SOUTH AUSTRALIAN DEFENCE INDUSTRY LEADERSHIP PROGRAM (SADILP) 2019

CONCEPT PAPER

DEFENCE INDUSTRY COLLABORATION

A novel approach for how the South Australian Defence industry can lead by example

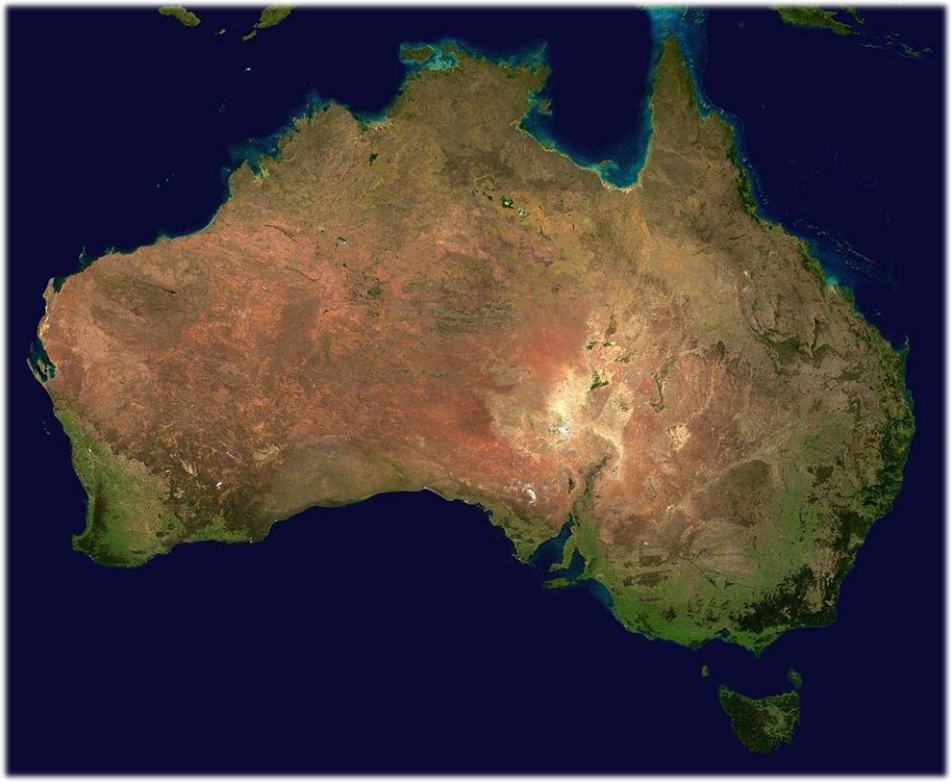

Figure 1 – A Composed Satellite Photograph of Australia [1]

Group members:

Ian Lomas, *Babcock Pty Ltd*

Rob Puttergill, *Cold Logic*

Andreanna Humphrey, *Saab Australia*

Chris Stoker, *Kadego*

Acronyms and Abbreviations

ADF	Australian Defence Force
AIC	Australian Industry Capability
ALHS	Advanced Load Handling System
AMSEG	Australian Maritime Shipbuilding and Export Group
ASDEFCON	Australian Standard for Defence Contracting
AWD	Air Warfare Destroyer
CAC	Commonwealth Aircraft Corporation
CASG	Capability Acquisition and Sustainment Group
CDIC	Centre for Defence Industry Capability
CDR	Critical Design Review
CoA	Commonwealth of Australia
DDG	Guided-Missile Destroyer
DISC	Dominance, Influence, Steadiness and Conscientiousness
DTC	Defence Teaming Centre
IP	Intellectual Property
IPT	Integrated Project Team
ISO	International Organisation for Standardisation
JMO	Joint Management Office
NATO	North Atlantic Treaty Organisation
NDISO	National Defence Industry Skills Office
NSM	Naval Ship Management
OPV	Offshore Patrol Vessel
PWD	Planned Withdrawal Date
RAAF	Royal Australian Air Force
RAN	Royal Australian Navy
RTSEK	REDARC Thermal Signature Enhancement Kit
RMP	Relationship Management Plan

SA	South Australia
SADILP	South Australian Defence Industry Leadership Program
SME	Small and Medium-sized Enterprise
STANAG	Standardisation Agreement (NATO)
TCDL	Tactical Common Data Link
TLS	Through Life Support
WAMA	Warship Asset Management Agreement

1. Introduction

1.1. Purpose

The purpose of this report is to present and discuss a revolutionary new approach for how the South Australian Defence industry can lead by example by using collaboration as a commercial tool to guarantee the success of current and future Defence projects and programs. The report discusses the critical elements that are required for effective industry collaboration, the types of collaborative frameworks that exist and why they are useful, the risks and the rewards of collaborating, the proposed action plan for how the South Australian Defence industry can lead by example in the ongoing development of collaboration as a commercial tool, and how to best utilise Defence industry collaboration to create and maintain sovereign capability.

1.2. Concept Paper Topic

The questions that were posed in our Concept Paper topic included the following:

- What are the critical elements for effective industry collaboration, and how can South Australia's defence industry lead by example in the ongoing development of collaboration as a commercial tool?
- What are the potential rewards for those who can successfully collaborate?
- What are the risks of collaboration?
- What are the risks of not collaborating?

These questions will be explored and answered throughout this report.

1.3. What Is Collaboration?

Collaboration is defined as the process whereby two or more parties work together to complete a task or to achieve a common goal [2]. Collaboration allows organisations to utilise complementary capabilities to achieve results that wouldn't have been possible as individual entities in isolation. Collaborations can be as simple as informal partnerships, or as complex as highly structured, legally binding joint ventures and strategic alliances.

The Boomerang World War II fighter aircraft, pictured in Figure 2, is a historical example of Australian industry collaboration, whereby three Australian companies formed a joint venture registered as the Commonwealth Aircraft Corporation (CAC) and proceeded to build 250 aircraft between 1942 and 1945 [4]. The collaborative venture heralded the beginning of Australia's indigenous, self-sufficient aircraft manufacturing industry. This demonstrates that collaboration within the Defence sphere is not a new idea, and is a great example of how Australian industry can successfully collaborate to achieve sovereign capability, which is a key feature of the action plan that will be presented later in the report.

Figure 2 – Boomerang World War II Fighter Aircraft [3]

2. Critical Elements for Effective Industry Collaboration

2.1. Critical Elements

Successful collaboration relies on effective relationships to bind the collaborating parties together. As shown in Figure 3, effective relationships are made up of three critical elements: trust, communication, and core values and culture. Each collaborating party needs to ensure they have mutual synergies in their methods of managing the relationship.

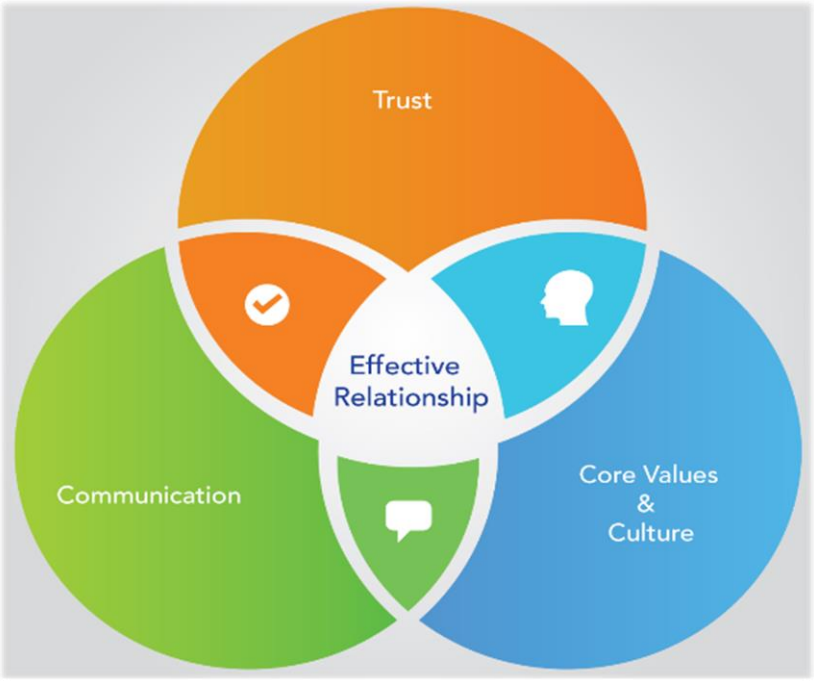

Figure 3 – Critical Elements for Effective Industry Collaboration

2.1.1 Culture and Core Values

Shared core values and corporate culture essentially means that all parties have complementary goals, strategies, vision and mission. It's important in the early stages of a collaboration to make sure that the core values of each party are aligned and complementary to each other, and that there's no conflict between individual strategies.

When setting the goals and strategy of a collaboration, it's important for each party to understand the results and outcomes that they're expecting. All parties need to ensure that there's no misunderstanding regarding the strategies of the other parties so that all parties are in a position to set a common project strategy and a common set of goals. The action plan should dictate who needs to complete each task, and by when.

Values are words, and behaviours are actions. Mutual respect is vitally important to ensure a successful collaboration. Good partnerships have a shared vision of what the parties are expected to accomplish. This doesn't mean that each party has identical expectations, but there should be synergy in their thinking. Any conflict and differences in the relationship should be resolved in a positive way by referring back to the mission statement as required.

2.1.2 Communication

Good communication is important so that others understand what is being communicated. It is recommended that it consists of an open door policy, which encourages mutual discussion and clarity of roles and responsibilities. Parties may also investigate the use of cloud-based work collaboration software to facilitate effective communication.

When communicating, it's important to understand the Dominance, Influence, Steadiness, and Conscientiousness (DISC) profile of other individuals. Each individual has a specific style of communicating, and people listen better to others who communicate in a similar style and language to their own.

An added effort needs to be made to ensure that the environment is psychologically safe for communication. Four ways to communicate with psychological safety are:

a. **Don't communicate it, nurture it:** Create an environment where it is safe to take appropriate risks and be authentic by positively reinforcing behaviours in others.
b. **Create open communication channels:** To assist with open communication have senior leaders engaging in non-formal sittings with the employees as an effective way of breaking down walls.
c. **Erase Fears:** Fear is the ultimate truth killer. Leaders must make it clear that real opinions are valued and welcomed. This starts by them showing their own fears and concerns.
d. **Build respectful and genuine relationships:** Say what you mean and follow through on your word. Take the time to understand all parties' perspective, emotions and unique life circumstances.

When people don't feel psychologically safe, it breeds anxiety, hostility and eventually disengagement. Parties will become defensive.

In addition to the above the following practices should be adopted when collaborating:

a. Have an open door policy,
b. Encourage two way constructive feedback,
c. Ensure that roles and responsibilities are clearly defined, and
d. Softer and more empathetic tone when communicating.

It is important to use a cloud-base work collaboration software that is live and easy to work in. When selecting a collaboration software, the following should be researched:

a. How does its functionality meet your needs?
b. How flexible is it?
c. How scalable is it?
d. How can each party access it?
e. How easily is the system used?
f. Is the system accessible?
g. Is the system secure and reliable?
h. What support does the vendor provide?
i. How do current customers use the system?
j. What is the pricing structure?

The questionnaire presented in Figure 4 is an example of a good assessment tool to use to determine the viability of open and honest collaboration between parties.

Shared Vision						
We do not have a shared vision						We have a shared and clearly understood vision
1	2	3	4	5	6	7
Goals and Objectives						
Members do not understand goals and objectives						Members understand and agree on goals and objectives
1	2	3	4	5	6	7
Responsibilities and Roles						
Roles and responsibilities of members are not clear						Members are clear about their roles
1	2	3	4	5	6	7
Decision Making Procedures						
We do not have effective decision making procedures						We have effective decision making procedures
1	2	3	4	5	6	7
Changing Membership						
We do not have procedures for changing members						We have procedures for changing members
1	2	3	4	5	6	7
Conflict Management						
We are able to successfully manage conflict						Conflict keeps us from doing anything
1	2	3	4	5	6	7
Leadership						
Leadership is not shared and inadequate						Leadership is effective and shared when appropriate
1	2	3	4	5	6	7
Plans						
We do not follow work plans						Plans are well developed and followed
1	2	3	4	5	6	7
Relationships/Trust						
People don't trust each other						Members trust each other
1	2	3	4	5	6	7
Internal Communication						
Members do not communicate well						Members communicate well with each other
1	2	3	4	5	6	7
External Communication						
We do not communicate well externally						Our external communication is open and timely
1	2	3	4	5	6	7
Evaluation						
We never evaluate our performance						We have built evaluation into all our activities
1	2	3	4	5	6	7

Figure 4 – Assessment Tool for Collaboration Viability [5]

2.1.3 Trust

Trust is perhaps the most important element for successful collaborations. One survey by Tolero Solutions found that 45% of people say lack of trust in leadership is the biggest issue impacting their work performance. So, a lack of trust impacts productivity. Luckily the solution is very simple: you will need to trust each other to get on with your job without interference. This becomes even more important with remote based collaboration.

Trust is nurtured when partners act in accordance with the processes, principles and responsibilities they jointly negotiate throughout the life of the collaboration. It is important to make sure that these understandings are captured in a written agreement so everyone knows what is expected. Allocate time for partners to participate in team building and socialising. Be intentional about integrating the different cultures, styles and needs of partners. And, never get complacent about your environment; continually review the level of trust and equity and how well these are being managed.

Partners depend on each other for their mutual success. It's critical to openly discuss and address power issues and conflict as they arise so they don't become the "elephant in the room". Assuming you've selected the right partners, acknowledge and value each of their contributions. Ask partners to declare their expectations and identify what they're bringing to the table. Remember to put in place a transparent and fair process for constructively managing conflict.

Some key factors that develop trust between organisations are as follows:

a. Access to the necessary skills and resources to perform the work,
b. Open and honest communication,
c. Consistency in behaviour,
d. Loyalty and respect,
e. Availability to discuss ideas, issues and potential solutions to problems (i.e. an open door policy),
f. A clear understanding and an appreciation of the capacities and capabilities of the other parties,
g. Genuine sharing of responsibilities, decision making and leadership (i.e. no hierarchical relationships),
h. Realistic and balanced expectations of the contributions of all parties,
i. Acknowledge mistakes about preconceived views, and
j. Find common ground and learn about new team members.

"Start small. Build trust. Work out what matters to each partner and where their strengths and weaknesses are. Focus on getting the first thing right so that you have the foundation of a long-term relationship."

A/Prof. Regina Crameri, Associate Director, Defence Science Institute

2.2. Effective Relationships

An effective relationship requires all parties to adopt genuine shared responsibilities, decision making and leadership where they have realistic and balanced expectations of the contribution of each party. It is recommended that hierarchical relationships are avoided where possible.

To assist with managing effective relationships, it is recommended that a Relationship Management Plan (RMP) be established that addresses the topics presented in Figure 5.

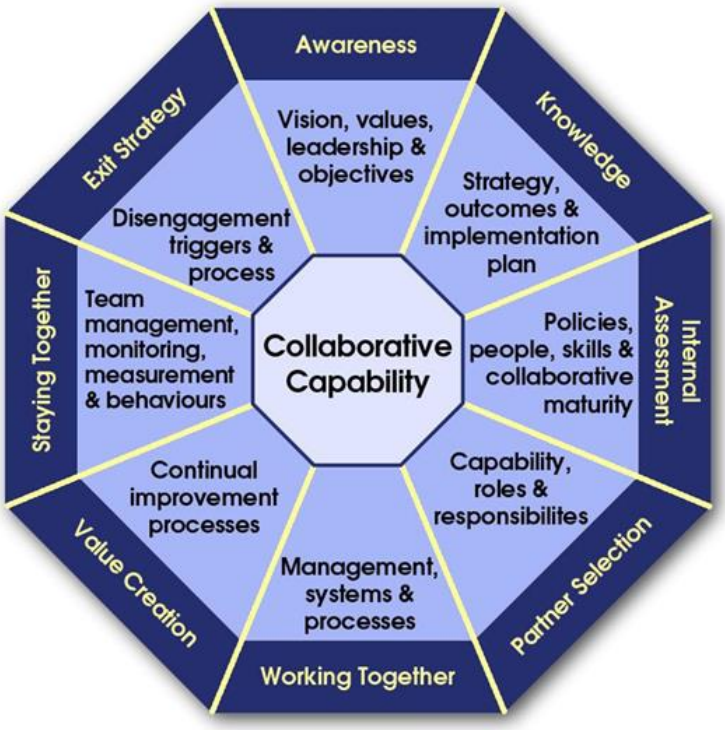

Figure 5 – Recommended Topics for a Relationship Management Plan [7]

The adoption of a collaborative approach is based on the assumption that all parties will deliver higher performance, and a greater value and benefit, than a traditional contracting relationship. It's crucial to establish an effective measurement that will enable all parties to monitor the relationship over the life of the project.

Effective relationships can be summarised through the use of the term 'amitica', which in Latin, translates to the word 'friendship'. Unlike the bond of trust, amitica is not open-ended or unconditional. Implicit in amitica are the conditions that people accept obligations and are committed to their fulfilment, but never to the degree that one person in the relationship will expect the other to endure harm and neglect self-interest. Obligations are mutual, and therefore, one member does not ask for conduct that will create imbalance [6].

3. Collaborative Frameworks

Collaborative frameworks are an agreement to work together that is usually underpinned by a solid commercial framework. The framework can range from a simple informal collaboration, such as working collaboratively with a supplier, to highly structured, documented, legally binding, formal arrangements such as joint tenders. Some examples of different frameworks are as follows:

a. **Alliance:** A formal relationship to share assets, expertise, risks, rewards and control to create greater value for the customer and themselves.
b. **Cluster:** A geographic concentration of organisations in a particular field.
c. **Collaborative Network:** A multi-party collaboration that drives towards common or compatible goals or vision.
d. **Consortium:** Associated entities directly cooperate in a project with joint engagement and management formally defined in a contract.
e. **Extended Enterprise:** Associated entities that collaborate directly and formally in the design, development, production and delivery of a product or service.
f. **Joint Venture:** A separate legal entity or partnership between firms which invest time, money, people and effort for an agreed purpose.
g. **Outsourcing:** A contractual arrangement to provide specific services for a fixed period of time.
h. **Partnering Program:** A direct and formal agreement for organisations to cooperate to accomplish clear business objectives with shared risks and profits.

3.1. Why Use a Framework?

A company's reputation as a partner is an important corporate asset, and using a framework enables all parties to develop a common taxonomy and to centralise the content. A framework will ensure that:

a. All parties develop a common taxonomy,
b. The content of the collaboration is centralised,
c. All partners are talking about the same thing,
d. There is one source of truth,
e. The risk management is structured,
f. There is connectivity of systems and good communication to avoid siloed work,
g. There is agreement on the technical platform,
h. The collaboration is not burdensome to either party, and
i. Collaboration is integrated into the culture of the organisations.

Meeting a standard is a way of proving your company is serious about collaboration, and demonstrates that you know how to do so effectively and efficiently.

The CASG Collaborative Contracting Better Practice Guide [18] provides guidance to CASG officials on collaborative contracting, the risks and benefits from the CASG perspective, when collaborative contracting should and should not be used, the options available to CASG and information on how to implement collaborative contracting. It also contains case studies on defence projects that have used collaborative contracting principles to illustrate the benefits of collaboration, and to illustrate how it works in practice. This guide focuses on the CASG perspective, and the ability to deliver 'value for money' capability to the Australian Defence Force. The guide could be expanded to enable SME's

to grow and develop their capability in the defence industry, and hence continue to provide value for money and sovereign capability to the Australian Defence Force.

3.2. International Standard for Collaboration

ISO 44001 is the international standard for collaboration, and provides a standard and structure for management systems. The high-level structure of ISO 44001 is similar to other ISO standards, and can be used to assist companies in establishing and improving collaborative relationships, both within and between organisations. The standard can be used to facilitate collaboration and educate businesses to look for a competitive advantage by collaborating with those who may have been considered to be rivals historically.

ISO 44002, Collaborative business relationship management systems – Guidelines on the implementation of ISO 44001, is a new standard that provides in-depth knowledge and understanding of the requirements in ISO 44001 to help organisations implement the standard effectively. It offers specific guidance for establishing, developing and managing third-party relationships using the eight stage lifecycle detailed in ISO 44001.

It is possible to gain certification in ISO 44001, but it is not currently possible to gain accreditation. Gaining certification or accreditation in ISO 44001 is not necessary to have effective collaboration within and between organisations. However, it is important for an organisation to be able to gain certification or accreditation to demonstrate that you know how to collaborate effectively and efficiently.

4. Risks and Rewards

Collaborations can fail for a number of reasons. These may include:

a. Failure to implement or adhere to a Relationship Management Plan (RMP),
b. A focus on cost in lieu of the intrinsic value of the collaboration,
c. Failure to understand the capabilities, strengths and weaknesses of each party,
d. The personalities of stakeholders, and the culture of the businesses,
e. Opportunistic behaviour that damages the developing business relationship,
f. Unequal risks and benefits for each party, and
g. Failure to keep promises, and lack of commitment from the beginning.

Due to the large number of failure mechanisms and the numerous risks involved, collaboration can be rather complex and challenging within the Defence environment. Table 1 summarises the risks of collaborating, the risks of not collaborating, and the rewards for those that can successfully collaborate.

Table 1 – Risks and Rewards

Risks of collaborating	● Loss of opportunity for other tenders, projects and activities. ● Exclusion from conducting other business due to a conflict of interest. ● Loss of competitive advantage due to the transfer of knowledge and/or Intellectual Property (IP). ● Information security issues due to the sharing of information. ● Reputational damage resulting from a joint failure. ● Conflict between one or more parties due to poor strategic alignment of objectives. ● One or more parties exploiting another party, one or more parties pretending to collaborate to gain information, or collaborative partners that don't want to collaborate. ● A reduced competition pool for tenders. ● Lack of accountability and monitoring of risks. ● Misalignment of strategic objectives.
Risks of not collaborating	● The inability to solve problems, develop product solutions and successfully deliver projects due to a lack of capability. ● Reduced access to new suppliers, customers and markets. ● Financial disadvantages from competing in lieu of collaborating. ● Loss of reputation due to the perception that an organisation cannot, or will not, collaborate. ● Loss of business to a larger organisation with more capability. ● Inability to bid for future work. ● Lack of learning and development opportunities for employees. ● Lack of knowledge transfer resulting in a lack of capability growth. ● Lack of competitive advantage and investment in shared outcomes.
Rewards for	● Financial gains such as cost reductions, an increase in revenue and

collaborating	profit, and financial incentives for collaborative working and good behaviour. ● Shared assets, expertise, risks, rewards, costs, profit, capital investments and human resources. ● New perspectives and more innovative ways to solve problems and develop product solutions. ● Achievement of shared business goals resulting in a more successful outcome for all stakeholders. ● Conduct of business that wouldn't have been possible or accessible otherwise. ● Provides a competitive advantage, leading to better commercial outcomes, and hopefully, market dominance. ● Allows access to new customers, suppliers and markets, leading to a wider portfolio, and improved public and industry exposure. ● Allows organisations to strategically position themselves for future work. ● Capability growth and evolution of the business. ● Improved reputation resulting from a joint success. ● Personal and professional growth of employees, and greater opportunities for secondments, training, learning experiences, etc. ● Transfer of information and knowledge, leading to more highly skilled employees, and improved business processes.

To guarantee success, it is vital that each party weigh up the risks of collaborating against the risks of not collaborating prior to actively pursuing a collaborative venture. The next section of the report presents some examples of successful Defence industry collaborations, where the rewards of collaborating have ultimately paid off for all parties involved.

5. Examples of Collaborations

5.1. The P-3 Accord

In November 2005, the Commonwealth of Australia (CoA), Tenix Defence and Australian Aerospace signed the P-3 Accord Master Agreement using a modified alliance type arrangement to provide capability upgrades and Through Life Support (TLS) for the Royal Australian Air Force (RAAF) AP-3C Orion maritime patrol and anti-submarine warfare aircraft. The three parties established a Joint Management Office (JMO) to supervise all Accord activities under a unique risk-sharing contractual arrangement, and developed and implemented all capability upgrades, TLS solutions and obsolescence resolutions through to the aircraft's Planned Withdrawal Date (PWD) [13].

The P-3 Accord was a modified form of a pure alliance arrangement where the intent was to ensure that each participant had a collective objective, responsibility and vested interest in delivering successful project outcomes by taking collective ownership of all project risks, and shares in the pain and gain, depending on how actual outcomes compared with pre-agreed targets. This meant that risks were shared equitably, but not equally, under pre-agreed pain and gain share [14].

Research by Grant Hensley from Tenix Aerospace and Defence highlighted the following issues with the alliance type arrangement used for the P-3 Accord [14]:

- Limited cultural acceptance.
- Insufficient communication between stakeholders.
- Staff retention.
- CoA dominance with decision making.
- Competitive nature in work share allocation in lieu of collaboration.
- Encouraging the alliance members to work together as a team and to leave corporate identities and egos behind.

To ensure the long-term success of the P-3 Accord, these issues needed to be investigated and resolved in a timely fashion. Hence, a number of recommendations to bring reforms to the P-3 Accord were proposed by Grant Hensley. Some of these recommendations are listed below [14]:

- Defence need to further develop the skills and processes necessary to work with industry in accordance with commercial best practice for long term partnering, including the capability to monitor and improve productivity and to benchmark costs.
- Collaborative arrangements that are not a pure alliance are unlikely to generate the same high performance and outcomes as a pure alliance.
- Strong and focused leadership is required to achieve results through collaboration.
- The development of a one-team corporate culture with effective leadership is essential to achieve success.
- Relationships that are based on trust and mutual respect need to be established by sharing information, improving morale, and encouraging collaboration to improve processes for a common purpose.
- Integrated Project Teams (IPTs) need to be structured in order to be effective, and an increase in CoA resources and involvement in IPTs is required.
- Siloed individual business thinking needs to be reduced.

- A more holistic consideration of project management concepts is required to foster creative approaches rather than process driven approaches.
- A stronger focus is required on the attraction, selection and retention of skilled resources.
- Resistance to change needs to be identified and resolved quickly.
- Industry participants must be permitted to have more control to enter into financial arrangements with other companies for expediency.
- Geographically separate divisions need to be reduced, and ideally amalgamated in one location, in order to improve culture.
- Industry participants must better understand the customer and their environment.

Cultural and commercial challenges appeared to be the most common issues amongst the participants of the P-3 Accord. Hence, commercial frameworks were revised, education was provided to teams on alliancing concepts and principles, and a robust change management plan to address key cultural issues was implemented. These activities resulted in a 35% increase in the overall performance of the P-3 Accord within the first 12 months of these activities being initiated [15]. This is a significant achievement that the participants of the P-3 Accord should be proud of.

Grant Hensley suggests that, although the P-3 Accord did not generate the same high performance and outcomes as a pure alliance would have, it produced more successful project outcomes in comparison to traditional Defence procurement methods. Hence, if all parties are committed to collaboratively working together and to sharing the risks, pain and gain of a project or program, the benefits in adopting an alliance type system of contracting will outweigh the perceived gains that one party would otherwise experience through traditional contracting methods [14].

In November 2008, the P-3 Accord went on to win a major accolade at the Engineers Australia National Excellence Awards for outstanding excellence, innovation and best practice relating to the rapid acquisition, integration and testing of the AP-3C Orion Operational Support Tactical Common Data Link (TCDL). The TCDL capability was delivered to a very aggressive schedule using considerable innovation which was exhibited through the close working partnerships that were developed within the P-3 Accord. This demonstrates that the participants in the P-3 Accord were able to address the initial issues and challenges that they faced, and implement vast improvements to improve collaboration that ultimately resulted in the achievement of a significant joint success that has been described as “nothing short of history making” [16].

5.2. The Air Warfare Destroyer Alliance

The Air Warfare Destroyer (AWD) Alliance, established under the SEA 4000 program, is a good example of three large Defence prime contractors, and the Department of Defence, working together in a collaborative venture to deliver a new multi-role capability to the Australian Defence Force (ADF). The three Hobart Class Guided-Missile Destroyers (DDGs) are the most lethal and capable warships the Royal Australian Navy (RAN) has ever possessed.

At the time, it was Australia’s largest naval project, and was the first major Australian Defence acquisition project to use an alliance business model. The alliance model eventually allowed for equitable sharing of risk and reward, and fostered a cooperative, collaborative environment that promoted “best for program” decisions amongst the stakeholders listed below:

- Navantia - Platform Systems Designer (contracted to the CoA).
- ASC AWD Shipbuilder Pty Ltd - Primary Shipbuilder.

- Raytheon Australia Pty Ltd - Combat Systems Integrator.
- Commonwealth of Australia - Platform Systems Designer and owner of the asset.

The program had enormous potential to be the benchmark for successful Defence industry collaboration. In a project such as this, the first ship was destined to be the most difficult and least efficient to build. This factor, combined with the fact that the "build to print" strategy was not aligned with the "Australianised" combat system ethos, led to the need for continual changes, even after the "design freeze" at the Critical Design Review (CDR) milestone. The post design freeze changes resulted in significant rework, and therefore, schedule slippage. This led to the AWD program being designated a Project of Concern between June 2014 and February 2018, after which it was removed from the list [9].

However, there are many reasons to celebrate the AWD program, both in terms of the eventual efficiency gains, but also in relation to the boost to sovereign capability that it brought about. With each discipline acting together as one team, the lessons that were learnt during the build of the first ship, *HMAS Hobart*, facilitated a 30% efficiency improvement on *HMAS Brisbane*, and this positive trend continued to the third ship, *NUSHIP Sydney*, with a further 30% improvement. This efficiency improvement meant that *NUSHIP Sydney* was actually ready three months ahead of schedule, which allowed for the installation of the MH-60R Combat Helo capability prior to delivery to the RAN, as well as various habitability improvements. If the build efficiencies had not been realised, *NUSHIP Sydney* would've been delivered to the RAN and almost immediately taken out of service for the aforementioned helicopter and habitability improvements.

At the start of the AWD program, the "Australian Industry *Content*" target was 50%. By the end of the program, the actual level that was achieved was 65%, with approximately 2,500 people employed at the peak of construction. In total, 2,779 Australian suppliers contributed to the program, with work strategically distributed nationwide due to capability considerations.

5.3. Other Marine Examples

The AWD Alliance is just one example of collaboration between major prime contractors and the CoA. Other maritime examples include the following:

- Naval Ship Management (NSM) (Babcock and UGL), which is part of the Warship Asset Management Agreement (WAMA), a strategic partnership between BAE Systems, SAAB, NSM and the CoA.
- SEA1180 Offshore Patrol Vessels (OPVs), which led to Luerssen and Civmec forming a new company known as Australian Maritime Shipbuilding and Export Group (AMSEG) to deliver the OPVs whilst enhancing Australia's sovereign capability.

5.4. Advanced Load Handling System (ALHS 17)

An example of successful collaboration involving Small and Medium-sized Enterprises (SMEs) and a large prime contractor is the partnership between Supashock, Century Engineering and Rheinmetall in the development of ALHS 17, an Advanced Load Handling System (AHLS) for military vehicles. This system provides a safer and more efficient method of loading ISO containers, modules and Standardisation Agreement (STANAG) compliant flat racks onto military vehicles. Load cycle times have been reduced to 25% of that of previous systems, and require only one person to operate the equipment from the safety of the Rheinmetall HX 8x8 truck [10].

Supashock have been able to leverage their expertise in advanced vehicle motion control and weight shedding, skills developed in the motorsport environment, and applied them to the Defence domain.

Of particular note, is that this is an example of collaboration via acquisition in which Rheinmetall acquired a significant minority shareholding in Supashock. The process leading to the acquisition was initiated by Supashock, and it took over 18 months to establish a solid relationship that yielded benefits for both parties.

Rheinmetall gained access to a much more agile research and development program than they had previously had, but they also acquired an innovative culture and technologies which gives the group a competitive commercial edge. For its part, Supashock has meshed well with both the Australian arm of Rheinmetall and also with the wider global group, benefitting from both the mature processes of the prime, and access to an entry point to the global reach of Rheinmetall's automotive division, which continues to provide many opportunities for Supashock to maintain a diversified market base.

The high level of commitment to this venture, demonstrated by the acquisition, underpins the strong collaboration and complementary skillsets now shared by the group. This partnering illustrates the significant gains that can be realised by sacrificing some of what you have, in order to reap greater benefits and opportunities in the future.

From our research, Supashock cited the culture of the Rheinmetall Group and its subsidiaries as a key factor for setting the scene for this successful collaboration.

5.5. REDARC Thermal Signature Enhancement Kit (RTSEK)

Another example of SME collaboration is that of REDARC Electronics and Form Cut (based in South Australia) and start-up Intelliparticle (based in New South Wales) to develop the REDARC Thermal Signature Enhancement Kit (RTSEK). This equipment facilitates the operational testing of the GIWS SMArt155 anti-armour modular artillery projectile, a precision guided munition that is able to target operational armoured vehicles whilst discounting previously destroyed or non-operational vehicles.

Previously, no nation with GIWS SMArt155 anti-armour modular artillery projectiles could fire them in an operational training environment due to the complex high voltage heat mats and generators required to do so. By using innovative carbon and graphite materials, the RTSEK solution allows a configurable target, without the addition of complex infrastructure or unnecessary hazards to the firing range [11].

Each of the companies involved in the collaboration were able to bring their own unique strengths to this venture, which demonstrate that companies of any size and location can successfully deliver innovative solutions, even on compressed timeframes, to Defence and the Capability Acquisition and Sustainment Group (CASG). This example also demonstrates the value and viability of interstate collaborative efforts.

5.6. Lessons Learnt

Companies such as those we have discussed in this report have developed collaboration as a commercial tool, enabling them to provide complete solutions for the needs of both Defence organisations and prime contractors without the inhibitory barriers or timelines involved in developing a seldom used in-house capability.

These examples of collaborations demonstrate frameworks that are acceptable to prime contractors and Defence, from both a commercial and risk profile perspective. They demonstrate successful SME collaboration and integration into the supply chain, satisfying the needs of both prime contractors and Defence.

When collaborating with other companies, it is important to realise that not every collaborative idea will be successful, and to know the exit strategy in advance. It is also important to ensure that the core values and culture of the companies align, and to investigate adjacent markets when looking for collaboration opportunities.

It is vital that Defence further develop the skills and processes necessary to work with industry in accordance with commercial best practice for long term partnering, including the capability to monitor and improve productivity and to benchmark costs. Strong and focused leadership is required to achieve results through collaboration, and the development of a one-team corporate culture with effective leadership is essential to ensure success. Relationships that are based on trust and mutual respect need to be established by sharing information, improving morale, and encouraging collaboration to improve processes for a common purpose. Finally, siloed individual business thinking needs to be reduced, and industry participants must better understand the customer and their environment.

6. Actions and Recommendations

Throughout this report, we have explored the critical elements for effective industry collaboration, the importance of frameworks, and the potential risks and rewards of collaboration. We've also discussed some examples which highlight these key points. Using this information, we've developed the following series of actions that will accelerate and consolidate the collaborative paradigm required to fully develop and realise sovereign capability. This action plan will ensure that the South Australian Defence industry can lead by example in the ongoing development of collaboration as a commercial tool.

6.1. Prime Contractors

In addition to increasing the visibility of the benefits and value of collaborative consortia within the supply chain, prime defence contractors must recognise the requirements of the SME to manage risk and overexposure by maintaining market diversity within their client base. Defence is just one market segment of a balanced and sustainable portfolio.

Cash flow is a significant factor, particularly for the many smaller SMEs that occupy the Australian industrial landscape. Prime contractors must take the earliest opportunity to release funds to enable the SMEs to maintain viable cash flow.

In terms of the actual process of dealing with Defence, prime contractors should act to provide support to SMEs, particularly those that are new to the Defence supply chain. Prime contractors are also ideally placed to provide guidance to their supply chains in how best to realise the value in collaborative ventures and how to implement and build upon proven frameworks.

6.2. Small and Medium-sized Enterprises

SMEs need to be prepared to invest in the long process of dealing with Defence and prime contractors. They need to be less opportunistic, have a focus on the longer term "big picture", and take the initiative to be proactive in building effective relationships within industry. SMEs should look to form collaborative relationships that transcend state boundaries and traditional rivalries. SMEs should also look to form cross-sectoral collaboration as suggested in *Defence Industry Skilling and STEM Strategy* [12].

6.3. Defence Industry Bodies

Defence industry bodies could be more organised and coherent in their representation and presentation to government, prime contractors and international markets. They should lead by example with an integrated collaborative approach to advocating on the behalf of other parties, and they must be ardent in their efforts to advertise and educate stakeholders in order to increase the visibility of the value and benefit of collaborative consortia within the supply chain.

6.4. Department of Defence

We suggest that the Department of Defence maximises Australian industry capability by providing significant incentives for prime contractors who facilitate and enable the growth and professionalization of SMEs within their supply chains.

These incentives could be in the form of rebates for achieving, or ideally surpassing, realistically achievable levels of Australian industry capability, and also by enforcing and promoting equal investment within Australia, via either financial or other inducement, for any contracts awarded to overseas suppliers due to lack of current in-country capability.

Collaborative contracting frameworks that have typically been related to prime contractors should be adapted and flowed down to the SME sector to encourage and allow the sector to embrace collaborative contracting, and the value for money fundamental input into capability it provides. We also recommend modifications to the Australian Standard for Defence Contracting (ASDEFCON) documentation to enable and streamline collaborative ventures.

6.5. Educational Institutions

In a world characterised by accelerating change and uncertainty, we recommend the adoption of a streamlined learning system in which tertiary and vocational training organisations offer short courses and micro credentials, specifically tailored to an individual's career, and offered as part of an employer supported ongoing process of professional development. This should include the national promotion of SA Defence tailored courses aligned with the *Defence Industry Skilling and STEM Strategy* [12], enhanced links with all Defence stakeholders, particularly the National Defence Industry Skills Office (NDISO), and a focus on the tools for business collaboration.

6.6. Joint Responsibilities

Each of the aforementioned organisations and institutions share a set of joint responsibilities to:

a. Provide greater awareness for the benefits of collaboration by promoting successful case studies.
b. Promote and publicise the use and value of collaborative frameworks.
c. Pursue a cultural shift towards a default desire to collaborate.

6.7. Action Plan and Recommendations

The actions required by prime contractors, SMEs, Defence industry bodies, the Department of Defence and educational institutions that will accelerate and consolidate the collaborative paradigm required to fully develop and realise sovereign capability are summarised in our action plan for sovereign capability shown in Figure 6.

Figure 6 – Action Plan for Sovereign Capability

7. Conclusion

In this report, we've defined collaboration, explored the critical elements for effective industry collaboration, discussed the importance of frameworks, presented the potential risks and rewards of collaboration, and discussed some examples of industry collaboration. Using this information, we then discussed the actions required by prime contractors, SMEs, Defence industry bodies, the Department of Defence and educational institutions that will accelerate and consolidate the collaborative paradigm required to fully develop and realise sovereign capability. These actions were then summarised in an action plan for how the South Australian Defence industry can lead by example in the ongoing development of collaboration as a commercial tool, and how they can best utilise Defence industry collaboration to create and maintain sovereign capability.

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9. References

1. Wikipedia 2019, *File: Australia satellite plane.jpg*, viewed 5 November 2019, <https://en.wikipedia.org/wiki/File:Australia_satellite_plane.jpg>.
2. Wikipedia 2019, *Collaboration*, viewed 5 November 2019, <https://en.wikipedia.org/wiki/Collaboration>.
3. Airliners 2019, *Commonwealth CA-13 Boomerang*, viewed 5 November 2019, <https://www.airliners.net/>.
4. Wikipedia 2019, *CAC Boomerang*, viewed 5 November 2019, <https://en.wikipedia.org/wiki/CAC_Boomerang>.
5. Taylor-Powell, E, Rossing, B & Geran J 1998, *Evaluating Collaboratives - Reaching the Potential*, University of Wisconsin-Extension, Cooperative Extension, <https://communitydoor.org.au/sites/default/files/assessment_tool_for_collaboration_viability.pdf>.
6. Pender, D 2018, *Teaming with other firms: A very short guide to ISO 44001 (Collaborative business relationships)*, Knowledge Perspectives Pty Ltd.
7. The Institute for Collaborative Working Canada (ICW-Canada) 2019, *ISO 44001 Official Publication Marks the Beginning of a New Era for Business Relationships*, viewed 18 November 2019, <http://www.icw-canada.com/iso-44001-official-publication-marks-the-begin-of-a-new-era-for-business-relationships/>.
8. Collaboration Coach 2019, *Building Effective Relationships*, viewed 28 November 2019, <http://www.collaborationcoach.ca/theme/building-effective-relationships/build-trust-negotiate-power-dynamics-and-communicate-effectively/>.
9. ASC Pty Ltd 2019, *Air Warfare Destroyer program removed from projects of concern list*, viewed 28 November 2019, <https://www.asc.com.au/news-media/latest-news/air-warfare-destroyer-program-removed-from-projects-of-concern-list/>.
10. Supashock 2019, *Supashock Wins Defence Teaming Centre Award*, viewed 28 November 2019, <https://supashock.com/supashock-wins-defence-teaming-centre-award/>.
11. REDARC Electronics 2019, *REDARC Thermal Signature Enhancement Kit: A Case Study in Defence Collaboration*, viewed 28 November 2019, <https://www.redarc.com.au/news/industry-partnership-on-target>.
12. Australian Government, *Defence Industry Skilling and STEM Strategy*, viewed 28 November 2019, <https://www.defence.gov.au/SPI/Docs/STEM-factsheet.pdf>.
13. Defence Industry Daily 2019, *Australia's A$ 1B+ P3 Accord Support Program*, viewed 21 November 2019, <https://www.defenseindustrydaily.com/australian-agreement-re-a-1b-ap3c-orion-support-upgrade-program-01505/>.
14. G, Hensley 2007, *Alliance Based Defence Procurement and the P-3 Accord*, viewed 21 November 2019, <http://alliancecontractingelectroniclawjournal.com/wp-content/uploads/2017/04/Hensley-G.-ND-'Alliance-Based-Defence-Procurement-and-the-P-3-Accord'.pdf>.
15. PCI Group 2019, *Performance Improvement and Alliance Culture Development*, viewed 21 November 2019, <http://www.pcigroup.com.au/client/performance-improvement-and-alliance-culture-development/>.
16. Manufacturers' Monthly 2019, *Defence project wins Australian Engineering Excellence Award*, viewed 21 November 2019, <https://www.manmonthly.com.au/news/defence-project-wins-australian-engineering-excellence-award/>.

17. Communication in a psychological safe environment , viewed 28 November 2019,>https://www.employeechannelinc.com/insights/blog/4-ways-to-communicate-psychological-safety-to-employees
18. Australian Government, Department of Defence, Capability Acquisition and Sustainment Group, “Collaborative Contracting Better Practice Guide”, Version 1.0, 28 September 2017