Report of the

Controller and Auditor-General

Tumuaki o te Mana Arotake

New Zealand Defence Force: Deployment to East Timor – *Performance of the Helicopter Detachment*

December 2002

Readers who are not familiar with all of the defence-related terms used in this report may find the terms explained in the glossary on pages 111-115.

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Foreword

In November 2001 we issued our report on the New Zealand Defence Force's (NZDF) Deployment to East Timor.[1] That report looked at how the NZDF planned for the East Timor operation, prepared a joint force, and subsequently deployed that force to East Timor.

We said in the November 2001 report that we would be reporting on a second examination of the roles performed by two particular elements of the New Zealand force in East Timor – helicopters and medical support.

This report contains the results of the first part of that examination. It looks at the contribution of the Royal New Zealand Air Force's helicopter detachment – looking mainly at planning for deployment during early to mid-1999, and operations from September 1999 to February 2000. I will shortly be publishing our report on the second part of the examination – *Ministry of Defence: Deployment to East Timor – Performance of the Health Support Services*.

As with our earlier examination, the professionalism and helpfulness of the New Zealand Defence Force personnel in preparing this report have impressed us. I thank in particular the personnel from No. 3 Squadron and other Air Force units we spoke to for their willingness and co-operation.

I hope that Parliament will find this report of interest, and that it will provide the NZDF with a basis to further improve current practices.

K B Brady
Controller and Auditor-General
18 December 2002

1 *New Zealand Defence Force: Deployment to East Timor*, November 2001, ISBN 0 477 02886 1; available on our web site www.oag.govt.nz

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Summary and Recommendations

The Air Force's No. 3 Squadron (3Sqn) contributed to the New Zealand Defence Force (NZDF) deployment in East Timor for just over three years. The helicopter detachment (the Detachment)[2] of up to six Iroquois helicopters and 115 personnel performed tasks such as troop insertion, aero-medical evacuation, and reconnaissance in support of the multi-national forces operating in East Timor since September 1999.

The Iroquois helicopters enabled the INTERFET[3] forces to deploy small groups of troops to remote areas quickly, or to transport small quantities of supplies to outposts in minutes rather than hours.

Overall Conclusions

In our opinion, the Detachment has performed well in East Timor and has made a valuable contribution to the military effort.[4] The success of the operation owed a lot to the standard of planning and preparation conducted in early to mid-1999.

The conflicting requirement to train for and undertake APEC[5] commitments (in September 1999) was also well managed, but imposed time constraints that meant there were limited opportunities to conduct joint training activities and more tailored aircrew training for East Timor.

Dealing with time constraints is a key theme in this report. Preparedness reports provide little detailed information on key capability shortfalls – such as estimates of likely acquisition times where these may exceed required response times – though systems improvements are in hand.

2 The helicopter detachment comprised most of the Air Force's No. 3 Squadron and other contributing separate Air Force units – such as Air Security and the Deployable Bulk Fuel Installation.

3 On 15 September 1999, a United Nations Security Council resolution authorised the establishment of a multi-national force to restore peace and security in East Timor, to be known as INTERFET. This was replaced in early 2000 by the UNTAET (United Nations Transitional Authority in East Timor) peacekeeping operation.

4 The NZDF also used 3Sqn's Seasprite naval helicopters in East Timor. We did not look at those helicopter operations.

5 The Asia-Pacific Economic Cooperation meetings are the primary regional vehicle for promoting open trade and practical economic cooperation. New Zealand hosted the APEC meeting in Auckland at the beginning of September 1999.

The Air Force was successful in acquiring key items of equipment and addressing issues that were critical for meeting deployment times. Nevertheless, the limited time available created a number of risk and capability issues – such as a very restricted ability to test or carry out training with new equipment.

3Sqn was able to sustain its contribution to the Detachment in East Timor beyond the Government's expected 12 months by altering the way that it operated. The risks and implications (especially for capability) of the longer deployment are not clearly reflected in the Minister's Purchase Agreement with the Chief of Defence Force.

Maintenance preparations for East Timor were conducted successfully. However, after deployment the supply of spare parts posed problems – increasing the risk that 3Sqn would not be able to provide the required number of helicopters for carrying out assigned tasks. Indicative information shows that the additional hours being flown by the Iroquois in East Timor have increased maintenance costs by a total of $540,000 a year.

3Sqn has a strong culture for learning lessons and has mechanisms for identifying both day-to-day and longer-term issues. How to identify lessons of a joint nature[6] is less well established and needs further attention. Similarly, joint training currently has no formal plan.

The Iroquois have been an important force multiplier[7] in the harsh environment of East Timor. However, the performance limitations of the Iroquois – both inherent limitations and those imposed by the environmental conditions – reduced the options available to military commanders.

Experience in East Timor will be useful for the NZDF's current study of its present and future need for helicopters.

Planning and Preparing for East Timor

(see Part Two on pages 31-43)

The successful operation of the Detachment in East Timor can be attributed, in part, to the standard of planning and preparation conducted in early to mid-1999. The Air Force and 3Sqn carried out valuable early planning into contingencies and deployment options, identifying issues

6 The term 'joint' refers to situations where two or more of the Services (Navy, Army or Air Force) are involved.

7 The helicopters allowed the Army infantry to be more effective than if only land transport was available. The capability of the force can therefore be said to have 'multiplied' due to the presence of helicopters.

that would be critical to the ability to deploy. Participation on the Joint Operational Planning Groups[8] helped in preparing plans consistent with changing NZDF requirements.

Valuable previous experience of Air Force and 3Sqn personnel that contributed to the successful planning of the East Timor deployment included:

- involvement in planning for the Bougainville deployment in 1997[9];
- planning of regular overseas exercises; and
- participation in planning courses with the Australian Defence Force or other equivalent courses elsewhere.

Maintaining this capability will be a key to the success of any future deployments.

We recommend that –

1 **The NZDF continues to strengthen the planning skills and experiences of Service staff to enable them to successfully conduct contingency planning in a joint environment.**

The Impact of APEC 1999 on East Timor Preparations

(see Part Two, paragraphs 2.42-2.46)

3Sqn had to prepare for APEC operations (carried out in early September 1999) at the same time as planning and preparing to go to East Timor. The need to assign six Iroquois to APEC duties while also completing pre-deployment training for East Timor created difficulties for maintenance planning, meeting aircrew requirements, and joint training.

For example, training for East Timor was not as focused as it would have been had 3Sqn not been involved in other commitments. These commitments limited the opportunities for 3Sqn to conduct specific joint training and to tailor aircrew training more directly to East Timor requirements.

8 These operational-level planning groups consisted of representatives from each of the three Services.
9 A detachment of three Iroquois and personnel of 3Sqn served in Bougainville from December 1997 to April 1998 as part of the Truce Monitoring Group.

Critical Capabilities

(see Part Two paragraphs 2.10-2.13, and Part Six on pages 85-96)

The Air Force and 3Sqn were successful in acquiring key items and addressing issues that were critical for meeting deployment times. However, a number of important risk and capability issues were raised during the process.

Under the Chief of Defence Force's Purchase Agreement with the Minister of Defence (see paragraphs 1.25-1.28 on pages 26-27) the Air Force is required to train door gunners only once the decision to deploy forces has been made. This decision might be made only a short time before the force is required to deploy, or might be altered to meet changing circumstances. As a consequence, the time available for this training could be limited.

Maintaining a core level of skill in door gunnery would reduce the need for hurried pre-deployment training and make more time available to train in primary skills.

We recommend that –

2 The RNZAF maintains an adequate level of door gunner capability to mitigate these risks.

3 The NZDF and the Air Force assess whether any other capabilities should be treated in a similar manner.

The Air Force's Air Security Branch had been established for six months when it was required to deploy to East Timor as part of the Detachment. A number of factors resulting from the 'infancy' of the Branch combined to generate conflicts among personnel on deployment.

These conflicts led to a formal Air Force investigation that identified the causes and recommended measures to resolve them. While the Air Force recognised the risks of conflict as part of early planning, there was insufficient time available to address them before deployment to East Timor.

We recommend that –

4 The NZDF recognises that factors such as the 'infancy' of a trade can affect operations and should be considered as critical when planning for deployments.

5 The RNZAF ensures that Air Security Branch deficiencies identified by the formal investigation are rectified.

Two key pieces of equipment (Iroquois armour and Aircrew Life Preservers) had been established as a critical capability shortfall for a number of years, but acquisition of the items did not begin until the need to deploy to East Timor arose.

Having to acquire critical items of equipment within such a short time limited the ability to test equipment extensively or to utilise the equipment as part of pre-deployment training. These short times also increased the risk that the equipment might not be available within the time required.

We recommend that –

6 The NZDF and the Air Force review relevant acquisition procedures to ensure that sufficient priority is assigned to addressing critical capability shortfalls.

Self-sufficiency

(see Part Two, paragraphs 2.14-2.17; and Part Three, paragraph 3.4)

The East Timor operation has highlighted the value of key NZDF units being capable of deploying as self-sufficient.[10] The Detachment was able to quickly and effectively participate in East Timor operations because careful planning minimised the need to rely on other units for key items or services.

We recommend that –

7 The NZDF ensures that key units continue to be capable of deploying as self-sufficient in future operations.

Performance in Theatre

(see Part Three, paragraphs 3.16-3.25)

The Detachment's performance in East Timor was of a high standard. It successfully managed to have the required number of Iroquois available for tasks throughout the INTERFET operation. The Iroquois were able to perform a number of valuable tasks in support of the forces in East Timor – in some cases at very short notice.

10 Self-sufficiency can only be maintained for a short period of time before requiring support such as re-supply of food and equipment. This short period of time allows force elements to begin operations without having to wait for the majority of support infrastructure to be in place.

However, the East Timor operation tested the capability of the Iroquois and demonstrated its performance limitations. The Air Force was already aware of the Iroquois' inherent limitations and how these affected Army operations.

The environment and level of threat in East Timor placed further limitations on the Iroquois, decreasing the number of people the Iroquois could carry or the amount of supplies it could lift. These performance factors affected the flexibility of Army operations, reducing the options available to Army commanders.

We recommend that –

8 **The NZDF assesses fully whether the Iroquois can meet the needs of future joint force operations – drawing on its experience in East Timor. This assessment should clearly state the role that helicopters are expected to play in the NZDF's concept of operations[11], including:**

- **how the NZDF sees helicopters operating with any new multi-role vessel; and**
- **how helicopters will operate with the new fleets of Light Armoured Vehicles and Light Operational Vehicles.**

9 **This assessment be undertaken without delay and used to inform the current study into whether the Iroquois is an adequate helicopter to meet the NZDF's current and future needs.**

Learning Lessons

(see Part Three, paragraphs 3.26-3.33)

3Sqn has a strong culture for learning lessons. Crew meetings after each flight and end-of-tour reports encourage the sharing of knowledge and enhance the day-to-day conduct of operations. Lessons learned that need to be gathered and disseminated in a more formal manner are recorded in Standing Operating Procedures (SOPs)[12] – thus ensuring that the benefits of good practice are available for the future.

However, there are limited formal means by which 3Sqn can gather lessons learned of a joint nature. As joint military operations could become more common in the future, it is important that there are ways to

11 The concept of operations is the broad outline of the way force elements should operate together in order to achieve set objectives.

12 A set of instructions covering those features of operations that lend themselves to a definite or standardised procedure without loss of effectiveness.

identify, record, and apply joint lessons learned. Doing so will ensure that all Services are aware of the problems encountered when working with each other, and that the others understand each Service's perspective.

We recommend that –

10 The NZDF strengthens its ability to gather and share lessons learned at a joint operational level.

Sustainability

(see Part Three, paragraphs 3.34-3.43)

The Detachment was deployed to East Timor for just over three years, compared with its Purchase Agreement obligation to carry out military operations for a maximum of 12 months at a time. The Air Force managed to sustain the Detachment's operations for this extended period by:

- assembling helicopter crews from other Air Force trades;
- reducing the number of helicopters and helicopter crews in East Timor (in line with United Nations requirements);
- reducing the length of each 'tour of duty' (or rotation) from 6 months to 3 months; and
- not maintaining the level of other outputs that 3Sqn is required to provide to the Government.

As the Government might in future again decide to deploy a helicopter detachment for a length of time that differs to that stated in the present Purchase Agreement, consideration should be given to modifying the current sustainability statement that covers only the one 12-month period. A modified sustainability statement would make it clear to the Government what resources are available for differing lengths of deployment and set out the risks – in particular, in terms of capability.

We recommend that –

11 The next Purchase Agreement includes a modified sustainability statement that clearly states the risks and implications (especially for capability) of differing lengths of deployment.

Reporting Preparedness

(see Part Two, paragraphs 2.3-2.5; and Part Four on pages 61-73)

Some capability limitations have been recognised in NZDF preparedness reports for a number of years, yet priority is given to other projects rather than addressing core capability limitations. For example, the need for Aircrew Life Preservers (essentially a combination of a bullet-proof vest and buoyancy aid) was seen as critical for nearly ten years, but the NZDF had not sufficiently prioritised the project for the items to be acquired.

A number of risks are created when the acquisition or development of key capabilities is rushed once the need to deploy is identified – including inadequate time to test, or train with, the equipment.

We recommend that –

12 The NZDF ensures that capability limitations identified in preparedness reports as restricting a unit's ability to meet preparedness targets are given sufficient priority for action to be taken to deal with them.

13 The purchase of critical items allows time for the items to be fully tested and introduced into service, and for personnel to train with and become familiar with the new equipment.

Once the capabilities that are limiting the preparedness of units have been identified, preparedness reports provide little additional information. More information on these capability limitations would assist the Government and the NZDF in understanding the risks that the limitations pose to units being able to meet future deployment requirements.

We recommend that –

14 The NZDF alters the preparedness reporting format to include information about efforts being made to remove key capability limitations – such as estimates of likely acquisition times when these exceed required response times – with the aim of clearly describing to the Government the risks that these limitations pose to NZDF preparedness.

A new system, the Air Performance Management System (Air PMS), has the ability to enhance preparedness reporting in a number of ways. Components of Air PMS that enable it do this include:

- a regime of Service Level Agreements (SLAs); and
- better reporting of performance information.

Air PMS will strengthen the information available about interdependencies between Air Force units through SLAs. The SLAs will clearly define the services required and detail the information needed to measure performance in providing the services.

Another key goal of Air PMS is to ensure that detailed management information is readily available. Air PMS will aid preparedness reporting by:

- reducing the amount of time spent on gathering preparedness data;
- allowing units to access this information more quickly; and
- increasing the ability to analyse trends in performance information.

We recommend that –

15 The Air Force uses the strengths of Air PMS to enhance preparedness reporting by:

- **using information collected for monitoring Service Level Agreements to fulfil preparedness reporting needs, thereby reducing the amount of time spent gathering preparedness information and increasing ease of access to this information; and**
- **using Air PMS information to make interdependencies between its units clearer as part of preparedness reporting.**

Maintaining the Iroquois

(see Part Five on pages 75-84)

Maintenance is a very important aspect of 3Sqn's day-to-day activities in that it allows 3Sqn to perform its primary function of conducting air operations. Regular servicing ensures that the Iroquois are maintained to a high standard. Maintenance preparations for East Timor were conducted successfully, with schedules managed to ensure that there were enough flying hours left on the Iroquois for the deployment.

However, once in East Timor, the supply of spare parts for the Iroquois at times posed problems for maintenance. Delays in receiving critical parts lengthened the amount of time some Iroquois were unavailable for tasks, creating the risk that the Detachment would not be able to supply the number of Iroquois for tasks that it was required to undertake.

We recommend that –

16 The NZDF establishes where the failure points in the spare parts supply system were.

17 The NZDF then reviews supply and inventory systems to ensure that supply of spare parts does not create unacceptable risks for future deployments.

The additional hours flown by the Iroquois in East Timor, and the conditions in which they have operated, are likely to have had an impact on component wear and aircraft condition. In addition, in order to operate each Iroquois for as long as possible in theatre, 3Sqn increased the maximum interval between phase maintenance services from the usual 200 hours to 300 hours.[13]

The Air Force has not analysed the effects on component wear and aircraft condition – due mainly to a lack of resources and the difficulty of extracting the necessary data from information systems. Indicative information points to the increased workload resulting in increased maintenance costs of approximately $540,000 each year across the fleet of Iroquois.

We recommend that –

18 The Air Force analyses maintenance data to establish the effect of the East Timor deployment on helicopter life and longer-term maintenance requirements.

19 The Air Force establishes the effect that extending the interval between phase maintenance services has had on the Iroquois, to inform similar decisions in future deployments.

13 See paragraphs 5.17-5.18 on page 81 and Figure 13 on page 82.

Joint Training

(see Part Seven, paragraphs 7.10-7.18)

While 3Sqn and Army regularly conduct joint training – including basic familiarisation activities with individual units and more extensive collective training exercises – there is no plan or agreement that defines:

- how often this training should take place;
- which Army units are given priority for this training; and
- what tasks are to be given priority throughout the training schedule.

Army lessons learned material has noted that some Army personnel in East Timor were not fully familiar with working with the Iroquois. Some Army Commanders were also unfamiliar with how to use the Iroquois to achieve their tactical objectives.

A formal joint training agreement should be drawn up to ensure that future training addresses those lessons learned, and that unfamiliarity in a joint operation does not create risks for future deployments.

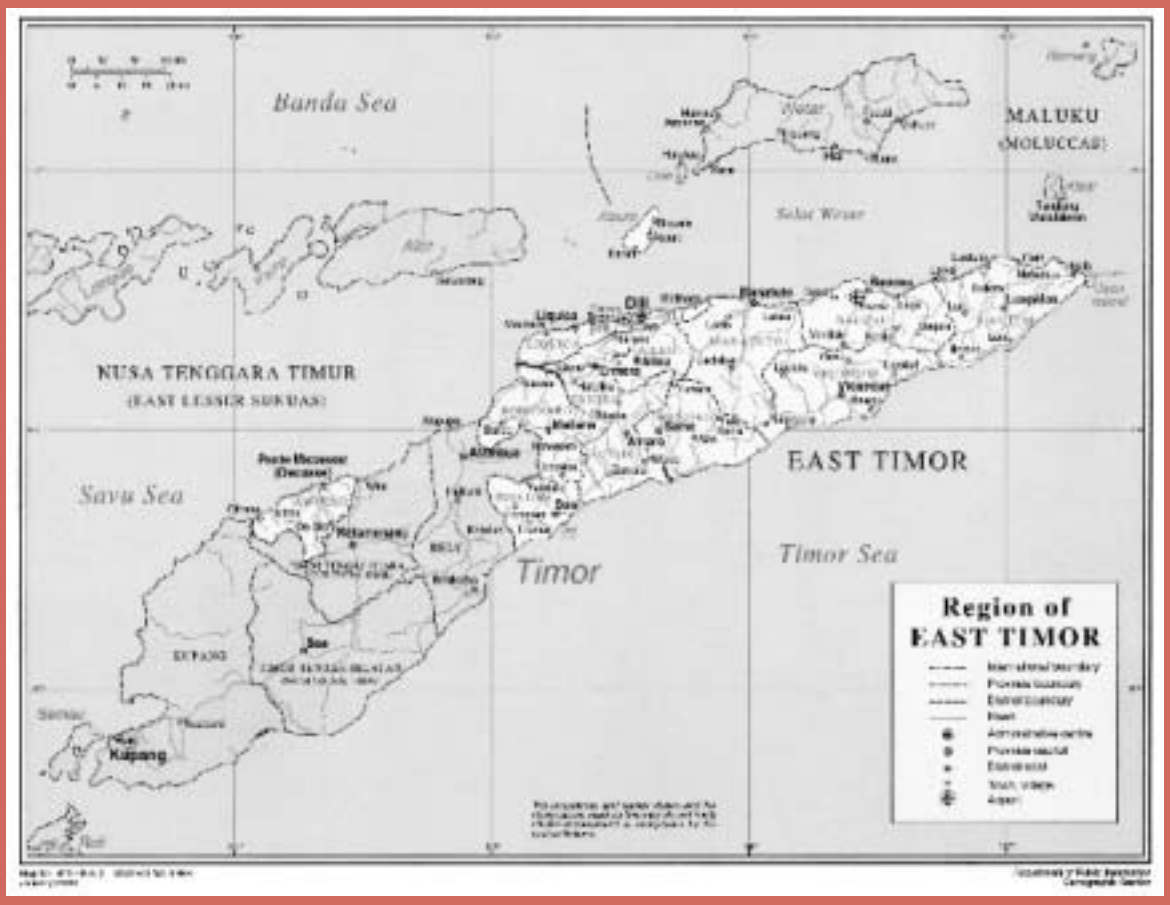
We recommend that –

20 The Air Force and Army conclude a formal agreement for the provision of helicopter support to Army training, defining the focus and volume of annual joint training.

21 This training be used to validate the NZDF's concept of how helicopters are to be used to support Army operations.

Part One

Introduction


Banda Sea
MALUKU
(MOLUCCAS)
Selat Wetar
NUSA TENGGARA TIMUR
(EAST LESSER SUNDAS)
EAST TIMOR
Savu Sea
Timor
Timor Sea
Kupang
Region of
EAST TIMOR

The East Timor Operation

1.1 On 15 September 1999 a resolution of the United Nations Security Council authorised the establishment of a multinational force – known as INTERFET – to restore peace and security in East Timor with authority to use armed force if required.

1.2 INTERFET comprised a coalition of 23 contributing countries with over 11,000 personnel, led by Australia. It was New Zealand's largest overseas military commitment since the Korean conflict. At its peak, the NZDF committed about 1,100 Navy, Army and Air Force personnel.

1.3 In February 2000, INTERFET was replaced by a United Nations peace-keeping operation known as the United Nations Transitional Administration in East Timor (UNTAET). Under its United Nations mandate, UNTAET provided security and maintained law and order in East Timor.

1.4 As part of this operation, New Zealand was given responsibility for about 1,700 square kilometres to the south-west of the country (including a long section of the border between East and West Timor) with the township of Suai as the base (see map on the opposite page). This area was characterised by poor infrastructure, difficult supply routes, limited communications, and considerable destruction by the retreating militia.

What Is this Report About?

1.5 In this report we take an in-depth look into the deployment and operations of the Detachment in East Timor. We focus on the Air Force and 3Sqn's involvement in planning for the East Timor deployment during early to mid-1999, and the Detachment's role (mainly as part of the INTERFET operation) from September 1999 to February 2000.

1.6 We examined the deployment and operations of the Detachment against the broad criteria contained in our November 2001 report. The criteria included:

- the level of preparedness of the Detachment prior to East Timor;
- the degree of operational planning undertaken;
- the amount of pre-deployment training completed and its relevance;

- how the Detachment performed in East Timor – both as part of INTERFET and in general; and
- how lessons learned have been collated and actioned.

1.7 We interviewed a very wide range of NZDF and Air Force personnel, and examined documentation – including plans, Defence Force Orders, command directives, correspondence, situation reports, and post-activity reports. The NZDF and Air Force facilitated access to all documents (including classified material, where required).

1.8 In May 2001 we travelled to East Timor and interviewed Detachment personnel, gathered documentary evidence, and visited both Dili and Suai. At the time of our visit the Detachment was wholly based at Suai.

The History of 3Sqn

1.9 3Sqn was formed in 1930 as a Territorial Unit based in the South Island. Initially, it operated local aero-club aircraft, and from 1941 flew fixed wing aircraft – such as Vincents, Hudson patrol bombers, Tiger Moths, Harvards and Mustangs – until receiving helicopters in 1965. The purchase of Iroquois and Sioux helicopters was a result of a major Defence Policy review in 1961, which saw the Air Force replacing a number of its obsolete aircraft.

1.10 Today, 3Sqn operates three types of helicopter – the Iroquois, Sioux, and Seasprite. The Sioux are small two-seater helicopters used for pilot training. They were purchased between 1965 and 1970 and are soon to be replaced because they do not adequately meet the Air Force's training needs. The new Kaman SH-2G Seasprite helicopters replaced the Wasp naval helicopters purchased in 1966. The Seaprites operate off the Navy's ANZAC and Leander class frigates.

1.11 The Air Force purchased 14 Iroquois helicopters between 1966 and 1970, with a fifteenth being acquired in 1976. 3Sqn now operates 14 Iroquois, with an additional airframe[14] brought into service in 1996 to replace two Iroquois that had crashed over the 30 years of operations.

1.12 Since 1966, 3Sqn crews have operated in places such as Vietnam, Bougainville, East Timor, various South Pacific island states (including for cyclone relief), Australia, Singapore, Antarctica, and a number of South East Asian countries (for training and exercises).

14 Essentially, a body without the major mechanical components, such as engines and rotor blades.

1.13 3Sqn is now located mainly at Base Ohakea near Palmerston North.

The UH-1H Iroquois Helicopter

1.14 The UH-1 Iroquois series of helicopters are considered to be the most widely used military helicopters in the world. Originally built by Bell Aircraft in 1956, more than 9000 (with numerous variants) have been produced. About 40 countries have used them. More than 5000 UH-1s were used in the Vietnam War during the 1960s and 1970s.

1.15 The UH-1H variant was produced with an improved engine that allowed it to outperform older versions. The upgrade also gave the UH-1H enough power to transport up to a maximum of 13 personnel (with no equipment, in ideal situations, and reduced range). Over 5000 UH-1Hs were built, more than any other variant of the UH-1 helicopter.

1.16 3Sqn's UH-1H Iroquois have a maximum speed of 232 km/h and can fly to an altitude of 6600 metres (20,000ft) above sea level. Their maximum range is 360km (extended to 660km if auxiliary fuel tanks are used) giving a total flying time of around 2 hours (3 hours and 40 minutes with auxiliary tanks, depending on climatic conditions). The Iroquois (under ideal conditions) has a maximum lift-off weight of 4300kg (9500lb) and can lift an under-slung load of 1045kg (2300lb). It requires a crew of three, with two pilots and one crewman.

1.17 Armaments for 3Sqn's Iroquois are two M60D 7.62mm machine guns that can be mounted at the rear of each side door. Other equipment that can be fitted to the Iroquois includes a rescue winch and a 30 million candle-power searchlight.

Organisation of 3Sqn

1.18 3Sqn is a unit of the Air Force. Figure 1 shows the structure of the NZDF, illustrating the positions of the Air Force and the Joint Forces HQ. In the East Timor deployment, the Joint Forces Commander had responsibility for the deployed forces.

Figure 1
Structure of the NZDF

New Zealand Defence Force

Chief of Defence Force

The Chief of Defence Force retains overall responsibility for all New Zealand military forces

Navy
Chief of Naval Staff

Army
Chief of General Staff

Air Force
Chief of Air Staff

Joint Forces HQ
est. July 2001

In peacetime the three Chiefs of Staff are responsible for raising and maintaining force elements at the required level of capability.

Commander Joint Forces New Zealand

The Joint Commander has responsibility for deployed forces. During peacetime the Joint Commander is responsible for directing the joint/combined activities of the three services.

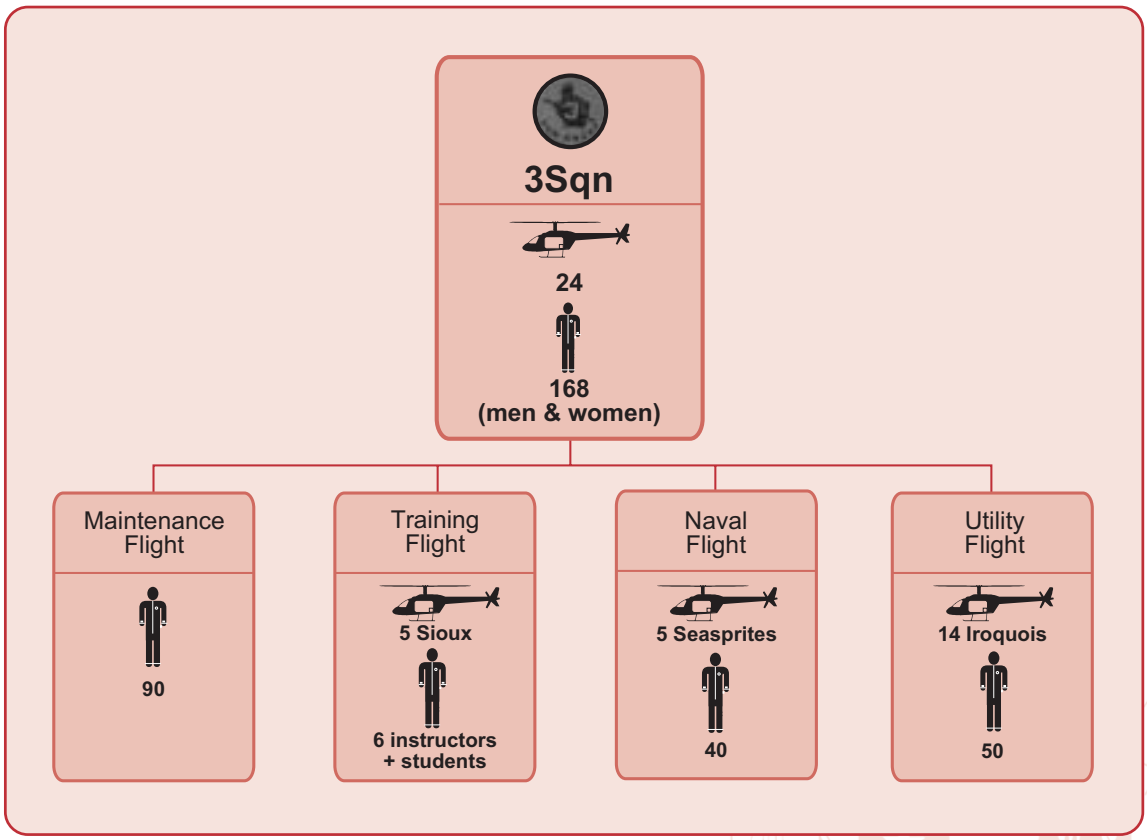
Component Commanders

Each Service has a representative as part of the Joint Forces HQ. They facilitate information flows between the single Services and the Joint Forces HQ and ensure consultation.

1.19 3Sqn comprises four main sections known as "flights"[15] (see Figure 2 below):

- Utility Flight, with 14 Iroquois and approximately 50 crew;
- Maintenance Flight, about 90 people conducting first and second line maintenance on all of 3Sqn's helicopters;
- Training Flight, which operates 5 Sioux helicopters (and uses the Iroquois)[16]; and
- Naval Flight, with 40 people operating the Seasprite helicopters for the Royal NZ Navy[17].

Figure 2
How 3Sqn Is Organised



15 A flight is the basic organisation unit for the Air Force.
16 The numbers of instructors and students in the training flight vary according to the needs of the Squadron. As at August 2002 there were six instructors and three students.
17 Naval Flight (supported by part of the Maintenance Flight) is based at Whenuapai, Auckland.

1.20 The four flights of 3Sqn include people with a wide range of skills and attributes.

Utility Flight

1.21 Utility Flight crew members include pilots, co-pilots, and crewmen. Pilots and co-pilots are trained to fly fixed-wing planes as well as helicopters. Crewmen, while not being trained to fly helicopters, are fully conversant with helicopter operations and associated activities.

1.22 The helicopter crew members are skilled at flying in a variety of environments, including mountainous terrain, tropical conditions, low-level flying, flying in formation, and night and instrument flying. In addition to these flying skills, crew members are trained in fire-fighting, search and rescue, emergency evacuation procedures, and relevant medical skills.

Maintenance Flight

1.23 Maintenance Flight comprises a variety of trades, including avionics, mechanics, and safety and surface specialists.

1.24 The Appendix on pages 107-110 describes the three levels of maintenance undertaken:

- Operating Level Maintenance, which is completed regularly and covers pre-flight and after-flight basic servicings;
- Intermediate Level Maintenance (or phase servicing), which involves stripping down parts of the helicopter; and
- Depot Level Maintenance, which is comprehensive maintenance completed on each airframe approximately every five years by a civilian contractor in New Zealand.

The Purchase Agreement

1.25 Under the Purchase Agreement between the Chief of Defence Force and the Minister of Defence, 3Sqn is required to deliver a number of tasks and activities each year as part of a Rotary Wing Transport Force (RWTF). These tasks cover three main areas:

- military tasks;

- civilian community support; and
- counter-terrorist operations.

1.26 Military tasks include conducting tactical air transport operations and aero-medical evacuation – covering operations such as flying supplies to forward units, conducting reconnaissance flights, and transporting Army troops into and out of operational areas. Aero-medical evacuation entails taking a patient from the point of injury to a medical treatment facility.

1.27 The capabilities developed by 3Sqn for its primary military role are also used for civilian community support. These tasks include search and rescue, civil defence, disaster relief (both in New Zealand and throughout the South Pacific), ceremonial support, assistance to Police operations, and providing support for the Antarctic programme.

1.28 Counter-terrorist operations involve working closely with the Army's Special Air Service (SAS) and conducting night operations. A small number of Iroquois are always kept ready at very short notice for these types of operations.

Maintaining Capability

1.29 In 2000, 3Sqn flew a total of 5400 hours in order to develop and maintain its capability to fulfil the tasks and activities required under the Purchase Agreement. These hours included unit exercises, operations, community support, and pilot training. Approximately 3200 of these hours were directly attributed to maintaining its Directed Level of Capability (DLOC).

1.30 Exercises are an important part of maintaining capability because they allow the helicopter crews to gain experience in operations and environments similar to those they expect to be deployed into. Exercises undertaken by 3Sqn every year can include:

- Tropic Astra – flying and survival training in a tropical environment;
- Blackbird – flying in mountainous terrain and at high altitudes; and
- Steel Talon – crews practising tactical operations as part of a mock deployment.

1.31 3Sqn conducts specialised training with Army. This is mainly with new recruits and the SAS. As part of their basic training new recruits undertake helicopter familiarisation, gaining experience operating in and around the Iroquois.

1.32 Experience in operating with the Navy is continually increased by 3Sqn operating the Seasprite helicopters.

1.33 Helicopter crews must complete a set number of flying hours every year in a range of competencies to maintain DLOC. These competencies include night flying, formation flying, and mountain flying. By practising these competencies annually, crews ensure that they maintain the skill base they established in initial training. For example, crews must spend 1½ hours a month operating with under-slung loads to ensure that this skill is maintained at DLOC. This level can be verified through mechanisms such as helicopter and crew logbooks.

Recent Developments

1.34 As a result of the Defence Real Estate Review and the closure of Hobsonville Base, 3Sqn relocated to Base Ohakea near Palmerston North at the end of 2001. This has brought 3Sqn closer to its main user, Army, which is mostly based at Linton and Waiouru. The central location also enhances 3Sqn's ability to respond to other needs throughout the country.

1.35 The NZDF is currently considering whether to enhance the Iroquois' performance and to extend its life through an upgrade, or replace it. This project is included in the Defence Long-Term Development Plan released in June 2002.

1.36 An upgrade, along the lines of the Huey II programme, would see the replacement of the main rotor blades and associated components, tail boom and tail rotor system, radios and light instruments, and hydraulics system. An upgrade would extend the service life and safety of the Iroquois, while reducing operating costs (because of improved reliability and the lower costs of spare parts).

1.37 However, it is possible that the NZDF could identify a requirement for a more capable helicopter than the Iroquois, in which case the Ministry of Defence would institute a replacement programme following Government approval. It is planned that the replacement or upgrade programme for the Iroquois will begin in 2005-06.

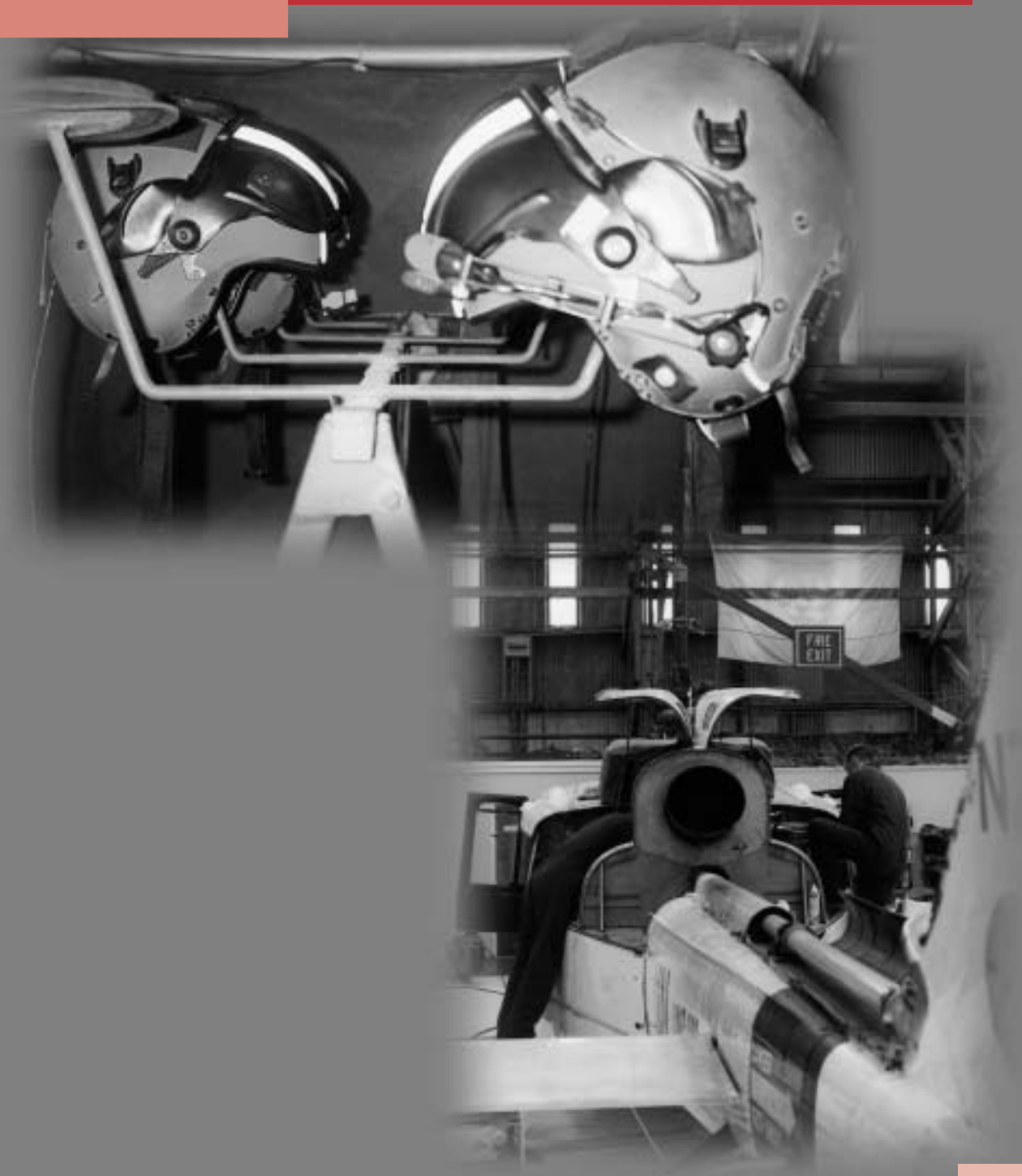
1.38 The New Zealand Battalion[18] was withdrawn from East Timor in November 2002. The United Nations' downsizing plans confirmed that the United Nations had no requirement for any NZDF combat force elements, including the four Iroquois helicopters, to remain in East Timor after November 2002.

18 A **battalion** is a unit of infantry composed of several companies - in the NZDF usually two infantry companies, a surveillance and reconnaissance company, and engineer, logistics, and medical elements. The New Zealand Army Battalion Group in East Timor consisted of up to 830 personnel.
A **company** is composed of several platoons, each **platoon** consisting of between 30 and 40 personnel.

2

Part Two

Preparing for and Going to East Timor



Early planning placed the Detachment in a sound position to perform well in East Timor. 3Sqn participated effectively in Joint Operational Planning Groups that enabled it to adapt to wider NZDF requirements. Information available for planning was of a good standard.

The Air Force and 3Sqn identified critical items during planning and moved quickly to rectify any deficiencies. Helicopter and personnel preparations were successfully completed within response times, although the short time for acquisition of some critical items created risks.

Planning and preparation for a possible East Timor deployment were complicated by the need to train for and carry out duties for the APEC meeting in September 1999.

Transporting the Iroquois and essential equipment by air to East Timor was an effective option.

Introduction

2.1 Effective planning by 3Sqn was a major factor responsible for its successful operation in East Timor. High-level planning ensured that the Detachment met the needs of the joint force. Equipment had to be acquired for use by aircrews and for installation in the Iroquois. Squadron personnel also undertook medical preparations for the tropical environment in addition to training and administrative tasks. All of this activity took place while 3Sqn was also preparing for and, later, undertaking duties for the APEC meeting in September 1999.

2.2 This section covers eight aspects of planning and preparing for operations in East Timor:

- reporting preparedness;
- initial planning for a likely contribution;
- identifying critical tasks;
- information for initial planning;
- working with the Joint Operational Planning Groups;
- preparing for deployment;
- managing APEC duties; and
- getting to East Timor.

Reporting Preparedness

2.3 3Sqn reported in late-1998 and early-1999 that it was partially prepared for the full range of operational tasks required.[19] Reports produced using the Operational Preparedness Reporting System (OPRES) noted that equipment limitations and personnel levels inhibited the ability of 3Sqn to deploy and sustain operations as required by the Government in the Purchase Agreement.

2.4 OPRES reports specifically stated that Iroquois armour and Aircrew Life Preservers were limiting the preparedness of 3Sqn. However, while these deficiencies were well known throughout the NZDF (having appeared in numerous OPRES reports previously), little comment was made on when the items were likely to be acquired. (More details are provided in paragraphs 4.21-4.35 under *Reporting Capability Shortfalls Through OPRES*.)

2.5 The OPRES reports also noted that modification programmes were under way to install secure communications equipment in the Iroquois as a medium-term project. No date of completion was mentioned. They also pointed out that 3Sqn had not undertaken joint training activities for some time.

Initial Planning for a Likely Contribution

2.6 3Sqn began planning in early-1999 for the possibility of a helicopter detachment being required for any East Timor operation. Figure 3 on the opposite page shows the timeline of planning activities. In March 1999, 3Sqn completed an operational planning study that presented four possible options for deployment. The study identified issues such as:

- impacts on other designated tasks;
- resources able to be deployed;
- indicative timelines for preparation;
- maintenance arrangements; and
- the requirement for additional training of trades.

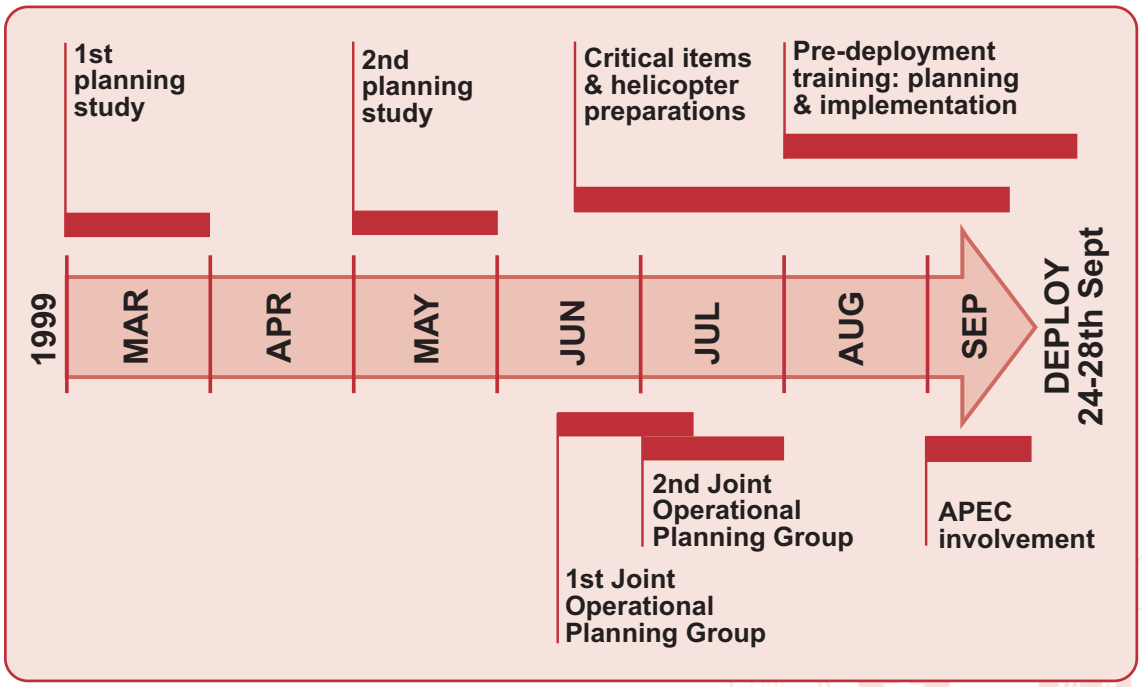
19 3Sqn reports its preparedness as part of the Rotary Wing Transport Force (RWTF) that includes units from other parts of the Air Force (see also paragraph 1.25 on page 26).

2.7 A second operational planning study was undertaken in May 1999. This study included three options, again with consideration of the impacts on other operations and resources required. These early plans even identified aircrew to be deployed.

2.8 The Air Force's preferred option was to send up to six Iroquois to East Timor with five aircrews (expanded to eight by late-August). This option also included undertaking phase maintenance in East Timor.

2.9 3Sqn planners noted that, while its preferred option would form the basis for more detailed planning, the option had been developed outside the framework of wider-focused planning groups and without a concept of operations for any East Timor deployment. The option was therefore subject to modification as more information became available, and as planning groups developed a clearer picture of tasks and needs for any military mission.

Figure 3
Timeline of Planning Activities



Identifying Critical Tasks

2.10 The NZDF had identified the inoculation of personnel against the Japanese encephalitis virus (JEV) as a critical task to meet any expected deployment date. On 10 May 1999, the NZDF ordered all units to immediately inoculate personnel identified as being likely to deploy.

2.11 3Sqn helicopter crews and ground staff were noted as being second in priority to receive the inoculations, behind members of the Special Air Service (SAS). JEV inoculation of 3Sqn personnel identified in initial planning was complete by 27 July 1999. Further JEV inoculations were needed for personnel added to the original deployment list.

2.12 In June 1999, 3Sqn informed Air Command of two additional critical path tasks – to ensure that enough helicopter crewmen and door gunners were available. Training of helicopter crewmen was under way and, once completed, 3Sqn was able to supply the eight aircrews outlined in the planning study option. The ability to provide door gunners was more complicated, though still completed within the response time. (See paragraphs 6.3-6.11 on pages 88-89.)

2.13 As outlined in paragraph 2.4, a number of equipment limitations were noted in OPRES reports as restricting 3Sqn's ability to perform in certain situations. Once it became clear what type of operation East Timor was going to be, and the likely threat level that would be faced, the NZDF and 3Sqn were able to identify those limitations that needed rectification.

Information for Initial Planning

2.14 Key personnel conducting the planning had been involved in preparations for the deployment to Bougainville. Experience from Bougainville had taught planners to plan for the worst-case scenario, and to plan for self-sufficiency as far as possible.

2.15 Planning for previous operations had relied on other units to provide the Detachment with equipment that was not always delivered and had left them under-resourced. This can be caused by other units misinterpreting the needs of the Detachment because of competing priorities. Having the Detachment deploy as self-sufficient avoided these risks.

2.16 Experience in detailing equipment requirements had also been developed through regular overseas exercises carried out by 3Sqn. This experience enabled planners to draw up a detailed list of equipment that would be required for a deployment (even down to the number of chairs required for their operations room).

2.17 Exercises had given 3Sqn a comprehensive idea of what stores would be needed. 'Pack-ups' are permanently assembled and contain nearly everything a helicopter and crew needs to be self-sufficient in theatre. For example, a maintenance pack-up contains tools and spares required for operations. These packs make planning and preparation easier and quicker, as they only need to be altered to suit the specific environment into which the Iroquois are deployed.

2.18 Planners were also able to draw on contingency plan templates that had been created for each of the employment contexts. These templates specify the force element that may be required for a range of scenarios, and include information on:

- likely activity rates;
- the number and skills of personnel likely to be needed;
- training activities that would need to be undertaken; and
- detailed lists of equipment that should be taken.

2.19 Templates also show other factors that need to be taken into account when using contingency plans (such as likely threat levels and mission types), as these factors will alter requirements. The templates serve as a valuable reference source for 3Sqn planners, allowing them to quickly formulate plans for actual situations such as East Timor.

2.20 3Sqn planners also made use of intelligence information provided by the NZDF. However, some information – such as maps of relevant areas and descriptions of the terrain – was either not detailed enough to be of much use or later turned out to be incorrect.

2.21 Issues identified through OPRES reports, while well known at 3Sqn level, did serve to inform higher levels of command of the preparations 3Sqn would need to undertake before deploying to a specific situation.

2.22 Overall, the information available to 3Sqn for planning was of a good standard. Regular exercises in a tropical environment had given 3Sqn a sound basis to plan for operations such as East Timor. Detailed information on the specific terrain was less satisfactory – initially increasing the difficulty of flying in East Timor – but did not greatly affect preparations.

Working with the Joint Operational Planning Groups

2.23 A representative from 3Sqn was part of the first Joint Operational Planning Group set up in June 1999 (see Figure 3 on page 35). The role of the helicopter planner was to provide specialist input to the Joint Operational Planning Group on helicopter operations. This input included advising the group on equipment and manpower requirements as well as deployment options.

2.24 During the initial planning and deployment phase the Air Command helicopter planner was located at the Joint Forces Headquarters in Trentham, Wellington. The role of the planner was to provide specialist advice to the Joint Commander (see Figure 1 on page 24).

2.25 In July 1999 a second Joint Operational Planning Group was set up to plan for the deployment of a smaller New Zealand contingent to East Timor. As a result of this planning activity a Warning Order was issued on 18 July 1999 requiring 3Sqn to prepare four Iroquois for an earliest deployment date of 20 September 1999.

2.26 Since 3Sqn began planning in March 1999, and a degree of preparation had already been undertaken, in our opinion it was well positioned to be able to respond to requests from the two Joint Operational Planning Groups. As initial planning was based on six Iroquois, the later formal NZDF request for six, and subsequent down-scaling to four, meant 3Sqn did not have to make significant changes to existing preparations.

2.27 Participation on the Joint Operational Planning Groups also assisted 3Sqn to develop its own plans consistent with the requirements of the joint force.

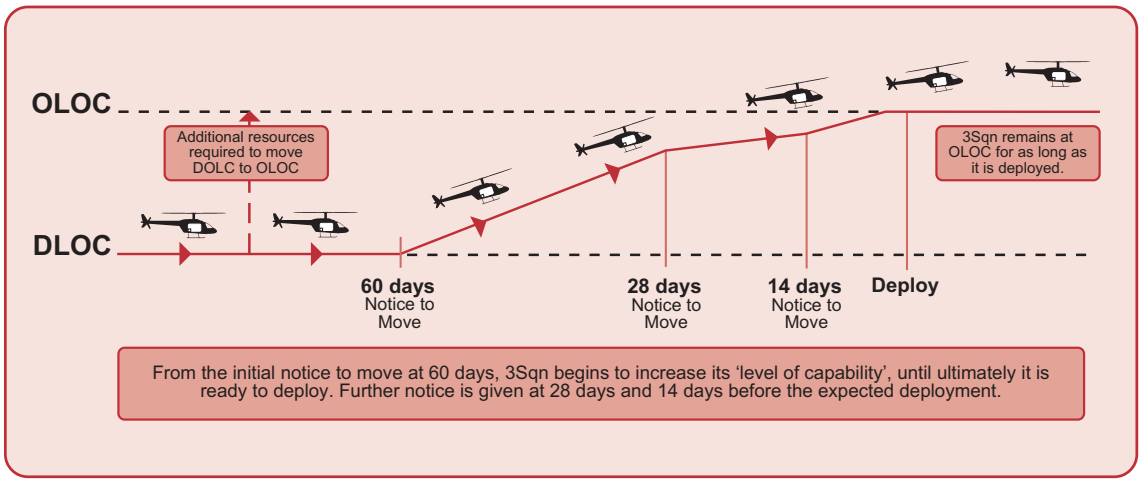
2.28 One helicopter planner from 3Sqn was also deployed with the NZ Forward Planning Group to the Australian Deployable Joint Force Headquarters in Brisbane. This planning group advised the Australian Defence Force of NZDF plans for deploying to, and operating, in East Timor.

2.29 The planners involved also had experience in the joint planning environment by, for example, having completed Australian Defence Force joint planning courses or an equivalent.

Preparing for Deployment

2.30 Once the force structure for the likely New Zealand contribution had been developed from the operational planning process, the Chief of Air Staff and Air Command issued their own instructions to 3Sqn in the form of Directives and further Warning Orders. These instructions form an important part of the planning process in that they provide formal direction and authority for units to move to a shorter response time – see Figure 4 below.

Figure 4
How the Move from DLOC to OLOC Works with Response Times



2.31 The tasks that 3Sqn anticipated it would need to complete in preparation for deployment fall into two main categories:

- preparing the Iroquois; and
- preparing personnel.

Preparing the Iroquois

2.32 Iroquois preparations included painting United Nations insignia onto the airframes, fitting armour and secure communications equipment, and conducting a weight and balance check. A number of critical items (such as the Iroquois armour) had to be acquired before this work could take place.

2.33 A Chief of Air Staff Directive of 27 July 1999 formally directed 3Sqn to begin to address those critical tasks that required additional funding. 3Sqn personnel immediately set about undertaking the tasks. For example, as 3Sqn had already obtained information on cost and supply times for sets of Iroquois armour, they were in a position to undertake a tender and acquire the armour quickly. (See paragraphs 6.12-6.22 on pages 89-91 for a more detailed description of the acquisition of these critical items.)

2.34 One of the key equipment preparations was the fitting of secure communications equipment to the Iroquois. An upgrade from the KY-58 communications equipment to the KY-100 equipment had been planned and was already in progress, but needed to be advanced quickly to meet the East Timor deadline.

2.35 Installation in the first three Iroquois identified for deployment was completed by 17 September 1999 after a number of technical issues were resolved. In a book on the East Timor Deployment[20] the authors note the work of 3Sqn personnel who –

> *designed a system to meet the RNZAF's requirements and then worked hard sourcing suitable parts, trialing installations, designing improvements and setting up a production line, all at minimal cost.*

Preparing Personnel

2.36 Work on preparing a pre-deployment training plan was undertaken in August 1999. An OLOC generation plan was prepared outlining the tasks required to bring 3Sqn to the required state of preparedness. Air Force manuals detail generic tasks required for individuals to meet OLOC standards. These were adapted to suit the specific training needs for East Timor.

2.37 Personnel training covered competencies such as combat survival, ground defence, weapons training, air gunnery, winch operation, and rappelling.[21] Specialist briefings included medical, intelligence, welfare and administration issues.

2.38 A family support package consisting of briefings and visits to Whenuapai and Hobsonville air bases was held for deploying personnel and their families over a weekend. This was supplemented by five days of pre-deployment leave for deploying personnel.

20 *Operation East Timor: The New Zealand Defence Force in East Timor 1999-2001*, by John Crawford & Glyn Harper, Reed Publishing (NZ) Ltd, Auckland, 2001, page 48.

21 Rappelling is when soldiers descend from a hovering helicopter by using ropes.

2.39 A number of OLOC preparation issues related to administration and medical matters. For example, ensuring that all deploying personnel had received the necessary vaccinations (known as Protocol A) was a key preparation task.

2.40 The expected cost of increasing 3Sqn's state of preparedness from DLOC to OLOC was reported to the NZDF in August 1999. To take into account changes in NZDF planning, updated preparedness budgets were prepared in September 1999.

2.41 The move from DLOC to OLOC for 3Sqn was achieved within the time scale formally identified. 3Sqn was already at a height of preparedness following the APEC conference. However, 3Sqn had to respond to quickly reducing response times that generated additional pressure for completing necessary preparations.

Managing APEC Duties

2.42 3Sqn had to prepare for APEC duties while also planning and preparing for East Timor. Preparations for APEC began in late-1998, with 3Sqn required to provide four Iroquois for security duties and VIP transport for the two weeks of meetings in September 1999. 3Sqn assigned six Iroquois to APEC to ensure that four were always available.

2.43 APEC duties were given priority at all stages of preparing for East Timor. 3Sqn knew it could not deploy to East Timor before 20 September 1999, once the APEC commitment had ended. INTERFET began in late-September, requiring 3Sqn to move from the APEC operation straight into East Timor.

2.44 Some aspects of APEC preparations fitted well with those for East Timor. For example:

- training for APEC was beneficial in some ways in that aircrews were already highly operational as a result of the APEC security commitments; and
- many of the modifications that were needed for East Timor were also required for APEC – such as Global Positioning System navigational equipment that had been fitted earlier in 1999.

2.45 However, a number of matters complicated planning and preparation for the East Timor deployment:

- Aircrew selected to deploy to East Timor were not allowed to fly together for ten days after receiving the JEV inoculation, making some of them unavailable for APEC training duties.
- Maintenance schedules had to be shuffled around to ensure that enough Iroquois were available for training and preparation duties for both APEC and East Timor (more detail is provided in paragraphs 5.8-5.13 on pages 79-80 – *Getting the Iroquois Ready*).
- Time constraints limited 3Sqn's ability to conduct joint training with Army that was specifically directed at tasks likely to be undertaken in East Timor.

2.46 Training for East Timor was not as concentrated as it would have been had 3Sqn not been involved in any other commitments in the run-up to deployment. For example, there would have been more opportunity to conduct specific joint training and tailor aircrew training to East Timor requirements.

Getting to East Timor

2.47 Deployment of the first three Iroquois took place on 24, 25 and 27 September 1999, with the fourth going to East Timor on 14 October 1999.

2.48 All four Iroquois were transported straight to East Timor by Air Force C-130 Hercules aircraft. By removing the main rotor assembly and one of the tail rotor blades (plus other smaller fittings such as aerials) an Iroquois can be transported inside the Hercules almost fully intact. Support equipment for the Iroquois can also be included with the Hercules load, as well as up to 18 personnel and their packs.

2.49 Transporting the Iroquois by air had a number of advantages. The Iroquois were not transported by ship because of the additional time and the added risk of damage if transported this way. Salt water is highly corrosive to the Iroquois airframe, resulting in additional maintenance and precautions to mitigate the risk. By airlifting straight into East Timor, 3Sqn also avoided having to double-handle the equipment – reducing the risk of breakages in transit.

2.50 Later on, when phase maintenance was being conducted in New Zealand rather than in East Timor, transporting the Iroquois by air reduced the need to deploy an additional Iroquois. As the aircraft that flies the Iroquois out of East Timor also brings one in – and takes less than two days to do so – there is no lost time from an Iroquois being unavailable (which would be the case if transported by sea for 10-12 days).

2.51 Detachment personnel did not have an acclimatisation period in Australia like subsequent Army personnel. As it was decided that the Detachment was going to be 'static' (i.e. not patrolling as groups or moving bases frequently) the need for acclimatisation was seen as unnecessary. The first personnel were flown by Hercules from Whenuapai to Dili on 24 September 1999. This 14-hour flight was repeated over the next three days to transport remaining personnel, to an initial total of 89.

Part Three

Operating in East Timor

The Detachment successfully set up camp in Dili, and later Suai, and began operations quickly. Deploying as self-sufficient proved valuable.

It was widely recognised that the Iroquois were an important force multiplier, although the Iroquois' limited capabilities restricted operations in some cases. These capabilities were further limited by the level of threat and the East Timor environment, reducing the operational options available to military commanders.

3Sqn has a good culture for learning lessons. Extending formal means for gathering lessons of a joint nature will enhance current practice.

Operations have been sustained in East Timor well beyond the 12 months expected by the Government by means of a number of adaptations to the way 3Sqn operates. Some of these changes have reduced the time that 3Sqn will have to spend regenerating a broad base of capabilities once the deployment ends.

Dili

3.1 The Detachment operated from the city of Dili from 24 September 1999 until mid-December 1999, when all components of the Detachment were finally transferred to Suai. It took one week to fully set up camp in Dili. Initial tasks involved establishing a secure perimeter, setting up tents and services, and reassembling the Iroquois. As the Detachment was required to provide at least two Iroquois for tasks, it took until the third day to become operational. These three days were required to rebuild all three Iroquois and conduct test flights before they were ready for operations.

3.2 The Detachment deployed into an extreme environment. The authors of *Operation East Timor*[22] note that *when the first group left New Zealand the temperature was about 12°C, but when they arrived at Dili at 7am the temperature was already over 30°C and rising rapidly.* Adjusting to this environment involved continuous consumption of water, lower workloads during the first few days, and careful planning of the day's activities. For instance, personnel would spend only 20 minutes out of each hour working until they were acclimatised.

22 Op. cit., page 68.

3.3 The security situation was also tense during the initial deployment. Indonesian Army personnel were still stationed in Dili when the Detachment was setting up. Whenever Detachment personnel were outside the camp's secure perimeter they wore flak vests and carried weapons. The uncertainty of the situation, and INTERFET forces being significantly outnumbered in Dili, meant that Detachment operations took place in a far from benign environment.

3.4 The Detachment deployed to Dili as a self-sufficient unit. In order to begin operations as quickly as possible the minimum amount of equipment required was flown in with the Detachment, with the remaining equipment arriving by sea two-to-three weeks later. Individual personnel took only their packs, tents and enough rations for 28-day self-sufficiency.

3.5 The first operations undertaken were reconnaissance flights in the immediate vicinity of Dili. These flights enabled commanders to assess the extent of damage in the area and to gather information on troop activities. Later operations involved troop insertion and extraction, especially along the Indonesian border. Conducting re-supply of outlying posts and areas also constituted a large portion of initial tasks. A number of aero-medical evacuations were also carried out.

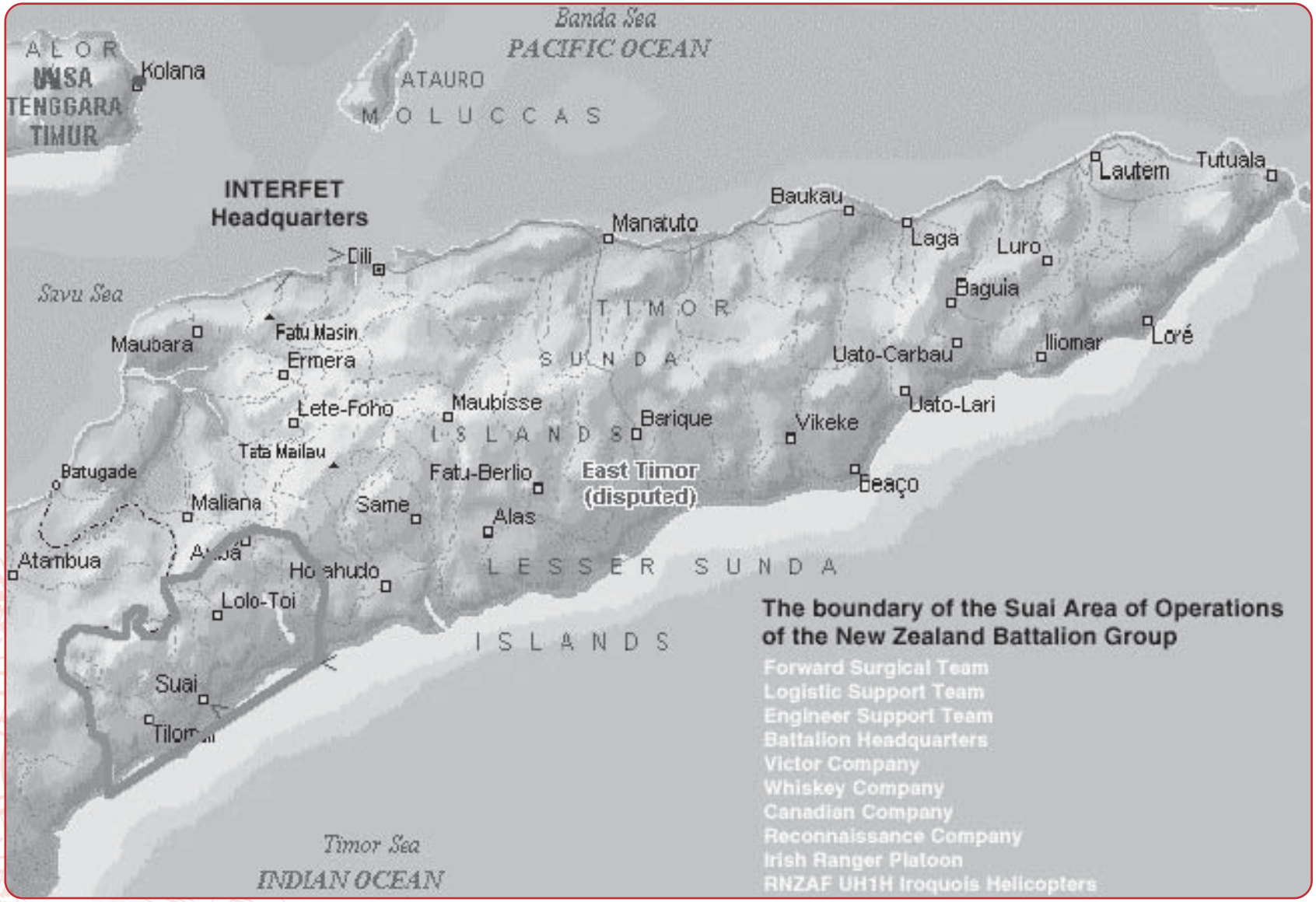
3.6 Operational command of the Detachment remained with the New Zealand Joint Force Commander while they were deployed. Operational control, however, was given to the overall HQ INTERFET.[23] This was exercised through the New Zealand Senior National Officer in theatre, who had authority to take back operational control for national tasks or for tasks that did not fall within the New Zealand Rules of Engagement.[24]

3.7 The remaining elements of the Detachment achieved OLOC on 14 October 1999 and subsequently deployed to East Timor on 15 October 1999. Within the first six weeks in Dili they built up the deployment to 115 people and six Iroquois to ensure that four Iroquois were always available for tasks. The 115 included a full-phase maintenance crew.

23 Under this arrangement the New Zealand Joint Force Commander retained overall authority over New Zealand forces in East Timor, but HQ INTERFET had the ability to use the forces for operations where acceptable.

24 Directives that define the circumstances and limitations under which forces will initiate and/or continue combat engagement with other forces that they encounter.

Map of East Timor

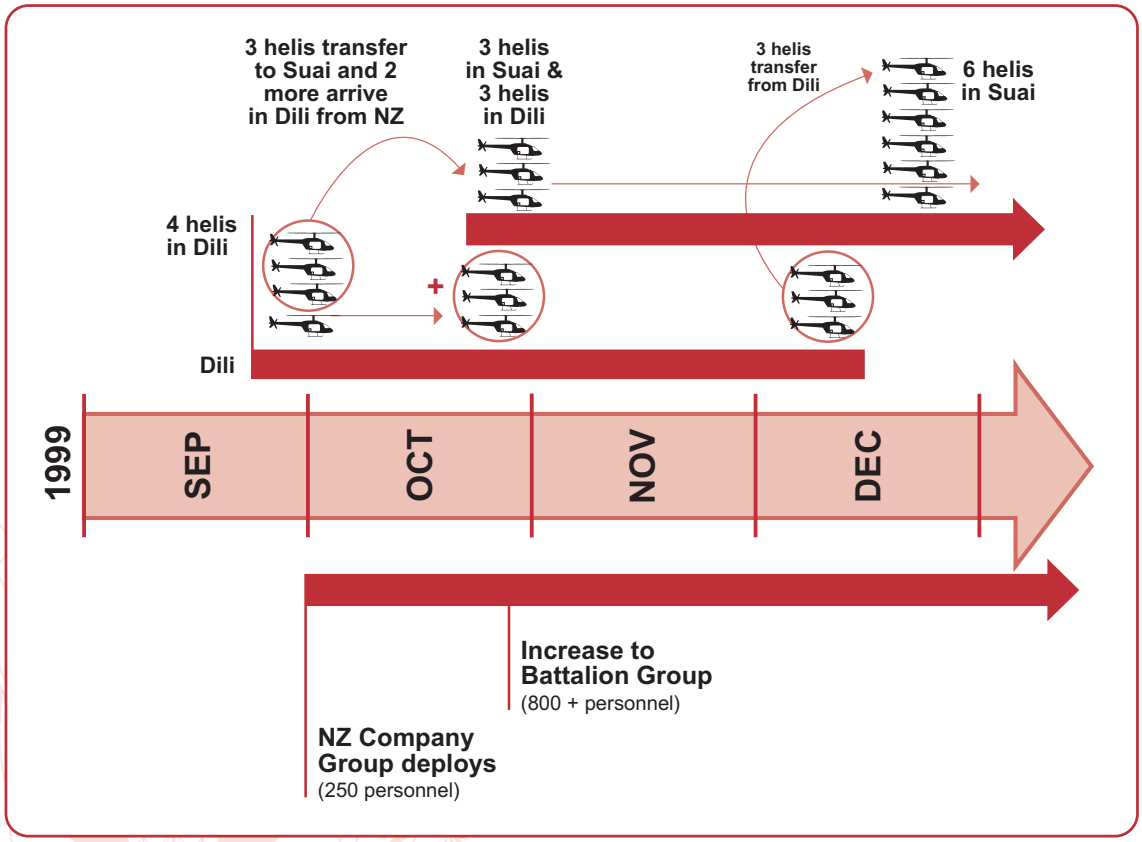


Suai

3.8 Once the international force had successfully occupied Dili and its immediate areas, the focus turned to expanding control to wider areas of East Timor. A large part of this role involved occupying the region bordering Indonesia, of which the New Zealand Battalion was given responsibility for the southern half. This effort was to be based around the township of Suai.

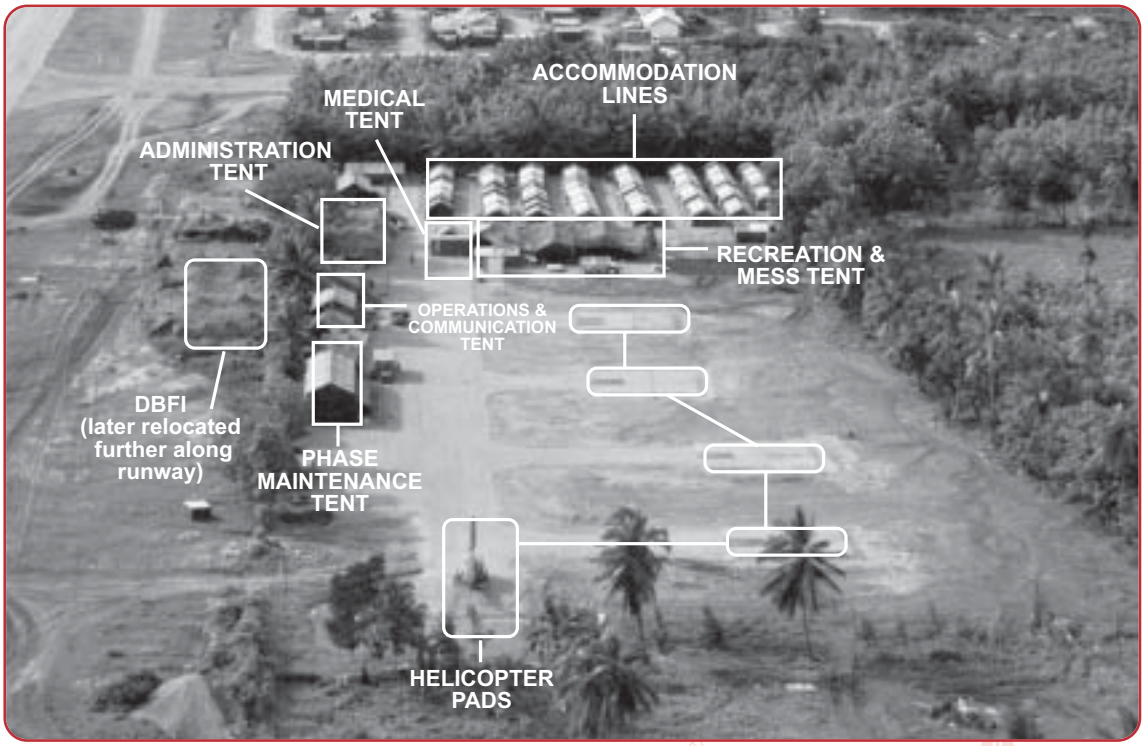
3.9 The Detachment began moving to Suai once the New Zealand Battalion had established itself there (see Figure 5 below for a timeline of the transfer). The move to Suai was done by first sending half of the Detachment to set up the Suai camp and secure the area. Most of the Detachment's Air Security personnel were sent with this first contingent since the Suai area was considered a greater risk than Dili. By 27 October 1999, the Detachment was operating three Iroquois from the new Suai base.

Figure 5
Timeline of Detachment's Move from Dili to Suai



3.10 The remainder of the Detachment moved to Suai once the camp had been established. By 15 December 1999, all six Iroquois and their crews had transferred from Dili and were operating from Suai. The Deployable Bulk Fuel Installation (DBFI)[25] was first set up in East Timor at the Suai camp, as the Australians had provided refuelling facilities in Dili. By the end of December, all of the Detachment's 115 personnel were deployed at the Suai camp (see Figure 6 below).

Figure 6
Layout of Detachment Camp at Suai



3.11 The Detachment's camp was established next to the runway at Suai. The site was far from hospitable when the personnel first arrived – it was covered in mud and infested with scorpions. Walkways between the rows of tents quickly became flowing streams in the rainy season. Australian Engineers – who were working on extending the runway – stayed on and helped build the camp. This included laying down shingle to provide a firm and reasonably dry base for camp buildings and walkways.

25 This is a set-up of inflatable fuel bladders that can be used on deployments to support vehicle operations (usually helicopters or planes).

3Sqn's Value to Army in East Timor

3.12 The main job for the Detachment in Suai was to provide air mobility for the New Zealand Battalion. Initially, most of the troop transport tasks were undertaken by the Australian Blackhawk helicopters, with the New Zealand Iroquois carrying out reconnaissance flights, supply tasks, VIP transport, and aero-medical evacuations. Once the Australian Blackhawks left East Timor in late-2000, the Detachment became responsible for supporting both the Australian and New Zealand Battalions.

3.13 The Iroquois were especially valuable in the border regions of East Timor. The difficult terrain, combined with extreme conditions, made ground movement within the area complicated and slow. Having the Iroquois available provided the ability to deploy small groups of troops to areas quickly, or to transport small quantities of supplies to outposts in minutes rather than hours.

3.14 It was very important that the Iroquois were a New Zealand asset and that they were under New Zealand command. This allowed the New Zealand Battalion to request urgent tasks from the Detachment much more quickly than if it had to request such tasks from another nation's helicopter squadron.

3.15 Assigning Iroquois to tasks followed a rigorous process that ensured all competing tasks were assessed and prioritised with reference to the limited number of flying hours available. As the United Nations had an agreement with the New Zealand Government for the provision of 200 flying hours a month (at one stage increasing to 300 hours), there were, at times, more tasks than hours available to undertake them.

Performance of the Iroquois in East Timor

3.16 The level of threat and the environment that they operate in limit the capabilities of the Iroquois. In the case of East Timor, these factors limited performance by the need:

- to fit armour to protect the crew against small arms fire – adding weight and (thus) reducing the load that could be carried;
- for an extra crew member to man a second door gun – again adding the weight of both the crew member and the machine gun; and
- to adjust for the high temperatures, high humidity, and high-altitude operations.

3.17 When planning missions a total weight before fuel of 7200lb[26] is used (see Figure 7 below). An Iroquois consumes 600lb of fuel an hour. A minimum fuel load of 200lb is also needed for landing (providing enough time to land if unexpected circumstances arise), giving the flight times and maximum weights shown in Figure 8 on next page.

Figure 7
Weight of Iroquois as Typically Used in East Timor

	Weight in pounds	
Typical empty Iroquois		5800
Plus –		
full crew (@ 235lb per person and equipment)	940	
full kit of Iroquois armour (including seat armour)	373	
two M60 machine guns	206	
box of spare water	40	
		1559
		7359
Less –		
counterweight for seat armour[1]		(200)
Basic weight before fuel		7159
Planning weight (allows nominal 40lb for any variation in weights above)		***7200***

1 When armoured seats are fitted a ballast weight of 200lb used as a counter-balance is removed from under the co-pilot's seat.

26 Pounds (lb) are the common international measure for aircraft weight.

Figure 8
Maximum Load for the Iroquois at Various Flight Times

Total Flight Time	Fuel Load Required[1] (pounds)	Maximum Load (pounds)
30mins	500	1800
1 hour	800	1500
1½ hours	1100	1200

1 Including the 200lb of fuel reserve for safety purposes.

3.18 The high temperatures, high humidity, and high altitude conditions that the Detachment was operating in further reduced the capability of the Iroquois. Peak engine power performance was often not attainable. For example, if an Iroquois had to re-supply a position at 5000ft, and the temperature was 24°C at this altitude, it would be able to carry only 900lb of personnel or equipment for a 30-minute flight. Such conditions meant that the Iroquois was often able to carry only four fully-equipped soldiers – because they can weigh more than 1200lb.

3.19 With two Iroquois (all that the Detachment was required to supply for operations for the majority of the time in East Timor) a patrol of eight soldiers could be inserted. But six lightly-equipped troops could be carried in each Iroquois, allowing a total of 12 soldiers to be inserted by two Iroquois.

3.20 Another restriction on the Iroquois – whether or not operating in East Timor – is the available cabin size. The way the Iroquois cabin is designed restricts the number of people that can be safely transported. Even if the Iroquois could lift twice the amount of weight that is currently possible, given the limited cabin space it would struggle to carry more than six fully-equipped soldiers.

3.21 The capabilities of the Iroquois, and the number available in East Timor, shaped Army operations in a number of circumstances. The ability to quickly respond to incidents with a sizeable force was limited by the number of soldiers the Iroquois could carry. This limited the flexibility of Army operations and meant that attendant risks had to be managed in other ways.

3.22 For example, if an incident required the deployment of a platoon-size response group, the operation would have to be executed with transportation limitations in mind. A minimum of four Iroquois would take at least two trips to transport the whole platoon to its position. This meant the first troops would have to be dropped off a safe distance from any likely threat to ensure that they could adequately defend themselves until the remainder of the platoon arrived. If only two Iroquois were available, this type of response would be practically impossible, leaving road transport as the only option, and therefore losing the speed of response.

3.23 The NZDF has been aware of these limitations for some time. A report on a joint exercise held in 1996 noted that *attempting to tactically move a Company of close to 100 men with three Iroquois is laughable at best.* The report also noted that the first troops inserted by the Iroquois (a total of twelve) are required to maintain security in the area until the second insertion occurs approximately 15-20 minutes later – *thus a single company move over approximately 10km requires in the order of 1 hour 40 minutes.*

3.24 As 3Sqn had not developed the capability to carry out night flying in circumstances such as East Timor, Army was not able to conduct night troop insertions or extractions without requesting the use of the Australian Blackhawk helicopters (which were only available up to late-2000). Night aero-medical evacuations had to be conducted by the Blackhawk helicopters as well. (An additional factor was the Blackhawk's ability to outperform the Iroquois as an aircraft in such a role.)

3.25 Air Command noted that there would be significant risks if the Iroquois were required to conduct night aero-medical evacuations once the Blackhawks had left. 3Sqn had not developed its Night-Vision Goggle expertise to cover such operations which, when combined with the mountainous terrain and tropical weather patterns, caused 3Sqn reports to note that *there is a high risk of an aircraft accident.*

Figure 9
A Week's Flying for 3Sqn in Suai[27]

Day 1	• Two Iroquois fly to Balibo to drop off five response force soldiers. Three patients flown back to Suai. • One Iroquois transports a Brigadier and his entourage to a command meeting. • One Iroquois takes 3Sqn medics to Bobonaro to pick up a civilian casualty and takes them to the Field Surgical Team in Suai.
Day 2	• Two Iroquois transport 2800lb of freight to a forward position, as well as a passenger. • One Iroquois transports Kylie Minogue and her entourage from Suai to Balibo where she performs for Australian troops, then to Dili before returning empty to Suai.
Day 3	• Two Iroquois fly in support of a reconnaissance mission by NZ troops. Several trips are made to transfer troops and 2000lb of freight.
Day 4	• One Iroquois flies to the Field Surgical Team to conduct aero-medical evacuation training. Winching demonstrations also performed. • Two Iroquois transport eight passengers, including an East Timorese detainee, from Belulik Leten to Suai. • One Iroquois flies six people from Suai to Batugade, returning to Suai with three others. The Iroquois then flies to an outpost to pick up three soldiers and 400lb of freight and returns to Suai; flies 500lb of freight back to the outpost; and again returns to Suai with three soldiers and 400lb of freight.
Day 5	• Two Iroquois conduct a re-supply mission to a site in Balibo. A total of 14 passengers and 800lb of freight are moved. • Two Iroquois insert a patrol of 15 members of a NZ Company into the jungle.
Day 6	• Two Iroquois fly seven members of a NZ Company on a reconnaissance of the border region. Two Iroquois deliver cases of water to troops based in Ainaro. • One Iroquois flies to Belulik Leten to drop off a medic and transport a lightning strike casualty to the Field Surgical Team in Suai.
Day 7	• One Iroquois picks up five Australian troops and inserts them to a forward position. • One Iroquois transports a Brigadier and his entourage. • Two Iroquois fly a high-ranking officer and accompanying officers on a reconnaissance flight to survey a suspected Militia stronghold. • Two Iroquois transport personnel and stores to a NZ Company post, but due to heavy cloud cover are unable to complete the task.

27 This is a compilation from throughout the deployment rather than an actual week.

Lessons Learned Processes

3.26 3Sqn has two main sources of lessons learned:

- daily debriefing sessions while in theatre; and
- end-of-tour reports.

3.27 Each aircrew has a debriefing session after every flight. Part of the Detachment culture is that all members of the crew are encouraged to speak openly at the end of an operation. In addition, a wider briefing/debriefing session is held each evening to go over the day's operations and to plan for coming tasks. For instance, at one of the briefing sessions we attended while in East Timor a junior pilot informed the other aircrews that at a particular landing area it is best to approach from the north to avoid possibly dangerous wind currents. By encouraging the sharing of this type of knowledge, the Detachment is effective in enhancing its day-to-day operations.

3.28 End-of-tour reports are completed by the Head of each section of the Detachment, which are then collated by the Detachment Commander and a summary completed with recommendations for action made. These reports are sent to the Air Component Commander and to various other Commands for information purposes. Air Staff and the Joint Forces Headquarters are responsible for addressing any outstanding issues that 3Sqn is not able to rectify – for instance, issues that would require funding beyond 3Sqn's authority.

3.29 A good example of an issue being raised in an end-of-tour report, and subsequently rectified, concerned the colour the New Zealand Iroquois were to be painted while in East Timor. Once INTERFET had changed to a United Nations led mission, the United Nations dictated that the Iroquois be painted white. The Detachment Commander noted in his end-of-tour report that *most army units we supported preferred to be inserted or extracted unobserved if possible. This was a virtually impossible task in a white aircraft*. The Air Force undertook negotiations with the United Nations and resolved the issue by painting two of the available Iroquois white and the other two in the usual green colour. This provided 3Sqn with some flexibility.

3.30 Any lessons learned that apply to the way 3Sqn operates are incorporated in the Squadron's Standard Operating Procedures (SOPs). These cover a range of situations (both peacetime and situations such as East Timor), and provide guidelines on how to conduct operations. Any developments from operations in East Timor are relayed back to New Zealand for

inclusion in the SOPs. SOPs for East Timor have also been developed to suit the specific duties being carried out there.

3.31 However, 3Sqn is aware that not all lessons learned in East Timor will be applicable to other situations. It is important that procedures do not mirror only one form of possible deployment. The SOPs are updated with this in mind – taking from the deployment what is important, while remaining flexible for the next situation that arises.

3.32 We consider that there are limited formal means by which 3Sqn can gather lessons learned of a joint nature. For example, 3Sqn will make its own observations concerning operating with Army, and Army will identify issues to do with operating with 3Sqn as part of its own lessons learned system. The Centre for Army Lessons Learned recorded 3Sqn comments in its lessons learned system, although these comments focused on higher-level issues.

3.33 We did not find any formal mechanism that allowed these issues to be compared and considered between the two Services. Such a mechanism would ensure that both Services are clear on the problems encountered when working with each other, and that each Service's reasoning is understood by the other.

Sustaining the Detachment in East Timor

Keeping 3Sqn in East Timor for 12 months

3.34 The Purchase Agreement requires a Detachment to be able to sustain itself in an operation such as East Timor for up to 12 months. The Agreement states that reinforcements and replacements to enable this 12-month sustainment period must come from within 3Sqn and other contributing Air Force units.

3.35 OPRES reports of 1999 noted that personnel levels would limit 3Sqn's ability to sustain operations for the required 12 months. This debate was held within the Air Force at the end of 1998 and beginning of 1999 and concerned whether or not 3Sqn required 15 or 18 crews to be able to sustain its commitment for the 12 months.

3.36 3Sqn is funded for up to 15 helicopter crews in order to provide a total of nine crews for deployment to situations such as East Timor where six Iroquois are required. The remaining six aircrews are required to carry out counter-terrorist and search and rescue operations in New Zealand. It was agreed that 3Sqn could source an additional three crews from within the wider Air Force and from training programmes that were continuously being undertaken. With these resources it was considered that 3Sqn would have enough personnel to send a second six-month rotation of nine crews.

3.37 It was not considered feasible for 3Sqn to sustain further rotations beyond this 12-month period. All 15 crews would require time to regenerate and retrain in key skills that had been lost due to being deployed.

3.38 As it became clear that 3Sqn would be required to deploy in East Timor well beyond the 12-month period, 3Sqn explored a number of options to sustain its operations. A request was made in November 1999 to reduce the number of aircrews in East Timor from nine to seven. Initially, NZDF Headquarters rejected this proposal because New Zealand was required under the United Nations agreement to maintain a higher level of operations than seven crews could sustain.

3.39 However, agreement had been reached by December 1999 that the New Zealand commitment in East Timor should reduce to a total of only four Iroquois in order to provide two for tasks. This made it possible to reduce the number of crews, and by February 2000 3Sqn had seven crews stationed in East Timor – a number that could be more easily sustained.

3.40 Another measure that helped 3Sqn to sustain the ongoing commitment in East Timor was the change from six-month to two-month, and then three-month, rotation periods. This had a number of benefits. Personnel morale issues improved with a two- or three-month tour being easier on families and partners. One of the other key reasons for this change was to prevent aircrew skills degrading to a point where they would be difficult to recover.

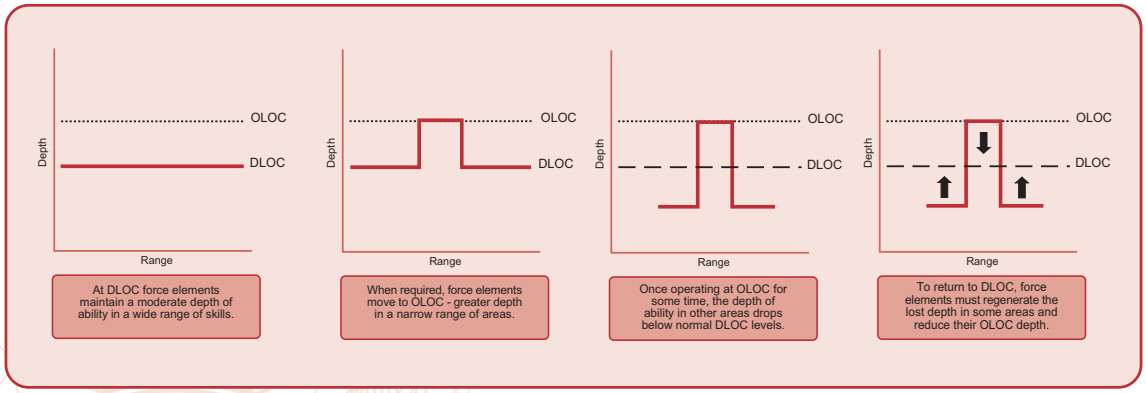
Regeneration of 3Sqn Capability

3.41 As aircrews in East Timor perform only a proportion of the tasks that they are trained to carry out, the level of skills in other areas declines (see Figure 10 below).

3.42 Regenerating this 'lost' capability in some units in other Services can take a considerable amount of time. This is not the case for 3Sqn, which has been operating at OLOC for over three years and has not lost skills to a point where regeneration of core skills has become a serious issue. As noted above, this is mainly due to the move to two-month and then three-month rotations, so that the amount of time that aircrews specialised in 'East Timor flying' was relatively limited.

3.43 For example, a helicopter crew in East Timor gains a lot of experience in mountain flying, but not in formation flying, search and rescue, or Police work. 3Sqn has estimated that if the length of the rotations had remained at nine or six months, it would have taken three months to retrain pilots to the general level of skills required.

Figure 10
From DLOC to OLOC and Back Again – the Rise and Fall in Skill Levels



Part Four

Reporting Preparedness

Subjective statements reflecting professional judgement will always play a part in preparedness systems reporting. However, OPRES does not make it clear where and on what basis these judgements have been made.

It is difficult to identify the preparedness levels of all units that contribute to the Air Force's ability to deploy a detachment of Iroquois.

OPRES does not show the full implications of capability shortfalls on preparedness. As OPRES is a 'snapshot' system, it does not provide information on when capability shortfalls are likely to be rectified or whether this is possible within agreed times.

A new system, Air Performance Management System, has the ability to enhance preparedness reporting in a number of ways – especially the collection of information.

A modified sustainability statement in the Purchase Agreement should make it clear to the Government what resources are available for differing lengths of deployment and clarify for 3Sqn what the Government's expectations are.

4.1 In this part of the report we consider four main issues arising from our examination of the reporting of 3Sqn preparedness:

- the level of subjectivity in OPRES;
- preparedness reporting of supporting units;
- sustainability requirement in the Purchase Agreement; and
- capability shortfalls reported through OPRES.

4.2 We also examine the Air Performance Management System (Air PMS). This recent development has the ability to enhance preparedness reporting in a number of ways – most notably by increasing the ease with which this information is collated and analysed.

Level of Subjectivity in Preparedness Reporting

4.3 Subjective statements reflecting professional judgement will always play a part in any military preparedness reporting system. These systems are designed to produce a high-level picture of preparedness that requires information to be summarised and aggregated as it progresses up the military command chain. Professional judgement is an unavoidable component at each point of summarisation and aggregation.

4.4 However, it is important that a preparedness reporting system:

- clearly identifies where professional judgements have been made; and
- that the statements reflecting the judgements are based on (but do not compensate for a lack of) relevant data.

4.5 Professional judgements appear in OPRES at two main stages:

- assessment by units of whether they are meeting Key Performance Indicators (KPIs); and
- comments on reports as they progress through the OPRES system.

Unit-level Subjectivity

4.6 When 3Sqn collates OPRES information biannually (until recently this was a quarterly exercise) professional judgements by key personnel often form the basis for unit-level OPRES reports. This occurs for two main reasons:

- a lack of systems to easily and quickly give basic OPRES information to those responsible; and
- uncertainty in the way some KPIs should be interpreted and reported.

4.7 At present, it is time-consuming to gather the information needed to measure some KPIs. For example, quantifying the number of spare parts for every single OPRES report is not done. 3Sqn personnel will use their professional judgement to determine whether they are meeting the KPI measures or not. This is done primarily to save time, because 3Sqn does not have information systems available to produce spares information in the form that OPRES requires.

4.8 In addition, any quantification of the number of spares 3Sqn currently has would not necessarily take into account the availability of critical parts as distinct from non-critical parts. For example, 3Sqn may have all of the required non-critical parts but only half of the critical parts that it needs. In this case, 3Sqn could report that it has 90% of total spares and is therefore fully prepared in this case. However, professional judgement by 3Sqn personnel would ignore this quantification and relegate 3Sqn preparedness to, say, 70%, by giving a stronger weighting to critical spares.

Command Comments Throughout the OPRES System

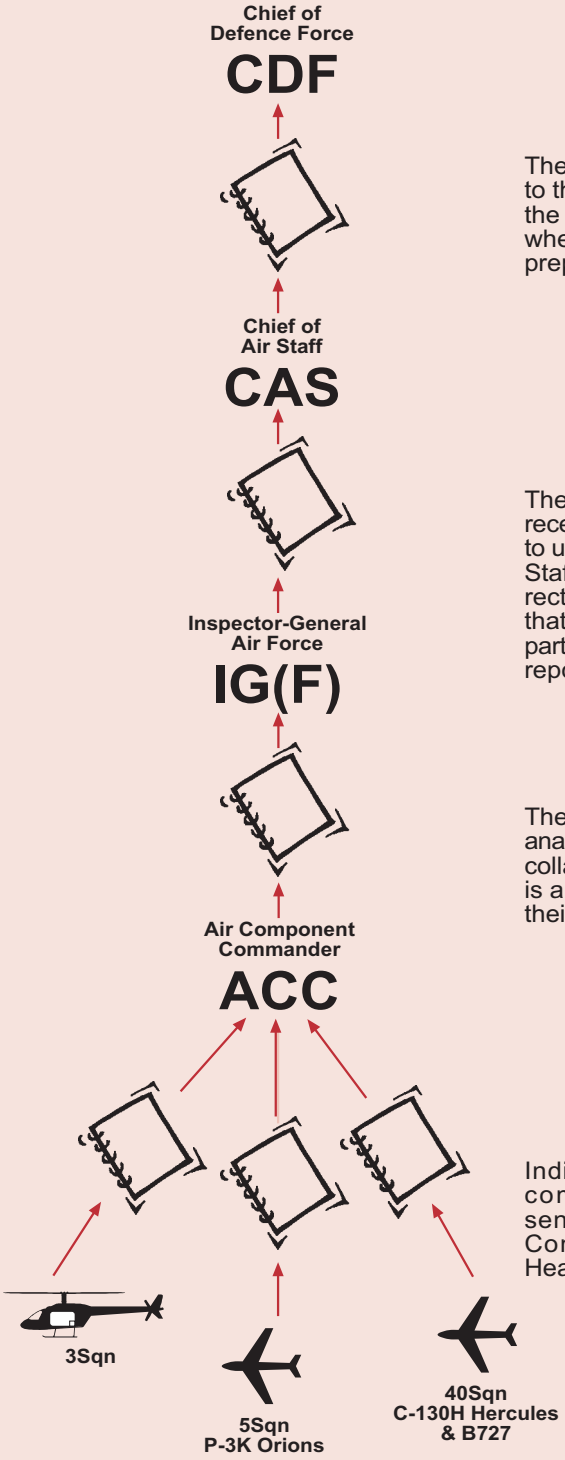
4.9 Professional judgements can also alter the content of OPRES reports as they progress through the system. Each step that the reports progress through results in an aggregation of a number of lower reports. For example, four force element reports will be aggregated at the Air Command level to form one Air Command OPRES report (see Figure 11 on the next page).

4.10 Comments can be made at each aggregation to qualify or re-interpret the assessed preparedness of units. Personnel at the Air Command level may view a certain measure differently to those at unit level, or may recognise opportunities to overcome deficiencies from other areas that are not available to personnel at unit level.

4.11 In our view, the basis on which these judgements are made is often not clear. The current system does not require professional judgement comments to be referenced in some way to the information that the judgements are based on. This lack of referencing can make it difficult for units to understand why aspects of their original reports have been altered, or to clearly understand the implications of the resulting subjective comments.

4.12 The units' difficulty is compounded by the fact that the present preparedness reporting system does not provide feedback to units on the decisions made at the higher levels.

Figure 11
The Levels of Preparedness Reporting



The Chief of Air Staff formally reports to the Chief of Defence Force through the NZDF-wide Inspector General, where a Defence-wide picture of preparedness can be developed.

The Inspector General (Air Force) receives the collated report and is able to use the other Branches of Air Force Staff (Development Personnel, etc) to rectify outstanding deficiencies. Any that cannot be fixed are reported as part of the Inspector General's OPRES report to the Chief of Air Staff.

The Air Component Commander analyses the individual OPRES reports, collates them into a single report, and is able to fix any deficiencies within their authority.

Individual Squadron Commanders complete OPRES reports and send them to the Air Component Commander at the Joint Forces Headquarters.

Preparedness Reporting of Supporting Units

4.13 Not all of the units that come together to form a helicopter detachment have their preparedness reported through OPRES. 3Sqn personnel form only a third of the Detachment deployed in East Timor. Other units such as Air Security and Deployable Bulk Fuel Installation (DBFI) are not normally part of 3Sqn.

4.14 When 3Sqn reports on its preparedness, it reports only on the preparedness of its aircrews, the availability of helicopters, and its ability to sustain this commitment. Other units that contribute to the Detachment are not included in this reporting. In the case of Air Security and DBFI, these units form part of the Operational Support Services, which do not report their preparedness as part of OPRES.

4.15 The ability of these units to support a helicopter detachment is considered as part of higher-level preparedness reporting. The mechanisms for doing so, however, are not as clear as if the units were required to report their preparedness in the OPRES format. We understand that the development of Service Level Agreements as part of the new Air PMS (see paragraph 4.36 on page 72) will increase the transparency of the preparedness level of these units.

Sustainability Requirement in the Purchase Agreement

4.16 The requirement under the Purchase Agreement to sustain any operational deployment of a helicopter detachment for 12 months is based on 3Sqn using all its capability to maintain a 12-month deployment and then taking time to regenerate this capability. 3Sqn is funded for sufficient numbers of personnel and equipment to be able to attain this, and must report on its ability as part of preparedness reporting.

4.17 The Detachment was deployed to East Timor for over three years. The NZDF stated in its Annual Report 2000 that East Timor had shown that *the RNZAF is manned to sustain Rotary Wing Transport Forces on continuous operations as specified in the Purchase Agreement.*[28] However, this statement does not make two points clear:

- that continuous operations are not specified in the Purchase Agreement and the NZDF is not usually funded on the basis of being able to provide such a 'continuous' capability; and
- that 3Sqn would not have been able to sustain the commitment of six helicopters and had to rely on a number of reductions (down to four helicopters, fewer flying hours, shorter rotations, and a reduction in output requirements in New Zealand) to allow it to remain in East Timor.

4.18 The 12-month sustainability requirement has impacts on planning. For example, by basing its planning for East Timor on the stated 12 months, 3Sqn:

- sent the majority of experienced maintenance personnel for the initial deployment and sufficient numbers for the first rotation, making it difficult to maintain a core of experienced personnel in subsequent rotations; and
- sent a number of qualified helicopter instructors on the initial deployment, making it difficult to train the aircrews required for subsequent rotations with the instructors that remained.

4.19 In some circumstances there will be a requirement to deploy a helicopter detachment for a shorter or longer period than the 12 months – as demonstrated by the East Timor deployment. The specification of a single 12-month sustainment period does not clearly detail the Government's intentions with regard to shorter or longer deployments.

4.20 We believe that a modified sustainability statement would make the risks and implications, especially for capability, of differing lengths of deployment clear to the Government.

28 *New Zealand Defence Force Annual Report 2000*, parliamentary paper G.55, page 111.

Reporting Capability Shortfalls Through OPRES

4.21 Capability shortfalls that restrict the preparedness of key force elements can appear in OPRES reports over a significant length of time. Two critical items (Iroquois armour and Aircrew Life Preservers) had appeared in OPRES reports for a number of years. As OPRES is not designed to report capability shortfalls and facilitate their rectification:

- little information is given on the time required for rectification in relation to response times;
- a high priority for acquisition or rectification is not guaranteed – even though such items are critical to meeting the levels of preparedness purchased by the Government; and
- the risks of acquiring equipment immediately before deployment are not communicated adequately.

Lack of Preparedness Information

4.22 Little information on rectification times and costs was provided when both the Iroquois armour and body armour items were reported as part of OPRES. In the report to the Chief of Defence Force for the period July to December 1998, the Air Force noted that the Iroquois armour *should be fitted as part of a programmed upgrade in FY02/03-04/05.* The same report noted that while body armour *is available within the longer* [response times], *it is a limitation for* [counter-terrorist] *operations*.

4.23 No information was provided as part of preparedness reports on:

- how long the equipment would take to acquire if 3Sqn needed to be deployed – including testing and fitting;
- an estimated cost for acquiring the equipment;
- the status of acquisition projects – whether they are on time or are not being resourced adequately; or
- the risks of not having the items, and the measures that would have to be adopted if they were not obtained.

4.24 Including short statements, such as those noted above, would inform the Government and the Chief of Defence Force not only of the impact that capability shortfalls are having on current preparedness, but also their likely impact in future reporting periods.

4.25 At present, this information is only available through other sections of the NZDF (such as the Development Branch) and is not considered a necessary part of preparedness reporting. However, we believe that the Government and the Chief of Defence Force would receive a fuller picture of force preparedness if this information were provided for key preparedness items.

4.26 While it may be difficult to obtain accurate information for some items (e.g. price information when not fully aware of requirement details), indicative figures would still provide the NZDF with a clearer picture of the possible impacts of deployment requirements. A clear statement of whether the equipment can be acquired within response times should be made to inform higher-level decision-making.

4.27 In February 1999, the Air Force requested that more information be supplied from units in addition to OPRES reporting. OPRES reporting did not *provide all of the information required … to enable Air Staff to be adequately informed about the health of RNZAF Outputs*.

4.28 The lack of information given also restricted the amount of follow-up that could be undertaken at the Air Staff level. Air Staff asked units to provide information on:

- why the rating is not P1 (highest level of preparedness);
- what is being done about the situation;
- what is the progress with the plan to rectify the situation;
- what will the rating be in six months' time; and
- when will the rating be P1?

4.29 This request has yet to be fully implemented by reporting units.

Priority Status of Critical Items Identified in OPRES

4.30 Even though a personnel issue, or an equipment deficiency, is critical enough to appear in OPRES reports as limiting force preparedness, it does not mean that any rectification project is assigned a high priority by the Air Force or the NZDF. Projects such as the acquisition of body armour for helicopter crews can remain static for a number of years because resources are applied to other projects instead.

4.31 The acquisition of Iroquois armour, a key capability, was to be addressed as part of a wider upgrade or replacement of the Iroquois. This was planned for completion in 2003-04 or 2004-05. While it was known that lacking this capability seriously restricted 3Sqn's preparedness for almost the full range of tasks, the NZDF was prepared to prioritise it as part of the planned upgrade and accept the risks of not being fully prepared for a number of years. However, these risks were not clearly noted as part of OPRES reports. For example:

- the likelihood of 3Sqn being required for deployment within this time was not noted; and
- the ability of the Air Force to implement an interim measure if required to deploy before completion of the project was not assessed.

4.32 Unlike the Iroquois armour, the body armour remained a stand-alone project. The project had been advanced a number of times during the 1990s, with trials of vests undertaken on at least two occasions. As the body armour was not a major item in terms of cost or overall NZDF capability development, the project was left to the Air Force to push forward (as a minor capital item).

4.33 Limited resources in the Air Force prevented the acquisition process progressing further. In our opinion, had the project been given the highest priority, and had the Air Force been able to adequately resource the project, the body armour could have been in service well before the need to deploy to East Timor arose.

Risks Arising from Acquiring Capability in OLOC Generation Period

4.34 A number of risks arise when capabilities have to be acquired quickly during the response time before deployment:

- there may not be enough time to procure the equipment required;
- there may not be enough time to adequately test the equipment;
- policy and procedures covering the use and maintenance of equipment may not be established; and
- the costs of acquisition may increase because of the delivery times demanded of manufacturers or suppliers.

4.35 The body armour provides a good example of these risks. No operating procedures were established before 3Sqn aircrews used the body armour. The manufacturer's guidelines for maintaining the armour were not obtained until late in September 1999, just before the Detachment deployed to East Timor. Advice was not gathered from all the areas of the Air Force that needed to have an input into the project – for example, engineering advice for the body armour modifications.

Air Performance Management System

4.36 Air Performance Management System (Air PMS) has the ability to enhance the operation of the current preparedness reporting system. Components of Air PMS that enable it do this include:

- a regime of Service Level Agreements (SLAs); and
- a better reporting system for performance information.

Service Level Agreements

4.37 Air PMS is based on SLAs between Air Force units. The SLAs are essentially 'contracts' between units that depend on each other to provide certain outputs. For example, the services that the Operational Support Squadron must provide in terms of Air Security, or DBFI support to operational units such as 3Sqn, will be outlined in an SLA. The SLA will detail the measures that will be used and who is responsible for collecting and presenting the information when assessing whether or not the unit has met its performance standards.

4.38 SLAs have the ability to make interdependencies within the Air Force more explicit and accountable. At present, these inter-dependencies are included only as part of higher-level OPRES reports and are based on the professional judgement of Commanding Officers. Preparedness information to support some of these judgements is often lacking.

4.39 Air PMS (through the SLAs) will strengthen the information base for professional jusgements by clearly defining the services required and detailing the information required to measure performance in delivering these services.

Reporting Performance Management Information

4.40 A key part of the regime of SLAs is the implementation of a reporting system to gather information to measure unit performance. A key goal of this system will be to ensure that personnel responsible can quickly access the detailed management information required. This will be made possible by the Air Force:

- identifying what information is required;
- identifying who should be responsible for collecting the information; and
- defining what form the information should be collected in.

4.41 It is intended that any information used for an SLA will also be used for OPRES reporting. As some OPRES measures are not currently supported by effective information collection systems, the ability to use systems for Air PMS purposes will:

- reduce the amount of time spent on gathering OPRES data;
- allow units to access this information more quickly; and
- increase the ability of the Air Force to analyse trends in performance information.

5

Part Five

Maintaining the Iroquois

Maintenance is a very important aspect of 3Sqn's day-to-day activities. Regular maintenance ensures that helicopters are kept in good mechanical condition and fit for operations when required.

3Sqn successfully prepared the Iroquois for deployment to East Timor. Maintenance scheduling was managed to ensure that enough flying hours were available for the deployment. Scheduling was complicated by having to provide Iroquois for the APEC meetings in September 1999 as well.

While maintenance was successfully conducted in East Timor, problems with the supply of spare parts complicated maintenance scheduling and Iroquois availability. These problems increased the risk of not being able to provide the number of Iroquois required for conducting tasks.

Both the additional hours being flown by 3Sqn because of East Timor and the increase in phase servicing intervals for deployed Iroquois will adversely affect the life-span of the Iroquois and maintenance required in the long term. The Air Force has not made any study of that effect.

Regular Maintenance

5.1 Maintenance is a very important aspect of 3Sqn's day-to-day activities. If the helicopters are not maintained to a high standard, the risk to personnel and equipment is high. Top priority is therefore accorded to maintenance to ensure that the mechanical condition of the helicopters is of the highest standard.

5.2 3Sqn carries out the first two levels of maintenance itself (Operating and Intermediate) and contracts Depot Level Maintenance to a civilian firm. A fuller description of each of the three levels of maintenance is provided in the Appendix on pages 107-110.

5.3 A number of other units in the Air Force contribute to maintenance by 3Sqn. The Aircraft Maintenance Planning Unit (AMPU) is responsible for determining the maintenance philosophy for all Air Force aircraft types, including the Iroquois and other helicopters. For example, AMPU carries out five-yearly analyses to determine the frequency, and scope, of subsequent phase servicings. The Ohakea Technical Support Unit provides technical engineering advice for Air Force aircraft.

Preparing the Iroquois for East Timor

5.4 Maintenance Flight is responsible for providing advice to the 3Sqn Commanding Officer, and relevant planners, during the initial stages of planning for a deployment. This advice includes:

- input at the planning stage of an operation;
- providing forecasts of aircraft maintenance activities over the period of an operation;
- providing information relating to engineering issues that arise during an operation; and
- identifying any matters that could affect future phases of an operation.

5.5 Advice was provided for the INTERFET deployment on the possible maintenance problems that were likely to arise for the proposed number of hours to be flown in East Timor. This fed into logistics plans for the proposed operation in an effort to determine how and where helicopter maintenance would be carried out. Factors considered included the numbers and qualifications of personnel, and the amount of equipment and supplies needed. In addition, planning considered the impact of deployment on maintenance activities required to maintain other 3Sqn outputs.

5.6 It was decided on the basis of this planning to conduct phase (Intermediate) servicing in East Timor – which saved having to transport an Iroquois from East Timor to New Zealand when it was due for phase servicing, and transporting another Iroquois to East Timor to take its place. Planning also identified the equipment needed to be included in a range of 'pack-ups'.[29]

5.7 Maintenance 'pack-ups' that 3Sqn used for deployment included:

- avionics;
- helicopter;
- armourer; and
- camp electrician.

29 A 'pack-up' is a predetermined list of items that is required for a specific task, which enables the items to be gathered quickly for deployment. (See also paragraph 2.17 on page 37.)

Getting the Iroquois Ready

5.8 The availability of any Iroquois for operational use is strictly based on its place in the maintenance cycle. For example, an Iroquois that has ten hours flying time left before it requires phase servicing (which can take up to 20 days to complete) is of limited value for a 40-hour operation. Consequently, one of the key tasks that 3Sqn undertook was to ensure that, at any time, sufficient Iroquois had completed phase servicing. The Iroquois were then able to operate for the maximum number of hours in East Timor.

5.9 This would normally be easily achieved. Under the Purchase Agreement, 3Sqn must provide a set number of Iroquois for a range of tasks within specified times. To do this requires 3Sqn to stagger the maintenance of the Iroquois fleet over the year so that the required number of Iroquois is available at any one time. This is part of 3Sqn's day-to-day business, and is one of its key accountabilities.

5.10 The need to prepare for APEC meetings in 1999 made maintenance planning for East Timor more difficult. Seven Iroquois had to be available from 10 September until 23 September 1999. One Iroquois was undergoing group servicing at the time, and a further two were having phase servicing completed. This left a pool of 11 Iroquois to provide the seven for APEC and complete preparations for East Timor (including pre-deployment training and helicopter preparations).

5.11 The build-up to APEC also meant having to schedule maintenance in order to complete essential work in time to meet East Timor deadlines. This included fitting Iroquois armour and secure communication equipment to those Iroquois identified as going to East Timor.

5.12 The management of phase servicing schedules before September 1999 left 3Sqn in a good position to make the required number of Iroquois available for East Timor:

- Two of the first three Iroquois to deploy had flown no more than 25 hours each (Tail Nos. 3801 and 3816 in Figure 12 on page 80), giving them at least 225 hours of flying in theatre before reaching the normal maximum of 250 hours (i.e. benchmark 200 hours plus 50 hours tolerance) before phase servicing.
- The third Iroquois (No. 3809) had flown more than 100 hours before deploying, giving it approximately 138 hours until requiring phase servicing.

- The Iroquois deployed in October had fewer total flying hours available – with one (No. 3807) having flown 180 hours, giving 70 flying hours in theatre before phase servicing.

Figure 12
Number of Flying Hours Until Next Phase Servicing of Deployed Iroquois

Tail Number	Date Deployed (1999)	Hours Flown Since Phase	Hours Left Until 250hr
3801	24 September	25	225
3816	28 September	15	235
3809	29 September	112	138
3805	20 October	110	140
3807	21 October	180	70
3814	22 October	55	195

5.13 The staggering of hours on the Iroquois meant that a similar number of flying hours could be completed on each Iroquois without the risk of all falling due for phase servicing at the same time:

- No. 3809 underwent phase servicing in theatre during November 1999;
- Nos. 3805 and 3816 underwent phase servicing in January 2000; and
- No. 3807 (the one with the highest number of hours flown before deployment) returned to New Zealand in January 2000 for group servicing.

Carrying Out Maintenance in East Timor

5.14 A total of 21 maintenance personnel deployed with the first three Iroquois in September 1999. A further 15 arrived with the additional three Iroquois in October 1999, including the phase maintenance team. The first three Iroquois were rebuilt and test flown within 36 hours of arriving in Dili. Following these initial test flights, adjustments were carried out to compensate for the tropical environment.

5.15 Once the phase servicing team was in East Timor the Maintenance Flight undertook the same range of maintenance activities that it would normally do in New Zealand. Daily servicings, 50-hour servicings, and phases were all conducted in theatre. Between November 1999 and the end of January 2000, four phase servicings were conducted, and more than 12 50-hour servicings were carried out before the number of Iroquois was reduced to four in February 2000.

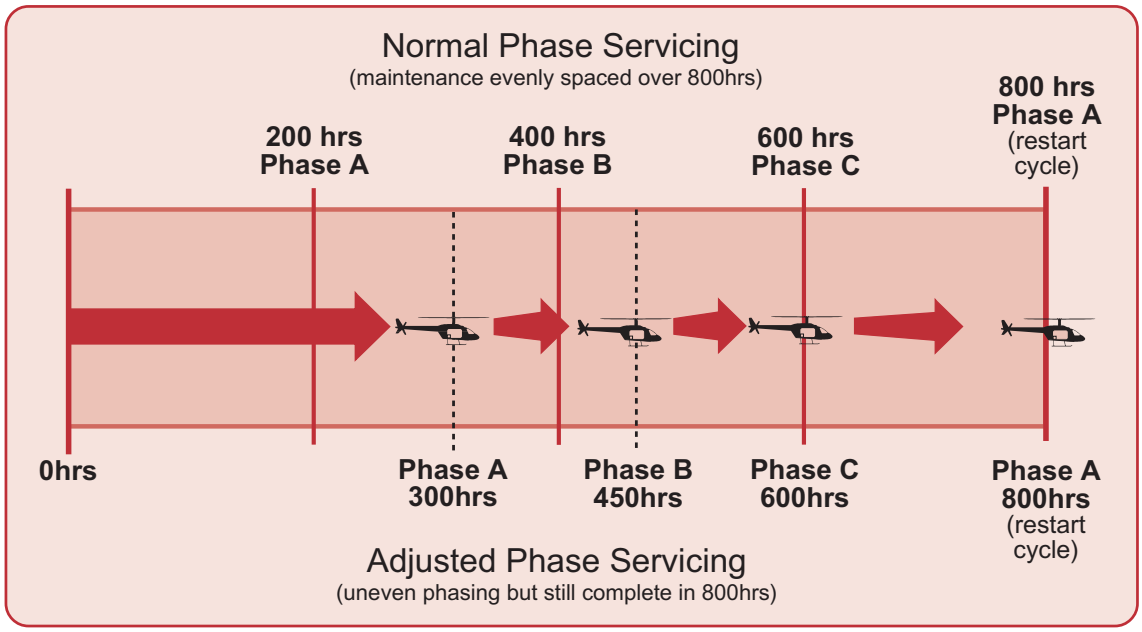
5.16 The Maintenance Flight Commander noted in the end-of-tour report for the first deployment that *the turnaround from start to finish of* [phase] *servicings was markedly quicker than those conducted in New Zealand*. Reasons included:

- the specialised team members were all trained and experienced;
- no training of inexperienced personnel was undertaken – such training would usually be done in New Zealand;
- phase teams worked with no weekend breaks in theatre, and few distractions; and
- few serious faults were found.

5.17 In order to maximise the length of time each Iroquois could be operated in theatre, 3Sqn increased the benchmark interval between phase servicings from 200 hours to 300 hours. Increasing the phase maintenance interval from 200 to 300 hours meant that the following phase servicing interval had to be reduced from 200 to 100 hours – thus ensuring that the same number of servicings took place within the total of 400 hours. Figure 13 on the next page illustrates the difference between the normal and adjusted phase servicing.

5.18 The increased intervals pushed the Iroquois to their limits. Maintenance Flight staff were satisfied that this strategy would not compromise the safety of the Iroquois, but accepted that longer operating periods put performance under pressure. The impact on the mechanical condition of the Iroquois was noticeable to maintenance personnel when they were returned to New Zealand after completing their 300-hours operating period.

Figure 13
Illustration of Normal and Adjusted Phase Servicing



5.19 The phase servicing team was brought home in February 2000, so that phase maintenance was undertaken only in New Zealand after that date. The main reason for returning phase maintenance to New Zealand was the reduction in the number of Iroquois deployed – from six to four (due to the number of hours required by the United Nations dropping to 200 a month).

5.20 That reduction in hours meant that 3Sqn had enough time and aircraft to transport an Iroquois back to New Zealand by C-130 Hercules for phase maintenance without increasing the risk of not being able to meet the required flying hours in East Timor.

Supplying Spare Parts for the Iroquois

5.21 A problem for maintenance in East Timor was the delay in the supply of spare parts. 3Sqn uses only those spares contained in the maintenance 'pack-up', and so must rely on the supply chain to operate efficiently in order to ensure that Iroquois can remain available.

5.22 Problems with spare parts affected Iroquois availability and the management of Iroquois maintenance planning. For example, on 31 October 1999, a signal was sent back to Air Force Command in Auckland stating that a main rotor blade and tail rotor assembly that had been ordered on 23 October 1999 had yet to arrive. The signal stated *with scheduled phase and 50hr servicings commencing this week 3Sqn will be unable to provide [the required] four aircraft for tasking.*[30]

5.23 Supply chain difficulties gave little flexibility to change the level of flying activity. Between July and September 2000, the Detachment was required to increase its number of flying hours in East Timor from 150 to 200. A fifth Iroquois had to be deployed to East Timor to ensure that this rate of flying could be met. A post-operation report noted that *the lack of spares in theatre, excessive lead times for spares from New Zealand, and … the inflexibility of the aircraft phase program* prevented four Iroquois from being able to meet this requirement satisfactorily.

5.24 A number of factors were responsible for inefficiencies in the supply of parts. A key problem was a lack of regular flights into the Suai area during the INTERFET operation. All supplies coming into theatre – including those of the NZ Army Battalion – had to be prioritised to make best use of the limited transport flights. Helicopter spare parts often needed to be assigned a lower priority than more critical items such as food, water or medical supplies – thus delaying the delivery of spare parts needed for maintenance and repair.

5.25 The supply system used to obtain spare parts also caused problems. Communication between the Air Force in Auckland, from where the parts were dispatched, and the National Support Element (NSE) in Darwin through which the parts passed to get to East Timor, was often inadequate for Air Force purposes and hindered effective planning of maintenance. For example, in November 1999, the Detachment was unable to plan the phase servicing of one of its Iroquois because the necessary parts had not arrived. This constraint put pressure on availability for tasks and for planning maintenance schedules of other Iroquois.

5.26 The Detachment adopted interim solutions to address these problems. Direct contact was often made with 3Sqn Headquarters in New Zealand in an attempt to speed up delivery. A permanent solution was reached in February 2001, when a more comprehensive store of spare parts was set up.

30 The part eventually arrived three days later before the planned maintenance on other helicopters took place, allowing 3Sqn to provide the required number of helicopters for tasks.

5.27 The solution included setting up a computer-controlled inventory system that tracked the number of spares available, and rates of attrition. A Detachment Maintenance Flight Commander noted in an end-of-tour report that *the establishment of the … store has decreased spares related aircraft unserviceabilities and has been crucial in maintaining the operational output of the* [Detachment] *as a whole.*

Long-term Maintenance Issues

5.28 The additional hours being flown by the Iroquois in East Timor have reduced the overall life of the Iroquois, and maintenance costs are increasing. The type of flying conducted in East Timor also pushes the operational boundaries of the Iroquois further than when conducting normal duties in New Zealand, because of the loads being carried and the environment they are operating in.

5.29 The Air Force has produced figures that indicate that these operational pressures are increasing maintenance costs. Before 2000, the cost of undertaking a phase servicing was about $40,000. Recent servicings (since the Iroquois have been operating in East Timor) have averaged $62,000 each.

5.30 If 3Sqn is flying 5000 hours a year, a total of 25 phase servicings will need to be completed. Previously, this would have cost about $1 million a year but now costs more than $1.55 million. In addition to the increased cost of these servicings, the time required to complete them is also increasing, consequently reducing the time that the Iroquois are available for operations.

5.31 Apart from this indicative information, the Air Force has not made any study into how operating in East Timor is likely to affect long-term maintenance issues. Available resources have not allowed the Air Force to put time into extracting and analysing the available data. In our opinion, it will be important to conduct such an evaluation in the near future – for two main reasons:

- to provide information for the consideration of an upgrade or purchase of new helicopters; and
- to feed into the five-yearly review of maintenance in order to assess future servicing schedules and times.

Part Six

Critical Items and Trades

Building up a capability, such as door gunners, takes a considerable amount of time. If deployment requirements change, the ability to conduct the training can be put under pressure, reducing the amount of training provided.

Development of the Air Security Branch to full operational status was cut short by the need to deploy to East Timor. Time constraints meant that attention could not be paid to creating awareness of the security role as part of pre-deployment training. A number of problems with air security were consequently experienced during the deployment.

For a number of years when the Iroquois were without armour 3Sqn was only partially prepared for operations. When the time came to deploy to East Timor, the Air Force had to acquire the armour in a very short time, without the opportunity to test equipment before acquisition or use in pre-deployment training.

3Sqn was also forced to acquire Aircrew Life Preservers (ALPs) in a short time. As an interim measure, 3Sqn had to borrow a number of ALPs from the British Ministry of Defence because the manufacturers could not meet the deadlines for deployment. Had the borrowing option not been available, 3Sqn would have had to deploy without aircrew protection – a considerable risk given the operating environment.

6.1 This part of the report looks at two critical equipment items and two trades, and how problems with them were managed once identified:

- Three of the four were identified in contingency planning in mid-1999 –
  - ensuring sufficient numbers of door gunners were available;
  - acquiring Iroquois armour; and
  - obtaining Aircrew Life Preservers (ALPs).
- The fourth emerged as an issue once the deployment was under way – the air security function.

6.2 Each of the four raises issues for the Air Force and the NZDF to consider.

Door Gunners

6.3 3Sqn is required to provide a door gunner as part of a helicopter crew only once deployed to an operation. It is not funded to maintain this capability as part of DLOC. Therefore, when a helicopter detachment is required to deploy it must identify suitable personnel from other trades and train them to perform the role of door gunner within the required response time.

6.4 The role of the door gunner is to operate one of the two M60 machine guns mounted at the rear of the Iroquois cabin. If the need arises they can provide covering fire for troops who are either entering or leaving the Iroquois, or can provide tactical fire from the air. While the machine guns have not been fired in anger in East Timor, the presence of door gunners is an important 'show of force' and deterrent in such an environment. The door gunner is also responsible for helping the pilot keep the Iroquois clear of obstacles when landing or hovering.

6.5 Door gunners were recruited from the Air Security Branch, mainly because familiarity with the M60 machine gun was common within the Branch. Personnel were screened for this role, involving psychological and medical testing.

6.6 A directive from the Chief of Air Staff in late-July 1999 noted that the requirement for door gunners was at that point uncertain because:

- the level of threat to NZDF personnel had been assessed as low-to-medium; and
- Rules of Engagement for the operation had yet to be agreed with the United Nations.

6.7 On the basis of this uncertainty, Air Force Air Command was ordered to identify and inoculate sufficient personnel to meet the door gunner requirement, and to prepare a training programme that could be implemented when the requirement had been confirmed.

6.8 The initial training programme for door gunners was conducted over a six-week period. Door gunner training began in August 1999 for those identified as deploying to East Timor with the first four Iroquois. This was completed by 17 September 1999, in time for deployment on 24 September 1999.

6.9 However, once 3Sqn had the order to prepare an additional two Iroquois and aircrews for deployment for Operation Castall (a Battalion-scale operation) in the middle of October 1999, additional door gunners needed to be trained. This training did not begin until 11 October 1999, leaving 3Sqn short of the required number of door gunners in order to have nine aircrews in theatre.

6.10 Because of the urgency of the situation, a compressed four-week training programme was drawn up for this second group of door gunners. Training was also hampered by the fact that few Iroquois were available for training – six Iroquois were deployed to East Timor and a number of the remainder were undergoing post-APEC maintenance, or being prepared for eventual deployment to East Timor. The additional door gunners were deployed in November 1999.

6.11 At present, the door gunner course is completed over five weeks and includes general aircrew skills as well as gunnery skills. A door gunner reserve has been built up to ensure that 3Sqn could sustain a commitment similar to East Timor, and that there is a core number of gunners to call on at short notice.

Acquisition of Iroquois Armour

Identification of Need

6.12 OPRES reports for 1998 and 1999 noted the lack of Iroquois armour as one of the main limitations on the Iroquois' ability to perform in higher-risk situations. For example, the July-December 1998 Biannual OPRES report to the Chief of Defence Force noted that *the Iroquois currently is not fitted with any self-protection equipment. This equipment should be fitted as part of a programmed upgrade in FY 02/03-04/05. This limits the range of contingencies to which the Iroquois could be deployed.*

6.13 The Air Force noted in its Minor Force Development Proposal for the Iroquois armour that *for the RWTF* [Rotary Wing Transport Force] *to be deployed into a theatre over a prolonged period where a significant threat from small arms exists there is a need to protect aircraft and crew with some form of* [Iroquois] *armour.*

6.14 The need for Iroquois armour was also identified by the NZDF as part of contingency planning in the first half of 1999. Once the Air Force became aware of the tasks it was likely to be conducting, and the likely level of threat it would be facing, it became clear that Iroquois armour would be required.

6.15 Initially, the Iroquois had protection only for the pilot and co-pilot in the form of armoured seats. This left the helicopter crewman and the door gunner vulnerable to small arms fire from below, requiring them to wear uncomfortable and restrictive flak vests.

6.16 The Air Force identified additional limitations as:

- the seats were very heavy and reduced the total payload that the Iroquois could lift;
- the way that the armoured seats were attached to the floor meant that they could detach during a heavy landing or on impact; and
- because of the weight of the seat, the centre of gravity of the helicopter could be affected – especially in low-load situations.

6.17 By placing an armoured floor into the Iroquois all crew members could be protected, without the need to keep the heavyweight armoured seats. In the Development Proposal noted above, the Air Force identified the capabilities for such a floor as being a *lightweight armour system that will provide protection against small arms fire.*

Acquiring and Fitting the Armour Sets

6.18 In our opinion, the Air Force moved quickly to acquire the Iroquois armour. By 7 July 1999, it was in contact with four companies identified as potential suppliers, which provided a range of information for the Air Force to consider. After further research, Air Force personnel visited three companies to ensure that their products met specifications. This was completed in mid-August 1999.

6.19 At the end of August 1999, the Base Auckland Tenders Board evaluated tenders. The Air Force was at this stage still looking at purchasing only four sets of armour. Armour of America was chosen as the preferred supplier of the four sets, and a purchase order was dispatched immediately. This allowed Armour of America to begin production of the sets in late-August 1999 and complete the order in September 1999.

6.20 The first two sets of armour were sent from America on 17 September 1999, taking four days to arrive in Auckland. On 18 September 1999, the Air Force became formally aware that it would have to provide six Iroquois for the East Timor operation, so that an additional two Iroquois would require armour. Approval for additional funding was sought without delay, and another order placed with Armour of America.

6.21 As the two extra Iroquois were to be deployed within a month, the time available for manufacturing the extra sets and having them fitted was even tighter than for the first sets. The two sets arrived on 11 October 1999 and were fitted within three days to allow the Iroquois to be ready for deployment from 14 October 1999.

6.22 The Air Force installed the armour in New Zealand. Armour of America assisted in fitting the first set, and the Air Force fitted the remaining sets itself.

Acquisition of Aircrew Life Preservers

Identification of Need

6.23 The requirement for a more capable set of ALPs had been noted within the Air Force and the NZDF for at least a decade. A number of vests had been considered during the 1990s. However, the programme was not sufficiently advanced and funding was not approved for acquisition of the ALPs. This was despite the items being noted on OPRES reports as one of the critical items restricting 3Sqn from being fully prepared for the full range of Employment Contexts.

6.24 When a helicopter detachment was deployed to Bougainville in 1997 a temporary solution was used. This involved aircrew wearing normal ballistic vests (borrowed from the Police) for protection against shrapnel and small arms fire, and then wearing a flotation vest on top. While tests in theatre proved that such an arrangement was serviceable, combining the two vests was bulky and unsatisfactory for operational use. Between the deployment to Bougainville and the final acquisition of a preferred ALP, 3Sqn had used six different forms of life preservers (including in-house designs).

6.25 Once 3Sqn was identified as being required for APEC duties, and later as part of any East Timor deployment, the ALPs became a critical item in order for the Squadron to meet its preparedness times. APEC duties, such as counter-terrorist operations, and the possibility of having to undertake operations at sea, meant that vests integrating both armour protection and flotation devices were required. Such vests would also be required for East Timor, with the threat of small arms fire and the requirement to fly over the sea identified as part of day-to-day operations for 3Sqn.

Acquiring the Aircrew Life Preservers

6.26 Previous work on identifying suitable ALPs had concentrated on American manufacturers. However, a number of them did not provide a fully integrated vest covering both ballistic protection and flotation requirements. For example, in 1997, 3Sqn considered four options – two of which required a separate flotation life preserver to be attached over the ballistic vest. A report recommended that one of the integrated vests be procured for analysis and trial by 3Sqn.

6.27 In August 1998, 3Sqn began a formal trial of equipment that was available. The trial included three vests – the Airsave Vest identified in the 1997 trial, the life saving vest utilised by the Australian Army Aviation Regiment, and a vest manufactured by ML Lifeguard Equipment Ltd. The results of the trial were reported back in July 1999, noting that the ML Lifeguard Equipment Ltd vest (known as an ALP) was the preferred choice.

6.28 Trials and testing had identified that the ALPs (as then manufactured) would have to be modified to move a pocket for a personal locater beacon, and that an additional Underwater Escape Module (UEM) would be needed to meet 3Sqn operational requirements. The manufacturers agreed to modify the vests, and a New Zealand supplier was found for the Underwater Escape Module.

6.29 A purchase order for 24 ALPs was placed with ML Lifeguard Equipment Ltd on 27 July 1999. However, the manufacturer was unable to provide the required number of modified vests by 1 September 1999 (the beginning of 3Sqn's APEC commitment) – the requirement for British-based manufacturers to obtain an export licence being a key factor.

6.30 An alternative arrangement was made to borrow 24 unmodified vests from the British Ministry of Defence until the manufactured ALPs were brought into service. This arrangement meant that enough ALPs were available for APEC and the deployment to East Timor.

Air Security

Formation of Air Security Branch

6.31 The Air Security Branch was formed in March 1999. It was planned that it would be fully operational by March 2000. However, the Branch was barely a quarter of the way through development when it was required to participate in APEC and East Timor operations.

6.32 Two trades were merged to form the Air Security Branch:

- General Service Instructors (GSIs) – who previously taught military skills (such as patrolling and weapons training) to Air Force personnel; and
- Air Force Police – who conducted normal policing duties on Air Force bases and were responsible for enforcing law and order among NZDF personnel.

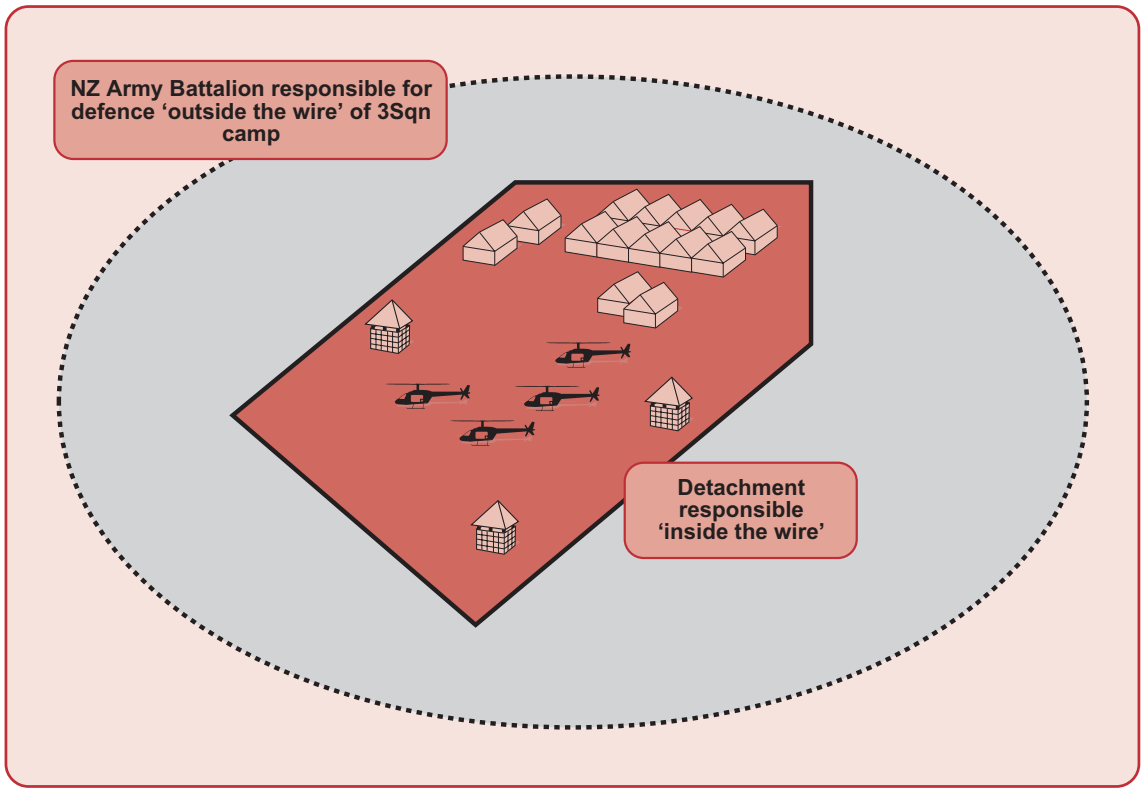
6.33 Currently, the Air Security Branch has 70 personnel. Of these, a minimum of 40 is required to maintain base security within New Zealand, leaving a pool of 30 available for deployment.

Preparing for Deployment

6.34 All Air Security Branch personnel were considered to be below DLOC status at the time the order to prepare for East Timor was given. Even preparations for APEC had been constrained by a lack of fully trained personnel and qualified instructors being available. Training for APEC was undertaken, but the lack of instructors and appropriate equipment meant that Air Security Branch personnel were deployed to APEC at a lower than desired trained state.

6.35 Employment Context Six defines the required number of Air Security Branch personnel to be deployed on operations. Eighteen personnel were required for a six-helicopter deployment, based on Army providing security outside of the camp (see Figure 14 on the next page). However, the Air Force disagreed with this number, believing that, while it would be sufficient to provide 'point defence' of the Iroquois, it would not allow for the greater role of securing the whole Detachment camp.

Figure 14
Responsibilities for Camp Security



6.36 Nineteen Air Security Branch personnel were identified for deployment to East Timor. A three-week training period was designed to develop the necessary skills amongst the group. Members of the group had previously been trained as either GSIs or Air Force Police, and there had been little time to develop a common skill set.

6.37 Training was carried out at Base Auckland with support from the Air Security Branch. However, most of the courses were prepared and delivered in an unplanned manner because of the lack of:

- doctrine for air security;
- Standard Operating Procedures;
- fully trained instructors; and
- time.

Operating in East Timor

6.38 The air security role was limited to providing security within the camp perimeter at Suai. Security 'outside the wire' was the responsibility of the NZ Army Battalion Group. In addition to Air Security Branch personnel, all camp personnel (including aircrew) were required to participate in camp security. When deployed, non-Air Security Branch personnel were required to spend 12 hours in 24 in their nominated trade, up to two hours contributing to camp security (patrolling or surveillance duty), and ten hours resting.

6.39 Air security tasks involved:

- security patrols at night (and by day as necessary);
- construction and maintenance of defensive positions;
- construction and maintenance of protective wiring;
- clearance and maintenance of 'fields of fire' (by chainsaw, weedeater, or spray);
- manning the camp's entry point (including the entry and exit of vehicles); and
- conducting/assisting with investigations as directed by the Detachment Commander.

Problems Identified

6.40 It came to the Air Force's attention that during the first deployment to East Timor there was *considerable discord, disharmony and frustration* within the Air Security Branch. A number of minor incidents and a general negative culture within the trade had developed to the point where Air Command carried out a formal investigation.

6.41 Two key problems were identified with the operation of Air Security Branch in East Timor:

- a lack of clarity over the roles to be performed by Air Security personnel as part of the deployment; and
- a lack of suitable equipment to carry out Air Security tasks.

6.42 Without clear policy documents (doctrine or Standard Operating Procedures) to provide a foundation for the Branch, confusion developed over the security tasks to be performed by Air Security and non-Air Security personnel. A lack of written orders or directives was also a complicating factor.

6.43 These factors led some Air Security Branch personnel to determine their own methods of operating – often in an as-required and unco-ordinated manner. In addition, non-Air Security personnel were not clear about the role they should play in camp security duties, in some circumstances developing negative attitudes towards the Air Security trade.

6.44 The Air Security Branch had yet to build up a pool of equipment to allow it to undertake its full range of duties. For example, night observation equipment had to be borrowed from Army to cover all security posts. Before this equipment became available, however, additional personnel had to be employed on night security duties to cover for the lack of equipment. Other equipment that needed to be purchased quickly for deployment included perimeter flood lighting and body armour for security patrols.

6.45 An Air Force Court of Inquiry into the problems was conducted in 2000 and Air Command has put a number of recommendations forward. These include:

- restating the philosophy for ground defence in the Air Force and the role of the Air Security Branch in line with this;
- reviewing the stated numbers of personnel required for the Air Security Branch; and
- reviewing the equipment required for the trade, and making sure that it was available.

6.46 The Court of Inquiry noted that the short amount of time available to conduct pre-deployment training – and the fact that air security was a very new trade – had both contributed to the problems identified.

Part Seven

Training

Regular training provides 3Sqn with a good foundation from which more specific training for deployments can be undertaken. Exercises are a key part of this training. While 3Sqn undertakes joint training with Army, there is no formal agreement to ensure that a certain level is conducted each year.

Training for East Timor was not as concentrated as it could have been because of the APEC commitments that 3Sqn had at the time. However, pre-deployment training provided helicopter crews and other personnel with valuable experience. The number and type of exercises conducted by 3Sqn in 1998 and 1999 proved valuable preparation for the East Timor deployment.

Regular Training

7.1 Regular training for 3Sqn consists of helicopter crews completing a designated range of tasks. Each of these tasks covers an area of proficiency that is required for a successful deployment. Tasks include:

- winch operations;
- night vision goggle flying;
- operating with under-slung loads; and
- troop movements (including rappelling).

7.2 3Sqn's 15 crews each fly between 200 and 250 hours a year to cover all of these tasks. General flying undertaken by 3Sqn throughout the year counts towards some of the DLOC task requirements.

7.3 Crews undergo more specific tests of core competencies and sit written examinations each year to ensure that they are up-to-date on key competencies. For example, a helicopter pilot will have to complete annual competency tests (known as 'Cats') to be allowed to fly. These cover key skills such as instrument flying, night flying, flying in confined spaces, winching, and loading.

7.4 Maintenance personnel complete a range of trade qualifications. Ongoing training involves keeping the 14 Iroquois available to conduct DLOC training. The same maintenance that would be carried out during a deployment is also carried out when the Iroquois are in New Zealand. As long as maintenance personnel are qualified and experienced enough to carry out maintenance in New Zealand they are considered to be at DLOC for operational purposes.

7.5 3Sqn also trains new pilots and crew members throughout the year. To train a helicopter pilot from scratch takes two years. This involves flight training on fixed wing aircraft and four months concentrating on helicopters. A further six months specialising with the Iroquois would then be required before the pilot could be deployed.

Exercises

7.6 Exercises form a key part of training for 3Sqn. Each exercise that 3Sqn undertakes is designed to develop specific skills that cannot be obtained through everyday flying. Regular exercises include:

- ***Steel Talon*** is usually conducted at Waiouru Military Camp and covers tactical flying skills and experience of living in a tented camp environment. Up to two weeks in duration, Steel Talon focuses on formation flying with four or more Iroquois, and involves up to 80 personnel.
- ***Blackbird*** focuses on developing mountain flying skills – for example, dealing with the cold, strong and variable winds, and flying at altitude. This is usually conducted in the South Island and involves six Iroquois operating for ten days. Between 60 and 80 personnel participate.
- ***Morepork*** develops aircrew night-flying skills by undertaking two hours flying a night for 2-3 weeks. Two Iroquois are usually used with between 15 and 20 personnel. This exercise is usually conducted from Base Ohakea.
- ***Tropic*** takes three to four Iroquois to a South Pacific location in order to train for operations in hot and humid conditions. It involves between 40 and 50 personnel, depending on the number of Iroquois involved.

7.7 Maintenance personnel also accompany Iroquois that are taken on exercises. This allows them to develop skills in carrying out maintenance as part of an operation and, for some exercises, as part of a tented camp.

7.8 The number of exercises that 3Sqn has been able to complete has reduced significantly as a result of the East Timor commitment. For example, participation in Operation Snowbird (Antarctica) in 1999-2000 had to be reduced from two Iroquois to one, four helicopter crews to three, and three maintenance crews to two. Originally, it was planned to fly 400 hours in support of Antarctic activities, but only 159 hours were completed.

7.9 Helicopter support for Antarctic operations stopped after 1999 because of the demands of the East Timor commitment. A number of other 3Sqn activities were affected in similar ways for the same reason.

Joint Training

7.10 3Sqn undertakes a range of joint training activities with Army. These include:

- basic familiarisation training;
- more specialised training in activities such as rappelling and winching;
- operating with Army on collective training exercises; and
- counter-terrorist and special operations training with the Special Air Service (SAS).

Basic Familiarisation Training

7.11 Basic familiarisation training covers safety around helicopters and procedures for entering and leaving them. This training is provided to all relevant Army personnel, and refresher training is provided when opportunities arise.

7.12 The training is designed to ensure that Army personnel know how to approach and leave a helicopter safely (including learning helicopter crewman signals), and are familiar with seating arrangements within the helicopter cabin and the storage of equipment.

7.13 Despite this familiarisation training, Army lessons learned from East Timor noted that there were problems with operating with under-slung loads and the marking of landing zones by Army personnel.

More Specialised Training

7.14 More specialised training extends this basic training and is provided to specialist Army units such as reconnaissance groups.

Collective Training

7.15 3Sqn also takes part in Army collective training exercises. This most often involves undertaking exercises with Company Groups, but periodically larger Army formations. This training is important for:

- each Service to develop Standard Operating Procedures for working with the other;
- developing skills in roles such as Air Liaison Officers; and
- Platoon and Company Groups to gain practical experience in using helicopters for supply and tactical operations.

7.16 No formal agreement exists between Army and 3Sqn for the provision of helicopter support to Army training. Neither 3Sqn, nor Army force elements, are required to conduct a set number of hours and tasks with each other in order to maintain preparedness levels. For example, Army's 1RNZIR (Army's frontline Infantry Regiment) is not required to conduct a set number of joint familiarisation training exercises, or use a set amount of helicopter support as part of collective training.

7.17 We believe that a training agreement would:

- ensure that a set level of joint training is carried out each year; and
- provide a good basis for reporting force elements' preparedness for joint operations.

7.18 Not all Platoon and Company Commanders were familiar with the use of helicopters for Army operations. While using helicopters is part of Platoon and Company Commander courses, the focus is usually on theory. As joint training opportunities at the collective level are limited, not all Commanders get to put theory into practice. This is also true for planners on larger operations.

Training for East Timor

7.19 A tactical training week was conducted at Whenuapai airfield for those personnel identified for deployment. Between 23 and 27 August 1999, a total of 87 personnel set up a full camp with tents – simulating living and operating conditions expected in East Timor. This training included medical, air security, maintenance, communications, aircrew, and DBFI personnel.

7.20 The aims of the tactical training week were to:

- identify and rehearse deployment requirements and setting up a camp;
- identify and rehearse security requirements – including developing personnel skills required for security duties additional to regular trade skills; and
- establish support facilities, identify any deficiencies, and ensure that deficiencies were rectified before actual deployment.

7.21 A number of other training activities were also included during the week. For example, a range shoot was held to give personnel renewed skill on weapons they had not operated recently, aircrew were retrained in the use of intravenous drips, and personnel were given instruction on patrolling duties. Other practical matters such as camp water, sewerage, and electrical systems were also covered.

7.22 Tactical flying and door gunnery were two additional sets of skills that were identified for East Timor, and which helicopter crews had to be trained for within the response times.

Training for APEC

7.23 3Sqn began training for APEC in March 1999 and continued until APEC meetings began in early-September 1999. A total of nine crews were trained for the seven Iroquois that were required.

7.24 An intensive training regime ensured that the crews were capable of undertaking the tasks allocated – which included counter-terrorist operations with night vision goggles. 3Sqn flew a total of 250 hours in training directly related to APEC, and spent 100 hours on tasks during APEC.

7.25 While some training for APEC was beneficial, not all aspects were suited to pre-deployment training for East Timor. Skills such as formation flying could be transferred to situations in East Timor, and the high number of hours that 3Sqn flew in the build-up to APEC developed general flying skills.

7.26 However, the nature of the APEC operation meant that aircrews had become very familiar with night vision goggle operations that were not used in East Timor. Additionally, the comparative level of threat in the two operations was substantially different – requiring aircrews to adjust mentally to a higher, and real, level of threat in East Timor.

Exercises Completed Before Deployment

7.27 3Sqn undertook a number of exercises in 1999. Two Tropic exercises were conducted in May and July 1999, involving a total of six Iroquois – two Iroquois deployed to the Solomon Islands in May and four Iroquois to Fiji in July. While these did not replicate the East Timor environment exactly, they did provide 3Sqn with experience in planning and conducting a multi-helicopter deployment.

7.28 Two night flying exercises (Morepork) were also completed during 1999, with six Iroquois flying a total of 80 hours in August, and five Iroquois completing a similar number in March. A further four Iroquois had completed an 80-hour Morepork in November 1998. These exercises were valuable experience for later APEC counter-terrorist duties.

7.29 Immediately before the APEC operation, two Iroquois completed a 40-hour exercise in mountain flying (Blackbird). Blackbird exercises usually involve six or seven Iroquois, but the need to train for APEC and East Timor meant 3Sqn could not make enough Iroquois and aircrews available. The previous Blackbird exercise had been in August 1998, when seven Iroquois flew a total of 200 hours in the South Island. In our opinion, 3Sqn was not able to update its mountain flying skills before deploying to East Timor (where mountainous terrain was part of everyday operations) because of its other commitments.

7.30 3Sqn also had to cancel its Steel Talon exercise for 1999 due to APEC and East Timor commitments. The tented camp at Whenuapai airfield in August 1999 (see paragraph 7.19 on page 103) was held instead, and smaller-scale formation flying was undertaken before deployment to East Timor. Seven Iroquois had participated in a Steel Talon exercise in November 1998, flying a total of 180 hours, and in March 1998 another seven Iroquois had completed a Steel Talon exercise that also included working with Army.

Joint Training Undertaken Before Deployment

7.31 3Sqn had carried out three small joint exercises with Army in the year before the deployment to East Timor. 3Sqn sent two Iroquois to Exercise Valkyrie in May 1999, and another two Iroquois to Exercise Corruna in November 1998. Two Iroquois were also sent to Exercise Silverlion in October-November 1998.

7.32 Tasks for Exercise Corruna included patrol inserts, under-slung loads, and carrying out re-supply operations by both day and night. An additional two Iroquois were made available on specific days in order to carry out Company-sized movements. 3Sqn also undertook familiarisation activities with Army units before the exercise. These activities included:

- briefing Army personnel on helicopter safety;
- entering and leaving the helicopters; and
- operating with helicopters carrying under-slung loads.

7.33 Larger joint exercises with Army had been conducted at the beginning of 1997 and 1998. These were:

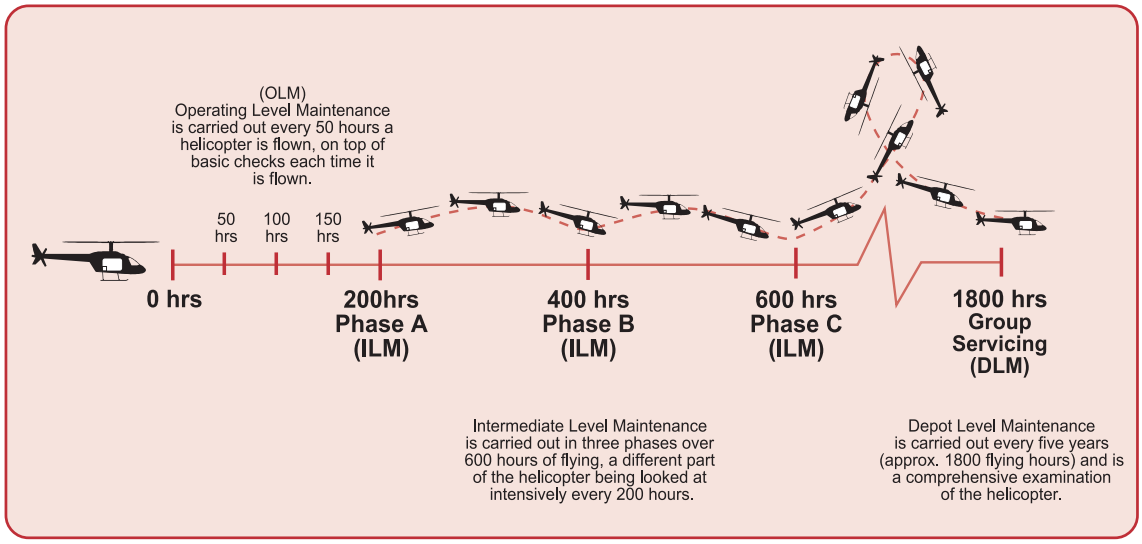
- Exercise Matakiri in March 1998, with seven Iroquois, undertaken as an addition to 3Sqn's Steel Talon; and
- Exercise Green Fern in February-March 1997, with six Iroquois.

7.34 Exercise Green Fern was a brigade-level exercise combining Army Territorial Force and Regular Force personnel. 3Sqn was used to train Territorial Force personnel in operating with helicopters – covering basic familiarisation briefs and drills. Tasks undertaken with Regular Force personnel included airmobile operations, patrol insertions and extractions, reconnaissance flights, and aero-medical evacuations.

7.35 3Sqn noted in its post-exercise report that the exercise was *an excellent opportunity for many of the pilots to plan and fly sorties as Mission Commander.*

Appendix

The Three Key Levels of Maintenance



Operating Level Maintenance (OLM)

A number of checks and services are carried out every time a helicopter is flown. These include:

- dispatch servicing – which covers tasks necessary to prepare the helicopter for the next level of servicing;
- pre-flight servicing – which is undertaken by aircrew immediately before the helicopter is to take off and makes sure that the helicopter is in flying order;
- after-flight servicing – which assesses whether the helicopter is suitable for further flying; and
- receipt servicing – which ensures that the helicopter is secure after a day's flying.

In addition to these basic steps, OLM includes two further servicings: daily servicing and 50-hour servicing. Whenever one of the helicopters is flown within a 24-hour period a daily servicing is undertaken. This servicing is a general inspection of the helicopter to check for obvious damage or wear and tear that has occurred as part of recent flying. Under RNZAF maintenance standards a daily servicing remains valid for seven days, or until the helicopter is flown again.

A 50-hour servicing occurs whenever a helicopter has accumulated near 50 hours of flying time. For instance, if a helicopter is flown for two hours a day it would require a 50-hour servicing after 25 days. This servicing comprises routine servicing, lubrication and anti-deterioration tasks necessary to maintain the helicopter in an acceptable condition. Maintenance personnel remove all of the major panels and cowlings on the helicopter so they can carry out an in-depth inspection of the airframe, engine, transmission, and both the tail and main rotors.

If a fault or damage is found, and assessed to be within the manufacturer's specified allowable limits, rectification of the problem will be deferred until the next scheduled major servicing. Otherwise, the fault is fixed as part of the 50-hour servicing. The rectification of faults noted by aircrew forms the major workload for the maintenance team.

Intermediate Level Maintenance (ILM or Phase Servicing)

Intermediate Level Maintenance is undertaken in three phases (A, B, and C), each one after approximately 200 hours of flying time. Each of the phases focuses on a different aspect of the helicopter. After a maximum of 800 hours, the helicopter would have had a comprehensive service of each of these three aspects, and would be due to start the cycle again.

Helicopter availability is planned around the phase maintenance programme. This servicing must normally be carried out within the range of 150-250 flying hours (there is a 50-hour flexibility around the 200 hour target). The NZDF prohibits flying beyond this range due to the increased risk to aircrew and equipment. For example, if a helicopter has already completed 180 flying hours it will not be tasked to an operation that will require it to fly for more than 70 hours (taking it over the 250 hour limit).

ILM usually takes 200 or more working hours per phase. This time may need to be extended if rectification work on identified problems is required.

Depot Level Maintenance (DLM or Group Servicing)

Every five years (on average) each helicopter undergoes Depot Level Maintenance, or group servicing. This intense inspection is carried out by a contracted firm at a non-Air Force location. It involves taking the helicopter apart in order to carry out a structural inspection. Many of the components looked at in this servicing are susceptible to long-term corrosion, and are difficult to inspect at any of the other maintenance levels. This level of maintenance requires over 600 working hours to complete.

Glossary of Terms

Glossary of Terms

Aero-medical evacuation

Transporting a patient to the nearest appropriate medical facility by air.

Capability

The ability to achieve a specified military objective. The major components of military capability are force structure and preparedness. Force structure comprises the personnel and equipment assembled in force elements for military tasks.

Command and control

The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of a mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, co-ordinating, and controlling.

Contingency

An emergency involving military forces caused by natural disasters, terrorists, subversives, or by required military operations. Due to the uncertainty of the situation, contingencies require plans, rapid response, and special procedures to ensure the safety and readiness of personnel, installations, and equipment.

Collective training

Training involving soldiers and force units exercising within a large group, rather than individually, usually at Company or higher level.

Critical item

An essential component of a force element if it is to conduct its operation effectively. Often an item in short supply or expected to be in short supply for the proposed operation.

Deployment

The relocation of forces and materiel to desired operational areas. Deployment encompasses all activities from origin through to destination.

Directed level of capability (DLOC)

A level of capability lower than that required to be deployed and commence operations. When directed by the Government, force elements have a specified amount of time to increase their level of preparedness from DLOC to OLOC (see below). Force elements are maintained at DLOC because it is too expensive to constantly maintain a broad range of force elements at a fully operational level.

Employment contexts

Descriptions of representative and illustrative security events for which there is a likelihood that the Government would expect to make a military response should the events occur.

Force element

A unit that directly contributes to the delivery of an NZDF output, e.g. a frigate or an infantry company.

In theatre

The area of military operations into which forces have been deployed.

Mission-essential tasks

Tasks which are fundamental for the performance or accomplishment of the force element's mission within the given employment context.

Operational level of capability (OLOC)

The state of preparedness where a force element is ready, combat viable, deployable and sustainable. When a force element is at OLOC it is able to be deployed and commence operations.

Preparedness

A measure of the ability of force elements to be employed on military tasks. Force elements must be held at a level of capability from which they can be raised to an operational status within a specified time, then deployed for the conduct of a particular type of military task and be sustained for a specified period while engaged in that task. The state of preparedness for particular military task is specified in terms of readiness, combat viability, deployability, and sustainability.

Reconnaissance

Obtaining information about the activities and resources of an enemy or potential enemy, or securing information concerning the characteristics of a particular area.

Response time

The time available, once committed by the Government, to prepare a force for deployment to a particular area of operations.

Territorial Force

Territorial Force personnel are part-time members of Army who train for a minimum of 20 days per year. The Territorial Force exists to maintain sufficient trained personnel to sustain and supplement the deployment of Regular Force Units when required. There are six regionally based Territorial Regiments.

Troop insertion

The act of placing a group of infantry soldiers into a specified area by vehicle, in this case by Iroquois.

Warning Order

One of a number of orders and directives issued in anticipation of an operational deployment. A Warning Order alerts force elements to the likely mission and intended outcomes, and outlines those preparatory tasks that need to be undertaken.