
The nature of future conflict and the implications for ADF interoperability: Building the future phalanx

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*The importance of coalition operations makes a close understanding of our allies' and likely coalition partners' warfighting concepts important to our own thinking, and interoperability – adapted to different circumstances – important to our own capability development.*¹

ADDP D.3 – Future Warfighting Concept

Introduction

1. The end of the Cold War did not usher in a new era of global peace. Instead, present world patterns and ongoing indicators for future conflict portray an environment characterised by diversity and complexity. Conventional, high-technology Western armed forces must come to terms with a world of failed states populated by ethnic para-militaries, of rogue regimes equipped with weapons of mass destruction, and of radical extremists embracing a philosophy of mass-casualty terrorism. As Evans argues, war is becoming more 'dynamic and chameleon-like' than ever before.²

2. Such future conflict will require the effective and cooperative harnessing of all forces and agencies at Australia's disposal to avert, neutralise or defeat its adversaries. Furthermore, this cooperative notion requires extension beyond the ADF and other agencies, to work within an array of coalition partner and ally counterparts to achieve Australia's national interests.³

The future *phalanx*

3. The composites of Australia's future defence and security *phalanx*⁴ will therefore number not only the ADF services, but also government agencies as Federal and State Police, Customs, Fisheries, ASIO, ASIS and DFAT. Moreover, analogous agencies and forces of another country or number of countries, may well hold the centre, left or right flanks of such a phalanx. While indomitable as a whole, such a phalanx's impermeability will rest upon its integral cooperation, understanding and seamless cohesion—the quality of the interoperability of its 'hoplites'.

4. Military organisations are often accused of preparing for the last war, not the next, and this criticism is very applicable to the ADF. The combination of a rapidly evolving global security environment and long lead times associated with capability development have resulted in the ADF's inability to provide the Australian Government with a sufficient range of options to respond to contemporary security challenges. Given the rapidly changing security environment, it is vital for the ADF to implement mechanisms to mitigate uncertainty, and better prepare the ADF for future conflict.

5. This paper aims to examine the nature of future conflict⁵ and the major impact this will have on the ADF. Given the perceived importance of interoperability, this examination will be achieved through assessment of future interoperability drivers and determinants, and their effect on the ADF.⁶ The paper then examines the issue of interoperability in greater detail, and the implications of this for the ADF.

NATURE OF FUTURE CONFLICT⁷

6. In envisaging the nature of future conflict and its impact on the ADF's interoperability, there are many elements comprising conflict as a concept that must be considered. Firstly, there are *enduring features of conflict*, existing regardless of time and circumstance. Secondly, for any future that arises, there will exist certain *determinants* that describe the conflict environment in which the ADF will operate. Finally, there are *change drivers* that will actually dictate how the ADF must evolve to effectively function.

7. The two most influential axial change drivers of future conflict that will shape the ADF's future interoperability requirements are: the *Primacy of Alliances* versus *Single Issue Coalitions*; and *Unilateralism* versus *Globalism*. This section explores these elements and how they may influence the nature of future conflict.

Enduring features of conflict

Complex terrain will continue to pose difficult problems for manoeuvre, and the 'fog of war' is not even close to disappearing totally.⁸

8. The chaotic features of *friction*, *danger* and *uncertainty*⁹ will undoubtedly remain as enduring features of conflict. Additionally, the rapid rates of development in *globalisation* and *technology* will continue unabated.¹⁰ Globalisation factors will affect future conflict in ways doubtless similar to those seen throughout history on a local or regional scale. Tendencies towards developing *greater cooperative defence* already occur on a global scale; increased connectivity and commercial interdependence between regions and nations evoke *growing links between globalisation and regionalisation*. This adds to the inestimable dispersion of and access to high technology, meaning any adversary regardless of size or overall level of advancement can acquire and operate hi-tech weaponry, adding to the *proliferation of advanced weapons* and subsequent asymmetric challenges they pose.¹¹

9. Championing of the universality of *human rights and sovereignty* is currently popular, but may not necessarily remain so.¹² In contrast, *urbanisation*, *environmental degradation* and the growing pervasiveness of the *media* all appear unlikely to diminish in even the long-term future.¹³ These four determinants combine to generate a greater tendency towards humanitarian pretexts for conflict, and moral, ethical and legal restrictions placed upon the ADF's warfighting approach.

10. Paradoxically, developments in technology, particularly in information technology and telecommunications, sensor systems and intelligence, weapon systems, human sciences, mobility and speed, and power sources,¹⁴ have delivered a reversion to a truer face of conflict; one that has been obscured by two centuries of focusing on 'conventional' war.¹⁵ This more complete perspective of conflict acknowledges the true complexity of the now multi-dimensional battlespace.

11. With the advances of weapon systems, the future battlespace will truly be devoid of spatial or temporal boundaries. However, complex terrain, whether physical, human or informational, will still degrade or negate sensors regardless of excellence, providing only fleeting glimpses of adversaries and contact without warning.¹⁶ Furthermore, this battlespace¹⁷ will become *disaggregated*, while combatant forces' capabilities will be dissipated, and effects diffused.¹⁸

Conflict determinants

12. The nature of future conflict will continue to be characterised by *scale, intensity* and *duration*, and the ADF should continue to anticipate operating in conflicts at any point on those spectrums.¹⁹ The environments in which conflicts will occur are similarly determined by discrete determinants, namely *human interaction, domain, innovation* and *chance*.²⁰

13. *Human interaction* between combatants—friendly and adversary—and non-combatants is expressed through their *free and creative will, political aims, resources* and *fallibility*.²¹ Recent conflict has demonstrated the deterministic nature of these factors. Only by mastering them, can a force successfully transition through and past the military end-state and achieve its ultimate political-strategic aim, through addressing the need for seamless inter-agency cooperation, resource sharing, creativeness and resilience to individual failure.²²

14. A conflict’s *domain* may be either physical or virtual.²³ The rapidly expanding virtual domain of conflict will encompass what is broadly termed network-centric warfare, along with information operations in all forms, including hacking and interdiction of commerce.²⁴ In the physical domain, the concept of homeland security already extends from conventional defence to counter-terrorism and grey-area war. Regional stability may necessitate direct and indirect intervention against both internal and external threats to our neighbours’ sovereignty. Australian support to global interests, whether physical or moral, may be unilateral, multilateral or globalist in nature, manifesting as either an alliance or single-issue coalition.²⁵

15. Variations in *innovation* will affect the doctrinal, technological and organisational *adaptiveness* of the ADF and other conflict participants.²⁶ Importantly, innovation will continue to reduce the importance of geographic proximity within the physical domain.

16. The effects of *chance* will dictate the way in which the chaotic enduring features of conflict will present as opportunities or threats to all participants, and their ability to creatively exploit such chances.²⁷ These may directly affect any inter-agency or inter-force cooperation wherein the ADF may be engaged, highlighting the requirement for cooperative *versatility* and *agility*, in addition to *orchestration*.²⁸

Table 1: Change driver – alliance primacy versus single-issue coalitions (Y-Axis)²⁹

Will Australia be wedded to an enduring alliance with the US and/or other extant ABCA allies?
Will Australia embark on a more regionalist perspective, as new international powers become ascendant, thus driving increasing ADF operational deployments supporting regional state interests?
Will economic and political evolution sufficiently level the international ‘playing field’ to precipitate only single-issue ‘marriages of convenience’ as the only basis for ADF coalition involvement in conflict?
Will the ascendancy of a non-Western global power nullify or obviate extant LOAC and ‘Rules of War’?

Future conflict change drivers

17. As distinct from the enduring features of conflict, and the determinants that will shape the battlespace environment, factors will emerge within the very nature of future conflict that will *drive change* in relation to the ADF’s interoperability requirements. Tables 1 and 2 each list four principal questions. Probable answers form the basis of four future political-strategic scenarios (Annex A) within which the ADF may face future conflict.

18. Utilising these change drivers described at Annex A to generate four relevant and plausible future conflict environments (i.e. worlds which future conflict will inhabit), conflict scenarios may be derived, generating common trends relating to what interoperability the ADF requires. These conflict scenarios, summarised in Table 3, span the range of change driver potentialities³⁰ and have been selected as representative of the majority of future conflict environments facing the ADF out to 2025.

The future of conflict facing the ADF

19. In summary, these future conflict scenarios postulate the requirement for the ADF to continue to be able to operate within a broad range of conflict scale, duration and intensity. The likelihood of operating in either a coalition or an alliance environment is very high in all scenarios, and inter-agency and inter-force cooperation will remain subject to these future conflict change drivers.

20. Within the future conflict scenarios pertaining to the representative worlds of *Orwellspring*, *Thunderburden*, *Ozymoneydias* and *Coercive Utopia*, a ‘line of best fit’ interoperability requirement is identifiable through the analysis contained within Annex B. This common requirement may be backcast to assist in assessing future interoperability implications for the ADF.

21. The longevity and degree of intimacy of the relationship between cooperating partners dictate the levels of interoperability relating to technology, doctrine and organisation. These levels are shaped by the standards³¹ that exist between agencies, forces or nations, and the number of partners foreseen. Annex B demonstrates that they are also shaped by the extent to which *like platforms* and commonalities are required, as opposed to a perhaps greater need to generate *like effects*.

Table 2: Change driver – unilateralism versus globalism (X-Axis)

Will preservation of national sovereignty remain the ADF’s ultimate <i>raison d’être</i> ?
Will actions in pursuit of the greater good of the world become the overriding <i>casus belli</i> , or will Australia’s national interests remain as the sole determinant for ADF entry into future conflict?
What is the ADF’s (indeed, Australia’s) future conflict role in a post-Westphalian global paradigm?
Will an omnipotent world governing body—possibly stemming from the UN—demand involvement in conflict by agencies and forces drawn from its confederation members, including those of Australia?

Table 3: Future world scenario conflict descriptions

<i>Ozymoneydias</i> ³²	The ADF is engaged in ostensibly conventional low to medium scale, intensity and duration conflict, with high likelihood of participation in a short-term single-issue coalition, most likely in pursuit of Australian unilateralist economic interests shared with its international coalition partner. Australia's growing distance from US hegemonic aspirations diminishes threats from terrorist or other asymmetric menaces, reflecting lower inter-agency cooperation need.
<i>Thunderburden</i> ³³	The ADF is engaged in continuous and dangerous humanitarian and peacekeeping operations, with high likelihood of intermittent but consistent multiple coalition partners, most likely in response to former-UN globalist interests. Operations are of extended duration, but of low to medium scale and intensity. Requirement for extensive national and international inter-agency cooperation occurs in tandem with joint and combined effects.
<i>Orwellspring</i> ³⁴	The ADF is engaged against a range of state and non-state adversaries in a variety of unconventional conflicts of extended duration, but small scale and moderate intensity. There is a high likelihood of alliance primacy with Australia's wider regional neighbour states, which share common but nonetheless self-centred unilateralist economic, environmental and political interests. The battlespace is vast and complex, but low tempo.
<i>Coercive Utopia</i> ³⁵	The ADF is engaged across the full spectrum of operations (with the exception of the very high end) including medium scale, low intensity and moderate duration conventional conflict, as well as extended duration, wide scale but lower intensity unconventional conflict against terrorist and other asymmetric threats. There is a high likelihood of enduring and consistent alliance primacy with multiple global states operating similar forces and agencies to those of the ADF, in pursuit of global, though not universally accepted, interests. Homeland security is of particular concern.

FUTURE INTEROPERABILITY – IMPLICATIONS FOR THE ADF

22. The requirement for the ADF to contribute effectively to alliance or coalition operations is recognised by Defence planners. However, planners may not appreciate the nature and magnitude of the problems associated with interoperability and coalition operations, and all of the implications of this for the ADF. While recent ADF operations in East Timor, Afghanistan, Iraq, and Solomon Islands provide some lessons, the unique nature of these deployments should not be used as the sole basis

upon which force development and interoperability decisions are made. This point was emphasised recently by Hugh White, who stressed the need to remain focused on the capacity to take independent action, and not re-shape the ADF to support US-led coalitions.³⁶

23. The recent contribution of ‘niche’ forces to the War on Terror distracts Defence planners from many of the real interoperability issues confronting the ADF. As noted in the recent *Army Journal*, a self-contained, technologically advanced, and networked force package is politically attractive, however, the important thing is to establish operational synergies to enable the ADF to cooperate on the future battlefield.³⁷ In other words, technology by itself is not the answer—it is only one of the enablers for interoperability. Other aspects of interoperability, such as culture, organisational structure, and doctrine, can significantly influence the ability of forces to operate together in a coalition. The second part of this paper focuses on equipment technology, doctrine, and organisation, and how these factors may influence the ADF’s ability to successfully prosecute future operations.

Technology implications

24. Technology is as much an enabler to interoperability as it is a barrier. The efforts by one state to gain technological superiority can in fact erode the effectiveness of a coalition.³⁸ Marshall describes the disparity generated by technological differences as technological asymmetry. This asymmetry can arise from a different degree of reliance on technology, or, relying equally on complex technology but utilising different forms, or using it for different purposes.

25. It therefore becomes difficult to forge and operate as coalitions where asymmetries exist between partners. Technological asymmetry can hinder coordination and communication between units of different nations and this could have deadly effects for combat troops, and increase the coalition’s logistic burden. Serious problems also arise if a coalition commander must shape the concept of operations to the capabilities of the partner with least technology. Strategic issues can also threaten the cohesion of the coalition, through a perception of unequal burden sharing or risk among the partners resulting from technological asymmetry.

26. Australia should therefore be cognisant of not becoming asymmetric with the US, who would be the prime coalition partner. While Australia cannot hope to match the technological advances attained by the US, it needs to ensure appropriate technology is attained to maintain sufficient interoperability. As Brigadier Melvin notes, ‘We should be able to fight with allies, but not as them.’³⁹ One of the most important factors to enable allies to fight together is the ability for them to communicate.⁴⁰ Interoperability of command and control systems, including situational awareness mechanisms is crucial to enable seamless operations.⁴¹ Coalition partners that can communicate together can fight effectively together.

27. From a technological point of view, there are a number of implications for the ADF for future conflicts. Firstly, resources must be committed to research into technology advances and especially on the ability to maintain interoperability with coalition partners given diverse equipment. As stated, communications and situational awareness assets must be a high priority, but so too should be the standardisation of consumables such as ammunition and fuels between coalition partners. Standardisation allows the ADF to link effectively into the US logistic system, and allows the ADF to support other coalition partners in non-US supported conflicts. Finally, to be a credible partner, the ADF must ensure it is able to deliver specific effects, accurately and swiftly.

Doctrine implications

28. While problems of technological divergence are usually remedied by investment in modern equipment and technologies, doctrinal divergence creates problems of an entirely different order. Doctrine is typically defined as ‘fundamental principles by which military forces guide their actions in support of objectives’.⁴² If contributing forces do not agree about fundamental military activities such as manoeuvre, force protection, civil affairs, and rules of engagement, it is difficult to achieve unity of effort within a coalition. These problems are further exacerbated in situations when military forces operate with police, government organisations, and NGOs, such as the intervention in Solomon Islands, or post-war reconstruction phase in Iraq.

29. The recent campaign in Kosovo illustrates how doctrinal differences can affect the conduct of operations. Although the US contributed the majority of forces, and commanded the coalition, political and coalition sensitivities meant the US was unable to conduct operations strictly in accordance with its doctrine.⁴³ This has significant implications for the ADF in the future. Importantly, the ADF must recognise that lead-nation status (such as we had during INTERFET) does not guarantee doctrinal ‘freedom of action’. Further, it is premature to assume that achieving doctrinal interoperability with the US will necessarily prepare the ADF suitably for all future coalition scenarios.

30. Both history and theory demonstrate doctrinal interoperability is achieved relatively easily between like forces.⁴⁴ Yet the ADF continues to expend effort and resources on further developing interoperability with its traditional allies (US, UK, Canada) for minimal actual return. This paper suggests the degree to which interoperability with our allies is actually improved is disproportionate to the amount of resources and effort currently invested. It may perhaps be more appropriate for the ADF to direct its efforts towards achieving better cooperation with dissimilar forces and other organisations, rather than achieving diminishing returns pursuing greater interoperability with traditional allies.

31. Given the nature of the contemporary global strategic environment, and the short timeframe and frequency with which disparate forces are drawn together as coalitions, ADF planners must accept that doctrinal interoperability in the future is not achievable. Ryan notes, the ADF should focus more on synchronisation and cooperation, rather than a purist notion of interoperability, with planners turning their attention to the arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive time and place.⁴⁵ Indeed, if the ADF commitment to Solomon Islands is indicative of future conflict, many future operations may not require close interoperability, and a high degree of ‘cooperability’ may suffice.⁴⁶ The organisational implications of this for the ADF are now examined.

Organisation implications

32. The organisation of the ADF is currently the subject of considerable debate in the highest echelons of government, and amongst strategists and academics. With such documents as the *Defence Capability Plan* and the recent Dobb–Dupont debate generating such considerable discussion,⁴⁷ the only certainty is that any decision will have significant impact on how the ADF fights in future conflicts. As many theorists now realise, force structure decisions associated with the 1986 Dobb Review and the 1987 White Paper, created significant shortfalls for the ADF during INTERFET, and allowed only small ‘niche’ capabilities to be ready for contribution to the recent war in Iraq.

33. The outcome of the expeditionary versus defence of Australia debate is very important, as it significantly affects ADF organisation and force structure. Codner contends it is more likely that two

nations with an expeditionary strategic concept will achieve a higher level of interoperability between their forces, than if one of the two nations has a strategic concept focused on traditional defence of the homeland.⁴⁸ With the ADF responsible for implementing the chosen strategy, the implication is clear: if the ADF is structured for defence of Australia, interoperability is not achievable and, as noted earlier, efforts should be better directed towards achieving cooperability.

34. The nature of future conflict will impact upon the organisation of the ADF in two further ways. Firstly, the current problems experienced by the US military in Iraq demonstrate that ‘winning the peace’ can be more difficult than winning the war. Rather, it is the post-conflict reconstruction phase of war that determines ultimate operational success.⁴⁹ However, in recent operations, such as East Timor and Solomon Islands, the ADF focus was on achieving its immediate operational objectives (security), and then handing over responsibility for the transition to stability to other agencies. This approach is not necessarily appropriate for future conflicts, as evidenced by the growing US casualties in Iraq. The implication is the ADF must also be organised and structured for the post-conflict phase of war. To do this will require greater flexibility, a change in mindset, and, perhaps, a trade-off in some warfighting capabilities.

35. The other organisational impact of future conflict is the breaking down of the Service ‘stovepipes’ within the ADF. Air Marshal Houston recently acknowledged a key lesson from the recent conflict in Iraq, being the need to establish a habitual training relationship between Army’s SF elements, and RAAF ground attack aircraft.⁵⁰ However, this will only treat the symptoms of interoperability problems, not the cause. Similarly, the shift towards a joint command environment will not achieve interoperability within the ADF, or with future coalition partners. Real organisational change within the ADF is required if the ADF is to be a truly joint force, capable of operating effectively within a coalition.

Conclusion

36. This paper’s assessment of the nature of future conflict sees the chaotic features of friction, danger and uncertainty as enduring, along with the features nested within the factors of burgeoning globalisation and technology. Similarly, the future ADF will continue to require the capacity to operate inside all forms of complex terrain.

37. The characteristics of scale, intensity and duration will continue to determine the environment where future conflict will occur. The physical and virtual domains of this increasingly disaggregated future battlespace will be further shaped by the human interaction within that environment of the ADF, fellow combatants, adversaries and non-combatants.

38. The ADF’s future participation within alliances or coalitions, and Australia’s degree of unilateral or globalist interest will remain pivotal change drivers for the nature of future conflict. The implications of the future conflict scenarios assessed predict a very high need for national and international inter-agency cooperation, and a similar need for both single-Service and joint combined effects.⁵¹ Cognisance of the implications of future conflict’s enduring features, determinants and drivers is therefore essential in assessing future impact on ADF interoperability.

39. Future conflict will continue to be characterised by diversity, complexity, diffusion, and lethality. Increasing globalism and the growth of multinational institutions will have the effect of drawing a number of parties into a conflict, providing both diversity and complexity. Increases in technology will improve lethality, dispersing forces throughout the battlespace. Asymmetry will be an undoubted feature of future conflict, as the technological gap between some stakeholders widens and as dependence upon technology increases in modern defence forces.

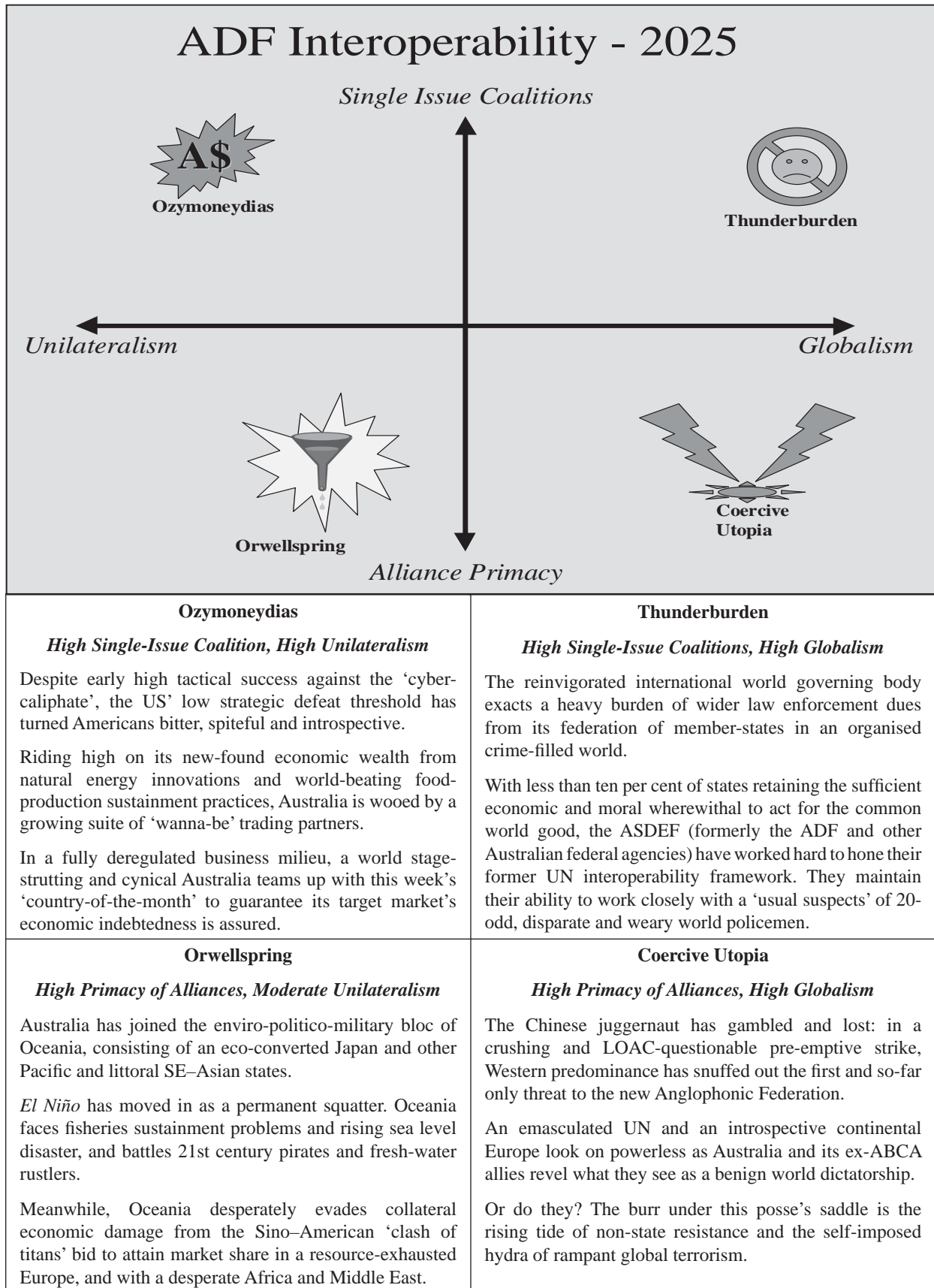
40. A fundamental requirement in future conflict will be the ability to achieve a seamless transition from war to peace, highlighting the requirement for organisational versatility and agility. Therefore, from an ADF perspective, there is a requirement to operate effectively with a broad range of national agencies and a diverse range of international state and non-state actors.

41. Interoperability is the key to the ADF's success in future conflict, and as Ryan notes, it is the 'Holy Grail' of combined operations.⁵² Effective interoperability can be achieved if the ADF focuses on enabling technologies and appropriate doctrine and organisational constructs.

42. Identifying, acquiring, and using the right technology is important to ensure the ADF does not become technologically asymmetric with potential coalition partners. The ADF needs to ensure communications and situational awareness suites are interoperable with coalition partners, and that consumables such as ammunition and fuel are standardised.

43. The ADF should also develop doctrine that provides flexibility and adaptability, thereby enabling cooperability with various state and non-state partners. Given the diverse and complex nature of future coalitions, it is not feasible to seek doctrinal interoperability only with the ADF's traditional alliance partners. The current debate on the organisation of the ADF should acknowledge that an expeditionary force structure would enhance the likelihood of achieving interoperability, thereby better preparing the ADF for future conflict.

44. The ADF is in a good position to achieve operational synergies with close allies and other potential coalition partners. Interoperability relies on technical, doctrinal, and organisational solutions. Additionally, the ADF needs to develop a mind-set that accepting a 75 per cent solution, understand the limits and costs of multinational cooperation, and accept the inevitability of interdependence, while not confusing it with operational dependence.⁵³



Interoperability Requirements Matrix

1. In short-duration coalitions, or where the need for cooperation will be peripheral, an interoperability of ‘*cooperability*’ alone may suffice.⁵⁴ A more long-lasting cooperation, or one composed for higher political stakes, may additionally warrant a degree of ‘*analogue replication*’ and the capability bricks generated.⁵⁵ Finally, cooperative commitments of extended duration, and/or those perceived as of vital political importance will benefit from not only interpretation and analogue replication, but may even dictate a ‘*digital replication*’ level.⁵⁶

Interoperability Requirements Matrix

Representative Future Conflict World Scenario	OZYMONEYDIAS	THUNDERBURDEN	ORWELLSPRING	COERCIVE UTOPIA
Interoperability Means and Manner Requirements	High Single-Issue Coalitions: High Unilateralism	High Single-Issue Coalitions: High Globalism	High Alliance Primacy: Moderate Unilateralism	High Alliance Primacy: High Globalism
Need for national Inter-Agency Cooperation	High	Very High	Very High	Very High
Need for international Inter-Agency Cooperation	Very High	Very High	Very High	Very High (Limited scale)
Need for combined joint platforms and commonality	Low	Low	Low	Very High
Need for combined single-service platforms and commonality	Low	High	Low	Very High
Need for joint combined effects	Very High	Very High	Moderate	Very High
Need for single-Service combined effects	Very High	Very High	High	Very High
‘Digital’ replication interoperability	Low	Low	Low	Moderate
‘Analogue’ replication interoperability	High	High	Low	High
‘Cooperability’ Requirement	High (broad)	Very High (broad)	Very High (deep)	Very High (deep)

Endnotes

1. Policy Guidance and Analysis Division 2003, *Australian Developing Doctrine Publication D.3 – Future Warfighting Concept*, Department of Defence, Canberra, p. 6.
2. SM Lynn-Jones and SE Miller (ed.), 1995, *Global Dangers: Changing Dimensions of International Security*, MIT Press, Cambridge, Massachusetts, p. 14; M Evans, 2002, 'Clausewitz's Chameleon: Military Theory and the Future of War', *Quadrant*, November, p. 12.
3. The ADF's Future Warfighting Concept (FWC) 'must allow the ADF to fight alongside, and in some cases lead, our coalition partners. The FWC must also allow the ADF to work with other Australian Government agencies and cooperate with local and international agencies where required'. Policy Guidance and Analysis Division 2003, op.cit., p. 17
4. The strength of the *phalanx* of ancient Greece stemmed from its theoretical basis of symbiotic protection. The shield carried by each soldier, or *hoplite*, afforded protection to his neighbour, and his neighbour to his, and so on in each rank. Each hoplite's life depended on working in intimate and precise cooperation with his comrades. When one phalanx was pitted against another, the result was invariably light casualties suffered by the victor, and virtual annihilation of the vanquished. Once its protective framework was shattered or pierced by the opposition's tactics—whether a phalanx or some other ruse—nothing could prevent a phalanx's demolition.
5. This paper uses the broader term of conflict rather than war, in order to embrace the full range of degree and perception of all opposing force interaction, from 'steps taken to enforce sanctions through to violent clashes', and the increasing importance of individuals and non-state actors. See Land Warfare Development Centre, 2002a, *Land Warfare Doctrine 1: The Fundamentals of Land Warfare*, Land Warfare Development Centre, Puckapunyal, Victoria, pp. 32–33.
6. An accepted methodology for envisioning alternative futures dictates that a focal question must first be determined (in this paper's case, 'What are the future conflict drivers and determinants for the ADF's interoperability with other agencies and forces?'). The following phases are then completed:
 1. Identify trends and variables (change drivers)
 2. Generate models or scenarios of most likely possibilities
 3. Identify strategy options to test against most likely possibilities.Before using the 'alternative future' scenarios to backcast and thus guide planning, five essential criteria must be met by each:
 1. Key variables for the organisation must be captured and consolidated into 'change drivers'
 2. All credible critical future events must be spanned
 3. The scenarios must have internal consistency
 4. The scenarios must be named; and
 5. Any particular 'world' must have a plausible history.
7. For this paper, the 'future' extends to 2025, wherein Australia will remain a sovereign entity, and recognisable within its current Westphalian construct. Given this continued existence, the strategic tasks assigned to the ADF by the present Government White Paper are also assumed to be broadly enduring. These are outlined in Land Warfare Development Centre 2002b, *2020 Objective Force Environment Paper*, Land Warfare Development Centre, Puckapunyal, Victoria, June, p. 2. The tasks of Defence of Australia (DA), Contribution to the Security of our Immediate Neighbourhood (CSIN), Supporting Wider Interests (SWI), and Peacetime National Tasks (PNT) emanate from Department of Defence 2000, *Defence 2000 – Our Future Defence Force*, Defence Publishing Service, Canberra pp. 46–53. The ADF's extant roles in defence of Australia, and protection of her national interests (Department of Defence 2000, op. cit., Section 2 *passim*) are also presumed to endure, namely:
 - Defend Australia from armed attack (p. 13)
 - Work regionally and globally to minimise the risk of war (p. 9)
 - Work locally and globally to build a more robust and resilient international system (p. 9)
 - Undertake operations other than conventional war in our own region and beyond (p. 10)
 - Assist in non-military security concerns including coastal surveillance and enforcement (p. 12)
 - Contribute to Government's efforts to cyber-attack responses (p. 12)
8. 'Le terrain complexe continuera de poser de difficiles problèmes au mouvement des unités et le <<brouillard de

guerre>> n'est pas près de se dissiper totalement.' Ballarin, Colonel (ed.) 2002, *Les Engagements futurs des forces terrestres*, Armée de Terre, Saint-Cyr, France, p. 13.

9. Described in *LWD 1* pp. 33–37.
10. Land Warfare Development Centre 2002b, op. cit., pp. 35, 38. LE Davis, 2003, *Globalization's Security Implications*, Rand, Santa Monica, CA, p. 1.
11. Land Warfare Development Centre 2002b, op. cit., pp. 38–39. For further discussion on 'high-technology inserts' and the threat environment in general, see Land Warfare Development Centre 2002a, op. cit., pp. 7–8.
12. The rise of totalitarian regimes cannot be discounted.
13. Land Warfare Development Centre 2002b, op. cit., pp. 38–39. Ballarin, op. cit., pp. 32–33, 36–37.
14. Land Warfare Development Centre 2002b, op. cit., p. 40.
15. Innumerable examples of 'unconventional war' exist in history. For example: Jewish zealot insurgency in Judaea against first-century AD Roman occupation; the English king Harald Hadrada's grey-area wars against Danish and Saxon piracy and pillaging; British counter-revolutionary wars in America; the Thuggee cult in India; and the hashish-induced terrorist actions of the original Arabian Assassins.
16. Future Land Warfare Branch 2003a, op. cit., p. 4. The resurgence of the notion of complexity in war was marked notably by US Marine General Krulak's 1989 concept of the 'three-block war'. In this concept, marines were envisaged engaging in a high tempo battle in one city block, while on two neighbouring blocks their comrades were simultaneously conducting counterinsurgency operations and humanitarian assistance respectively.
17. Battlespace includes maritime, aerospace, land, electromagnetic and informational environments.
18. Future Land Warfare Branch 2003a, op. cit., pp. 8–9. *Battlespace disaggregation* attempts to collectively term the concepts of the *non-linearity* and *non-contiguous* nature of future conflict environments. Policy Guidance and Analysis Division 2003, op. cit., p. 8, Land Warfare Development Centre 2002b, op. cit., pp. 42–43.
19. *Scale* encompasses degree of national security threat, size and nature of forces committed and battlespace dimensions. *Intensity* describes the tempo, degree and technological sophistication of violence employed. *Duration* is the temporal length spent in or transition through the phases of a conflict. Land Warfare Development Centre 2002b, op. cit., pp. 34–35. These are alternatively depicted within the Spectrum of Operations in Policy Guidance and Analysis Division 2003, op. cit., p. 24.
20. As described in *LWD 1*.
21. Land Warfare Development Centre 2002b, op. cit., p. 36.
22. Operations in Iraq and Timor are of specific example. In particular, the difficulty US and UK forces experienced in their transition from the warfighting Phases 1 to 3, into Phase 4 – the sustainment and rebuilding phase of Operation IRAQI FREEDOM. Brims, Major General R. 2003, *The British Army and the War in Iraq*, paper delivered at the Chief of Army Conference, Australian Defence Force Academy, 1–2 October. See also C Conetta, 2002, 'Terrorism, World Order, and Cooperative Security: A Research and Policy Development Agenda', *Project on Defense Alternatives Briefing Memo No 24*, Cambridge MA, Commonwealth Institute, 9 September, p. 5.
23. Land Warfare Development Centre 2002b, op. cit., p. 37.
24. Future Land Warfare Branch 2003b, *Army Approach to Network-Centric Warfare (Draft)*, 23 September, pp. 2–4.
25. Policy Guidance and Analysis Division 2003, op. cit., pp. 15–16. These are reflected in the ADF's tasks dictated in D2000, loc. cit.
26. Land Warfare Development Centre 2002b, op. cit., p. 37.
27. Land Warfare Development Centre 2002b, op. cit., p. 37.
28. See Future Land Warfare Branch 2003a, op. cit., pp. 15–16, regarding the ADF's application of the three force multipliers of *Versatility*, *Agility*, and *Orchestration*, to achieve its balance and adaptiveness.
29. Table One's change driver maps whether Australia's partnership in alliances or single-issue coalitions will be more likely. The outcome determines the position of each future scenario on the Y-axis of the graphic at Annex A. Similarly,

Table Two's change driver (determining X-axis position) ascertains the relative likelihood of the ADF's future conflict participation, driven by Australia's future tendency to act unilaterally, or from more globalist motives.

30. These are: High Single Issue Coalition, High Unilateralism: *Ozymoneydias*; High Single Issue Coalitions, High Globalism: *Thunderburden*; High Primacy of Alliances, Moderate Unilateralism: *Orwellspring*; and High Primacy of Alliances, High Globalism: *Coercive Utopia*.
31. For example, such as the various NATO Standardisation Agreements, or those existing within the Quadripartite Standardisation Agreement (QSTAG) framework. See also A Ryan, 2003, *Coalitions and Interoperability: An Australian Perspective*, paper delivered at the Chief of Army Conference, Australian Defence Force Academy, 1–2 October, p. 2.
32. *Ozymoneydias*: Combines Percy Shelley's enduring image of the mythical king Ozymandias' hubris and ephemeral power, with the notion of contemporary avarice.
33. *Thunderburden*: Reflects the 'International Rescue' obligations of the iconic *Thunderbirds* puppets, overshadowed by a mundane realisation of the incessant, demanding and thankless task this really represents.
34. *Orwellspring*: Combining the Orwellian 1984 concept of ceaseless yet somehow remote conflict between economic blocs, with the implied future importance of fresh water, clean air and other commodities currently taken for granted.
35. *Coercive Utopia*: Reflects the prospect of future failure of the 'collective utopia' objective of universal idyll, through the corruption of the original term.
36. J Kerin, 2003, Police 'intervention force' needed, *The Australian*, 2 October 2003, p. 2.
37. J Essex-Clark, 2003, 'Niche Forces: First Thoughts from an Army Perspective', *Australian Army Journal*, vol 1, no 1, pp. 14–5.
38. T Marshall, P Kaiser and J Kessmeier, (eds) 1997, *Problems and Solutions in Future Coalition Operations*, Strategic Studies Institute, US Army War College, 1997, p. 51
39. R Melvin, 2003, *The British Way of War*, Chief of Army's Conference, 1 October 2003.
40. C Bir, 1997, 'Interoperability and Intervention Operations', *Royal United Services Institute Journal*, vol 142, no 6, December 1997, p. 23.
41. M Codner, 2003, 'Hanging Together: Military Interoperability in an Era of Technological Innovation', *Whitehall Paper 56*, Royal United Services Institute for Defence Studies, London, p. 74.
42. M Codner, 2003, op. cit., p. 65.
43. RAND, 2001, *Operation Allied Force: Lessons for Future Coalition Operations*, Research Brief no 72, <<http://www.rand.org/publications/RB/RB72/>>, viewed 3 Oct 03.
44. The ADF has operated effectively with US, UK, and Canadian forces in major conflicts including both World Wars, the Korean and Vietnam wars, and the Malayan insurgency. More recently, the ADF has operated effectively with the US and UK in Afghanistan and Iraq. Marshall suggests as a general rule, the greater the similarity between military forces, the easier it is for them to work together. T Marshall, P Kaiser and J Kessmeier, (eds) 1997, op. cit., p. 51.
45. A Ryan, 2003, *Coalitions and Interoperability: An Australian Perspective*, Chief of Army's Conference, 2 October 2003.
46. This aligns with Annex B's conclusion that 'analogue' and 'digital' replication are not essential to ensure cooperability.
47. For example, *The Weekend Australian* of 4–5 October 2003 devoted a whole page to an article regarding the future of the Australian Army. P Walters, 2003, 'Not so quiet on the home front', *The Weekend Australian*, 4–5 October 2003, p. 23.
48. M Codner, 2003, op. cit., p. 54.
49. Future Land Warfare Branch 2003a, *Complex Warfighting (Draft) Version 3.1*, 22 September, *passim*.
50. A Houston, 2003, *Recent Joint Operations: Australian Perspectives*, Chief of Army's Conference, 2 October 2003.

51. By contrast, the need for single-Service and joint combined platforms is mostly low and often isolated.
52. A Ryan, 2003, op. cit., p. 1.
53. A Ryan, 2003, op. cit., p. 1.
54. ‘Cooperability’ in this sense includes mutual understanding of terms and doctrine, compatibility in such interfaces as command, control and communications, and an awareness of the respective strengths and limitations of organisation and technology. Organisational and doctrinal differences restrict partners to fighting alongside each other only.
55. ‘Analogue replication’ describes where doctrine and macro-organisation are mirrored between partners to produce like ‘capability bricks’ at formation, battle group and combat team—possibly even detachment—level. Analogous equipment not only achieves cooperability with its counterpart, but also produces *like effects*, the results of which are understood and can be employed for planning purposes.
56. ‘Digital replication’ describes a wholly contiguous force, where—with the exception of minor items such as uniforms, ration packs and personal equipment—doctrine, major equipment and organisation is mirrored between partners. Because of the existence of *like platforms* in addition to like effects, the capability brick concept descends to individual personnel of like trade and specialisation.

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