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**THE HUMAN FACTOR: THE LEAST UNDERSTOOD
COMPONENT OF AIR POWER**

By

Squadron Leader Gary Williams

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INTRODUCTION

Few people really grasp the full extent of what is meant by the human factor, or its real significance to military operations. That there is little grasp of its nature is evidenced by the frequent equating of human factor issues with 'personnel' and 'human resources' issues. These are related, yet quite distinct issues. 'Personnel' functions are usually described as those functions performed by particular departments within an organisation in particular areas of specialisation. The activities they deal with are generally such activities as recruitment, selection, training, salary administration and industrial relations.[1] A list which is more military-specific includes recruitment, training, appraisal, promotion, conditions of service, career management and resettlement. Within the RAAF, these functions have been managed within distinct directorates in Air Force Headquarters such as the Directorates of Air Force Recruiting, Personnel Airmen, Personnel Officers, Commercial Support Program - Program Support, Personnel Entitlements and so on. The common perception of personnel management is that it is the sum of these various functions.

By contrast, proponents of 'human resources management' (HRM) contend that the various personnel functions have often been performed effectively, but not as an integrated strategy aimed at contributing to the goals of the organisation. Furthermore, personnel managers have had little influence at the strategic planning level, and are accorded low status in the organisation.[2] HRM, therefore, includes all the usual personnel functions, but in an integrated manner, and linked to the organisation's goals. The term HRM seems to be favoured by civilian organisations; 'strategic personnel management' tends to be favoured more by the military.[3]

Even this broader concept, however, represents only an incomplete picture of the contribution made by people. If we do not understand the total contribution of our people, we may overlook vital aspects and fail to manage them. We could thus lose some capability, or in the worst case, lose lives. The concept of 'the human factor' incorporates all the elements of personnel management functions, all the elements of HRM, and all the other factors not covered by either, yet which determine, in the case of the RAAF, our ability to apply air power. This concept is predicated upon a recognition that our members' contribution is a product not only of the management of the individuals' conditions of service and welfare, but also of their inter-relationships, their feelings and attitudes, their morale and *esprit*, and their values and beliefs.

That there is little grasp in the ADF of the significance of the human factor to military operations is evidenced by the lack of emphasis on it in our policies and practices, and

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[1] Though there might be slight differences from one writer to the next, a cursory glance at the texts on Personnel/Human Resources Management on the shelves of most libraries will reveal that they list essentially the same activities. For example, see Nankervis, A.R., Compton, R.L., and McCarthy, T.E., *Strategic Human Resource Management*, Nelson, South Melbourne, 1993, p 4; Schuler, R.S., Dowling, pJ., Smart, J.P., and Huber, V.L., *Human Resource Management in Australia*, Second Edition, Harper Educational, Pymble, Australia, 1993, p 16; and Dunphy, D., and Stace, D., *Under New Management*: *Australian Organisations in Transition*, McGraw-Hill, Sydney, 1992, p 113.

[2] Dunphy and Stace, *Under New Management*, p 114.

[3] *Serving Australia*, The Report of the Personnel Policy Strategy Review Team (now commonly referred to as The Glenn Report), Directorate of Publishing, Defence Centre - Canberra, 1995, p 91.

the low 'Cinderella' status which has been given to it in decisions relating to operations and capital investment.[4] The notion that combat effectiveness is dependent on people is not new, and is stated in the doctrines of most modern armed forces. The actual transfer of this notion into practice, however, is less frequently observed, and all too often the need to manage all components of the human factor is overlooked. The aim of this paper is to highlight the human factor and its contribution to air power.

THE HUMAN FACTOR AND AIR POWER CAPABILITY

Air power capability can be considered to be the ability to apply air power to impose the national will on another state.[5] In terms of the effectiveness with which the RAAF can apply air power, this capability may be termed the RAAF's 'combat effectiveness'. This term is used frequently by the various researchers to describe a force's ability to apply combat power, and hence its use in this text to refer to air power capability should cause no confusion.

In order to understand how people contribute to air power, we must first understand more about people: about how they act, and how they interact with the RAAF, with each other, with the combat environment, and with the structure and processes that are endemic to the RAAF. This paper focuses on two significant aspects of these interactions in the particular environment of the RAAF: firstly, it focuses on how people contribute to the operations and overall effectiveness of the RAAF in achieving its mission; secondly, it focuses on how well the RAAF employs (in the broader sense of the word) its people to achieve that mission.

THE HUMAN FACTOR IN COMBAT EFFECTIVENESS

People And Cohesion

The human factor is frequently addressed in terms such as *esprit de corps*, motivation, morale, and leadership. Though some variation in emphasis may be attributed by various authors, essentially they all talk about the same thing - the motivation of the soldier to perform as part of a group. In more recent discussions of the human factor, the term 'cohesion' has gained popularity. A widely accepted definition of cohesion is:

> the bonding together of members of an organization/unit in such a way as to sustain their will and commitment to each other, their unit, and the mission.[6]

This direct link between combat effectiveness and cohesion has been observed throughout the history of warfare. As early as the fourth century BC, most Greek

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[4] *Serving Australia*, p 215.

[5] A derivation from the *Air Power Manual's* definition of military capability as 'the ability to apply, or threaten to apply, violence through the combat power of its armed forces, to impose the national will on another state', p 16.

[6] Johns, John H. (ed), *Cohesion in the US Military*, National Defense University Press, Washington DC, 1984, p 9.

states used a military formation called the 'phalanx' in their battles. This rectangular body of heavily armoured and armed men, up to eight deep, depended on its cohesion to be effective. A gap in any side would open a weakness which could be exploited by opposing forces.[7] As warfare progressed, cohesion was just as important to cavalry units as to the phalanx. The lack of cohesion within the British cavalry at the Battle of Waterloo led to its defeat.[8]

More recently, with the advent of air power, cohesion is no less important. The early aviators of World War I relied on teamwork, flying in teams because of a shared concern about an unseen adversary attacking from behind.[9] Formation flying is designed to foster teamwork, mutual support and cohesion. The 'combat box' pattern of the US B-17 bomber formations in World War II was designed to achieve the best concentration of fire in any direction against attacking aircraft. If any aircraft broke formation, the loss of cohesion often proved fatal.[10] In Soviet-Israeli dogfights over the Suez in 1970, Israeli pilots noted that the Soviet MiG pilots 'tended to lose cohesion, even break up and panic, as soon as the engagement started'.[11] The significance of cohesion has been demonstrated repeatedly in both air and surface battles. The development of air combat tactics has been driven by 'the quest for effective schemes of mutual support',[12] and fighter pilots of today still rely on their wingman, electronic warfare teams, and air-to-air refuelling and airborne warning and control support aircraft. The level of cohesion between all these elements, and indeed all the other support elements, is significant in determining the level of combat effectiveness.

Consequences of a Lack of Cohesion

With so much evidence pointing to the increased combat (and peacetime) effectiveness achieved by building higher levels of cohesion, the corollary is that lower levels of cohesion tend to decrease combat effectiveness. In some cases this has caused much inefficiency, in others it has led to friction within a unit or force, and in others it has resulted in battles being lost.

The problems of lack of cohesion in the US forces in Vietnam, for example, are well documented. Many units suffered because of the replacement and rotation policies of the army, which made it difficult to develop cohesion. In some cases, 'the entire composition of the unit could change in six months'.[13] While it is true that many units did indeed perform well and were well led, it is also true that many of the well publicised instances of drug use, refusal to engage in combat, 'fragging' (assassination) of officers and NCOs by their subordinates, mutinies and

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[7] Preston, Richard A., and Wise, Sydney F., *Men In Arms: A History of Warfare and Its Interrelationships with Western Society*, Holt, Rinehart and Winston, New York, 1979, p 17.
[8] Wells, Major Mark K., 'The Human Element and Air Combat', *Air Power Journal*, Spring 1988, p 72.
[9] Watts, LtCol Barry D., *Foundations of US Air Doctrine: the Problem of Friction in War*, Air University Press, Alabama, 1984, p 126.
[10] *ibid.*
[11] *ibid.*
[12] Watts, Barry D., 'Fire, Movement and Tactics', *TOPGUN Journal*, Winter, 1979/80, pp 11-20.
[13] Knowlton Jr., Major William A., 'Cohesion and the Vietnam Experience', p 60.

insubordination, and a high desertion rate have been attributed to the lack of cohesion.[14]

The effects of lack of cohesion in Vietnam were not limited to the US forces. The RAAF also felt the effects. An example, at the inter-Service level, is the antagonism between RAAF and Army in the early stages of the RAAF's involvement in Vietnam. In the first year, relations between the Services were quite bitter. The Army sought assistance for its operations and could not understand the RAAF's seeming lack of enthusiasm to supply it. Brigadier O.D. Jackson, the 1st Australian Task Force commander at the time, felt that the RAAF 'seemed to lack urgency' in their control of operations, while orders he gave 'appeared to be taken as a basis for discussion'.[15] Though nobody questioned the flying skill of the individual pilots or their bravery, the Army perceived that the RAAF, with its pilots living in hotels remote from the Army units, with the application of excessive safety regulations, and the initial lack of armour and door guns on the helicopters, only had 'a quaint notion of the war they were in'.[16]

There were also occasional incidents where some aircrew's actions strained relations. In one instance, their actions were actually counter-productive. Some pilots considered that suspending radio sets from a helium-filled balloon (an effort to improve communications for the Army's Special Air Service) represented too great a danger to their flying, despite having lights strung along the length of the cord. The pilots deliberately hovered over the balloon until a panel ripped and the balloon fell.[17]

Relations did improve over time, as each Service became accustomed to the manner of operations of the other. The example cited illustrates how counter-productive lack of cohesion can be, and the improvement in relations also adds to the weight of evidence that cohesion takes time to develop.

There is some hint that the initial bitterness between the Army and RAAF in Vietnam may have led to long-standing prejudices and a certain 'dangerous mythology', and that this may have been a factor in the continued Army push to gain control of the helicopter fleet, as it did in 1986, some 20 years later.[18]

The Falklands War provides a recent example of the effects of a lack of cohesion, particularly in the case of the Argentines. The British, in general, functioned as a cohesive force, whereas the Argentines had many units comprised of conscripts who had not had the opportunity to bond together and whose leadership was poor. The majority of conscripts in the theatre had barely one month's training.[19] Given that the levels of technology of both forces was roughly equivalent, the outcome was largely attributable to the human factor. The British forces' greater level of confidence,

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[14] *ibid.*, pp 61-63.

[15] McNeill, Ian, *To Long Tan: The Australian Army and the Vietnam War 1950-1966*, Allen and Unwin, St Leonards, NSW, 1993, p 300.

[16] *ibid.*, p 431.

[17] Coulthard-Clark, Chris, *The RAAF in Vietnam: Australian Air Involvement in the Vietnam War 1962-1975*, Allen and Unwin, St Leonards, NSW, 1995, p 150.

[18] *ibid.*, p 144.

[19] Stewart, Nora Kinzer, 'South Atlantic Conflict 1982: A Study in Cohesion', *Military Review*, April, 1989, p 36.

superior leadership and cohesion ultimately became the deciding factor.[20] The lack of cohesion amongst the Argentine forces became even more apparent during the negotiations for surrender - one of the conditions for the Argentines was that their officers be allowed to retain their side arms for 'protection against their own men'.[21]

All of the available evidence points to the fact that in all respects, in combat and in peace, cohesion can be considered to be a force multiplier of the first order. Although cohesion is not the only factor to be considered in combat - the other elements of weapons, strategy and logistics must also be considered - in the stress of combat it is cohesion that keeps fighting units together and enables the other factors to come into play.[22]

As crucial as cohesion has been throughout history, it is likely to become even more so in battles of the future. Where once large troop formations were required to deliver massive fire concentrations, warfare has developed to a stage where the trend is towards greater numbers of smaller, independent units operating with a higher degree of autonomy, and more dispersed to increase their survivability. Accordingly, they will fight less under the direct influence of the commander, and rely more on small unit leaders. Furthermore, the increased lethality of weapons and high intensity of operations will put added strains on the combatants, which will fragment groups which are not cohesive.[23]

How Can Cohesion Be Fostered?

One of the most highly acclaimed forces of World War II, and arguably one of the finest in history, was the German *Wehrmacht*.[24] In recognising the importance of cohesion, the *Wehrmacht* established units and divisions comprised of troops from particular geographical regions, so that they would share common backgrounds, interests, dialects, culture and experience. Units were formed, for example, from Bavaria, Prussia, Wurtemberg, and so on. This practice was also used by the US army at the start of World War II, but was eventually discontinued on the basis that if a particular unit suffered heavy losses in combat, this would have a significant effect on one particular community back in the US. It therefore dropped the system in order to 'spread the burden' across communities.[25] Nonetheless, the value of forming a cohesive unit has not been disputed, and while community-based units may not be formed, there are many other strategies for building cohesive units.

Another strategy employed by the *Wehrmacht* to exploit the advantages of cohesive units was to use a 'unit replacement' rather than 'individual replacement' policy. That is, rather than sending individuals in a piecemeal fashion to replenish a unit, the *Wehrmacht* aimed to withdraw a whole unit from the front line and replace it with a unit which had been training together and building its teamwork (now termed

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[20] Henderson, *Cohesion*, p 3.

[21] *ibid.*

[22] Hooker Jr., Major Richard D., 'Building Unbreakable Units', *Military Review*, July-August 1995, p. 26.

[23] *ibid.*

[24] van Creveld, Martin, 'On Learning From the *Wehrmacht* and Other Things', *Military Review*, January 1988, p 66.

[25] Hoiberg, Anne, 'Military Staying Power', in Sarkesian, *Combat Effectiveness*, p 232.

'working up' in popular parlance) in a training depot. The units which were withdrawn from the front line were given rest, retraining and replacements at one of these depots, and could then be used to replace another unit withdrawn from the front line.[26] In addition, when individuals had been evacuated from the front line for, say, medical reasons, after recovery they were returned to their original unit, not to a 'new' and unfamiliar one.

Another feature which fostered cohesion was that the German NCOs were not used to replace officer losses. The NCOs were seen as a primary ingredient in small-unit cohesion, and were left in charge of small groups to maintain their stability. Furthermore, despite the pressures of the war, Germany continued to run lengthy NCO training courses right up to the war's end.[27]

Two other modern armies which have received much acclaim for their effectiveness and cohesiveness are the North Vietnamese Army (NVA) and the Israeli Army. Though none of the *Wehrmacht*, the NVA or the Israeli Army may represent the 'perfect' military force, they all represent extremely effective forces and 'textbook examples' of how to create and maintain a cohesive force. Indeed, each attributes their success to their high level of cohesion. (Interestingly, the fall of the *Wehrmacht* at the end of World War II coincided with two major factors which reduced cohesion: as the situation in Germany worsened, soldiers became preoccupied with their families at the expense of concern for the unit; and when the situation became so bad at the front that soldiers could not get food, water and medical treatment, the bonds with the unit broke down as they focused primarily on individual survival.)[28]

Much can be learned from an analysis of the practices adopted by these forces, who all devoted considerable attention to the human factor in their organisations. Though each was faced with a different political and societal system, there are many similarities in their approaches to fostering cohesion. Furthermore, analyses of these and other forces consistently reveal the same set of principles for developing cohesion. Table 1 summarises those factors which are consistently recorded as fundamental to the development of cohesion.

Cohesion and the RAAF

The lessons from conflicts throughout this century consistently demonstrate that combat effectiveness is greater in cohesive units. In searching for an edge over a potential adversary, any force would be well advised to consider how well its policies and manning systems build cohesion, as this is a primary force multiplier. The RAAF in particular, because of its small size, needs to capitalise on the human factor as it can no longer count on maintaining a technological edge in the region.[29] How well it fosters cohesion will determine to a large extent its combat effectiveness.

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[26] Hooker, Major Richard D., 'Building Unbreakable Units', p 32.
[27] *ibid.*
[28] Shils, Edward A. and Janowitz, Morris, 'Cohesion and Disintegration in the *Wehrmacht* in World War II', quoted in Knowlton, 'Cohesion and the Vietnam Experience', pp 58-59.
[29] *Defending Australia, p* 27.

Table 1 - Factors Which Build Cohesion[30]

<u>FACTORS WHICH BUILD COHESION</u>

Attention to the physical, security and economic needs of the individual

Affiliation - friendship with peers and a feeling of belonging

Pride in accomplishment of tasks

Pride in the unit

Teamwork

Mutual trust

Common values and goals

High level of training on relevant skills

Confidence in other group members and in the group as a whole

Shared norms about self-discipline

Personnel stability (low turbulence in the unit)

Organisational emphasis on development

Consistency of organisational goals and policies

Belief in the human element of the organisation

Belief in the worth and dignity of the individual

Appropriate leadership style and behaviour at all levels

Effective communications in all directions

Equipment that fosters confidence

Operational capability that fosters confidence

The RAAF is faced with a unique situation. Its defence strategy is based on the defence of the air-sea gap to the north, and particularly with regard to air power, upon the RAAF deploying to a number of forward operating bases (FOBs) in the north. With the most likely scenario being a short-warning conflict, there will be no appreciable 'work-up' time, so our effectiveness will depend on the extant levels of cohesion and readiness of all those deployed.

There are two avenues of deployment. Firstly, some squadrons or units may deploy as a whole, and these usually comprise the aircraft squadrons or generally mobile units such as 114 Mobile Control and Reporting Unit (114MCRU), elements of Air Transportable Telecommunications Unit (ATTU), and the airfield defence squadrons. The second avenue, which is the norm for the majority of 'support' personnel, is to deploy people from disparate units from a number of the main operating bases.

Let us consider the first avenue. A fair degree of cohesion may be assumed within certain squadrons, or at least within some flights within those squadrons. As an

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[30] Adapted from Cardinali, Dr Richard, 'The Significance of Socialisation and Cohesion in Contemporary Society-Military Transitions', *Australian Defence Force Journal*, January/February 1992, p 35.

example, 3 Squadron (an F/A-18 fighter aircraft unit) may work as a particular unit at Williamtown, and deploy as a unit to one of the FOBs. The people of the unit will be working together at the new location in much the same way as they do 'at home'. The commander cannot assume, however, that the squadron, simply by virtue of its being a squadron, will operate cohesively. There are cases through the RAAF's history where some lack of cohesion has been demonstrated even within an established unit. In the book *The Desert Harassers: Memoirs of 450 Squadron*, the author cites an example where a dispute between aircrew and ground crew over the ownership of some beer culminated in the pilots' mess being blown up (although, miraculously, parachutes and log books had been removed from the mess before the explosion).[31] The commander must therefore make every effort to encourage cohesion-building practices. This is not confined to within the unit, but outside as well, as the level of cohesion between the squadron and other units deployed to the FOB must be considered too.

As highlighted earlier, the importance of the small-group leader in building cohesion cannot be overstated. It is therefore the responsibility of every leader, not just the commanding officer, to work toward achieving it. Junior officers and NCOs, as well as flight commanders and executives, need to have a cohesion-building focus. In order to engender this mode of thought, the RAAF could well look at incorporating it into its education and training process, as well as including an assessable item on the annual Officer Evaluation Report (OER) or Airmen Evaluation Report (AER) along the lines of 'implements practices to foster cohesion and build teamwork'.

With respect to the 'support' personnel, the policy which determines how the FOBs are manned is the 'Contingency Activation Position' (formerly referred to as 'shadow posting') policy.[32] The decision has been made to 'post by appointment', meaning that members holding particular appointments at the southern bases are deployed to a FOB whenever that base is activated. The members posted to a particular section at the FOB come from disparate units all over the country. The newly activated unit will be made up of people who may not have met each other before, and many of them may never have been to the base. Given that the most likely scenario facing Australia allows us little 'work up' time, those people deployed to the FOB will be expected to form part of a combat-ready structure immediately upon arrival.

The alternative policy of 'posting by individual' involves posting particular people to particular appointments at the FOB, so that essentially the same people will hold the same positions each time the base is activated. People at the FOB will know who they are working with, and get the opportunity to exercise with them repeatedly (as often as the base is activated) and thus build friendships, trust and cohesion.

While the practice of 'posting by appointment' is administratively easier than 'posting by individual', it is completely the opposite of what one would adopt as a cohesion-

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[31] Barton, L., *The Desert Harassers: Memoirs of 450 Squadron (RAAF)*, Astor Publications, Mosman, 1991, p 7, quoted in Rienks, Squadron Leader P.W., *Human Factors in Air Force Combat Effectiveness*, Fellowship Paper Number 3, Air Power Studies Centre, December 1991.

[32] The term 'Contingency Activation Position' (CAP) was adopted in early 1996 to replace the term 'shadow posting'. This was because it was thought to better reflect the link between the posting process and contingency activation, and that the methodology links positions rather than individuals to contingency units.

fostering policy, and stands at odds with the decades of research which advocate the importance of building cohesion. This has been acknowledged by the planners responsible for developing the activation plan.

The effectiveness problems resulting from the 'posting by appointment' practice are exacerbated by the infrequency of activation of the FOBs (in some cases less than once a year). This means that those who gather to form a unit or section in one instance, may be quite different from those who do it the next time, because of posting turbulence. Members may not see the same people twice. The possibility of developing cohesion in this scenario is very limited.

This lack of cohesion may be of little consequence in a scenario where the air base is insulated and isolated from the possibility of being attacked - but this is unlikely to be the case. The members of 'support' units may well be exposed to attack and have to defend their base. They may well be responsible for their own lives and the lives of others. In a combat environment, their reliance on each other and their confidence in each other will determine how well they operate. Building confidence takes time, as does building the competence from which confidence derives. 'Neither can be achieved in an organisation, military or otherwise, whose people move like tumbleweeds in the desert wind.'[33]

As the current policies inhibit the development of cohesion, the burden falls more heavily on the commanders and leaders of the contingency units. Any lead-time which is available and any time not being spent actively on primary duties should be utilised in some cohesion-building activity, rather than trying to 'keep everybody busy'. Unit/section sport, recreational and social activities should be strongly encouraged, along with other steps which might promote bonding and a sense of *esprit* - unit awards, caps, T-shirts, emblems and so on have frequently been adopted by flying squadrons, and might be worth consideration by contingency support units as well. Most importantly though, attention must be given to the individuals within the unit, so that they feel the unit is indeed concerned with their welfare and problems.

Another component of cohesion and combat effectiveness exhibited by those highly effective forces discussed earlier is a policy of unit rather than individual replacement. Currently, with respect to replacing the RAAF's Initial Deployment Force (IDF), there is no policy other than a statement that there exists a Rotation Pool (RP) which will replace the IDF after 12 months. The arbitrariness of this 12 month figure is problematical, in that most evidence indicates that in any level of conflict, people and resources will be stretched in weeks or months rather than a year. Hence, it may be anticipated that replacements will be needed much sooner than the 12 month period.

The RAAF therefore needs to determine how to execute this process of replacement - does it let units degrade to a certain point and then replace the unit with one which has been in training, or does it slot replacement people in one at a time? The lack of policy at the moment provides an opportunity to develop one which takes account of all the human factors as well as the traditional 'personnel fill' approach. It needs to learn from the experiences, good and bad, of other forces rather than making its own

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[33] Thiemann, F.C., 'Tenure in Position', Fort Monroe: US Army TRADOC 1979, quoted in Sorley, Lewis, 'Prevailing Criteria: A Critique', in Sarkesian, Sam C. (ed.), *Combat Effectiveness*, p 76.

mistakes to learn from. What is needed is the courage to create a policy which will improve combat effectiveness through attending to the human factor, rather than adapting or modifying policies which have been devised to achieve efficiency and ease of administration.

If the RAAF's aim is to be combat-effective, then its policies and practices must reflect these tenets. This demands longer tenure in units, a system of manning which brings the same people together regularly, and a system of unit rather than individual replacement. Many of the RAAF's current policies work to inhibit rather than develop cohesion. More attention should be given to developing policies which enhance cohesion and thus our combat effectiveness, rather than achieve administrative efficiency. Through this, a greater qualitative edge can be attained.

People and the Ratio of Fire

One of the most fundamental issues in military tactics is determining how much firepower can be brought to bear against an enemy. Throughout the course of history, a multitude of military planners and theorists of the likes of Da Vinci, Galileo, Machiavelli, Clausewitz, Jomini and a number of more recent writers, have adopted a mechanistic, numerical or even geometric approach to this issue.[34] The essence of battle planning, they considered, was to have the right number of weapons arranged in the appropriate configuration to achieve maximum effect. For example, given a particular suite of weapons, formations and tactics have been designed which optimise the front presented to the enemy. In the case of ground troops, advances are made in a particular formation, and defensive positions are arranged to site as many weapons as possible to cover possible enemy approaches with interlocking arcs of fire. In the case of the air force, the B-17 formations of WWII were devised to provide the best arrangement of defensive guns for the formation, exposing enemy fighters to the maximum number of weapons that could be amassed. The cell and trail formations of B-52s over North Vietnam employed the same principle of a geometric arrangement structured for mutual defence, not unlike the 'squares' of the 17th century French armies.[35] These are examples of the application of one of the principles of war, namely 'concentration of force'.

Given a particular array of weapons, however, the commander seldom seems to consider what is referred to as the 'ratio of fire'. The term 'ratio of fire' refers to the rate of combat participation of the particular unit. In other words, the proportion of members in possession of a weapon who actually use it when they might reasonably be expected to do so. (The inverse figure - the proportion of members who do not use their weapon - is commonly referred to as the 'rate of combat refusal'.) Seldom have commanders addressed the question: 'During an engagement with the enemy, what ratio of fire can be expected from a normal body of well trained combatants under average conditions of combat?'

Most commanders assume that if they have, say, 100 weapons pointing at the enemy, then 100 will be fired in combat, less perhaps a small percentage due to equipment

[34] For further discussion, see Beaumont, Roger A. and Snyder, William P., 'Combat Effectiveness: Paradigms and Paradoxes', in Sarkesian (Ed), *Combat Effectiveness*, p 26.
[35] Wells, Major Mark J., 'The Human Element and Air Combat', p 73.

malfunction or the fog and friction of war. The research data, however, paints a rather different picture.

The most significant study of the question of ratio of fire was conducted by S.L.A. Marshall during World War II. He accompanied around 400 infantry units along the front line in the European and Central Pacific theatres, and conducted post-combat interviews with the soldiers. In addition to his findings on cohesion, he found that no more than a quarter of the men who were involved in actions directly against the enemy actually fired their weapons. One might rationalise this by suggesting that many of the soldiers who did not fire their weapons were novices, but the 25 per cent estimate 'stands for well-trained and campaign-seasoned troops' as well.[36]

Not surprisingly, this figure came as a shock to many commanders, and has been hotly contested by some. Nonetheless, the figure has not been disputed by the US military, which quotes it in a number of documents. An interesting finding with regard to the various commanders and leaders is that Marshall did not find one platoon, company or battalion commander who had made any effort to find out how many of his soldiers had actually engaged the enemy with his weapon. A significant number, however, when they were asked how many they thought had fired their weapons, made the automatic reply 'I believe that every man used a weapon at one time or another', and many had said that they had viewed the action and it seemed as though everybody was taking an active part. Immediately after engagements the infantry companies were interviewed at a full assembly, and it was when the soldiers spoke out as witnesses in the presence of the commanders and leaders that they discovered the truth of the findings. Marshall observed that almost universally, the commanders 'had not been trained to interest themselves in this problem'.[37]

More recently, accounts of the British parachute battalions involved in the Falklands War suggest that the rate of combat participation was not a problem for them, although they recognised it as a problem for the Argentinians. The analyst who interviewed the British soldiers acknowledges, however, that his deductions are 'less valid than those of Marshall [and others]'. He suggests that this is because whereas Marshall conducted interviews straight after the action had been concluded, he had conducted his interviews several weeks after the experience of battle, 'when the skin of the accepted version of events was solidifying fast'.[38] Even a much shorter time enables people to re-frame their experiences into a palatable account. As has been eloquently and accurately expressed: 'on the actual day of battle naked truths may be picked up for the asking; by the following morning they have already begun to get into their uniforms'.[39]

What is of great significance for the RAAF is that the figures for the infantry relate to those who are specifically trained for that purpose, and whose time is dedicated to the use of their weapon and combat tactics in a ground combat environment. For RAAF

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[36] Marshall, S.L.A., *Men Against Fire: The Problem of Battle Command in Future War*, Peter Smith, Gloucester Massachusetts, 1978, p 50.
[37] *ibid.*, pp 53-55.
[38] Holmes, Richard, *Firing Line*, Harmondsworth, Middlesex, England, 1986, p 325.
[39] Hamilton, Ian, quoted in '"Naked Truths for the Asking": Twentieth-Century Military Historians and the Battlefield Narrative', in Charters, D., Milner, M., & Wilson, J. (eds), *Military History and the Military Profession*, Praeger, Westport, Connecticut, 1992, p 45.

members deployed to a FOB and charged with the defence of the base, weapons handling is but a secondary task. Indeed, they are expected to perform their 'primary' task for eight hours, then undertake base defence for a further four hours. Their primary training relates to their area of technical expertise, and weapons training and base defence forms a much smaller part. One might reasonably infer that they are less confident in weapons handling than an infantry soldier, less experienced in ground combat training, and have spent less time training as a small group than would an infantry platoon. One could hardly expect them to therefore perform any better than infantry soldiers in regard to ratio of fire, and a cogent argument can be made that they would likely perform less well.

Combat Refusal

A concept closely related to ratio of fire is that of combat refusal. This may be individual, as discussed in the bulk of Marshall's work, or it may involve groups of people, when it is termed collective combat refusal.

Examples of soldiers refusing to engage in combat, instead sheltering in the sleeping bags or fox-holes, have been documented not only in World War II, but also in the Korean War, the Falklands War (in the case of the many Argentinian soldiers) and the Gulf War (which also provided some unusual and well-publicised examples of other forms of combat refusal, such as the Iraqi soldiers who surrendered to an Uninhabited Aerial Vehicle).

The most noteworthy example of collective combat refusal in RAAF history is the case of the Japanese attack on Darwin in 1942, when large numbers of airfield defence personnel retreated *en masse*.

In the case of aircrew, an aircraft provides an opportunity to avoid going on a mission. Judging whether an aircraft is unserviceable is the responsibility of the aircrew, and a reluctant crew can abort a mission claiming any number of technical faults with the aircraft - for example, radio systems, navigation systems, fuel systems, fire control or other warning indicator systems, and so on. In some cases it is very difficult to distinguish between a genuine fault and one which has been reported to avoid flying. In World War II the phrase 'LMF', meaning 'Low Moral Fibre', was coined to refer to anybody suspected of consistently reporting aircraft faults in order to avoid operational flying.[40] Other strategies employed by some aircrew included dropping their payload hurriedly or away from the target, to avoid having to fly through the greatest concentration of air defences.

Low moral fibre was a concern to commanders even as recently as the Gulf War. One RAF commander admits to concerns about it when there was a succession of aircraft returning due to reported faults, and later in the campaign when a number of crews were missing their targets with laser guided bombs.[41] During the initial phase of the air war, when the Iraqi air defences were still considered to be a significant threat and missions were more stressful, serviceability records indicate that the pilots were much more inclined to abort missions than they were later in the war. Indeed, at least one

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[40] McManners, Hugh, *The Scars of War*, Harper Collins, London, 1993, p 199.
[41] *ibid.*, p 200.

RAF pilot was taken off flying duties because he kept aborting missions due to aircraft failure.[42] Later in the air war, when Iraqi air defences had been largely suppressed and missions could be flown more comfortably at higher altitudes, the number of unserviceabilities was considerably less.

Given that even in well-trained, seasoned combat forces, the ratio of fire may be so low that only 25 per cent of their members engage an enemy in combat, it is imperative that planners of any force tackle the problem seriously if they are to attain the degree of firepower they want.

Causal Factors

The reasons attributed to this high rate of refusal to fire are largely psychological; that is, influenced predominantly by human nature. The contributing factors may be any, or any combination of, the following: fear, isolation, lack of confidence, lack of leadership and lack of cohesion.

It comes as no surprise that fear should feature in the list of reasons that people do not participate in combat. What may come as a surprise to many, however, is that as great as the fear of being killed, is the fear of killing, so strong is our conditioning. In most societies children are taught from a very early age about right and wrong and the ethic of 'thou shalt not kill'. It is enshrined in law, so that those who take another's life are dealt with most severely by society. Religious dogma reinforces the belief of life being sacred, and that we should love our enemies as our brothers. Most of those involved in combat will have had in excess of 20 years' inculcation of these values. Although combatants can be trained to be completely familiar with and comfortable with their weapon, and can, for example, be skilled marksmen, this is of little significance on the battlefield or in the air, when the consequences of employing that weapon conflict with their ingrained values about respect for life. Firing on the range, and even live-fire exercises make it no easier to kill someone, which conflicts with the deeply ingrained value system of the combatant.

Isolation relates to the notion that when forces are dispersed, control is difficult to achieve and the will to fight is diminished. It is easier for one or two people to 'lie low' when they cannot be observed, and is more common when they cannot see what their comrades are doing.[43] As future conflicts are likely to involve more dispersed forces and smaller groups with greater autonomy of action, the effects of isolation may become of even greater significance in military planning.

Many of the effects of a lack of cohesion on combat performance have already been discussed. Combat refusal is yet another consequence, for when teamwork can be developed, the members' perceived level of confidence and capability increases, and so too does their level of combat effectiveness.[44]

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[42] *ibid.*

[43] Holmes, *Firing Line*, p 326.

[44] S.L.A. Marshall, *Men Against Fire*, pp 123-137.

Implications for the RAAF

The significance then, is that if the RAAF is planning its defence of bases on a mechanistic, numerical basis, assuming a ratio of fire of 100 per cent - that is, basing its defences on the number of sentry posts around the base and the number of personnel at each post - then it risks failing to learn from the lessons of other forces, at the expense of RAAF members' lives. If we position people around the perimeter in numbers corresponding to the number of weapons we believe we need to mount, yet fail to recognise that in an engagement perhaps only one in four may use their weapons, we may well find that there are insufficient numbers for our defence. Attention to this aspect of human nature must therefore be given top priority in our training and planning.

The first major steps in the issue of ratio of fire are to recognise that the problem exists, and to make everybody aware of it. Once people are aware of it, training strategies can be devised to address the problem, and policies which take account of the problem can be developed.

People and Readiness

A definition of readiness can be synthesised from the various descriptions in the *Air Power Manual*. This would produce something like 'the ability to undertake operations in a timely manner in response to enemy actions or intentions'. (Additionally, sustainability would be the ability to continue to do so for the required duration.) The Defence White Paper of 1994 (DA94), states that readiness requires high rates of training, near complete staffing, and fully provisioned and maintained equipment holdings.[45]

Of the three factors - equipment, training and personnel readiness - the easiest to assess is the level of equipment readiness, as it is tangible and easily quantifiable. The other two areas are less tangible and assessments are therefore more subjective and qualitative. The problem with this is that in an attempt to make them less subjective, a mechanistic approach is frequently employed. This involves using figures such as number of filled posts, qualifications of those in positions, experience level of personnel, proportion of unit fully trained, and so on.

Evaluating readiness 'by the numbers', however, overlooks the other factors of significance such as the relationships between members and between the unit and other units, as well as other factors such as the level of commitment of the individual members. Research findings show that the mechanistic, quantitative approach, if used as the only guide, results in a distorted picture of readiness. This can result in training, funding and management decisions being focused on less important issues rather than the central ones.[46]

A holistic approach is therefore required, taking into account not only those easily quantifiable factors, but also those which are less quantifiable and more subjective,

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[45] *Defending Australia*, p 31.
[46] *ibid.*

though no less important in determining readiness. These factors will be considered in turn.

Equipment

Equipment readiness is in some respects easiest to quantify because one can count the number of pieces of equipment and the number of people and compare whether there are enough pieces for all the required people to operate, and maintain and replace. There are other factors which can be categorised as relevant to equipment readiness, yet may not be so easy to determine. The policy of equipment being 'fitted for, not with' a particular system enables the RAAF to maintain a reduced level of readiness, supposedly being able to fit whatever new system is required in time to operate it effectively. As our major potential threat is that of a short-warning conflict, this policy is perhaps flawed, and hinders determination of actual levels of readiness.[47]

In order to become operationally ready, consideration would have to be given to the time taken to fit equipment, modify systems, train operators and maintenance staff, and revise and update logistics aspects. To do so in a short time-frame is perhaps unrealistically ambitious. The experience from the Gulf War was that new equipment did not function perfectly when it was fitted - several adjustments were required before it functioned as planned. This consumed time, as did the training of crews to a level where they felt confident in using the system.[48]

Another issue related to equipment readiness is the real level of readiness of those items which are supposedly already at the highest level of operational readiness. When the British forces deployed to the Gulf, the 1st Armoured Division was created by stripping most other tank and artillery units both in Germany and the UK. Regiments left in Germany returned from leave to find that their tanks had been decimated and rendered immobile, their equipment cannibalised so that those going to the Gulf had sufficient parts to make them reliable. Though the units were considered operationally ready (by peacetime standards) in both Germany and the UK, on deployment to the Gulf they had to be transformed to a level of readiness suitable for actual combat.[49] Furthermore, the troops had to complete a strenuous training program once they arrived in Saudi Arabia before they could be considered ready for war.

Scales of equipment can often lead to another problem. Combatants who are used to reduced scales of equipment in peacetime, for cost-efficiency reasons, often find that in a real combat scenario, vast quantities are made available to them. This is something to which they have to adjust, and carrying extra gear or using newer equipment may disturb their normal practices, and hence distract them from how they have been accustomed to operating. At the start of the Falklands War, for example, the British troops, despite being equipped with Blowpipe and Carl Gustav weapons systems, night observation devices, laser binoculars and radar units, discarded them

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[47] Waters, *Gulf Lesson One*, p 119.
[48] *ibid.*, p 298.
[49] McManners, *Scars of War*, p 73.

all because they were simply too heavy.[50] Similarly, the amount of gear soldiers had to carry meant that their pace across the meadows was little more than a stroll.

The important factor in determining readiness with respect to equipment is that there is much more to be considered than simply the numbers available. While this component is easily quantifiable, there are other significant factors which must be taken into account:

    a. system development times and familiarisation times with new equipment, which will affect how quickly a force can respond, as well as affecting the user's level of confidence with it;

    b. scales of issue which are different in peacetime from those appropriate for war, which will affect the people concerned as they have to adjust their normal practices and may experience a number of difficulties with new levels of equipment, such as weight, space, useability, portability and so on;

    c. the ability to field the requisite number of not only items of equipment, but also spare parts in sufficient quantity for war-time operations, which may degrade the overall readiness of the force.

Training

In preparing for combat, the training component also needs to be considered from a more holistic perspective. That is, training needs to prepare our members for combat by simulating as closely as possible the combat environment in which they are likely to find themselves. Exercising and training only one component of the force, or training each part separate from the others, results in no opportunity for exercising the interactions and building the cohesion that will be essential for effective operations. The training must be realistic, arduous and of sufficient length, if the members are to appreciate the combat environment they may have to function in.

Peacetime training must be as realistic as possible, for what might be considered by exercise planners to be relatively insignificant differences between peacetime and war-time routines can have a significant effect on people's performance in actual combat. By way of example, RAF Tornado crews who flew in the Gulf War expressed that their training always focused on **not** releasing the bombs they were supposedly practising dropping.

They [the bombs] are actually designed not to drop in peacetime. If you've been training in peacetime for a practice attack, you've trained not to make that [final] switch - if you do the bomb will come off. So for real, when you do drop the bomb, you've broken the routine, and so stand a good chance of breaking other routines too.[51]

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[50] Charters, Dr David A., 'Lessons to be Learned from the Falklands War', in MacDonald, Brian (ed.), *War in the Eighties: Men Against High Tech*, Canadian Institute of Strategic Studies, Toronto, 1983, p 29.

[51] McManners, *Scars of War*, p 195.

In never using a switch, a pilot, for example, will not know how it operates: is it heavy or light pressure; does it click or is it digital; what is there to indicate that it has operated? Similarly, unless aircrew practise dropping bombs or firing missiles, they will not experience the changing aerodynamics of the aircraft when the weapon is dropped or launched. In situations where aircraft handling may be critical, an unexpected experience could prove costly.

This experience underscores the value of realistic training, and may be extrapolated from bomb release into all other areas involving live-firing. The same may also apply to low-flying, flying at high-all-up-weight, high sortie rates and continuous 24-hour operations. The breaking of one well practised routine could potentially lead to the breaking of others, some of which may concern operational effectiveness and some of which may relate to the safety of the members themselves. In the Gulf War some of the Tornado crews were more concerned about getting the switches right and successfully dropping their bombs than about the Iraqi air defence or the missile alarms.[52]

In order to be more realistic, exercises must also involve 'free-play' scenarios rather than following a script. Giving the opposing commanders latitude to pursue a strategy as they choose emphasises innovative problem solving, and forces them to deal with rapidly changing situations and operating with degraded capabilities.[53] Scripted scenarios may give the impression of competence with respect to certain elements of the force, but lack the unpredictable, confusing aspects which will be a part of real conflict, and hence may disguise the force's real level of readiness.

Personnel

In addition to their integral role in training and equipment readiness, personnel make a vital contribution to readiness in a number of other ways. Going beyond simply having the right number of personnel, and training and equipping them, their willingness to deploy and fight is a prime determinant of readiness. This willingness is, in turn, determined by their values, their personal and family welfare, their level of cohesion and their morale. Because these human factors are not so easily quantified, they have traditionally received less attention than equipment and even training issues, yet they are essential to readiness considerations.

Cohesion has already been dealt with in some detail. Morale has long been recognised as important, evidenced by its inclusion as one of the principles of war. Accordingly, methods for developing morale have comprised part of the curriculum of most leadership training courses for many years. Factors long recognised as contributing to morale include R&R (rest and recreation), provision of sufficient and good quality food, adequate shelter and clothing, and good quality equipment.

These factors have tended to focus on the unit, or the individual as part of the unit, and to overlook the members' 'family' component. This factor is extremely significant in consideration of today's military, and is deserving of special attention.

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[52] *ibid.*

[53] Air Force Manual 1-1, Volume 1, *Basic Aerospace Doctrine of the United States Air Force*, p 18.

The Military Family and Readiness

In terms of military history, the phenomenon of the majority of soldiers being married and having a family is a relatively recent one. In 1913, for example, army regulations in the US strongly discouraged marriage, except in cases where it was considered to be in the public interest, and still with the caveat of 'but the efficiency of the Service is to be the first consideration'. This is thought to have inspired the (now) tongue-in-cheek adage that 'if the Service wanted you to have a wife, it would have issued you with one'.[54] This adage has existed in the services of most Western nations and probably indicates a consistent line of thought on marriage in the Services of the various countries. Traditionally, the role of the military has been to perform a specific mission or set of missions, and as such it has demonstrated little tolerance toward any human constraints which might be perceived as hindering the mission. Members having the extra 'baggage' of a family was often seen as being such a constraint.[55]

The 1960s seem to have been a turning point in the recognition of the significance of family concerns for, in the US at least, this marked the first time when the number of family members of military personnel exceeded the number of military personnel. By 1978, 60 per cent of all military personnel were married. For the USAF, the percentage of members with family responsibilities grew from 33 per cent to 67 per cent in the 20 years up to 1985.[56] Australian figures are harder to come by, but given the similarity of the societies with respect to marriage, they are probably not greatly different.

While this phenomenon is interesting, it would be of little significance to this discussion if it were not also true that the relationship between the member, the family and the military institution contributed to combat readiness. In recognition of the importance of the human component in combat, the US Army established the Walter Reed Army Institute of Research (WRAIR) which, since 1980, has been researching many of the human factors affecting, *inter alia*, the combat readiness of the military.[57] Through many years of research, the institute has established that units, members and families all affect the functioning of each other, and that building strong families through attending to the welfare of not only the member, but also that of his/her family, is 'a cost-effective way of enhancing readiness'.[58]

The WRAIR found in 1988 that 'healthy families keep soldiers alive on the battlefield'. Soldiers who enter combat or deployed situations with existing stresses relating to personal or family issues are 'extremely vulnerable to combat fatigue, panic, poor judgment, and the loss of the will to fight'. Furthermore, the wishes and perceptions of a military member's family have direct effects on the morale and

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[54] Albano, Sondra, 'Military Recognition of Family Concerns: Revolutionary War to 1993', *Armed Forces & Society*, Winter 1994, Volume 20, No. 2, p 286.
[55] Hughes, Roslyn, *Greedy Institutions: The Australian Military and its Families*, A dissertation for Master of Public Administration, University of Canberra, 1993, p 23.
[56] *ibid.*, p 289.
[57] Kirkland, Lt Col Faris R. *et al*, 'Discipline Under Fire', p 57.
[58] Kirkland, Lt Col Faris R., and Katz, Pearl, 'Combat Readiness and the Army Family', *Military Review*, April 1989, p 64.

performance of the member, and indirect effects on soldier commitment and unit cohesion.[59]

In order to ensure that a military force performs to its best, to achieve a qualitative edge, it behoves the leaders and executives to ensure that personal and family problems are minimised, and that unit-soldier-family relationships are enhanced. This is an important realisation - that the relationship is three-way. The relationships between the soldier and the unit, and between the soldier and the family are often considered, but just as important is the relationship between the family and the unit. A dysfunctional home environment, or one in which there is a feeling of antipathy between the family and the unit, can have a deleterious effect on not only the member concerned, but also on the unit. Conversely, a healthy home environment can boost a member's individual performance and also that of the unit. Personal and domestic problems should therefore be viewed as unit problems, as they may affect the unit's readiness and survival in combat.

Family matters affect readiness in another significant way as well. Research over recent decades overwhelmingly indicates that families' wishes and perceptions dictate members' decisions on whether to remain in the Service, and on their level of commitment to the Service. Supportive families and, importantly, supported families, improve retention rates and the level of commitment to the Service.[60] Higher retention rates improve the readiness and effectiveness of the force. The corollary of higher retention rates is lower turbulence, which has the flow-on effect of improving cohesion and competence, as there are fewer 'fresh' members in the unit and a greater level of individual and collective experience. (There is also significant economic benefit to the military because there is a lesser requirement to conduct initial and basic training courses.)

There are two major issues to arise from the evidence relating to families and the military. Firstly, it is vital that a unit's leaders recognise the contribution of its members' families to unit readiness, level of commitment, and retention rate. Unless they realise that supportive and supported families actually enhance the operational capability of the unit, there is the likelihood that they will perceive family issues as incidental to the unit's mission, or even a hindrance to it. Secondly, they must have the skills to be able to develop a positive relationship between unit, member and family, and to foster 'healthy' families. This involves an additional component to their leadership training. Whereas morale is given some treatment in leadership courses, a similar emphasis should be given to family support matters. These, rather than being a drain on already tight resources, can be very cost-effective in improving readiness and retention, and perhaps more so than conventional approaches. The US Marine Corps, for example, reported that family programs were 'almost twice as effective as re-enlistment bonuses in improving retention'.[61] Studies from the RAAF and RAN concurred, stating that although various other factors affected members' decisions on retention, the most important factor was spouse support'.[62]

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[59] Hughes, *Greedy Institutions*, pp 39-40.
[60] Kirkland and Katz, 'Combat Readiness and the Army Family', p 64.
[61] *ibid.*, p 74, Note 33.
[62] Hughes, *Greedy Institutions*, p 31.

In terms of readiness, there are several important lessons for the RAAF. Realistic training - arduous, of sufficient length, and involving live-firing - must be considered not an expensive luxury, but an essential method for achieving readiness. Those forces which have been involved in combat operations in recent years attest to the benefits of such training, which ultimately saves lives. While increasing the level of realism of training is understandably more costly, to reduce the level of realism because of cost rationalisation represents false economy.

The importance of the family cannot be overstated. Though there are many family programs in place, and further advances being made in family welfare issues, the important thing to recognise is that there is an institutional blindness to the contribution that the family makes to operational readiness and effectiveness of the RAAF. Family welfare is critical to readiness and effectiveness, yet many leaders still view family programs as subsidiary, altruistic, or of secondary importance. Such a view is akin to saying that your lungs are less important than your heart! The RAAF and the families of its members both contribute to the successful accomplishment of the RAAF's mission. The family contributes to our qualitative edge. It should therefore be regarded as a part of the RAAF, not apart from it.

People and Stress

Two facts relating to modern conflict are universally accepted: the increasing lethality of modern weapons and the increased intensity of operations have significantly increased the levels of stress faced by combatants; and stress reactions can cause a significant proportion of battlespace casualties. In the light of these facts, it is remarkable that so little attention has been directed towards the problem, either doctrinally or organisationally.[63] Despite decades of research into combat-related stress, instances of which have been known to exist since the American Civil War, it is only very recently that any institutional support has been given to developing a comprehensive doctrine on the prevention and management of it.[64]

Perhaps this inertia towards embedding stress management in military doctrine can be attributed to a lack of understanding of the nature and extent of the problem - no action can be taken where awareness does not exist. It is therefore of vital importance that all members of the RAAF, not just the leaders and medical staff, are aware of what it is, how it manifests, what effect it has, and what can be done about it.

The (developing) ADF doctrine on stress (ADFP 714) uses the term 'operational stress' to encompass all those historical terms (such as shell shock, combat exhaustion, battle fatigue, and so on) as well as the concepts of critical incident stress, acute stress, and Post Traumatic Stress Disorder (PTSD). It gives a rather comprehensive description of the environment which may contribute to stress, which can include 'humanitarian and peacekeeping operations, separation from family, friends or Australian society, combat patrols, combat, exposure to displaced persons camps, massacre sites or major training or road accidents'.[65]

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[63] Wardlaw, Major G.R., *Proposals for the Management of Combat Stress Reaction in the Australian Army*, Research note 7/88, Directorate of Psychology, July 1988, p 5.
[64] At the time of writing, the Australian Defence Force Publication 'ADFP 714 Operational Stress Management' was still in the process of being developed.
[65] Draft ADFP 714, Chapter 1.

Additionally, there are numerous stress factors which are particularly germane for aircrew.[66] In what is an unnatural environment for people - flight - there is always an element of risk, as the environment is very unforgiving. Coupled with the intrinsic stresses of flying in an aircraft are the other mission-related stresses, which include: bodily stresses resulting from high-G manoeuvres; the need for short reaction-times; complex technical systems to manage; information overload; long sorties in cramped conditions; low-level high-speed flight, even at night; and ever increasing levels of technology in anti-aircraft defences. Additionally, the requirement for continuous operations can impose other physical stresses - the F-15E aircrews in the Gulf War, for example, were put on drugs - both 'uppers' and 'downers' - to get more out of them for the critical phases of the war.[67] These and other drugs can have unwanted side-effects as well as producing mental fatigue.

There are also a number of other stress factors of a non-operational type which nonetheless impinge on the psychology of deployed members. These include separation from families, operating longer than normal shifts, expansion of normal duties (for example, adding ground defence duties onto the end of a normal work day), concerns about the welfare of family members left at home, lack of privacy, strange and uncomfortable environment, changed sleeping and working patterns. This list is by no means comprehensive, but provides a glimpse of the range of factors which can disrupt people's lives, and hence induce stress.

Thus, in encompassing the whole gamut of stress factors which can cause people to react dysfunctionally, this paper uses the term 'operational stress casualty' in lieu of 'psychological casualty', except when making direct reference to quoted data.

Typically, a list of normal combat-related stress symptoms might include:

    a. increased muscle tension and perspiration;

    b. reactions of the respiratory, circulatory and urinary systems;

    c. fear and panic;

    d. sensitivity to noise;

    e. sleep difficulties;

    f. irritability, resentment, apathy; and

    g. lethargic or euphoric post-combat moods.

When reactions go beyond these and become so severe as to prevent the person from performing normal duties, he/she may be considered a stress casualty.

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[66] Naturally, there are also stresses which are experienced only by naval and army personnel in their unique environments, but in this document the use of stresses pertinent to aircrew serves as an appropriate example.

[67] Keightley, Squadron Leader Bruce, 'Maritime Aerospace Strategy', in *Air Power Presentations 1995*, Air Power Studies Centre, Canberra, 1995, p 132.

Operational stress degrades effectiveness in at least two ways. Combat-related operational stress reactions can lead to a significant number of stress casualties, and consequently a substantial reduction in the fighting force if the casualties cannot be treated quickly and returned to their normal duties. Secondly, everybody will be affected by their experiences in the operational environment. A large number could be expected to develop symptoms of PTSD if they have been exposed to any stressful incidents. As PTSD often manifests in dysfunctional behaviour over a long term, this represents a further reduction in effectiveness as sufferers are less productive at work and will be required to undergo a lengthy period of psychological assistance. In both cases, the loss of effectiveness can be significant. This can be ameliorated by a comprehensive policy of stress management, which addresses the recognition and treatment of operational stress.

The Incidence of Operational Stress Casualties

In World War II, American casualties from psychological effects accounted for 23 per cent of all casualties.[68] British figures from the 2nd Army Campaign in 1944 show the proportion of stress casualties as 20 per cent of all battle casualties. In the Arab/Israeli conflict of 1967, the number of Egyptian stress casualties outnumbered the number of wounded in action by three to one. In 1973, when the Israelis were attacked first, 900 of the first 1600 casualties had 'no physical injury'.[69] In 1982 Israel was again involved in combat, this time in the Lebanon War, and the proportion of stress casualties from that conflict was 23 per cent.[70] The proportion of American stress casualties in the Korean War was approximately the same (23 per cent) during the initial phase of the war (though this decreased after front-line treatment centres were established).[71]

Vietnam, by comparison, had relatively few cases of 'combat stress reaction', a phenomenon which has been attributed to the relatively low intensity of actual fighting. Veterans, however, exhibited quite a high incidence of PTSD - around 30 per cent, with half of these still experiencing the symptoms today, some 20 years after the conflict.[72]

Figures from the Falklands War and the Gulf War (both, significantly, very short conflicts) reflect a relatively small proportion of 'combat stress' casualties (5-10 per cent), but very disturbing figures on the proportion exhibiting PTSD:

    a. a survey of two British parachute battalions (2Para and 3Para) indicated that five years after the war, 50 per cent of Falklands veterans who remained in the Army 'admitted to symptoms suggestive of PTSD', and another 21.9 per cent 'admitted to symptoms that suggested that they were actually suffering from the full PTSD syndrome'.[73] (As stress sufferers frequently leave the armed

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[68] Lim, B., and Oei, T., *Combat Stress: A Critical Look at Psychological Dysfunction in Battle*, p 1.

[69] Labuc, S., *Stress in Battle: A Commander's Guide*, an unclassified paper for TTCP, September 1987, p 3.

[70] Wardlaw, Major G.R., *Proposals for the Management of Combat Stress Reaction in the Australian Army*, p 12.

[71] Holmes, *Firing Line*, p 260.

[72] McManners, *The Scars of War*, p 370.

[73] *ibid.*, p 402.

forces not long after return from a conflict, there is a reasonable argument that the incidence among those who had already left would be even higher.)

b. Gulf War figures may well be similar to those from the Falklands, as PTSD sufferers continue to emerge - only 12 months after the cessation of hostilities, the British Army alone had more than 500 officially diagnosed cases, with some psychiatrists believing that the number would rise 'exponentially'.[74]

The figures quoted present a conservative picture of the incidence of stress casualties. Many cases have probably been diagnosed as other problems (referred to as 'occult PTSD'), so the figures probably reflect a somewhat lower figure than the real incidence.[75] Furthermore, the real number of stress casualties may be underestimated, as many may also be physical casualties. Some experts believe that, by way of example, many of those physical casualties suffering from trench foot and exposure in the Falklands may also have been stress casualties, 'succumbing while others suffering similar physical problems soldiered on'.[76]

It has been calculated that in conflicts from World War II onwards, around 30 per cent of all casualties have been stress casualties, and most literature suggests that around one in four members of the force (Note: not one in four casualties!) could be stress casualties in future conflicts. The US, incidentally, planned for this figure in their preparations for the Gulf War.[77] This figure reflects the added stresses on today's combatants, such as: greater accuracy and lethality of weapons; higher intensity conflict and around-the-clock operations; and the threat of nuclear, biological and chemical weapons.

Dealing with Operational Stress

The overwhelming body of evidence on treatment of operational stress casualties suggests that early identification and treatment of the problems reduces the likelihood of later reactions.[78] In addition, those who have received treatment quickly and in proximity to the front-line have returned to duty much more quickly than those whose treatment has been delayed or who have been evacuated to a rear area. Furthermore, assessment of their performance on returning to their unit shows that they perform as well as anyone else.[79]

Stemming from the accumulated experience of a number of forces, there is now a widely accepted set of principles for dealing with operational stress. These principles are:

a. *Proximity.* This demands that treatment takes place in a safe place as near to the battle as possible.

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[74] *ibid.*, p 399.
[75] *ibid.*, p 377.
[76] *ibid.*, p 402.
[77] Draft ADFP 714, Chapter 4.
[78] This is a consistent theme through all of the source material used in this section.
[79] Wardlaw, *Proposals for the Management of Combat Stress Reaction in the Australian Army*, pp 17-20.

b. ***Immediacy.*** This refers to the necessity to commence treatment as soon as possible after it has been recognised. (Noting that early recognition is important.)

c. ***Expectancy.*** This relates to the need to impart to the casualty the expectation that he/she will return to normal duties in the near future.

d. ***Simplicity.*** This last principle asserts that treatment should be short and simple, requiring that the casualty be provided with rest, food, sleep, clothes and an understanding listener.[80]

Many forces have adopted a formal structure which embeds these principles into the normal training and operations of the force. The USAF and the Israeli Defence Force both provide noteworthy examples.

The USAF operates a three-tier system. The first level is 'buddy care', where individuals are trained in the recognition of stress symptoms and the initial support and treatment measures appropriate for the situation. If the casualty (often not considered to be a casualty at this stage) does not respond at this level, he/she is referred to the next level - a Battlefield Stress Management Team (BSMT). This team comprises, for example, a psychologist, a psychiatrist, social actions personnel and a behavioural science officer. The BSMT provides a safe place for rest and psychological support, but still in proximity to the battle. The third level operates a treatment program of one to four days, further removed from the battle but still with the notion that the casualty will return to normal duty. Only after this level proves ineffective is the casualty withdrawn to more distant facilities such as a hospital.[81]

The Israeli Defence Force operates a similar tiered system, and incorporates 'psychological first aid' into its basic first aid training, so that individuals can recognise the symptoms of stress reaction in their comrades and treat them accordingly. This is continued throughout their service, so that when they undertake first aid refresher training, psychological first aid is included.[82]

In both cases (the USAF and the Israeli Defence Force), uniformed psychologists are deployed to the front-line (or very near it) with units, and undertake exercises with them so that they can gain an appreciation of the environment in which the unit operates. In the Gulf War, the Royal Navy deployed teams of psychiatrists with each of the ships that sailed for the war zone. They briefed everyone on the lessons, from a psychological perspective, that had been learned from the Falklands, explaining what symptoms to look for and how to deal with them. RAF psychiatrists were deployed to treat aircrew who had been shot down and taken prisoner during the war. These examples illustrate the growing recognition of the significance of the operational stress factor.

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[80] *ibid.*, p 13.
[81] *ibid.*, p 22.
[82] Labuc, *Stress in Battle: A Commander's Guide*, p 5.

Prevention Measures

Everyone will suffer from the stresses imposed during operations; it is only a matter of degree. The aim of prevention measures is therefore not so much to completely eliminate reactions to stress, but to prevent them from leading to dysfunctional behaviour. A secondary aim, having identified an operational stress casualty, is to manage the casualty in such a way as to prevent the symptoms from becoming worse and resulting in longer-term problems.

The fundamental principles in the prevention and management of operational stress are as follows:

a. *Education.* All members of the military need to be educated about operational stress so that they realise that everybody will experience stress reactions, and that this is a normal phenomenon.

b. *Training.* Everybody should also be trained to recognise when someone is experiencing abnormal stress reactions and to administer psychological first aid measures. This needs to be tested and exercised as part of normal first aid training. Leaders especially need to be trained to understand, assess and address the psychological behaviour of the people they are responsible for.

c. *Structure.* The force should incorporate a structured system of stress management at a number of levels. Beginning at the 'buddy' level, each successive level should be concerned with more intense levels of treatment, by more experienced people.

d. *Policy.* The important thing from a policy perspective is to foster the attitude that operational stress reactions are inevitable and have more to do with situational factors than characteristics of personality. Accordingly, operational stress casualties should be considered as no less brave, strong or committed than someone who has suffered an appendicitis attack. Comprehensive support policies should reflect this attitude.

Finally, a summary of the research data indicates that there are some other significant factors which diminish the likelihood of casualties resulting from operational stress: realistic combat training and unit cohesion. Both these factors have already been addressed from an operational effectiveness perspective. It is also significant that they have a substantial effect on the resilience of the unit to operational stress. Realistic training better prepares people for the stresses of combat and enables them to better endure stresses because they are not so unexpected. This process has been termed 'battlefield inoculation'. The data also shows that units which exhibit a high level of cohesion also fare better than others in terms of the incidence of operational stress casualties.[83]

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[83] These findings are iterated in most of the source material, and are also acknowledged by being included in the developing ADFP 714. For articles which highlight the issues of realistic training and cohesion in relation to stress, see: Smith, Captain Arthur M., 'Fear, Courage and Cohesion, *Proceedings*, Volume 120, Number 11, pp 65-69; and Hunter, Edna J., 'Stress and the Combat Leader', *Marine Corps Gazette*, August 1988, pp 58-64.

Implications for the RAAF

Though Australia has had less involvement in combat in recent years than, say, the United States, Great Britain or Israel, it cannot overlook the effects of operational stress for several reasons. Firstly, the increasing range and capability of weapon systems means that our air bases are increasingly likely to come under attack in the event of conflict. Whether people are involved in fighting or simply in working in an area of operations, they are likely to experience stress by virtue of working in unfamiliar surroundings, in unusual circumstances. Everybody in the Gulf War was subject to the stress and anxiety owing to the constant threat of chemical and biological warfare and Scud attacks. Although with the benefit of hindsight these turned out to be relatively minor threats, that did not diminish the levels of stress and anxiety they induced during the conflict.[84]

Secondly, a number of other operations in which the RAAF is involved, such as UN operations or disaster relief, can cause very high levels of stress. The following account gives an indication of the stressful situations humanitarian and peacekeeping operations personnel can be subjected to:

> The killing was going on right under the UN noses. 'They especially took up old women and executed them 15 metres or so from the Australians.' ... The Australians and Zambians, bound by rules of engagement and, in any case, vastly outnumbered, could do nothing ... World War II soldiers who went into places like Belsen saw dead bodies. But these soldiers had actually treated them as patients, played with the kids, and then we saw them killed in the most graphic way. Then we had to count the bodies.[85]

Additionally, there are many other non-operational factors which place stresses on people, whether on deployment or even in their normal workplace.

There are a number of significant issues arising from all this. For example, when planning the number of people to be deployed to a combat operation, consideration must be given to the fact that up to 25 per cent of the force may well be incapacitated due to psychological factors. The current manpower required in uniform equation, however, allows for a total casualty figure of only 5 per cent of the initially deployed force (which is planned to be replaced from the rotation pool after 12 months). This figure seems to have appeared as an 'accountancy' factor, with little consideration of the considerable bank of evidence available on operational stress casualties. To expect such a low figure of casualties of all types seems to be completely out of line with the experiences of other military forces. It would be nice to be optimistic, but the RAAF does not have the network of training or of support programs that other larger forces have. It would therefore seem unrealistic to assume that our personnel would cope many times better than those of other forces with such programs.

What is needed is a realistic assessment of the stresses involved in likely RAAF operations, and to adopt a program of education, training and management which addresses operational stress realistically. Training needs to include psychological first aid measures, and these need to be regularly practised, just as physical first aid is.

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[84] McManners, *Scars of War*, p 190.
[85] Gittoes, George, *The Bulletin*, 6 June 1995, quoted in the draft ADFP 714, Chapter 2.

This includes incorporating operational stress casualties in exercise programs. Education needs to address the attitudinal problems associated with operational stress, and reflected in the organisational lethargy to devote resources to it for so long. Appropriate management incorporates the need to establish a progressive system for assessment and treatment of stress casualties, with the aim of returning people to duty as soon as practicable and minimising longer-term effects. This also requires a commitment to specially trained people to be deployed with units or to the bases. These need not be psychiatrists, but could be chaplains, psychologists, behavioural scientists or medical staff. Yet they do need to be an integral part of any detachment to an area of operations. The USAF and Israeli Defence Force provide models which could be adapted by the RAAF to its own needs.

Other Human Factors

A number of human factors additional to those already dealt with may influence our combat effectiveness. Failing to recognise and address them may result in either reducing the number of available personnel or decreasing their effectiveness. Each of these factors needs to be managed competently if the RAAF is to improve its level of effectiveness by dispelling ignorance and overcoming wasteful practices. Though many of the factors may appear self-evident, our past record in dealing with them would indicate that many of our leaders and managers do not see them as such, or alternatively, do not consider them significant.

Environmental Factors

Deploying to an arid, hot environment (a situation which is not unreasonable, considering the location of our FOBs) may cause higher than usual incidences of sunburn, heat exhaustion, dehydration and so on, especially if members are possibly going to be required to wear NBC suits as well, as was the case for coalition forces deployed to Saudi Arabia in the Gulf War. Even in our own region, we cannot ignore the threat from chemical weapons, which are relatively cheap and unsophisticated, readily available, and favoured by many countries as they provide a disproportionate effect in terms of terror and the need to prepare against them. There is some indication that the threat already exists in the south-east Asia region, so consideration of this added difficulty in our harsh climate is necessary.[86]

In tropical areas, a high incidence of tropical disease is likely. An illustrative example is the deployment of personnel to Milne Bay in World War II: the squadrons involved (75 and 76 SQNs) were deployed without adequate anti-malarial medicines, with insufficient long-sleeved clothing, little mosquito repellent and mosquito netting, and poor procedures for the use of what drugs there were. As a result, nearly a third of the squadron became casualties to the disease, with the medical officer treating 26 casualties in less than three weeks (though this number is considered to be an underestimate).[87]

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[86] Waters, Wing Commander Gary, 'The Gulf War and the Personnel Factor', *Australian Defence Force Journal,* July/August 1992, p 31.
[87] Wilson, David, *The Decisive Factor*, Banner Books, Melbourne, 1991, pp 104-105.

Cultural Factors

Deployments to our FOBs do not pose a major problem for us from a cultural perspective. Overseas detachments, however, may face a number of problems if cultural differences are not taken into account. When deploying to a Muslim area, for example, there are religious and societal differences which could affect how we operate. Planners need to be cautious in selecting dates and times so that they do not conflict with religious holidays or prayer calls, or other significant dates. There are also dietary restrictions which affect our interaction with people of other nations, and we should show an awareness of these rather than causing offence, which can in turn jeopardise the level of support provided. They also have a different view on the role of women in society and what they can do. The coalition forces had to pay considerable attention to these matters during the Gulf War: US forces were granted some concessions by the Arab states with respect to women being able to drive vehicles and dress in their uniforms; the custom of some drivers to hang non-Islamic religious symbols (such as rosary and scapular and St Christopher medallions) in vehicles, while technically forbidden by Islamic law, was tolerated when the US units were well away from populated areas.[88] Such dispensations, however, cannot be assumed for all future scenarios.

Another example comes from the UN experience in Somalia, where Somali culture holds different views on religious and cultural matters. At one stage during the operation, for example, the potential existed for a considerable degree of friction with the local community when the UN team needed to exhume a number of bodies from proximity to a water supply, in order to prevent the spread of dysentery. Psychological operations (PSYOPS) personnel had to spend some time explaining the reason to the Somalis, and give assurances that all due care would be taken and respect offered.[89] Had this action not be taken, the vital support of the local people could have been jeopardised.

Social Factors

An astounding statistic from World War I is that there were 52,528 hospital admissions for Venereal Disease (VD) from the Australian Army alone. As the average duration of each hospital stay was 52.2 days, this constituted 'a serious drain on manpower as well as an added burden on already hard-pressed medical services'.[90] This was supposedly addressed in World War II, when troops were issued condoms to reduce the incidence of sexually transmitted diseases. Figures from Vietnam, however, show that the incidence of VD had not diminished. For the 50,000 ADF personnel deployed to the war, there were more than 11,000 reported cases.[91] Though this averages out at 20 per cent, the rate of infection at times was as high as 478.1 per 1000 per year,[92] and in 1966 almost a third of RAAF servicemen were under

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[88] Freeman, Major General W. D., Hess, Commander R. J. and Faria, Lieutenant Colonel M., 'The Challenge of Combined Operations', *Military Review*, November 1992, pp 4-10.

[89] Wilson, Captain D.J., 'Psychological Operations in Somalia', *Australian Defence Force Journal*, July/August 1994, p 40.

[90] Holmes, R., *Acts of War: The Behaviour of Men in Battle*, Free Press, New York, 1989, p 95.

[91] O'Keefe, Brendan G., *Medicine At War*, Allen & Unwin, Canberra, 1994, p 399.

[92] *ibid.*, p 126.

treatment or post-infection surveillance for the disease.[93] Compared with World War I, very few of the reported cases in Vietnam required hospitalisation, but they still consumed time and resources, and sick parades drew personnel away from their duties for a period of time, thus rendering their units less effective. Certainly, when added to the incidence of other tropical diseases and gastro-intestinal infections, which affected 30 per cent of the RAAF contingent in its first two months in Vietnam,[94] the effect was significant.

Human/Machine Integration

Our defence policy emphasises investing in equipment to strengthen our long-term defence capacity.[95] Traditionally, the acquisition process has focused on cost and capabilities,[96] tending to overlook factors such as how easy it is to maintain and how user-friendly the equipment is. The focus on hardware without also considering human factors can result in a number of problems, as evident in some recent Australian examples:

    a. *Night Vision Goggles (NVGs).* There are a number of physiological factors related to the operational and continued use of NVGs. These include lack of depth perception, headaches, blurred vision and visual confusion. Difficulties such as these are bad enough with binocular NVGs, but are expected to be even greater with monocular ones.[97] These types of effects could well contribute to safety problems as well as diminished operational effectiveness.

    b. *Blackhawk.* The policy decision to change the seating arrangement for the Australian Blackhawks from that used by the US forces resulted in decreased legroom and a change in the rake of the seats. It also made the loadmaster's task much more difficult and introduced a number of occupational health and safety issues, such that 'there are significant implications for the safe conduct of operations'.[98]

    c. *Seahawk.* During the development and acquisition phase for the RAN Seahawk, the decision on crew and equipment levels meant that, since no automatic reloading device for the sonobuoy launcher was fitted, operational effectiveness was compromised.[99]

These examples support the assertion that many acquisition and configuration decisions are made on the basis of cost or hardware capability, rather than on useability or ergonomics. The problems which arise emphasise the fallibility of a mechanistic approach rather than a holistic one.

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[93] *ibid.*, p 241.

[94] *ibid.*

[95] *Defending Australia*, pp 32, 55.

[96] Earnshaw, Paul, 'Economic Aspects of Defence Acquisition', *Australian Defence Force Journal*, September/October 1993, p 17.

[97] From a draft paper prepared by the Defence Human Sciences Interim Steering Group, 27 September 1996, pp 2-3.

[98] *ibid.*, p 3.

[99] *ibid.*, pp 3-4.

In the late 1980s, the US Army recognised the significance of the human factor in determining the capability of equipment, and instituted a program, termed 'MANPRINT', aimed at integrating manpower, personnel, training, human factors engineering, health hazards and system safety considerations into the acquisition process.[100] It focused on 'soldiers using the systems, rather than the engineering specifications that reflect primarily the hardware capability'.[101]

Another factor which will steadily take on increasing significance is the management of information. Higher levels of technology will be able to provide information of higher quality and in greater quantity than ever before, and be able to disseminate it more widely and quickly. The factor which will determine the worth of an information system will be how people are able to use the information, for more will be available to them than they can manage at one time. Leaders must therefore understand that information is not the critical component, but how people are able to use it.

How the person integrates with the technology is at least as important as the level of technology of the equipment itself. Leaders must ensure that the human factor is considered in all decisions regarding the acquisition, development and use of equipment in order to derive its full capability. This is beginning to be realised in the ADF with the establishment of a Human Sciences Interim Steering Group in 1996. If the ADF is committed to achieving a qualitative edge, then this initiative must be fully supported and given the resources required to investigate the human factor in our defence capability.

Alcohol

It is difficult to determine the full extent to which alcohol contributes to a degradation of the RAAF's effectiveness. The reason for this is because so few resources have been devoted to research on it, that there is little data. Furthermore, the effects are insidious, in that problems which arise are often not recorded as alcohol-related. For example, hospital admissions record symptoms rather than causes: a patient with liver problems is reported as having liver problems, not 'liver problems stemming from use of alcohol'; one admitted with an injury is recorded as having an injury, not 'having an injury sustained as a result of being under the influence of alcohol'. Discipline problems, family problems, depression and other stress symptoms, all of which affect our productivity, retention, readiness and effectiveness, may in many cases have stemmed from alcohol-related issues, yet not be recorded as such. Like 'occult PTSD', there is also a degree of 'occult alcoholism'.

As the RAAF has not embarked on a program to determine how it is effected by alcohol, it is worthwhile to review some figures from the general community and the Navy, which sponsored a project in 1994 to research the extent of alcohol and drug use of its members.[102]

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[100] Zelko, Marjorie, Adams, Lieutenant Colonel Curtis H., and Braun, Colonel Bruce A., 'Manprint', *Military Review*, April 1989, p 23.

[101] *ibid.*, p 29.

[102] 'Bold Strokes and Long Marches: Addressing Alcohol and Drug Issues in the Royal Australian Navy', Australian Drug Foundation Report, December 1994.

Firstly though, the ADF's Alcohol Rehabilitation Program (AREP) at Richmond treats no more than around 150 people Service-wide each year. This is considered to be the 'tip of the iceberg' in terms of the extent of the real problem, especially when considering figures from the general community. In our society, five per cent of the community are classified as 'dependent on alcohol', with a further 20 per cent considered 'misusers'.[103] In extrapolating these figures to the RAAF, which has a population of, say, 16,000 people, then we would expect that if we mirror society in our usage of alcohol, there would be 800 RAAF members dependent on alcohol, with a further 3,000 classified as misusers.

Figures from the Navy survey show that alcohol use was actually 'markedly more than the general community' in many of the survey items, and that 'it is accepted that a strong culture of alcohol use remains'.[104]

There is no evidence to suggest that the RAAF is any more responsible in its approach to the use of alcohol than the Navy or the general community. One must therefore assume that there are a significant number of members who either misuse alcohol or are dependent on it. It is widely acknowledged that in both these situations, work performance suffers, and the potential for accidents rises.[105] Accordingly, the RAAF's effectiveness suffers. But it is not only the organisation that suffers - individuals who misuse or abuse alcohol also suffer from the detrimental effects on their physical health, their self-esteem, their life expectancy, and their quality of life, including relationships with their family and friends.

A further contributing factor is that there is a tendency for people during deployments and operations to turn to alcohol out of boredom or as a reaction to stress, and they often consume more than they would otherwise if they were at home. The incidence of loss of productivity and the potential for accidents is therefore increased in these situations.

One of the few figures available for the RAAF is that an estimate of the loss of productivity for the RAAF annually is 290 person years.[106] That is equivalent to nearly 300 positions being vacant each year because someone is either sick, injured or ill through alcohol-related factors. Some units may be aware of their own level of use or abuse of alcohol, but consider it their own business, and thus there is no overall RAAF picture.

There are, of course, many instances where absences or inability to function at work are covered up by work colleagues or section commanders, or are excused for one reason or another. The case of 'the morning after a dining-in night' serves as an example of the latter.

Briefly then, there is a significant problem for the RAAF in terms of degraded effectiveness through alcohol-related issues. Furthermore, there is no institutionalised mechanism for determining the full extent of the problem, which makes combatting it

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[103] Telephone interview with Dr Helen Parsons from 3RAAF AREP, 22 May 1996.
[104] 'Bold Strokes and Long Marches', p ix.
[105] Reflected in DI(AF)PERS 4-14.
[106] Minute 'Resource Implications of Alcohol Intervention Program', reference AF90/31481 Pt2(52) of 10 October 1995, from DGPM-AF to DGPERS.

almost impossible. It is a problem which needs to be addressed if we are to capitalise on our human resources, which determine our effectiveness.

MANAGEMENT OF THE HUMAN FACTOR

The Military Management Paradigm

The roots of modern military management can be traced back to the influence of Frederick the Great. In the 18th century, Frederick revolutionised the army by introducing reforms which served to reduce his soldiers to the level of automatons. His aim was to shape the army into 'an efficient mechanism operating through means of standardised parts'. As a means of achieving this he: introduced ranks and uniforms; extended and standardised regulations; increased specialisation of tasks; used standardised equipment; created a command language; and introduced systematic training which included drill.[107] These reforms allowed him to forge the 'parts' of the army machine from any raw material, and to easily replace them when needed.

The late 18th century also saw the beginnings of the Industrial Revolution, characterised by the invention and proliferation of machines. Many of Frederick's ideas and practices were appealing to factory managers as they helped them in solving problems associated with the design and development of factory organisations. Frederick's vision of a mechanised army 'gradually became a reality in factory and office settings as well'.[108]

The mechanistic approach to the military and industry alike predominated throughout the 19th century, but was not codified into a comprehensive theory of organisation and management until the early 20th century. A major contributor to this was Max Weber, who noted that the bureaucratic form routinises the process of administration exactly as the machine routinises production. The proponents of classical management theory and scientific management theory elaborated on Frederick's ideas and were strong advocates of Weber's model of bureaucracy (though he himself expressed concerns about its effect on people). The organisations they designed and the jobs people performed were designed exactly as though they were machines.

This mechanistic, bureaucratic organisational form has been the prevalent form of organisation and has dominated management thinking for most of the 20th century. Many organisations are still structured along those lines, and many 'new' management initiatives are aspects of classical management disguised in modern terminology.[109]

The RAAF, for example, can still be characterised as a 'classical' bureaucracy, displaying six of Weber's main features of a bureaucracy. [110] It is also guided by an

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[107] Morgan, Gareth, *Images of Organization*, Sage, Newbury Park, CA, 1986, p 24.
[108] *ibid.*
[109] *ibid.*, pp 28-29. Examples of these will be dealt with at greater length in subsequent discussion of issues in management.
[110] Stoner. J., Yetton, P., Craig, J., and Johnston, K., *Management* (Second Edition), Prentice Hall Australia, Sydney, 1994, p 39.

'impersonal rationality', where interactions are 'between office-holders, not personalities'.[111] In fact, the RAAF, like most Western military organisations, provides almost a textbook example of a large bureaucracy. It has long held an image of itself as a technological organisation, run by technicians and using leading edge technology. It has long used the machine metaphor in its image of itself and in the way it describes itself. It is therefore hardly surprising that the bureaucratic, mechanistic model has become such a deeply embedded part of RAAF management culture.

Bureaucracy was a very effective method for assisting the transformation from an agrarian-age society to an industrial-age one. It aligned the needs of the emerging industrial age with the level of readiness of the people. They were undereducated, unaccustomed to machines, and unfamiliar with organised work practices. Bureaucracy enabled managers to 'fit' the people into the factory environment.[112] Today, however, the populace no longer needs to be trained in the ways of an industrial age. Our society is well-educated, and well-accustomed to the technological advances and machines which do much of our work for us. Robots now replace people in many factories, and people are increasingly using information rather than tools. Furthermore, massive urbanisation and communications media have made us 'quite conscious of the underlying concepts of bureaucracy and life in the industrial era'.[113]

Notwithstanding the many changes which have occurred in our society in the past half-century, many of today's organisations still flourish using the bureaucratic form. The McDonalds restaurant chain is a prime example. In many respects, the operation of McDonalds, and a large number of other fast-food outlets, can be considered a production-line. The restaurant's operation resembles more a factory than the image traditionally conjured up by the term restaurant. In this respect, McDonalds is well suited to a bureaucratic structure and the principles of scientific management.

So too are many other organisations whose operations are essentially machine-like. That is, there is a straight-forward task to perform, the environment is stable, one wishes to produce the same product time after time, and the human parts of the machine are compliant and behave as they have been designed to do.[114] Some organisations which satisfy these conditions might include motor vehicle assembly-lines, franchises, finance offices, and so on.

But the changes in our society are enormous. Our populace is much better educated today. Tertiary qualifications are commonplace and people, through the extensive communication media, are more aware of current affairs at local, regional and global levels. Information is available instantaneously.

People today have an expectation of a better quality of life, they are more questioning of authority, display a greater awareness of human rights and dignity, and greater concern for the environment. Equity, Occupational Health & Safety, Work Place

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[111] Hales, C.P., *Managing Through Organisation*, Routledge, London, 1993, p 93.
[112] Nirenberg, John, *The Living Organization: Transforming Teams into Workplace Communities*, Irwin, Burr Ridge, Illinois, 1993, p 22.
[113] *ibid.*, p 24.
[114] Morgan, *Images of Organization*, p 34.

Bargaining and Industrial Relations issues typify the greater emphasis on the human side of work. People are less inclined to put up with being treated as a cog in the machine.

There is greater demand and competition for highly educated workers, and a greater number of families where both partners work. Employment packages need to be more attractive and flexible, and take greater consideration of parenting and family concerns.

Technology is also undergoing a fundamental transformation. There is a shift from mass-produced same-ness to mass-produced differences (responding to the market desire for individuality); from wealth in owning assets to owning processes; and from technologies of optimisation to technologies of adaptation. [115]

Warfare, too, has changed. The increasingly sophisticated technology requires people who are more highly educated and more highly trained to operate and maintain it. The vast amounts of information which can be delivered in near-real-time require people to be able to process it and respond quickly, at all levels. The greater accuracy and destructiveness of weapons means that rather than massive accumulations of forces, dispersal into smaller groups with greater autonomy will be the norm. This is facilitated by more effective communications systems. As 'high-tech' systems are acquired by many nations, it will be the innovative application of these systems which gives an edge to one side or another.

The requirements of modern combat are incongruent with the strengths of the bureaucratic organisation. The battlespace is not the stable, predictable environment in which the bureaucracy functions best. Success is determined by flexibility, adaptability and responsiveness, not prescribed, predictable actions. Battles rarely go 'according to the text-book', so innovation and a unique approach to particular circumstances is required.

It would appear, therefore, that from both a peacetime organisational perspective and a combat perspective, the bureaucratic, scientific-management-based organisation may not be the most appropriate form of organisation for the RAAF of today or the future. Now it seems anachronous - yet it endures. This not to say that the RAAF has ignored all other management theories. It has incorporated elements of other management styles into its management repertoire.

'RAAFQ',[116] for example, was implemented and credited with achieving significant efficiencies. In one instance, F-111 deeper-level maintenance at 501 Maintenance Flight was reviewed, practices modified, and the maintenance time subsequently reduced from 41 weeks to 20. In another case, supply and storage of aircraft tyres was reviewed, and the resulting modification of practices produced a saving estimated at $1.9m recurring.[117]

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[115] Kelvin, Kelly, 'Organic Matter: The Growth in the Machine', *The Bulletin*, 3 October 1995, p 42.

[116] The term RAAFQ was used until 1994 to describe the RAAF's adaptation of Total Quality Management (TQM) - a widely known theory embracing participative management. From 1994 it has been accepted as such a part of normal culture that there is no longer any requirement to refer to it as a separate methodology.

[117] Information supplied courtesy of RAAF Directorate of Management Services, November 1996.

Personnel matters have greater prominence than ever before, and there exists a vast personnel organisation within the RAAF, dealing with a wide array of issues. The value of people in achieving the RAAF's mission is increasingly recognised. Attending to the human element of the organisation pays dividends not only in economic terms, but in operational effectiveness. This will increasingly be the case as we move into an information age, where knowledge-workers will be the power brokers.

Yet there are still deficiencies in our personnel practices, and 'better management of our personnel' remains a concern throughout not only the RAAF, but the whole of the ADF. In order to improve our management practices and the way we implement programs, particularly those which relate to the human factor, we need to adopt a more holistic approach. Our current image of ourselves, and whole ethos of management are in need of up-dating.

This involves more than simply reviewing our personnel policy and practices. While these are necessary and beneficial, such reviews treat the symptoms, but do not address the cause of the problem. Accordingly, a new conceptual model is in order.

A Conceptual Model

A change is needed at the conceptual level because many of the problems stem from the whole way in which we view ourselves, a product of our collective conditioning and ingrained beliefs. This concept of ourselves enables us to function and maintain the *status quo*, but also constrains us in our thinking and problem solving. New initiatives tend to be grafted on to our existing system. We are in many ways trapped by the comfort and security of our current system, preferring to modify things than to throw them out and adopt new ones. We are reluctant to chart new waters, much like Columbus' peers of the 15th century.

In order to resolve problems arising from our current conceptual basis, we need to be able to remove our conceptual shackles and look at ourselves in a new way. Our problem is not so much that our concept is faulty, but that it is anachronous and no longer aligns with the needs and circumstances of today or for the future. In leading to the new conceptual model, it is worthwhile briefly reviewing our conceptual alignment.

The Technologist View of the RAAF

The most prevalent view of the RAAF has been through the lens of technology. Since its inception, the RAAF has portrayed itself as the technological service. It has always led the other services in leading-edge technology, and aircraft have always had an enormous public profile through air shows, ceremonial flypasts, displays of formation flying and the like. The majority of recruiting advertisements have also focused on or featured aircraft.

The time of the RAAF's inception coincided with the popular acceptance of scientific management and bureaucratic principles, and the highly prominent mechanistic metaphor. Not surprisingly, the image of the RAAF was that of aircraft, weapons systems, air bases, equipment and assorted hardware. The metaphors and language

related to the RAAF as a machine, and the organisation was engineered accordingly. People were viewed as 'cogs in the machine', or treated as numbers or statistics.

This view of the RAAF was appropriate for the times and the nature of society. Technological advances were still of an industrial nature (compared with today's advances which are increasingly informational), so the machine concept and subsequent management style were well aligned. Society's expectations of employment and management were consistent with the bureaucratic model, and the profile of the employee was quite predictable - all factors which supported the contemporary concept of the RAAF.

The problem, as discussed earlier, is that this view leads us to focus on machines at the expense of people, resulting in a number of people-related problems. This view has, however, endured in many areas. Our task-oriented, specialised approach engenders the view in many of those whose area of expertise is focused on the technological aspects of the air force - engineers, pilots and maintenance staff for example.

The Reductionist View of the RAAF

The influence of the human relations movement led us to focus more on people, yet our concept of management was still firmly rooted in the principles of Newtonian science. That is, a science of reductionism, predictability and order. This was reflected in our management practices and policies.

People who view the RAAF through this lens still manage essentially by the scientific management method, treating members identically, and instrumentally - that is, on the basis of what contribution they could make to the organisation. Personnel functions have neither been integrated with each other, nor into strategic considerations. The important point is that in this view, the RAAF is seen as being comprised of people, but they are all essentially identical, they all behave in a predictable, reliable manner, and they all have the same needs and desires. Policies are developed accordingly - to deal with the 'typical' RAAF member. What this view fails to recognise is the individuality of each member, and the synergy derived from the relationships between them, and between them and the organisation.

This reductionist approach gave rise to the perception of personnel problems as being separate from the main business of the RAAF. Management initiatives attempted to address personnel problems, but achieved only partial or temporary success because they dealt with symptoms, rather than the root cause of the problems. As Newtonian science has been found to be incapable of dealing with quantum physics, so too the reductionist approach is unable to cope with the myriad changes occurring in the late 20th century. The concept of the RAAF being comprised of 17,000 individuals who behave identically, predictably, efficiently and who have the same needs and desires is obsolete. A new concept which embraces the principles of relationships, diversity and unpredictability is needed - a holistic view.

A Holistic View of the RAAF

Rather than being identical, each member of the RAAF has a unique set of interests, commitments, skills, beliefs, and so on. It is the product of all these factors which determines their personality, and also defines the way in which they will respond to situations and to other people. These traits and interactions determine how the people function within the RAAF, and hence determine the RAAF's capability.

But the RAAF does not exist simply as an aggregate of people; rather, it exists as a part of each member. That is, within each person is an element which is devoted to the RAAF - but this is not the sum total of that person's humanity. Each person may be a parent, a son or daughter, a sportsperson, a musician, a writer, a member of a club or association, as well as being a specialist whose technical skill set then defines their role in the RAAF.
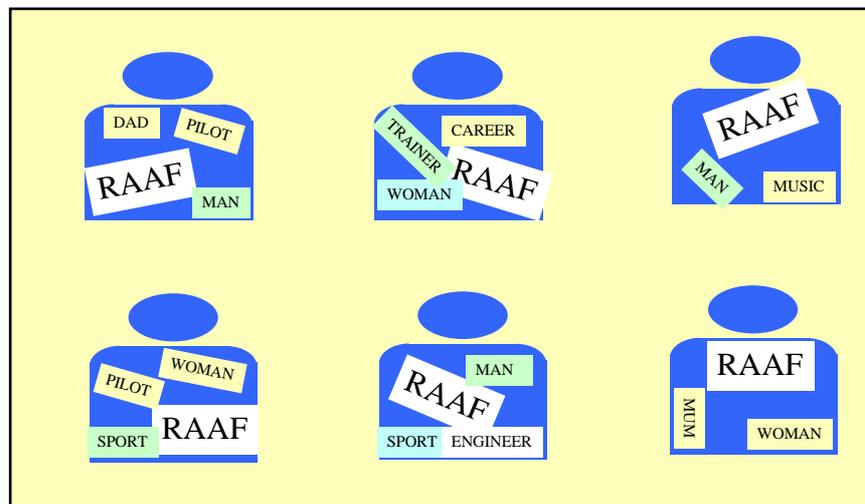

Figure 1 -   The RAAF (Holistic view)

A holistic view recognises that a person is not exclusively a RAAF member, and is not necessarily even primarily a RAAF member. All members, however, devote some portion of their existence to the RAAF. That a component is allocated to the RAAF is the feature common to each member; the other factors are unique.

Each person is unique, but by virtue of part of each person being devoted to the RAAF element, each shares a certain commonality with the rest, and is prepared to conform to particular standards and behaviours: wearing uniforms, having certain standards of haircut, maintaining a certain level of fitness, accepting postings to different areas, and so on. The RAAF can affect that part of the person which s/he is prepared to allocate to the RAAF, but exerts little direct control over the other parts.

This model, though seemingly uncomplicated, represents an immense change in conceptualisation of the RAAF. The RAAF changes from being an extrinsic force holding people together or containing them, to being an intrinsic factor, created and held together by the shared beliefs of many, many people. It is a mind-shift of the

same order of magnitude as changing our belief system from a geocentric universe to a heliocentric one: although the day-to-day observance of events is the same, the underlying philosophy and knowledge produces enormous differences in explaining behaviour and predicting outcomes.

The model illustrates the individuality of each member, and the diversity of the total work-force, for each figure is different. It emphasises that the RAAF is created by people, and that its form is determined by their inter-relationships. It represents each individual and each relationship as unique, and varying with time.

A Holistic View of the Individual

As discussed, each individual in the RAAF has a complex nature, with various elements having differing levels of importance attached to them by the individual. Typically, but not exclusively, members will have various interests, loves, responsibilities and hobbies which pull them in different directions at different times. This can be represented as a 'Holistic Compass', with the various directions corresponding to various elements comprising the whole person. This is represented at Figure 2.
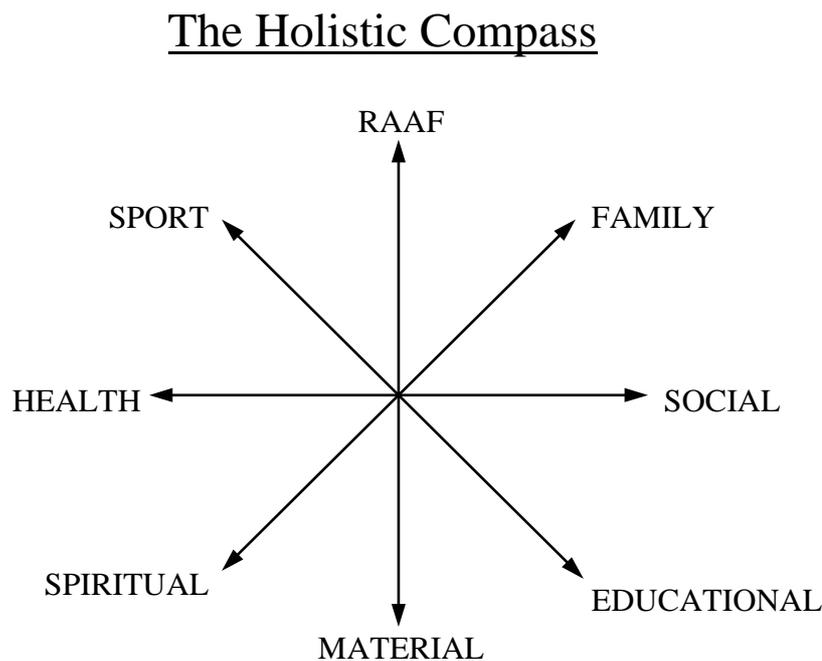
The Holistic Compass

Figure 2 - The Holistic Compass

Each person will be drawn in different directions to differing degrees, according to circumstance, upbringing, ambition, family situation, and so on. Where one member may exhibit a strong interest in the RAAF axis, another may be less RAAF-oriented, and more materially motivated. Both perform their job well, but for different reasons. Again, where one person may be strong on the social axis (enjoying the RAAF for the company and social activities), others may be more family-oriented (enjoying the RAAF for a stable job and good conditions of service). Every member will have a

unique 'plot'. People who are driven passionately by any one factor will tend to have a 'spike' along one axis. People who are balanced in all aspects of their lives will tend to have more circular plots.

Importantly, a person's plot is not immutable. Changing circumstances will result in changed emphasis on one or other elements. A person who becomes a parent may well exhibit a diminished RAAF emphasis with a corresponding increase in family element. Someone may have been quite content for years as a non-commissioned officer, then apply for a commission and 'spike' in the material direction, encouraged by the lure of greater financial benefit. While everybody's plot is unique, it is also changeable. A graphic representation, therefore, is only a 'snapshot' of a person's plot at that particular time.
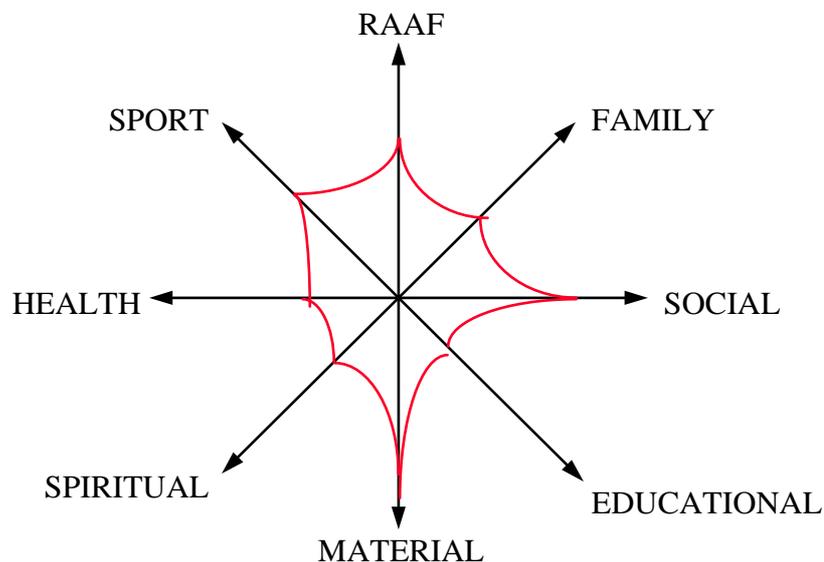
The Holistic Compass

Figure 3 - The Holistic Compass - A Typical Plot

The profile of the person depicted, which is purely an example, is that of a person with a primary interest in the material aspects of life, which may give an indication that money and career are the main motivating factors at this point. Social, RAAF and sport elements are also strong, possibly suggesting that the person enjoys the camaraderie aspects of work and life. Family, health, spirituality and education are given less weighting in this case, although these factors may change with age, marriage, illness, or a host of other causative factors. Importantly, the plot is not prescriptive, but is indicative of the almost infinite variety of combinations of factors in a person's life. This contrasts with the scientific management model of people as parts of the machine, and even the human relations model, which tended to focus on the person's working life only.

It is also important to realise that the various elements depicted do not comprise an exhaustive list - many more can and do exist. The elements chosen are simply representative of what might be considered a balanced life-style. It is also important to remember that the elements are inter-dependent and inseparable. The overall product is rather like a chocolate pudding: individual ingredients can be identified as sugar, flour, water, milk, cocoa, eggs and baking soda, but in the end product, these things cannot be separated. They all blend together in the final product. So too with people. The final product - the individual - is a product not just of the component elements, but how they interact and bond together. To extend the analogy a little further, trying to separate the constituents of the pudding is futile, and attempts result in something other than a pudding. Likewise, the things that make up a person's *esse* cannot be separated from each other and treated individually, for each affects the other in some way.

These holistic images of the RAAF and the people who form it contrast with the former mechanistic, reductionist views. Accordingly, we now need a management concept which aligns with the holistic concept of the organisation.

Towards a Holistic Concept of Management

The problem, from a management perspective, is that the RAAF bureaucracy tends to apply the one 'RAAF Template' to all of its people. The legacy of a utilitarian, mechanistic heritage, the RAAF template generally resembles a spike in the RAAF axis, simultaneously much less pointy in other axes which are perceived as not directly contributing towards RAAF operations. This perception reflects the reductionist philosophy inculcated into our managers, separating members from the other non-RAAF elements in their lives which are seen as not being directly work-related. People are managed by making them 'fit' the organisation. This would be illustrated on the holistic compass by an incongruence between the member's plot and the RAAF template. Traditionally, the expectation is that 'the bits that don't fit' the template are irrelevant to RAAF operations, and members would be expected to compromise their lifestyle, values, interests or ambitions. Managers usually justify this with the familiar catch-cry 'the needs of the Service must come first'.

The holistic concept of management, by contrast, emphasises that it is the whole person that determines how that person operates within the RAAF. It recognises that expecting people to sacrifice elements of their being will result in decreased motivation toward the organisation, or decreased performance in the job through 'push-back'.[118] Complementing this is the awareness that attending to the personal needs of each individual benefits the organisation as well in a number of ways, such as increased levels of commitment and greater likelihood of retention.

It also recognises that the organisation exists not as an assemblage of hardware or even people, but as a complex fabric of the belief systems and values about the

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[118] The term 'push-back' is widely used in leadership and management texts to refer to the resistance of people to imposed change. Push-back strategies include minimum performance, sabotage of success, begrudging compliance, creative avoidance of work, and so on. This topic is dealt with extensively in the Investment In Excellence program, developed by The Pacific Institute and widely used by the RAAF in the late 1980s and early 1990s.

organisation that are shared by the people concerned. The relationships between them, and with the organisation, are as important as the individuals themselves.

Organisations which have embraced a holistic approach to management exhibit certain behaviours and display particular attitudes, related to: organisational self-image, individual complexity, empowerment and service attitude. These are described below.

Organisational Self-Image

In the holistic organisation, recognition that people constitute the organisation and determine its effectiveness is reflected in the language used in policies, in documents and in general discussions. Greater reference is made to 'the people that make up the RAAF' as opposed to 'the RAAF', having the effect of humanising as opposed to de-humanising our image. Phraseology such as 'people who are interested in ...' as opposed to 'members who are interested in ...' has a similar effect. We have embarked on an education program relating to 'gender equity' and how language should be used in such a way as to avoid subordinating the role of women. In holistic management, 'human equity' in language is a concern - people are not to be subordinated to abstraction and language. Officialese like 'It is the opinion of this office that ...' is replaced by a simple, humanistic 'I believe ...'. Managers manage 'from the first person', grammatically speaking.

The careful choice of metaphors and myths promotes the image of the organisation as a complex human system rather than a piece of equipment. Human factors are given prominence in decisions about finance, acquisition, training, logistics and operations.

Furthermore, the holistic organisation uses pictorial representations which make a point of including people. (The vast majority of publications about the RAAF and its history include photographs of various aircraft types, and discuss roles, campaigns, squadrons and particular battles without mentioning people at all.) Recruiting drives focus on people rather than simply, say, aircraft.

Individual Complexity

A holistic management philosophy recognises the complex nature of each individual, and that it is the whole person that determines the level of job performance and commitment to the organisation, and hence the overall effectiveness of the organisation. This involves a recognition of the importance of all the elements of the holistic compass, and of the importance to the organisation of each person having a degree of balance in their life.

Empowerment

The holistic approach to management encourages people to participate more in the decisions which affect them, and recognises their contribution. In this approach, objectives and vision statements are not imposed from upon high, but are developed in consultation with the people involved in implementing them. Frequently, vision statements are developed by one or two senior executives and then handed down the chain. These evoke compliance rather than commitment. The holistic approach is to

develop a shared vision, which represents the visions of all people concerned. Commitment will only be achieved when each person has some ownership of the vision. Otherwise it becomes 'your vision, not my vision'. Each person has a unique perspective of the organisation, and contributes that vision to the whole. It is somewhat like a hologram. If a holographic image is broken into pieces, each piece contains an image of the whole, but each piece is unique - it contains a view of the whole from a slightly different angle. It is only when all the pieces are put together that the full image, from all angles, appears. The organisation therefore makes extensive efforts to seek each member's vision of it.

Power, in the holistic approach, is not exercised by virtue of position. Self-managed work teams are encouraged, as are higher levels of autonomy, so that decisions do not have to be 'rubber-stamped'. Managers view power differently: not as personal 'power over', but as a collective 'power to'.[119]

Service Attitude.

This indicator refers to the attitude of providing a service to customers, rather than administering a system of rules and regulations. The focus is on 'how can I assist you' rather than on 'do you meet the criteria'. This aspect is perhaps one of the most challenging for those conditioned to the bureaucratic method of management, as the inherent power differential is diminished. Instead of telling people what they can or cannot do or have, the new ethos is to enable them to do or have something. Managers become accountable to the managed. This philosophy is becoming more evident in many civilian organisations. It is exemplified by the Melbourne MET (Metropolitan Transport) in 1996, which embarked on an extensive campaign to publicise that it was 'changing from a public transport *system* to a public transport *service*'. But this is not only appearing in civilian organisations - the USAF Personnel Directorate, for example, also encapsulates this philosophy in its Vision Statement:

> Air Force *people* providing responsive personnel policies, programs and *service* - building the world's best air and space force.[120]

The full statement also includes the elaboration that 'Air Force people' is a deliberate choice of terms, which recognises who the USAF really is, and that the USAF's mission will be supported by 'continuously improving the capability and quality of life of our people'.[121]

Key principles of the holistic management concept are:

a. the use of language, metaphors and images to portray the organisation as a human enterprise;

b. the recognition of the complexity of the individual, and the effect of the whole person on all work-related issues;

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[119] Hales, *Managing Through Organisation*, p 43.
[120] Air Force Personnel Beyond 2000, USAF Home Page, Internet, 11 July 1996, p 1. My emphasis in italics.
[121] *ibid.*

   c. the notion of mutual gain, whereby assisting the individual to meet his/her needs directly benefits the organisation;

   d. an emphasis on enabling and empowerment rather than control and direction; and

   e. an attitude of management providing a service rather than a system.

These principles represent a substantial change from those scientific and bureaucratic ones on which the RAAF's current management practices are founded. The model of management which stems from these principles is contrary to the traditional military model of authority, control and hierarchies. It resembles more closely a football team: a collection of people with individual strengths and weaknesses (but no-one more important than any another); mutual respect for each other; helping each other with encouragement and communication; and working towards a common goal, yet fulfilling their own needs in doing so.

Future Directions - Enabling It To Happen

As has been the case for the many management initiatives which have been implemented in the past, the success of any new concept will depend on the manner in which it is implemented. The methods used in the past are inappropriate. The existing structure and philosophy of the organisation are so deeply ingrained that anything grafted onto this structure will only be partially effective. A complete overhaul is required.

The clue to success in this issue - management of the human factor - lies in the cause of the problem, namely the invisibility of people in the history, the policies and the self-image of the RAAF. Our technological, operational, mechanistic focus has served us poorly with respect to putting people foremost. Recent aphorisms such as 'people are our most valuable asset' only pay lip-service to the issue when the policies, the metaphors, the imagery and the very language we use express the opposite. It seems ironic that *The Air Power Manual* acknowledges on one of the early pages that 'irrespective of the type of conflict or the weapons used, wars are won or lost by people'[122] yet 'personnel' are not discussed, other than incidentally, until Chapter Twelve. Likewise, the DA94 states that 'people are fundamental to all our defence capabilities',[123] but are not discussed until Chapter Six.

What we need to do is create a culture where people are put foremost, as one would expect an organisation to do with its 'most valuable asset'. After all, 'the one asset possessed by an Air Force that actually appreciates rather than depreciates over a period of time and operations is people'.[124] This involves putting them foremost in: the language and the metaphors we use; our training courses at basic and post-graduate level, as well as external courses; our doctrine; and our policies and practices and their underlying philosophies.

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[122] *The Air Power Manual*, p 6.
[123] *Defending Australia*, p 57.
[124] Mason (RAF), Air Vice-Marshal R.A., quoted in Wythes, Wing Commander P.J., 'Determining the Cost of Personnel Wastage in the RAAF', *Australian Defence Force Journal*, July/August, 1991, p 33.

Steps towards putting people foremost in our language and metaphors, training courses, and policies and practices are discussed at considerable length in *The Power of Many*. [125] The rest of this paper takes the topic of 'doctrine' as but one example of how greater focus on the human factor can be achieved systemically.

Doctrinal Issues

Doctrine is defined as 'the fundamental philosophy concerning the employment of a defence force'.[126] RAAF doctrine expounds a number of maxims and imperatives which provide guidance on how we apply air power. The maxims are universal guiding principles, whereas the imperatives are more specific points of emphasis to which the RAAF has to devote attention 'in order to best achieve the objective of air power'.[127] As in many of our current policies and beliefs, our doctrine too, exhibits the fundamental problem of lack of emphasis on the human factor which has been highlighted. As doctrine forms the guiding principles for our employment of the force, it is therefore a particularly worthwhile subject of review with respect to human factors. As the effective management of the human factor is fundamental to our ability to apply air power, it is important to embed that principle in our doctrine. Our doctrinal imperatives, which represent those things to which we must devote attention to achieve the objectives of air power, are therefore the most suitable point in which to highlight our human dependency.
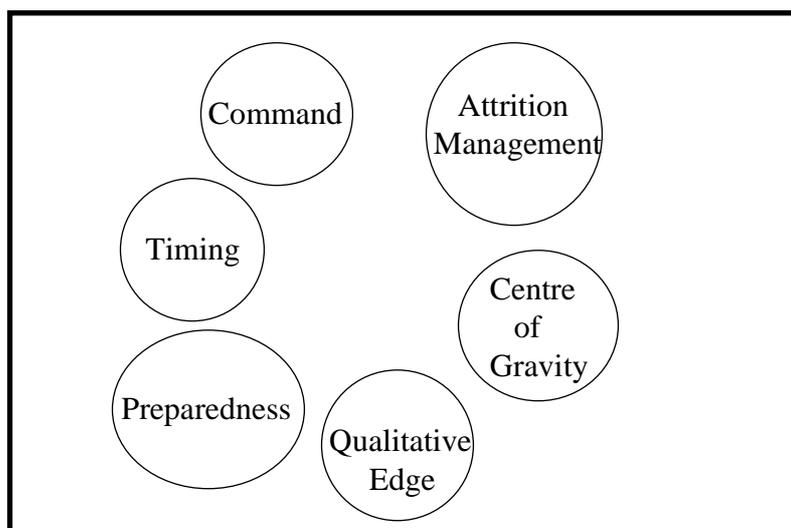

Figure 4 - Current Set of RAAF Imperatives

The RAAF's imperatives are: command, qualitative edge, attrition management, timing, preparedness and centre of gravity. These are represented diagrammatically at Figure 4. The diagram depicts the imperatives as separate entities, which accurately reflects the treatment given them in *The Air Power Manual* - each is treated separately, with no mention of overlap or the impact of one on the other. This again

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[125] Williams, Squadron Leader G.J., *The Power of Many*, Air Power Studies Centre, Canberra, 1996.

[126] *The Air Power Manual*, p 27.

[127] *ibid.*, p 64.

illustrates the scientific, reductionist conditioning which has for so long, and so strongly, directed our thinking.

Let us review each of the imperatives in turn, with particular regard to the human component of each and how this could be better expressed.

Command

Command has been described as the 'first' imperative because of the enormous potency of air power and the need for it to be applied without the loss of either flexibility or concentration of force. 'RAAF air power must be commanded at the highest practical level by a single, *experienced commander* with *expertise* in the application of air power'.[128] Significantly, this requirement embodies several critical factors, including: there is a need for a commander; the commander must have experience; and, the commander must have expertise.

There is a need for a commander. While this may seem self-evident, the significance of a deliberate reading of the statement is that command is a human endeavour, not a mechanical process, and we need to take account of the ramifications of this. In other words, we need to consider the commander's personal qualities from the perspective of decision making ability, performance under pressure, inter-personal skills, leadership style, analytical skills, and so on. While these may be considered to be implicit in the statement of having a commander, we must make this a conscious process, as the quality of the commander is of greater significance than the mere appointment of a commander.

The commander must have experience. The implication of this statement is that the commander must have accrued experience which will be appropriate for the appointment. This does not occur by chance, but must be managed. The commander must have had the opportunity to gain this experience over a number of years, and in a variety of postings - squadron positions, staff, management, logistics, policy and so on. Despite the requirement for a broad experience base, the planners must ensure that the officer spends enough time in each position to attain a full understanding of it. In this sense, the experience of the commander is a product of a number of personnel management issues. In order to provide officers with experience, the career planners and manning staff must have the ability to effectively identify officers who have the potential to reach the top, place them in appropriate positions and, importantly, retain their services. The quality of the commander, then, is dependent also on the skills and abilities of the personnel management staff.

The commander must have expertise. The significance of this statement is not that the commander has accrued experience, but there is an implicit judgment about the quality of performance while amassing that experience. In other words, simply being in the job is not enough - the commander must have demonstrated an understanding of the position, exercised sound judgement, displayed good leadership and management abilities and proved the ability to 'grasp the picture' at a variety of levels - strategic, operational and tactical. In addition, the would-be commander's supervisors must have reported this performance accurately and with a view to future command

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[128] *ibid.* My emphasis in italics.

responsibilities of the officer. This demands not only appropriate management of the would-be commander, but also appropriate training and development of the officers responsible for the reporting and development of the would-be commander.

Some may argue that a significant factor of command is the organisational structure, but this too is brought about by people, who use their experience and expertise to shape the organisation to facilitate command. Accordingly, command is wholly determined by a number of personnel management factors. It is a people issue.

A final word on command is that in *The Air Power Manual*'s treatment of it, only the Chief of the Air Staff (CAS)[129] and Air Commander Australia (ACAUST) are discussed. The application of air power will also depend, however, on how well unit commanders exercise their command. CAS and ACAUST command at the strategic and/or operational levels, but the tactical level is the domain of unit commanders. The skill level of individual commanders will determine how well their units perform and consequently, how well air power is applied. Unit commanders must be able to motivate their people, foster cohesion in the unit, and ensure that adequate welfare strategies are in place, as these all contribute to the effectiveness of the unit. In discussing command, we cannot afford to exclude unit commanders, and their personnel management considerations as well.

Qualitative Edge

The RAAF must achieve a qualitative edge through 'a balance between quality and quantity, exploitation of suitable technology, quality of training and expertise, and attitudes of personnel'.[130] In principle, this imperative propounds the concept that the RAAF can achieve an advantage over an adversary through the right mix of technology, and of people. Where we have not achieved the appropriate balance, however, is in the proportion of attention given to people compared with that given to technology.

It is already widely acknowledged that technology without the efforts of people is useless. Notwithstanding developments in the field of Uninhabited Aerial Vehicles (UAVs),[131] the bulk of our aircraft are dependent on aircrew to fly them, and all aircraft are also dependent upon the ground maintenance crews and base support network. This applies equally to new and older technology, and the advantage that can be gained through technology, when comparing one air force with another, relates directly to the quality of training and the attitudes of the people of the force. Although being equipped with newer technology can instil a technological advantage, it is not so much the particular weapons systems, but the way they are used (by people) which determines the worth of the system. This is reflected in USAF air power doctrine, which states:

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[129] Title as used in the manual. The appointment has been re-designated Chief of Air Force (CAF) since the writing of the manual.

[130] *ibid.*, p 65.

[131] There has been a succession of terms accompanying the development of such vehicles, some attaining greater popularity than others. Other terms include: RPV, which refers to Remotely Piloted Vehicle, URAV to Uninhabited Reconnaissance Aerial Vehicle and UCAV to Uninhabited Combat Aerial Vehicle.

People are the decisive factor in war. Although airmen tend to emphasise the importance of their equipment, how that equipment is used (the human factor) is far more important.[132]

Given that the gap in technology between Australia and its neighbours is in fact shrinking, the RAAF must ensure that the maximum advantage is gained through attending to the people component of the qualitative edge.[133]

The Air Power Manual further states that for operations to be consistently effective, attention must be paid to training and continuing practice, as well as a positive frame of mind, and these positive attitudes are ultimately dependent on leadership.[134] Leadership, of course, is an entirely personal, people-oriented activity, with significant training implications.

All of this training - for use of weapons systems, for leadership, and for development of positive attitudes and engendering commitment - is something which cannot be left to chance. It must be managed. In addition, because the bulk, if not all of it, relates to people, it can be considered to be another human factor management activity, which must be given its due weight in considerations of force development. It is the factor which will give us our relative advantage for comparatively little expense. What the RAAF's planners must realise is that attention to these human factor management issues is of paramount importance in maintaining the qualitative edge, and hence the RAAF's capability.

Attrition Management

By attrition management, *The Air Power Manual* means reducing the risk, and effects, of battle damage to the limited resources available to the RAAF. Methods of doing so include exploiting the geography and the isolated nature of Australia, and by applying air power in such a way as to minimise the risks associated with our assets. These two factors rely on skilled people being able to plan strategically, operationally and tactically. At whatever level, though, the management of attrition relies on training. Once again, this is a factor which cannot happen by chance, and enormous effort must be put into training our people in these fields if we are to manage the attrition of our resources.

However, there is another factor which has not been addressed by the manual and our doctrine - the attrition of our people in a combat situation. Psychological studies consistently reinforce that operational stress casualties may occur in the ratio of about one to every four individuals in action. This results in a serious degradation of the combat force, made more serious if we have not countenanced the fact that it may occur. There are of course, other factors to consider which may affect the attrition rate of people as well: very hot or very cold environmental conditions, high risk disease areas, lack of hygiene facilities, to name but a few.

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[132] Air Force Manual 1-1, Volume 1, *Basic Aerospace Doctrine of the United States Air Force*, p 18.
[133] *Defending Australia*, p 27.
[134] *The Air Power Manual*, p 65.

If we deploy the minimum number of people to a combat area and expect them all to function fully, we will be misleading ourselves. The management of attrition of people is a factor which we need to be aware of and plan for with as much effort as that of equipment attrition. Attrition management is also, then, closely related to many aspects of human factor management.

Timing

Timing is described in *The Air Power Manual* as the synchronisation of concentration of the appropriate force; with the requisite sustainment, at the decisive point and time.[135] Whatever processes are involved in getting these elements synchronised, the actual doing of it is a human activity. It requires somebody planning, coordinating, controlling, communicating, evaluating and adjusting the various activities which must take place. This is not a mechanical activity, but the domain of people well trained and able to exercise judgment and make decisions. The process of training people to make the right decisions about timing needs to be managed.

Preparedness

The Manual describes preparedness as 'the ability of forces to undertake operations in a timely manner and to sustain the activities involved in those operations'.[136] To indicate the human component of 'forces', the description could more aptly read '...the ability of people to undertake activities ...'. Preparedness involves both readiness and sustainability, both of which (as discussed earlier) are heavily dependent on human activities.

Centre of Gravity

The term 'centre of gravity' (COG) relates to the centre at which a force should strike to cause maximum destructive effect to the enemy's will or ability to make war, and may be physical or psychological. A COG may be a physical entity such as a command and control centre or a munitions depot, but may also be something other than physical, such as strong leadership, the enemy's national will or perhaps its cohesion within an alliance.[137]

The concept of COG is a subject of considerable debate in military circles. Some discussions on the 'revolution in military affairs' suggest that the COG concept is less appropriate for the future as the military environment and style of warfare is likely to change considerably.

The revolution in military affairs may see the transition from concern with centers [sic] of gravity to a less mechanistic and more sophisticated notion of interlinked systems.[138]

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[135] *ibid.*, p 67.

[136] *ibid.*

[137] *ibid.*, p 8.

[138] Warden III, John A., from 'The Enemy as a System', quoted in Steven Metz and James Kievit, *Strategy and The Revolution in Military Affairs: From Theory to Policy*, Strategic Studies Institute, US Army War College, 1995, p 7.

The reason for this is that it is increasingly difficult to identify a single, or even several, targets, the destruction of which will bring the enemy 'to its knees'. One estimate is that every developed nation has 'a remarkably similar number of key targets (about 500) and aiming points (about 3,000)'.[139] The developing theories indicate that perhaps a more appropriate method of identifying these targets is to classify them as the 'national elements of value' (NEVs) of a nation, also referred to as 'instruments of power'. These can be categorised into four types: political, economic, military and informational.[140] Each of these has some human component.

Whichever label is chosen - COGs, NEVs or Instruments of Power - the important notion is that the targeting process is not simply mechanistic, but demands consideration of the human factors endemic to the enemy. They must be considered when assessing the enemy's alliances, morale, religious conviction, ability to endure hardship and many other unique elements of the society. Accordingly, we need to understand the human aspects not only of our own personnel, but also that of an enemy. Thus in terms of the selection, training and development of the people involved in the identification and targeting process, there is a management consideration. Consequently, there is a significant human component of the COG imperative as well.

A New Imperative

While the recurring theme through this discussion of our imperatives is patently obvious, it is also blatantly true. The fact is that all of the imperatives listed so far are either totally human activities or totally reliant upon them. The manual simply has not written it in that way, which is consistent with the mechanistic approach adopted in most of our policies and practices.

Notwithstanding the manual's mechanistic approach, it does mention in passing that 'personnel will remain the crucial factor in the quality and capability of air power'.[141] In order for people to be so, however, they must be managed appropriately. This includes their recruitment, training, professional development, career management, and so on.

Because of the fundamentally important roles that people and their management have in our application of air power, management of the human factor should be recognised as the prime imperative. Each of the currently-listed imperatives is either wholly or largely dependent on 'human factor management', and should therefore be subordinate to it. A representation of the set of imperatives which better depicts this relationship, therefore, is proposed in Figure 5.

This model has two distinct advantages: firstly, it immediately focuses our attention on the fact that people are the crucial factor (which hitherto has largely been a platitude); secondly, it also highlights that attention to the management of the human

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[139] Hallion, Richard P., quoted in Clodfelter, Mark and Fawcett Jr., John M., 'The RMA and Air Force Roles, Missions, and Doctrine', *Parameters*, Volume XXV, Number 2, Summer 1995, p 26.

[140] Barlow, Major J.B., *Strategic Paralysis: An Air Power Theory for the Present*, Air University Press, Alabama, February 1994, p 55.

[141] *ibid.*, p 69.

factor is of paramount importance. In addition, it provides a doctrinal basis for the increasingly humanistic initiatives in our policies and practices.
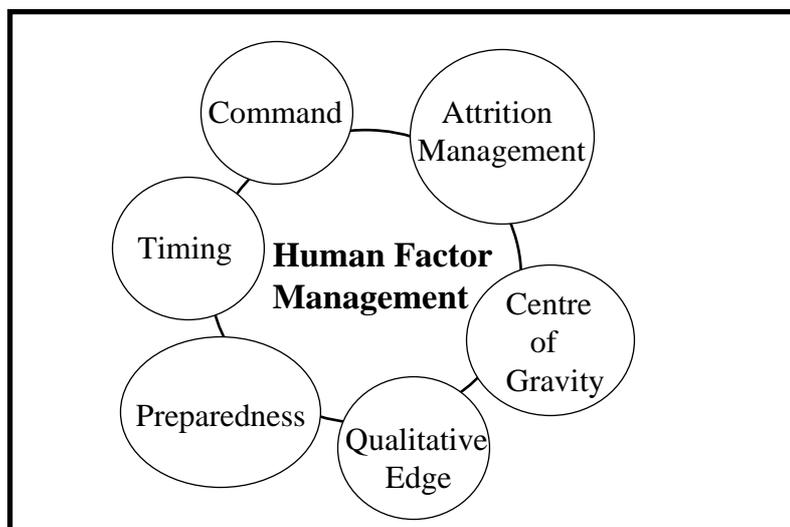

Figure 5 - Proposed Set of RAAF Imperatives

Who Manages the Human Factor?

There are many aspects which affect people's ability to function effectively, and hence affect the RAAF's capability, which fall outside the purview of 'personnel management'. These include: psychological factors such as stress reactions and self-esteem; sociological factors such as belongingness, teamwork, ethics and pride; physiological factors such as interfacing with equipment, reactions to different environments, and response to fatigue; mental factors such as information processing and problem-solving; and others such as cultural, moral and religious factors. The full extent of managing the 'whole person' exceeds the limited scope of 'personnel management'.

Accordingly, we need to accept that there is a place for 'human factors specialists', who have a broader picture of the human asset, and can provide qualitative advice to managers, leaders and senior executives on a wide range of human factor issues. These people need to have been trained, and to have gained experience in, more than just 'management'. It is an area which requires professional behavioural scientists, psychologists and sociologists. These could be Service or civilian, but their input should be sought in all strategic and operational decisions, so a Service background is probably desirable. Interestingly, the Academic Planning committee for the Australian Defence Force Academy recommended that a Department of Behavioural Science be established within two years of the academy's opening, but as yet this has not taken place and there has been no teaching in psychology or sociology.[142]

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[142] Smith, Hugh, *Officer Education and the 'Military After Next': A Response to the Price Report*, Australian Defence Studies Centre Working Paper Number 33, December 1995, p 15.

Accordingly, we need to investigate training some of our members in this area, or look to other agencies who can provide that level of expertise, and formalise their involvement in major decision-making processes.

Many of the other aspects which have been covered so far do not fall conveniently into categories which can be addressed by a single policy or practice. The need for realistic training, the combat ethos for all personnel, the air base as a weapon system and the like are multi-faceted issues and hence need consideration from a multitude of policy areas. This underscores the importance of having human factors specialists involved in strategic decision-making and policy development activities.

The changes outlined provide a starting point for the cultural change which is needed for the RAAF as it moves into the next century. That change involves putting people foremost in all our activities - operations, acquisition, management, logistics, strategic planning and so on. To put this into effect, the human factor must be highlighted in our lexicon, our organisational self-image, our doctrine, and our policies and practices.

These areas have received little attention to date, yet contain the key to our ability to adapt to the changing environment, to attract and retain the people we will require in the future, and to capitalise on the human potential within the organisation.

Conclusion

For many years, the human factor in the military has been overlooked, if not being completely invisible to many. More recently, it has been written into our consciousness in perfunctory statements such as 'people are our most vital asset', 'people are our most valuable resource', 'people *are* the ADF', 'people underpin our defence capability', and so on. But this has been little more than superficial.

It seems incongruous that our 'most valuable asset' or 'most vital resource' has been so poorly managed for so long. The reason for this is that the link between people and our ability to conduct operations has hitherto not been elaborated. Many still believe that personnel issues are altruistic, done for the good of the member, but only when that does not interfere with the requirements of the Service. As a result, people issues have been attributed the status of being ancillary, and 'we'll get around to them when we have the time and resources'. This contradicts directly the concept that 'people *are* the ADF'.

This utilitarian focus is deeply ingrained, a legacy of our bureaucratic, scientific management heritage. It is anachronous in today's age of rapid technological and societal flux. It is perpetuated by bureaucrats who have been conditioned to 'control, control, control'.

The mechanistic approach may have been appropriate once, but it is no longer. Things will never again be the way they once were. Our people are much more highly educated and emancipated. Knowledge-working is replacing manual labour. The industrial age is giving way to the information age. It is time to take off the blinkers, to 'take our heads out of the sand', and look at the whole picture.

This paper has described how the human factor is not ancillary, but fundamental to our air power capability. It has provided a conceptual basis for our management practices and philosophies, offering a more holistic view of the individual and the organisation. It has also offered some guidance on the steps to take towards effecting the required paradigm-shift. Perhaps most importantly, it has illustrated how to incorporate these into our guiding principles - our doctrine. And finally, it suggests that we need to acquire, foster and utilise specialist knowledge and expertise in the field of 'human factors' - through behavioural scientists, psychologists, sociologists and the like. 'Human Factor Management' should be recognised as a specialisation, and specialists from this area should form the core of staff in those directorates whose primary role is the management of people. They should also take their place as advisers in the highest-level committees and work-groups.

The accomplishment of these steps will truly indicate a better understanding of 'The Human Factor', and people will be managed much more like 'our most valuable asset'.