Requirements for 5th Generation Manoeuvre Warfare

11/22/19

By Dr. Robbin F. Laird, Research Fellow, The Williams Foundation

In this report, the major presentations and discussions at the Williams Foundation seminar on the requirements for fifth generation manoeuvre held on October 24, 2019 in Canberra, Australia are highlighted along with interviews conducted before, during and after the seminar as well.

What is fifth generation manoeuvre?

The definition by Air Commodore Gordon of the Air Warfare Centre:

"The ability of our forces to dynamically adapt and respond in a contested environment to achieve the desired effect through multiple redundant paths. Remove one vector of attack and we rapidly manoeuvre to bring other capabilities to bear through agile control."

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THE SEMINAR APPROACH AND PROGRAM: THE PROLOGUE

The original seminar announcement highlighted the latest seminar on the crafting of the Australian Defence Force as a fifth-generation force as follows:

On October 24, 2019, the Williams Foundation will host its next seminar on building an integrated fifth generation force.

This seminar will be held in the National Gallery of Australia in Canberra from 0800 through 1530. Since 2013 the Sir Richard Williams Foundation seminars have focused on building an integrated fifth generation force. Recent seminars have evolved from the acquisition of new platforms to the process of shaping and better understanding the environment in which that integrated force will prepare and operate. In doing so they have, among other things, highlighted the challenges of making the strategic shift from counterinsurgency operations in Iraq and Afghanistan to higher tempo and higher intensity Joint operations involving peer competitors.

Within this context, the 2019/20 seminars will further develop the ideas associated with an increasingly sophisticated approach to Joint warfighting and power projection as we face increasing pressure to maintain influence and a capability edge in the region. In doing so, the Sir Richard Williams Foundation will continue to look at the evolution of the Australian Defence Force from the perspective of the sovereign lens and setting the conditions for future success.

The seminar in October 2019 is titled 'The Requirements of Fifth Generation Manoeuvre' and will examine the differences and potential gaps in how the Australian Defence Force must equip and organise for multi-domain operations.

In April 2020, we will expand on the theme and focus on 'Preparedness for Fifth Generation Manoeuvre'. This seminar will explore the readiness, training and sustainment activities necessary to prepare for a broad range of possible contingencies in support of national security objectives, which might involve acting independently in the broader region.

Seminar Outline

Fifth generation manoeuvre will go hand-in-hand with the Australian Defence Force's ability to orchestrate a rapid increase in tempo and open up new ways and means of projecting power and undertaking an indirect approach to warfare. Building upon the existing foundations of Australian Defence Force manoeuvre capability, the aim of the October seminar is to explore the differences in character and attributes of fifth generation manoeuvre and identify potential gaps in the way we must think, equip and organise to meet emerging national security outcomes.

The seminar will consider manoeuvre from a historical perspective and evolve the concept to the emerging policy and requirements of contemporary operations, especially as they relate to power projection and the emergence of the electromagnetic spectrum as a warfighting domain in its own right.

It will examine how we sense, make sense, and decide within the emerging operational environment and highlight the increasingly sophisticated and integrated relationship between the human and technology and the trusted autonomous systems which will characterise fifth generation operations.

The seminar will further examine the enduring requirement for situational awareness as a prerequisite for operational success, and the challenges of developing a broader understanding of the environment and communicating command intent to enable manoeuvre, especially when the electromagnetic spectrum is both contested and congested. Multi-domain command and control will be a critical enabler for fifth generation manoeuvre with communication and network resilience a fundamental consideration in force design and employment.

Seminar: The Requirements of Fifth Generation Manoeuvre

24 October 2019

Program

Time	Topic	Confirmed Speakers
0800-0830	**Registration and light breakfast**	
0830-0835	*Welcoming Remarks*	AIRMSHL Geoff Brown AO (Retd) Sir Richard Williams Foundation
	Introduction and MC	SQNLDR Jenna Higgins Sir Richard Williams Foundation
0835-0900	*The Manoeuvrist Approach - a historical perspective*	WGCDR Jo Brick Australian War College
0900-0925	*The Changing Character of Manoeuvre*	AIRCDRE Phil Gordon Commander Air Warfare Centre
0925-0950	*Assured Access for the ADF in the Asia Pacific*	Prof Brendan Sargeant, Strategic and Defence Studies Centre
0950-1020	*Implications for Force Design*	Michael Shoebridge Australian Strategic Policy Institute
1020-1050	**Break – Morning Tea**	
1050-1115	*Achieving multi-agency situational understanding*	RADM Lee Goddard CSC Commander Maritime Boarder Command
1115-1135	*Multi-Domain Command and Control and the Role of Autonomy*	Richard Czumak Lockheed Martin Australia
1135-1200	*Network requirements for Fifth Generation Manoeuvre*	AIRCDRE Leon Phillips, OAM Chief Information Officer Group
1200-1225	*Fifth Generation Command and Control*	AIRMSHL Mel Hupfeld AO DSC, Chief of Air Force
1225-1255	Panel Session	Prof Sargeant, Michael Shoebridge, AIRCDRE Gordon, RADM Goddard, AIRCDRE Leon Phillips
1255-1355	**Break - Lunch**	
1355-1420	*Land Forces in 5th Generation Manoeuvre*	BRIG Ian Langford DSC and Bars Head Land Capability
1420-1440	*Next-Gen integrated force: what's really stopping us?*	Hugh Webster Boeing Defence Australia
1440-1505	*Establishing the Defence and Industry Partnerships for Fifth Generation Manoeuvre*	Anthony Fraser AO, CSC, Deputy Secretary, Capability Acquisition and Sustainment Group
1505-1525	*Industry perspective*	AVM Chris Deeble AO CSC Retd, Northrop Grumman
1525-1550	*Panel Discussion*	COL Ward, Anthony Fraser, Hugh Webster, Chris Deeble
1550-1600	Formal Close	AIRMSHL Geoff Brown AO (Retd) Sir Richard Williams Foundation

The seminar will also highlight the ongoing need to inculcate a fifth-generation mindset into combat support and combat service support functions to better exploit the advantages of greater access and movement of information as well as the traditional physical enablers of manoeuvre. It will consider the role of critical infrastructure and geography and the opportunities and risks associated with the Australian operating environment.

The program and the speakers were as follows:

Overview of the Seminar

The focus of the seminar was upon the changing nature of the regional context for Australia and how the fifth generation force needed to evolve to operate effectively in the dynamically changing region and how best to provide for the continuous change which an evolving integrated distributed force clearly needs to gain the decisive advantage needed in a contested region.

The session built from the two most recent sessions where the focus on shaping an integrated distributed force was the assumption based upon which further development of the Australian Defence Force would be built.

The first session last year posed the question of how to extend the reach of the ADF within the region through shaping longer range strike capabilities.

The second session then broadened the consideration to how to enhance the sustainability of the force by shaping a more resilient Australia and enhanced capability for Australian industry and the infrastructure renewal in Australia could be built.

This seminar proceeded from the operative assumptions on how for the ADF to be able to enhance its capability for a decisive advantage when needed within the region and beyond, when necessary to operate alone, or in a leadership role within coalitions, or when contributing to a coalition led by partners or allies.

There were several key themes developed throughout the three sessions during the day, and the upcoming articles on those sessions and the final report of the seminar will provide more detail on the various sessions themselves.

A major theme throughout the day was the nature of the challenging region and the threat calculus facing the ADF. The notion of manoeuvre was taken in a wider sense than simply military tactical advantage and was considered in the wider context of information war and gaining a strategic advantage through political warfare, supply chain dominance or defeating the enemy without firing a shot.

Gaining an information advantage and C2 dominance featured throughout the day as a key part of 21st century manoeuvre warfare, with warfare understood in the wider context in the region where dealing with 21st century authoritarian powers as well as the threats and anomalies associated with 21st century terrorism and analogous challenges needed to be dealt with.

Fifth generation manoeuvre was highlighted in terms of enhancing the ways the ADF in terms of its evolving C2 and ISR operational infrastructure could provide the force with the ability to bring decisive effect to the threat or the challenge.

The head of the Australian Air Warfare Centre, AIRCDRE Phil Gordon, provided the following definition of fifth generation manoeuvre: "The ability of our forces to dynamically adapt and respond in a contested environment to achieve the desired effect through multiple redundant paths. Remove one vector of attack and we rapidly manoeuvre to bring other capabilities to bear through agile control."

Throughout the day, various speakers provided their perspectives on how to build out the capability identified by AIRCDRE Gordon.

A key contribution came from industry where the evolving relationship between industry and government was the focus of attention. The core point was the need for industries o work more effectively with one another and with government in order to be able to provide a more cohesive engagement with industry to shape the kind of integration which is prioritized by the build out of the integrated distributed force.

One point highlighted was that by linking industry labs more effectively the capability of industry to support the evaluating capabilities for the integrated force would be enhanced.

A case study of how the kind of integration being built might be accelerated was provided by Rear Admiral Goddard, the head of the Maritime Border Command.

Here the level of integration among key agencies in the Australian government are being enhanced with a core focus on dealing with the threats and challenges facing Australian border security, and by being able to deal with threat or challenge at its source.

This requires Australia to bring integrated capability to the effort but doing so with close cooperation with allies and partners.

As Rear Admiral Goddard put it:

Through our capacity as a convening authority, at any point in time I can rely on ADF, AFP, AFMA, intelligence agency, AFP and others unified together for effect; a true Multi-Agency.

The advantages of this unity of effort must be leveraged ultimately at the tactical level, through what I would term Command and not control – Robbin Laird has termed control the 'legacy approach to hierarchical approval'

and I would tend to agree with his assertion that any advantage on the battlefield we currently have would be negated by a hierarchical approach.

MBC must take advantage of the opportunities afforded from a distributed force to achieve mission success through technological advantages – our future will be through allowing sound decision making at the tactical level through sound connectedness.

By virtue of the nature of the command, MBC is answerable to both the Home Affairs Portfolio and the Australian Defence Force through the Chief of Joint Operations. This in itself has the opportunity to create advantage for the civil maritime security mission; the advantage of operating in the so-called 'Grey Zone.'

While MBC operations are civil in nature, it has a high end mission – security of our maritime borders – and uses high-end assets to do so; an ideal future would to see the entire spectrum of both civilian and military assets put to the task.

Operating within this grey zone allows MBC to play a large role supporting and engaging a large remit of stakeholders. With regular contact with all facets of government from State/territory up to Commonwealth as well as industry in a supportive role, MBC's force elements encompass land, sea and air – a unique arrangement in regards civil maritime security, however Australia's Borders are unique which necessitate this approach. Reflecting a Fifth-Generation approach, the force is scalable dependent on the threat or response that is required and the structure at Maritime Border Command allows this force to fully integrate providing both situational awareness and effect.

With the Maritime Border Command living the transition so to speak, the ADF is working a broader scale transformation of its own which can interact with this real-world experience as well.

And the need for an integrated force built along the lines discussed at the Williams Foundation over the past six years, was highlighted by Vice Admiral David Johnston, Deputy Chief of the ADF at the recent Chief of the Australian Navy's Seapower Conference in held in Sydney at the beginning of October:
"It is only by being able to operate an integrated (distributed) force that we can have the kind of mass and scale able to operate with decisive effect in a crisis."

The need for such capabilities was highlighted by the significant presentation by Brendan Sargeant at the seminar where he addressed the major strategic shift facing Australia and why the kind of force transformation which the Williams Foundation seminars have highlighted are so crucial for Australia facing its future.

In the future there will be times when we need to act alone, or where we will need to exercise leadership.

We have not often had to do this in the past – The INTERFET operation in Timor, and RAMSI in the Solomon Islands are examples.

We are far more comfortable operating as part of a coalition led by others. It is perhaps an uncomfortable truth, but that has been a consistent feature of our strategic culture.

So I think our biggest challenge is not a technical or resource or even capability challenge – it is the enormous psychological step of recognising that in the world that we are entering we cannot assume that we have the support of others or that there will be others willing to lead when there is a crisis. We will need to exercise the leadership, and I think that is what we need to prepare for now.

To return to the title of this talk: if we want assured access for the ADF in the Asia Pacific, then we need to work towards a world that ensures that that access is useful and relevant to the sorts of crises that are likely to emerge.

I will leave one last proposition with you. Our assured access for the ADF in the Asia Pacific will be determined by our capacity to contribute to regional crisis management. That contribution will on some occasions require that we lead.

The task now is to understand what this means and build that capacity.

THE MANOEUVRIST APPROACH: PAST, PRESENT AND FUTURE

A key focus during the day was to examine how the manoeuvrist approach was morphing into the evolving 21st century combat force for the liberal democracies in dealing with the challenges posed by the 21st century authoritarian powers.

The scene setting presentation for the seminar was provided by WGCDR Joe Brick of the Australian War College. She provided a look back to inform the way ahead for Australia and its allies to position themselves for decisive advantage in 21st century conflict.

Her focus was upon how to gain the strategic advantage by leveraging your capabilities to operate more rapidly in the battlespace and with tools which allow you to gain phycological as well as physical advantages. She quoted William S. Lind to highlight that maneuver is "a style of warfare marked by obtaining positional advantage and moving faster than the enemy."

She argued that we need to operate from a "manoeuvre mindset" whereby the focus is upon obtaining a position of advantage by being able to attack the mind of the adversary. It is crucial to prepare the battlespace in such a way to gain an advantage even before a battle.

She underscored that we are shifting from an industrial to an information age concept of maneouver warfare where information is a key source of gaining strategic advantage. How to shape information dominance is a key part of the evolving approach to maneouver warfare.

She quoted the Australian Army's doctrine of what they call accelerated warfare: "Accelerated warfare means owning the speed of initiative to outpace, out-manoeuvre and out-think conventional and unconventional threats. It requires excellence in the art and science of decision making…."

FIGURE 1 WGCDR JOE BRICK OF THE AUSTRALIAN WAR COLLEGE PRESENTING AT THE WILLIAMS FOUNDAITON SEMINAR, OCTOBER 24, 2019.

A key element of shaping such a capability revolves around the kind of Command and Control which the force can exercise in multi-domain operations. This was the topic of the presentation of the Commander of the RAAF's Air Warfare Centre, AIRCDRE Phil Gordon.

This is how he defined fifth generation manoeuvre:

"The ability of our forces to dynamically adapt and respond in a contested environment to achieve the desired effect through multiple redundant paths. Remove one vector of attack and we rapidly manoeuvre to bring other capabilities to bear through agile control."

In his presentation, he started by discussing what is new and what is not in terms of 21st century manoeuvre warfare.

FIGURE 2 AIRCDRE PHIL GORDON PRESENTING AT THE WILLIAMS FOUNDATION SEMINAR OCTOBER 24, 2019.

This slide captured how he addressed this issue.

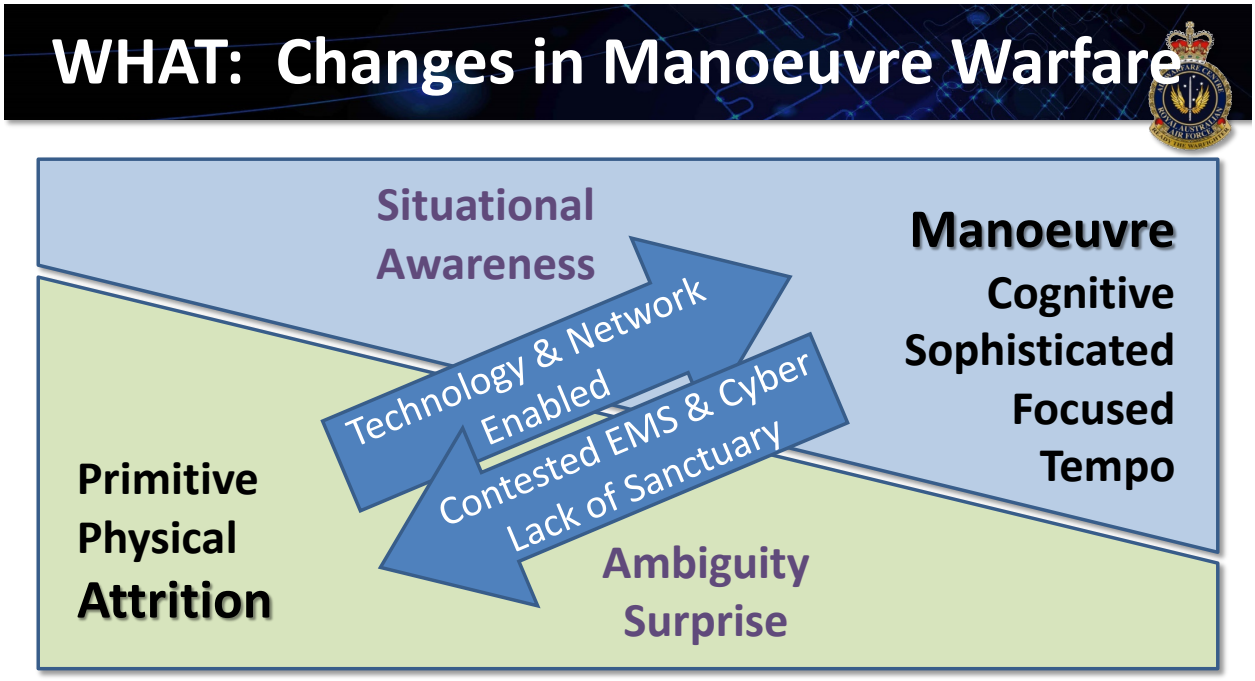

FIGURE 3 AIRCDRE PHIL GORDON SLIDE FROM HIS PRESENTATION AT THE WILLIAMS FOUNDAITON SEMIANR OCTOBER 24, 2019.

He then addressed how he saw the C2 piece of this as a crucial glue holding together mission success.

The following slide captured how he conceptualized this dynamic.

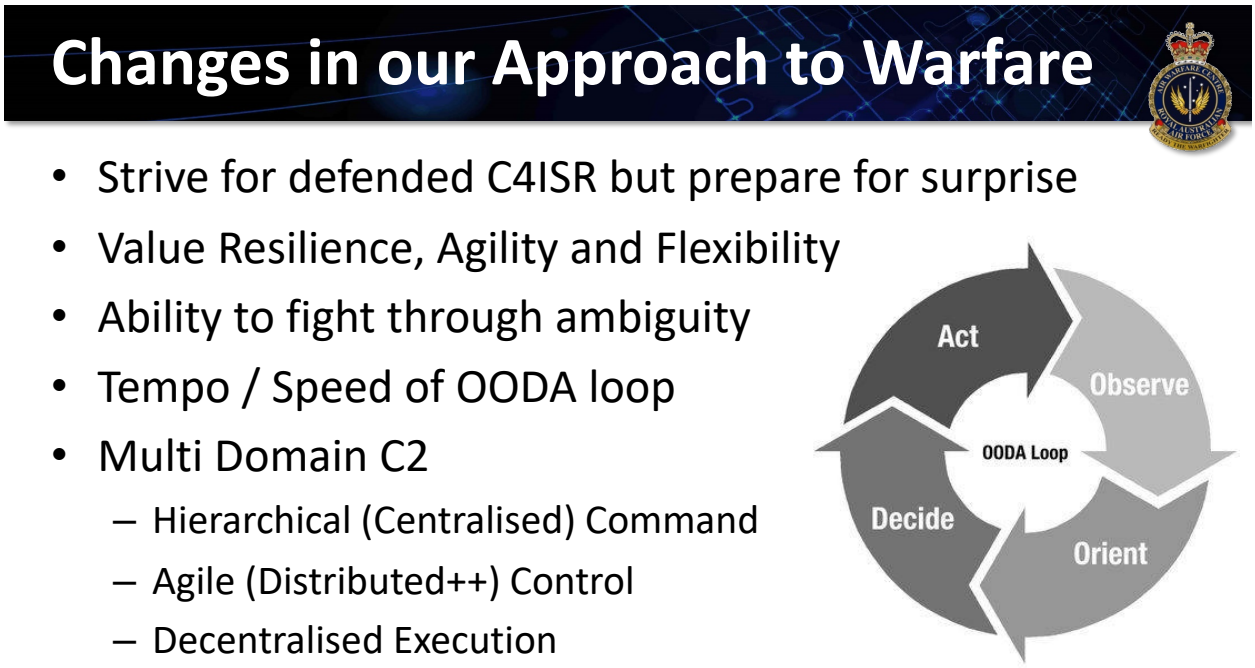

FIGURE 4 AIRCDRE PHIL GORDON SLIDE FROM HIS PRESENTAITON TO THE WILLIAMS FOUNDAITON SEMINAR, OCTOBER 24, 2019.

He argued as did Air Marshal Hupfeld in his presentation later in the day that this was not a static achievement, but fluid and dynamic and required mastering the art of transient advantage against the adversaries we are confronting today.

This is how he highlighted the dynamic learning curve which the force and its technology needs to go through to achieve this outcome or capability.

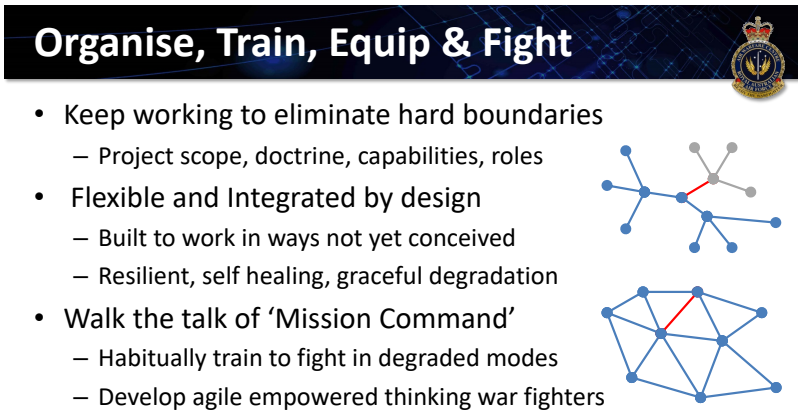

FIGURE 5 AIRCDRE PHIL GORDON SLIDE FROM HIS PRESENTATION TO THE WILLIAMS FOUNDATION SEMINAR OCTOBER 24, 2019.

Michael Shoebridge, Director - Defence, Strategy & National Security, of the Australian Strategic Policy Institute, then underscored the central salience of shaping force structure design which would enable the further transformation of the ADF to be able execute the kind of mission command which AIRCDRE Phil Gordon

and his staff at the Air Warfare Centre were working on for the RAAF and the ADF as its transformation unfolded.

Shoebridge underscored what he sees as key elements for ongoing transformation for the ADF in the period ahead. He argued that the ADF and its core allies have gone through the past twenty years of warfare that have little to do with the competition with the 21st century authoritarian powers.

This is a very different environment in which preparing for and engaging in direct competition with advanced authoritarian states is quite different from the land wars in the Middle East.

FIGURE 6 MICHAEL SHOEBRIDGE PRESENTING AT THE WILLIAMS FOUNDAITON SEMINAR, OCTOBER 24, 2019.

This creates very significant differences for the ADF and its allies.

For example, warfare in the electromagnetic spectrum is to be assumed and expected. C2 for operations will be contested. The supply chain will be challenged in operations. And the strategic shift entails the enhanced need to provide for the direct defense of Australia as well.

"We have a bubble of fifth generation capability, such as the F-35, but we need to deepen our capabilities more generally."

He argued that force design needs to underscore the ability of the ADF's key force elements, "to disperse and aggregate rapidly and easily."

He argued that platforms like the F-35 need to become transformed into "super users" which can distribute not only information but distributed operations "which are not allowed under current rules of engagement."

The coming of autonomous systems to integrate into the disaggregated force as well.

"We will need a new data and information architecture to guide the way ahead."

"We will need a system which can works at the tactical edge effectively."

WGCDR Joe Brick had mentioned the Australian Army's thinking about "accelerated warfare" which certainly resonates with what Shoebridge highlighted at the seminar.

And during the afternoon session, BRIG Ian Langford, the head of Army's Land Capability programs highlighted how he saw the Army adapting to the new environment and contributing to fifth generation manoeuvre.

BRIG Ian Langford argued that the evolving networks of forces enabled by a fifth-generation approach could provide new ways to mix and match forces to allow for more combat flexibility.

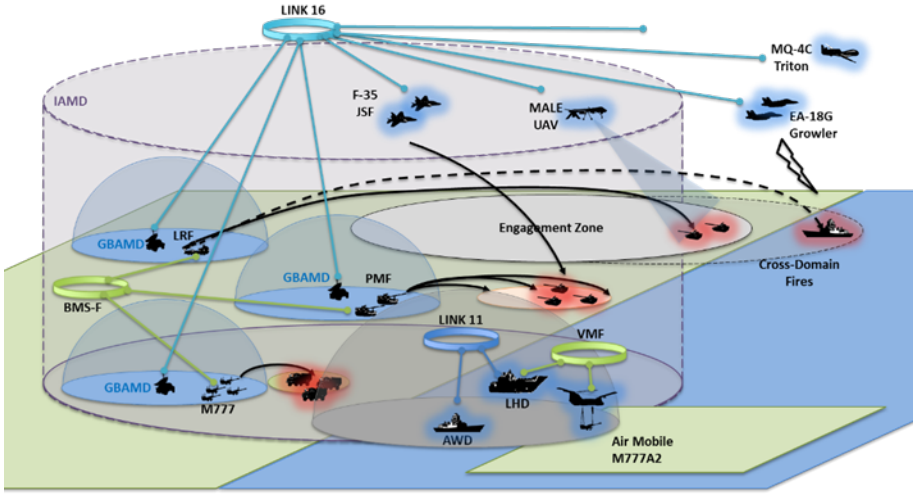

FIGURE 7 GRAPHIC CONTAINED IN SLIDE FROM BRIG IAN LANGFORD'S PRESENTATION.

He did caution that one challenge the ADF and its allies faced was the telescoping of various forms of warfare and the need to shape an appropriate force mix to be able to tailor the force to the combat challenge. In this sense, he underscored the need for the ADF to evolve as the Swiss Army Knife of the ADF.

He cited the following as highlighting his own view of the way ahead as well:

FIGURE 8 BRIG IAN LANGFORD PRESENTING AT THE WLLIAMS FOUNDAITON SEMINAR, OCTOBER 24, 2019.

'Manoeuvre warfare acknowledges the chaotic nature of warfare…Implicit in uncertainty is the understanding that conditions are rarely permanent and, more than likely, are temporary in nature, whereby *adaptability is critical to success.* Additionally, this warfighting philosophy views the enemy as a system – a system, which if its cohesion is shattered then panic and paralysis will ensue and will ultimately result in the enemy no longer possessing the ability to resist'.

- USMC Marine Corps Doctrinal Publication One

C2 AND ISR PARADIGM SHIFTS ENABLING 5TH GENERATION MANEOUVER

To achieve the kind of agility and decisive effect which 5th generation maneouver can achieve requires a significant re-focus on the nature of the C2 and ISR infrastructure which enables the legacy and new platforms which are re-shaping capabilities for the combat force capable of operating across the full spectrum of crisis management.

In today's world, full spectrum crisis management is not simply about escalation ladders; it is about the capability to operate tailored task forces within a crisis setting to dominate and prevail within that crisis.

If that stops the level of escalation that is one way of looking at it.

But in today's world, it is not just about escalation management in a narrow sense but it is about the ability to operate and prevail within a diversity of crises which might not be located on what one might consider an escalation ladder.

They are very likely to be diffuse within which the authoritarian powers are using surrogates and we and our allies are trying to prevail in a more open setting which we are required to do as liberal democracies.

This means that a core legacy from the land wars and COIN efforts needs to be jettisoned if we are to succeed – namely, the OODLA loop.

This is how the OODA loop has worked in the land wars, with the lawyers in the loop, and hence the OODLA loop.

The OODA loop is changing with the new technologies which allow distributed operators to become empowered to decide in the tactical decision-making situation.

But the legalistic approach to hierarchical approval to distributed decisions simply will take away the advantages of the new distributed approach and give the advantage to our authoritarian adversaries.

What we are seeing is a blending of technological change, with con-ops changes and which in turn affect the use and definition of relevant military geography.

In other words, the modernization of conventional forces also has an effect on geography.

As Joshua Tallis argued in his book on maritime security, the notion of what is a littoral region has undergone change over time in part due to the evolution of military technologies.

"Broadly speaking, the littoral region is the 'area of land susceptible to military influence from the sea, and the sea area susceptible to influence from the land.'

"In military terms, 'a littoral zone is the portion of land space that can be engaged using sea-based weapon systems, plus the adjacent sea space (surface and subsurface0 that can be engaged using land-based weapon system, and the surrounding airspace and cyberspace.'
"The littoral is therefore defined by the technological capability of a military, and as a result, the littoral is not like other geographic terms."[1]

What is changing is that the force we are shaping to operate in the littorals has expansive reach beyond the presence force in the littorals themselves.

If you are not present; you are not present. We have to start by having enough platforms to be able to operate in areas of interest.

But what changes with the integrated distribute ops approach is what a presence force can now mean. Historically, what a presence force is about what organically included within that presence force; now we are looking at reach or scalability of force.

We are looking at economy of force whereby what is operating directly in the area of interest is part of distributed force.

The presence force however small needs to be well integrated but not just in terms of itself but its ability to operate via C2 or ISR connectors to an enhanced capability.

But that enhanced capability needs to be deployed in order to be tailorable to the presence force and to provide enhanced lethality and effectiveness appropriate to the political action needed to be taken.

This rests really on a significant rework of C2 in order for a distributed force to have the flexibility to operate not just within a limited geographical area but to expand its ability to operate by reaching beyond the geographical boundaries of what the organic presence force is capable of doing by itself.

This requires multi-domain SA – this is not about the intelligence community running its precious space- based assets and hoarding material. This is about looking for the coming confrontation which could trigger a crisis and the SA capabilities airborne, at sea and on the ground would provide the most usable SA monitoring. This is not "actionable intelligence."

This is about shaping force domain knowledge about anticipation of events.

This requires tailored force packaging and takes advantage of what the new military technologies and platforms can provide in terms of multi-domain delivery by a small force rather than a large air-sea enterprise which can only fully function if unleashed in sequential waves.

The focus on the requirements for fifth generation maneouver at the Williams Foundation seminar underscored several key aspects of how to achieve the outcome of a tailored force which could achieve sufficient effects to operate and determine outcomes across the spectrum of crisis management.

Getting the Right Piece of Information to the Right Shooter, the Right Effector, the Right Sensor, at the Right Point in Time

Air Vice Marshal Chris Deeble, now retired and now head of Northrup Grumman in Australia, provided a perspective based on his unique experience working the fifth-generation transition in the RAAF. He has worked on the Wedgetail, the tanker, and the F-35 programs, and based on a decade of extensive experience bringing new capabilities to the RAAF and the ADF, he is well positioned to suggest ways ahead with regard to the build out of a fifth generation maneouver force.

The core target which needs to be achieved in order to enable, empower and further develop the fifth generation force was identified by Deeble as follows: "Getting the right piece of information to the right shooter, the right effector, the right sensor, at the right point in time."

He argued that such an outcome cannot occur by happenstance but must be the focus of attention from the outset. "It must be architected."

Deeble underscored that "we need to focus on information management as a maneuver force capability. It is not just about the platforms, but the information enabling the joint force to operate as a fifth generation maneouver force."

He further argued that for such a capability to become a dominant reality will require "future proofing the force" by having an evolving but guiding architecture which is based on operational experience and open ended to innovations.

But it is crucial that such innovation is done through evolving adaptations from operational experience, rather than long lists of requirements keeping industry outside of the ongoing conceptual rethinking.

"We have not yet achieved critical mass for the kind of collaborative efforts which can achieve this outcome."

But clearly this is the means through which the ongoing future proofed architecture can be shaped and implemented by the innovations being delivered by the combat force operating throughout the spectrum of conflict management.

Rethinking Networks

When describing C2 and ISR or various mutations like C4ISR, the early notions of C2 and ISR seen in both air-land battle and in joint support to the land wars, tend to be extended into the discussions of the C2 and ISR infrastructure for the kill web or for force building of the integrated distributed force.

But the technology associated with C2 and ISR has changed significantly throughout this thirty year period, and the technology to shape a very different kind of C2 and ISR infrastructure is at hand to build enablement for distributed operations.

As Marja Phipps of Cubic Corporation's Mission Systems has put the shift underway with regard to C2 and ISR networks:

"Earlier we built a dedicated single network connection for a specific task, such as providing targeting information to the platforms involved in a specific operation."

The "networked" force was built around platforms that would use networked information to create desired and often scripted events.

But the C2 and ISR revolution we are now facing is reversing the logic of platforms to infrastructure; it is now about how flexible C2 and ISR interactive systems can inform the force elements to shape interactive combat operations on the fly.

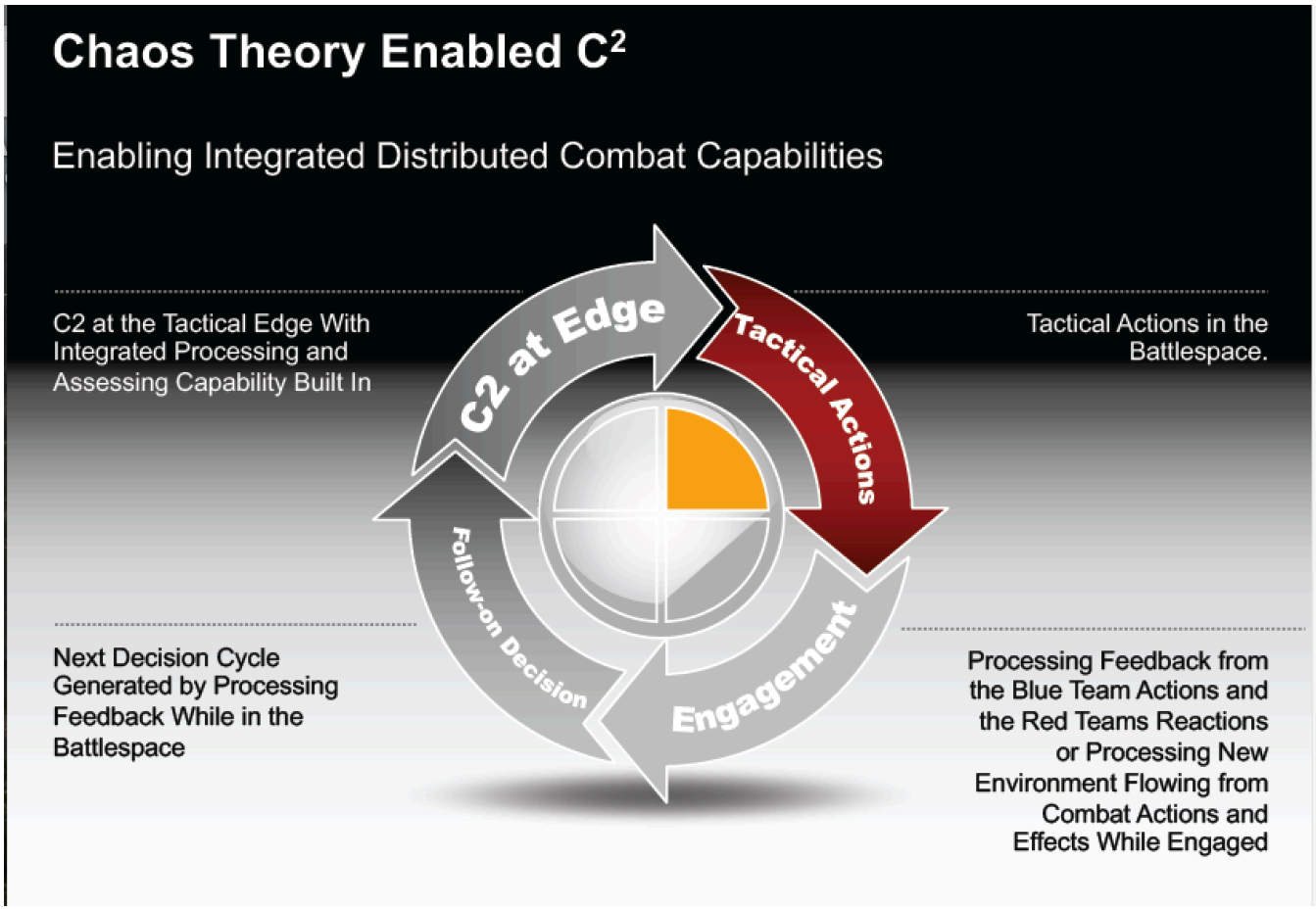

FIGURE 9 C2 AT THE TACTICAL EDGE: CHAOS THEORY ENABLED C2 CREDIT: SECOND LINE OF DEFENSE

That is, the new capabilities are enabling tactical decision making at the edge and posing real challenges to traditional understandings of how information interacts with decision making.

It is about learning how to fight effectively at the speed of light in order to achieve combat dominance.

And these new capabilities are providing a real impact on force development, concepts of operations and force training as well.

"With the new technologies and capabilities, we are now reusing networks for multiple purposes and making sure that they can adapt to the changing con-ops as well."

"We are seeing integration of the networks and the integration of the information management services and then the dual nature of the applications on top of those integrations.

"Rather than building a single purpose intel common operating picture, we are now capable of building an integrated intelligence and battlespace management common operating picture for the use of the combat forces engaged in operations."

In other words, "we are building an adaptable network of networks. In traditional networks, when data is brought in from a dedicated system, it needs to be repurposed for other tasks as needed."[1]

[1] https://sldinfo.com/2019/10/shaping-the-c2-isr-infrastructure-for-an-integrated-distributed-force/

At the seminar, AIRCDRE Leon Phillips, OAM Chief Information Officer Group, provided a very comprehensive overview to the kind of changes, both evolutionary and revolutionary, which networking was undergoing as the infrastructure of the ADF as a fifth-generation force.

FIGURE 10 AIRCDRE LEON PHILLIPS PRESENTING AT THE WILLIAMS FOUNDATION SEMINAR, OCTOBER 24, 2019.

According to AIRCDRE Phillips:

Modern, 5th generation defence forces, will need to be competent across the continuum of conflict, supporting times of political tension through to high-end peer to peer warfighting.

This left and right of arc has the potential to leave us conflicted with choice over exactly what our data and network needs are. Notwithstanding, technology growth is leading to a greater array of more complex sensors and shooters, dispersed across the battlefield.

We face the threat of faster, more agile hypersonic threats and the proliferation of disruptive technology offered by cheaper drones as well as attacks on our networks.

For us to be effective we need to ensure our systems are well connected, through robust, multi-pathed networks and that we are capable of operations despite degraded networks.

Data exchange between tactical and strategic networks offers us competitive advantage and we need to recognise the merging and synergistic nature of both. We are benefiting through our investment in high-end warfighting technology however need to think more deeply about the information exchange between these and our CONOPS so we make the best investments and tradeoffs in a fiscally constrained environment.

Finally, we must invest more heavily, both intellectually and financially in the development of weapon systems and C2 systems that we develop as they give us control in how we bind and glue our tactical systems together, ensuring our ecosystem is optimised.

He argued that the investment piece clearly needs to be aligned with what Deeble was calling for in terms of architectures which can deliver the kind of sovereign capability which Australia needs for its fifth- generation force but capable of being interoperable with allies and partners as well.

This is not Costco buying where we leverage US economies of scale by buying in packs of 6. Like all good investment portfolios, there should be some money slated for high risk, high return ventures. The real Jericho challenge is to convince the Investment Committee and Government of this.

Noting the volume of data we capture and the likelihood of constrained data paths, I suggest this data analytics needs to be at both the tactical and strategic level to ensure only data of value is kept and shared.

For instance, you can collect a lot of imagery on a maritime patrol flight but how much is useful? Processing at the tactical edge to extract more immediate value and sharing only what is of value is paramount. Opportunities exist to use our developed and controlled technologies such as our converged deployable and embedded networks to be the hub of this effort. It's the applications that are hosted here that we need to invest in with a tighter coupling of strategist, warfighter, delivery agency and industry.

At the strategic level there will be an abundance of data. Data from allied sources and data collected over days, months and years. Combing through the data, perhaps more slowly than at the tactical edge, can offer us early queues on our adversary's intent.

Earlier on I mentioned the geopolitical landscape and the murky nature of modern conflict. Data analytics at this level may need to expand beyond traditional military sources, depending on the circumstances.

How much social media and public information would we also be interested in?

Having an agility to respond and evolve our analytics given the strategic circumstance we find ourselves in is important.

Again, investment in Australian owned and developed data systems allows us this flexibility.

Enhancing the Capability of the ADF to Contribute to Full Spectrum Crisis Management

The Chief of Staff of the RAAF, Air Marshal Mel Hupfeld, provided the final presentation at the Williams Foundation Seminar. In his presentation, he embraced the earlier discussions on the C2, ISR, network development assessments, but underscored how he saw such efforts reshaping the capabilities of the ADF and its role for the nation.

Clearly, a fifth-generation force "Will necessarily require robust redundant ITC systems capable of handling an exponential growth in data generation accompanied by exponential increases in processing power and speed."

Certainly, as the ADF enhances its network capabilities to deliver a more integrated force, it will be more capable of multi-domain integrated operations.

But for the Air Marshal, we needed to think beyond narrowly considered kinetic or warfighting impacts of such a capability.

"The multi-domain approach should not be limited to thinking about combat scenarios. We should use a multi-domain approach across the spectrum of operations to shape our thinking about how to generate access, presence, influence, deterrence, denial…."

FIGURE 11 AIR MARSHAL MEL HUPFELD PRESENTING AT THE WILLIAMS FOUNDATION SEMINAR, APRIL 24, 2019.

In effect, he argued that force integration was not an end in of itself but a means of expanding Australian influence in the region and its ability to more effectively defend Australia's interests. Enabling fifth generation maneouver means that the ADF can expand its role and utility for the Australian government to expand its impact and influence throughout the region and globally.

In short, although the discussion of C2, ISR and networking can get terribly technical, the ground truth is that these are means to enhance an operational force's capabilities which, in turn, enhance its utility to the nation and to the ability of the national leadership to achieve the effects, politically and diplomatically they seek.

THE INDUSTRY-GOVERNMENT ECO SYSTEM AND SHAPING AND DELIVERING ADF FIFTH-GENERATION MANOEUVRE CAPABILITIES

FIGURE 12 INDUSTRY PANEL AT THE WILLIAMS FOUNDATION SEMINAR, OCTOBER 24, 2019.

The presentations which dealt with the defense industry and the government-industry relationship highlighted that the legacy approach which focuses on setting platform requirements will not deliver effectively fifth generation manoeuvre capabilities.

The industrial-government eco system is evolving and that evolution needs to deliver cross-domain integration and that, in turn, requires government and industry to work together more effectively.

Getting past a narrowly focused stove-piped platform acquisition process, on the one hand, and finding ways to shape Australian defense architectures which can subsume systems bought abroad within a more integrated Australian set of capabilities, on the other hand, are two of the key tasks facing the Australian defense system.

Shaping and Delivering the Integrated Force: The Perspective of Hugh Webster, Boeing Defence

In an article by Stephen Kuper of Defence Connect published earlier this year, Hugh Webster of Boeing Defence was quoted with regard to a key aspect of meeting the challenge of shaping, building out and sustaining an integrated force:

Conceptualised as a "system-of-systems" responsible for combining the data gathering, analysis and firing solutions of inter-service platforms like the F-35 Joint Strike Fighter, E-7A Wedgetail, P-8A Poseidon, Hobart Class and Hunter Class and the National Advanced Surface to Air Missile System (NASAMS) LAND 19 Phase 7B, AIR 6500 has become an increasingly challenging project.

The challenge laid down to industry by the RAAF and government has been taken up enthusiastically by industry keen to be at the cutting-edge of capability delivery, particularly given the opportunity to establish a paradigm-shifting integrated, multi-domain combat and battle management system capable of air and missile defence for a force as technologically advanced as the Australian Defence Force.

Boeing, one of the prime contractors tendering for the AIR 6500 program, has sought to identify the nuances and challenges of the program, while presenting solutions to benefit all parties.

Hugh Webster, chief engineer of new business at Boeing Defence Australia, told Defence Connect,

"This complex Joint Integrated Air and Missile Defence (JIAMD) and Battle Management System, really is a necessity for the ADF. The system will 'knit together' individual capability packages SEA 5000 and LAND 19 Phase 7B to existing 'nodes' and 'shooters' like the E-7A Wedgetail and F-35 Joint Strike Fighter."

At present, the challenges are largely defined by integrating a multi-layered system made up of individual platforms, including the short-range, ground based air and missile defence capabilities like Raytheon's NASAMS system as part of LAND 19 Phase 7B, with the ground-based AIR 6500 program and a national Integrated Air and Missile Defence (IAMD) system, which includes platforms like the Hobart and Hunter Class vessels, Wedgetail and F-35.

"From Boeing's perspective, the program is too large and too complex for anyone prime to successfully deliver on its own, particularly without a clearly defined technical roadmap for each of the layers within the proposed 'system-of-systems'," Webster said.

Recognising this, Boeing recognised that success will require a long-term operational and technical roadmap, identifying the need for a single IAMD "glue" that will be responsible for combining the individual and highly specialised capabilities provided by other prime contractors, like Lockheed Martin, Northrop Grumman and Raytheon, through the aforementioned platforms.

"We have looked at each of the contributing platforms, like Lockheed Martin's Aegis in the Hobart and Hunter Class, the F-35, Boeing's Wedgetail, 'Loyal Wingman' and Project Currawong, and the Raytheon NASAMS platform, and recognised we need to focus on working together to deliver the outcome Air Force and government are asking for," Webster explained.

Boeing's technical vision reinforces the need for Defence and industry to work between and among themselves, and with Australian SMEs, to deliver local solutions that can then be paired with the right mix of US technology to deliver best-for-warfighter solutions.

"This technical vision also recognises the unique role Australian SMEs play in the broader equation. World-leading companies like CEA Technologies and Daramont bring unique leading-edge technology, systems and capability solutions to the table," Webster said.

Additionally, Boeing's solution seeks to draw on the methodology of successful integration programs like Project Currawong and the E-7A Wedgetail Airborne Early Warning & Control (AEW&C), particularly the close working relationships between acquirers, operational users and industry. This locally driven success developing and delivering complex "systems-of-systems" programs for the ADF shows that AIR 6500 design, integration, delivery and support would also benefit from a strong Australian presence.

"Our focus isn't on 'shiny new toys', it is on helping Air Force and government to tangibly identify and answer the roadmap questions, while demonstrating the success and precedence Boeing has had combining various prime contractors, platforms, operational users and Australian SMEs to meet clearly defined capability requirements," Webster told Defence Connect.

The AIR 6500 Project presents an opportunity for Australian industry to participate in an exciting and strategically important program to build and maintain an enduring and regionally superior Australian capability, with an opportunity to enter export markets….

Webster's presentation at the seminar provided a hard-hitting overview on how he saw the challenges to getting at the kind of outcome he identified in the Kuper article.

If I was charged with solving future force integration, my mental frame of reference would be a Defence-industry jointly developed roadmap, which would outline the what, how and who of this next-generation integrated force. Each part of the roadmap also gives us a frame to think about what's stopping us from great operational outcomes at scale.

The roadmap starts with the vision, which is what we want this next-gen integrated force to do in the long run to support our manoeuvre needs.

Webster then identified four operational needs which provide the pillars for crafting, shaping and sustaining an evolving integrated force.

The first level is ISR.

This starts with joint, shared, collaborative sensor networking. An easy example is the use of an air EW sensor such as the Growler in the land EW fight. When you start doing that, then you need to figure out how to manage networked sensors.

But force level ISR is more than that. Defence needs to move away from ISR stovepipes, for example find a way to fuse COMINT, MASINT and HUMINT so that we're maximising the effectiveness of the ISR platforms and techniques that we have.

The second level is multi-dimensional C2.

We need C2 systems, doctrine and supporting training that really enables the best decisions in complex battle spaces. We will use multi-domain ISR to provide fused, all source information but the battle outcome is delivered in terms of joint integrated effects, and this takes humans to understand a situation and make reasoned decisions.

Most of you are familiar with the doctrine of 'centralised command, decentralised control', but I wonder if that is actually applicable in the next-gen environment anymore. A colleague of mine Antony Martin introduced a phrase that I prefer: 'Hierarchical Command – Agile Control'.

When you think about hierarchical command, this is different than centralised command. And Agile Control is clearly not the same as decentralised control.

The third level is integrated effects.

Regardless of what you think of the terms 'kill web', 'combat cloud' and 'mosaic warfare', integrated effects are going to be the assymetric tool that is going to allow the ADF to succeed.
Integrated effects will be built on a network of complex weapons systems.

They will use adaptable architectures to connect across these multiple platforms and weapons systems, but interestingly there won't be a single glue to tie them all together, it will be a complex mesh that will evolve over time.

And from a weapons perspective, we will need engage capabilities that trade range, lethality and most importantly affordability. There will need to be a mix of capabilities to penetrate as well as deliver effects from stand-off ranges, and we will need to think harder about 'left-of-launch' effectors.

FIGURE 13 HUGH WEBSTER PARTICIPATING IN THE WILLIAMS FOUNDAITON SEMINAR, APRIL 24, 2019.

The US experience in NIFC-CA gives us some clues about how to deliver these integrated effects. They didn't wait to design a perfect architecture up front before they started connecting platforms across their kill web.

And so can we: we can develop our own integrated effects incrementally by networking existing and incoming systems: we can link Wedgetail, the Army Currawong meshed network, the Air Warfare Destroyer. And not only do we have these platforms in service in Australia, we also have the industrial support base to do something about knitting them together.

The fourth level is EM Battle Management.

We need extensive spectrum awareness not only about our frequency use, our adversary's frequency use, but also NGO and civilian needs. And the latter two aren't well documented or technically integrated, and collateral damage estimation of non-kinetic effects is an order of magnitude harder than for kinetic effects.

And finally we need them to be integrated with elements such as pschyops and information warfare, and this is really a creative arts activity.

All this leads to the need to craft the kind of architectures necessary to build, operate and sustain the ADF as an integrated force.

I want to be clear that its essential that the ADF doesn't wait for perfect architectures to be analysed in detail before we start implementing….

I think Defence needs to lean on industry more to help. Both large OEMs and small SMEs are a vast untapped experience base. When we start doing the work, some decisions will fall to one prime or another, whereas some decisions will require some sort of collaborative work. If Defence just focuses on above-the-line resources from industry because probity is hard, you're missing out on key intellectual capital.

Hugh Webster highlighted the barriers which the current acquisition system puts in place blocking the kind of integration which this seminar and previous Williams Foundation seminars have highlighted as central to the future of the ADF.

If we reverted back to our generational language, it's like we're trying to acquire a 5th Gen force using, at best, a 3rd Gen acquisition process. Now there is no single silver bullet here, but I think there needs to be thought applied to matching technology development cycles with acquisition cycles.

So for example, if you're buying industrial age tech such as radars, engines and fire trucks, then it's ok to use fairly linear, well templated processes. But if you're buying 'Information Age' tech such as software, or doing complex systems integration, then you need to use modern, best practice acquisition processes.

He underscored that linking up industry labs in Australia could provide a powerful but as yet untapped capability to drive the process of innovation for an integrated force.

I think we need some acquisition machinery reform. We need to encourage flexible and innovative procurement approaches, with reformed probity processes. We need to develop and allow novel execution and commercial strategies.

There needs to be greater industry engagement during requirements phases, and by that I mean industry OEM participation at up to SAP level, and not just with MSPs or 'above the line' contractors. We need to be looking more at the asynchronous development of capabilities: we need to prototype, then experiment, then field, and then use, rinse and repeat.

We need to do more force level integration in labs prior to operations in the field. Several companies have labs here in Australia such as NG's SIL, Boeing's Joint Battle Management Development Environment, Raytheon's CAVE environment or Lockheed's Endeavour Labs.

We need to connect these labs and do some risk-retiring integration work first, such as how might a Wedgetail operate with a JSF more effectively.

To be fair, industry will need to work hard to resolve Intellectual Property issues. Defence and Industry have to solve Inter-Industry collaboration, so that instead of Company A vs Company B, we have Company A + Company B + CoA to drive a best for warfighter outcome for the ADF.

He then highlighted the importance of a significant reshape of the training piece to force structure development.

I think there's a disconnect between how we organise and plan for "raise-train- sustain" back at home bases, and then how we "fight" as part of a task group. If we're serious about Multi-domain planning & tasking, should we organise differently?

He then underscored the importance of the nature of the workforce which can generate and support the way ahead for force integration.

All of our training processes need to "teach" – if I can use that word – a greater, broader appreciation of options, and how to apply creative thinking to military processes.

He concluded by tying together the various key elements to building, operating and evolving an integrated force as follows:

NextGen integrated operations requires a different approach not only to warfighting but also to acquisition, operations and training as well. We need to balance 'information age' and 'industrial age' capabilities, and recognise that NextGen manoeuvre is not just about platforms, but rather the entire ecosystem from acquisition through to operations. An Integrated Force Level approach is required for all of these things.

Now these concepts are not new. Jericho established some of these vectors, but what really needs to change is how we prosecute them. We need laser like clarity on what's stopping us, and these fundamental blockers need to be unstuck.

With our architectures, we need to make key decisions and develop roadmaps, but don't wait for perfection. And we must unstick our acquisition processes, or we'll be forever talking about '7 minute abs' or '5th generation', and not actually benefiting from these things.

It will be expensive and pathfinding, but operationally we can't afford not to.

The Challenge of Future Proofing the Force: The Perspective of Air Vice Marshal (Retired) Chris Deeble, Northrop Grumman Australia

Chris Deeble's presentation followed nicely from that of Hugh Webster's. And his presentation straddled both his experience in the RAAF with several cutting edge programs, and his transition to industry.

The core target which needs to be achieved in order to enable, empower and further develop the fifth generation force was identified by Deeble as follows: "Getting the right piece of information to the right shooter, the right effector, the right sensor, at the right point in time."
He argued that such an outcome cannot occur by happenstance but must be the focus of attention from the outset.

"It must be architected."

He argued that to "future proof" the force it was crucial for industry and government to work together in shaping an ongoing process of conceptual force development and operational innovations which entered the force and then could be fed back into an ongoing conceptual redesign effort.

He argued that "defence requires an agile, resilient, secure and self-healing network architecture to support its unique force structure and future joint and coalition warfighting needs."

And this required what he called a mission engineering approach which he conceptualized as seen in the graphic below:

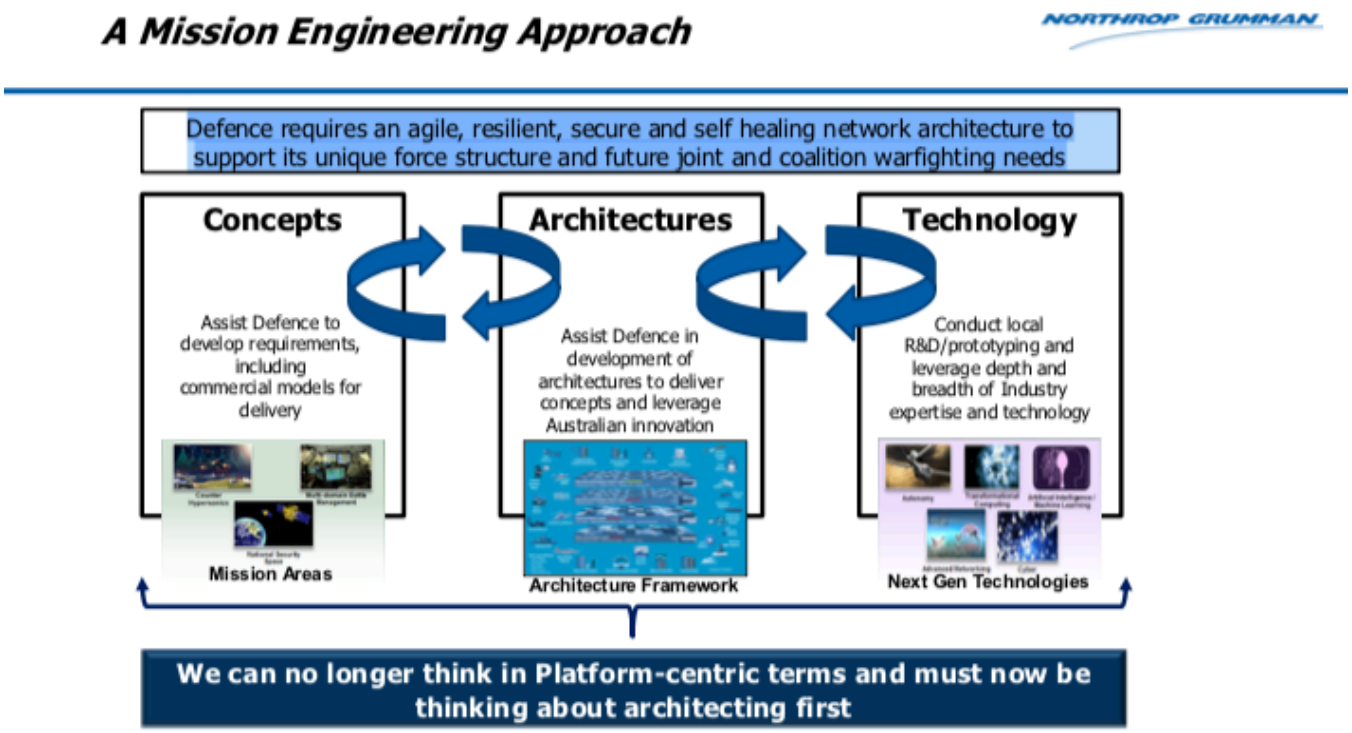

FIGURE 14 SLIDE FROM AVM (RETIRED) CHRIS DEEBLE'S PRESENATION TO THE WILLIAMS FOUNDATION SEMINAR, OCTOBER 24, 2019.

This approach launches a conceptual, development, experimentation, training, operational deployment cycle which is critical to the ongoing modernization of an integrated force.

Deeble underscored the clear need for "evolving concepts, architectures and technology requiring a collaborative and trusted experimentation environment."

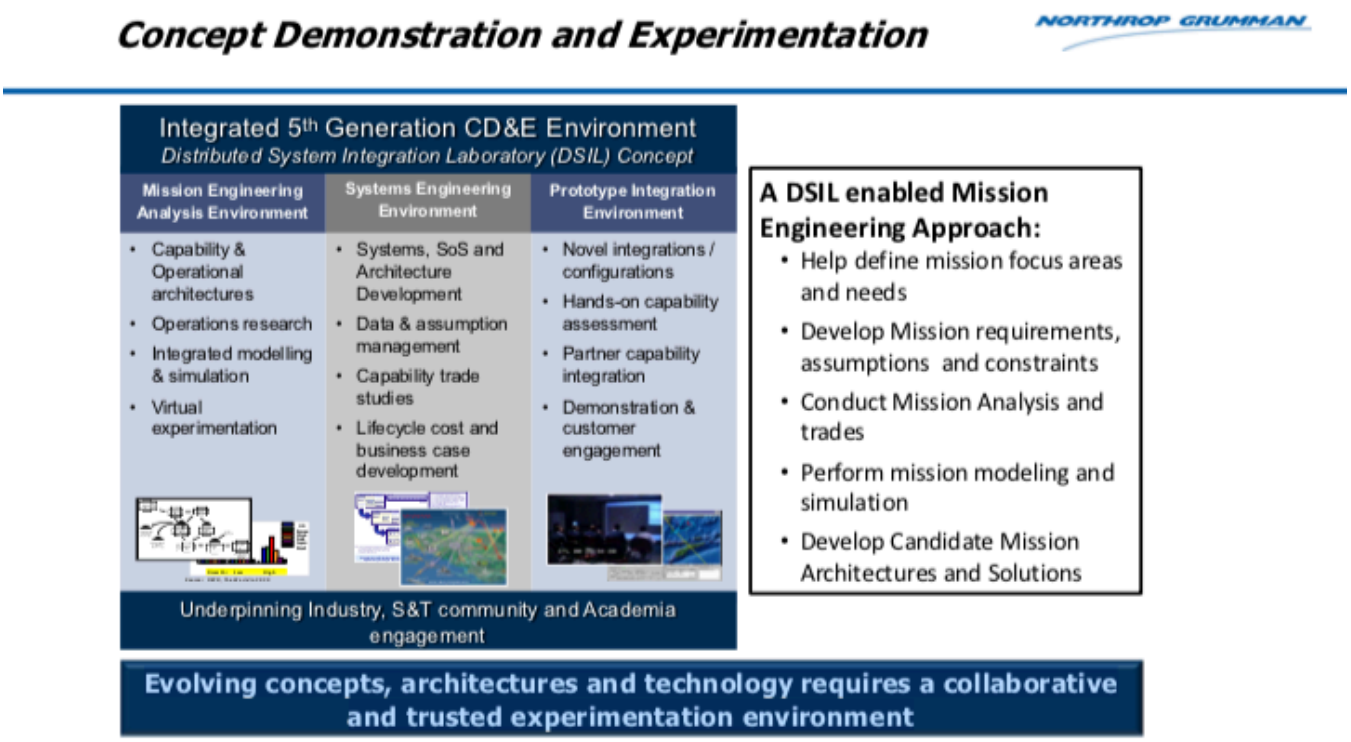

FIGURE 15 SLIDE FROM PRESENTATION BY AVM (RETIRED) CHRIS DEEBLE'S PRESENTAITON TO THE WILLIAMS FOUNDATION, OCTOBER 24, 2019.

In short, both Webster and Deeble underscored the need to leverage the current ADF joint force development efforts to transition to a new cycle of innovation in which industrial and government collaboration could be strengthened to drive integration by design rather than focusing on after-market integration of individually acquired platforms.

Building in Integration: Reshaping Training and Encompassing Development

The presentations of Webster and Deeble considered together underscored the importance of shaping a conceptual to development to training to operational cycle which needs to underly the "post-requirements" revolution which acquisition processes are going through.

In an interview I did with Air Vice Marshal (Retired) John Blackburn in 2017, a key element of this emerging cycle of innovation was the focus of discussion.

The Australian Defence Force has set a tough bar for itself – shaping an integrated force and crafting an ability to design such a force.

This is a tough bar but one which they are trying to energize in part by leveraging their new platforms to shape a way ahead beyond the classic after-market integration strategy.
But how best to do this with regard to training and development of the force?

And how to maximize the combat effectiveness to be achieved rather than simply connecting platforms without a significant combat effect?

When we visited Fallon this year, we were impressed that the training command is adding new buildings which are designed to shape greater capability to get the various platform training efforts much better connected.

Fallon is known as the Carrier in the Desert; but as the carrier and its role within the fleet evolve and encompass distributed lethality and the kill web, so must the Carrier in the Desert evolve.

It starts with the addition of two new buildings, which embrace the shift.

One building is to house the integrated air enabled force; the second houses the simulators that drive the process of their integration.

The first building, building P420, will house the integrated training effort.

"The entire building is a SCIF (Sensitized Compartmented Information Facility) at 55,000 square feet.

"We will have offices in there.

'We will have auditoriums.

'We will have classrooms.

'We will have mission-planning rooms.

'And the building will also house the spaces from which we monitor and control missions on the Fallon Range.

"We will be able to do all of our operations at the appropriate classification level for the entire air wing."

The additional new building will house the simulators.

"Building P440, which is 25,000 square feet, will host initially the simulator devices for the integrated training facility.

"These include F-35, E-2D, Super Hornet, Growler, and Aegis."

We were also interested in the clear desire to shape Training, Tactics, and Procedures (TTPs) cross platforms where possible.

The F-35 coming to the carrier deck also has key radar capabilities, notably built by the same company, Northrop Grumman, and working integration will provide a key opportunity to enhance the capabilities of the CAG in supporting fleet operations.
Clearly, tools like Live Virtual Constructive training will become increasingly more important in training for the extended battlespace and there is a clear need to work integration with live assets today with US and Allied forces in order to lay down a solid foundation for something like LVC.

The team emphasized the need to have the advanced assets at NAWDC to allow for the kind of integrated training, which is clearly necessary.

They would like to see E-2Ds and F-35Cs physically at NAWDC to allow for the kind of hands on experience, which can build, integrated cross platform training essential for the development of the skill sets for dominance in the 21st century battlespace…

Hence, a different pattern is emerging whereby training is as much about combat development TTPs as it is about single platform proficiency.

"The problem is right now, we don't have aircraft here to fully develop cross platform integration, because we don't have enough time spent together to figure out the optimal direction to drive that kind of integration."

But what is missing is a capability to connect training, notably cross platform training with software code rewriting of the sort, which the new software upgradeable platforms like F-35 clearly can allow.
Indeed, we added to the above article the following:

One could also add, that the need to build ground floor relationships between code writers and operators needs to include the TTP writers as well.

During my visit to Canberra, I had a chance to discuss with Air Vice-Marshal (Retired) John Blackburn how the training approach could be expanded to encompass and guide development.

"We know that we need to have an integrated force, because of the complexity of the threat environment will will face in the future. The legacy approach is to buy bespoke pieces of equipment, and then use defined data links to connect them and to get as much integration as we can AFTER we have bought the separate pieces of equipment. This is after-market integration, and can take us only so far."

"This will not give us the level of capability that we need against the complex threat environment we will face. How do we design and build in integration? This is a real challenge, for no one has done so to date?"

Laird: And the integration you are talking about is not just within the ADF but also with core allies, notably the United States forces. And we could emphasize that integration is necessary given the need to design a force that can go up an adversary's military choke points, disrupt them, have the ability to understand the impact and continue on the attack.

This requires an ability to put force packages up against a threat, prosecute, learn and continue to put the pressure on.

Put bluntly, this is pushing SA to the point of attack, combat learning within the operation at the critical nodes of attack and defense and rapidly reorganizing to keep up the speed and lethality of attack.
To achieve such goals, clearly requires force package integration and strategic direction across the combat force.

How best to move down this path?

Blackburn: We have to think more imaginatively when we design our force.

A key way to do this is to move from a headquarters set requirements process by platform, to driving development by demonstration.

How do you get the operators to drive the integration developmental piece?

The operational experience of the Wedgetail crews with F-22 pilots has highlighted ways the two platforms might evolve to deliver significantly greater joint effect. But we need to build from their reworking of TTPs to shape development requirements so to speak. We need to develop to an operational outcome; not stay in the world of slow motion requirements development platform by platform.

Laird: Our visit to Fallon highlighted the crucial need to link joint TTP development with training and hopefully beyond that to inform the joint integration piece.

How best to do that from your point of view?

Blackburn: Defence is procuring a Live/Virtual/Constructive (LVC) training capability.

But the approach is reported to be narrowly focused on training. We need to expand the aperture and include development and demonstration within the LVC world.

We could use LVC to have the engineers and operators who are building the next generation of systems in a series of laboratories, participate in real-world exercises.

Let's bring the developmental systems along, and plug it into the real-world exercise, but without interfering with it.

With engagement by developers in a distributed laboratory model through LVC, we could be exploring and testing ideas for a project, during development. We would not have to wait until a capability has reached an 'initial' or 'full operating' capability level; we could learn a lot along the development by such an approach that involves the operators in the field.

The target event would be a major classified exercise. We could be testing integration in the real-world exercise and concurrently in the labs that are developing the next generation of "integrated" systems.

That, to my mind, is an integrated way of using LVC to help demonstrate, and develop the integrated force. We could accelerate development coming into the operational force and eliminating the classic requirements setting approach.

We need to set aside some aspects of the traditional acquisition approach in favor of an integrated development approach which would accelerate the realisation of integrated capabilities in the operational force.

A Multi-Domain Perspective Driving Force Integration: The Perspective of Richard Czumak

Richard Czumak is an Operations Analyst-5th Gen at Lockheed Martin and is based in Australia. He provided an overview of how the United States is dealing with multi-domain operations, the role of the Lockheed Martin labs in the United States in this effort, and how the linking up of the labs in the United States with labs in Australia can drive the kind of integration which the ADF is both seeking and building.

He provided a perspective on how the United States has progressively moved over time from earlier concepts of conventional force modernization to the current focus on multi-domain operations.

He cited the current Chief of Staff of the US Air Force, General Goldfein, who has highlighted the dynamics of change as follows:

"In this information age of warfare, advantage will be achieved … [by] harnessing the vast amount of information our sensors can generate, fusing it quickly into decision-quality information, and creating effects simultaneously from all domains and all functional components anywhere in the world."

FIGURE 16 RICHARD CZUMAK PRESENTING AT THE WILLIAMS FOUNDAITON SEMINAR, OCTOBER 24, 2019.

And when re-considering the OODA loop, Czumak argued that each aspect of the OODA loop was in the process of transformation with multi-domain C2 being built into the force.

With regard to the Observe dimension:

- Leverage cross-domain cueing to detect and engage enemy systems
- Develop all categories of intelligence in any necessary domain in the context of opposed access.
- With regard to the Orient dimension:
- Quickly turn data into decision- quality information
- Create sharable, user-defined operating pictures from a common database
- Collect, fuse, and share accurate, timely, detailed intelligence across all domain

With regard to the Decide dimension:

- Integrate actions and capabilities across domains and at lower echelons
- Rapidly plan deliberate and dynamic targeting from all domains
- Synchronize planning and execution across domains
- Enable subordinate commanders to act independently in consonance with the higher commander's intent

With regard to the Act dimension:

- Simultaneously create effects from all domains
- Manage lethal and nonlethal fires in all domains within the same targeting and fire support coordination systems.
- Apply lethal and nonlethal fires flexibly and responsively between domains.

He cited an example of the process of change involving the HIMARS artillery system.

Earlier, when I visited MAWTS-1, the process of integrating the capability of the F-35 to leverage HIMARS into a joint firing capability was highlighted.

Then the Marines have taken that capability onboard an amphibious ship.

And Czumak cited the presence of both US Army and of a USMC HIMARS units in Talisman Sabre 2019 and there integration with the ADF as an example highlighting the way ahead.

In short, multi-domain C2 is a key attribute of the integrated force.

But to get there fully will require industry working with government in a different manner and more effectively to get around the stove-piped platform challenge.

Reconfiguring Industry to Work the Force Integration Challenge: The Perspective of MGEN Tony Fraser, Deputy Secretary Capability Acquisition and Sustainment Group

Fraser provided an overview on the ongoing efforts of Defence to acquire new systems and to work the processes of integrating those systems into an process of integration for the ADF.

His overview provided a sense of the achievements and challenges facing Australia, a country which imports much of its equipment, but is expanding its work force to support that equipment but driving a process of change in which greater integration can be achieved.

FIGURE 17 MGEN TONY FRASER PRESENTING AT THE WILLIAMS FOUNDATION SEMINAR, OCTOBER 24, 2019.

His presentation provided a good reminder that mastering sustainment processes and working them more effectively in support of integrated tasks forces is a key driver of change as well.

Indeed, at the recently concluded Seapower Conference held in Sydney in early October 2019, the drivers of change associated with sustainment were highlighted by senior Australian Navy officials.

For example, in a session which focused on shaping a new sustainment approach for naval forces, Rear Admiral Wendy Malcolm, Head of Maritime Systems Capability Acquisition and Sustainment Group, highlighted the importance of ensuring that a new sustainment strategy be built into the build out of the next generation Australian navy.

She argued that the Australian government has committed itself to a step change in naval capability. Australia will be engaged in the most significant recapitalization of its Navy since the Second World War.

"We need to reshape the way we sustain our fleet as we go about a significant change in how we are doing Naval acquisition."

"As a result, we need to future proof our Navy so that it is capable and lethal and available when and where they are needed.

"We need to build a sustainment model which ensures that we can do this as well."

Sustainment has been largely thought of as the afterthought to acquisition of a new platform. She argued that with the new "continuous shipbuilding approach" being worked, sustainment needs to be built in from the start into this process approach.

"We should from the outset to consider the best ways to sustain the force and to do so with engagement with industry in the solutions from the outset."

She noted that the acquisition budget is roughly equivalent to the sustainment budget, and this means that a new approach to sustainment needs to accompany the new acquisition approach from the outset to ensure the delivery and operations of the most lethal and capable combat fleet which Australia can provide.

"There are serious external and internal forces that are forcing change in our thinking about how we will use our fleet…. A major investment in shipyards, work force, and in new ships requires an appropriate sustainment approach to deliver the capability to do the tasks our navy is and will be required to do."

The shift to "continuous ship building" entails a major shift in how Australia needs to think about sustainment as well. She argued that a number of technologies had emerged which allow from a more flexible and adaptative way not only to build but to sustain ships as well.

"We need to take a fleet view and to shape a continuous approach to sustainment as well."
Rear Admiral Malcolm dubbed the new approach of a continuous sustainment approach or environment as Plan Galileo.

Similar to what the RAAF has termed Plan Jericho as suggesting that discontinuity was as important as continuity, she has argued that there is a need for significant relaunch of thinking and build out of sustainment.

Plan Galileo is built around three key efforts.

The first is an improved approach to capability life cycle management.

The second is the establishment of regional maintenance centers.

The third is associated with the first two. Industrial engagement is crucial to driving regional hubs with true sovereign capability that is complementary to the national shipbuilding effort.

She underscored the importance of shaping a sustainment capability which can provide for redundancy and to do damage battle repair in crisis situations.
And she added that the Australian navy will need to focus as well on sustainment away from Australian territory as well.

She argued that the rebuilt dockyards and work force need to become multi-mission competent rather than single platform focused.

In this regard, she highlighted the importance of building regional support centers which could support a wide variety of vessels and systems.

In other words, Rear Admiral Malcom provided a significant cautionary warning – if a shift in the sustainment model does not occur, the capability of even a newly built navy will be undercut in the conflictual world into which we have entered.

She made a vigorous case that the "continuous shipbuilding" approach needed to have a sustainment approach built in as well.

Indeed, given the dynamics of change associated within each class of ships associated with dynamics such as software upgradeability and in terms of building an integrated force within which the Navy will operate, the cross-domain operational requirements will require a modernization approach that becomes part of what one might consider to be sustainability.

And with the return of the significance of national and regional geography, the last thirty years reliance on a globalization process in which 21st century authoritarian powers have been key participants needs to be rethought, modified and reconfigured.

The presentation by Rear Admiral Malcom on the way ahead with sustainment is suggestive of how the government is addressing the need for change.

And in his briefing, Tony Fraser underscored a number of changes which the government has focused upon in shaping a way ahead.

The following slide from his presentation highlighted some of these key elements shaping a way ahead:

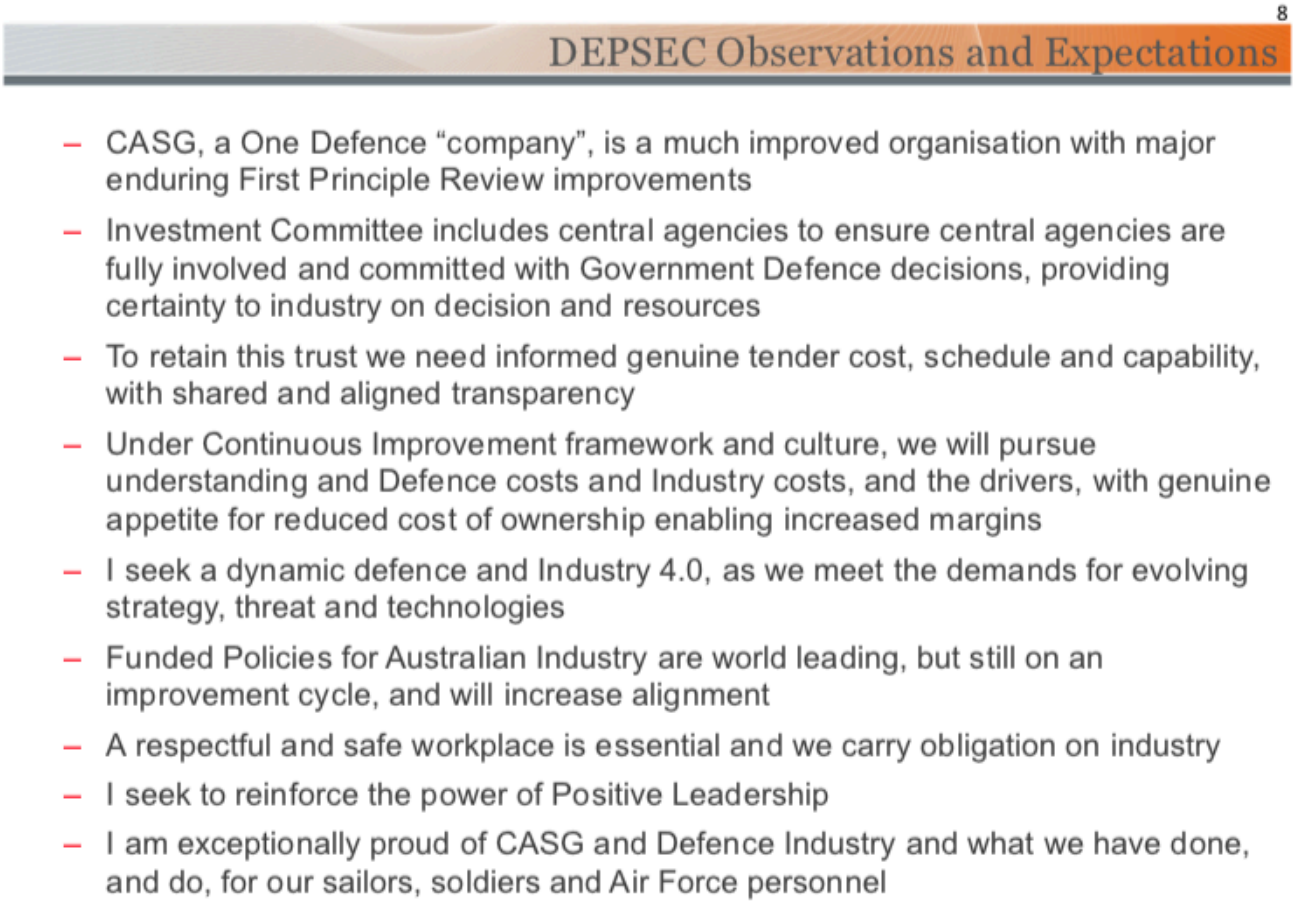

FIGURE 18 SLIDE FROM MGEN TONY FRASER'S PRESENTATION AT THE WILLIAMS FOUNDAITON SEMINAR, OCTOBER 24, 2019

The Industry 4.0 piece is especially important given the digital cores being built into the new platforms being built and the central role for the evolving C2/ISR infrastructure for the reshaping of how those platforms work with one another.

An example of how Industry 4.0 is shaping a new capability for the ADF including the Maritime Border Force is the case of the new offshore patrol vessel.

This program is not being built on traditional platform lines, but is being worked in an Industry 4.0 appraoch.

In an interview I did with Robert Slaven, a former Australian Naval Officer and now with L3Harris Technologies, this process of change was highlighted:

It is clear that this way ahead, which is central to being able to shape, operate and command, an integrated distributed force is building on the legacy platforms we have now, but is also a prologue to any new platforms to be built in the future.

A case in point is the Australian Arafura Class Offshore Patrol Vessel, which is being built with the ability to leverage off-boarded systems as a designed in feature of its own operational capabilities.
In this sense, the coming of the OPV plays a forcing function role within the ADF as its shapes what they call a fifth-generation force.

"The OPV will have a crew of around 40 and be tasked with the normal Patrol and Constabulary tasks the Armidales currently do for the Navy and the Border Command.

"But because of the inbuilt flexibility of the C5/ISR infrastructure onboard, the OPV will become part of the much larger distributed force, with reachback and force-multiplication capabilities way beyond its reach as a single ship.

"It could operate as the mothership for a wide range of autonomous systems; and it can push that information into the wider battlespace."

In other words, the OPV is being designed from the ground up with off-board systems and the new C5/ISR morphing infrastructure as key building blocks.

And given the modular flexibility associated with the ship and with the autonomous system payloads, the OPV could be an advance force element of an amphibious task force, provide support to a destroyer task force, be a key command element for a gray zone operation, and so on.

Because it is designed to be able to contribute to and to leverage unmanned systems from the outset, it can be task organized beyond its core mission.

From that sense, the future is now.

Conclusions From the Industry-Government Panel

The key takeaway with regard to shaping the industry-government process to deliver a fifth generation combat force is pretty straightforward: shaping the collaborative processes and framworkrs among industry players and with government in delivering a capability outcome is a key part of what is required to get the capability needed.

Put in blunt terms, with the teaming that will deliver a platform narrowly considered, it will only be about technologies and platforms; it will not be about delivering integrated capability.

Collaborative teaming within Australia can be facilitated by the relatively small size of industry in Australia.

But the question of IP sharing is a key aspect facing the challenge of delivering the collaboration needed.

If the desired outcome is to deliver and evolved an integrated force effect, how do you build a team which can deliver such an effect as part of the organizational process, rather than being worked as an after-market integrative patch work solution?

THE WILLIAMS FOUNDATION SEMINAR ON FIFTH GENERATION MANOEUVRE REQUIREMENTS: LOOKING AHEAD

A week after the completion of the October 24, 2019 Williams Foundation Seminar, I had a chance to talk with Air Marshal (Retired) Geoff Brown about the main findings from the Seminar and the way ahead for the Seminar series.

Question: What do you consider the main findings from the seminar?

Air Marshal (Retired) Geoff Brown: We looked at how one could achieve fifth generation manoeuvre and one of the key issues is how the industrial working relationship could best support these efforts.

One of the key ideas was linking the industrial labs together in order to achieve better force integration development and support. And to get industry involved earlier in the process of building programs.

There are many key issues to work out but it is clearly important to shape a more effective collaborative working set of arrangements to get the kind of integrated force which we need.

Another key takeaway is that we already have a command operating as an integrated force which allows us to maximize our influence.

The Maritime Border Command has been able to achieve the kind of inter-agency cooperation which gives you the kind of capability which you want to have to maximize your effectiveness and enhance the probably of a good result.

Question: Where do we go from here?

Air Marshal (Retired) Geoff Brown: We need to relook at how we can integrate manned and unmanned platforms into integrated operations.

With our manpower limitations, we clearly need to find effective ways to incorporate remotes into the combat force.

And for the seminar after that we are looking to focus on cyber operations, and to do so from the standpoint of their integration into the ADF, not simply just as a specialized skill set.

We need to look at the incorporation of cyber into operations rather than as a stove piped activity dominated by the intelligence community.

We then discussed various case studies which might be the best way to get at the manned-unmanned teaming efforts.

Clearly, there are two key areas where the ADF is focused.

The first is the loyal wingman for the Air Force, and the second are autonomous maritime systems for the Navy.

Both might prove to be good areas for further exploration at the next seminar.

SUSTAINING THE FIFTH GENERATION MANOEUVRE FORCE: THE DURABILITY DIMENSION

An integrated distributed force capability is not possible without the capability to support such a force prior to, during and after its engagement. It is a question of providing durability for the force through effective logistics and sustainment.

Prior to and after the seminar I had a chance to discuss this challenge with Lt. Col. David Beaumont, Commanding Officer & Chief Instructor at Australian Army School of Logistics Operations.

Lt. Col. Beaumont: "Fifth generation manoeuvre is about accelerating the speed to deliver the desired combat effect through a greatly improved decision-making process. It's important that this speed is felt across the force and not just in the combat forces. As we build a force structure capable of this speed, we must ask how best can we sustain the pace? How do we direct this combat power where and when it is needed, with the resources it needs to win?"

Question: Part of the challenge is reshaping the Australian basing structure. It is a question of determining where best to base the force in order to more rapidly project power into the region. How should we think about this challenge?

Lt. Col. Beaumont: "Force posture – in an operational sense – is one way to answer the question, 'how quickly can the force get to the point of need at the right time?' In the context of strategy, it's about how our national surge capability during a crisis. The promise of speed requires will inevitably create a significant logistics demand.

"Thinking simplistically, sustaining operations at a higher speed tempo will require a greater fuel and munitions supply, repair parts etc. We will need to ensure that we can surge those stocks to the engagement force either by either ensuring the force is mobile from existing bases, or with an operational force posture that leverages or accesses supply closer to the combat zone.

"This will requires a significant rethink to Australian strategy, where military forces might be based, where they might 'stage' their operations from, and how the force prepares itself more broadly.

"Assured supply will be key to this. This particularly applies to contingency stocks, and the supply chain that supports the force when it is in combat. When we are facing a crisis, it is inevitable that partners who are using the same combat systems will be putting demand on the stocks and the supply chain.

"Maximising self-reliance is key. And, of course, it is not hard to see that adversaries will seek to disrupt our supply chains as part of their approach to crisis dominance. Our operational tempo will reduce with every interdiction.

"And this raises the significant question of the tradeoffs being paying for the stocks and supplies you need to deal with short warning crisis and the investments in the force itself. How to manage the tradeoff between sustainability and buying and building your platforms for the force is a significant management challenge."

Question: In effect, aren't talking about the durability of the force, i.e., the ability of the force to operate long enough to prevail in a crisis situation.

Lt. Col. Beaumont: "That is a good way to put it.

"Durability is also about your ability to survive initial combat shocks, replenish and respond, eventually to ensuring continue high combat performance.

"Between two adversaries, it is the one that responds the quickest and replenishes the fastest that will gain the initiative.

"It is very possible we will have short warning times, so the ability to take shocks and to manage the counter punch effectively will be a key requirement for durability of the force in a crisis."

IN LIEU OF A CONCLUSION: LOOKING AT THE CHALLENGES GOING FORWARD

The past two years of Williams Seminars have taken up the question of how Australia could more effectively defend itself and to work with allies for deterrence in depth in the APR. This has been done from the standpoint of how the force transformation of the ADF which has been labelled building and operating a fifth-generation force.

In effect, the two trend lines, the rethinking of defense and security strategy in the region and working more effective ways for the ADF to operate in that region have become joined into an overall discussion about the strategic shift facing the ADF and Australia.

At the Williams Foundation Seminar held on October 24, 2019, a core question was: How might the ADF can operate more effectively within the dynamics of strategic change in the region?

Two of the presentations highlighted different aspects of the challenge facing the ADF and Australian within the operational dynamics of the region.

The first was a presentation by Brendan Sargeant, the well-known Australian strategist with many years of experience in the Australian government. Next year he will become the head of the Strategic and Defence Studies Centre within the Australian National University.

The second was by the head of the Maritime Border Command, Rear Admiral Lee Goddard, whose command is already living the dynamics of change which foreshadow the broader transformation facing the ADF in the region.

The New Strategic Situation Facing Australia

Sargeant entitled his presentation at the Seminar: Assured Access for the ADF in the Asia Pacific. The underlying point of his presentation was straightforward: Australia's interests are increasingly contested in the region and being able to work and to lead efforts when necessary with partners and allies was crucial to the defense of Australia.

It is not just about the kinetic capabilities, but the ability to generate political, economic and diplomatic capabilities which could weave capabilities to do environment shaping within which the ADF could make its maximum contribution.

FIGURE 19 BREDNAN SARGEANT PRESENTING AT THE WILLIAMS FOUNDAITON SEMINAR, APRIL 24, 2019.

I have been asked to talk about **Assured Access for the ADF in the Asia Pacific.** This is a large topic. What I want to do is step back and talk about the nature of our strategic environment, and to suggest ways of thinking about how it is changing. This is a preliminary to asking what is the nature of the strategic and defence challenge that it now presents to us.

I want to put forward some propositions about what is happening in our strategic environment and how we might from an Australian perspective think about the implications of the changes that we are seeing.

I would also like to put on record my appreciation for the help that Robin Laird and Paul Dibb, in our many conversations, have given me in thinking about some of these issues. Of course, any atrocities I commit belong to me.

How we think about strategic challenges and how we describe the world, that is, how we construct the problem set, can help us think about what policy and strategic approaches might be best suited to dealing with it.

We are at one of those points in world history when the strategic order is changing. This has been the central topic of discussion in policy and academic circles for the last decade. It was foreshadowed in the 2009 Defence White Paper and elaborated in different ways in the 2013 and 2016 Defence White Papers. It haunts the 2017 Foreign Policy White Paper.

This sense of change has become more acute over the past two or three years to the point where it seems to be generally agreed in commentary circles that the 2016 Defence White Paper is no longer adequate as a frame for understanding our strategic environment, or as a vehicle to guide future policy development. So, the question is: what now?

I have often commented that in our strategic assesments and policy development, we have consistently underestimated the rate of change in our strategic environment. Perhaps this is the equivalent in policy circles of the often discussed 'Conspiracy of Optimism' in project management.

However, that said, I personally have been astonished at how quickly the consensus has emerged across policy and academic communities that the world has changed irrevocably and that we are not certain about what sort of future we are going into.

When people talk about change in the contemporary environment, the first step is usually to point to major structural forces – demographic shifts, economic development, restructuring of national economies, urbanisation, to name some of these forces.

More recently there is the rise of China, and particularly the China that has emerged as a result of the assertive policies of the current leadership under President Xi Jing Ping. We have also seen very significant shifts in US strategic and economic policy with the advent of President Trump. Neither the United States nor China could be now described as status quo powers. In different ways they are seeking to reposition their role in the strategic order, and this is playing out in many different ways across the world.

There are other large forces in play, and in the Indo-Pacific. These include astonishing economic growth, major demographic shifts, the impact of climate change, and a broader movement towards a restructuring of the strategic order.

If we look across the world, one major trend has been a strengthening of nationalist movements within countries, the rise of populism on both the right and the left, a loss of confidence in the traditional institutions of governance at both the national and international level, the rise of authoritarian powers within a liberal rules based order and who are now seeking to challenge and mould this order to their ends. We are in a period of political experimentation and upheaval and it is hard to see what is on the other side.

One proposition we might consider is that we are seeing the breakdown of one model of globalisation, a model we have called the rules-based order. This model, under challenge, is no longer delivering what it promised. What I would have described a few years ago as its pathologies (transnational crime and political violence) have become more prominent.

Much energy in contemporary policy work is aimed at preserving this model. Both the 2016 Defence White Paper and the 2017 Foreign Policy White Paper highlighted the centrality of the rules-based order as one of the foundations of Australian prosperity. In my view it was also the foundation of our strategy in relation to the challenge of China. Reading those documents now, one gets an uncanny sense that they repeatedly invoke the rule-based order because they know that it is diminishing.

I think a question that hangs over all of us is whether this rules-based order can be preserved, and if not completely, what elements of it will remain as we go into the future. Perhaps there is a further question – if we think it is under serious challenge, does that mean that we are already in a different world? In other words, we talk about the future, but perhaps the future has already arrived and we can't see it clearly, or we don't want to see it. I think this question will preoccupy policymakers for some time to come, but I also believe that some of the changes we are seeing are the result of large and irreversible forces. The world will not return to what it was.

So, the world is changing, and the future will be different to the one that we hoped for a few years ago. How different we don't know. That said, the question for policy, when all be noise is removed, is: how are we going to adapt? What does this mean for Defence?

If I wanted to make another proposition about the strategic system that we call the Indo Pacific, I would argue that the strategic architecture that might establish a framework for understanding and solving the challenge of building and managing a new strategic order is not sufficient for the task.

We are seeing what I would describe as experiments. In some ways it is a period that resembles the post-Second World War environment in that there are many ideas in play, and people are proposing and

experimenting with different architectural initiatives and formations or trying to renovate old ones. But we are not yet at a point where it has settled or whether we will know what will work. I put something like the QUAD that brings together the United States, India, Japan and Australia in this category

This has profound implications for Australia and how we might think about defence.

The debate in Australia about defence has over decades revolved around two poles, both caricatures of complex and nuanced ideas that achieved even greater complexity when you consider their practical application in the context of the times.

However, caricatures are useful because they help us delineate trends in thinking – the fashions of the time, if you will. These poles are, of course, Forward Defence and Defence of Australia. Debates in Australia about defence have tended to fall within this broad conceptual framework. There are different ways of understanding the parameters of the conversation, but it boils down to the relative priority you would give to the defence of Australia as a geographical entity as opposed to defence engagement more broadly in the world to support the emergence and maintenance of an international system conducive to our national interests.

Where you want to put emphasis in relation to policy will drive decisions about the development of capability and the use of the ADF.

In the world of practical policy development and implementation, and operational imperatives, these debates can seem a bit theoretical. But if you look at the trend of Australian policy over decades, you can see that there is a tension and it does have consequences for the development and use of the force. One of the more significant criticisms of the 2016 White Paper is that in identifying strategic goals for defence, it did not distinguish between the relative importance of these goals and therefore provide a framework for thinking about priorities in developing capability.

If you take a very broad historical perspective, the debate starts to look a bit like arguments about how many angels might fit on the head of a pin. The overriding strategic reality for Australia since its inception has been that our defence policy has been developed within the framework of our protection by a friendly hegemon - up until the end of the Second World War, the British Empire; and after the Second World War, the United States through the alliance relationship.

What this has meant for Australian strategic culture is that we have never had to think about policy outside the framework of hegemonic protection. It also means that some of the heavy lifting in diplomacy and defence policy has been done by the major partner and that we have under-invested in both diplomatic and defence capability. I question whether the combination of these factors has also resulted a strategic culture that is in many ways derivative, or immature - the culture of a young and relatively inexperienced country accustomed to the protection of a larger power. One manifestation of this is the under-investment in our diplomatic capability and our over reliance on the US alliance as the foundation of our security.

We are now moving into a strategic order where that protection may not necessarily be there on the terms that we have been accustomed to. This is a profound change. It means we have to think very differently about our strategic culture and the defence challenge.

I want to describe some features of this change.

Often when we talk about the justification for having a defence force, we speak in terms of being able to exercise sovereignty, to be able to support our national interest through the use the armed forces. My own view about defence is that it is toolkit that enables the government to do many things in the world, but when all that is peeled away, it exists to ensure national survival against existential threats. It is the final guarantor of the state's sovereignty.

We are in a world where no country is fully sovereign – partial sovereignty is the new normal. I recognise in saying this, that this has always been a reality, but I think the situation is different now because we can't offset that partial sovereignty with the security that was provided by the rules-based order guaranteed by the United States, and the model of globalisation that it supported.

From another perspective, globalisation underpinned by the rules-based order allowed us to trade sovereignty for security – or to express it another way, it enabled us to accept levels of strategic risk which are now starting to look unacceptable.

So, what does the emerging world look like?

Some propositions:

- we are seeing the emergence of new models of globalisation. Some elements include the rise of authoritarian powers underpinned by capitalist economies who are prepared to develop arrangements of convenience to advance their strategic interests and to weaken the authority to and capability of the liberal democracies;
- increasing nationalisms, some with malign impacts;
- weakening consensus on how the international economic order should be managed and governed;
- the weakening of institutions of global governance, and the de-legitimisation of the underpinning legal frameworks that support them;
- less consensus on what the global problem set is (eg. the climate change wars);
- less appetite for global solutions and a strong emphasis on local, bilateral, or regional based solutions to problems;
- declining capacity to manage major transnational problems – eg. people movements;
- massive disruption through the proliferation of new technologies and social media.

This adds up to a world where the global system is less favourable to our national interests and we have less capacity to influence the development of solutions to problems that impinge on our interests.

From the perspective that I have been discussing, the major feature of the emerging global environment is that it increases, rather than reduces, the risk to our security. And part of that risk is in how the emerging system actually operates. For example, can we assume that in a crisis we will have the same access to we currently enjoy to global supply chains?

So the question is: in a world where partial sovereignty is the norm, where we can no longer trade sovereignty for security with the same confidence that we have done so in the past, where global or transnational institutions and conventions are weakening, and where the rules that guided decision making are either diminishing in authority or being discarded, how do we achieve security?

To frame the question another way is: how do we mitigate the risk that partial sovereignty creates in a world with a global system does not deliver security benefits that it used to? How do we build and manage defence capability in this context?

We are not the only country with this challenge.

If we look at the defence challenge through this lens, we can see that some of the assumptions that underpinned defence policy and planning are no longer as robust as they might have seemed. Some implications include:

- that global supply chains will continue to deliver what we need during a crisis;

- that we can assume privileged access to technology and war stocks through the operation of the alliance system;
- we don't need to stockpile fuel in Australia because of our confidence that the global system would continue to provide supply during a crisis;
- We could continue with a boutique defence industry and just in time logistics systems which are an outreach of larger global systems into which they are integrated.

The world allowed this – in fact, the way the world worked created positive incentives to maximise efficiency through the development of interdependence with external suppliers confident that the rules-based order would continue as we had known it.

It has some other consequences for our strategic culture.

Most of our operational commitments have been to some extent discretionary. We have participated in coalition operations and the primary policy justification has been to support the rules-based order and to ensure that we continue to pull our weight within the alliance.

The INTERFET operation in East Timor is perhaps the major exception, and I think this has some lessons for the future.

We have developed capabilities that assume very high levels of interoperability with the US. This assumes continuing convergent interests, or that the US will give us priority in a crisis.

We have under invested in defence to the extent that we have used the rules-based order to manage strategic risk. Is 2% really sufficient expenditure in an environment where we are carrying much more risk because of the changes in the strategic order?

I believe this is that that this adds up to a very different world for Australia. More importantly, it means a very different way of operating in the world.

There are many implications arising out what I have suggested here. And, of course, I recognise that the future is difficult to discern through the fog of the present. This is another way of saying that there are many possible futures. But, if we accept that the rules-based order as we have known it is undergoing profound change, then we will need to change, and our policy, and operational culture will also need to change.

We will need to be far more flexible and pragmatic in our understanding and management of the alliance relationship.

- Alliances exist through the activities that are undertaken in their name. They are only relevant for as long as it they are relevant; that is, for as long as the activities that are undertaken in the name of the alliance are meaningful to both parties. In a shifting world, we will have to continue to negotiate our alliance as a continuing and provisional proposition that works when it is expressed in meaningful activity that supports our shared security interests. The alliance as some sort of bank account into which you make investments for the future day is not a useful framework in the world that is likely to be as volatile as that which we are entering, and where our interests may at times diverge.
- Perhaps a more productive way to think about an alliance relationship is that it enables the parties to work together to respond to a crisis at the operational level while building strategic capacity to forestall or manage future crises. This puts more emphasis on crisis response; it puts a focus on capability building; it does not imply an ongoing convergence of strategic interests in every situation.

We need to build more resilience and sustainability into our defence industry and logistics systems in the recognition that the global environment carries risk that we may not be able to mitigate in a crisis.

We need to strengthen and diversify our engagement across the Indo Pacific to build the capacity to work with others two respond to crises.

In doing so, we need to ask the question: what are the likely security challenges and how will they take expression in ways that might require the use of armed force? We then might have a conversation about that with other countries as a framework for building the capacity to respond.

We need to strengthen our diplomatic capacity and to establish a much stronger presence in our region, both to understand what is happening and to influence what might happen.

Underinvestment in diplomacy reduces our capacity to shape and influence the events and trends that impinge on Australia's interests. In times of change, presence matters and is a strategic and operational imperative.

If I had to sum up the extent to which changes in the world will change us, and the response that we need to build, I would summarise thus: in the past we could handle problems within a strategic framework which was stable and which was generally understood and agreed by all the parties involved. This is what the rules-based order represented, underpinned as it was by American power and the institutions of global governance.

In the future, it is likely that we will need to construct both the rules that govern how we think about a crisis in order to respond, as well as responding to the crisis at the same time.

This means that every crisis will be different and will perhaps demand a response in its own terms. It means that we will experience crises that we haven't had to deal with in the past, so we may not have the historical references to rely on as a vehicle for understanding what we are dealing with and guiding responses.

I think this means that we need a strategic policy culture that is more improvisational, pragmatic, with a more ruthless sense of our national interests in a world that will not necessarily want to support those interests.

This leads me to my final point. In the future there will be times when we need to act alone, or where we will need to exercise leadership. We have not often had to do this in the past – The INTERFET operation in Timor, and RAMSI in the Solomon Islands are examples.

We are far more comfortable operating as part of a coalition led by others. It is perhaps an uncomfortable truth, but that has been a consistent feature of our strategic culture.

So I think our biggest challenge is not a technical or resource or even capability challenge – it is the enormous psychological step of recognising that in the world that we are entering we cannot assume that we have the support of others or that there will be others willing to lead when there is a crisis. We will need to exercise the leadership, and I think that is what we need to prepare for now.

To return to the title of this talk: if we want assured access for the ADF in the Asia Pacific, then we need to work towards a world that ensures that that access is useful and relevant to the sorts of crises that are likely to emerge.

I will leave one last proposition with you. Our assured access for the ADF in the Asia Pacific will be determined by our capacity to contribute to regional crisis management. That contribution will on some occasions require that we lead. The task now is to understand what this means and build that capacity.

The Maritime Border Command as a Key Asset in Shaping a Way Ahead to Defend Australia's Interests in the Region

Sargeant and others throughout the seminar underscored the importance of a whole of government or at least more integrated government approach to dealing with the defense and security problems in dealing with the APR.

The Maritime Border Command is in many ways already living the life of what presages a broader set of changes in the ADF's role within a new strategy for Australia going forward.

In an interview I did with Rear Admiral Goddard last spring, the role of the MBC as a harbinger of change was highlighted:

To provide for Australian maritime security, the focus has been upon three strategic directions.
First, the Australian government has a very clear set of regulations and laws governing immigration and approaches to dealing with security at sea.

As Rear Admiral Goddard put it: "I can act on suspicion; which allows us to be proactive in dealing with threats."

Second, the force is organized as an integrated one, so that new capabilities coming into the ADF, like the P-8, Triton, Offshore Patrol Vessels and new frigates and other Australian Border Force assets can be leveraged as necessary for operations.

Operation Resolute is a combined force approach to providing for perimeter defense and security of Australia.

As it was put on the Royal Australian Navy website:

Operation RESOLUTE is the ADF's contribution to the Whole-of-Government effort to protect Australia's borders and offshore maritime interests.

It is the only ADF operation that currently defends the Australia homeland and its assets.

The Operation RESOLUTE Area of Operations covers approximately 10 per cent of the world's surface and includes Australia's Exclusive Economic Zone which extends up to 200nm around the mainland. Christmas, Cocos, Keeling, Norfolk, Heard, Macquarie and Lord Howe Islands also fall within the Operation RESOLUTE boundaries.

FIGURE 20 REAR ADMIRAL LEE GODDARD, HEAD OF THE MARITIME BORDER COMMAND PRESENTING AT THE WILLIAMS FOUNDAITON SEMINAR OCTOBER 24, 2019.

Commander Maritime Border Command (MBC) is the overarching operational authority that coordinates and controls both Defence and Australian Border Force assets from his headquarters in Canberra.

Maritime Border Command is the multi-agency taskforce which utilises assets and personnel from both the Australian Border Force (ABF) and the Australian Defence Force (ADF) to safeguard Australia's maritime jurisdiction. Its maritime surveillance and response activities are commanded and controlled from the Australian Maritime Border Operations Centre in Canberra.

We discussed some of the new technologies which allow for greater SA over the maritime zones, but of course the challenge is to turn SA into ways to influence actors in the maritime zone.

"It does no good just to know something is happening; how do we observe but let the bad guys know we see them and can deal with them?"

Third, obviously IT and C2 are key elements of bringing the force to bear on the threats.

But doing so is a significant challenge, but one where new technologies and new capabilities to leverage those capabilities for decision making clearly are helping.

This is a work in progress where the Commander works with several government departments as well as industry to deliver more effective intelligence to determine where the key threats are to be found and being able to deploy assets to that threat.

Rear Admiral Goddard underscored that developments in the IT and decision tools area were already helping and would be of enhanced performance in the period ahead.

"With some of the new AI tools we will be able to process information more rapidly and turn SA into better decision making."

Fourth, obviously this means working closely with partners in the region, such as Malaysian, Indonesia and the Philippines and shaping ways to operate more effectively with one another.

A challenge being posed by the Navies in the region is that they are clearly are generating what have been called gray zone threats.

This is why the Command is really part of more broadly understand security capability within an overall national crisis management effort.

And as the threats change or challenges change, the capabilities for the Command working with the ADF will need to change as well.

https://defense.info/interview-of-the-week/rear-admiral-lee-goddard-maritime-border-command-australia/

Rear Admiral Goddard's presentation at the Williams Foundation Seminar highlighted the core focus of the command in terms of the means to achieve the kinds of results they needed to achieve.

His presentation which was tailored to deal with the seminar topic of fifth generation maneuver was entitled:

Achieving Multi-Agency Situational Understanding and follows:

Operating within this grey zone allows MBC to play a large role supporting and engaging a large remit of stakeholders.

With regular contact with all facets of government from State/territory up to Commonwealth as well as industry in a supportive role, MBC's force elements encompass land, sea and air – a unique arrangement in regards civil

maritime security, however Australia's Borders are unique which necessitate this approach. Reflecting a Fifth Generation approach, the force is scalable dependent on the threat or response that is required and the structure at Maritime Border Command allows this force to fully integrate providing both situational awareness and effect.

Why do we need the flexibility such a force provides? Maritime Border Command is responsible for 8 Civil Maritime Security Threats; not all these threats represent what might be considered traditional Coast Guard functions, rather they embody Border threats across the spectrum of Crime, violence, environment and exploitation. Piracy, robbery and violence at sea, response to Oil Platform and illegal domestic activity in our marine parks might be three examples of Coast Guard like functions performed by MBC on any given day.

MBC – even with the combined force assigned elements at its disposal – cannot conduct this mission alone. It takes global partnerships and strong interagency co-operation and co-ordination.

Maritime Border Command's co-ordinating function is aimed to create time and space aiming to prevent crisis management. By way of example, in the counter narcotics space, MBC coordinates with the Australian Federal Police, Australia Criminal Intelligence Commission, AUSTRAC and State Police Forces as we

ll as international agencies such as the United Nations Office of Drugs and Crime and the INTERPOL. Overseas national law enforcement agencies such as the US Drug Enforcement Administration and the UK's National Crime Agency not only provide valuable and timely intelligence, they also allow us to push our national border for narcotics importation far off shore.

The ability to create time and space beyond our physical national borders improves MBC's responsiveness within the SFAA and is only achievable through effective Maritime Domain Awareness.

Technological improvements in platforms are only part of the picture for effective MDA – the platforms must be combined as a Joint effect and they must be interconnected – isolated pockets of effect will not only devalue the operating picture, such a limited focus may lead to decision making out of context with the wholistic picture; the veritable fog of war.

Our collective mission through the Fifth Generation manoeuvre must be a forcing function to enable effective decision making though interconnectedness.

The Perspective of Paul Dibb

Brendan Sargeant provided a clear overview on the changing strategic context for the defense and security of Australia; and Rear Admiral Goddard provided insights into how a multi-agency integrated Command had already adapted to the new context.

Both posed the challenge of how reshaping of the ADF within the context of a changing Australian strategy would intersect with and affect the evolution of threats and challenges in the region?

How would such an ADF and Australian strategic transition affect the behavior and orientations of the 21st century authoritarian powers?

As Paul Dibb put it in a recent interview:

What analysts are referring to as the challenges in the gray zone are in the domain we are talking about.

Our Chief of Defense Force, General Angus Campbell, gave a speech in June at ASPI and highlighted the challenges and dangers with regard to gray zone activities, which is to say using coercion, disruption and supply chain denial to get what they want, rather than having to start and end with kinetic force.

The Chinese have clearly expanded into the South China Sea, but critical to Australia is whether the South Pacific is next.

It is very likely China wants to squeeze our strategic space not just in Southeast Asia but the South Pacific

This demands different thinking in Canberra, and it demands bringing together the things you've raised, like fuel supplies, like water, like source code writing, like mobilization.

It is about not allowing a gray zone to exist dominated by the 21st century authoritarian powers.

https://defense.info/featured-story/2019/11/australian-defense-strategy-in-transition-the-perspective-of-paul-dibb/