof of Concept (POC), demonstrate and trial the innovation, and report findings and recommendations on the concept throughout this process.
    - Once Phase One is complete, ASC Shipbuilding may see value in innovation concepts worthy of further investment requiring additional concept development, prototyping and shipyard integration at Osborne Naval Shipyard. This phase is known as Phase 2.
  - Innovation Challenges are a stand-alone activity supported by ASC Shipbuilding funding and have no contractual deliverables to the design, manufacture, build and sustainment activities of the HCFP.
  - Where the Innovation Challenge does support the HCFP and Continuous Naval Shipbuilding (CNS) is its value in being able to engage industry to develop and demonstrate innovative Shipbuilding solutions.
  - An Innovation Challenge is birthed from a themed problem statement developed by ASC Shipbuilding's R&T team whom seek industry and academia participants via the Industry Capability Network (ICN). ASC Shipbuilding will utilise the HCFP ICN Gateway Portal to seek Requests for Proposals (RFP's) for an assigned period.

#### 1.1 Purpose

- The objective of this Phase One Innovation Challenge is to investigate Digital Safety technologies in the age of Industry 4.0. It is proposed to explore and evaluate the capabilities, opportunities and limitations of the Digital Safety technologies within a test environment that replicates that of the Shipyard.
- The focus for Innovation Challenge Digital Safety surrounds three key areas:
  - Manual Handling;
  - Extraction and Ventilation; and

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- Wearables for Safety.
- Vendors are to choose and respond to only one of the three applicable problem statements in the Proposal Template provided by ASC Shipbuilding in relation to the three key areas.

	Digital Safety Technologies			
No.	Key Area	Problem Statement		
1	Manual Handling	ASCS is seeking smart solutions to reduce manual handling injuries within ship compartments. This includes handling loads, awkward positions and repetition.		
2	Extraction and Ventilation	ASCS is seeking smart solutions for sufficient ventilation & extraction during construction within ship compartments.		
3	Wearables for Safety	ASCS is seeking smart solutions to accurately determine where personnel are located inside the ship at a point in time.		

#### 1.1.1 Table 1: Digital Safety Technologies

#### 1.2 Expected Outcomes

- The key outcomes from this challenge are:
  - Understanding how technologies used in other industries could be applied into the shipyard;
  - What performance could be achieved in the shipyard; and
  - Limitations of the technology in a shipyard environment.
- The Vendor undertaking the Innovation Challenge Digital Safety must be able to identify their findings of the above in a Final Report as a result of their investigation whilst also physically demonstrating their Digital Safety solution/concept to ASCS personnel at ASC Shipbuilding's Factory of the Future Pilot Line Zero facility. These are to form part of the Vendors contractual deliverables whereby a full list of deliverables are detailed within this SoW.

#### 1.3 Demonstration Site

- Established in 2020 by ASC Shipbuilding, Line Zero is an industrial area of the Tonsley precinct in South Australia undergoing development. ASC Shipbuilding is constructing the Line Zero - Pilot Factory of the Future which is the location of the Innovation Challenge installation and demonstrations.
- The Vendor participating in the Innovation Challenge Digital Safety is required to demonstrate their proposed Innovation Challenge solution and its capability at this purposely built facility whereby Digital Safety solutions can be tested and demonstrated in a facility that imitates that of a manufacturing setting and/or shipyard environment.



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#### 1.4 Laboratory 4.19

- ASC Shipbuilding occupies an Industry 4.0 laboratory within the Flinders University building at the Tonsley Precinct in South Australia. The laboratory is where ASC Shipbuilding's R&T personnel predominantly reside. The Laboratory provides a unique environment where R&T personnel can conduct research and perform tests and trials of equipment such as autonomous ground vehicles (AGV), cobots and 3D printers as well as conducting analysis on such equipment's application to shipbuilding processes.
- Although the Line Zero Pilot Factory of the Future provides an environment replicating that of the Shipyard, in some instances, the Laboratory provides a more appropriate environment to conduct concept tests, trials and demonstrations and therefore can be used for this purpose of the Innovation Challenge as agreed by ASCS and the Vendor prior to contract signature.



# 2 Scope Context and Requirements

#### 2.1 Scope

- This document covers the organisation and operational requirements for the Innovation Challenge Digital Safety whereby:
  - the Vendor shall undertake and deliver a Proof of Concept (POC) Report in relation to their Innovative Digital Safety solution;
  - upon acceptance and approval of the POC Report, the Vendor shall deliver and demonstrate an Innovative Digital Safety solution design which is applicable to and addresses one of the provided problem statements and can be potentially integrated into a Shipyard environment;
  - the Vendor must make all cost allowances and procure, supply, transport, install and test all materials, plant and equipment, tools, accessories and the like to perform temporary and permanent works to be performed, associated with the Innovation Challenge Digital Safety activities as per this SoW;
  - the Vendor must deliver all agreed deliverable milestones in accordance with this SoW.

#### 2.2 Work Description

- To undertake the Innovation Challenge Digital Safety the Vendor must deliver all key deliverables to successfully meet the Innovation Challenge's requirements and expectations:
  - complying with all RFP attachments and annexures, including this SoW and associated referenced documentation and the like;
  - providing all necessary labour, materials, vehicles, plant, tools, equipment, goods, items, consumables (e.g. cleaning materials etc.), testing apparatus, environmental, safety and quality controls and logistics resources to perform all necessary temporary and permanent works;
  - Performing any design services as required by this SoW and RFP's attachments and annexures, to perform all necessary temporary and permanent works.
- In all instances of the Innovation Challenge Digital Safety, Vendors are required to firstly develop and deliver a Proof of Concept (POC) Report to ASCS.
- ASC Shipbuilding will review the value of the POC Report and determine whether to proceed or not with the Vendors concept to full demonstration and thus the fulfilment of deliverables 2-7 listed in Table 2.2.1.
  - $\circ$  The Vendor will be formally notified by ASCS in writing as to whether it wishes to:
    - proceed to physical demonstrations; or
    - If it wishes to conclude the Project and not proceed to any further deliverables.
  - It is understood by both parties that ASC Shipbuilding is under no obligation to pursue with the Digital Safety project after the POC Report if it chooses the option to not proceed.



#### 2.2.1 Key Deliverables Overview

Milestone	Description	Deliverables	
1	Proof of Concept (POC) Report	Must include: Concept Overview Concept Capabilities Concept application and need for concept in Shipyard environment Key Processes Key Outcomes Viability of concept Recommendation to ASC Shipbuilding Presentation of POC to ASC Shipbuilding Key processes Key outcomes Future options	
ASC Shipbuilding to accept and endorse the POC before Vendor progressing to Milestone 2.			
2	Innovation Challenge Digital Safety Project Plan	Must include: Project Overview Project Approach/Methodology Scope Milestone List Schedule Baseline and Work Breakdown Structure (WBS) Personnel List Cost Baseline Risks and Assumptions	
3	Design Documentation Delivery	Must include: • Block diagram • Interconnection • Hardware & Software BoM • Individual Lines	
4	Demonstration Integration Complete	Must include: ASC Shipbuilding Safety Risk Assessment	
5	Demonstration Trials Complete	Must include: • Vendor demonstrating a working Digital Safety Innovation Challenge to ASC Shipbuilding	

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		Must include:		
		Capability gap analysis		
		<ul> <li>With respect to the original intent as set out in the Project Plan:</li> </ul>		
		<ul> <li>Detail work undertaken and any deviation from the project plan (including reasoning for deviation)</li> </ul>		
		<ul> <li>Project successes</li> </ul>		
		<ul> <li>Noted shortcomings or areas for improvement</li> </ul>		
6	Final Report & Handover	<ul> <li>Compliance matrix against requirements as set out in the Project Plan</li> </ul>		
		<ul> <li>Capability gap analysis for shipyard rollout / assumed requirements for application into the shipyard.</li> </ul>		
		Recommendations for:		
		<ul> <li>Next steps</li> </ul>		
		o Technology insertion roadmap		
		Indicative (scalable) costing of future steps		
		Actual cost for trial as delivered against the CBS		
		<ul> <li>As a minimum to include breakdown of cost of labour and cost of non- labour</li> </ul>		
		Schedule progress against Project Plan		
7	Monthly Progress Reports	<ul> <li>Brief narrative on progress for the past month and anticipated progress for the upcoming month</li> </ul>		
		Agreed scope changes in the last month		
		Any updates to risk / opportunity		

• All key deliverables are subject to clarification and acceptance by ASC Shipbuilding by written communication:

• ASC Shipbuilding are to seek clarification and confirm acceptance in accordance with the this SoW.

### 2.3 Methodology and Deliverable Format

- The Vendor undertaking the Innovation Challenge is required to detail their methodology via their response to the RFP whereby it is intended that their innovation solution will be delivered to ASCS for demonstration. The Vendor shall describe the intended approach they will undertake in order to carry out the Innovation Challenge project work including the resources utilised and effort required;
- The Vendor is to supply technologies applicable to purpose for:
  - Design demonstration
  - Build demonstration;

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- Evaluate performance;
- Evaluate features

#### 2.4 Trialling and Witnessing of the IC Demonstration

- All Innovation Challenge testing and demonstrations will be subjected to witnessing by ASC Shipbuilding and/or any other party/persons required;
- The Vendor must detail in their final report a recount of the demonstration which is to be performed as per project requirements and the procedures and shall specifically contain the following:
  - scope of the demonstration, including a demonstration method, which shall provide a general description of the activity;
  - configuration of the system under demonstration and initial conditions for demonstration, including any preparatory requirements or other pre-demonstration activities;
  - demonstration equipment, documentation, venue and personnel required for the conduct of the demonstration;
  - all safety and environmental requirements necessary for the performance of the demonstration;
  - a description of any data inputs or data files required for the conduct of the demonstration;
  - The outcome of the demonstration including any corrective actions and recommendations for next time.

#### 2.5 Stakeholder Engagement

- The Vendors' personnel will be expected to actively coordinate and effectively interact and communicate with various stakeholders in order to complete the Innovation Challenge Digital Safety project detailed in this SoW. These may include, but are not limited to;
  - ASCS Personnel;
  - Third Party Representatives/ Auditors
- Throughout the project the vendor is required to provide a predetermined monthly progress report to the ASCS Project Manager.

#### 2.6 Exclusions

• Nil. This SoW is anticipated to be all inclusive to meet the requirements of the specification.



# 3 Assumptions

#### 3.1 Term, Completion and Acceptance Requirements

- The Innovation Challenge Digital Safety project will run for a total term as agreed in the contracted Minor Services Agreement (MSA);
- The Effective Date (ED) for the Innovation Challenge Digital Safety will be on the day of issuance of a Purchase Order (PO) by ASCS;
- ASC Shipbuilding will evaluate acceptance of each milestone once the milestone has been completed and delivered to ASCS;
- The acceptance of each milestone will trigger a milestone payment to the vendor or as agreed in the MSA.

## 3.2 ASC Shipbuilding Furnished Facilities & Equipment

- It is assumed that all requirements for the installation of the vendor's innovation challenge solution will be identified, detailed and agreed in the vendor's Innovation Challenge Digital Safety Proposal submitted to ASCS prior to signing the MSA;
- ASC Shipbuilding shall provide a designated test/demonstration space required at Pilot Line Zero, Tonsley Precinct for the Vendor at no cost;
- ASC Shipbuilding shall provide power to the vendors designated test/demonstration site at Pilot Line Zero, Tonsley precinct;
- ASC Shipbuilding shall provide access to the vendor to any agreed project applicable data and/or information necessary to conduct and complete the Innovation Challenge Digital Safety activities;
- The vendor is to provide all equipment and materials required in order to undertake the Innovation Challenge Digital Safety project;
- The vendor is to disclose to the ASCS stakeholders as to what requirements will need to be met in regards to furnished facilities and equipment at Pilot Line Zero and or any other ASCS facility locations.

#### 3.2.1 Temporary Access

- The vendor and any subcontractor personnel required to undertake working activities at either Tonsley Precinct location (Pilot Line Zero or Laboratory 4.19) must have a police check as a minimum security requirement for site access;
- ASC Shipbuilding are to provide all designated vendor and subcontractor personnel with a Tonsley site induction prior to them accessing the site. Once personnel have undertaken the relevant site induction they will be classed as an authorised person;
- Personnel that includes site visitors, vendors and/or subcontractors that have not undertaken a site induction are required to be escorted at all times by an authorised person that has undertaken the necessary site induction whilst at either of the Tonsley Precinct locations;
- ASC Shipbuilding shall ensure that the vendor and their subcontractors are provided with the necessary site access for personnel as well as equipment;
- ASC Shipbuilding security will issue and control swipe access passes for all authorised vendor and their subcontractors personnel to conduct work at Pilot Line Zero and/or Laboratory 4.19 at the Tonsley Precinct;
- If required within Pilot Line Zero, the vendor will supply all materials, erect, certify and make allowable costs for the use of all fixed access systems such as scaffolding and the like or mobile elevated work platforms with the assistance of ASCS;

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Vendors and their subcontractors are to cap the number of designated personnel requiring site access to perform activities at any one time (see Section 5 of this document for more details).

#### 3.2.2 Personal Protective Equipment (PPE)

- All vendor and subcontractor personnel on site at Pilot Line Zero are required to wear: •
  - Vendor or subcontractor supplied safety glasses; 0
  - Vendor or subcontractor supplied enclosed steel toe capped footwear; 0
  - Vendor or subcontractor supplied high visibility work wear. 0
- It is mandatory for gloves to be carried on glove clips at all times by workers who will be undertaking physical work, even when not in use;
- Workers shall use any additional PPE for any tasks being performed as determined by the relevant risk assessment including:
  - Vendor or subcontractor supplied bump caps; 0
  - Vendor or subcontractor supplied gloves; 0
  - Vendor or subcontractor supplied hearing protection; 0
  - Vendor or subcontractor supplied dust mask/ face shield. 0
- In the case of events/ dignitaries attending Pilot Line Zero, PPE may be relaxed to normal attire if a risk assessment for the activities being performed during the visit records the risks as acceptable without PPE. Approval must be obtained from the SHE site Manager or delegate;

#### 3.2.3 Site Workstation

- ASC Shipbuilding shall provide the vendor with a designated workstation area of approximately 4 metres squared (as a minimum) at Pilot Line Zero to conduct all Digital Safety activities unless prior agreement has been arranged between ASCS and the vendor. Additional working space requirements are to be negotiated on a case-by-case basis with ASCS prior to the commencement of work;
- ASC Shipbuilding shall provide the vendor with a work bench or desk in the vendor's designated • working area at Pilot Line Zero unless prior agreement to an alternative between ASCS and the vendor:
- ASC Shipbuilding shall ensure that all designated Vendor workstations have a power source and task lighting within their workstation.

#### 3.2.4 Storage Facilities and Materials Handling

- ASC Shipbuilding shall provide a secured 20ft storage container for the purpose of on-site storage for all listed vendors' materials and equipment that is kept at the Line Zero project site;
- ASC Shipbuilding shall be responsible for the safeguarding and security of all listed vendor materials, equipment and other items that are kept in the provided on-site storage at Pilot Line Zero site;
- The vendor is to provide details on all equipment and materials which are required to be stored at Pilot Line Zero prior to any Innovation Challenge project work commencing;
- The vendor must ensure that all equipment and materials not disclosed are to be stored offsite and supplied just in time and as required in line with project programme, to minimise on site storage;
- The vendor is required to conduct a Risk Assessment (RA) of the site prior to the commencement of any project activities being conducted at the Tonsley Precinct whereby:
  - All powered plant must be risk assessed; 0
  - All equipment is to be in date for electrical Test and Tag; 0
  - All significant activities require risk assessments. 0

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#### 3.2.5 Mobile Plant

• The vendor is responsible for the supply of all required mobile plant and equipment required for the demonstration at the Pilot Line Zero site with the assistance of ASCS;

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- The vendor is required to communicate requirements for mobile plant equipment with ASCS prior to the equipment's arrival onsite;
- ASC Shipbuilding shall inform the vendor of any Legislative, ASCS or other requirements for operating mobile plan equipment onsite if applicable.

#### 3.2.6 Site Internet

 ASC Shipbuilding shall provide the Vendor with secure access to Internet connectivity via Ethernet and or access to an innovation challenge specific WLAN network whilst conducting work on the Innovation Challenge Digital Safety at Pilot Line Zero and/ or Laboratory 4.19 for demonstration purposes.

#### 3.2.7 Vendor Risk Register

• ASC Shipbuilding requires the Vendors to maintain a Risk Register as part of completing the Innovation Challenge Digital Safety project. This is not a required deliverable but may be requested at any stage by ASCS for review or auditing purposes.

#### 3.2.8 Pilot Line Zero Site Awareness

- Maximum floor point loading is equal to 1,000kg;
- Area Floor loading is equal to 2,300kg/m<sup>2</sup>. ASC Shipbuilding shall provide a plan on request of the vendor or any subcontractors.

#### 3.2.9 Environmental Awareness

- Due to various other Research and Technology projects being conducted simultaneously at both Pilot Line Zero and the Laboratory 4.19 facilities by ASCS and other vendors and subcontractors, the vendor understands and accepts that following factors may cause interference and/ or impact upon the way in which vendors may conduct project activities. These include but are not limited to:
  - Excessive Noise;
  - Frequency Interference;
  - Magnetic Fields Generation;
  - EMF Radiation;
  - MIG/TIG Welding;
  - Floor Vibration;
  - VOC Fumes (paint etc.)



# 4 Pricing Schedule and Conditions

#### 4.1 Cost Breakdown Structure & Schedule of Deliverables

- Phase one funding provided by ASCS for the Innovation Challenge Digital Safety is allocated for projects to be conducted for maximum value of \$100,000 AUD for each successful vendor.
- Prior to agreeing to proceed with the Vendors proposal to the Digital Safety Innovation Challenge, ASCS require the vendor to provide a clear and transparent articulation of a project Cost Breakdown Structure (CBS) in accordance with the deliverables which is to be included within the Vendor's Innovation Challenge Digital Safety Proposal. This includes but is not limited to a cost breakdown of:
  - Direct and Indirect Materials;
  - Hardware equipment;
  - Software equipment;
  - Plant Equipment/ Items
  - Labour rates and hours;
  - o Deliverables at each milestone;
  - Installation;
  - Overheads;
  - Third Party Sub-contractors
- The vendor is to provide a milestone schedule in accordance with the table below unless the Vendor has an alternative milestone payment schedule which is agreed upon by ASCS and is articulated in the vendors proposal and referred to in the MSA.

Milestone	Deliverable	Date (ED+)	Value (\$) excl. GST
1	Proof of Concept (POC) Report	ED+ x weeks	\$ x
2	Innovation Challenge Digital Safety Project Plan	ED+ x weeks	\$ x
3	Design Documentation Delivery	ED+ x weeks	\$ x
4	Demonstration Integration Complete (Line Zero)	ED+ x weeks	\$ x
5	Demonstration Trials Complete (Line Zero)	ED+ x weeks	\$ x
6	Findings Report and Recommendation	ED+ x weeks	\$ x
	1	Fotal (excl. GST)	\$ x

- If the vendor's alternative milestone payment schedule is preferred, the vendor must provide the preferred milestone payment schedule in their proposal document to ASCS. Which must detail:
  - o a list of the vendors preferred milestones;
  - o payment schedule dates at the deliverable milestone;
  - o The value (AUD) of each milestone which excludes GST.
- The vendor will be paid in accordance with the agreed terms and conditions listed in the contract and only for the deliverables in which it fulfils.
  - The vendor will be paid for the POC amount once this first deliverables has been achieved.

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 ASC Shipbuilding will not provide funding, nor shall the vendor expect funding to the subsequent deliverables beyond the POC Report if ASCS wishes to not progress with the project further.



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# 5 Personnel

- The vendor must provide as part of their proposal submission a proposed organisation chart which identifies the roles and responsibilities for the proposed Innovation Challenge Digital Safety project personnel;
- The vendor must allow for and attend the following site specific training and inductions provided by ASCS as described in this SoW;
- For the purpose of site inductions and procedures at Pilot Line Zero when undertaking demonstrations it would be expected that the vendor would select a core group of personnel that would attend the site;
- The vendor will further identify any third party personnel who is proposed to conduct activities in contribution to the Innovation Challenge Digital Safety project. The vendor will further identify the third party members' roles and responsibilities to ASCS;
- The vendor will ensure that any third parties also undertake and complete the specific training and site inductions provided by ASCS if deemed necessary;
- ASC Shipbuilding are responsible for ensuring that all personnel on site at Pilot Line Zero conducting works for the Digital Safety Innovation Challenge will have undertaken the necessary inductions and training to be compliant with all site, equipment and plant handlings, Safe Operating Procedures (SOP) and other safety procedure requirements.

