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Capability Acquisition and Sustainment Group

FUTURE SUBMARINE PROGRAM
SEA1000

COMMONWEALTH REQUIREMENTS TO ACHIEVE SOVEREIGN SUSTAINABILITY OF MISSION SYSTEM EQUIPMENT

VERSION 1.0

Future Submarine Program
Capability Acquisition and Sustainment Group

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DOCUMENT CONTROL INFORMATION

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Future Submarine Program

Capability Acquisition and Sustainment Group

16 August 2018

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REFERENCES

1. RAN, Australian Navy Publications (ANP) Glossary of Terms, <http://authoritdppweb/N4/index.htm#90.htm>.
2. RAN, Future Submarine Capability Support Intent, Objective ID D16787461, DRAFT.

ACRONYMS

ANP	Australian Navy Publications
CC	Converter Cubicle
CoA	Commonwealth of Australia
DA	Design Authority
DGR	Diesel Engine and Generator Set
EA	Engineering Authority
FSM	Future Submarine
FSP	Future Submarine Program
LMA	Lockheed Martin Australia
MEM	Main Electric Motor
OEM	Original Equipment Manufacturer
OSI	Operating and Support Intent
RAN	Royal Australian Navy
STW	Set To Work
WDS	Weapon Discharge System

1 INTRODUCTION

1.1 Objective

The industry strategy of the Future Submarine Program (FSP) is:

> *The Future Submarine Program aims to deliver Australia a regionally superior submarine capability, which will be built, operated and sustained with sovereignty. The program therefore seeks to ensure that the Australian industrial capability necessary to support the build, operation and sustainment of the Future Submarine is established. This will involve maximising the involvement of Australian industry in all phases of the Program without unduly compromising capability, cost or schedule.*

For the purposes of this paper, "sovereign sustainment" is defined as follows:

> *The ability to sustain the FSM through the application of technical data and other information and intellectual property rights including that relevant to the design of, and the technology employed in the FSM including in relation to the upkeep, update and upgrade of the Future Submarine without undue dependence on overseas organisations.*

While the ability to build and sustain 100% of every aspect of the FSM in Australia is desirable, the aim of this paper is to establish the minimum necessary requirements for achieving sovereign sustainment of specific equipment items being procured for the Future Submarine (FSM).

1.2 Scope and Assumptions

In addressing this aim, the following scope is defined in order to bound the discussion:

- General sovereign sustainment requirements will be developed which are relevant across all FSM systems.
- Only in-service sustainment is covered in this paper. The build phase is not covered, though it is acknowledged that opportunities for Australian involvement will exist and could positively contribute towards sovereign sustainment.
- The scope of this paper is limited to the technical aspects of platform and combat systems equipment sustainment and does not explore wider issues such as non-technical facilities, RAN crew training and training equipment/simulators, commercial aspects, export controls, industry/Navy skills retention and politics.
- Specific sustainment requirements will initially be developed for the Critical Systems[1], then Main/Major systems (Naval Group/LMA terminology respectively) and other systems. Essentially, these requirements will expand on the general requirements for key sustainment tasks where relevant.
- Sustainment considerations are intended to reflect the minimum requirements for the Commonwealth to achieve sovereign sustainment.
- For LMA: The Sovereign Sustainment Paper is intended to clarify and provide further guidance on the Commonwealth's Sovereignty Requirements. If there is

s47C [redacted] Critical Systems have a large bearing on the design of the submarine, and are defined early in the design process.

any inconsistency between the Sovereign Sustainment Paper and the Contract (CASG/FSP/Contract323/2018), the Contract will take precedence to the extent of the inconsistency. Any amendments to the Contract (if required) will be in accordance with clause 18.2 of the Conditions of Contract.

- For Naval Group: The Sovereign Sustainment Paper is intended to clarify and provide further guidance on the Commonwealth's Sovereignty Requirements. If there is any inconsistency between the Sovereign Sustainment Paper and the Contract (CASG/FSP/ Contract356/2016), the Contract will take precedence to the extent of the inconsistency. Any amendments to the Contract (if required) will be in accordance with clause 10.1 of the Conditions of Contract.

It is emphasised that this paper only considers those aspects of sustainment that are directly relevant to sovereignty. Sustainment in general is a very broad topic, the majority of which is beyond the scope of this paper. For further information, references such as the FSM Support Intent (Ref. 2) should be consulted.

1.3 Definitions

The following terms have specific meaning whenever used throughout this paper:

- Design Authority (DA) - A person or organisation that has the overall responsibility for developing and ensuring the integrity of a design of a system or equipment, ensuring that the design decisions are documented and the consequences of any design decision are understood.
- Engineering Authority (EA) – An individual with the delegated authority to make technical decisions or provide advice concerning ADF maritime materiel. This is based on the individual's competency and the risk associated with decisions they are authorized to make.
- Local/Locally – Within Australia (or New Zealand), by Australian (or New Zealander) industry or personnel.
- Supplier – The company or organisation which has designed, manufactured and supplied the equipment. This is likely to be Naval Group, LMA or one of their suppliers.

2 GENERAL SOVEREIGN SUSTAINMENT CONSIDERATIONS

The definition of sovereign sustainment for use in this paper (§ 1.1) refers to "upkeep, update and upgrade" of the FSM. The following definitions of these terms are adapted from the Australian Navy Publications (ANP, Ref. 1) glossary:

- Upkeep – Activities conducted at any time in the capability life cycle to restore materiel to its specified operating, physical or performance standard. Note: An Upkeep job permits no change to the functional, allocated or product baseline.
- Update – Activities conducted at any time in the capability life cycle to modify or replace materiel hardware, software or firmware without changing function or performance. Note: Updates aim at reducing the capability life cycle cost. They can be used to resolve obsolescence problems and to improve operability and reliability.
- Upgrade – Activities conducted at any time in the capability life cycle to enhance existing materiel performance or create new materiel capability. Note: An Upgrade requires a change to the functional, allocated and product baseline, and therefore requires an approved engineering change management process and change directive.

In general, the vast majority of FSM sustainment tasks will require the following generic inputs from Naval Group, LMA or their suppliers:

- General Operation and Maintenance (Upkeep)
  - Training
  - Documentation
  - Knowledge Transfer
  - Supply of Parts
  - Special Tools and Test Equipment and Special Purpose Facilities
- Design Change Management
  - Design Update
  - Design Upgrade

s47G(b), s33(a)(ii), s47C

[redacted]

2.1 General Operation and Maintenance Inputs (Upkeep)

2.1.1 Training

Operators must be trained in all aspects of system operation and maintainers (whether defence or industry personnel) must be trained in all stages of the maintenance process for all maintenance tasks, including system testing and Set To Work (STW) and fault

finding. Initially, this training would be conducted by the supplier and could take place at overseas facilities. However, in order to develop sovereign sustainability, a "train-the-trainer" approach, including establishment of training systems and materials in Australia, should be adopted as early as possible to allow subsequent training to be conducted s47C, s47G(b) .

Requirements s47C sovereign sustainability:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation (e.g. normal, alternate and degraded modes of operation).
- The supplier shall provide training to maintainers and technicians to comprehensively cover all maintenance tasks, system testing and STW.
- The supplier shall provide "train the trainer" programs, and define/provide training systems, and materials which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

2.1.2 Documentation

The supplier shall provide a complete suite of documentation that provides detailed instructions on how to perform all operation and maintenance tasks. s47C, s47G(b)

Requirements s47C sovereign sustainability:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks including test and STW.
- s47C, s47G(b)
- s47C, s47G(b)

2.1.3 Knowledge Transfer

In addition to the tangible documentation and training discussed above, the supplier will need to transfer the less tangible design knowledge and experience. This extends to design, maintenance and operating knowledge which assists is undertaking investigation and repair as well as possessing the background maintenance knowledge and information to conduct Maintenance Effectiveness reviews and Reliability Analysis.

EA input and approval is generally required to address the following circumstances:

- Defects and Damage – when the equipment is damaged during operation (due to internal or external cause), knowledge of system is required to undertake investigation and repair.

- Out-of-spec defects – When defects found during maintenance activities or operation fall outside of allowable tolerances and therefore risk based advice is required on how to proceed with repairs.

s33(a)(i)(ii), s47C [redacted]

- Design baseline changes – When the design of the mission system is updated or upgraded.

s47C, s47G(b) [redacted]

2.1.4 Supply of Parts

The security of the parts supply is critical to ensuring sustainment of the FSM. In order to ensure security of parts supply, a local, dependable supply chain shall be setup s47C, s47G(b [redacted]

Requirements s47C sovereign sustainability:

- s47C, s47G(b) [redacted]
- The supplier shall use standardised and readily available parts and consumables wherever possible (e.g. bolts, o-rings, lubricants etc.).

While not a specific requirement for this paper, other methods are available to mitigate against lack of parts supply. These should be considered as supplementary measures:

- s47C, s47G(b) [redacted]
- Minimum sustainment period buys - sufficient spares to sustain the FSM for the minimum sovereign sustainment period defined in the Support Intent.
- Repairable items – Additional boat sets of equipment suitable for repair and refurbishment that can be swapped with onboard equipment (repair by replacement) during both programmed maintenance as well as in scheduled maintenance periods. s47C, s47G(b) [redacted]
- s47C, s47G(b) [redacted]

2.1.5 Tools, Equipment and Facilities

The supplier shall specify the tools and equipment necessary to conduct all specified maintenance tasks, diagnostics and fault finding, and shall supply any special purpose support and test equipment required for these tasks. For simple tasks, it is likely that only a general workshop and basic tooling will be required, but for some major refurbishment

and repair of complex assemblies, specialised tooling, equipment and facilities may be required.

s47C, s47G(b) [redacted]

2.1.6 Other Requirements

To include any other requirements that may be specific to the particular equipment, for example, if the supplier is requested to provide recommendations or any requirement not covered elsewhere.

2.2 Design Change Management (Update and Upgrade)

2.2.1 Design Upgrade

As stated above, updates and upgrades involve changing the design baseline and therefore require involvement and approval of the EA. s47C, s47G(b) [redacted]

Upgrades will generally involve changing the design baseline in order to enhance the capability of the submarine. Over the life of the submarine, it is highly likely that such upgrades will be required in order to maintain regional superiority. s47C, s47G(b) [redacted]

2.2.2 Design Update

Design update differs from upgrade in that it is not performed in order to enhance capability, but to maintain existing capability when confronted by issues such as obsolescence or unavailability of parts.

s47C, s47G(b) [redacted]

A SUMMARY OF GENERIC REQUIREMENTS

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing, diagnostics and fault finding and Set To Work (STW).
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for s47C, s47G(b) maintenance tasks, including test, diagnostics and fault finding and STW.
- s47C, s47G(b)
-

Knowledge Transfer:

- s47C, s47G(b)

Supply of Parts:

- s47C, s47G(b)
- The supplier shall use standardised and readily available parts and consumables wherever possible.

Tools, Equipment and Facilities:

- s47C, s47G(b)

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

DOCUMENT ADMINISTRATION SHEET

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B CRITICAL EQUIPMENT REQUIREMENTS

B.1 Platform Systems – Batteries

System:	Batteries

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing and Set To Work (STW).
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks, including test and STW.
- s47C, s47G(b)
-

Knowledge Transfer:

- s47C, s47G(b)

Supply of Parts:

- s47C, s47G(b)
- The supplier shall use standardised and readily available parts and consumables wherever possible.

s33(a)(i)(ii), s47C

Tools, Equipment and Facilities:

- s47C, s47G(b)

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

B.2 Platform Systems – Diesel Generator Rectifiers

System:	Diesel Generators Rectifiers

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing and Set To Work (STW).
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks, including test and STW.
- s47C, s47G(b)
-

Knowledge Transfer:

- s47C, s47G(b)

Supply of Parts:

- s47C, s47G(b)
- The supplier shall use standardised and readily available parts and consumables wherever possible.

Tools, Equipment and Facilities:

- s47C, s47G(b)

Other Requirements:

s33(a)(i)(ii), s47C

- The supplier shall provide recommendations for sovereign capability to remove, strip-down and overhaul diesel engines, reassemble, test and restore complete DGR and ancillaries s47C [redacted]
- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

B.3 Platform Systems – Main Motor and Converter Cubicle

System:	Main Motor and Converter Cubicle

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing and Set To Work (STW).
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks, including test and STW.

s47C, s47G(b)

Knowledge Transfer:

- s47C, s47G(b)

Supply of Parts:

- s47C, s47G(b)
- The supplier shall use standardised and readily available parts and consumables wherever possible.

Tools, Equipment and Facilities:

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall provide recommendations for sovereign capability to repair, test and restore the MEM and s33(a)(i) Australia.

s47C, s47G(b) [redacted]

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

B.4 Platform Systems – Main Switchboards

System:	Main Switchboards

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing and Set To Work (STW).
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks, including test and STW.
- s47C, s47G(b)
-
- The supplier, where possible, shall provide documentation, s47C, s47G(b)

Knowledge Transfer:

- s47C, s47G(b)

Supply of Parts:

- s47C, s47G(b)
-
- The supplier shall recommend a special spares holding of modular switchboard frames and parts for switchboard refurbishment (e.g. in the event of a switchboard fire).
- The supplier shall use standardised and readily available parts and consumables wherever possible.

Tools, Equipment and Facilities:

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

B.5 Combat Systems – Weapons Launch System

System:	Weapon Launch System

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing and Set To Work (STW).
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks, including test and STW.
- s47C, s47G(b)
-

Knowledge Transfer:

- s47C, s47G(b)
- The EA shall be capable of making engineering decisions locally on all reasonably foreseeable defects for upkeep purposes, and shall be capable of performing updates and upgrades to the design baseline.

Supply of Parts:

- s47C, s47G(b)
- The supplier shall use standardised and readily available parts and consumables wherever possible.

Tools, Equipment and Facilities:

- s47C, s47G(b)

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

- The supplier shall recommend an appropriate approach to the management of spare parts, which may include spares holding and a rotatable pool of spares for major sub-assemblies

C MAIN / MAJOR EQUIPMENT REQUIREMENTS

C.1 Platform Systems – s33(a)(i)(ii), s47C, s47G(b)

System:	s33(a)(i)(ii), s47C, s47G(b)

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged:

Upkeep

- Remove and replace the s33(a)(i)(ii), 47C 47G(b)
- Inspect the s33(a)(i)(ii), 47C 47G(b)
- EA to make informed engineering decisions for defect rectification locally
- Assessment of deviations (concessions) to the design baseline are conducted locally

Update

- Updates to the design baseline are conducted locally
- Address obsolescence issues

Upgrade

- Upgrades to the design baseline are conducted locally

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training:

- The supplier shall provide training to local maintainers to s47C, s47G(b) planned and corrective maintenance tasks. Note that the term "local" throughout this document refers to "being within Australia" and is not CASG/RAN/contractor specific.
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b).

Documentation:

- s47C, s47G(b)
-

Knowledge Transfer:

- s47C, s47G(b)
- [redacted]

Supply of Parts:

- The supplier shall specify Life-of-type buys for sufficient spares to sustain the FSM for the entire life of class.

Tools, Equipment and Facilities:

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

C.2 Platform Systems – s33(a)(i)(ii), s47C, s47G(b)

System:	s33(a)(i)(ii), s47C, s47G(b)

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged:

Upkeep

- Conduct Built-in-Test (BIT) functions to detect and isolate faults and monitor performance.
- Inspect the s33(a)(i)(ii), s47C, s47G(b) in order to conduct fault finding and diagnostics.
- Analyse sensor information either locally or at a centralised system to facilitate troubleshooting and through-life equipment monitoring.
- Isolate, remove and replace the s33(a)(i)(ii), s47C, s47G(b) in-situ (including but not limited to s33(a)(i)(ii), s47C, 47G(b)

Update

- Updates to the design baseline are conducted locally (where possible).
- Address obsolescence issues

Upgrade

- Upgrade s33(a)(i)(ii), s47C, s47G(b) (including but not limited to s33(a)(i)(ii), s47C, 47G(b)
- Upgrades to the design baseline are conducted locally (where possible).

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all operational modes.
- The supplier shall provide training to local maintainers to s47C, s47G(b) planned and corrective maintenance tasks. Note that the term "local" throughout this document refers to "being within Australia" and is not CASG/RAN/contractor specific.
- To facilitate local maintenance, the supplier shall design the s33(a)(i)(ii), s47C, 47G(b) Built-in-Test (BIT) capability to detect and isolate faults and monitor performance.
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b)

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems. Note that the term "documentation" includes any form of data, whether it be documents, drawings etc.
- s47C, s47G(b) [redacted]
- The supplier shall provide comprehensive documentation s47C, s47G(b) [redacted] thereby allowing the Engineering Authority (EA) to make informed engineering decisions s47C, [redacted]. Design documentation shall include guidelines on s33(a)(i)(ii) [redacted] as an aid to local maintainers.
- s47G, s47G(b) [redacted]

Knowledge Transfer:

- s47C, s47G(b) [redacted]
- [redacted]

Supply of Parts:

- In addition to s47C, s47G(b) [redacted], the supplier shall recommend an appropriate approach to the management of spare parts, which may include spares holding and a rotatable pool of spares for major sub-assemblies.
- The supplier shall use standardised and/or readily available parts and consumables wherever possible (e.g. bolts, gaskets, o-rings, lubricants etc.).
- s47C, s47G(b) [redacted]

Tools, Equipment and Facilities:

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

C.3 Platform Systems – s47C, s47G(b) [redacted]

System:	s47C, s47G(b) [redacted]

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged:

Upkeep

- Remove, replace and (where viable) refurbish equipment and sub-assemblies such as s47C, 47 [redacted]
- Remove and Replace s47C, s47G(b) [redacted]

Update

- Updates to the design baseline
- Address obsolescence issues

Upgrade

- Add the ability to remove s47C, s47G(b) [redacted] if identified through life

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all operational modes.
- The supplier shall provide training to maintainers to s47C, s47G(b) [redacted] maintenance tasks. Note that the term "local" throughout this document refers to "being within Australia" and is not CASG/RAN/contractor specific.
- s47C, s47G(b) [redacted]
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers s47C, s47G(b) [redacted].

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems. Note that the term "documentation" includes any form of data, whether it be documents, drawings etc.
- s47C, s47G(b) [redacted]
- [redacted]
- [redacted]

Knowledge Transfer:

- s47C, s47G(b) [redacted]
- [redacted]

Supply of Parts:

- In addition to s47C, s47G(b) [redacted] above, the supplier shall recommend an appropriate approach to the management of spare parts and consumables, which may include spares holding and a rotatable pool of spares for major sub-assemblies.
- The supplier shall use standardised and/or readily available parts and consumables wherever possible (e.g. bolts, gaskets, o-rings, lubricants etc.).
- Local suppliers of the materials required to maintain the s47C, s47G(b) [redacted] of the system shall be determined/developed.

Tools, Equipment and Facilities:

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

C.4 Platform Systems – s47C, s47G(b)

System:	s47C, s47G(b)

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged:

Upkeep

- Remove and replace s47C, s47G(b)
- Remove and replace; s47C, s47G(b)
- Remove and replace and refurbish s47C, s47G(b)
- Remove and replace and refurbish s47C, s47G(b)
- Remove and replace and refurbish s47C, 47G(b)
- s47C, s47G(b)
- s47C, s47G(b)
- Remove and replace s47C, s47G(b)
- Remove and replace s47C, s47G(b)
- s47C, s47G(b)

Update

- Potential s47C, s47G(b)
- Address obsolescence issues

Upgrade

s47C, s47G(b)

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all operational modes.
- The supplier shall provide training to local maintainers to s47C, s47G(b) planned and corrective maintenance tasks. Note that the term “local” throughout this document refers to “being within Australia” and is not CASG/RAN/contractor specific.

- s47C, s47G(b) [redacted]
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of operators, maintainers and engineers s47C, s47G(b) [redacted].
- s47C, s47G(b) [redacted]

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems. Note that the term "documentation" includes any form of data, whether it be documents, drawings etc.
- s47C, s47G(b) [redacted]
- [redacted]
- [redacted]

Knowledge Transfer:

- s47C, s47G(b) [redacted]
- [redacted]

Supply of Parts:

- In addition to s47C, s47G(b) [redacted], the supplier shall recommend an appropriate approach to the management of spare parts, which may include spares holding and a rotatable pool of spares for major sub-assemblies.
- The supplier shall use standardised and/or readily available parts and consumables wherever possible (e.g. bolts, gaskets, o-rings, lubricants etc.). s47C, s47G(b) [redacted]
- s47C, s47G(b) [redacted] used shall be readily available within Australia, and if possible, be commonly used across throughout the RAN.
- It should be possible to readily refurbish electric motors or replace them with readily available motors.
- s47C, s47G(b) [redacted]

Tools, Equipment and Facilities:

- Wherever possible, maintenance tasks shall be designed to use only standard tooling and readily available workshop equipment

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

C.5 Platform Systems – s47C, s47G(b)

System:	s47C, s47G(b)

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged:

Upkeep

- Inspect in-situ.
- Corrective and preventive maintenance to be done in-situ.
- EA to make informed engineering decisions for defect rectification locally
- s47C, s47G(b)
-

Update

- Updates to the design baseline are conducted locally.
- s47C, s47G(b) .
- Qualification of introduced parts.
- Address obsolescence issues

Upgrade

- Upgrades to the design baseline are conducted locally.
- s47C, s47G(b) .
- Qualification of new equipment.

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training:

- The supplier shall provide training to operators to comprehensively cover the operation of all systems.
- The supplier shall provide training to local maintainers to s47C, s47G(b) maintenance tasks. Note that the term "local" throughout this document refers to "being within Australia" and is not CASG/RAN/contractor specific.
- s47C, s47G(b)
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of operators, maintainers and engineers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems. Note that the term "documentation' includes any form of data, whether it be documents, drawings etc.
- s47C, s47G(b) [redacted]
- [redacted]
- [redacted]

Knowledge Transfer:

- s47C, s47G(b) [redacted]
- [redacted]

Supply of Parts:

- In addition to s47C, s47G(b) [redacted], the supplier shall recommend an appropriate approach to the management of spare parts, which may include spare holding and a rotatable pool of spares for major sub-assemblies.
- The supplier shall use standardised and/or readily available parts and consumables wherever possible (e.g. bolts, gaskets, O-rings, lubricants etc.).
- s47C, s47G(b) [redacted]

Tools, Equipment and Facilities:

- s47C, s47G(b) [redacted]

Other Requirements:

- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.

C.6 Platform Systems – s47C, s47G(b) [redacted]

System:	s47C, s47G(b) [redacted]

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged:

Upkeep

- s47C, s47G(b) [redacted]
- s47C, s47G(b) [redacted]
- s47C, s47G(b) [redacted]
- Coating application
- Long-term storage (under controlled conditions)
- s47C, s47G(b) [redacted]
- Assessment of deviations (concessions) on the design baseline to be conducted locally

Update

- s47C, s47G(b) [redacted]
- s47C, s47G(b) [redacted]
- Address obsolescence issues

Upgrade

- Undertake appropriate engineering analyses in order to s47C, s47G(b) [redacted]
- Generation of s47C, s47G(b) [redacted] specification

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training:

- The supplier shall provide training to local maintainers to s47C, s47G(b) [redacted] maintenance tasks (including, but not limited to installation, coating application, inspection, assessment, replacement). Note that the term "local" throughout this document refers to "being within Australia" and is not CASG/RAN/contractor specific.
- The supplier shall provide training to local maintainers to comprehensively cover storage requirements and any associated maintenances.
- The supplier shall provide training to local engineers to enable local engineering decisions regarding reasonably foreseeable defects, s47C, s47G(b) [redacted] obsolescence, and upgrades.

- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers and engineers s47C, s47G(b) .

Documentation:

- The supplier shall provide documentation that includes comprehensive instructions for the installation, coating, inspection, assessment, and replacement of s47C, s47G(b) Note that the term "documentation" includes any form of data (e.g. documents, drawings, CAD models etc.).
- s47C, s47G(b)
- s47C, s47G(b)
-

Knowledge Transfer:

- s47C, s47G(b)
- The supplier shall transfer sufficient engineering knowledge and experience to enable local engineers to make decisions regarding reasonably foreseeable defects, s47C, s47G(b) obsolescence, and upgrades.

Supply of Parts:

- The supplier shall recommend an appropriate approach to the management of s47C, s47G(b) spares.
- The supplier shall use standardised and/or readily available connections (e.g. bolts).
- The supplier shall ensure a licensed local supplier with local manufacturing and qualification capabilities and/or sufficient local stock to support planned and reasonably foreseeable unplanned maintenance.
- The supplier shall use standardised s47C, s47G(b)
- The supplier shall specify Life-of-type buys to sustain the FSM for the entire life of class where appropriate.

Tools, Equipment and Facilities:

- s47C, s47G(b)
-

Other Requirements:

- The supplier shall align all planned maintenance activities with the FSM usage upkeep cycle.

- The supplier shall provide information on the design life of the s47C, s47G(b) and any planned replacement period.

C.7 Combat Systems – s47C, s47G(b) [redacted]

System:	Combat System – s47C, s47G(b) [redacted]

Sustainment Objective

In order to achieve sovereign sustainment of the system, at minimum the following activities are envisaged when the system is operated and maintained in accordance with the Original Equipment Manufacturer's (OEM) instructions and manuals:

Background

For sustainment purposes, equipment may be considered as either removable or non-removable, depending on whether it is removed and maintained in a workshop environment or maintained in-situ.

Upkeep

- Preventive and Corrective maintenance
- Strip and survey, including engineering assessment

Update

With respect to update of the design baseline, it is envisaged that the following activities are conducted locally:

- Obsolescence management
  - Note that obsolescence applies to mechanical components s47C, s47G(b) [redacted] and electronic equipment (both hardware and software)
- Design baseline configuration management

If future updates are required due to changes in interfacing equipment (e.g. combat system or platform system upgrades that affect the interface with the equipment), it is envisaged that the majority of update work would be conducted locally, however it is accepted that input may be required from the original designer.

Upgrade

- With respect to upgrade of the design baseline, it is envisaged that s33(a)(i)(ii), s47C [redacted] are likely to be integrated in future. The intent is for the majority of such integration work to be conducted locally, however it is accepted that this may require reach back to the original designer of the equipment for some approvals.

Sustainment Artefacts

In order to deliver the above objective, it is anticipated that the following artefacts will be required:

Training

- The supplier shall provide training to operators to comprehensively cover the operation of all systems in all modes of operation.
- The supplier shall provide training to maintainers to s47C, s47G(b) maintenance tasks, system testing and Set To Work (STW).
- s47C, s47G(b)
- The supplier shall provide "train the trainer" programs which allow local personnel to conduct future training of maintainers and operators s47C, s47G(b) .

Documentation

- The supplier shall provide documentation that includes comprehensive instructions for the operation of all systems in all modes of operation.
- The supplier shall provide documentation that includes comprehensive instructions for conducting all maintenance tasks, including test and STW.
- s47C, s47G(b)

Knowledge Transfer

- s47C, s47G(b)
- The EA shall be capable of making engineering decisions locally on all reasonably foreseeable defects for upkeep purposes, and shall be capable of performing updates and upgrades to the design baseline.

Supply of Parts

- s47C, s47G(b)
- The supplier shall use standardised and readily available parts and consumables wherever possible.

Tools, Equipment and Facilities

- s47C, s47G(b)

Other Requirements

- The supplier shall maximise the involvement of Australian industry throughout the FSM lifecycle phases (including the use of in country agents).
- The supplier shall base all planned maintenance activities around the FSM usage upkeep cycle.
- s47C, s47G(b)