

# **Coalition Interoperability: An International Adventure**

by

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‘Interoperability - commonality of arms - is a hallmark of coalition warfare....’<sup>1</sup>

## **INTRODUCTION**

1. To say there have been many rapid changes in the world political and military environment in the past decade is no earth-shattering statement. Increasing complexity and uncertainty make it more difficult for national leaders to know how to deal with threats. Military downsizing means, among other things, stretching capability wider, and possibly a bit thinner. One way to reinforce military capability is to fight in a coalition of forces from different nations, as seen in the 1991 Gulf War. But fighting in coalition comes at a cost, either during the war, or before the war. It does no good to fight together if systems, doctrine, and command of the individual forces are so different that all synergy is swallowed up during the war in battling the differences, not the enemy. To avoid this cost of inefficiency during the war, nations must ‘pay up front’ by planning and structuring to operate effectively together before the war. They must work to gain interoperability.

2. The purpose of this article is to evaluate the issues facing the United States and her allies (in this case, Australia) in their quests to recognize and successfully deal with interoperability challenges. Across the strategic, operational, and tactical levels of war, interoperability has varying applications. This article will focus mainly on issues at the military strategic level, although certain examples and issues in the tactical and operational levels will emerge, as appropriate. It will also deal with interoperability as it pertains to the western military alliances in general, and to the United States and Australia in particular. After an initial look at what ‘interoperability’ means, the article will briefly look at past interoperability imperatives, then current interoperability structures and trends. Finally, it will examine what the future could hold - pitfalls and potential solutions.

## **DEFINITIONS**

3. Although often used synonymously, various terms like ‘standardization’ and ‘interoperability’ actually have different meanings. While different organizations may use some of the terms differently, the major interoperability forums discussed here have fairly common usage, and their definitions will be used throughout this essay. ‘Standardization’ refers to the overall, multilevel goal of increasing the operational effectiveness of coalition military forces through various similarities. Standardization is applied primarily to the areas of doctrine, procedures (‘tactics’<sup>2</sup>), and logistics<sup>3</sup> (‘defense materiel and battlefield equipment’<sup>4</sup>). It is ranked into the following four levels of increasing standardization:

a. compatibility - to operate without mutual interference;

- b. interoperability - to operate more effectively together by exchanging services;
- c. interchangeability - equal performance, exchangeable with minor adjustment;  
and
- d. commonality - using the same doctrine, procedures, or equipment.<sup>5</sup>

Commonly, the term 'interoperability' is used to mean 'standardization' (including in this essay),<sup>6</sup> possibly because it is the minimum level of standardization towards which the majority of forums strive.<sup>7</sup>

4. Also, the various acronyms and iterations referring to the area of Command, Control, Communications, Computers and Information (Warfare) (C<sup>3</sup>, C<sup>4</sup>, C<sup>4</sup>I and C<sup>4</sup>IW) have become almost synonymous terms, and will be used interchangeably throughout, unless a more specific meaning is required.

### **PAST INTEROPERABILITY IMPERATIVES**

5. The ability of allied military forces to fight together effectively has been increasingly valued this century due to the increased use of combined (or coalition) warfare, initially during the two world wars. Many of the modern forums and methods of improving this standardization were initially put in place in the period after World War II (WWII). The American, British, and Canadian (ABC) Armies' 'Plan to Effect Standardization' came about in 1947, to continue the close cooperation begun during WWII. The initial plan's purpose (to ensure the three armies could eliminate any obstacles to full technical and materiel cooperation, allowing the most effective use of their pooled resources) has remained constant, while the framework has expanded a number of times. The latest Basic Standardization Agreement (BSA) gave it the new name of the ABCA (American, British, Canadian, and Australian) Armies' Standardization Program (or just ABCA) in 1964. New Zealand became associated with ABCA through Australia in 1965, although they are not a signatory to the BSA.<sup>8</sup> Another major interoperability forum was established in 1948 - the Air Standardization Coordinating Committee (ASCC). While focusing on the application of airpower as opposed to land power, the basic purpose and initial members were the same as ABCA, with Australia joining in 1964 and New Zealand in 1965.<sup>9</sup>

6. Certainly during the Cold War, this type of interoperability was very important in Europe, and specifically in the North Atlantic Treaty Organization (NATO). Faced with the threats from the USSR and the Warsaw Pact, NATO (including three members of ABCA and ASCC) early on established interoperability as a major goal to be pursued. NATO has pursued the admittedly elusive proper and effective levels of standardization in the areas of doctrine, procedures (tactics), and equipment (logistics and battlefield). Through separate organizations working in different areas, they have achieved varying degrees and permanence of success, and are currently going through a major reorganization of their interoperability efforts, described in more detail later in the essay.<sup>10</sup>

7. The Australia, New Zealand, and United States (ANZUS) Treaty has been a cornerstone western alliance in the Asia-Pacific region since its inception in 1952. The Treaty did not require development of interoperable military forces, but its impact has largely produced just such an effect. The Australian Prime Minister directed in 1957 that Australia would try to standardize armament and techniques with the United States, as far as was practical.<sup>11</sup> Australia and New Zealand then took up their respective roles in ABCA and the ASCC in the mid-60s.

8. The 1991 Persian Gulf War provides one of the most recent examples of the imperative of coalition interoperability. The difficulties in meshing the forces of 38 nations into anything resembling a smoothly operating military force were enormous.<sup>12</sup> Even though many members of the Coalition were also members of other alliance organizations with interoperability forums, the successes and failures of those efforts were exposed by the light of coalition warfare. For example, Australia decided against sending some of its F-111C aircraft after issues of provision of jam-resistant radios, electronic countermeasure pods, and Identification-Friend-or-Foe (IFF) equipment were deemed too expensive or difficult to overcome. All of these pieces of equipment are key interoperability items.<sup>13</sup>

## **CURRENT STRUCTURES AND TRENDS**

### **Interoperability Forums**

9. This historical emphasis on interoperability within the western military alliances has led to a plethora of forums being formed within and across those alliances to deal with the hard work of establishing and maintaining it. NATO, within its own alliance military structure, established area-aligned bodies to deal with interoperability, all of which used inputs from working groups to produce Standardization Agreements (STANAGs) and Allied Publications (APs). These bodies worked in the area of operations (tactics, procedures, and doctrine), materiel standardization, logistics, and NATO C<sup>3</sup>.<sup>14</sup>

10. Since there is less of a central structure within the remainder of the western alliances, including the Asia-Pacific region, the interoperability forums are somewhat more independent than NATO's. As previously described, the ABCA and ASCC organizations are more functionally aligned, dealing with all issues within their functional areas of land and air power respectively. They deal with all of the areas that NATO breaks out separately - i.e., operations (tactics, procedure, and doctrine), materiel, logistics, and, to a lesser extent, C<sup>3</sup>.<sup>15</sup>

11. Various other interoperability forums involving the Asia-Pacific region work on specific functions, creating a virtual alphabet soup of organizations with overlapping domains:

- a. Combined Communications Electronics Board (CCEB) - C<sup>4</sup>I, primarily land and air;

b. Australia, Canada, New Zealand, United Kingdom, and United States (AUSCANNZUKUS) Naval Command, Control and Communications Organisation - naval C<sup>3</sup>;

c. The Technical Cooperation Program (TTCP) - research and development (R&D);

d. ABCA Navy Field Z - one working area of a larger standardization program, concentrating on warship construction, maintenance, and support (currently in abeyance);

e. Quadripartite Combined and Joint Warfare Conference -doctrinal and training interoperability;

f. Many others, including some bilateral forums (formerly trilateral under the ANZUS Treaty) dealing with various issues (e.g., communications, logistics).<sup>16</sup>

12. What are the issues and trends facing these organizations today? The first striking feature of this partial list of interoperability forums is the amount of attention paid to the topic - so many people laboring so hard, trying to make it all work. NATO has placed great emphasis on interoperability, expending lots of energy and effort in producing its STANAGs and APs over many years.<sup>17</sup> But what results have all of these forums achieved? According to the head of the Office of NATO Standardization, the results have been mixed, with more successes in the operations and procedures areas, and less in the materiel area. One of the problems he identified is that the interoperability work previously went from the bottom up instead of the top down. This meant that the work of the individual forums wasn't rank-ordered in aggregate, allowing each group to work on what it saw as important instead of receiving strategic guidance from top-level leaders. There was little or no coordination between the groups and other NATO bodies, leaving the potential, at least, for groups to work at cross purposes. To counter these problems, NATO introduced a new Standardization Organization in 1995, designed to give strategic guidance, coordination of efforts, and standing staff support. The top authority for NATO interoperability is made up of senior national representatives, provides the strategic guidance, and reports directly to the NATO Council. NATO is confident this new structure and process is giving their interoperability efforts the boost and focus they were missing.<sup>18</sup>

13. Not surprisingly, other interoperability groups have noticed the same sorts of problems. ASCC's Australian Assistant for Standardization noted that they arrived at similar conclusions in the past few years about their lack of strategic direction and limited coordination with other interoperability forums, causing poor prioritization and use of resources. In the past year, ASCC revamped its working parties (the main groups working in functional areas) to ensure they were addressing issues that met the national objectives of the member nations, not just those proposed by working party members.<sup>19</sup> The ASCC Management Committee's U.S. member further explained that surveys are now being sent every year to each nation's major commands, agencies working in the affected areas, and working party members, asking what problems there are, and their relative importance. Any problems identified are forwarded as deficiencies, which then have to be approved by the member nations' senior representatives, the National Directors (ND).

The required endorsement by the one-star rank ND is (hopefully) the guidance that the work being performed fits into each country's strategic framework.<sup>20</sup> That is clearly the goal in the '1996 Direction to the ASCC' published by the Management Committee and signed by every ND. The emphasis is on 'visible and coherent' strategic guidance, organizational efficiency, and effective outputs for the member nations.<sup>21</sup> The important part can't be controlled by the forum, but is the responsibility of each nation - ensuring that each ND is an effective conduit for strategic guidance and inputs back and forth between their own military leadership and the ASCC. This is an important point, because it's highly unlikely that a one-star ND has the final say on strategic guidance for all ASCC interoperability issues.

14. Another area targeted by NATO and ASCC is that of trying to stop the overlaps and disconnects of the various interoperability forums, brought on by insufficient communication. Even a quick glance at the forums listed above indicate that there may be some redundancy of functions, such as between the AUSCANNZUKUS Navy C<sup>3</sup> organization and the CCEB. Efforts to increase communication at both the national and international level have been initiated by various members of the ASCC and CCEB, but this definitely is an iterative process, which is just getting started.<sup>22</sup> Just as NATO institutionalized a liaison body to accomplish that task, the other forums will need to start working more closely together, or else worldwide military budget cuts will spell the end of many interoperability efforts.

15. The interoperability organizations appear, then, to be struggling to meet the same two challenges as many national military forces. First, they need to ensure the structure allows them to get proper strategic direction for their activities. Second, they must make certain their efforts are as efficient and effective as possible.

### **Current Interoperability Issues**

16. One of the current challenges during this time of rapid change is the realization that different countries face different types of interoperability problems. In particular, nations with smaller economies, military forces, and budgets will more quickly run up against the reality that interoperability can cost a lot of money, and a higher percentage of their defense budgets. As Air Commodore J.W. Kindler, Australian Defence Headquarters' (ADHQ) Director General, Capability Policy and Planning put it, 'Interoperability with our allies is important, but only if the cost is acceptable'.<sup>23</sup> Interoperability is driven by technology, and as the rate of change of technology gets faster, this cost of interoperability tends to make progress lag. Some very basic examples would include the standards for weapon system data links and the P-3 aircraft magnetic tape (magtape) player. Australia has been working to get its equipment up to the Link 11 data link standard, just to catch up, but now the standard has changed to Link 16, causing more loss of interoperability, which could cost even more money to overcome. The impact is, and will be, felt in loss of target track data between the United States Navy (USN) and the Royal Australian Navy.<sup>24</sup> The P-3 magtape players were an area of achieved commonality between the Royal Australian Air Force (RAAF) and the USN, two operators of the aircraft, but recent and future upgrades are causing the two forces to diverge, losing precious interoperability.<sup>25</sup>

17. The picture which emerges from present interoperability efforts is one of some successes, but a moving playing field is shifting the target. Some structural and process changes are being made

within some of the interoperability forums, but rapidly changing technology and shrinking defense budgets seem to be conspiring to steal away gains already made. With such difficulty in handling the current situation, what are the future challenges?

## **FUTURE DIRECTIONS**

### **Downsizing Effects on Interoperability**

18. As individual nations of the western coalitions grapple with the future directions of their post-Cold War militaries, one trend is clear across the world - downsizing. This near-universal downsizing seems reasonable, as the external threat appears to have diminished. But it still leaves a concern about how to retain a reasonable core of capability while decreasing overall size. Three possible ways of dealing with this dilemma can have conflicting effects on interoperability and its future direction.

19. One method of reconciling the conflict is to shed certain responsibilities and reduce capability. Taking this path would generally mean drawing back from all or some of a nation's alliance commitments, to some sort of 'frontier' defense posture. It will reduce total size and certain capability requirements, such as force projection elements, but increase others, due to the loss of allied assistance. This will certainly decrease the number of systems and procedures requiring interoperability, or at least the number of countries with whom to be interoperable.

20. Conversely, increased reliance on alliance partners is the second means of meeting defense needs during downsizing. History seems to have shown that most countries would rather form alliances than go it alone, and the sharing of burdens can certainly free up resources for other things. But, as is currently true, increasing reliance on allies means agreeing on what needs to be shared (which is often very difficult) and working even harder than before on interoperability.

21. A third method of 'getting more with less' is to increase the use of high technology. This generally means gaining capability (lethality, precision, etc) while requiring less people overall. Along with increasing alliances, this seems to be a current favorite strategy. It exacts a high price in interoperability requirements, though, due to some high initial costs for the newest technologies, and the high rate of turnover and change.

### **Challenges for Australia and the United States**

22. The United States appears to be relentlessly pursuing the last two methods of retaining, or even increasing, capability during its drawdown. In the United States' Joint Chiefs of Staff blueprint for how they will structure and fight in the future, 'Joint Vision 2010', it is clear that they place high value on both combined operations and exploiting advances in technology:

We must find the most effective methods for integrating and improving interoperability with allied and coalition partners. Although our Armed Forces will maintain decisive unilateral strength, we expect to work in concert with allied

and coalition forces in nearly all of our future operations, and increasingly, our procedures, programs, and planning must recognize this reality.<sup>26</sup>

This era will be one of accelerating technological change. Critical advances will have enormous impact on all military forces. Successful adaptation of new and improved technologies may provide great increases in specific capabilities. Conversely, failure to understand and adapt could lead today's militaries into premature obsolescence and greatly increase the risks that such forces will be incapable of effective operations against forces with high technology.<sup>27</sup>

23. These two objectives are also clearly articulated by Australia in its own context by both the previous and current governments. In their 1994 Defence White Paper, they strongly endorsed their regional and global alliance structure, and called the alliance with the United States 'a key element' of their defense policy.<sup>28</sup> If anything, the current government has strengthened this view. Minister for Defence Ian McLachlan said in November 1996, 'A continued strong alliance relationship with the United States is an essential part of ... future Asia Pacific stability and prosperity'.<sup>29</sup> Equally, Australia's desire to maintain a regional technological edge is parallel to the same desire expressed globally by the United States.<sup>30</sup>

24. So, if the United States and Australia are expressing similar views on the courses to be taken to retain capability while downsizing, where do the challenges lie? The first thing to understand is that the military forces (and their leaders) in both countries realize how important interoperability is, but they also know that it has limits and brings its own set of problems. U.S. Air Force Instruction (AFI) 60-106 (Draft) states: 'Standardization is voluntary at the national decision making level. Nations should make every effort, however, to maximize the use of limited resources and to standardize equipment and/or procedures which are essential to combined operations.... Standardization is not appropriate when it would significantly hinder or retard research, materiel development, strategy, tactics and/or operational techniques'.<sup>31</sup> The Australian Defence Force (ADF) publication ADFP 2 Supplement 1 echoes the same thoughts in its section on the ASCC, indicating agreement with interoperability's importance and limits.<sup>32</sup> Statements by the U.S. Pacific Air Force commander<sup>33</sup> and the Commander-in-Chief of the joint (multiservice) U.S. Pacific Command during visits to Australia, and the commander of the USAF's Electronic Systems Center,<sup>34</sup> to name a few, indicate the grasp many top level U.S. leaders have of the importance of joint and coalition interoperability and its challenges.<sup>35</sup> Indicating his own understanding of one such problem which greatly concerns the United States, the Chairman of the Joint Chiefs of Staff, Gen. Shalikashvili, told the U.S. Congress in February 1997:

As the United States continues to improve its combat information and communication systems, an important consideration is the impact such modernization will have on friends and allies. The United States is the world leader in the exploitation of information technologies....

As a result, the Services are making key investments in new information technologies, investments that will produce significant combat multipliers in the next century. Unfortunately, friends and allies are not proceeding at the same pace

or with the same levels of interest. The United States must ensure key information systems remain interoperable and complementary with allies. This is particularly important to the success of multinational operations.<sup>36</sup>

25. Gen. Shalikashvili's remarks bring to light two major concerns regarding Australian-American concerns, one from each nation's perspective. First, sources throughout all levels of the United States military currently say C<sup>4</sup> is the highest priority interoperability issue.<sup>37</sup> The same thought is present in and around the ADF. Most of the concern seems to come from people associated with interoperability forums like TTCP<sup>38</sup> or from those working in think tanks<sup>39</sup> and R&D,<sup>40</sup> both inside and outside the ADF. The message comes even from the top, although maybe not as clearly, nor as the top priority. Minister for Defence McLachlan listed acquisition of modern [and interoperable] C<sup>3</sup> systems fourth of four major capability improvements needed in the future when he addressed students at the Joint Services Staff College in April 1997.<sup>41</sup>

26. The flip side of the same coin is the second (and Australia's main) concern. Australia fears, as one Australian Army lieutenant colonel put it, that the United States may be 'building itself out of interoperability',<sup>42</sup> or, using the most common phrasing, becoming a 'technology island'.<sup>43</sup> The concern is certainly not just an Australian one. German Army Gen. Klaus Naumann, chairman of NATO's Military Committee, has voiced concerns that the U.S. may cause a "disconnect" by charging too rapidly after technological advances.<sup>44</sup> 'The United States is moving with unparalleled velocity toward the kind of high-tech military equipment that has no match in Europe. I am beginning to worry that, one day, we will wake up and find that our armies can no longer work well together.'<sup>45</sup> This is certainly a valid issue, as pointed out by Gen. Shalikashvili above in the case of C<sup>4</sup>. Another example is fighter aircraft. Australia expects to upgrade its F/A-18 and F-111 fleets over the next few years,<sup>46</sup> but they also are looking at when they will need to buy replacements for both. According to Dr. Alan Stephens of the RAAF's Air Power Studies Centre, a potential candidate would be the Joint Strike Fighter (JSF) being developed by the United States. There is one major interoperability rub - a possible architecture for the JSF which would include data linking many traditionally-onboard information systems from off-board platforms. Since the U.S. is the owner of many of those expensive off-board platforms (satellites, Airborne Warning and Control System (AWACS), and ground stations), how would Australia get the required data if the United States were unable to support particular training or operational use?<sup>47</sup> These areas are just two of many which pose difficult interoperability conundrums. There would seem to be four major courses of action open to both players in these situations.

27. First, the United States could 'hold back' on the pursuit and acquisition of technologically advanced systems for its military, staying instead with older systems. That is highly unlikely for a number of operational and strategic reasons. For starters, the operational principles laid out and agreed upon by the members of the ASCC, for example, state: 'Standardization must not be permitted to impede research and development, procurement, operations, or the development of advanced tactics and techniques of the ASCC member nations.'<sup>48</sup> It has already been recognized and agreed that interoperability should not be a weight holding back the progress of any or all of the allies. The operational reasoning is clear - if an ally is able to develop, procure, and field equipment which can gain an advantage over a coalition adversary, then all of the allies gain from that advance. Strategically, the United States military has laid out its thoughts regarding the

potential threat in Joint Vision 2010: ‘Our most vexing future adversary may be one who can use technology to make rapid improvements in its military capabilities that provide asymmetric counters to US military strengths, including information technologies’.<sup>49</sup> ‘Technologically superior equipment has been critical to the success of our forces in combat.... We must continue to ensure our soldiers, sailors, airmen, and marines are fully capable of fulfilling their required tasks with equipment that is engineered to provide superior mission performance....’<sup>50</sup> Based on these reasons, there will be no holding back when it comes to technological pursuit.

28. A second course of action would be for the United States to lend equipment to allies when needed for use in a coalition operation. To understand the scope of this, it must be realized this would also mean either training, and keeping proficient, coalition personnel on equipment they don’t own, or else lending U.S. personnel with the equipment for combined exercises and real world operations. While maybe useful for a short-term fix, this is obviously not a lasting solution. It would mean the United States would have to bear the cost of keeping her allies interoperable, and that isn’t realistic in times of universal drawdowns. This is precisely the conclusion reached by the commanding general of the U.S. Army’s I Corp after last year’s ABCA Exercise Cascade Peak 96, a Corps-level command post exercise hosted at Fort Lewis, Washington. In his after-action report ‘Lessons Learned’, his first comment dealt with the interoperability gap in C<sup>4</sup>I, and suggested the above ‘[n]ear term work-around’ to close it.<sup>51</sup> Useful, but not lasting.

29. The third course of action would see Australia (or another ally) choose not to pursue the necessary technology to achieve the minimum acceptable level of interoperability in a given area. This option is *de facto* the same as the first method of dealing with downsizing - i.e., shedding responsibilities and alliances, since loss of minimum acceptable interoperability would mean isolation inside of an alliance. If that downsizing option has already been rejected, the difficult part of this option, and the next, is in determining the minimum required level of interoperability.

30. The fourth course of action is for Australia to buy at least the minimum technology required to meet the minimum level of interoperability. This is difficult because it requires an accurate assessment of the minimum level, and it also requires the ‘hard calls’ in strategic assessment and budget allocations. Essentially, what this option requires for a country in Australia’s position is to make some serious decisions about the nature of the threat, where defense priorities lie, and how to allocate enough dollars to meet those priorities. This would appear to be the exact course of action Australia is currently choosing. The current government moved quickly in its first year and a half in office to revitalize the Australia-United States alliance,<sup>52</sup> undertake a review of Australia’s security situation (threats and priorities),<sup>53</sup> and review and reform the ADF structure to free up the resources to support needed force structure changes.<sup>54</sup> While the strategic review results will not be publicly releasable for some time yet, the general feeling from multiple sources around ADHQ is that the Howard government is moving back to strategic guidance which places more emphasis on coalition interoperability.<sup>55</sup>

31. Having chosen a path to help solve that interoperability problem, the next challenge arises. Based on its current strategic assessment, Australia finds itself in a difficult position regarding its most likely threat. That assessment has a major effect on establishing force structure, which in

turn has a great impact on interoperability. Defence Minister McLachlan indicated in a May 1997 address to the Royal United Services Institute of Australia conference that they are trying to develop a balance between a more isolated 'fortress Australia' policy, concerning itself just with defense of Australia's mainland, territories, and approaches, and an expeditionary-minded 'forward defense' policy, sending Australian troops to fight wherever an ally is fighting. Pointing out that it is not a major change in actual previous practice, only previous rhetoric, he concludes, 'In saying that we need to take a broader definition of our defence interests, we are seeking to provide a more balanced and accurate description of what has been a bipartisan policy for years.... We want to have a rather more direct link between what our forces actually do, and what we say they do'.<sup>56</sup> This balance in policy makes the task of determining the interoperability requirements even more difficult, since diminishing or reinvigorating alliances can result in different structures, and two interoperability extremes.

32. This difficulty may be clearest in the current debate over the restructuring of the Australian Army known as Army for the 21st Century (Army 21; A21) or 'Restructuring The Army' (RTA). In this move, the ADF will change from the highly-interoperable, traditional Army Division structure, with separate support units, to one made up of independent brigade-sized Task Forces, with embedded support elements. The restructuring is being made to address many of the different aspects of defending Australia which have little to do with fighting with an ally.<sup>57</sup> But these changes have caused great concern within ABCA about the ability of Australia to mesh with the other member armies.<sup>58</sup> Even some sources within ADHQ feel it is likely that the RTA structure, with its smaller sized units, means the Australian Army will not be able to fight effectively with the other ABCA armies in a large-scale coalition conflict, but should be able to fit into a lower level conflict.<sup>59</sup> Evidence of this ongoing debate within the Australian Army comes from an assessment by the Australian 1 Brigade (1 Bde) commander after the ABCA Exercise Cascade Peak 96:

If the probability of engaging in coalition warfare is more likely than a Defence of the North scenario, as must be the case in any reasoned appreciation, then the type of structures encountered by 1 Bde during Ex. Cascade Mist/Peak must be used to inform the process of force structure about to be embarked on by the Australian Army. To restructure that part of the Army that is likely to be sent to conduct coalition warfare so that units are optimised for a specific level of warfare in a specific geographical location, would be to strike at the very heart of interoperability and credibility.<sup>60</sup>

The Australian Army maintains that RTA is still in the implementation planning stage, and is starting a major trial to determine, among other things, its effect on interoperability.<sup>61</sup> Time will tell if they will be able to make changes, or even abandon the structural change altogether, if the trial shows a negative effect on interoperability beyond the strategic balance point.

33. Even structural issues in non-combat areas can have effects on interoperability. Multiple sources inside and outside the ADF feel an area they need to address is the acquisition structure.<sup>62</sup> Acquisition processes that take exceedingly long times cause interoperability efforts to fall behind, costing money, effort, and loss of capability. The United States military has also struggled with this issue over recent years, and will continue that emphasis, as well.

## CONCLUSION

34. With the growth of coalition warfare during this century, interoperability has emerged as a critical but complex issue, fraught with great advantage and extremely difficult problems. Given today's uncertain geopolitical environment, though, most nations seem to think the costs are worth the headaches, or at least better than the alternatives. The United States and Australia have enjoyed a long and productive partnership, and are members of other equally successfully alliances. Both seem to have nearly the same view of the relative importance of interoperability, although each experiences different problems. How successful are the two nations at dealing with these challenges, and what areas of interoperability efforts would be most fruitful for them to pursue individually, together, and in multinational interoperability forums?

35. Australia and the United States have good levels of understanding and vision of interoperability problems, albeit not uniformly throughout their individual and collective structures. Due to its size and global position, the United States military is able to emphasize coalition warfare and interoperability while maintaining a structure which can operate independently. This gives it an advantage, allowing it to accomplish both coalition and unilateral effect at the same time. Australia, on the other hand, sometimes has to weigh alliance concerns against its own desires for a self-reliant defense, and these often seem to be in conflict. This makes Australia's interoperability task the more difficult one.

36. The first area to pursue is making the strategic link between structure and interoperability. A lot of thought in interoperability is given to systems and doctrine, but force and acquisition structures and processes have a major impact on how the eventual integration works. It is critical that the decisions regarding these structures be made as part of the strategic planning process, not at some lower level where the effect is hidden.

37. The fear of the potential United States 'technology island' is valid and understood. The solution is not simple, and will probably be a combination of actions taken by both the United States and Australia (and other allies). While interoperability will not be used to inhibit pursuit of technology, awareness of potential problems for allies may allow alternative solutions to be discovered during development. Australia will need to factor the cost of high-technology interoperability into its strategic development process, as some items may just have to be bought. Interim fixes of technology loans by the United States may allow short-term solutions while long-term ones are being pursued.

38. At the interoperability forum level, efforts must continue to increase their efficiency and effectiveness. Forums must stay focused on the problems that matter most to their members, and there must be a system of providing prioritization and strategic guidance from their supervising elements. Overlapping responsibilities of different forums must be eliminated through better communication. Eventually, the western forums outside of NATO will need to meld into, or at least fall under, one organization. This is necessary to prioritize tasks, eliminate redundant work, and efficiently share common types of resources (like full-time management staffs). Since three

members of these independent forums are also members of the NATO standardization process, eventual consideration may be given to having some annex organization to the NATO structure.

39. The final area seems to be the most important - a clear strategic guidance link, both intra-national and international. The forums must continue (or start) the move to give better strategic direction to their working groups. Discussion should start between countries at the highest international strategic level to sort out the competing priorities, since every nation will have a different perspective on what, and how important, the problems are. Member nations must then ensure that the guidance they want is reaching their representatives on the forums. This link must work in both directions, since the problems and concerns from the tactical/operational levels must inform the strategic decision-makers, and the strategic decisions must then provide guidance back down to tactical/operational levels. This seamless top-to-bottom integration is what it's all about for those at the tip of the sword. Colonel Gerry Morey of Canada's Maritime Air Group has it right: 'The fact that presidents and prime ministers agree that our forces will collectively monitor the ocean approaches to North America is little solace at 0300 when the chief oceanographer can't provide you with essential planning data because the acoustic prediction model is "Secret No Foreign".'<sup>63</sup>

### **ACKNOWLEDGMENTS**

1. Lumpe, Lora, 'Clinton's Conventional Arms Export Policy: So Little Change', Arms Control Today, Vol. 25, No 4, May 1995, p 12.
2. Ferrari, Maj. Gen. Giovanni Battista, 'NATO's new Standardization Organization tackles an erstwhile elusive goal', NATO review, Vol. 43, No 3, May 1995, p 33.
3. 'ASCC National Directors' Task Order - 1997/98', Air Standardization Coordinating Committee (ASCC), Washington, D.C., 16 January 1997, p A-1.
4. Ferrari, loc. cit.
5. ABCA Armies' Standardization Program Information Booklet, National Standardization Office, Army Office, Australian Defence Headquarters, Canberra, 1995, p 2.
6. Naumann, Gen. Klaus, 'From cooperation to interoperability', NATO review, Vol. 44, No 4, July 1996, p 1.
7. 'ASCC National Directors' Task Order...', loc. cit.
8. Australian Defence Force Publication (ADFP) 2 (Operations Series - Division of Responsibilities within the Australian Defence Force), Supplement 1 (International Interoperability Arrangements Handbook), Canberra, First Edition, 28 June 1995, p 6-1.
9. *ibid.*, p 5-1.
10. Ferrari, *op cit.*, pp. 33-34.

11. ADFP 2, op cit., p 1-1.
12. 'C<sup>3</sup> Technology Trends for Coalition Forces', The Technical Cooperation Program (TTCP), Sub-Committee on Non-Atomic Military Research and Development, Sub-Group S, Washington, D.C., March 1994, p 10.
13. Green, SQNLDR Mark; Owen, WGCDR Rick; and Harwood, SQNLDR John, Force Development (Aerospace) Branch, Australian Defence Headquarters, Canberra, interviewed by author, 9 May 1997.
14. Ferrari, loc. cit.
15. ADFP 2, op cit., pp. 5-2, 6-1.
16. *ibid.*, pp. 3-1 to 10-1.
17. Naumann, loc. cit.
18. Ferrari, op cit., p 33-35.
19. Sawade, WGCDR C., Force Development (Aerospace) Branch, Australian Defence Headquarters, Canberra, interview with author, 13 June 1997.
20. Cantrell, Lt. J., ASCC Management Committee, Headquarters USAF/XOXX-ISO, Arlington, VA, email correspondence, 13 June 1997.
21. 'ASCC Handbook', Air Standardization Coordinating Committee (ASCC), Washington, D.C., 1996,
22. Sawade, loc. cit.
23. Kindler, AIRCDRE John, Director General Capability Policy Planning, Australian Defence Headquarters, lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 6 June 1997.
24. McClure, Bruce, DSTO/CCISIL, Canberra, phone interview with author, 11 June 1997.
25. Green, loc. cit.
26. 'Joint Vision 2010', United States Department of Defense, Joint Chiefs of Staff, 1996, p 9.
27. *ibid.*, p 11.
28. 'Defending Australia: Defence White Paper 1994', Australian Government Publishing Service, Canberra, 1994, pp. 85-102.

29. McLachlan, Ian, Minister for Defence. 'Defence Co-operation: The United States, Australia, and Our Regional Neighbours', Media Release, Canberra, 22 November 1996.
30. 'Defending Australia', op cit., pp. 26-27.
31. United States Air Force Instruction (AFI) 60-106 (draft), 'The United States Air Force International Military Standardization Program', undated, paras. 1.8.3 and 1.8.7.
32. ADFP 2, op cit., p 5-1.
33. Lorber, Gen. John, USAF Pacific Air Forces (PACAF) Commander, lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 27 May 1997.
34. Boatman, John, 'The Jane's Interview' with Lt. Gen. Charles E. Franklin, Jane's Defence Weekly, 4 February 1995.
35. Ennett, Dr. Jim, Scientific Advisor (SA)-1, Air Force Scientific Office, Air Force Headquarters, Canberra, phone interview with author, 20 May 1997; Waters, GPCPT Gary, Director of Capability Planning, Australian Defence Headquarters, Canberra, phone interview with author, 10 July 1997.
36. Shalikhvili, Gen. John M., Chairman of the United States Joint Chiefs of Staff, Posture Statement given during testimony before the 105th Congress, 12 February 1997, pp. 14-15.
37. AFI 60-106, op cit., para. 1.6.1; Fawcett, Lt. J. USAF Air-to-Ground Operations School (AGOS), Hurlburt Air Force Base, Florida, email correspondence, 28 May 1997; Tatum, Lt. Randy, US Army Rep. to ABCA Armies, Army Headquarters, Canberra, phone interview , 20 May 1997, and interview, 4 July 1997.
38. 'C<sup>3</sup> Technology Trends...', op cit., pp. 11-13, 20.
39. Anderson, Ken, and Dibb, Paul, 'Strategic Guidelines for Enabling Research and Development to Support Australian Defence', Canberra Papers on Strategy and Defence No. 115, Australian National University, Canberra, 1996, p 100.
40. Bedford, Tony, 'Systems Architecting', Synopsis of the Chief Defence Scientist (CDS)/ Vice-Chief of the Defence Force (VCDF) Conference, May 1996, Defence Science and Technology Organisation (DSTO), Canberra, 1996, p 25.
41. McLachlan, Ian, Minister for Defence, 'The Defence Reform Program and Regional Engagement', address to the Joint Services Staff College, Weston, Australia, 29 April 1997.
42. Graham, Lt. H.L., 16 Air Defence Regiment Commander, Australian Army, briefing to No. 50 Command and Staff Course, 17 April 1997.
43. Owen, WGCDR Rick, loc. cit. with Green.

44. Wilson, George c., 'U.S. technology is leaving allies behind, official warns', *Air Force Times*, 20 October 1997, p. 22.
45. 'Separation of Powers,' 'Verbatim' quote page, *Air Force Magazine*, August 1997, p. 75, quoting the *Washington Post*, 6 July 1997.
46. McLachlan, loc. cit.
47. Stephens, Alan, 'Winning quickly: Strike/reconnaissance operations', *Asia-Pacific Defence Reporter*, Vol. 23, No 2, February/March 1997, p 8.
48. ADFP 2, loc. cit.
49. 'Joint Vision 2010', op cit., pp. 10-11.
50. *ibid.*, pp. 7-8.
51. 'ABCA Exercise CASCADE PEAK 96 Chief Evaluator's Report' (including endorsement by Lt. Gen. C.G. Marsh, Commander, and attached training notes from Commander, 1 Brigade, Australian Army), I Corp, U.S. Army, Fort Lewis, Washington, 13 November 1996, p 13.
52. McLachlan, 'Defence Co-operation', loc. cit.
53. Waters, loc. cit.
54. McLachlan, 'The Defence Reform Program...', loc. cit.
55. Green, loc. cit.; Waters, loc. cit.
56. McLachlan, Ian, Minister for Defence. 'Defending Australia's Interests: Challenges for a new strategic era', address to the Royal United Services Institute of Australia International Seminar, Australian Defence Force Academy, Canberra, 15 May 1997.
57. Hartley, Maj. Gen. John, Australian Army, 'An Australian Army for the 21st Century', in Malik, J.M. (ed.), *The Future Battlefield*, Deakin University Press, Geelong, 1997, passim.
58. Tatum, loc. cit.
59. Merchant, Steve, Assistant Secretary, Strategic Policy and Planning, Australian Defence Headquarters, Canberra, lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 21 May 1997; Vale, Brigadier Brian, Chief of Staff, HQ Logistics Command - Army, Lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 15 July 1997.
60. 'ABCA Exercise CASCADE PEAK 96...', op cit., pp. 18-19.

61. Tatum, loc. cit.

62. Green, loc. cit.; Tatum, loc. cit.; White, Cliff, Air Force Scientific Advisor, Air Force Headquarters, Canberra, lecture to No. 50 Command and Staff Course, RAAF Fairbairn, Canberra, and conversation with author, 2 June 1997.

63. 'Price of working together', Jane's Defence Weekly, 8 April 1995, p 29.

### **BIBLIOGRAPHY**

ABCA Armies' Standardization Program Information Booklet, National Standardization Office, Army Office, Australian Defence Headquarters, Canberra, 1995

'ABCA Exercise CASCADE PEAK 96 Chief Evaluator's Report' (including endorsement by Lt. Gen. C.G. Marsh, Commander, and attached training notes from Commander, 1 Brigade, Australian Army), I Corp, U.S. Army, Fort Lewis, Washington, 13 November 1996

Anderson, Ken, and Dibb, Paul, 'Strategic Guidelines for Enabling Research and Development to Support Australian Defence', Canberra Papers on Strategy and Defence No. 115, Australian National University, Canberra, 1996.

'ASCC Handbook', Air Standardization Coordinating Committee (ASCC), Washington, D.C., 1996.

'ASCC National Directors' Task Order - 1997/98', Air Standardization Coordinating Committee (ASCC), Washington, D.C., 16 January 1997.

Australian Defence Force Publication 2 (Operations Series - Division of Responsibilities within the Australian Defence Force), Supplement 1 (International Interoperability Arrangements Handbook), Canberra, First Edition, 28 June 1995.

Bedford, Tony, 'Systems Architecting', Synopsis of the Chief Defence Scientist (CDS)/ Vice-Chief of the Defence Force (VCDF) Conference, May 1996, Defence Science and Technology Organisation (DSTO), Canberra, 1996.

Boatman, John, 'The Jane's Interview' with Lt. Gen. Charles E. Franklin, Jane's Defence Weekly, 4 February 1995.

'C<sup>3</sup> Technology Trends for Coalition Forces', The Technical Cooperation Program (TTCP), Sub-Committee on Non-Atomic Military Research and Development, Sub-Group S, March 1994.

Cantrell, Lt. J., ASCC Management Committee, Headquarters USAF/XOXX-ISO, Arlington, VA, email correspondence, 13 June 1997.

'Defending Australia: Defence White Paper 1994', Australian Government Publishing Service, Canberra, 1994.

Ennett, Dr. Jim, Scientific Advisor (SA)-1, Air Force Scientific Office, Air Force Headquarters, Canberra, phone interview with author, 20 May 1997.

Fawcett, Lt. J., USAF Air-to-Ground Operations School (AGOS), Hurlburt Air Force Base, Florida, email correspondence, 28 May 1997.

Ferrari, Maj. Gen. Giovanni Battista. 'NATO's new Standardization Organization tackles an erstwhile elusive goal', NATO review, Vol. 43, No 3, May 1995.

Graham, Lt. H.L., 16 Air Defence Regiment Commander, Australian Army, briefing to No. 50 Command and Staff Course, 17 April 1997.

Green, SQNLDR Mark; Owen, WGCDR Rick; and Harwood, SQNLDR John, Force Development (Aerospace) Branch, Australian Defence Headquarters, Canberra, interviewed by author, 9 May 1997.

Hartley, Maj. Gen. John, Australian Army, 'An Australian Army for the 21st Century', in Malik, J.M. (ed.), The Future Battlefield, Deakin University Press, Geelong, 1997.

Kindler, AIRCDRE John, Director General Capability Policy Planning, Australian Defence Headquarters, lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 6 June 1997.

Lorber, Gen. John, USAF Pacific Air Forces (PACAF) Commander, lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 27 May 1997.

Lumpe, Lora, 'Clinton's Conventional Arms Export Policy: So Little Change', Arms Control Today, May 1995.

McClure, Bruce, DSTO/CCISIL, Canberra, phone interview with author, 11 June 1997.

McLachlan, Ian, Minister for Defence, 'Defence Co-operation: The United States, Australia, and Our Regional Neighbours', Media Release, 22 November 1996.

McLachlan, Ian, Minister for Defence, 'The Defence Reform Program and Regional Engagement', Address to the Joint Services Staff College, Weston, Australia, 29 April 1997.

McLachlan, Ian, Minister for Defence, 'Defending Australia's Interests: Challenges for a new strategic era', address to the Royal United Services Institute of Australia International Seminar, Australian Defence Force Academy, Canberra, 15 May 1997.

Merchant, Steve, Assistant Secretary, Strategic Policy and Planning, Australian Defence Headquarters, Canberra, lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 21 May 1997.

Naumann, Gen. Klaus, 'From cooperation to interoperability', NATO review, No. 4, Vol. 44, July 1996.

'Price of working together', Jane's Defence Weekly, 8 April 1995.

Sawade, WGCDR C., Force Development (Aerospace) Branch, Australian Defence Headquarters, Canberra, interview with author, 13 June 1997.

'Separation of Powers,' 'Verbatim' quote page, Air Force Magazine, August 1997, quoting the Washington Post, 6 July 1997.

Shalikashvili, Gen. John M., Chairman of the United States Joint Chiefs of Staff, Posture Statement given during testimony before the 105th Congress, 12 February 1997.

Stephens, Alan, 'Winning quickly: Strike/reconnaissance operations', Asia-Pacific Defence Reporter, Vol. 23, No 2, February/March 1997.

Tatum, Lt. Randy, US Army Rep. to ABCA Armies, Army Headquarters, Canberra, phone interview with author, 20 May 1997, and interview with author, 4 July 1997.

United States Air Force Instruction (AFI) 60-106 (draft), 'The United States Air Force International Military Standardization Program', undated.

'Joint Vision 2010', United States Department of Defense, Joint Chiefs of Staff, 1996.

Vale, Brigadier Brian, Chief of Staff, HQ Logistics Command - Army, Lecture to No. 50 Command and Staff Course, RAAF Staff College, RAAF Fairbairn, Canberra, 15 July 1997.

Waters, GPCPT Gary, Director of Capability Planning, Australian Defence Headquarters, Canberra, phone interview with author, 10 July 1997.

White, Cliff, Air Force Scientific Advisor, Air Force Headquarters, Canberra, lecture to No. 50 Command and Staff Course, RAAF Fairbairn, Canberra, and conversation with author, 2 June 1997.

Wilson, George C., 'U.S. technology is leaving allies behind, official warns,' Air Force Times, 20 October 1997.