5TH ASIA-PACIFIC SECURITY CONFERENCE

THE EVOLUTION OF MILITARY POWER IN THE 21ST CENTURY

31 JANUARY – 1 FEBRUARY 2010
SINGAPORE

S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
A Graduate School of Nanyang Technological University

SINGAPORE AIRSHOW

5TH ASIA-PACIFIC SECURITY CONFERENCE

THE EVOLUTION OF MILITARY POWER IN THE 21ST CENTURY

REPORT OF A CONFERENCE ORGANISED BY
S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES (RSIS)
AND
SINGAPORE AIRSHOW & EVENTS PTE LTD

31 JANUARY – 1 FEBRUARY 2010
SINGAPORE

S.RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
NANYANG TECHNOLOGICAL UNIVERSITY
2010

Contents Page

This report summarizes the proceedings of the conference as interpreted by the assigned rapporteur and editor. Participants neither reviewed nor approved this report.

The conference adheres to a variation of the Chatham House rules. Accordingly, beyond the points expressed in the prepared papers, no attributions have been included in this conference report.

INTRODUCTORY REMARKS

Amb. Barry Desker

Ambassador Barry Desker, Dean of the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, Singapore, in his introductory remarks, observed that military transformation is not only an interesting subject, but one which has deep and important repercussions for international peace and security. Nowhere is this more apparent than in the Asia Pacific, where many states big or small are engaged in the transformation of their militaries. From a grand historical perspective, the evolution of military power has been an ongoing phenomenon. And yet, from the late twentieth century onwards, the preferred term used to engage the subject of military transformation has been "revolution", as in the "Revolution in Military Affairs".

A decade now into the twenty-first century, the question is this: How best to conceptualize and understand the transformation of military power in the twenty-first century? Is it through an evolutionary approach, which suggests incrementalism and continuity, or is it through a revolutionary framework, which suggests disruptive and discontinuous change? The answer probably lies somewhere between the two extremes. Determining where it lies is the central puzzle.

In order to understand military transformation, Ambassador Desker emphasized the importance of understanding the variety of forces influencing this transition, which include variables such as technology trends, emerging security threats, and the evolving strategic environment. More importantly, the evolution of military power, and military transformation broadly defined, has repercussions beyond the realm of defence and security. Militaries are not only embedded in broader society, but also reflect developments that occur in society. Even as the evolution of military power is driven by advances in military technologies and new war-fighting concepts, it is also driven by broader political, economic, social and technological forces. Any discussion of military power raises the more fundamental question of what war-fighting means in the twenty-first century, as well as the closely related question of the role and raison d'être of the armed forces. In this context, the focus at this conference on airpower highlights its critical features—flexibility and mobility—which will enable airpower to play a critical role as militaries meet the challenges of the twenty-first century.

Ambassador Desker concluded his remarks by noting that for any country which is undertaking military transformation, these are highly critical and salient issues. Singapore, with its own military in the midst of a generational transformation, is no exception.

KEYNOTE ADDRESS

Dr. Ng Eng Hen

Dr. Ng Eng Hen, Minister for Education and Second Minister for Defence, put forward the Singapore perspective, as a small country, with limited resources and many constraints, having to navigate the widening arena of security threats precipitated by extraordinary events within the last decade. Back in 2004, driven by the desire to increase its effectiveness through the systemic integration of weapons and platform technologies throughout the three services as a result of the ever-widening threat scenarios and spectrum of operations, the SAF adopted its 3rd Generation transformation agenda. The intention is to fight as one lean, integrated "highly-networked" and responsive force, with the capacity to participate in a wide variety of multi-national efforts in places like Afghanistan, Aceh, through to the Gulf of Aden. The widening of both the scope of activities and the geopolitical contexts of SAF deployments meant the SAF has needed to acquire new equipment, develop new concepts of operation, size the right force structure, as well as train and develop the necessary human capital in order to build capabilities for this ever-widening security agenda.

The SAF, however, cannot operate in this new security environment alone. Collaborative efforts with military and non-military agencies in other States are needed to solve complex security challenges. When effectively executed, these efforts can deliver pay-offs for the benefit of the wider general community. For small states like Singapore, the overarching security architecture and the stance of major powers within that framework are also all-important. The Sino-American Joint Statement, issued during President Obama's recent visit to China in 2009, was therefore a positive development. In that statement, the United States and China agreed to "nurture and deepen bilateral strategic trust", so as to further cooperation on counter-terrorism, law enforcement and climate change, among other issues. It is imperative for the security of the Asia Pacific that such collaborative efforts are not allowed to be derailed by occasional blips in inter-state relations.

Dr. Ng further noted that while Singapore will do its part to foster inter-state and inter-agency cooperation, the government recognizes the inherent pit-falls in attempting multi-state engagements. Differences in views and interests that are not carefully managed can easily ruin mutual confidence and derail or dilute efforts on cooperative arrangements. There are three practical principles that underpin effective cooperation: inclusive cooperative arrangements that bring in all stakeholders; flexible cooperative arrangements that can take into account the different capabilities and comfort zones of security partners; and finally, cooperative arrangements must be underpinned by good mutual understanding between stakeholders.

Confidence building measures need to be in place to foster a deeper dialogue and understanding between various partners. In the absence of such understanding, benign actions by one state could easily be misinterpreted in a hostile manner by neighbours, leading to a reluctance to cooperate or worse still, conflict. In order to avoid such misunderstandings, countries will need to engage one another in dialogue on security issues at multiple levels and different fora.

The long-standing Munich Security Conference in Europe and the more recent Manama Dialogue in the Middle East are examples of effective platforms for states to engage in constructive dialogue. In the Asia-Pacific region, the annual Shangri-La Dialogue has proved to be an effective platform for facilitating dialogue between countries, from which useful ideas have emerged and developed into practical cooperation.

At the beginning of the twenty-first century, few thinkers, if any, predicted the security challenges facing states today. It would be fair then to conclude that the only certainty going forward is that security challenges are likely to become even more unpredictable and complex. Individual armed forces have had to adapt in quick succession to evolving and expanding threat scenarios. In this environment,

cooperation across agency, sectoral and national lines will become even more indispensable in dealing with the multi-dimensional security challenges that cut across national boundaries. It is to the collective advantage of the states in the Asia Pacific to continue to invest in efforts to nurture cooperative arrangements that include relevant stakeholders, provide the flexibility to accommodate their interests, positions and contributions, and engage the others constructively to build mutual understanding.

PANEL I:
Transformation of Military Organizations in the Asia Pacific

Mr. Richard Bitzinger

Richard Bitzinger, Senior Fellow at RSIS, chaired the first panel on Transformation of Military Organizations in the Asia Pacific. He commented that the issue of modernization and transformation in this region is unavoidably shaped by the great powers, in particular the United States and China, as both are among the global leaders when it came to military technology trends. For this reason, in trying to understand how airpower will be shaped in the Asia Pacific, it is important to first examine technology trends and technology developments in these countries among others.

Mr. Bruce Lemkin

The first panellist, **Bruce Lemkin, Deputy Undersecretary for International Affairs, USAF**, recalled that he spoke at a similar forum in Singapore six years ago where he had emphasized the need for strong relationships, cooperation, and appropriate military interoperability to enhance security in the Asia-Pacific region. Six years on, Lemkin believes that the region has seen how important such relationships, interoperability, and military cooperation are in managing the multitude of challenges in today's world.

Lemkin suggested that the Asia-Pacific region faces a great number of both challenges as well as opportunities. The region is characterized by diversity due to its vast and varied geography, and its multitude of cultures. But despite this diversity most of the region has a number of important features in common, such as the tyranny of distance with immense stretches of open sea that are bestrewed by critical chokepoints. A striking example would be the Straits of Malacca, where more than a third of the world's trade as well as half of its oil transits through its narrow passage. The loss of security and the freedom of movement at this critical chokepoint will be deeply detrimental for the rest of the world.

Lemkin argued that the world's economic well-being hinges on the freedom to transport goods from one nation to another. Thus security cooperation, partnership-building, and the development of interoperable capabilities between regional stakeholders are necessary in order to effectively manage the multitude of threats and challenges in Asia.

Highlighting Asia's importance to the United States, Lemkin noted that the region accounts for nearly US$1 trillion of its annual trade, and American commitment to Asia is clearly demonstrated by the deployment of its military forces to numerous Asian countries in support of regional stability and security. Apart from the military hardware the United States makes available to partner nations to enhance their military capabilities, Lemkin said that the United States also shares its operational concepts and doctrine, as well as assist with the conduct of training and exercises to develop higher levels of proficiency among its partners. Another

example of its commitment to the region is its collaboration with partner nations in improving their quality of logistical and maintenance support of their aircraft fleets.

Addressing the importance of harnessing the appropriate technologies to ensure regional security, Lemkin commented that the contributions of airpower have evolved from purely attack and strike roles. The multitude of challenges Asia faces today highlights the growing need for greatly enhanced situational awareness. As such, Intelligence, Surveillance, and Reconnaissance (ISR) capabilities take on particular significance for Asia.

But technological innovation is not without its drawbacks. Lemkin pointed out that as capabilities and technologies have evolved over the last decade, so have new limitations become apparent. The importance and sophistication of ISR capabilities have grown tremendously, resulting in a veritable flood of information which presents a challenge in processing and dissemination into usable and actionable intelligence. Lemkin remarked that while information may be the "petroleum" of the twenty-first century, bandwidth is its precious pipeline. Thus to fully harness the potential of such intelligence, the United States must be able to share relevant data with other platforms, including its regional partners when appropriate.

Lemkin emphasized the need for the United States and its regional partners to develop interoperable capabilities with a comprehensive Command and Control, Communications and Computers, and ISR (C4ISR) architecture. He stressed that it is only through such an arrangement that the United States and its regional partners can properly integrate existing capabilities, identify the shortcomings, and plan for future capabilities. This regional C4ISR architecture will synergize all applicable systems and platforms such as ISR, airborne early warning and control, missile detection and defence, and space-based capabilities. He added that these developments will enhance situational awareness and the detection of the threat, whether it is piracy or transport of weapons of mass destruction, and the means to accurately intercept threats and take appropriate action. Finally, it will also facilitate regional efforts to minimize the threat of cyber attacks and exploitation, and to detect and defeat such threats.

The application of airpower is still relevant against the faceless and trans-national threat of terrorism. Through adapting existing capabilities and developing new ones, Lemkin argued that the USAF has demonstrated that airpower is an instrumental tool in the fight against extremist threats. Lemkin suggested that partner air forces throughout the Asia-Pacific region can study the experiences of the USAF, and develop the appropriate capabilities to enhance their security against an agile and unpredictable threat.

In conclusion, Lemkin explained that by exercising, training and operating together with the United States, regional partners can improve their individual and collective abilities as well as their effectiveness. Despite the region's diversity, the desire to create a better future is a commonly shared idea. Through mutual cooperation and by building appropriate capabilities, regional partners can ensure that this idea comes to fruition.

Mr. Deba R. Mohanty

Deba R. Mohanty, Senior Fellow in Security Studies, the Observer Research Foundation, India, examined the subject of military transformation through its impact on global politics and international relations. Mohanty began his presentation by highlighting the upward trajectory of recent global military expenditure, noting that the world spent US$1.46 trillion in 2008, exceeding even the Cold War's high of US$1.26 trillion in 1987. According to Mohanty, the global military expenditure is likely to increase in the future as a result of major transformational efforts by the militaries of the United States and China.

Another major development is the increasing expenditure on military research and development activities. Mohanty pointed out that US$140 billion was spent on research in 2008, twice of the amount spent at the peak of military research efforts during the Cold War.

Mohanty noted that the global arms trade showed a comparable upward trend, with over US$400 billion

spent on procurement of conventional equipment in 2008 compared to US$312 billion in 1987. Much of this equipment belonged to the third- and fourth-generation technology tiers.

Turning to military force structure, Mohanty remarked that key military organizations undergoing transformation, in particular the United States and China, are experiencing major structural changes. This phenomenon is evidenced by the increasing prevalence of specialized units such as special forces and joint forces within these organizations.

At the core of the dynamics that drive transformation are the military industries. According to Mohanty, the global military industry consolidated during the post-Cold War period, especially in the United States and much of Western Europe. As a result, today's defence market is dominated by large corporations with global reach and established market positions. He added that the key drivers of force transformation are influenced by a number of variables, such as experience in conflicts as well as the spin-on and spin-off effects from the research and development industry. Another factor influencing military transformations is the escalating cost of advanced military systems—such as embedded or integrated hardware—that are necessary in such transitions.

Mohanty believes that the Asia-Pacific military transformation will be technologically led—the multitude of advanced technologies and the ability of the military organizations to exploit them effectively is a key benchmark in examining regional military transformation. Such technologies include: information technology, precision systems, stealth capabilities, composites, directed energy, and unmanned systems. Harnessing nanotechnology, space capabilities, and embedded systems effectively is also essential for military transformation.

At the same time, while the United States seeks to retain its primacy in the region, China is not content to remain in second position. According to Mohanty, China will seek parity with United States military power in the region by 2050. Indeed, China's military modernization drivers, such as decisive political directives from its leaders, its desire to acquire high tech equipment, strong research and development industrial base, and its adoption of United States models in many aspects of its modernization, may lead to the eventual accomplishment of that goal. However, Mohanty also pointed out there are still significant challenges to be overcome. He noted that the Chinese military industrial complex is still some ways behind the level of United States industry. On the social-economic front, China's growing rural-urban divide is another impediment to its military transformation efforts.

In conclusion, Mohanty stressed that the United States has to remain engaged in the Asia-Pacific region. Finally, in spite of China's increasing efforts to close the technological gap between itself and the United States, the latter will continue to retain the decisive edge.

Dr. Zhu Feng

Zhu Feng, Professor at Peking University's School of International Studies, China, began with a review of the regional defence budget. According to Zhu, it is important to examine a number of salient issues, such as the levels of defence expenditure, the kinds of equipment being procured, and the intent behind defence acquisitions when studying military transformation.

Zhu noted that Asia-Pacific defence budgets continue to rise despite the recent economic crisis. For example, a number of ASEAN nations have increased their military budgets and are acquiring high-end military platforms such as advanced combat aircraft and submarines, while others have expressed interest in procuring similar equipment.

In South Korea, the military budget has been steadily rising, increasing nearly seven per cent in 2008 and subsequently nine per cent in 2009. China increased its budget by 15.6 per cent, although he acknowledged that the accuracy of the Chinese military expenditure is open to debate. Australia has also expressed its intent in its new defence white paper to spend nearly US$67 billion in the next two decades to acquire major air and naval platforms. Russia, another key player in the region, has increased its budget by 43 per cent in 2009.

Zhu suggested that a number of driving factors underpin this upward trend in regional defence expenditures. Firstly, regional defence budgets continue to be influenced by potential flashpoints such as the increased tensions on the Korean Peninsula and territorial disputes in the South China Sea. Secondly, some regional nations are hedging against future uncertainties especially under the spectre of an economically weakened United States and the potential waning of its presence in the Asia Pacific, as well as the increasing assertiveness of China. Zhu remarked that the uncertainty caused by China's rise has led some defence analysts in India to take a pessimistic view of its military modernization, and he believes that a similar hedging strategy is a factor in New Delhi's efforts to improve its military forces in terms of quality and quantity as an insurance against a potential rival across its border.

While many external analysts have studied China's military modernization by focusing on its capabilities and potential intent, Zhu argued that the leading factor influencing Chinese military thought is domestic insecurity. From that viewpoint, military modernization is necessary to deal with internal issues such as maintaining domestic control, managing ethnic tension and social unrest, and protect the ongoing political and economic transition. Another consideration is Beijing's strong reactions to Washington's recent announcement of arms sales to Taiwan. Zhu remarked that it reflects Beijing's lack of confidence in a peaceful resolution of the Taiwan issue. However, he believes that despite China's ongoing military modernization, it does not mean that it will result in an aggressive posture of its forces particularly at the international level.

In conclusion, Zhu argued that the issues he highlighted in his presentation—tensions on the Korean Peninsula, territorial disputes in the region, border tensions on the Sino-Indian border, and the uncertainty of the Sino-U.S. power balance in the Asia-Pacific—will continue to encourage the growth of regional military expenditure. He warned that these enduring issues may potentially result in serious misunderstandings among regional stakeholders if not well-managed. To ensure the stability of the Asia-Pacific region, Zhu suggested that cooperation of regional nations as well as the maintenance of robust Sino-U.S. power relations is essential.

Mr. Dean Cheng

Dean Cheng, Research Fellow for Chinese Political and Security Issues at the Heritage Foundation, United States of America, began by highlighting the growing importance of space power in military transformation in the twenty-first century.

Cheng noted that one of the best portrayals of the revolution in military affairs is perhaps illustrated by images of precision-guided weapons successfully hitting specific targets with pinpoint accuracy in recent wars. These precision strikes were only made possible by space power—targets were located with satellite imagery, the weapons themselves were guided by satellite navigation, and the images of the strikes transmitted through satellite communications.

According to Cheng, the evolution of military power in the twenty-first century is tied to the growth of space power. And nowhere is it more apparent than in Asia, where several major states are seeking to establish credentials as major space actors by progressively developing space capabilities. Cheng suggested that should their armed forces be called upon to go to war, they will do so with the range of advantages made possible through the exploitation of the ultimate high ground of space.

For his presentation, Cheng suggested that the highest level of space power is only available to states that have the political will, financial and human resources to produce the range of space-related infrastructure such as launchers, satellites and ground equipment, as well as indigenously control the entire process of launching, tracking, and controlling satellites. Cheng believes that in Asia, China is the leading nation in space power, followed by India and Japan.

Cheng asserted that China possesses all of the components which enable robust space capabilities. Since initiating its space programme under the auspices of Plan 863 in the late 1980s, China has built at least three launch sites across the nation, giving it the capability to launch multiple space missions simultaneously. One of these facilities, the Xichang Satellite Launch Centre, was also reportedly the launch site of the successful anti-satellite test in July 2007. According to Cheng, China is constructing its fourth launch facility on Hainan Island which will allow Beijing to place even larger payloads into space. Along with its capacity to manufacture and deploy a range of satellites, Cheng noted that the Chinese military would not have to rely on the United States, Russia, or Europe for its operational needs.

Turning to India, Cheng commented that while India's space programme is not as advanced as its neighbouring Chinese counterpart, it has nevertheless a space power. India has developed a full range of space launchers including the polar satellite launch vehicle and geosynchronous launch vehicle. Like China, India has developed a variety of satellites, some of which may have military applications such as imaging. India has also expressed interest in developing anti-satellite capabilities using kinetic-kill interceptors and laser-based systems. In 2008, India demonstrated its considerable mastery of space launches when it successfully launched 10 satellites into orbit simultaneously, breaking the record formerly held by Russia. Unlike China, however, India's space programme has succeeded in leveraging its space capabilities into greater cooperation with the United States. For example, the Chandrayaan-1 satellite which detected evidence of water on the moon carried a U.S.-designed instrument package.

Moving on to Japan, the third regional player in space, Cheng highlighted that Japanese space research has traditionally been conducted solely by civilian agencies as a result of its restrictions on military and security activities. Now headed by the Japanese Aerospace Exploration Agency, Japan's space programme relies on a domestically produced space-launch vehicle based at the Tanegashima Space Launch Centre, one of its two national launch facilities.

While Japan's space development efforts were aimed at avoiding an overt military role, Cheng noted that it possesses satellite capabilities that nevertheless have potential military applications, such as the JERS-1 radar imaging satellite which orbited in 1992. However, Japan became more partial to the military applications of satellites after a North Korean test missile flew over Japanese territory in 1998, prompting Japan to develop the Information Gathering Satellite (IGS), which is essentially a military reconnaissance system. More importantly, however, was the enactment of a new space law in 2007, the "Basic Space Law", which allows the Japanese Self Defence Force to exercise control over the IGS.

In conclusion, Cheng believes that within the framework of space as a great enabler of military power, nations are intent on ensuring that their militaries will be able to access and exploit information afforded by space-based systems in order to improve the effectiveness of their forces. As the Chinese anti-satellite test demonstrates, space systems confront new challenges, and are not likely to operate unhindered in the event of conflict. At the same time, unmanned aerial vehicles and other advanced capabilities offer a potential alternative to space-based systems for at least some mission requirements. Aerospace power—both air and space—is essential for successfully fighting and winning the future wars of the twenty-first century.

In the Question and Answer Session that followed, one issue raised addressed existing trajectories of force transformation for the U.S. military, especially the air force, within the next 10 to 15 years. Force transformation is about relevance, that is, to adapt to the ever changing circumstances as well as prepare for potential challenges in the future. Transformational changes should ideally be implemented after rigorous analysis—manifested in such documents as the United States' Quadrennial Defence Review, which lays out the roadmap in articulating the latest vision of force transformation for the United States military—but it has to be accepted that identifying potential future challenges unavoidably involves substantial guesswork.

A related issue is the need for collaboration and cooperation among regional partners, if a regional C4ISR architecture is to be at all possible. The security challenges facing the region as a whole are simply too complex to be addressed by any single state. Such partnerships are manifested in programmes such as the Joint Strike Fighter programme,

which despite the adjustments in its production schedule and planned acquisitions, will be an important representation of relationships between the United States military and its global partners.

A second issue addressed the prospect of cooperation on space matters, in light of the seemingly escalating competition and tensions in developing space-related technologies in the region. Since space is a shared domain which is part of the global commons, consequences from the indiscriminate use of space by one nation can potentially affect the activities for other nations. For example, the destruction of a satellite in space generates debris which is damaging to all parties.

While there may be an incentive for nations to cooperate and mitigate issues such as space debris in peacetime, it is questionable whether or not the same notion will hold true in the event of a conflict or crisis. Governments will have to decide whether the post-war consequences from destroying a satellite and creating space debris outweigh the fact that it may be exploited to provide useful information to an adversary and turn the tide of the conflict in their favour.

A third issue addressed the rationale for the Australian and Indian respective force modernization programmes. Is there a real need as well as national aspirations driving the modernization programmes for these nations? It could be argued that the rationale behind national defence modernization programmes is a subjective matter depending on the particular nation being examined. While a myriad of reasons inevitably shapes their response, all nations seek their particular rationale for military modernization based on their own unique cognitive processes. The definition of security and the perception of insecurity vary from nation to nation. This seems to defy any attempts of scholarly study on the issue.

With regards to India's motivations, its recent military modernization is a by-product of both subjective and objective influences. The subjective influence is India's past experiences and a disjunction between military preparedness and its ability to fight wars; the objective influence is the result of a structural reform of India's national security architecture after the 1999 India-Pakistan conflict in Kargil. As a result, in the past seven years the Indian military formed new joint and strategic forces commands, as well as the increased participation of private firms in military-related industries. India's modernization programme is not entirely influenced by the potential threat posed by China, but to a greater extent driven by domestic demands from within.

The last issue regarded the possibility of a regional bilateral relationship that was likely to result in a conflict within the next decade, as well as the potential solutions that can mitigate that risk. At one level, it may be possible to argue that a state-on-state conflict within the region is unlikely within the next decade or even the foreseeable future. This view attributes this likelihood to the presence of enlightened leadership in the major countries that will seek peaceful resolutions to extant conflicts. Rather, the threat of conflict is likely to come from non-military sources which are already apparent at this time.

At another level, however, it is possible that the likely sources of conflict will come from China's periphery. China has a number of concerns. Firstly, it is challenged by the difficult denuclearization process of North Korea and the potential reunion of the two Koreas in the future. Secondly, continued disputes on the Sino-Indian border present another concern for China, although both nations ought to be able to prevent an escalation in hostilities along the border. Thirdly, China is concerned about the Taiwan issue, although Zhu assessed that China is not likely to resort to armed force. However, Beijing continues to be extremely sensitive to United States arms transfer to Taiwan.

At a third level, it is possible to argue that there are potentially multiple flashpoints for conflict in Asia. Much of Asia remains divided by the Cold War. There are still unresolved border issues. There are unresolved historical disputes that affect bilateral and multi-lateral relationships which prevent the growth of multi-lateral cooperation in the region. However, it is possible to see the India-Pakistan conflict as likely, given the history of conflict between them.

Finally, ultimately, no one knows if a conflict would occur. While there are multiple flashpoints in the Asia Pacific and even beyond with the potential for conflict, it is absolutely necessary that countries be able to resolve the underlying issues that create those flashpoints in a non-violent manner. It is imperative for regional stakeholders to understand the conditions for a safer world and to work together to reduce the likelihood of conflict.

PANEL TWO

The Future of Airpower

Dr. Bernard Loo

Bernard Loo, the Coordinator of RSIS' Military Transformations and Military Studies Programmes, chaired the second panel on The Future of Airpower. Before introducing the panellists, he commented that airpower was a critical issue for those who studied military organizations, war, and strategy; and for those who are practitioners and policymakers.

Mr. Richard Aboulafia

The first panellist, **Richard Aboulafia, Vice President, Analysis, Teal Group Corporation**, began his presentation by charting the history of combat aircraft deliveries. With the exception of Russia, approximately 300 fighter aircrafts were delivered worldwide in 2009—a significant drop when compared to 900 in 1989. Similarly, the United States Department of Defense's tactical aircraft procedure witnessed a fall from 387 units in 1987 to 72 units in 2009. Nevertheless, in a market currently worth US$16–17 billion per year in deliveries, the United States accounts for US$11 billion—and remains the dominant player. On the other hand, Europe's share in the military aircraft market is shrinking. These trends reflect a change in the capabilities of the aircraft and perceptibility of the countries concerned.

Aboulafia noted that nowadays, export customers are demanding more, not just in the incorporation of high-end technologies such as Active Electronically Scanned Array (AESA) radars, but also in terms of higher levels of co-production and indigenization. With the exception of the Airbus A400M military transport, vertical European solutions have proven to be successful. European co-production and joint ventures have enjoyed success in key export markets such as Brazil and South Korea. This thinking has been migrated from the military to civil segments at the expense of American companies. The neglect of allied Concept of Operations by the United States further worsens the problem for American players.

In 1998, exports accounted for 72.5 per cent of the global fighter market thus keeping the military aircraft industry afloat. In contrast, only 29.8 per cent of the world's fighter production was exported in 2009. Aboulafia identified the bulk of the export fighter market as a group of about twenty-eighty countries willing to pay between US$30 to 40 million per unit. Only five countries including Singapore and India are willing to pay more on a per unit basis at "fly-away" price-tags of US$55 million or more. In theory, much depends on India. The Indian Multi-Role Combat Aircraft competition is an undetermined significant portion and lifeline of the future export market.

Moving on to the development of the F-35 Joint Strike Fighter, Aboulafia drew emphasis on the project's importance and the uphill battle to develop a peer competitor. The difficulties of harmonizing requirements across borders, resurrecting design teams, budgets and the current emphasis on Unmanned Combat Aerial Vehicles with very limited spending present huge obstacles to creating F-35 competitors. Current competitors to the F-35 are a mixed bag; the Eurofighter is the F-35's next best-placed competitor, but the availability of its AESA radar is uncertain and line survival is also an issue; the Rafale still a "Franco-French" plane; the Swedish Gripen will possibly be "dead" in two years; the F/A-18E/F is very much dependent on the United States Navy; and the Russians remain reliant on the SU-30 for export.

Aboulafia concluded that at the end of the day, there is room for much cautious optimism for the F-35 albeit with the following two qualifications—is the world ready for the price tag and what happens to the low end of the market? Going back to his central theme, Aboulafia wondered if other countries are going to migrate up to join the five that are willing to purchase aircraft at a "fly-away" price-tag which is the biggest question in the combat aircraft market today.

Mr. Andrew James

Andrew James, Senior Lecturer, Science and Technology Policy and Management, Manchester Business School, The University of Manchester, United Kingdom, detailed the new challenges to European airpower as the military focus on small and medium-sized conflicts rather than large-scale war; the emphasis on flexible capabilities and rapid insertion of new technology onto existing platforms; the emphasis on security over defence; more intensive security roles in the monitoring of infrastructure, territory and border; and last but not least, police, border guards, and coast guards are increasingly becoming key to national security missions and undertaking more complex tasks.

James further identified strategic lift, heavy helicopters, air-to-air refuelling, combat search and rescue and intelligence, surveillance, target acquisition, and reconnaissance as shortfalls in European military capabilities. European defence spending is also severely constrained by chronic budget deficits and the fact that European citizens favour spending on welfare, not warfare, means limited political support for defence budgets.

On the prospects for major European procurement programmes, James noted that outsourcing and services represent a large and growing share of European defence procurement spending. Technology insertion and upgrades to existing platforms is likely to be the future core business of the defence industry in many sectors. Major platform procurement programmes are declining and equipment modernization in new NATO countries now well advanced. All significant combat aircraft contracts are either in delivery phase or firm commitments from customers. The problems associated with the A400M represent the latest example of the limits of the traditional European cooperation model.

Strategies of European companies to deal with the decline of defence procurement at home include entry into the United States market, diversification of products, services, and customers, evaluation of opportunities in the security market and growing efforts to access the Asian market. From a European perspective, Asia is a major defence market opportunity which allows for more than a geographically balanced business portfolio and reduced dependence on United States defence budget. European companies are seeking growth opportunities in the security market, but are faced with the challenges of the size of addressable market, market structure, competitive conditions and incumbents, user requirements and culture, need for complementary capabilities to understand the customer and channels to market, and need for new business models.

James concluded by presenting his forecast for the European defence industry by 2025. This includes the blurring of defence, security and non-defence technology development and application; a shift towards an open innovation model for defence technology development based on networks of partnerships with suppliers of technological and industrial capabilities; suppliers are likely to come from non-traditional sectors as well as the traditional defence industrial base and will be geographically distributed across Europe (with Asia playing a key role); and finally, innovativeness of the defence industry will be measured not only on its capacity to generate new and disruptive technologies but also its ability to generate new and innovative packages of outsourcing and services, new business models and innovative private financing mechanisms to meet customer requirements.

Air Commodore (Retd) Jasjit Singh

Air Commodore (Retd) Jasjit Singh, Director, Centre for Air Power Studies, New Delhi, India started with the statement that there is no single template when it comes to the sources of security challenges and more resources do not necessarily provide more security. When it comes to airpower, it boils down to the ability to operate from the medium and influence (even control) what is happening on the surface of the earth. In the absence of airpower, even low technology capabilities can prove highly effective. Low-cost, low-technology airpower can be highly effective in sub-conventional warfare with non-state actors.

Moving on to conventional warfare, Singh argued that land warfare has to be far more calibrated and controlled as land forces once engaged become very difficult to manage and control. Hence, there is every risk that from thereon, it can escalate into decisive military victory. The use of combat power, therefore, has to be limited in a variety of ways. In the event of another conventional war involving the Indian sub-continent, the presence of nuclear weapons in the immediate region would be an additional factor. Land warfare in such circumstances would have to be extremely limited which raises the question of how do you apply military coercive power. In such a scenario, with a clear idea of its effects, airpower can be built up as an instrument of choice and applied in a much calibrated measured way.

Singh further posited that airpower will remain as an instrument of choice even in operations other than war. India which is particularly prone to frequent and intense natural disasters of all types has seen the deployment of airpower of all three armed services in disaster relief. In recent history, the Indian Air Force has been involved in disaster relief from the 2005 Tsunami to flood relief in 24 states all at the same time in an area stretching 800 by 500 kilometres.

Singh concluded by identifying the key technology trends of high priority from the Indian perspective which include space-based capabilities and reconnaissance, surveillance and target acquisition (RSTA) capabilities. He argued that the set of technologies that enable long-range RSTA are particularly crucial. Last but not least, the development of India's fifth generation fighter aircraft allows partnerships right across the line from government to non-government, public to private sector and India to foreign.

Dr. Mark Lorell

Mark Lorell, Senior Political Scientist, International Security and Policy Group, RAND Corporation, started his presentation by touching on the major recapitalization needs as well as looming key mission and system decisions of the United States Air Force. The main ones include the debate between conventional and counterinsurgency roles, how much of the current manned force should be replaced with unmanned aircraft and follow-on successors for the F-22, F-35 and the current generation of smart munitions.

Lorell provided examples of the technological issues that have to be examined in order to meet some of these future requirements. He highlighted the role and cost of fifth-generation all aspect low-observable technology; discussion of aerodynamic capability versus low-observable capability; the technological issues that have to be resolved in order to decide the role and number of unmanned aircraft systems; and what should be the relative emphasis when it comes to munitions such as directed energy munitions, electromagnetic bombs, deep penetration bombs as examples of multiple technology challenges and choices.

Lorell argued that the real challenge confronting the United States Air Force is maintaining innovation and affordability in a situation of increasingly constrained budgets. The military aircraft industry is highly consolidated with declining numbers of programmes. Projected significant declines in research and development and procurement budgets pose clear challenges to next generation equipment. Funding shortfalls for existing systems in the pipe-line are also projected. The increasing developmental and integration complexity as well as reduced numbers of new starts and procurement quantities add to the growing cost of weapon systems. In the past five to six years, the United States Air Force has experienced increasing cost growth exceeding the 25 to 50 per cent of the baseline costs that required programmes to be reassessed and possibly cancelled. Additionally, the United States Air Force had to face embarrassing disruptive source selection protests that resulted in congressional efforts at defence acquisition reform.

The United States Congress has imposed radical acquisition reforms such as the Department of Defense Instruction (DoDI) 5000-02, December 2008, and the Weapon System Acquisition Reform Act (WSARA), May 2009. WSARA and DoDI 5000-02 have radically changed the future of the Air Force's acquisition environment. WSARA and DoDI 5000-02 mandated significant new tasks, oversight and reporting requirements as well as new Department of Defence Cost Assessment and Program Evaluation and Performance Assessment and Root Cause Analysis oversight organizations. According to Lorell, WSARA promises benefits but poses major challenges.

Lorell concluded by stating that it is very unclear how far the legislation is going to be implemented. At the end of the day, the key concern is that this law might lead to a reduction of new starts, a hesitation to take technology risks, dramatically increased workload and lengthened schedules. Furthermore, the challenge of responding to budget shortfalls and growing costs of aircraft would be made more daunting for the United States Air Force. Instead, he suggested that careful implementation of programmes with full staffing and appropriate training could improve outcomes. There is a need to develop a planning template for succession of carefully phased increments to recapture flexibility, permit innovation and redirection.

In the Question and Answer session, a question was posed about what the future image of airpower might be—one that might move away from an image that was platform-centric. At one level, airpower is being thought increasingly of in terms of its capabilities. It is not the platforms per se but rather the avionics, sensors and targeting systems that are increasingly becoming the central issue of airpower. At another level, however, the increasing questions regarding the escalating costs of emerging airpower platforms notwithstanding, platforms may still be an important issue. However, flexibility and platform life spans are going to be the key issues. A third perspective insists that command of the air remains the central enabler of military operations, military technological changes notwithstanding. In that regard, airpower as it is traditionally understood—a platform-centric image of airpower—remains important.

A second question raised the issue of unmanned combat platforms. The issue is that unmanned systems made up only about ten per cent of the overall airpower market, and much of it within the United States. Unmanned systems are coming on line, but it is likely to take some time before unmanned systems can really replace manned systems. In any case, it might well be a balance of manned as well as unmanned systems that provide an optimum strategic capabilities balance.

DISTINGUISHED LUNCH TALK

Security Outlook during Economic Uncertainty and Instability

Mr. Gordon England

The Honourable Mr. Gordon England, President, E6 Partners LLC, United States, began his talk by hailing the government of Singapore as a like-minded security partner with a strong commitment to promoting regional and international peace and stability. In his judgement, Singapore has struck the right balance between individual freedom and the collective good, between individual opportunity and the country's economic development. Mr. Gordon noted that many Asian nations including Singapore have steadily increased their contributions to Afghanistan in the past few years, whether by increasing niche capabilities, such as mentors and trainers, or by substantially increasing civilian and financial assistance.

Even with the distraction of the Middle East, the Clinton, Bush, and Obama administrations consistently placed a high priority on the Asia-Pacific region. Five treaty alliances continue to form the foundation of the American military presence in Asia today. The United States continues to work closely with the Republic of Korea and Japan to implement agreed plans to realign combined force postures, restructure allied security roles and capabilities, and strengthen collective deterrent and defence capabilities. England believes that the United States continues to have the economic muscle to field large military forces when needed, and to influence international events to maintain stability and peace.

It remains the world's only plausible superpower—and a force for good. No other country can protect worldwide sea lanes or keep a hegemonic power from dominating a continent. No other country can field forces globally in large numbers to engage terrorists on their own terrain, and no other country can field a strategic missile defence system to protect itself and its allies. That role however is now in jeopardy, and, in England's judgement, that is not a desirable security outcome.

England cautioned that as insurgency and terrorism threaten stability and economic gain, the greater concern is the response of governments to all of this: the over-reaching response of many governments to the economic crisis of the past 15 months and the under-reaching response to international terrorism. However, the budget books from Asia to Europe to the United States do not look good. America, in particular, is facing explosive future debt. By the end of 2019, according to the Administration's budget numbers, the federal deficit will grow to US$23.3 trillion from US$11.9 trillion today.

If global influence follows wealth accumulation, then America is decidedly going in the wrong direction. In the meantime, global influence is following the shift in wealth from west to east, but it is not apparent that the emerging nouveau riche countries are yet willing to shoulder the responsibility of trying to maintain worldwide peace, stability and economic growth. A multi-polar world has many promising benefits as long as it is not in gridlock and unable to address security problems. If many governments are fiscally overreaching, many are also under-reaching to combat terrorism.

England concluded by emphasizing that the world economy and international security are inextricably intertwined. As economic prosperity accelerates in some countries—those nations must focus on the international security responsibilities that come with economic strength. If indeed, security and economic development are two sides of the same coin, then we should be concerned with the overreaching response of many governments to the economic crisis on the one hand and the under-reaching response to international terrorism on the other.

Rapporteur:
Mr Kelvin Wong

Edited by:
Dr Bernard Loo

Agenda

5th Asia-Pacific Security Conference
31 January -1 February 2010
Conference Theme: The Evolution of Military Power in the 21st Century

Sunday, 31 January 2010

1800 hrs **Registration**

1930 hrs **Welcome Address**
Ambassador Barry Desker, Dean
S. Rajaratnam School of
International Studies (RSIS)
Nanyang Technological University

1945 hrs **Keynote Address**
Dr Ng Eng Hen, Minister for
Education and Second Minister for
defence, Singapore

2015 hrs **Dinner**

Monday, 1 February 2010

0730 hrs **Arrival of delegates and speakers**

0830 hrs **Introductory Remarks**
by Ambassador Barry Desker

0835 hrs **Panel I: Asia-Pacific Military**
Transformation

Chairman:
Mr. Richard A. Bitzinger
Senior Fellow, RSIS, Singapore

Speakers:
Mr. Bruce S. Lemkin
Deputy Under Secretary of the
Air Force, International Affairs,
Washington, D.C., USA

Mr. Deba R. Mohanty
Senior Fellow in Security Studies
Observer Research Foundation,
India

Dr. Zhu Feng
Professor, School of International
Studies and Deputy Director,
Centre for International &
Strategic Studies,
Peking University, PRC

Mr. Dean Cheng
Research Fellow, The Heritage
Foundation, USA

1000 hrs **Tea Break**

1030 hrs **Panel 2: The Future of Airpower**

Chairman:
Dr. Bernard Loo, Associate
Professor and Coordinator, Military
Transformations/ Military Studies
Programmes, RSIS, Singapore

Speakers
Mr. Richard L. Aboulafia
Vice President, Analysia Teal
Group, USA

Mr. Andrew James
Senior Research Fellow
Senior Lecturer
Manchester Business School,
The University of Manchester, UK

Air Commodore (Retd.) Jasjit Singh
Director, Centre for Air Power
Studies, New Delhi, India

Dr. Mark A. Lorell
Senior Political Scientist
International Security and Policy
Group, RAND Corporation, USA

1200 hrs **Lunch**

1245 hrs **Distinguished Lunch Talk**
Security Outlook during Economic Uncertainty and Instability

Chairman:
Ambassador Barry Desker, Dean,
RSIS, Singapore

Speaker:
The Honourable Gordon R. England
President, E6 Partners LLC
Former Deputy Secretary of Defence,
Former Deputy Secretary of Homeland Security
Former Secretary of the Navy, USA

1330 hrs **End of APSEC 2010**

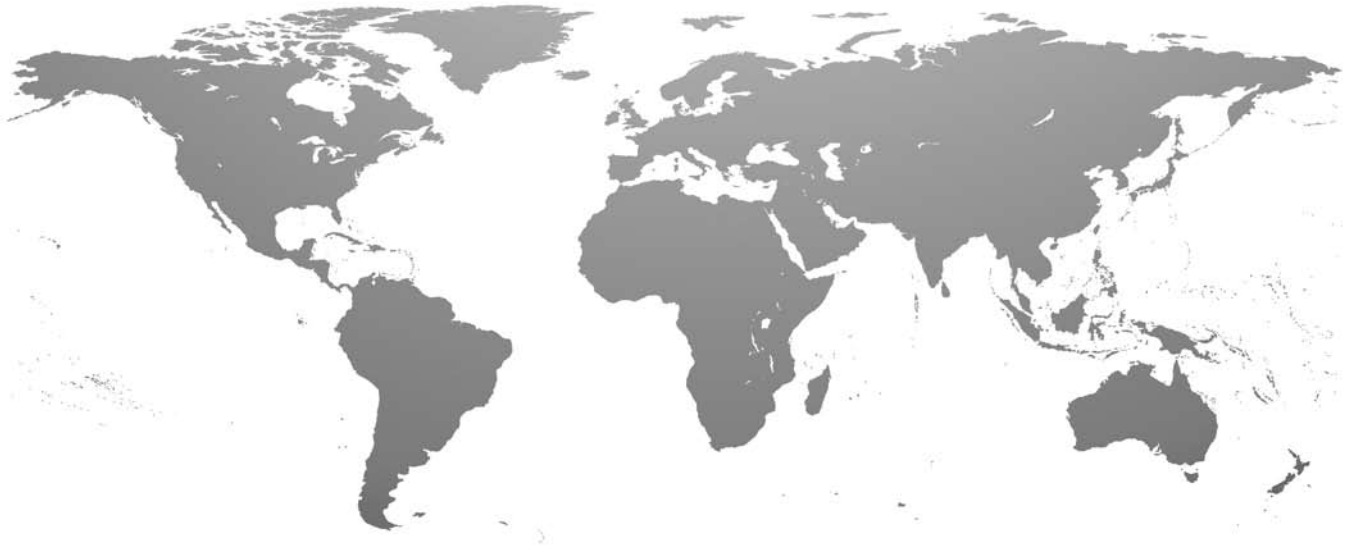
About the S.Rajaratnam School of International Studies

The **S. Rajaratnam School of International Studies (RSIS)** was officially inaugurated on 1 January 2007. Before that, it was known as the Institute of Defence and Strategic Studies (IDSS), which was established then years earlier on 30 July 1996. Like its predecessor, **RSIS** was established as an autonomous entity within Nanyang Technological University (NTU).

The School exists to develop a community of scholars and policy analysts at the forefront of Asia-Pacific security studies and international affairs. Its three core functions are research, graduate teaching and networking activities in the Asia-Pacific region. It produces cutting-edge security related research in Asia-Pacific Security, Conflict and Non-Traditional Security, International Political Economy, and Country and Area Studies.

The School's activities are aimed at assisting policymakers to develop comprehensive approaches to strategic thinking on issues related to security and stability in the Asia-Pacific and their implications for Singapore.

For more information about RSIS, please visit **www.rsis.edu.sg**



S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES

A Graduate School of Nanyang Technological University

Design by Oxygen Studio Designs

S. Rajaratnam School Of International Studies, Nanyang Technological University,
Block S4, Level B4, Nanyang Avenue, Singapore 639798
TEL 65-6790-6982 | FAX 65-6793-2991 | EMAIL wwwrsis@ntu.edu.sg | WEBSITE www.rsis.edu.sg