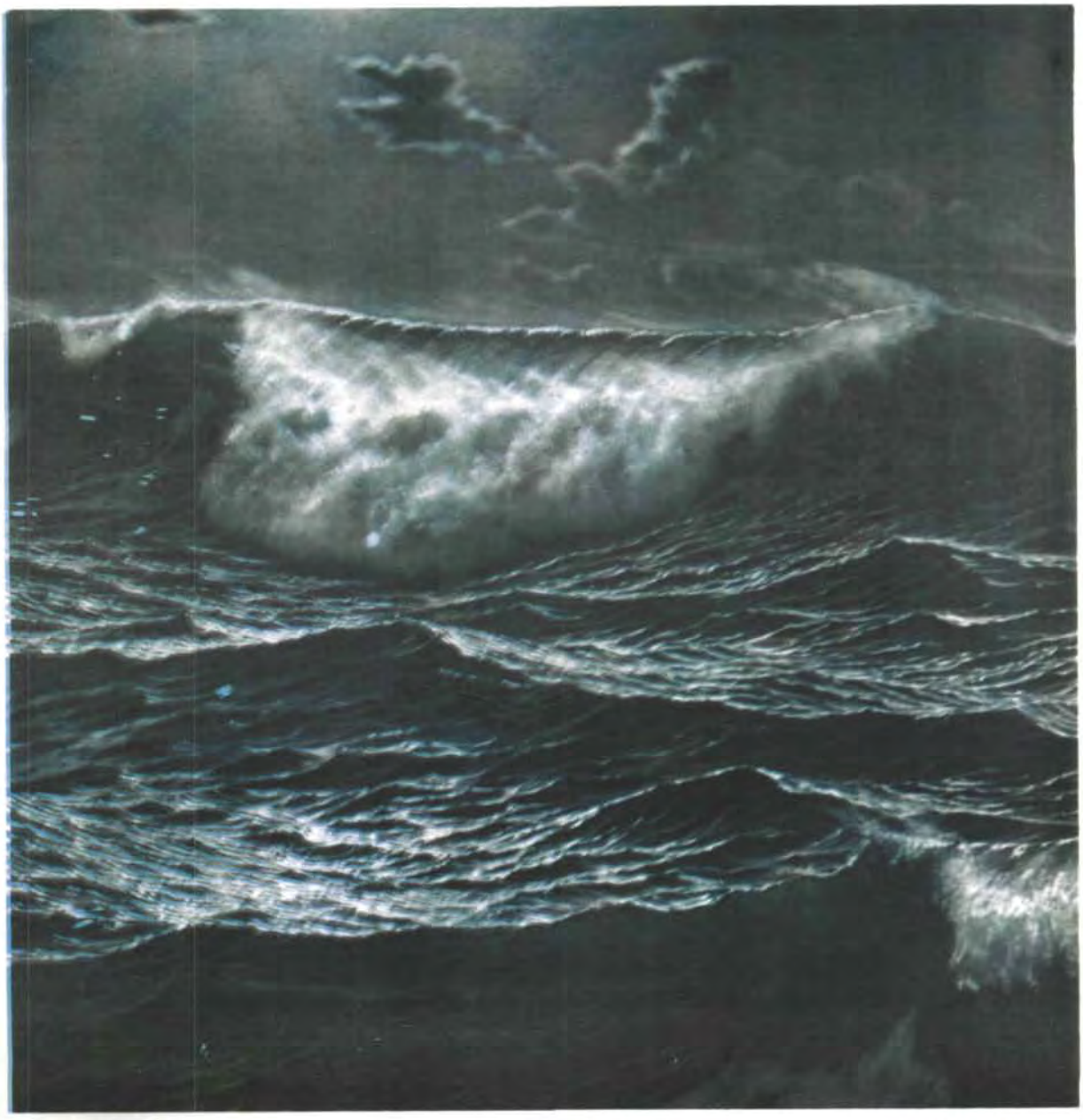
142

JOURNAL OF

THE AUSTRALIAN NAVAL INSTITUTE



VOLUME 2 MAY 1976 NUMBER 2

AUSTRALIAN NAVAL INSTITUTE

1. The Australian Naval Institute has been formed and incorporated in the Australian Capital Territory. The main objects of the Institute are:—

   a. to encourage and promote the advancement of knowledge related to the Navy and the Maritime profession.

   b. to provide a forum for the exchange of ideas concerning subjects related to the Navy and the Maritime profession.

   c. to publish a journal.

2. The Institute is self supporting and non-profit making. The aim is to encourage freedom of discussion, dissemination of information, comment and opinion and the advancement of professional knowledge concerning naval and maritime matters.

3. Membership of the Institute is open to:—

   a. Regular Members—Members of the Permanent Naval Forces of Australia.

   b. Associate Members—(1) Members of the Reserve Naval Forces of Australia.

      (2) Members of the Australian Military Forces and the Royal Australian Air Force both permanent and reserve.

      (3) Ex-members of the Australian Defence Forces, both permanent and reserve components, provided that they have been honourably discharged from that force.

      (4) Other persons having and professing a special interest in naval and maritime affairs.

   c. Honorary Members—A person who has made a distinguished contribution to the Naval or maritime profession or who has rendered distinguished service to the Institute may be elected by the Council to Honorary Membership.

4. Joining fee for Regular and Associate Member is $5. Annual Subscription for both is $10.

5. Inquiries and application for membership should be directed to:—

   The Secretary,
   Australian Naval Institute,
   P.O. Box 18,
   DEAKIN, A.C.T. 2600.

CONTRIBUTIONS

As the Australian Naval Institute exists for the promotion and advancement of knowledge relating to the Naval and maritime profession, all members are strongly encouraged to submit articles for publication. Only in this way will our aims be achieved.

DISCLAIMER

In writing for the Institute it must be borne in mind that the views expressed are those of the author and not necessarily those of the Department of Defence, the Chief of Naval Staff or the Institute

JOURNAL OF THE AUSTRALIAN NAVAL INSTITUTE (INC)

CONTENTS

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OUR COVER

The front cover picture is a reproduction of a painting by Dennis Hardy, by courtesy of Mr. A. E. Stephen of Surfers Paradise.

CHAPTER NEWS

Canberra

A meeting of the Canberra Chapter was held at 1930 on 30 March 1976 at RSL National Headquarters, Canberra.

Under the Chairmanship of the Convener of the Chapter, Captain L.G. Fox RAN, 15 members assembled to hear a paper written by Captain N. Ralph DSC RAN titled: 'Australian Maritime Trade–A Problem for Defence'. Unfortunately, Captain Ralph was unable to present his paper in person due to service commitments. However, the paper was most ably presented by Commander J. Haines RAN who substituted at short notice.

The Chairman then called upon the President of the Institute, Commodore V.A. Parker RAN, and Captain D.J. Martin RAN to each give a short talk on their view of the problem posed by Captain Ralph.

During and after these talks a lively and interesting discussion ensued.

In closing the meeting, the Convener thanked Commodore Parker, Captain Martin and Commander Haines for their presentations and pointed out that there was obviously scope for more papers to follow the theme presented by Captain Ralph.

In expressing disappointment at the modest attendance, the Convener stated that it was not very encouraging to those who spent a considerable amount of their time and effort preparing papers for presentation. He hoped that further meetings would show some improvement.

The members were advised that Lieutenant R.M. Jemesen RAN had agreed to act as Secretary/Treasurer of the Canberra Chapter.

The next meeting of the Chapter will be held on Wednesday, 30th June, 1976.

Sydney

The meeting held on the 10th of March was well attended; we had 24 there, our highest number so far. Captain J.A. Robertson RAN convened the meeting and introduced the major topic of Naval Wargaming by giving a brief review of its history from the 18th century. He then introduced Mr. Dennis Brackmen, of Napoleon's Bookshop in Pitt Street, Sydney, who discussed recreational wargaming.

Mr. Brackman is a wargamer of international experience, a Captain US Army (Reserve) and a Vietnam veteran. He spoke on recreational wargames available, how they are devised, constructed and played. He then proceeded to give a brief demonstration of the game 'The Solomon Islands Campaign', using the game to demonstrate a brief historical commentary. The discussion centered around the accuracy of these games, their usefulness and who plays them.

Captain E.E. Johnston RAN then gave a short talk on the Computer Wargame System at the US Naval War College. He discussed the basic equipment involved and then how the games are organised. One point put forward during the ensuing discussion was whether the Institute or the RAN should be involved in wargaming (apart from the AIOTT) as a tool–not only as a decision making trainer but also to determine equipment fits, and force structure.

On 14th April the Institute combined with the Naval Historical Society at the TAS School HMAS Watson to watch the film 'Tora Tora Tora'. A short address on the Intelligence aspects of the film was given by Lieutenant Commander W.N. Swan RAN (ret'd) before the screening of the film.

On 7th May a presentation on the Battle of the Coral Sea was given at HMAS Penguin. A detailed report is expected to appear in the next edition of the Journal.

Members are reminded that any contributions they have for the Journal should be forwarded to the Secretary of the Institute. At the moment the Institute has no stockpile of articles, nor a large number of articles in the 'pipeline'. The editors are doing a good job with limited resources and a larger selection of articles would make their job considerably easier. Letters, book reviews, articles and essays are all acceptable.

Correspondence

The Editor,
Journal of the Australian Naval Institute

Dear Sir,

In the Battleship Mentality proceedings (February, 1976), the Prosecution case was essentially a ploy to establish guilt by association. The Defence recognized the device, but yet employed similar tactics to mitigate blame by pointing the finger at fodder bills for British Army horses and the RAF's ill-fated TSR-2.

In point, the charge of Battleship Mentality in the RAN was not properly investigated at all. Battleship Mentality exists in the Australian Defence Establishment all right, and undoubtedly the Navy no less than anywhere else. Look no further than the DDG acquisitions during the gun-boat war of Confrontation, the RAAF bright idea to use Mirages in the ground-support role, and the Army infatuation with tank squadrons. Look at the current nonsense about School Cadet Corps, the burgeoning Defence bureaucracy, and the infamous 'no threat' syndrome in particular. Where is the debate on missile-armed patrol craft, VTOL aircraft, fibre optics, and modern logistic support technology? Certainly not in these pages, subscribed to by only a couple of hundred stalwarts out of a potential of thousands.

On the other hand, there are innovative, forward-thinking, right-minded men. We probably do have the embryo Jackie Fishers (and included amongst these frustrated ranks would be those sufficiently professionally enthused to subscribe to this Journal), but I would wager the Battleship organization of Defence Central will prevent their ever developing into fruitful maturity. Coupled with this is the obstructionist Battleship Mentality of those who advise on and allocate national resources and priorities.

However, as responsible jurymen we must cast a vote based solely upon the facts presented, and so I decide on the old Scottish alternative verdict of NOT PROVEN. The case is by no means closed but should come up for trial again upon presentation of additional, and relevant, evidence.

Juror

ANI FIRST ANNIVERSARY

The Australian Naval Institute was officially formed on the 4th April, 1975, with the objects of encouraging and promoting the advancement of the Naval and Maritime professions and also providing a forum for the exchange of ideas on related subjects. The foundation membership consisted of 57 Regular and Associate Members and after the first year this total has been increased to over 200.

As could be expected, the majority of the ANI Members have qualified to join by virtue of their RAN, RANR or WRAN service, but there is also a reassuring number of interested civilian and foreign naval applications. This indicates that the Institute is becoming more widely known and that the future is full of promise.

Admiral Sir Victor Smith, A.C., K.B.E., C.B., D.S.C., Vice Admiral H. D. Stevenson A.C., C.B.E., and His Honour, Judge Trevor Rapke, Q.C., B.A., L.L.B. graciously accepted the Council's invitation to become Honorary Life Members.

Chapters of the Institute have been formed in Sydney and Canberra and both groups have convened on a number of occasions during the past year. The papers delivered at these meetings have covered a wide range of interesting and thought provoking topics and these are now permanently recorded in the first three issues of our Journal.

That the Institute has published three Journal issues within the first year of operation is a source of pride and is also testimony to the hard work and splendid organisation of the Editorial Sub-Committee. In addition to being distributed to each Member, the Journal will be available to students at the various Staff Colleges in Australia and also at a number of important libraries.

Valuable publicity has been accorded the Australian Naval Institute in the prestigious Proceedings of the United States Naval Institute and it is hoped that the future exchanges of information will be a source of satisfaction and mutual benefit to both organisations.

A competition was recently held for the purpose of establishing a design for the Institute's crest. Mr. C. Clarke of Navy Office was the successful entrant. The crest which is reproduced on page 20 will be featured in future issues of the Journal.

With the passing of the first anniversary the Council believes that the Institute is now firmly established and that, in fulfilling the objectives drafted by the foundation members, it will grow in numbers and stature to become an important link in the propagation of Naval and Maritime knowledge in Australia.

FROM THE EDITOR

The appeal for contributions to the Journal, which has been repeated in the last two editions, is gradually coaxing members to let us have material which is so badly needed if the Journal is to develop as well as we would like. However, despite the encouraging signs of awakening interest on the part of a few new contributors, members are again exhorted to put pen to paper and allow themselves the luxury and the satisfaction of seeing their thoughts, comments, criticisms, humourous anecdotes etc. in bold print for posterity to read in a serious and developing professional Journal.

There is no party line and contributors may at their request have their items printed under a nom-de-plume.

One new feature, which it is hoped will become a permanent part of our Journal is entitled 'I Was There When . . .'. This is meant to provide the opportunity for contributors to publish their experiences which previously they may have recounted in informal and perhaps convivial gatherings to those few who may have listened. This is your opportunity to share those experiences with your professional colleagues. The first of what is hoped to be a lasting series of the 'I Was There When . . .' features appear in this issue.

Members are also reminded that additional copies of past numbers of the Journal may be purchased for $2.50 a copy, but this depends on how long stocks last. Membership is steadily increasing, and stocks of the inaugural publication (Vol 1 No 1) have now been exhausted. Copies of subsequent magazines are available however on application to the Secretary.

STOP PRESS

As this edition of the Journal has been prepared for final printing, the need for contributions for the August edition has become increasingly clear.

Major articles are always welcome, but in addition, there is a pressing need for smaller items, particularly for our regular features such as Classic Signals, Ship Handling Corner, and Technical Topics. With the wealth of experiences, professional and otherwise, which must have been gained by our many members in their travels to all corners of the world, it does not seem unreasonable to expect a flood of contributions, but regretfully, such is not the case. At present, our cupboard is bare.

Additionally, whilst it is flattering to believe that every article & comment we publish meets with the unanimous approval of all our readers, the thought that eventually some member or members may be provoked into disagreeing in print is the one hope to which we cling. Don't worry about inconveniencing the editorial staff, only your reticence does that.

Professionalism and the Naval Institute

All of us would claim to have a deep interest in the security of the country in which we live and would also pronounce that we can take a balanced view of the total defence structure, of which the Navy is but one of the integral parts. Then, because we are Naval people and understand the many factors which make the Navy unique, most of us would feel justified in devoting our attention primarily to the state of the RAN and the prospects for its future. We would certainly give a lot of thought to the details of today's Navy which need improvement; equipment, training methods, maintenance procedures, command and administrative organisation to name a few. We should also be giving a lot of attention to the perpetuation in tomorrow's Navy of the things we value today: the good feeling of being in a happy ship; the teamwork, loyalty, cheerfulness, skills and energy of those around us; the knowledge that we can do a very important job very well. We would argue that this country needs a good Navy but we would realise that tomorrow's Navy won't be much good unless the members of today's Service care deeply for it, believe in it, want to see it endure and are prepared and able to do something about it. In short, the future of the Navy depends almost entirely upon the professionalism of its members.

What is Professionalism?

The Kerr and Woodward reports, which were backed by the Parliament, announced that Service people were professionals in the accepted sense of the word, and made use of a historic and dignified phrase 'the Profession of Arms'. How many of us paused to ask what this meant? The Shorter Oxford English Dictionary describes 'profession' as: 'A vocation in which a professed knowledge of some department of learning is used in its application to the affairs of others or in the practice of an art founded upon it'. Webster says: 'The occupation, if not purely commercial, mechanical or agricultural or the like, to which one devotes oneself; a calling in which one professes to have acquired some special knowledge used by way either of instructing, guiding or advising others or of serving them in some act, as the profession of arms, of teaching, of chemist.' How do we measure up against these definitions? If we are sure that we satisfy the descriptions, and if we accept other meanings from my dictionary, (eg vocation=moral duty, devote=dedicate, calling=strong impulse towards a duty), then it could be said that, on the whole, we come out reasonably well, but perhaps most of us could suggest some room for improvement, if not for each of us as individuals then perhaps for those around us! The qualities which should separate us from the 'purely commercial, technical and agricultural' are those with quaint old names like dedication, selflessness, commitment to service, and loyalty.

There are two immediate problems facing us: to make sure we **are** professional and to make others outside the Service aware of the fact. There are many ways in which we can enhance the qualities inherent in the definitions quoted above. To name but a few, we can ensure that we are good at our own jobs by keeping up to date and by practice; second, we can seek every opportunity for further education both inside and outside the Service to broaden our knowledge and understanding; third, we can widen our circle of friends and acquaintances outside the Service and make ourselves understood by them; fourth, in our dealings with civilian Public Servants we can ensure that we have got our facts right and that our arguments are not based upon subjectivity or jealousy, then fight for what is right; fifth, in talking with politicians, we can seek to impress them that we recognise and value the primacy of the civilian as vested in the Parliament, that we expect them to make the decisions and be accountable for them, but that we are not political pawns whose advice can be ignored; sixth, we must show that, while we may be experts in management we also understand the difference, and the need for it, between management and leadership.

How Professional Are We?

Let's look at ourselves and our messmates to see if we portray the sort of image that is, I hope, beginning to take shape in this article. Are we as proficient technically as we should be? Could we, say, put forward sound arguments, in the context

of national development, foreign affairs and defence, about why Australia should have a carrier, or more destroyers, or even a Navy? If a civilian asks for a good book on maritime strategy, could we think of one, or give him one, or quote from one? Would we recommend, wholeheartedly, the RAN as a career for our favourite son? Do we devote enough time to the interests of our juniors, or to the support of our seniors? Do we bemoan our lack of tertiary education yet make no effort to organize something for ourselves? Do we blame all the wrongs on 'them' without making constructive suggestions? Do we abuse Public Servants rather than try to understand them?

Opposite Influences

We will certainly have to be truly professional if the RAN is to retain its character. The words 'profession' and 'defence' have recently attracted various connotations, many of them undesirable. Some factions of public opinion, notably the cynics, the pacifists, the cowards and the pleasure-seekers, cast aspersions upon patriotism, armed services, loyalty, elitism, rank and privilege. It is difficult to 'hold fast to the faith and to that which is good' when the insidious or blatant influence of the knockers envelopes us via the press, television, radio, and the words of academics, left wing politicians, perhaps our neighbours or even our families. It is not easy to feel wanted when we hear of 'no war for the next fifteen years' and when we experience cutbacks in manpower and delays in getting new equipment. Industrial strife, or plain sloppy workmanship, have effects upon ships and men which give rise to feelings of disgust and despair at being let down by the very people who have expected, and may in future expect, us to put our lives at risk for them. Publicised resignations by senior officers may affect our steadfastness of purpose and give us gnawing doubts about our own careers. We may worry about the way in which the top leadership of the Service has become buried to an extent in an amorphous bureaucratic department wherein the greater part of the planning and budgetting, and most of the important decisions, appear to be in the hands of people who, whatever their devotion, industry and experience, are **not** Service officers; they are not accountable for their mistakes and decisions, or lack of decisions, by death in combat or by court martial.

Recent years have seen increases in pay and allowances and some improvements in conditions of service designed to make the Serviceman content, but we would all be happier if it was understood that comfort alone is not what we need; we would rather get our satisfaction through knowing that we are necessary and effective, that our time and exertion are well spent and even that our efforts are appreciated.

Well meaning busybodies have tried to impose upon us new-look innovations meant to improve our lot but which in fact could erode the very roots of Naval responsibility and discipline, and could undermine seriously our foundations. The Defence Ombudsman is now in being; trade unions have not yet gone into uniform. Neither would be necessary if we did our jobs properly.

So What?

So far, I have tried to describe professionalism in the Navy and the need for it, and to list some of the influences which oppose the maintenance of that professionalism. In brief, we can do something about our professionalism and our future, but we must be very good at our jobs, we must understand how and why we fit into the scheme of things, we must believe in ourselves and the Navy and we must advertise ourselves.

The Naval Institute

This brings me at last to the point of this article. The birth of the Australian Naval Institute, and of this Journal, come at a very appropriate time. I have suggested that, if we are of any value to our society, nobody will ever realise it until we understand thoroughly ourselves and our chosen way of life. Our corporate strength derives from our own teamwork and mutual respect. I hope we can all see what a significant role the Institute and its Journal have to play in fostering and nourishing our professionalism; should they founder it may only be because we just aren't good enough. Let us use the pages of the Journal as a forum for discussion and argument; don't just sit in the mess and complain that nobody will listen to us, that we don't have the chance to discuss the vital issues, that everybody five years older is senile, that the Navy is too conservative . . . etc. Let us realize that 'They' is 'We', and get on with it. Let us take up our pens and write; take time to clear our minds of some of those pent-up ideas previously frustrated by overwork, lack of eloquence and laziness. And if we don't agree with an article, or its sentiments, or if we support somebody's ideas and want to add our two bob's worth to the discussion, it can only strengthen the Institute and its members, and help the Editor, if we put the thoughts on paper and submit them for publishing.

Let us be truly professional, use the Journal to convince each other that we are, then share this knowledge with those who need to know—which is everybody. And, by the way, join the Institute and get our friends to do the same!

—**Slingshot**

Australia's Maritime Trade: The Problem of Defence

BY CAPTAIN N. RALPH, D.S.C., RAN

An address to the Australian Naval Institute, Canberra, 30th March, 1976

Introduction

The importance of maritime trade to national economies varies according to the degree of self-sufficiency of the country concerned. On one hand the economies of UK and Japan have a precarious dependence on trade; on the other the economy of the USSR has a very limited requirement for trade. However no country can fully realize economic potential unless she trades competitively in world markets. The degree to which economic potential is realized determines the standard of living of the people, political influence abroad and inter alia, the level of the country's defence. There is no military strength for Australia except on the basis of economic strength and it is on this basis that we best ensure the security of the country.

The purpose of this paper is to indicate the importance of maritime trade to Australia and suggest its sensitivities to external factors which might have implications for defence. This should be the first step in a series of studies which other Institute members might take up in the interests of achieving a greater public awareness of the defence problems of Australia.

The scope of this paper is as follows:

a. A description of the current nature and pattern of Australia's maritime trade.
b. Discussion of some implications of any disruption to this trade.
c. An outline of the general nature and movement of shipping engaged in Australia's trade.
d. A summary of the inherent sensitivities of this trade to factors which might have implications for defence.

Pattern of Australia's Maritime Trade

Australia is a major trading nation and in terms of total value of trade it ranks 13th in the world. Expressed as a percentage of GDP, Australia's trade is around 30% which is above that for Japan and US.

From the early years of settlement Australian production of primary commodities including minerals, has been heavily export oriented, particularly to UK. In the case of manufacturing industries the comparatively small domestic market acts as a restriction on economies of scale which modern production techniques require. Consequently participation in international trade is of fundamental importance to the Australian economy. Imports have been an essential input to sustained growth and diversification of the economy and to finance such imports, exports must grow at a similar rate.

Imports

Imports have increased almost 5-fold over the last 20 years, stimulated by strong economic growth, a high rate of population growth, industrial development and rising incomes. The main groups into which exports may be generally classsified are:

a. Producers materials (material for manufacturing industry) 44% of imports
b. Producers capital equipment (machinery) 18%
c. Transport equipment 7% increasing
d. Finished consumer goods 24% increasing
e. Fuel 3% increasing
f. Other 5%

THE AUTHOR

Captain Neil Ralph was born in Melbourne in 1932. He joined the RAN in 1952 as an aircrew trainee and later qualified as an observer in the Fleet Air Arm. After service in 808 and 724 All Weather Fighter Squadrons he started pilot training in 1958 and was subsequently posted to 805 AWF (Sea Venom) Squadron. Shortly after he was posted to UK for helicopter ASW training and returned to Australia with the new Wessex 31A in 1961. After service in 725 and 817 Helo ASW squadrons in Albatross and Melbourne, then sea service in HMAS Anzac, he was appointed in command of the first RAN Helicopter Flight Vietnam '67-68. This was followed by service in HMAS Yarra, a year at RAAF Staff College, then Executive Officer of HMAS Sydney. He became very interested in maritime trade during a 2¼ year posting on the Directing Staff of the Royal Naval Staff College at Greenwich in U.K. '71-73. After a year at HMAS Albatross as Cmdr (Air) in 1974 he was promoted Captain and took up his present appointment as Director of Naval Training.

The growth of the industrial sector has to a large extent led to increased import demand for producers' capital equipment and producers materials and these now account for over 62% of total imports, a proportion significantly higher than 20 years ago.

Imports of finished consumer goods have roughly kept pace with the overall growth of imports and consumer demand while fuel's share to total imports has decreased considerably, largely reflecting increased self-sufficiency.

Over the last 20 years substantial changes have occurred in the sources of Australia's imports. The UKs share of our imports has fallen from 49% to 14%. US (22%) replaced UK as leading supplier in 66-67. ASIA (34%) and EEC (13%) have increased their share of Australian import markets. (West Germany is leading source from EEC).

Exports

Australia's export trade remains dependent to a large extent on farm products despite the growing contribution of mining products and manufactures. Seasonal influence on agricultural production and the often sharp variations in world commodity prices have resulted in heavy fluctuations in Australia's export earnings. For example, in 1972-73 the **volume** of wool exports fell by 5% while the **value** rose 96% above the previous year.

The diversification of exports has been a principal objective of Australian export policy in the post-war years. In the late 1940's farm products accounted for just under 90% of Australia's export earnings, whereas today, they account for around 52%.

The steady growth in exports of manufactures has been partly responsible for the reduced proportion of farm products, but in recent years exports of mining products have played the major role. In 1953-54, exports of mining products were valued at $102m., or 6% of total exports. By 1973-74, exports of mining products accounted for 24% of total exports and stood at $1,607m. Since 1963-64, exports of manufactures have increased from 11% to 20% of total exports.

The relative importance of the United Kingdom as an export outlet for Australia has reduced considerably over the last two decades, falling from 36% in 1953-54 to 7% in 1973-74. Both ASIA (from 17% to 49%) and the Americas (from 9% to 15%) have greatly increased their shares of the Australian export market, especially over the last 10 years. Japan became Australia's major export market in 1966-67 and now takes 31% of all our exports. The United States has raised its share from 7% in 1953-54 to 11% in 1973-74. However, in contrast to the pattern of import growth, the share of the EEC in Australia's exports has fallen, from 23% to 10%.

Oil

Because of the pervasive importance of this commodity, oil should be considered separately. We have seen that oil imports are currently comparatively small and local production provides over 70% of the requirement. However as is generally known, to whatever level local production may reach, we will continue to have a requirement for heavy ME crudes for use in heavy industry.

Already there is a tendency for imports to increase again and the areas of increase are mainly in bituminous products (increase of 64%) heavy lubricants (34.2%) and heavy fuel oil (34%) fuel (11%).

The main sources of our imports of crude oil refined product are:

KUWAIT is lead supplier	27% of total
BAHRAIN	13.3
SAUDI ARABIA	17.1
IRAQ	11.1
SINGAPORE	10.6

The trend to increase imports of oil from the ME will continue as consumption in Australia decreases and local sources reduce output. A reliable forecast for 1984-5 expects consumption to have risen by 75% over 75-76 figures. Australian oil sources will be able to supply only a small fraction of the requirement by that time. We become again precariously dependant upon ME sources.

To summarise the nature and direction of our maritime trade we find that:

a. The level of imports has risen enormously although the composition has not markedly changed. There is a tendency to import more finished consumer goods, which indicates:
   (1) Increased affluence
   (2) Production costs of similar products in Australia are probably higher in many cases owing to higher wage costs
   (3) Balancing trade with Japan
b. The composition of exports has changed considerably the minerals and manufactures are now balancing the rural export levels.
c. The source of imports and the destination of exports are now oriented strongly toward Asia and the Americas.
d. The importation of oil fuel will increase markedly over the next 5-8 years, with ME becoming the major source.

Implications of Disruption to Maritime Trade

The change in our major trading partners has brought about fundamental changes in Foreign Policy and by implication, Defence Policy.

Disruptions to trade can be caused in a number of ways, from trade blocks to blockades, from shortages at source to blackmail from source, political/economic duress or denial of use of trade routes.

Earlier we looked at the general nature and source of imports and, now to try to assess some of the effects of shortages caused by disruption, we need to look more closely at both. Firstly the composition of imports. We could probably do without many of the items which were included in the groupings mentioned earlier.

In researching this subject considerable difficulty was experienced in establishing which items were essential to the economy. Import Licences, long since abolished would provide this information. The Department of Overseas Trade apparently attempted to establish import excise essentiality on the basis of the amount of duty imposed on items, i.e. if the item had 7½% duty or less it indicated that the item was not available locally and therefore a degree of essentiality applied to it. Judged by this criteria 63% of imports were essential. This is obviously too high.

The short list which follows indicates those items with an idea of comparative value which are suggested as essential to a nucleus economy.

	$M
Crude Rubber	43.0
Wood	110.4
Petroleum and associated products	376.6
Organic chemicals	153.6
Plastic materials	145.2
Tyres	59.1
Newsprint and other paper products	167.4
Iron and steel	213.5
Calculators, computers etc.	341.1
Machinery	584.6
Aircraft Parts (excluding engines)	222.8
Professional, scientific and optical goods	111.8
Total this list	2585.7
Total all imports (74-75)	6085.0

This works out to be about half the current imports although obviously some reduction in quantity could be accepted. However we must also have regard to unemployment caused by shortages and the consequential strain on a nucleus economy to provide the social support expected. Additionally trading relations could be damaged in cases where Australia could not meet export commitments and alternative sources established e.g. iron ore for Japan from Siberia.

There are some items which are imported and are absolutely essential to the manufacturing process:

a. petroleum coke
b. some ferrous alloys
c. caustic soda for making aluminium
d. graphite.

To try to trace the precise levels of essential imports will require a great deal of research. The unemployment caused by shortages might be the best means to measure the effect. In broad terms, restrictions on finished manufactures (which are all consumer oriented—motor cars, transistor radios, colour TV etc) should not make too great an impact on the economy. Some unemployment in the retail industry will result and prices will rise as a result of the shortage.

Industry in Australia would however suffer considerably. As we have seen, industry relies to a considerable extent on imports of heavy machinery and producers materials. The shortage of producers materials will be the first felt—in the manufacture of plastics and plastic components and tools, to name a few areas. There will be a significant increase in unemployment in the manufacturing industry which is the largest single employer in the Australian work-force.

Probably the greatest single effect will occur in the mining of minerals. Almost all of the heavy equipment and tyres are imported owing to the specialised and complex nature of the equipment. Output will probably reduce to a fraction as current equipment is not replaced. The effect would be significant in 12 months.

Again, it is difficult to make a precise judgement on the real effect of the economy of a reduction in imports of oil but as we have seen we will become dependent on overseas supply of oil and the greater the dependence the greater the consequences. As an indication of the effects of oil restrictions in the **current** situation, the following unemployment would probably result.

10% reduction in supply – 85000 workers
15% reduction in supply – 128000 workers
20% reduction in supply – 171000 workers

A serious effect would of course be the reduction in our ability to trade.

Restrictions on the import of finished manufactures should not greatly harm the economy. Reductions in mineral output will occur if the specialized mining equipment is not imported. Reductions in import of producers' capital equipment and materials will have very large and penetrating effects on the economy, unemployment being not the least effect. The consequences of reductions in level of oil imports will increase considerably from now on.

Domestic Trade

In looking at trade generally we cannot afford to overlook interstate trade. Much of our industry depends upon the movement of large amounts of cargo around the Australian coast.

For example:

Steel Making
- iron and coal is moved in considerable quantities

Aluminum
- with exisiting industry location, bauxite, alumina and aluminium metal must be moved.

Petroleum
- with the bulk of our domestic oil produced in Bass Strait we again face a national transport need.

Nickel
- although nickel is mined and refined in Western Australia its main use is in New South Wales.

Sugar
- to cite one example basic sugar refining is undertaken in northern New South Wales and Queensland only. It is a bulk cargo normally handled by sea and if this is not available, there may not be sufficient railway or road facilities to meet the tonnage.

An inter-related example of domestic and national trade in the production of alumina. Currently we are exporting to Japan large quantities of salt which is used in part for the production of caustic soda essential to the domestic refining of bauxite.

Regional Commitments

In time of war for reasons other than the war-effort itself, we must consider supporting the economics of neighbouring countries. For example, there is a close trade relationship between Australia and New Zealand and a certain degree of economic integration. In times of tension it will be important to maintain existing trade relationships. We would continue to import maximum possible quantities of pulp, newsprint and timber from New Zealand to support the New Zealand economy. Similarly with exports, New Zealand is reliant on Australia for items such as: petroleum products, copper, iron and steel and aluminium.

For reasons of morale and also to maintain the PNG economy we should maintain imports from PNG of: coffee, tea, cocoa, vegetable oil, in addition to rubber which would be of strategic interest in war.

Papua New Guinea generally relies on Australia for a large part of its import requirements. Without these and in the absence of alternative suppliers PNG might be in difficulties.

General Nature and Movement of Trade Shipping

It is convenient to consider trade shipping under the 2 main groupings: (a) overseas (b) coastal.

Overseas shipping comprises 2 main groups: (a) bulk (b) general cargo.

Overseas/Bulk Shipping

We are all aware of the nature of bulk ships– they vary in size from 500 tons to 500,000. Generally their economic speed is 17 knots or less. According to their size there are restrictions to the ports they can use, the routes they can use and their use of the Panama and Suez Canals. The size of bulk ships grew tremendously after the closure of the Suez.

In Australian trade bulk ships are used in the transport of oats, wheat, coal, bauxite, salt, sugar and oil. The most intense traffic is from the West Australian iron ore ports of: Dampier, Hedland and Walcott. Most of this traffic goes to Japan via Ombai and Lombok Straits. There is an average of 3 ships loaded in each port every 2 days and the traffic between Australia and Japan comprises about 8 ships, 4 northbound and 4 southbound in every 400 mile stretch. In all there are 30 bulk ore carriers between Japan and Australia in transit at any one time.

Other bulk shipping exports from Western Australia occur mostly out of Fremantle which exports grain to Asia and the Middle East, Alumina and mineral sands. Combined with the iron ore and salt traffic further north, there is a considerable flow of overseas bulk ships operating on the west coast of Australia, and now bulk operations on the east coast.

Bulk carriers operate extensively out of Weipa and Gladstone in Qld. More than 5 million tons of bauxite is shipped overseas annually from Weipa and another 5 million shipped to Australian aluminium plants at Gladstone and Bellbay in Tasmania. Bulk carriers in and out of Gladstone ship out 7½ million tons of coal and 2 million tons of alumina annually, while delivering 4½ million tons of bauxite. Much of the exported bulk cargo goes to Japan. Hay Point, another Qld. port near McKay, exports 8½ million tons of coal annually.

Coal is bulk carried from both Newcastle and Port Kembla, 7½ million tons from Newcastle and 3½ million tons from Port Kembla, to overseas ports, again mostly to Japan.

Other East Coast bulk exports are sugar from McKay, Lucinda and Bundaberg. Liquified petroleum gas is shipped to Japan from Westernport. Bulk wheat is shipped from Adelaide, Sydney, Newcastle, Brisbane and Geelong in Victoria, Geelong being the largest wheat shipper in Australia.

Bulk imports into Australia occur at some of the ports mentioned but not nearly at the same level. Caustic soda and petroleum coke, fertilisers, sulphur and liquid chemicals are the main bulk imports and of course oil. Most bulk ships therefore arrive in ballast.

Oil from the super-tankers is received at: Adelaide, Geelong, Altona, Westernport, Kurnell and Brisbane. Refined products are then distributed around Australia by sea excepting that Darwin and ports in NW Australia receive refined products direct from Singapore.

General Cargo

The general cargo vessels group comprises mainly:

a. Container ships, the largest group being the Sealane 41000 ton vessels which carry 2000 containers at over 30 knots.
b. Lash (Lighter Aboard Ship) which require minimum port facilities. The number of these ships will grow but will not approach anything like the number of container ships. Speeds about 23 knots.
c. Hybrids–specially designed according to particular trade but carry both containers and hold cargo. Roll on roll off, etc.
d. Hold cargo–used for smaller operations.

Overseas operations usually are organised through conferences. There is the: Australian European Conference, Australian North Bound Conference (East Aisa, Japan, Korea etc), Australian–American Conference.

Container ships are handled only at ports where loading and unloading facilities are available. In Australia this restricts their movement to the major ports in the capital cities. The trend has therefore been to centralise cargo handling and concentrates this shipping on Sydney, Melbourne and Fremantle. New container complexes are planned for Adelaide and Westernport.

Other overseas general cargo ships operate in and out of capital city ports but take on cargo at some regional ports. Ships operating between Australia and the Pacific Islands are generally small vessels and are frequent callers at regional ports.

The volume of overseas trade passing through Australian ports as a percentage of trade is: Sydney 33% (including Port Kembla and Newcastle), Melbourne 16.5% (including Geelong and Westernport), Fremantle 15.2%, and N.W. Australia 35.3%. (30% of this trade flows east to America, 30% Europe and elsewhere and 40% to Asia.)

The general picture of overseas trade traffic is a very active one, involving bulk and container ships, and numerous smaller cargo vessels. There are approximately 10,600 ship arrivals from overseas each year with cargo. The movement of shipping to and from Australian ports carrying this trade is considerable. The following figures are inward arrivals at the ports shown for 74-75 (includes coastal):

Sydney (5809)	Port Jackson	3264	
	Botany Bay	371	
	Port Kembla	813	
	Newcastle	1361	
Melbourne	Port Melbourne	2631	(1516 o/s 115 coastal)
	Geelong	429	(291 o/s 138 coastal)
	Westernport	405	(161 o/s 244 coastal)
Fremantle		1804	
Q'land	Brisbane	1304	(946 o/s 358 coastal
	Maryborough	14	
	Bundaberg	96	
	Gladstone	430	
	Rockhampton	78	Kirma 358
	Hay Point	157	Thurs. Is. 109
	McKay	221	
	Bowen	27	(Total 3910)
	Townsville	489	
	Lucinda	65	
	Innisfail	27	
	Cairns	477	
	Cape Flattery	58	

The picture is further characterised by the concentration of much of this shipping through Lombok, Ombai and Jomard Straits to the north of Australia.

Coastal Trade

Approximately 5% of freight carried in Australia is carried by coastal shipping. However although this is small it is of major importance as the sea freight cannot be relocated by other means. The shipping involved comprises the smaller general cargo type, bulk oil and ore carriers. Torres Strait is important to the movement of bauxite from Weipa, the limiting depth of Torres is 36 feet and the channel is of course very narrow. Also the iron ore carriers from the NW ports return to the NW having delivered their cargoes to the steelworks at Westernport, Port Kembla and Newcastle. Ships like Mt. Newman of 119,000 tons, Anlych Castle 109,000 tons, Iron Sirius and Iron Summers take passage westward in ballast through Torres.

Sensitivities of Australian Trade

Through a rather long course through Australia's maritime trade we have established that Australian manufacturing industry is a very significant importer of both capital machinery and materials. Much of this comes from the Americas and Europe. Manufacturing industry is an increasing component of the base of the Australian economy and the econ-

omy's health is proportional to the level of manufacturing industry. Shortages in manufacturing materials and equipment will first manifest itself in unemployment, and cause all of the social problems associated with unemployment.

We pay for our imports by exporting rural products, minerals and some manufactured goods. Rural products tend to be seasonal but mineral export is continuous at a considerable rate. Reductions in export earnings from minerals means a balance of payments problem which is either solved by using reserves or reducing imports. Probably the import of finished manufactures could be reduced without significant impact. The direct rate of unemployment arising out of reduced mining would not be significant. The greatest impact of reductions in trade will be a reduction in the standard of living which the older members of the community might accept but the young people of today who take current standards as the normal would find reduction in these standards as something to protest volubly about. Domestic chaos would result if there was disruption to trade.

The success of our maritime trade is currently geared to the success of the Japanese and American economies. Should difficulties in trading arise with either, Australian trade and therefore the economy would suffer. Difficulties in diplomatic relationships between Australia and her trading partners are unlikely to arise in the foreseeable future. Problems may however arise from our dependence upon Japan as an export market because of the closer proximity of mineral deposits in China and Siberia. In this event the Australian economy would seriously suffer as alternative markets of the magnitude would be difficult to find. Furthermore the economic relationships made between Japan and her neighbours may strongly influence political relationships which might have implications for the continuing security of South East Asia. Disruption in oil supplies to Japan from the Middle East is more likely to upset Japanese and Australian trade. Without the current and the increased oil flows required to maintain Japanese industry its requirement for Australian raw materials would reduce. The supply of oil from the ME to Australia will increase from now on and in a few years we may be precariously dependent on this source. There are very real and distinct disadvantages in being in this situation.

The shipping which carries our main trade to Japan routes through the strategic straits of Lombok, Ombia and Jomard. Unavailability of these routes would have considerable consequences for the conduct of this trade. Similarly Torres Strait is important to coastal trade—mostly for the movement of bauxite to Gladstone and Bell Bay. Shipping by sea is the only means of moving bauxite from Weipa.

Because of the scale and expense of constructing and operating specialised cargo terminals, Australian cargo movement is limited mainly to 3 ports, Sydney, Melbourne and Fremantle. Whilst in a defence context this may be an advantage, an aggressor may also see advantages in it for him. Oil refineries are more dispersed but a reduction in the supply to any one could dislocate the industry.

The volume of shipping involved in Australian trade is considerable. There are nearly 15,000 inward movements to Australian ports each year, with a peculiar mix of dispersal and concentration in the total disposition.

Conclusion

Maritime trade is essential to continued Australian prosperity and therefore basic to the determination of all Government options including defence. It must therefore be adequately protected. The present nature and pattern of Australian maritime trade is largely dependent upon:

a. The continued pace and growth of the economies of trading partners.
b. The maintenance and growth of existing trade relationships at least until Australia can diversify export markets.
c. Continued freedom of the sea lanes.
d. Stability in international relations to ensure a, b and c.

The problem for defence includes consideration of:

a. The amount of shipping involved in Australian trade.
b. The dispersal of shipping around Australia.
c. Concentration of shipping on a few main ports.
d. The strategic importance of straits in the established shipping lanes and the lack of options.
e. The varying speeds of merchant ships.

Australia has yet considerable trade potential to realize and there is no doubt that maritime trade will increase further. The types of ships is not likely to vary much in the foreseeable future but the numbers involved obviously will. Increased diversification of trade will mean more use of more sea-lanes, adding to the problem of defence.

I was there when...

Cyprus Patrol Incident

October 1959. Instances of violence between Greeks and Turks in the island of Cyprus were beginning to decrease. There was talk in the air of a negotiated peace settlement, and of independence for the troubled colony. Nevertheless, British troops kept tight control ashore, while the Royal Navy maintained an unrelenting patrol to stop gunrunners and illegal entry.

This story starts with a British destroyer steaming purposefully towards the end of her four day patrol . . . 30 minutes, 6 miles, to go. Then, off the run for a precious 2 days' stand-down: a sports carnival with the Royal Welsh Fusiliers in the local garrison; jolly picnics with the staff of the British Army hospital; sailing, swimming, skindiving and general gaiety. Throughout the ship the atmosphere was buoyant, cheerful, full of anticipation. Then – crunch! An immediate signal from Commodore, Cyprus: 'Army reports darkened ship grid reference 123456 course East, speed medium.' Proceed with all despatch and investigate.' When the position was plotted, it turned out to be 3 hours' steaming away. So 'hard a port, ring on 25 knots, boarding party will be required at 0030' –and so much for our cherished hopes. Never mind, at least we could finish off the patrol with a swift arrest, made possible by smooth Army/Navy co-operation.

My first inkling that all was not well came when I awoke from a doze in a wardroom chair at 0045. Seeing the assortment of gaiters, pouches, pistols and webbing hanging on me reminded me that I was in charge of the boarding party and that we should have been ready fifteen minutes ago. I got the rest of the party mustered and also checked on the seaboats crew and lowerers of the watch on deck, then went up to the bridge, trying to show a proper mixture of nonchalance and efficiency. Going to the bridge was a mistake; the Captain was berserk because the suspected vessel couldn't be found, the boarding party wasn't ready and he was missing his run ashore. I cowered in a dark corner.

Just then a small radar contact was detected five miles away–nothing visual on the bearing therefore it *must* be a darkened smuggler. With some feeling of relief we started the usual routine i.e., creep up on him, darkened and silent, drop the seaboat, illuminate with the 20 inch signal projector, cover him with the 40mm, then board and search. With the confidence born of experience, tradition, training and familiarity we slipped into the drill.

'Away boarding party.' We, and the Turkish Cypriot policeman, clambered into the seaboat; quiet, efficient orders from the bridge; quiet oaths as people stubbed their toes, ran into each other and tripped over their weapons in the pitch black night. 'Lower the seaboat to the waterline.' I noticed that we were suspended some five feet above the waterline but, before I could comment, the First Lieutenant staggered onto the upper deck yawning and rubbing his eyes, took in the darkened scene on instinct and ordered 'Slip'. Down, down, down we fell before hitting the sea with a wallop then shearing away on our errand, our helmets knocked off and bones jarred by the impact. When we were 50 yards away, the Petty Officer noticed that the policeman, who had definitely been in the boat at the davit head, was missing so we turned back towards the ship. There we found him, clutching his lifeline, swinging five feet above water, scared out of his wits, alternately swearing and praying, determined never to let go. We had to knock him off the lifeline into the bottom of the boat, where he was gagged and sat upon.

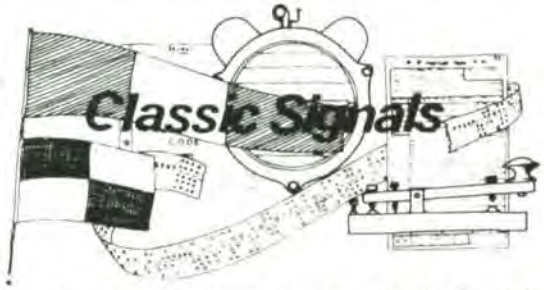
Having overcome all setbacks, we cut under the stern and followed the instructions passed via the portable radio. Check equipment, check webbing, assume a fierce expression. On came the searchlight. Standing starkly in the beam stood our target for tonight–one large fishing buoy, with a radar reflector and three bored sea gulls. It was suggested that at least we shoot the seagulls, but we decided that would not be British. But no smuggler, no infiltrator, not even a cache of weapons under the buoy, let alone a full fish trap. Back to the ship, hoist away, and all that sort of thing–Boarding Officer report to the bridge. The Captain, smarting from the anti climax, was busy suggesting to the First Lieutenant, Navigator, OOW and me, ways in which our performance could be improved when he was interrupted by the second anti climax, in the form of a fresh signal thrust into his hand.

'Immediate from Commodore Cyprus. Disregard my last. Army now assess that vessel reported was RN destroyer and regret that grid reference was garbled.' We didn't need an operations research expert to point out to us that the first contact reported had been of ourselves.

D.J.M.

The Second Coming

I was there when we thought we were witnessing the Second Coming. Cruising some miles off the Vietnamese coast in deep water during Market-time Operations, the look-out reported a man walking on the water some distance off the starboard bow. The OOW, obviously a free-thinker, frantically searched his chart for sand-bars while the curious faithful gathered to gaze in awe at this wonder of the millenium. As the ship cautiously approached our ambulatory dharma, a secular explanation became apparent to our incredulous eyes: he was a fisherman tending his nets, and his locomotion was achieved by shuffling through the water a mat of woven fronds just below the surface and just out of sight from any distance. It was an extraordinary phenomenon and the padre was later able to deliver an inspired sermon, singling out the look-out for his piety and the OOW for his scepticism. *DJC*



The Fleet had been exercising in the Coral Sea in hot sunny weather for about a week. As a result the fair-skinned Captain of an open bridge destroyer had his face burnt bright red. He was called alongside the Flagship to get mail before being detached. As the line came over the Admiral made a signal:
Flag: 'Why is the Captain of ——blushing?'.
Destroyer: 'At my age it's just hot flushes'.

— • • • —

The Fleet Commander, with the Fleet Communications Officer (FCO) in attendance, was conducting officer-of-the-watch manoeuvres. One ship reacted very slowly to a particular flag hoist and took a painfully long time to achieve new station. The following conversation took place on the Flag bridge:

FCO: 'Suggest Negative Bravo Zulu[1] to ship —, Sir.'

Fleet Commander: 'Who is their OOW?'

FCO: 'Sub-Lieutenant —, Sir'. (Names already signalled at beginning of serial)

Fleet Commander: 'No. That is an unnecessary signal to a Sub-Lieutenant. Everything done by a Sub-Lieutenant is Negative Bravo Zulu unless he is told otherwise.'

1. Negative Bravo Zulu means "not well done".

Seaking Recovery Operation
November 1975

BY CAPTAIN J. A. ROBERTSON, RAN

This paper was presented by Captain J. A. Robertson at the Sydney Chapter meeting on 10th December, 1975.

Background

A Seaking ditched in the Shoalhaven Bight just before 2100 on Tuesday 21st October 1975. The crew got out without injury but the aircraft sank fairly quickly. To the non-aviator this raises some questions about the boat hull shape of the Seaking, but my understanding is that the value of it is limited by sea conditions, and it is effective only with the main rotor still turning. At all events, the incident occurred because of a massive loss of lubricating oil in the main gearbox and it was necessary to shut down the engines and ditch. In addition the sea and swell was running at about 2 to 3 metres when it settled on the surface, and it overturned after a few seconds, probably because a rotor blade hit the water.

Location Phase

Snipe and TRV 802 were given the task of locating the aircraft and they did so with some ingenuity. The original position given to *Snipe* produced no result until the Commanding Officer of *Snipe*, Lieutenant Green, remembered that the Wessex used to rescue the aircrew had been held on NAS Nowra's radar as the recovery took place. *Snipe* requested and was conned into position by Nowra's radar to establish a datum. From a hydrographic side-scanning sonar operated by Commander Calder in TRV 802, the aircraft was located in 210 feet of water, 500 yards from the datum. Droggies sonar produced the picture shown on opposite page on Sunday 26th October which not only identified the aircraft positively, but also indicated its attitude. *Snipe's* divers, using the standrad Navy Drager equipment were limited to 170 feet but dived on the position and from this limiting depth identified the aircraft visually and grappled the wreck, attaching lines to the aircraft winch. A minesweeping buoy was then used to mark the position.

Recovery

With the aircraft located it now became possible to consider recovery. And there were good reasons for making the attempt:

Firstly, to establish the cause of the accident;

Secondly, to recover as much of the aircraft and its equipment as possible for re-use operationally, e.g. the dunking sonar, or for training; and

thirdly, it was possible, I understand from a newspaper report, that a claim could possibly be made on the manufacturer.

So there was enough at stake to warrant the attempt. There were, however, some obvious difficulties in both the diving and the salvage operations. The first and most important was diving to 210 feet to attach lifting lines. To make this aspect quite clear it is necessary to digress into some factors concerning diving.

THE AUTHOR

Captain John Alan Robertson was born at Melbourne in 1926. He graduated from the RAN College in 1943 and saw service in the Royal Navy on the East Indies Station and in the English Channel. After the war he took part in the Post-War Mine-clearances of the Barrier Reef and New Guinea Islands areas. He specialised in Communications in 1952 and, after RN exchange, joined *HMAS Melbourne* (CVS 21) for her commissioning in 1955. As a communicator, he has also been, variously, Fleet Communications Officer, Officer in Charge NAVCOMMSTA Darwin, and Director of Naval Communications. After passing the RN Staff Course in 1963 he had a further two years exchange service in Singapore as a Joint Planner on the staff of the CINC Far East. Subsequently he was posted as Executive Officer *HMAS Melbourne*. He has commanded *HMAS Duchess* (DD 154), 1967-69, and *HMAS Hobart* (DDG 39), 1970-2, and is currently in command of *HMAS Stalwart* (AD 215). He is the co-founder of the Institute and convenor of the Sydney Chapter.

Diving Problems

Diving is limited to 170 feet with Drager equipment because it uses an enriched oxygen/nitrogen mixture. If you dive deeper on enriched oxygen you can get oxygen poisoning as it is forced into the body under pressure. Normally this 170 foot limit is more than sufficient for mine clearance purposes and for hull searches, so that is why we use it.

To go deeper there are a number of methods available such as reverting to ordinary compressed air, using oxygen/helium mixtures, or using an articulated suit. Since the Navy is not into deep diving as a policy we do not have either the hard suit or the oxygen/helium equipment available. The problems of using compressed air are twofold. Firstly, nitrogen narcosis, that is to say, the biological effect of nitrogen under pressure at depth, has a similar effect to the narcotic effect of laughing gas in the dentist's chair. In the inflated language of journalism it is called rapture of the deep. The second problem is that divers, on air, at depth, need to be staged to the surface so as to avoid the bends. Bends occur when a too sudden ascent to the surface allows the nitrogen in the blood to expand into pockets of gas in remote ends of blood vessels. The expanding gas compresses the nerves and the result, if untreated, is a painful and often fatal paralysis. To prevent it the diver is brought back to sea level pressure slowly so that the excess nitrogen in the blood can be purged naturally from the system, and this is done either by staging up from the bottom, or by using a recompression chamber, and sometimes both.

I am sorry about that longwinded explanation but it is essential to understand the effects these matters had on our operation.

Recovery Task Unit Formed

The Navy equipment available was surface supplied compressed air and our divers were not current in using it at depths of 200 feet. It had been used in the deep dives at Lake Eucumbene some years ago but it was necessary for the Diving Team to work up to deep diving again on compressed air. The second problem was salvaging the aircraft. How do you get it to the surface? And once there, how do you get it out? We have no salvage ships, and *Kimbla*, which is the nearest approach we have, was about as far away from Sydney as possible at that time. The submerged weight of a Seaking was estimated at about 12000 lbs while its weight in air was probably between 15000 and 18000 lbs and the only way *Stalwart* could lift the bigger weight was by using the forecastle winch, or by a spreader (made by the Fleet Maintenance Unit) on one of the boat davits. The ships cranes are limited to 3 tons except for one 6 ton crane.

All these matters were discussed at a meeting at Fleet Headquarters and the Fleet Commander issued an Operation Order assigning *Stalwart, Snipe, Ibis, Brunei*, CDT 1 and AWL 304 to a Task Unit, with a mission to recover the aircraft and transport it to shore.

Stalwart was included to provide the Recompression Chamber, and her medical facilities, and in addition we had the invaluable support of Surgeon Lieutenant Mackenzie of the School of Underwater Medicine and his POMED, the Fleet MCDO, and two aviation engineer officers. As indicated earlier, *Stalwart* could also provide the necessary lift out of the water. *Ibis* had its minesweeping winch and echo sounder. *Snipe* had its mine hunting sonar, winches, diving supervision and diving expertise. *Brunei* was available with a 3 point moor for a diving platform; the AWL was provided as an aircraft lighter to carry the aircraft back to Jervis Bay if we got it out of the water.

Phase 1 –Plans

On Friday morning 31st October a Seaking was flown onboard *Stalwart* at Garden Island to allow everyone concerned to look at the aircraft and familiarise themselves with its features.

Photographs of the Seaking were taken at the time and various strong points for attaching lifting lines were noted. That afternoon most of the units sailed and assembled in Jervis Bay on Saturday 1st November where a Seaking was embarked in *Stalwart* for use by the unit. This aircraft was subsequently replaced with a Wessex.

A meeting of everyone concerned was held in *Stalwart*. Although intentions could be signalled in general terms there were too many variables to be able to say with certainty what would happen. We operated on a pragmatic basis, one step at a time. The outline plan was:

a. *Stalwart* to anchor ½ mile from the Seaking position on Saturday night.
b. *Brunei* to sail, anchoring to make a 3 point moor over the wreck by 0500 Sunday.
c. *Ibis*, which was keeping a watch on the marker buoy at the salvage site, to remain in the vicinity and be joined by *Snipe* at first light on Sunday 2nd November.
d. AWL 304 to remain in J.B. at 3 hours notice.
e. As soon as *Brunei* was moored over the wreck the Diving Team was to begin diving. For the 210 foot dives the diver would descend in a matter of say 2 minutes, and would have to take 57 minutes to stage back to the surface. On reaching the surface the diver was to be transferred back to *Stalwart* where he was to be hoisted in by crane and left alongside the Recompression Chamber until it was certain that he was not going to suffer from bends. We did not want a situation with one diver in the chamber and a second one diving who might need to be placed in it in a hurry, so, until the first diver was clear, no instructions would be given for the next diver to go down. You can see that for five minutes effective work it was going to take the best part of two hours at a minimum. What was worse there would be at least an hour's wait from when the diver finally finished his work on the bottom until he could be asked about what he had achieved.
f. From there on the plans were deliberately vague but the outline idea, having secured a line to the rotor head was to lift the aircraft with flotation bags secured to 120 feet of 4" line. This would bring the aircraft to, say, 90 feet from the bottom. From there it was intended that it be towed into a depth of 170 feet or less, raised by *Snipe's* winch to 40 feet for technical inspections, and then either towed to shore, somewhere, most likely Jervis Bay, or hoisted by *Stalwart* and placed on the AWL. The latter would depend on getting a lift on the rotor head and on the sea conditions. If it was at all rough the weight of the water inside the aircraft hull was liable to break up the airframe. Models were used to test the geometry of moving an object the size of a Seaking.

Phase 1 – Events

Stalwart anchored as planned on Saturday night. At 0300 Sunday morning *Brunei* on leaving Jervis Bay suggested the sea and swell looked unsuitable but she was instructed to continue to the salvage site, and by 0600 the weather had moderated sufficiently to make the attempt. Unfortunately on trying for her moor *Brunei* cut the line of the marker buoy. *Snipe* was sent back into J.B. to change her minehunting sonar to relocate the wreck, while *Ibis* and the embarked Seaking were used to try and locate it with their echo sounder and sonar respectively. They did this fairly well and *Ibis* buoyed the probable position. While we waited for *Snipe* to return and verify the position *Ibis* was used as a tug to try and help position *Brunei* over the wreck, but, after a couple of hours, it was clear that mooring *Brunei* as precisely as we needed in open waters was not practicable. *Snipe* returned, verified the aircraft position shortly after 1600, and using their grappling method, her divers re-marked the aircraft attaching the buoy line to the aircraft winch again. After discarding the idea of using *Brunei* as a diving platform it was decided that diving would be undertaken from Gemini rafts. But by the time all the preparations had been made darkness was falling

and the diving party only had time for a dry drill run.

We planned for the first deep dive to begin at first light about 0530 next morning. In fact it was not until 0935 that the first deep diver went in. This is one lesson which we kept on learning. It always takes much longer than you expect. After he had been down 4 minutes he asked to be recovered. With staging we did not get him back until 1036. He was very cold and almost exhausted. The current had caused him to use 350 feet of hose in 210 feet of water and he had not even seen the aircraft. Thank goodness for a real professional who knew that his situation was potentially dangerous and had the sense to come up.

We hoisted him in as previously arranged. (See photographs).

And in about 20 minutes he started to experience symptoms of decompression sickness. So he went into the chamber with the Medics in attendance.

He is shown coming out again in another photo.

He was all right then.

It was clear that surface supply equipment would not be any good in the tidal conditions in the Shoalhaven Bight and approval was sought, and given, to buy commercial self-contained compressed air equipment. Four days later we reassembled in Jervis Bay to try again with the new equipment

Phase 2–Events

The divers spend Friday the 7th working up from *Snipe* while *Ibis* went off to check the buoy and sort out the lines on the marker buoy at the salvage site.

At first light on Saturday the 8th November *Stalwart*, *Snipe* and *Ibis* were on the site ready for another shot, but it was not until 1116 that the first deep diver had completed his time on the bottom and started to ascend. A Drager fitted diver was sent down to see what he had done and come up with him. It was just as well, he needed his air replaced at 60 feet and was put on pure oxygen at 20 feet.

The debrief was gloomy. He had suffered from nitrogen narcosis; he had only been able to attach a stray line to the aircraft tail wheel; he did not think we could get a line on the rotor head, and the visibility was poor.

The second deep diver that day only managed to get the lifting strop to the vicinity of the starboard wheel sponson. But the third and last diver for that day got a light line (2½") secured to the forward picketting point and the lifting strop secured to the starboard wheel sponson.

All the divers had suffered from nitrogen narcosis to a greater or lesser extent.

However our hopes were high that we would raise the aircraft next day, Sunday 9th November, using lifting bags on the two lines. We had given up on the rotor head because it was inaccessible. Sunday was disappointing, the weather was getting worse, all the divers were getting very tired from being tossed around in Gemini rafts all day, and diving, both deep and shallow. Then, despite our precautions, our second deep diver got decompression sickness. So we stopped for the day. On Monday 10th the weather improved and we set about attaching a specially made T-bar to the 4" line on the starboard sponson so as to take the 3 lifting bags which, inflated, would support 3000 lbs each. To make up the lift to 12000 lbs a fourth bag would go on the 2½" on the picketting point. At 0742 the first bag on the 4" popped to the surface soon after it was inflated, indicating that either the line was not secured to the aircraft, as we had been told, or it had come adrift subsequently. *Snipe* heaved in on the 4" to find out if anything was on the end, and at about 1000' it was clear that the 4" was shackled to another 4" line which had been lost on the bottom in earlier dives. Clearly one of the divers had shackled the two lines together while under narcosis and had not remembered, but, by the weight which eventually came on, it seemed certain to *Snipe* that the aircraft was on the end all right. To make sure a deep diver was put down

to the bottom. This was CPO Paulsen, who said that the 4" was on the sponson, but the 2½" was fouled and would take no weight. By 1700 we were again out of divers and had stopped for the night to allow them their 24 hours recovery period between dives.

By now it had been decided that we would try the lift on the starboard sponson line alone and hope that the sponson did not break off.

Tuesday 11th November, the day everyone else was so excited about the change of government,we were too busy to notice. By 1140 the bags had been inflated by divers and, with *Snipe* holding the end of the 4" lifting line, and with the buoyancy bags on the surface the whole conglomerate was drifting southwest towards the coast with the Seaking about 150 feet below the surface. Assisted by a nudge from *Snipe's* active rudders the aircraft was towed into 28 fathoms by 1400, and *Snipe* started to heave in on her winch to bring it up to 40 feet for inspection. At 1438 the 4" line parted, and the aircraft settled on the bottom, but now we could use Drager equipment for diving. This time the aircraft was on its starboard side, so the line was secured to the port sponson and *Snipe* started to heave in on its winch again. At 1643 the nylon lifting strop on the sponson fused and parted, and the aircraft bottomed again. This time a wire strop was attached to the port sponson, and other lines were secured to the picketting points. We stopped there that night with the aircraft on the bottom, hopeful for the next day.

By 0828 on Wednesday, 12th November, the aircraft was off the bottom again and up to 60 feet from the surface. Divers began stuffing it with air bags and attaching them wherever they could. And the first technical inspection took place–without result.

The fuel tanks were inflated with air, on a suggestion by LCDR Brown. At 0935 the aircraft broke surface upside down. The tail section, which was hanging by a thread, was cut off and taken inboard by *Snipe*.

Examination of the aircraft indicated that it was possible that, in this upside down position, the rotor and gearbox might fall out because of corrosion, so we strapped on the rotor head and engine with a RAAF nylon salvage net. This fear later proved groundless but with doubts about the rotor head we could not right the aircraft out in Shoalhaven Bight, and in any case the swell was too big to consider lifting it out of the water.

The Long Tow to Jervis Bay

By 1340 we had enough buoyancy and enough confidence in the arrangements for *Snipe* to begin the long tow to J.B. Two Gemini and divers stayed by the aircraft all the time, and the crews had to be changed round throughout the afternoon and night. We had a few alarms during the tow, but, shortly after midnight, *Snipe* was at Point Perpendicular. *Snipe* anchored at 0345 that morning with the Seaking floating astern. The last three miles had taken over three hours to cover.

By 0920 on the morning of November 13th the

second technical inspection had revealed the probable cause of the gearbox failure.

By 1200 *Snipe* had towed the aircraft into the Marine Section Jetty and, by 1415, using lines on the sponson and rotor head the aircraft was lifted on to the Jetty and turned upright ready to be transported to Nowra.

We had completed our task.

"Lo the angler. He riseth early in the morning and upsetteth the whole household. Mighty are his preparations. He goeth forth with great hope in his heart – and when the day is far spent he returneth, smelling of strong drink, and the truth is not in him"

ANI Crest Competition

In the inaugural journal of the Australian Naval Institute, members were invited to submit entries in a competition for a crest suitable for adoption by the A.N.I. The crests were to be simple, suitable for use on all official stationery and the Journal, and later for lapel badges, tie pins and cufflinks, topical and linked with the Australian Naval Institute aims.

In all, fourteen contributions were submitted for consideration by the Council, and all were of such merit as to cause the Council some difficulty in deciding on the ultimate winner. The Council expresses its appreciation of the time, effort, imagination and artistic merit which went into the preparation of the fourteen submissions and would like to congratulate all contributors on the excellence of their entries.

The winning entry was submitted by Mr. C. Clarke, and is produced in black and white below. It is intended that the crest, suitably coloured, should feature on the cover of all subsequent Journals.

The Council congratulates Mr. Clarke and again thanks all other contributors for their entries.

The comments below by Mr. Clarke on his design should be of interest to members.

'The design of this crest was prompted by a consideration of the aims of the Australian Naval Institute as listed in the Journal—the promotion of interest in naval & maritime affairs.

The significance of the design is as follows:

a. The outer circle of rope is a typical representation of maritime crest designs.
b. The ship's wheel, with eight spokes on the rim symbolizes the world-wide nature of Australia's maritime influence.
c. The Commissioning Pennant bearing the Cross of St. George, worn by all commissioned ships of the RAN, symbolises the Naval aspects of the design.
d. The outline of Australia shows Australia as an island continent and is intended to highlight our dependence upon maritime trade.'

NOTE: Mr. Colin Clark is employed in the estimating and programming division of the Director of Naval Dockyards, and has had a close association with the RAN over the past 19 years having commenced his career with the RAN as a toolmaker. Before coming to Canberra in 1970, he was employed at the RAN Torpedo Establishment in Sydney, the Estimating Section at Garden Island and at Williamstown Naval Dockyard in Victoria.

Introducing ILS

BY LIEUTENANT COMMANDER D. J. CAMPBELL, RAN

(The author acknowledges drawing from an article by Mr. Mark Wiant of the U.S. Naval Material Command, which first appeared in the Navy Supply Corps Newsletter)

INTRODUCING: ILS

Once upon a time a watchkeeper went to slake his thirst at the ops room brew boat. To his chagrin he found that the element of the AN/POT 70 was burned out. The duty greenie shook the stores assistant and between them they discovered:

- a handbook for the superseded AN/POT 55;
- a maintainer who had just done the course on the AN/JUG;
- a spare element for the AN/POT 90, planned for fitting throughout the Fleet next year;
- removal of the element was an expensive dockyard job;
- the AN/POT series was incompatible with the watchkeeper's AN/MUG in any event. He should have been using an AN/CUP in the new metric configuration.

Since this scenario had been played out around the Fleet in a myriad themes and variations, it was apparent that this vexing problem needed to be met with an Infinitely Lovely Solution. Thus it was ILS came to be introduced to the RAN because it was recognized that even the very best ships, weapons, and men are not worth very much in terms of operational capability unless their support is assured, complete, and particularly these days, economical.

ILS, or Integrated Logistic Support as it is otherwise known by the purists, can be defined as the composite of all support considerations necessary to ensure the effective and economical support of a system or equipment over its entire life-cycle. As our trans-Pacific cousins are fond of saying, it has a womb-to-tomb application. The principal elements of the support considerations are:

- Maintenance Planning, including preventive and breakdown maintenance;
- Personnel and Training;
- Supply Support, including spares and repair parts;
- Test and Evaluation Equipment;
- Technical Data, including manuals and drawings, and other data for operational support;
- Shipboard and Shore Based Facilities;
- Transportation and Handling;
- Logistic Support Management Information;
- Logistic Funding.

The basic intention of the ILS system is to combine logistic support planning with hardware design so that the life-cycle support requirements can be reduced to the minimum. For example, reliability, maintainability, and accessibility (RMA) should be built-in and should not be dealt with as an awkward afterthought once the equipment has been delivered to the Fleet. If a module is to be repaired ashore,

THE AUTHOR

Lcdr. D.J. Campbell entered the RAN College in 1961. After his baisc training in Australia, USA, and UK. he served in a variety of Supply and Secretariat postings including Fleet Headquarters, HMA Ships Hobart and Supply, the RAN College, and on the staff of the Naval Attache in Washington. It was in this latter posting that he became interested in project management and logistic support planning in particular. He is a member of the Society of Logistics Engineers. Lcdr Campbell is currently in the newly-created posting of Staff Officer (ILS) in the officer of the Chief of Naval Materiel.

then access should be designed into, or integrated with, the system so that the module can actually be removed, and be removed with ease. It's not much good if the simple AN/POT has to be dismantled completely in order to replace the burned out element.

A second basic aim is to ensure consistency or integration between the various ILS elements because of their essentially interdependent nature. For example, if that AN/POT is to be repaired onboard then the technical manual must contain the proper instruction, the training programme must produce the necessary skills, test equipment and tools must be available, the spare element must be provided to the ship, and there must be space to do the repair in the ship and to store the spare. To carry it further, the packaging must be such that the element survives getting to the ship, and the documentation such that it can be identified and located once onboard.

The discerning reader will have observed that there is nothing arcane about the ILS concept. It is simply good, applied common sense. The innovation that it does bring to the RAN is a change from supporting design alone, but also designing support. That is not a cute, but empty, buzz-phrase–there are fundamental differences in the two approaches.

ILS must have an established part in all acquisition projects, major and minor. This statement is substantiated by the inescapable fact of increasing support costs vis-a-vis initial acquisition costs, and this is especially true in the manpower field. In the past, many of the logistic elements have been applied individually, but not in a systematic way as part of a total support package. Elsewhere, support has been considered only once an item has been procured and deployed–'instant logistics' if you like. Both situations have had the inevitable result of inadequate and costly logistic support, and have also produced a generation of dissatisfied logistics customers in our supply and engineer officers, and as the ultimate arbiters, commanding officers at sea. Now, logistics must be considered at all stages of the acquisition process and logistic support must be developed at the same time as the parent equipment. Let's have a look at how ILS works in theory.

It doesn't matter whether we are talking about a simple device such as a capstan or a complex system such as a helicopter. Simple or complex, the procedure is the same so let's stick with the ops room brew boat. During the earliest phase of its acquisition, and indeed at its very concept stage, the design is analyzed to see if it is one which keeps logistic requirements to the practical minimum. Automatic test provisions, plug-in components, standardized connectors and the like, are commonplace today. If the designer has not included such features to reduce manpower requirements, he should have very good reason.

The next step is to consider how best to configure the design so that the remaining logistic elements can be reduced to the most efficient and economical level. The key function is to identify and integrate what maintenance and support actions are required because of equipment design limitations, operational considerations or safety factors. The design and configuration of the prototype AN/POT are analyzed to determine a wide range of characteristics such as accessibility, spares interchangeability, and repairability, to mention only three.

Next, is to develop a support system that enables us to maintain and support the AN/POT in its intended environments. This is a most extensive task and involves the establishment of requirements keyed to specific activities and levels of maintenance, considering the use of special and general test equipment, identifying facilities, spares and repair parts, quantitative and qualitative personnel requirements, training equipments, and where appropriate, contractor services which may provide all or selected parts of our logistic support.

This is where the 'Integrated' of ILS is so vitally important, for none of those requirements can be considered in isolation, and this is why the watchkeeper had his unrequited caffeine craving. In the case of the AN/POT, of course, many of these requirements would not be applicable but there were sufficient involved to cause all the trouble. An additional point to be made here is that the ILS Plan must be tailored to individual requirements.

The next major step in applying the ILS Concept is perhaps the one with which most people are familiar and is the 'visible' part. This involves the acquisition of the necessary support resources including personnel, technical data, facilities, support and test equipment, spares and repair parts, and training equipment.

The person in charge of all this activity is the Project Director (or Project Officer, depending on the size of the operation) and he has the responsibility to develop and carry out the ILS programme. Generally, he in turn delegates the ILS responsibility to an ILS Manager if he is fortunate enough to have one. If he doesn't, he does it himself. The ILS Manager is the one to ensure the integration of the elements of logistic support as well as integrating these elements, as a whole, into the item's design and development.

The ILS Manager, depending on the size and complexity of the item, may be supported by Logistic Element Managers (LEMs). These are people who will manage and integrate an element such as supply support, complements, or training. These people would be part of one of the interested functional directorates within Navy Office, and obviously the LEMs are expert in their field. However, the ILS Manager, as can be seen from the vast scope of work for which he is responsible, is not a specialist. He must have an understanding and appreciation of design, maintenance, and supply, to mention but a few. Above all, he must be able to co-ordinate – with tact.

That's ILS in theory. In practice in the RAN we do little of the sort.

ILS was introduced to the RAN in the heady days of the DDL project. It was an ambitious undertaking and was enthusiastically pushed by the early practitioners. Although this project was cancelled, ILS, fortunately, was not abandoned but survived in the succeeding FFG project. Nevertheless, some of the criticism of the DDL project remained with its associated management techniques and ILS was somewhat of a casualty in this regard. ILS never really had a chance but was judged and found wanting, and its revival has been regarded warily by some eyes. Functional directorates have always attended, up to a point, to the logistic support elements but until now there has not been that essential co-ordination of their various efforts. Resistance exists on the grounds of inter-directorate rivalry, the 'rice-bowl' syndrome, and often a suspicious ignorance of what ILS is really all about. One of the aims of this article is to dispel these baseless objections.

ILS Managers are working in the Guided Missile Frigate, Heavy Lift Ship, Underway Replenishment Ship, Patrol Craft, Armed Helicopter, and Minehunter projects. Perhaps the sceptics will have to wait some years to judge for themselves the outcome of ILS planning when the results, successful or otherwise, will rapidly become evident upon commissioning. Even then, it must be confessed, there could still be grounds for rebuke because we are largely working on only half of the full ILS concept. We do very little in the way of design and so most of our purchases, even of major items, are essentially off-the-shelf buys. There is little that can be done in these cases about influencing design, but there is wide scope for ensuring that other support considerations are catered for in a timely, effective, and economic manner.

At present, therefore, to use the term ILS Manager in the RAN is to use a misnomer. As design is so far removed from our province the Project Director must largely accept what is offered in the manufacturer's glossy brochures and he becomes, in reality, an Acquisition Manager. His so-called ILS Manager, in turn, is more properly an Assistant who is tasked with co-ordinating the activities of others in support matters. Nevertheless, progress is being made so the proper ILS nomenclature should be used. Perhaps its continued usage will help to speed the process from illusion to reality.

As mentioned before, most of our projects involve off-the-shelf purchses of overseas design and production, and if ILS is voiced as a concern then it is largely catered for by the hopeful expectation that the manufacturer will have attended to it. More often than not, fortunately for the RAN, this effort has been expended by the manufacturer under the direction of, say, the US Navy and we inherit the benefit through commonality of equipment and co-operative logistic support arrangements. Nevertheless, we frequently modify overseas design better to suit RAN requirements of operational environment, or because the US Navy's maintenance concept may differ radically from our own. These factors must force us, to a considerable extent, into ILS deliberations.

The pressing impacts of Australian Industry Participation and the need to foster local defence industrial capability are further pressures inexorably forcing ILS upon us. Above all are the facts of rising support costs. In recent years we have consistently spent more on support than on new equipment. Capital equipment amounted to just over 12% in the 75/76 Navy estimates. By the very nature of modern weaponry, the maintenance/capital ratio in new equipment acquisitions is high, but without the analytical benefit of ILS there can be no method of exercising any effective control over this proportion. We have long since passed the point where, for many equipments, maintenance costs exceed capital costs. Furthermore, despite a central defence organisation, all three Services have differing provisioning and funding philosophies and all compete vigorously for a share of the Defence Budget. ILS would help to justify and substantiate the Navy's claim in this arena and if the share is less than expected it would help to stretch it to best effect. This latter aspect is particularly important and illustrates the benefit of ILS outside the scope of its formal objectives. Budgetary crises are not unknown to us and will, doubtless, continue in the future. It is a fact of life that when money becomes short, support considerations are the first sacrifices to be made. In the face of such inevitability, ILS can soften the blow by indicating where cuts can be taken with the least damage. If defence spending is to be held more or

less at a constant proportion of the GNP (as it probably will) then it is apparent that the maintenance share will have to be reduced if a building programme for a viable Fleet is ever to be sustained. There is no realistic alternative, political, economic, or military, but to use the tool of ILS.

Despite the reality of the necessity for ILS, there are some perfectly good reasons why it is off to a slow start in the RAN.

First, it is not widely understood. There needs to be an extensive educational programme to get people thinking ILS, and to train those who will be involved in ILS planning in the future. This alone is a formidable task, but a start has been made. This article is one such instance.

Second there need to be produced written implementation guides and directives. At present, such documentation as we have consists of US publications, and although the concepts and principles remain valid, procedural differences abound. Additionally there is the difference in our terminology: We prefer to say 'answer' rather than 'optimized analytical response'. This is not a trivial issue but is a real stumbling block, and so it is not a simple solution merely to plagiarize US publications. To some extent the wheel will have to be re-invented, and this is a costly and time-consuming task.

Third, is the immense problem of available resources–personnel and financial. At first sight, this is also the greatest problem, but in fact it could well be the least. If ILS becomes properly and widely understood, then resources would be provided on the very pragmatic grounds that if ILS is adequately funded at the project development stage, then the savings in resources over the entire life-cycle would be substantial. There is a catch of course: It is so often expedient to attend to the more pressing and visible issues of today and to let tomorrow's problems be looked after later, and hopefully by someone else. It's an absurd philosophy, but one that has extensive adherence nonetheless. The fact remains that if you can save ten men from a ship's complement then your life-cycle saving is in the region of five million dollars. If, through neglect to apply a proper ILS analysis, this potential saving is not identified and achieved then surely someone is culpable. To arrive at this saving through formal analysis and trade-off studies you can spend a lot of dollars and still be out ahead. If you can delete one single line item from a ship's stores allowance list, the saving in software alone over the life-cycle would be about $800, to say nothing of the capital hardware cost. If these sorts of facts are fully appreciated, then there can be no rational excuse for scrimping on ILS.

We have looked briefly at ILS in theory and practice. It would be profitable to dwell for a moment on its future prospects and the underlying philosophy.

To be done thoroughly, the ILS process must be based on analytical determination of logistic requirements. This is not easy to achieve, and neither is it cheap, but it is cost-effective. The determination requires the use of established techniques such as Level of Repair (LOR), Logistic Support Analysis (LSA), and Life Cycle Costing (LCC). The 'analysis' currently used in the RAN to determine support is better described as the arithmetic manipulation of applied, often subjective, judgement. Consequently, the results of any support analysis are of doubtful value and could always be subject to question. Questions relating to a particular support analysis can't be answered satisfactorily because the judgement that raised the question is seldom the judgement that was the foundation of the analysis. That may sound a bit tortuous, but it's true. In short, pre-ILS logistic support determination is often amateurish.

On the other hand, if the logistics analyst had at his disposal laws of logistics as the design engineer has the laws of science, the validity of support analysis would be enhanced. In the case of design, the designer applies the laws of science in combination with his best judgement to achieve a system that fulfils the intended purpose. The success of the design is dependent on how well the designer allowed his creativity and judgement to be limited by the established laws of science. Questions relating to design can be resolved readily, as long as the designer's decision does not conflict with those laws. The success of this engineering approach to design speaks for itself. Today's mechanized, automated Navy exists because the designer has been able to create the systems with the performance that the Navy requires.

Our ability to design systems has far exceeded our ability to support them and the resulting logistics dilemma has led to a frantic effort to catch up. Unfortunately this effort has attacked the symptoms and not the true cause of the problem.

Better methods of inventory control, allowance determination, and cataloguing, for example, have been introduced. They have been accompanied by quality control, value engineering and design-to-cost concepts. Their application has to some extent alleviated the symptoms–inadequate support and excessive cost of support. But the problem continues and it is simply this: Specific support requirements may not be known until the system has been operational for some time. General support requirements are recognized such as the need for trained

maintainers, instructions, spare parts, and tools. The unanswered questions are: How much of each; where should they be positioned; and what are the optimum mixes of these ingredients?

In the past, these questions have been answered by the logistician by estimating a new system's requirements by applying this judgement based on experience of similar systems. The results of this arithmetic manipulation of applied judgement are inadequate support and rising support costs. ILS, properly implemented, offers a new approach in attacking this problem.

Development of analytical tools for the logisticians must begin with the determination of the frequency that the elements of support are required. This is dependent on the inherent reliability of the item. The traditional approach to reliability has been to design to achieve a prescribed mission reliability. This was done by determining the reliability of the critical systems and adding redundant systems as necessary to ensure that the prescribed mission reliability was met. But to establish the inherent reliability of each repairable item with the precision required by logistics analysis will impose an additional emphasis on the design and delivery of reliable assemblies and systems. This attacks the root cause of the problem.

Until useful reliability data is avaialbe and applied, specific support requirements will be determined by applied judgement. In the RAN, this will continue to be a 'seat of the pants' approach until such time as the ill-fated DRAMA programme is re-activated, and until trained logistics analysts are able to be employed from the very outset of a project's development. Industry will need to respond more accurately and honestly in their manufacturer's recommendations for support.

Equally important to successful logistics analysis is cost. Cost in terms of dollars must be established for manhours and the systems' downtimes just as validly as the hardware and software costs of support. Sophisticated life-cycle costing techniques are available now, but we don't use them. We must use them.

The basic factors of logistics–reliability and cost–have the potential of becoming the'laws of logistics'. The logisticians's creativity and judgement, limited by these laws, could develop a support analysis that would assure adequate, timely, and economical support, in a parallel fashion to the engineering design. Indeed the two disciplines should move in an iterative process towards a fully integrated end item.

Everyone in the Navy is involved, to a greater or lesser extent, with ILS. This is true whether we are using an equipment at sea, maintaining it ashore, or dreaming about it as a staff officer in Canberra. It is an all-embracing discipline which penetrates into every functional area–manning and training, design and maintenance, procurement and supply, and operations, of course, which must initially state the desired reliability for ships and equipment in the full knowledge of the cost involved. Recall our original description of ILS: The composite of all support considerations necessary to ensure the effective and economical support of a system or equipment over its entire life cycle. By definition it is vitally important to the operational capability of the RAN.

The next time you reach for your own AN/POT put yourself in the position of that watchkeeper, and think about it for a moment. ILS is as much an attitude of mind as anything else.

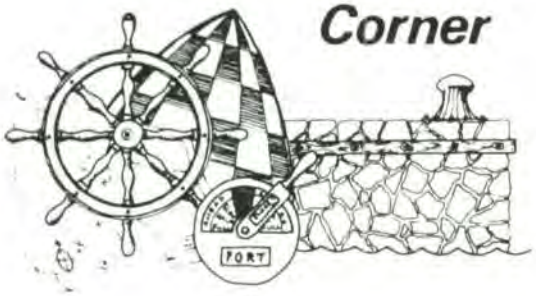
SHIP DESIGNERS

. . . but that is the natural fate of designers of ships–the speed enthusiasts & the gunnery experts & the advocates of armour protection. the men who have to keep the ships at sea and the men who have to handle them in action all combine to curse the designer.

Then comes the day of battle, & the mass of compromise which is a ship of war encounters another ship of war which is a mass of different compromises, & then, ten to one, the fighting men on the winning side will take all the credit to themselves & the losers–such of them as survive–will blame the designers all over again.

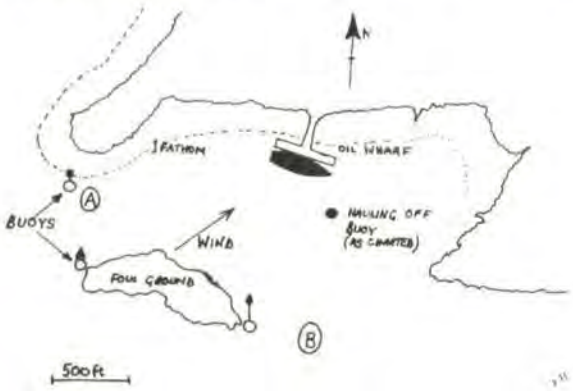
"The Ship"
by C. S. Forester

Shiphandling Corner



INCIDENT ONE

This incident occurred at a little-used port in the Far East. The Ship was a Daring Class Destroyer. She and her consort were due to go alongside a fuelling wharf at 0800 (local), in sequence, fuel, move to other berths and then both Captains were to be flown out to the national capital for official calls on all the rich, great and famous in the country. It was a tight schedule. The response to the logreq said that tugs would stand by on arrival. The alongside berth was like this:



The berthing plan was to pass through Position A, between the foul ground and the point west of the wharf. Although there was a stiff sou'westerly blowing it was well within the ship's capabilities to get alongside and, with a tug to assist, it looked dead easy.

The plan also assumed the existence of a charted Hauling Off Buoy which, with its ground tackle, would preclude the use of the ship's anchors, and in any case, this buoy could be used if required to get away. On entering harbour at about 0750 the first blow fell when Harbour Control said that the promised tugs were not available. The ship forged on and things began to happen quickly, as they do on these occasions. On rounding the point and shaping up for the berth no Hauling Off Buoy could be seen. The second blow had fallen to upset the planning. As the ship slowed down for its final approach it became obvious that the sou'westerly would have more effect than was comfortable, and, in the absence of the Hauling Off Buoy, an anchor could, and would have to be used. As it was, the ship ended up gently and comfortably alongside with 3 shackles out on the starboard cable. Despite views previously held by the Captain about the dangers of using short lengths of cable, the anchor had held the ship well up on berthing, and it seemed reasonable that it might do the same on departure. Queries about the tugs and the hoped-for Hauling Off Buoy met with bland amiablility from the shore authorities, and it was clear that departure could not rely on assistance from them. Some confidence was placed on the 3 shackles out–but sadly misplaced confidence as it turned out.

On departure the cable was hauled taut and the spring and engines were used to get some turning moment on; not too much, because there was not that much manoeuvring room between wharf and shoal. Finally though, it was necessary to go astern to shorten in, weigh, and get out. As the cable was heaved in the anchor dragged, the ship caught the wind and its bows bumped all the way down the wharf. As the ship cleared the western end of the wharf, it became increasingly clear that there was some considerable risk of grounding between the wharf and the point. By then the cable was in to about a shackle, the ship still had stern way on but was drifting down wind. The foc'sle was ordered to stop heaving and put on the brake and the slip "Half ahead Port, revolutions 135, slow ahead Starboard, Starboard 30", and the ship responded and gathered headway quickly, the cable went taut and this helped wrench the bow to starboard and safety; better to lose an anchor than a ship. The stern swung worryingly close to the western end of the wharf but once clear the revs could be taken off, and the anchor could be dredged out into clear water and weighed. It had been a near thing.

What Self Criticism is Offered?

In hindsight it is hard to offer any excuses. The Captain made a mess of it from beginning to end, and only that he avoided damage to his ship got him out of the severe censure he deserved. He started to go wrong when he assumed that promised tugs would be available and the chart was maintained up to date by the host country, but proper attention to the aim of safe handling and less con-

cern about his diplomatic role could have prevented all the consequences. Instead of the dash to the wharf through Position A he should have heard the warning bells as he entered harbour and was told no tugs were available. If he had then proceeded to Point B, and weighed up the situation he could have taken it all much more calmly. Even when apparently committed to the berth at Position A he could just as easily have turned to Starboard, proceeded to Position B, and again, taken stock of the situation. Instead he rushed on impetuously into what ended as a hazardous situation, full of anxieties about what were only secondary considerations at the time. The only things in the Captain's favour were the good understanding which had been developed, with his team on the foc'sle, and his splendid engineroom, and their quick responses to his final and almost desperate orders which eventually saved the situation.

Having made a foolish mistake in getting alongside with 3 shackles out in those circumstances, the Captain could have invited his consort to anchor somewhere towards Position B, pass him a line and then use the consort as a very powerful tug. Armour propre, is probably the right expression why this was not done, but how silly it looks in retrospect. Better a little dented pride and no worries, rather than what happened. Finally when he was getting into extreme danger with the anchor still down and the ship blowing down wind, rather than go ahead and dredge the anchor out that way, he could have just as easily gone astern and dredged it out between the point and the shoal. Changing from ahead to astern at that critical time only gave the wind more opportunity to force him further to leeward.

Lessons Learnt

The aim was submerged and confused with subsidiary considerations. Another ten minutes weighing up the situation would have been unimportant in the long run and it would have saved a lot of unnecessary worry. More importantly the ship would never have been in any danger.

Professional Wrecker's Comments

The overall plan for berthing/unberthing seemed reasonable. However the plan required the use of tugs and a buoy. As tugs and buoy were not available an alternative plan was required.

The lesson to be learnt is that a plan is devised so that an evolution may be carried out safely and efficiently. If the plan becomes unworkable a dangerous situation is probably developing and a re-think is necessary.

CYCLOPS

INCIDENT TWO:

Incident One in the Shiphandling Corner of the February 1976 issue brings to mind another instance of shiphandling concerning the minesweepers built in Australia during the war years.

The first ships of the class were built with 1750 HP engines and Deloraine was the first to be built at Morts Dock with 2000HP engines. This involved several structural changes in the ship and re-arrangements which included pockets in the wing fuel tanks to accommodate larger boilers, change of rotation of propellers and some steering gear modifications because of an extensive re-arrangement of the bridge structure.

Time came for trials and there was much discussion on shiphandling characteristics with the new propellers and the civilian pilot was warned of the change of propeller rotation and the possibilities of misinterpretation of engine orders.

It was a fine calm day with the water of Morts Bay as smooth as an oil slick when a small tug pulled the bow out before main engines were ordered slow ahead both with 10 degrees of port rudder. As speed built up it soon became apparent that the ship was swinging to starboard. Was this the effect of propeller rotation? There was little time for discussion as successively increasing degrees of helm were ordered to correct the swing. The point of no return had come and before a change of direction could be achieved, the ship continued to swing in spite of a crash astern order. A collision was inevitable with a Sydney ferry moored at its overhaul yard. Only slight damage on either side and mostly to the rickety wharf to which the ferry was secured.

Investigation showed that the steering gear rods in the re-arrangement had been moved from one side of the ship to another, another train of bevel wheels introduced and rotation altered which gave port indication on the bridge with a starboard rudder. The gear had been checked but not well enough because when orders were given at the basin trials to go hard over each way, no one had bothered to ascertain whether the bridge and steering flat were synchronised port to port and starboard to starboard.

R.F.A.

The Aircraft Carrier Past and Future

BY COMMANDER G. NEKRASOV, RAN

An address to the Sydney Chapter of the Australian Naval Institute on 21st January, 1976.

The history of seagoing air power has been a turbulent one. Most navies became aware of the importances of the aircraft from the early days of aviation.

Perhaps it can be even said that the first attempt to start Naval Aviation was made by Daedulus in the ancient times, who made wings for himself and his son Icarus in order to escape from the island of Crete. There was a 50% success: Daedulus made it, Icarus didn't. Then there was a long gap.

During WW1 aircraft were already employed–in one way or another by all combatant fleets. These, of course were generally used as a secondary weapons, except, curiously enough, in the Black Sea, when the Russian Imperial Navy had attempted to mount some operations with the Seaplane Carriers playing a major part.

Also during WW1 the Royal Navy had poineered and developed new techniques which ultimately led to the appearance of the Aircraft Carrier as a ship type.

The first carrier, however was an American one –*USS Langley*–a converted collier fitted with a wooden platform.

After WW1 the development of the Aircraft Carrier as a ship type was progressed by the major navies: the Royal Navy, the U.S. Navy and the Imperial Japanese Navy.

There was some experimenting with the design, thus the *Lexington* and *Saratoga* were armed with 8" guns, the Japanese built their early carriers with horizontal funnels and built them in pairs–one ship in each pair had the island on the PORT side.

The trend setter in the development process proved to be the large, fast and expensive ships–the *Eagle, Lexington, Kaga.* (Both *Lexington* and *Kaga* were originally laid down as Battle Cruisers.

There were also some unusual developments–such as the U.S. Navy's flying carriers: the airships *Acron* and *Macon.*

The German Navy was much too late in embarking on a Carrier building programme and the *'Graf Zepplin'* never saw service.

All three carrier navies developed their own philosophies and, ironically it was a blessing for the Western World that whilst Britain had developed a strong Air Force, the U.S. developed a strong Naval Aviation which always remained an integral part of the U.S. Navy.

Even in those days the cost of the carriers had worried some people, thus Fletcher Pratt in his book "Sea Power in Today's War" expressed concern that the loss of *Lexington* or *Saratoga* could be a crippling blow to the U.S. Navy. How wrong he was!

Early operations during WW2 were reminiscent of those in WW1–a battleship-cruiser-destroyer-submarine war, however the carrier proved her worth during the *Bismark* chase and even more convincingly during the attack on Taranto.

At this stage one may wonder whether the *Bismark* raid would have been such a fiasco had she been protected by *"Graf Zeppelin's"* Messerschmidt fighters.

THE AUTHOR

Commander Nekrasov was born in Zagreb, Yugoslavia on 21st January 1933, and emigrated to Australia in 1950. He joined the RAN in 1957 after graduating from Melbourne University as an electrical engineer. He has had a variety of postings ashore and afloat serving in Daring class destroyers three times; HMA ships Quiberon, Sydney and Derwent; Staff of Garden Island Dockyard, Training Officer at the RAN Electrical School, RANTAU, and the Directorate of Communications System Design in Navy Office. He assumed his current post as the Electrical Officer, HMAS Melbourne in June, 1974.

We all know what happened later. From the sinking of the *'Bismark'* to the sinking of the *Yamato* the carriers went from strength to strength. Carriers faced big guns, shore based aircraft, submarines and even guided missile–for this is what in fact the Kamikazes were–particulary the rocket powered OKA's–and the carriers triumphed.

From Pearl Harbour, through Ceylon, Coral Sea, Midway, Philippines Sea, to Leyte and Okinawa the carriers dominated the Pacific War. Less spectacularly, but equally important was the operation of the R.N. carriers in the North Atlantic.

During WW2 there were several parallel developments in carrier types. First there was the large fleet carriers and the Essex class and the *Shinano*, then there were the smaller CVL's–a marriage between a cruiser hull and a flight deck, then the escort carriers CVE's, built on a merchant hull and finally there were Merchant aircraft carriers (MAC's) Fighter catapult ships and the catapult armed merchantmen (CAM's).

We tend to forget the role played by the CVE's, the CAM and MAC's.

In the years that followed WW2 and the Korean War, the future of the Aircraft carrier became clouded with uncertainty to such an extent that Capt. Donald McIntyre concluded his book "Aircraft Carrier- The Magistic Weapon" with a gloomy statement:

> "It is possible that the carrier's reign as the Queen of the Sea will be a short one and it may already be approaching its end."

One is tempted to ask "Why?"

The case against carriers can be summed up under the following headings:

a. They are 'too costly'
b. They are 'too vulnerable'
c. They are 'not viable'
d. They are 'not cost effective'

(Most of these arguments were used even before WW2).

Let us tackle the first item first: the term 'cost effectiveness' often means different things to different people. For reasons which I do not intend to discuss now, I have my reservations about its use in many a debate or study.

What one must stress, is that a 'cost effective solution' (on paper) which does not result in a winning combination of weapons and tactics in the ultimate test–the battle–is of no use whatsoever. There are no consolation prizes to the losers in a sea battle.

As for viability, I, being a technical man, can only offer a simplistic view, that the essence of Naval tactics is still as stated by Lord 'Jacky' Fisher: Hit first, hit hard and keep on hitting. In this aspect, the carrier and her aircraft have the capacity to detect the enemy at a very long range, whether the enemy be ship, aircraft or even submarines and to attack that enemy with the minimum of delay. The carriers can also provide a sustained effort in attacking the enemy. To quote Ravi Kaul's paper in the USNI Proceeding: "The most important lesson of the (Indo-Pakistan) war is the classical one: if you locate and destroy the enemy's ships you achieve all the other aims simultaneously."

The question is: can the carriers achieve better results than say, a combination of shore based aircraft and missile armed ships?

In this respect it is highly significant that today's fastest growing Navy, all set to achieve the domination over the world's oceans, has progressed from submarines and cruisers to guided missile armed ships and shore air arm and has now produced Moskva class ships with Kiev class carriers to follow. It certainly appears that Admiral Gorshkov regards the carriers as the Navy's ultimate weapon.

During WW2 Great Britain attempted to rely on shore based air power for her sea borne trade protection and it was the Chief of *Air* Staff who said:

> "The only method of protection likely to be effective is the shipborne, high-performance fighter."

Since WW2 the carrier has proved her effectiveness again and again Korea and Vietnam, during the Suez crisis, in numerous 'cold confrontations' and finally during the Indo-Pakastani War.

On this occasion *INS Vikrant* played a significant, possibly the decisive part in isolating East Pakistan and did it despite the fact that her Hawker 'Seahawks' were obsolete when compared with Migs and other aircraft used by both sides.

However, to quote Ravi Kaul once more: 'In common with other air forces, that of India is not at its best when operating over the sea' and 'Just as all other navies inadequately supplied with aviation the Navy of India has been disatisfied with the maritime reconnaissance support by the local air force.'

One should add that although *Vikrant* attacked shore targets, including airfields, she was never attacked or located by the Pakistan air force.

Mobility reduces vulnerability. On this score Admiral Zumwaldt stated in an interview that nothing would be invulnerable in an all out nuclear war, adding, that he would feel safer on a carrier's bridge than ashore. As for non-nuclear war, he pointed out that during the operations in the Gulf of Tokin not one of the aircraft was destroyed by enemy action on the carriers' decks, whilst on the

airfields some 400 aircraft were destroyed and a further 4000 damaged.

There were admittedly mishaps due, possibly, to mishandling of ammunition, but no irreparable damage was done to any of the carriers.

There is also little doubt that the damage control could have saved some of the carriers during WW2, e.g. *Lexington, Shinano.* To prove this statement *HMS Illustrious* in the Mediterranean survived a savage attack by the Luftwaffe which resulted in a multitude of hits.

At Leyte Admiral Spague's CVE's survived the onslaught by Admiral Kurita's battleship and cruisers.

At this point I would like to add some statistics: during the WW2 Allied Navies commissioned 172 Carriers–of them 19 were lost, a percentage loss of 11%. By comparison the losses in British Commonwealth Navies were Battleships 18%, Cruisers 33%, Destroyers 36%, Sloops 21% and Submarines 37%.

We now must face the question of cost and perhaps once again 'cost effectiveness', if you like.

Nuclear and ordinary attack carriers are very costly and can only be operated by superpowers. They are strategic weapons–but unlike their underwater counterparts they have a vast spectrum of capabilities for local conflicts. Therefore we can expect that superpowers will continue to operate them.

However even the bigger naval powers had to look for a cheaper ship to implement the command and control of the seas. I refer to the sea control ship, which is in fact a resurrection of the CVE and also the ARAPAHO concept–a portable flight deck and container support ship for a few aircraft, mounted on top of a container ship. This is in fact a resurrection of the MAC and CAM concept.

In the meantime France has produced two smaller carriers with an all round capability and the Royal Navy has produced the through deck cruiser (CH). Another interesting British innovation is the design of a 'Mini Carrier'–of 6000 tonnes displacement and having a complement of 250, a 450 foot flight deck suitable for Harriers and Helicopters.

Then there were various proposals for a 'flexible ship'. In my article 'Quo Vadis, Small Naval Power?' published by the USNI and in a shorter article published by the 'Pacific Defence Reporter' I have argued the case for the flexible ship. Incidentally, I was delighted when D. G. Robertson argued against me, for we need a healthy professional debate. Recently I read with great interest CMDR Donohue's paper 'Naval Air Power and the R.A.N.' in the last 'Journal' of the ANI–and in particular his mention of S.A.P. based on a container ship hull, which would involve minimal structural changes.

Briefly, I would like to continue the debate regarding the 'flexible ship'–I do not see the 'flexible ship' as a present day MAC, I regard this ship as a rough and ready warship designed around–not a slow hull (as was the case with the CVE's) but a fast container ship hull and fully equipped with containerised weapons and support systems.

She would not be aesthetically as pleasing as the CH but would have the advantage of quick refits, quick updating and rapid repair of battle damage to her systems. She would need to have a better damage control arrangement than that of a merchantman. In addition a ship of this type would not be too expensive to build or to operate even by a small navy. In my humble opinion she could provide a truly effective weapon which even a shoe string budget could afford.

Isn't that what we need?

It is my submission that an Island Nation must be capable of protecting her trade, she must be capable of protecting approaches to her shores. In the case of an oceanic nation the best way to achieve this is by seagoing air power. Thus, far from Capt. McIntyre's gloomy prediction, I feel that the carriers will remain the most valuable asset in any Navy–in any country with maritime interests. In one form or another she will remain the Queen of Sea warfare.

BOOK REVIEW

'THE CODE BREAKERS' **by David Kahn**
Sphere $1.95

'THE ULTRA SECRET' **by F.W. Winterbotham**
Futura $2.20

The late Ian Fleming was a self-possessed Anglo-Scot whose public pose was that of the super-sophisticate–very Noel Coward, complete with cigarette holder, Supercool. He drove an Avanti, the only one in Europe and needed no encouragement to expound on its mechanical features. He lived a rich fantasy life which he turned to considerable profit with his James Bond books. On close acquaintance he had the saving grace of a self-mocking sense of humour. His first book 'Casino Royale' in which Bond was sent to France to beat a gambling Russian agent, Le Chiffre, was based on his own experience in World War II. A German agent in Lisbon was known to be a keen gambler and Fleming persuaded DNI that the enemy agent would be discredited if an experienced player took him down at the tables. Fleming was sent to Lisbon but the German beat him handsomely. He returned to London broke. War is hell.

It is pretty clear from 'The Ultra Secret' that Fleming got the basis of the plot of 'From Russia With Love' from life. In Fleming's book Commander James Bond was sent to Istanbul to bring back a Russian cypher machine, the Spektor. In 1938 Commander Alastair Denniston went to Poland and brought back the then current German machine cypher, the Enigma. With the machine in their hands the British Secret Service (sometimes called the Secret Intelligence Service) broke into the main German cypher system during 1939, and this success did much to offset the immense initial physical advantage enjoyed by Germany. The product of this cryptanalytic success was called 'Ultra' which explains the title of Winterbotham's book.

There is a strange parallel in the fact that the Germans sold the Enigma to Japan in the 30's and the Japanese modified it to produce a family of high level cyphers. According to Kahn, a U.S. Army Signal Intelligence Service team, lead by Friedman, broke into this machine cypher by cryptanalysis alone and built up a cryptographically compatible analogue device. When a Japanese 'Purple' machine was recovered, finally, it was found that the U.S. built version resembled it closely. Perhaps this should not be so surprising as it seems at first sight.

Kahn's book is a paperback version of the hardcover original which could be described as the definitive unclassified work on cryptanalysis. Despite considerable pruning to bring it down to paper back size, this latest version is still a very complete textbook on a subject shrouded with many security layers. Kahn ranges over the whole field of codes, cyphers and secret writing, and their lengthy history from Egyptian heiroglyphs to the recent past. The standard classics–transposition cyphers, double transposition cyphers, Playfair's diagraphic, Vigeneres table, machine cyphers and speech secrecy (scramblers or inverters)–are all covered, as well as disguised writing, microdots and the use of little known languages such as Gaelic and Navaho. The historical examples of the Admiralty's Room 40 in World War I and the famous Zimmerman telegram, the Friedman Team's work on 'Purple' and more recent Russian agents' systems are covered in some detail. There are also accounts of German, Italian and Russian activities and successes in cryptanalysis. Kahn is particularly restrained in his desire not to make extravagant claims for this aspect of Intelligence and to put it into a proper historical perspective. This understatement is a welcome difference from some journalists masquerading as historians, who give single solutions as to the reason why some battles were won, or lost; his balanced outlook makes a refreshing change. There is hardly space to do justice to this important book and the comprehensive coverage of its immense subject. Sufficient to say that there is just too much to be read and understood properly in days of reading.

Winterbotham's book was published later than Kahn's original and this may account for some discrepancies about when and how the Enigma machine was acquired. Winterbotham was in on the origins of the 'Ultra' system, and Kahn obviously did not have access to the story of Commander Denniston's secret journey to Poland, nor does he mention the capture of a German U-boat and its Enigma machine in May '41. He quotes instead the USN capture of U505 and its cypher machine in May '44. Kahn then goes on to say 'The Allies now read U-boat operational traffic'. According to Winterbotham it was very much earlier. It can only be assumed that the unsensational Kahn was unable to discover the earlier successes in his detailed research. In a sense Winterbotham complements and updates Kahn for British efforts in World War II and for that he is valuable, as well as for some insights he gives into the British Secret Service in those days. His book is rather discursive and personal, almost chatty, and he falls into the trap, avoided by Kahn, of suggesting that cryptanalysis was the war winner. He is also irritating but illuminating in his revelations of inter service jealousies and rivalries to take control of (part of?) the Secret Service (MI6?) in 1939. Air Marshall Sir John Slessor in his foreword reveals a similar anti-Navy prejudice. Sad. There is local interest in Winterbotham's account of cryptanalytic teams in Australia and of tactical units with advanced RAAF headquarters in the Pacific War.

Both books show how individual Service Communications Intelligence organisations in the USA and Britain have becme amalgamated into the present NSA and SIS, in which, it would seem, military personnel now play a minor role. When Sir John Slessor writes that cryptanalysis in conjunction with HF/DF lead to a situation in which the principle headquarters concerned with fighting the Battle of the Atlantic the crucial importance of Intelligence in all its forms is underlined. There is a truism that 'You can't operate without plans and you can't plan without Intelligence'. The restriction on the knowledge of Intelligence which led to surprise at Pearl Harbour is too recent an example for us to forget too quickly.

The 'Code Breakers' is, as I have said, too long and detailed to be read at a sitting or even in a single borrowing, and 'The Ultra Secret' is a necessary complement to it. I suggest that if you have not got them you should outlay the small sum involved and keep them on your bookshelf for reference. They should be required reading for all military professionals. Both books are indexed for easy reference but unlike the James Bond novels, there is no sex, and all the violence is off stage.

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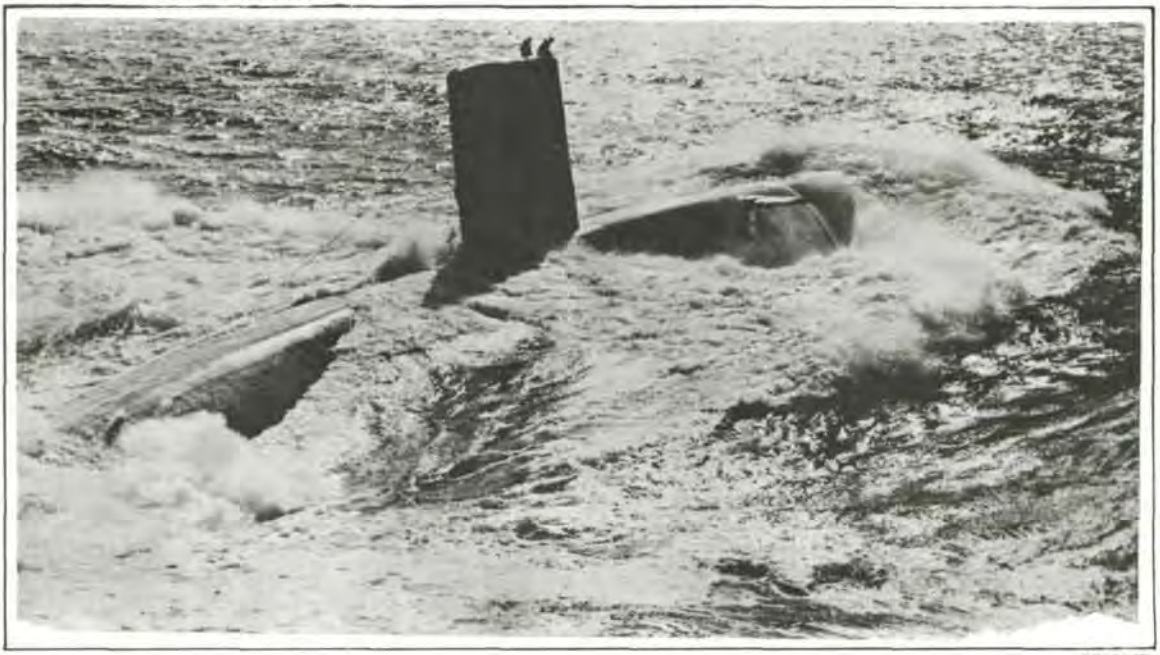

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