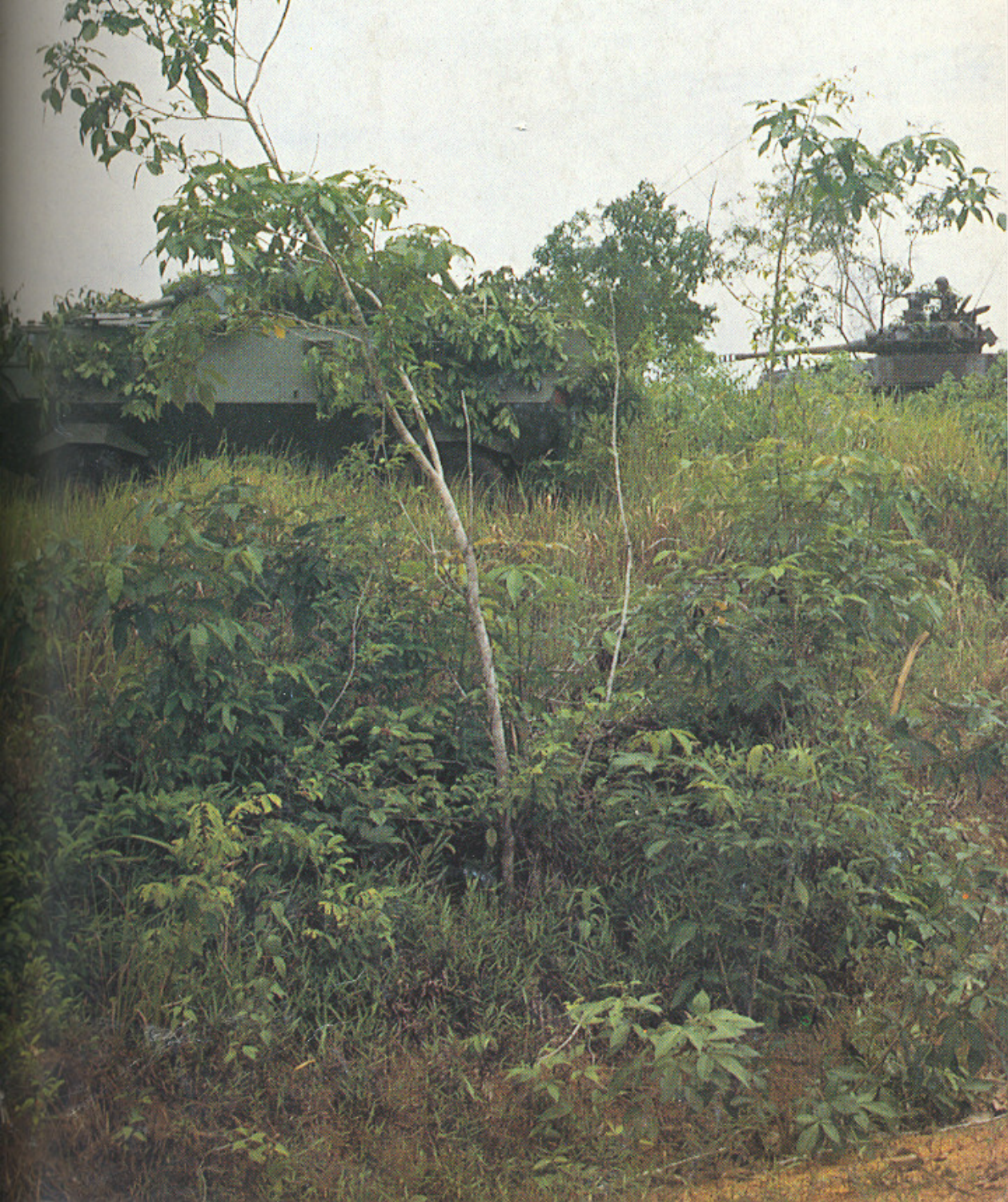


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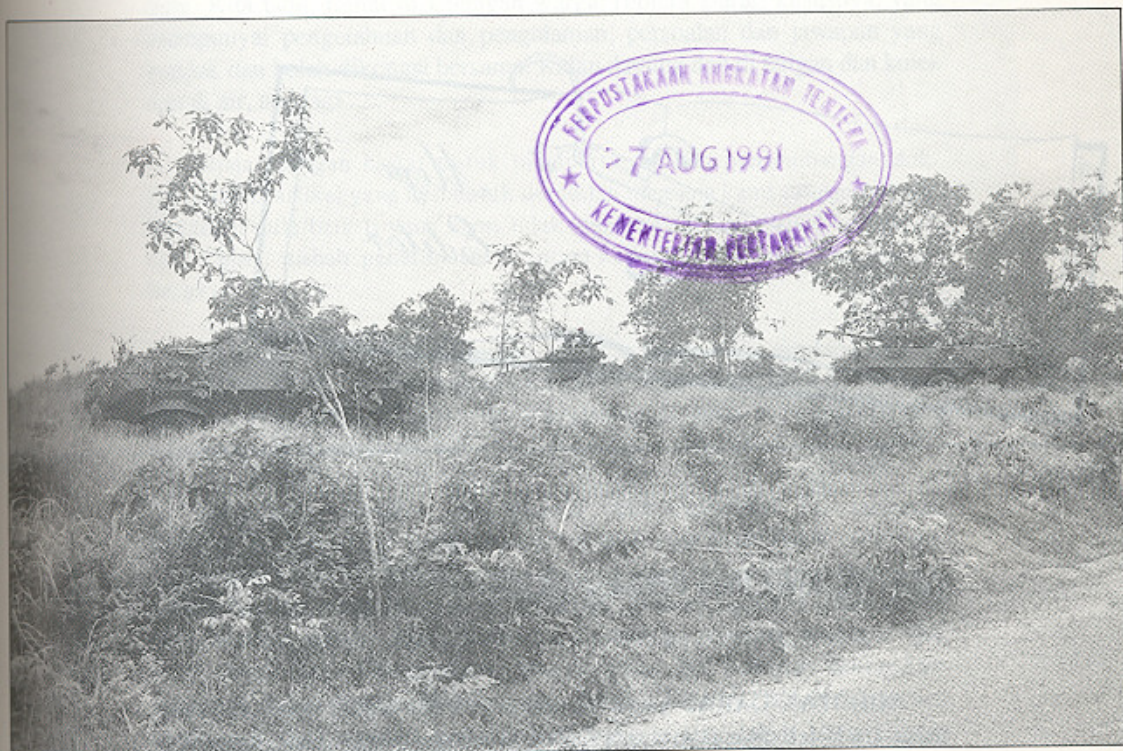
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ARTIKEL KULIT MUKA

KOR ARMOR DIRAJA
- Dari Kacamata Seorang Kavalier

TAHNNIAH

Artikel Terbaik Keluaran ke 1722

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PENDAHULUAN

Armor merupakan elemen kombatan Tentera Darat negara-negara Barat mahupun kebanyakan negara-negara lain di rantau Asia. British memberi gelaran "bistari" atau "elite" kepada Kor ini. Oleh kerana ia sebagai sebuah "combat arm" yang mahal untuk menubuh dan menyenggaranya maka ia amat "scarce" dalam tentera. Namun begitu, ia tetap menjadi elemen kebanggaan dan menjadi keperluan bagi setiap tentera darat mana-mana negara mengikut kemampuan masing-masing. Dilihat dari sudut sejarah peperangan, khasnya Peperangan Dunia Pertama dan Kedua, penentuan sesuatu pertempuran itu banyak bergantung kepada unsur kebijaksanaan pergerakan elemen Armor dalam keadaan-keadaan yang genting. Peristiwa mustahaknya elemen Armor dan peranan kombatnya dibayangkan melalui ungkapan Duke of Wellington (1811):

"Saya sentiasa menganggap kavalri sebagai satu-satunya elemen ketenteraan kita yang paling "delicate". Sebilangan kecil sahaja pegawai yang benar-benar berpengetahuan dalam kaedah penggunaannya; begitu juga dengan mereka yang berpeluang memperoleh pengalaman melihat pergerakan lebih dari dua rejimen sekali gus. Oleh itu kita perlu seberapa

upaya mengatur gerak elemen ini dengan kekuatan yang padu dan dalam simpanan sediaan, secara mengejut untuk menentu kemenangan di pihak kita".

Pemahaman terhadap kesesuaian penggunaan tank atau kenderaan tempur perisai (armoured fighting vehicle (AFV)) dalam persekitaran negara masih samar-samar semenjak dahulu lagi. Pihak Inggeris juga tidak percaya bahawa tentera Jepun mampu dan berjaya menggunakan tank sebagai penggerak utama dalam usaha mereka menakluki Tanah Melayu. Begitu juga dengan pendapat kebanyakan daripada golongan mengenai kemungkinan penggunaan tank dalam peperangan Vietnam. Tentera Rakyat Vietnam (Vietnamese People's Army) yang menjadi rakan gabungan Tentera Vietnam Utara atau Vietcong mempunyai anggapan yang sama dengan meyakinkan pihak Amerika dan Vietnam Selatan bahawa mereka tidak mungkin menggunakan tank dalam peperangan tersebut. Tetapi apa yang memeranjatkan Amerika ialah pihak Vietnam telah berjaya menggunakan tank walaupun di tempat-tempat yang disangkakan sebagai "non-tankable". Dengan muslihat ini penggunaan tank untuk memeranjatkan musuh menjadi lebih berkesan. Dari pengalaman tersebut, kita juga akan mendapat manfaat dan faedah yang tidak diduga

R ARMOR

RAJA

DARI KACAMATA SEORANG KAVALLIER

MEJ TAHA @ ARIFFIN BIN MOHAMMED

Jika kita tidak menolak langsung kemungkinan menggunakan elemen armor di dalam keadaan tanah dan persekitaran negara ini.

SEJARAH RINGKAS PERKEMBANGAN KOR ARMOR

Wujudnya Kor Armor Diraja kita dewasa ini adalah setelah melalui beberapa perubahan mengikut peredaran masa, yang mempengaruhi teknologi dan ilmu ketenteraan. Detik kelahiran Kor Armor kita berakar-umbi apabila tertubuhnya sebuah pasukan berbilang kaum yang pertama dalam sejarah Tentera Darat kita. Ia adalah inisiatif General Sir Gerald Templer, Pesuruhjaya Tinggi British di Tanah Melayu ketika itu. Pasukan yang ditubuhkan pada 3 Jul 1952 itu dinamakan "Federation Regiment".

Setapak lagi perkembangannya ialah apabila tertubuhnya pula "A" Squadron Federation Armoured Car Regiment" (FACR) di Rasah, Seremban pada 2 Sept 1952. Dalam masa lima tahun sahaja ia itu pada bulan Feb 1957 pasukan ini telah diperbesarkan sebagai sebuah rejimen yang lengkap. Pada 1 Jan 1960, hasil dari keputusan dasar Kementerian Pertahanan yang telah dibuat pada bulan Jan 1959, kedua-dua rejimen berkenaan telah dicantumkan

dan dikenali sebagai "Federation Reconnaissance Corps" atau Kor Peninjau Persekutuan. Dengan tertubuhnya Kor ini, maka riak-riak pendekatan ala kavalri dan armor dalam Tentera Darat kita telah mula berputik.

Dari Peninjau Ke Kavalri (1960 - 1979).

Peringkat awal haluan Kor ini menuju kepada unsur-unsur Armor ialah setelah ia mengambilalih beberapa inventori kenderaan perisai baru seperti kenderaan "Ferret Scout Car (FSC)". FSC yang telah mengharumkan prestasi Kor selama kira-kira 20 tahun itu mula pula beransur-ansur dijadikan "obsolescence" dan "non-retention". Dalam tempoh ini Kor telah pula diperkenalkan dengan kenderaan-kenderaan perisai seperti "APV Panhard" diikuti oleh "APC Commando V 100". Untuk kereta perisai kombatan pula, "Commando V 150" dengan senjata utama 90 mm Mecar telah diperolehi. Ini diikuti oleh Sibmas yang juga mempunyai senjata utama 90 mm Cockerill. Sesuai dengan perkembangan perolehan inventori kenderaan baharu ini, designasi Kor Peninjau telah ditukar kepada Kor Kavalri, walaupun kenderaan perisai kombatan terakhir seperti Scorpion diperolehi selepas penukaran itu. Dengan penukaran ini tahap perkembangan Kor bolehlah dikatakan sebagai di peringkat pertengahan.



Organisasi, Kelengkapan dan Latihan. Tidak banyak dapat diperkatakan mengenai kelengkapan utama Kor pada peringkat awalnya. Di zaman FACR, Kor hanya mempunyai inventori "Daimler Scout Car" yang kemudiannya disusuli oleh FSC. Dari segi latihan pula, walaupun semasa itu Kor berasaskan konsep separa infantri, namun keperluan melatih anggota ke taraf ketukangan krew kenderaan juga telah dititik beratkan. Dengan adanya dua cabang ketukangan ini, maka terdapatlah masalah perancangan kerjaya, terutama pada peringkat awal kerjaya seseorang itu.

Pada zaman pertengahan ini juga, organisasi dan hala cara rejimen Kavalri, masih belum jelas menggambarkan haluan Kor dalam jangka panjang. Ini mungkin juga disebabkan oleh wujudnya dasar atau konsep armor terhad sehingga ke hari ini. Kebanyakan daripada kita masih sangsi dengan kesesuaian peranan armor berat seperti tank bagi negara ini. Keperluan semasa bagi memenuhi kehendak operasi menentang ancaman PKM, telah memainkan peranan yang penting dalam pembentukan Kor ini pada masa itu. Sama ada perkembangan selanjutnya akan menampakkan pemisahan dari konsep dan kepercayaan seperti itu atau tidak, akan dibincangkan nanti.

Dari Kavalri ke Armor. Penukaran designasi Kor ini dibuat sekali lagi pada tahun 1986, iaitu setelah empat tahun tertubuhnya rejimen yang terakhir sekali dalam Kor ini, iaitu Rejimen 11 Armor. Rejimen 11 Armor ini rata-rata memegang inventori kenderaan perisai "Scorpion Light Reconnaissance", (dengan senjata utamanya juga 90 mm

Cockerill) dan kenderaan perisai pengangkut (AFV Stormer). Justru itu ia dianggap sebagai sebuah men tank. Namun pada hakikatnya organisasi Rejimen ini masih tidak berganjak dari tradisi kavalri yang masih mempunyai unsur infanteri. Nampaknya keadaan ini akan berterusan untuk jangka masa yang panjang.

Mungkin akan timbul pertanyaan ketika berbual-bual dengan pegawai-pegawai dari negara lain mengenai apakah jenis tank yang kita gunakan. Sebagai Kavalier, kita mungkin menjadi serba salah kerana tak tahu apakah sebenarnya hendak dipertanyakan. Dengan hanya meningkatkan persenjataan Scorpion tidaklah bererti kategori kereta perisai tersebut turut dipertingkatkan.

Rumusan. Perkembangan Kor pada peringkat pertengahan ini (tahun 1960 hingga 1979) sentiasa ketinggalan. Ini dapat dibayangkan melalui penukaran kereta-kereta perisai. Penukaran kereta perisai dari FSC ke AFV, dari yang pertama hingga seterusnya, mengambil masa kurang dari 10 tahun sahaja. Proses yang secepat ini disebabkan oleh kenderaan kenderaan itu sendiri. Sebagai contoh kenderaan V150, V100 dan Panhard bukan sahaja tidak tawar lasak tetapi usang dalam pasaran dunia. Begitu juga dengan perolehan terakhir, iaitu Scorpion, yang agak ketinggalan zaman. Sepatutnya kenderaan ini sudah diperolehi terlebih awal iaitu dalam tahun tujuh puluhan dahulu dan bukannya kenderaan siri Commando dan Panhard. Seandainya perkembangan sedemikian berlaku, sudah pasti pengalaman Kor telah hampir meningkat ke tahap pengalaman tank jika dirancang secara progresif.



Selama ini Kor tidak mendapat pengalaman pendedahan secara beransur dan progresif dalam aspek kereta perisai, apatah lagi pengalaman dalam pengendalian tank. Faktor ini, patut diambil kira untuk membentuk satu Kor Armor yang mantap dan jitu.

RIAK-RIAK PERANCANGAN MASA HADAPAN UNTUK KOR

Nampaknya perancangan Kor Armor dewasa ini, terutama dalam segi mewujudkan sebuah rejimen tank yang khusus, boleh dibanggakan jika berjalan lancar dan tidak terbantut lagi kerana pilihan yang tidak sesuai atau kekurangan wang. Hal ini jelas dibayangkan dengan:

- Melengkapkan organisasi Rejimen 11 Armor yang separa dan inventori tank sebenar akan diperolehi.
- Mewujudkan sistem nukleus, iaitu mengambil anggota-anggota yang berkelayakan dari rejimen tank yang sedia ada pada masa itu untuk menubuhkan rejimen kedua dan seterusnya.

Briged Armor. Ura-ura Tentera Darat akan membentuk sebuah Briged Armor, merupakan satu langkah yang positif untuk jangka panjang ke arah mempunyai elemen armor yang padu. Batalion "mechanised infantry" sedang dalam proses pembentukan sekarang. Dengan tertubuhnya pasukan-pasukan ini kelak, besar kemungkinan Briged Armor akan mempunyai "organic" unitnya terdiri daripada

batalion 'mechanised', rejimen kavalri, woksyp armor dan elemen ordnansnya sendiri. Briged Armor ini juga mungkin akan diletak di bawah kawalan teknikal Jabatanarah Armor bagi keperluan latihan dan aspek-aspek teknikal kenderaan. Namun begitu kerana adanya elemen infantri dalam briged berkenaan, pemerintahannya akan diletak terus bawah Panglima Tentera Darat. Dengan adanya cabang kawalan dan pemerintahan ini, sedikit sebanyak akan menimbulkan masalah. Namun begitu ini boleh diatasi sekiranya Cawangan Armor markas Kor dipertingkatkan dengan staf-staf setaraf dengan Jabatanarah Armor sekarang.

Dengan kemungkinan pertama tadi, iaitu jika ia diletakkan di bawah pemerintahan terus Panglima Tentera Darat, secara lojiknya briged berkenaan akan terbabit dengan kawalan-kawalan tertentu Cawangan-Cawangan dan Jabatanarah-Jabatanarah dalam Departmen Tentera Darat. Ini bermakna Jabatanarah Armor perlu dipertingkatkan organisasinya supaya berupaya mengadakan bantuan teknikal kepada briged tersebut. Kemungkinan juga Jabatanarah Armor akan mengandungi staf-staf infantri yang terlatih dan mempunyai pendedahan di dalam konsep "mechanised". Yang demikian bermaknalah batalion-batalion "mechanised infantry" ini akan diserapkan ke dalam Kor Armor. Langkah ini secara langsung akan memperkembangkan Kor Armor dalam konteks kita.

MASALAH-MASALAH UMUM KOR

Aspek latihan Khas Untuk Kor. Kor ini telah berusia hampir 40 tahun. Ini boleh dikira sudah



cukup dewasa. Sebagaimana yang disebutkan tadi, Kor telah agak ketinggalan sedikit dalam aspek-aspek utama seperti pendedahan kepada kenderaan perisai terutama tank, untuk membolehkannya melalui proses transisi ke arah perolehan tank. Walau bagaimanapun kerana "preponderance" tank yang bakal diwujudkan adalah lebih rendah daripada bilangan dan kekuatan "force level" unsur-unsur armor yang lain seperti kavalri dan "mechanised", maka masalah ini masih boleh diatasi dan belum terlambat. Berdasarkan kepada atur gerak rejimen kavalri yang sedia wujud, dan pegangan inventori kereta perisai yang ada, aspek utama latihan tidak akan menimbulkan masalah. Ini kerana ciri-ciri asas yang telah wujud tidak banyak berbeza dengan kenderaan yang akan diperolehi. Krew kenderaan hanya perlu menjalani latihan penyesuaian dan tidak melibatkan konsep dan teknik penggerakan. (Deployment and tactical/technical concept).

Di sebaliknya pula peralihan dari kereta perisai biasa kepada tank memerlukan latihan yang intensif secara menyeluruh. Seandainya rejimen tank sejati mau ditubuhkan maka adalah lebih sesuai jika ia diubah dari organisasi yang dibentuk bagi rejimen 'light track' yang ada sekarang. Maksudnya rejimen tank yang bakal diwujudkan nanti hendaklah mengandungi semata-mata unsur tank sahaja tanpa unsur-unsur infantri dan APC. Ini dapat mengelakkan rejimen tank dari masalah kepelbagaian aspek latihan supaya dapat ia menekankan latihan khusus bagi tank sahaja. Dari segi atur gerak pula, rejimen ini harus diletakkan dalam 'strategic reserve' di bawah pemerintahan Panglima Tentera Darat, dan di bawah kawalan teknikal Jabatanarah Armor.

Pemilihan Kenderaan Perisai. Aspek ini perlu diberi perhatian yang mendalam. Di sebalik langkah-langkah 'preamble' yang dijalankan sebelum penetapan ujian penilaian diadakan seperti kajian pasaran dan mengenalpasti jenis, kategori dan 'configuration' yang diperlukan, kita telah kecundang dalam membuat ketetapan muktamad. Banyak faktor yang boleh dikaitkan kerana terjadinya hal sedemikian seperti kajian pasaran yang tidak menyeluruh, batasan kewangan dan faktor-faktor lain yang berkaitan. Huraian lanjut adalah seperti berikut:

- **Kajian Pasaran.** Semasa merancang untuk memperolehi kereta perisai pertama selepas FSC, tiada terdapat sebuah agensi khas Kementerian untuk menyelaraskan kajian pasaran dan membuat penilaian ke atas segala peralatan baharu yang ingin diperkenalkan. Oleh itu, perkara tersebut telah secara tidak langsung, dikendalikan tanpa 'consolidated effort'. Dalam keadaan sedemikian segala langkah mengadakan kajian pasaran hanya dijalankan masing-masing oleh Jabatanarah yang berkenaan. Dengan ketiadaan agensi khas seperti Sel Ala sekarang, maka segala kajian tidak menyeluruh dan hanyalah bergantung kepada pendedahan pasaran yang ditonjol oleh firma tempatan atau wakil pembekal asal dari luar negeri itu sahaja.
- **Penilaian.** Penilaian ke atas kenderaan perisai hanya dijalankan oleh Jabatanarah pengguna, sekadar ujian memandu dan aspek-aspek yang tidak menyeluruh. Juga

oleh kerana pada ketika itu tidak banyak pendedahan yang dialami, maka penilaian tertumpu hanya kepada satu atau dua jenis kenderaan sahaja. Ini disebabkan kita telah memilih kenderaan untuk diuji terlebih dahulu dan bukan berdasarkan kepada apa yang ada dalam pasaran semasa itu.

Masalah Barang Ganti (Spare Parts Backing).

Masalah yang ketara yang dihadapi oleh Kor sepanjang masa ialah memperolehi bantuan dan liputan barang ganti kenderaan perisai. Di antara kelemahan aspek ini adalah seperti berikut:

- **Ketiadaan Liputan Terperinci.** Semasa mengikat kontrak dengan pihak pembekal keperluan barang-barang ganti yang menyeluruh dan lengkap tidak dinyatakan dengan jelas. Di sebalik sesuatu proses ujian dan penilaian yang memakan masa yang agak panjang, aspek terpenting ini (barang ganti) gagal ditekankan dengan serius. Dari pengalaman yang lepas nyata bahawa senarai keperluan barang ganti ini berasaskan kepada alat komponen utama sahaja tanpa menyebut komponen-komponen kecil termasuk alat-alat dalam komponen utama tadi. Dengan sebab itu, apabila timbul masalah 'nuts, screws and bolts' ia akan menjadi satu masalah yang sukar diatasi kerana pihak pembekal tidak bersedia untuk menampung keperluan mendadak.
- **Bidang Ordnans.** Tanggungjawab pihak ordnans dalam bidang pembekalan merangkumi inventori yang amat luas. Sungguhpun terdapat beberapa alat khas untuk pasukan (terutama dalam kategori elektronik) dan khas untuk perkhidmatan yang dipegang oleh Kor, namun bilangan alat guna sama sahaja sudah cukup besar dan ini tentunya menjejaskan pengurusan Ordnans. Tambahan pula untuk menguruskan barang-barang kenderaan perisai memerlukan kefahaman dan pendedahan yang khusus. Terutamanya, kenderaan jenis 'B' yang telah lama ada dalam inventori. Ordnans perlu mempunyai cabang khas untuk mengurus barang-barang ganti khas tersebut. Di samping itu mereka perlu didedahkan dengan pengetahuan-pengetahuan yang berkaitan. Ini termasuk juga melatih kumpulan jurugegas mekanik, elektronik dan meriam perisai dari Kor JLTJ untuk kerja pembaikan yang berkesan.
- **Kawalan Mutu Dan Pesanan.** Aspek ini adalah bersangkutan dengan huraian di atas.

Pesanan barang ganti biasanya dibuat oleh Ordnans berpandukan kepada Jadual Peralatan Lengkap (CES) dan Jadual Liputan Ganti yang termaktub dalam Kontrak Pembelian permulaannya. Ini diikuti oleh stok senggaraan yang diperlukan bagi menampung keperluan barang ganti seterusnya, berpandukan kepada kekerapan sesuatu barang ganti itu digunakan. Sebelum ini dapat dilakukan, Ordnans juga perlu mengambil langkah seperti membuat anggaran berpandukan kepada pengalaman lepas. Kaedah ini sesuai kerana apa yang berlaku ada kalanya ialah alat ganti yang dianggap tidak laris menjadi sebaliknya kerana sesuatu sebab dan kaedah di luar jangkaan. Misalnya penggunaan 'alternator belt' dijangka tidak kerap kerana pada kebiasaannya alat ini boleh tahan sehingga setahun atau lebih. Tetapi oleh kerana sesuatu sebab yang di luar jangkaan alat ini didapati perlu diganti mungkin lebih kerap dari palam pencucuh api. Ini juga berhubung kait dengan kawalan mutu terutama apabila sesuatu 'consignment' barang ganti itu memerlukan kawalan mutu yang berkesan. Untuk membolehkan ini dilaksanakan, agensi yang mengurus kawalan mutu juga perlu mempunyai pengalaman dan kemahiran dalam bidang-bidang teknikal yang berkenaan.

PENUTUP

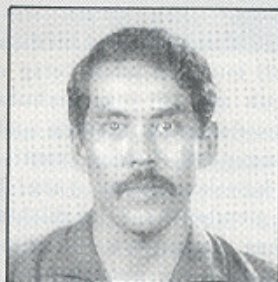
Perkembangan Kor Armor dalam konteks Tentera Darat kita tidaklah begitu pesat jika dibandingkan dengan usianya yang hampir 40 tahun sekarang. Mengambil kira faktor-faktor setempat dan 'preponderance' Armor dan infantri yang diperlukan bagi Tentera Darat kita, tidaklah boleh dinafikan bahawa tahap 'force level' armor adalah masih rendah, walaupun dalam nisbah satu skuadron bagi satu batalion dan satu rejimen bagi satu briged. Latihan ke arah 'armoured infantry cooperation' yang sangat penting tidak dapat dilaksanakan dengan berkesan kerana faktor ini. Jika apa yang dinyatakan ini diperolehi maka latihan akan menjadi lebih berkesan. Latihan bergabung antara armor, infantri dan elemen-elemen lain bantuan kombat bukan sahaja memerlukan persefahaman dari segi teknik dan taktik, malahan interaksi antara satu sama lain juga merupakan faktor penting. Latihan di peringkat briged tidak menjadi masalah jika nisbah satu rejimen kepada satu briged dapat diadakan sebilang waktu, tanpa mengilirkan rejimen kepada briged-briged yang akan menjalani latihan itu.

Langkah ke arah mewujudkan Kor Armor dalam Tentera Darat kita mengikut perancangan sekarang iaitu penubuhan Armor, "mechanised infantry" dan jejimen tank adalah dianggap bersesuaian dengan kriteria jangka masa panjang yang diperlukan bagi Kor. Tujuan kita untuk melihat Tentera Darat mempunyai Kor Armor yang 'preponderancenya' yang condong ke arah "mechanised infantry" sambil tidak mengabaikan unsur-unsur armor seperti kavalri dan tank. Apa yang diharapkan ialah supaya kavalri wujud sebagaimana organisasi yang sedia ada tanpa banyak perubahan besar. Organisasi tank pula mengikut konsep pasukan tank Amerika Syarikat, United Kingdom atau Australia.

Dari perkembangan terbaru ini dengan termeterainya perjanjian damai dengan PKM dan di-

jangka keperluan gerakan menentang peng PKM akan berakhir, khususnya di Semenanjung Malaysia, maka suasana kini paling ideal untuk mengambil peluang ke arah memantapkan la konvensional/gerila demi keperluan 'training war' iaitu salah satu peranan kita.

Sealiran dengan perkembangan yang dirangka bagi Kor Armor dalam jangka masa panjang, lah diharapkan agar penelitian yang mendalam terperinci diberi dalam aspek perolehan kenderaan, perisai dan bantuan-bantuan penyelenggaraan untuk barang ganti dan sebagainya. Untuk ini adalah disarankan supaya Kor Armor mempunyai ordonans sendiri bagi mengurus barang ganti dan peralatan-peralatan khas untuk Kor.



Meji Abdul Tahar @ Ariffin bin Mohamad mula berkhidmat pada 16 Mei 70. Seorang bekas siswa MTD, Sg. Besi dan MTAT, Haigate. Beliau pernah menjadi PS 2 Anggota Markas 1 Div dan PS 2 Alai DTD KEMANTAH. Seorang pegawai Armor tulen 2 Armor, bertapak sebagai Pemimpin Trup hinggalah sebagai Pemimpin Skuadron. Telah menghadiri kursus Regimental Officer Advance di Armoured Centre, Puckapunyal Australia dan kini menjadi Penolong Pegawai Memerintah 11 Armour Diraja.

RALAT

Terdapat beberapa kesilapan teknik pada keluaran ke - 17. Untuk artikel "An Introduction to Frequency Management" misalnya, sila buat pindaan atau tambahan berikut:

1. MS 21 ruangan 2 baris 6. Masukkan "... will always be given to an official from Telecoms Singapore. The Permanent Secretary...." selepas "... the post of the Permanent Secretary....."
2. MS 22 (Biodata Penulis, . Batalkan ayat kedua dan masukkan. "He attended Staff College in 1986 and is currently a Directing Staff of the Senior Tactics Division in PULADA."

Segala ketidaksempurnaan dikesali. Begitu jugalah dengan artikel-artikel lain yang tidak dapat disebutkan di sini.



Kritikan terhadap pelaksanaan Syariat Islam dalam pembentukan Masyarakat

KAPT ABDUL RAHIM BIN MOHAMAD

PENGENALAN

Masyarakat Islam dalam eritkata yang sebenarnya adalah sebuah masyarakat yang di dalamnya mengandungi segala urusan yang meliputi keduniaan dan akhirat berlandaskan Al-Quran dan Hadith.

Realiti kehidupan masyarakat Islam pada hari ini telah berbeza, terutamanya mereka yang telah dijajah oleh kuasa-kuasa barat. Penerapan hukum-hukum Islam dalam kehidupan mereka hanya terbatas kepada hukum-hukum yang berkaitan dengan upacara-upacara ibadat di luar dan di dalam masjid, upacara-upacara sambutan hari-hari kebesaran agama, hukum-hukum yang berkaitan dengan kekeluargaan dan pusaka. Adapun hukum-hukum yang berkaitan dengan jenayah, muamalat dan acara, maka undang-undang barat diamalkan sepenuhnya.

Akibat dari gejala ini telah menimbulkan tanggapan di kalangan penganut-penganut Islam sendiri yang menganggap bahawa undang-undang Islam itu hanya terbatas kepada hal-hal yang telah disebutkan diatas.

Pada hakikatnya, syariat Islam adalah lebih luas dari itu. Ia merangkumi aspek kegiatan kehidupan manusia dan memainkan peranan yang penting dalam mencorak dan membentuk suasana kehidupan Islam yang sebenar. Ia sebagai pembendung mungkar dan penghayat ma'ruf.

Sebelum persoalan ini dianalisis lebih jauh maka dirasakan perlu untuk terlebih dahulu diberikan penjelasan tentang perkataan 'SYARIAH'. Perkataan 'SYARIAH' atau 'SYARA' mempunyai berbagai pengertian mengikut konteks penggunaannya. Fuqahak menggunakan istilah ini dengan memberi pengertian yang khusus, iaitu hukum-hukum yang ditentukan oleh Allah SWT kepada hambaNya melalui lidah RasulNya.¹ Di dalamnya terdapat perkara-perkara aqidah dan perkara-perkara amalan lahir bagi manusia. Kemudian ia dipecahkan pula kepada tiga cabang ilmu iaitu ilmu kalam, ilmu fiqh dan ilmu tasawuf. Di akhir perkembangannya istilah SYARIAH ini hanya digunakan untuk hukum-hukum yang berkaitan dengan amalan-amalan dan kegiatan lahir manusia.

Maka kesimpulan dari penganalisisan tentang persoalan ini, pengertian SYARIAH yang akan

1. Badran. Al-Syariah, Al-Islamiah, (Iskandariah, 1972) Hal. 8.

dipakai di sini ialah sepertimana yang digunakan oleh Fuqahak.

ANTARA SYARIAH DAN UNDANG UNDANG MANUSIA

Undang-undang manusia yang difahami oleh kebanyakan ahli masyarakat Islam masa kini ialah yang membicarakan tentang urusan-urusan perkara keduniaan. Mengikut konsep ini agama tidak termasuk dalam pengertian skop undang-undang kerana ia telah disalah ertikan sebagai hanya berkisar pada perkara-perkara yang berhubungan dengan ketuhanan dan kerohanian semata-mata, tidak melibatkan urusan-urusan keduniaan.²

Konsep memisahkan agama daripada undang-undang adalah berbahaya kepada kesejahteraan pembentukan masyarakat, kerana ini akan melahirkan undang-undang yang dilaksanakan tanpa ada kawalan nilai-nilai agama. Maka natijah dari itu akan membawa kepada pertumbuhan dan perkembangan undang-undang yang berunsur manusia semata-mata dan inilah keadaan yang wujud dalam amalan negara-negara sekular sekarang.

Oleh kerana itu pengertian undang-undang ini sempit serta tidak tepat digunakan sebagai ganti perkataan SYARIAH kerana ternyata ia berbeza dari segi konsep dan fungsinya. SYARIAH mempunyai skop dan kandungan yang lebih luas daripada undang-undang kerana di dalamnya terkandung unsur-unsur agama dan juga undang-undang. Ini adalah manifestasi kehendak dan perintah Allah yang menyeluruh bidangnya; yang menyentuh perhubungan antara manusia dengan manusia secara individu, hubungan sesama masyarakat, hubungan dengan alam dan hubungan manusia dengan Allah, penciptanya. Maka dengan itu undang-undang yang ada hanya diasaskan kepada kekuasaan negara semata-mata dan pembahagian yang terdapat di dalamnya tidaklah selengkap yang didapati dalam SYARIAH³. Oleh itu dalam memahami SYARIAH yang terkandung di dalamnya unsur-unsur aqidah, ibadat rohaniah serta unsur-unsur undang-undang yang bidangnya tidak dapat dipisahkan daripada realiti hidup manusia, maka amatlah tidak tepat jika kita memahami SYARIAH ini sebagaimana fahaman yang didapati di negara-negara sekular sekarang yang memisahkan pertalian antara agama dan undang-undang. SYARIAH mempunyai pengertian sendiri yang terasing dari fahaman yang biasa dipegang tentang konsep undang-undang dan agama sebagaimana yang disebutkan di atas.

PELAKSANAAN UNDANG-UNDANG (SYARIAH)

Setelah Nabi Muhammad SAW memperkukuhkan iman dan taqwa umat Islam di Mekah selama 13 tahun maka ekoran daripada itu telah lahirlah golongan-golongan mujahid; pejuang yang rela sanggup hidup dan mati untuk Islam serta mempunyai keyakinan kepada kebenaran Islam yang tidak boleh diganggu-gugat lagi, pancaran iman yang tersemat di dada mereka dilahirkan dalam gerak-gerak serta tindak-tanduk kehidupan seharian.

Sebenarnya, memberi kesedaran keagamaan semata-mata kepada manusia belum mencukupi untuk membentuk peribadi seluruh umat manusia kerana masih terdapat segolongan manusia yang memerlukan kepada tindakan hukuman demi membentuk peribadinya. Oleh itu Islam sebagai agama yang diturunkan untuk membentuk peribadi manusia, sewajarnya ia mempunyai kelengkapan yang cukup untuk menghadapi segala kemungkinan dan keperluan. Undang-undang SYARIAH adalah penting untuk mengawal masyarakat; maka dengan pentingnya undang-undang inilah kita dapati dalam masa kehidupan Nabi Muhammad SAW selama sepuluh tahun di Madinah, Al-Quran memusatkan kepada persoalan pembentukan watak dan peribadi muslim, kerana perkara itu amat diperlukan untuk menyusun dan mengawal masyarakat Islam yang baru muncul di Madinah.

Undang-undang yang dijelaskan di atas telah berjalan dengan baik dalam pemerintahan Islam yang dipimpin oleh Nabi Muhammad SAW sebagai pentafsir dan penjelas kepada perjalanan undang-undang. Baginda melaksanakan undang-undang itu kepada seluruh warganegara yang tunduk kepada pemerintahannya di Madinah iaitu 'City-state' yang rakyatnya terdiri daripada berbagai golongan agama. Sungguhpun begitu pelaksanaan SYARIAH telah berjalan dengan baik dan dapat diterima oleh semua pihak kerana undang-undang Islam itu diterima sebagai undang-undang negara, yang memberikan kebebasan pada penganut-penganut lain untuk mempraktikkan ajaran agama masing-masing.

Pelaksanaan SYARIAH Islam itu bukannya terhenti setelah wafatnya Nabi Muhammad SAW malah telah diteruskan oleh sahabat-sahabat yang menggantikan baginda. Kejayaan mereka membentuk masyarakat Islam amat jelas sekali dengan

2. Lihat Ramadan, *Islamic Law*, (edisi 2, 1970), Hal. 25.

3. Lihat Mahmud, *The Nature of Islamic Political Theory*, (Karachi, 1975) hal. 180.

tercapainya keamanan dan kestabilan dalam kehidupan masyarakat.

Rahsia kejayaan Islam membentuk masyarakat ialah kerana terdapat di dalamnya ajaran yang lengkap untuk keperluan manusia, dan contoh teladan yang ditunjukkan oleh Nabi Muhammad SAW dalam masyarakat yang berasaskan ajaran itu, sehingga sahabat-sahabat dapat menyambung dalam bentuk kehidupan yang sama selepasnya kerana sunnahnya telah bertapak.⁴

Kejayaan pembentukan individu muslim, penyusunan masyarakat Islam dan kelahiran 'city-state' hingga pada akhirnya berpusat padanya kekuasaan pelaksanaan SYARIAH, adalah hasil dari panduan yang diberikan oleh Nabi Muhammad SAW dalam membina peribadi manusia yang berasaskan ajaran Quran. Disiplin yang diberikan kepada muslim itu adalah bertahap-tahap bermula dari bawah lalu menyusur ke atas. Cara yang digunakan oleh Nabi Muhammad SAW dalam pembinaan umat adalah merupakan sunnah yang mesti diikuti dan merupakan cara yang digunakan oleh Quran. Sekiranya cara ini diabaikan dalam usaha membina umat maka untuk sampai kepada matlamat yang baik adalah diragukan, sebab menyimpang dari sunnah yang diasaskan oleh Nabi Muhammad SAW.

SKOP SYARIAH

SYARIAH pada umumnya dapat dibahagikan kepada dua bahagian; hukum-hukum yang berkaitan dengan ibadat dan hukum-hukum yang bukan ibadat. Hukum-hukum yang berkaitan dengan ibadat ialah seperti sembahyang, puasa, zakat, haji, nazar, sumpahan dan sebagainya. Hukum-hukum ini bertujuan mengatur hubungan hamba dengan Tuhannya. Hukum-hukum ini adalah sebahagian dari syariah, tidak boleh dipisahkan kerana peranannya dalam membentuk kesedaran keagamaan, menjaga disiplin, membentuk peribadi dan perwatakan individu muslim yang akhirnya menguntungkan pembentukan dan kestabilan kehidupan masyarakat.

Ada pun hukum-hukum yang lain dari hukum-hukum ibadat, terdiri daripada perkara berikut:

- Undang-undang keluarga yang membicarakan masalah-masalah keluarga sejak pembentukannya, yang bertujuan untuk mengatur hubungan antara suami dengan isteri, dan keluarga di antara kedua belah pihak.

(Yang melibatkan hal ini didapati di dalam 70 ayat).

- Undang-undang sivil yang membicarakan masalah-masalah muamalat dan pertukaran dalam kehidupan manusia seperti jual beli, sewa-menyewa, gadaian, berhutang dan bayarannya. (70 ayat).
- Undang-undang jenayah iaitu membicarakan tentang perbuatan-perbuatan jenayah yang dilakukan oleh mukallaf serta hukum-hukum keseksaan yang patut dikenakan ke atas penjenayah. (30 ayat).
- Undang-undang acara iaitu membicarakan tentang perkara-perkara yang berhubung tentang percikaraan, kesaksian dan sumpah. (13 ayat).
- Undang-undang perlembagaan yang membicarakan tentang sistem pemerintahan dan asas-asasnya. (10 ayat).
- Undang-undang antarabangsa iaitu membicarakan tentang hubungan antara negara-negara Islam dengan negara-negara yang bukan Islam dan hubungan orang-orang bukan Islam dalam orang-orang Islam. (25 ayat).
- Undang-undang kewangan dan perekonomian iaitu membicarakan tentang hak orang-orang yang miskin ke atas orang-orang yang berada, mengatur kemasukan dan perbelanjaan kewangan negara. (10 ayat).

Berasaskan kepada kajian yang dibuat terhadap kandungan Al-Quran ternyata bahawa hukum-hukum yang dijelaskan secara terperinci tentang ibadat dan yang sehubungan dengannya seperti undang-undang keluarga serta pusaka, adalah bersifat 'taabbudi' yang tidak ada ruang untuk menggunakan neraca aqal (berijtihad) dan ia tidak akan berkembang atau berubah dengan sebab perkembangan atau perubahan masyarakat. Adapun hukum-hukum yang lain daripada ibadat dan keluarga, yang tergolong dalam undang-undang sivil, jenayah, perlembagaan, antarabangsa, kewangan dan iktisad, hanya berupa kaedah-kaedah umum dan prinsip-prinsip asasi yang tidak dibentangkan secara terperinci (kecuali sedikit sekali) kerana difikirkan undang-undang ini berkembang dan berubah meng-

4. Lihat Syed Riazul Hasan, *The Reconstruction of Legal Thought in Islam*. (Lahore, 1977), Hal. 26

ikut perkembangan masyarakat dan perubahan masa. Oleh itu Quran hanya menentukan kaedah-kaedah umum dan prinsip-prinsip asas agar pihak pemerintah pada setiap masa mempunyai kelengkapan membuat undang-undang terperinci mengikut keperluan masing-masing berpandukan Al-Quran dan Sunnah.

KEPIMPINAN NEGARA DAN PELAKSANAAN UNDANG-UNDANG

Meninjau SYARIAH pada keseluruhannya dan proses perkembangan yang berlaku di zaman Nabi Muhammad SAW dan sahabat-sahabatnya, didapati ada dua fenomena. Pertamanya pelaksanaan undang-undang yang tidak perlu kepada tekanan dan kuasa dari luar. Malah ia dapat berjalan dan terlaksana dengan kesedaran keagamaan yang ada pada pengikut-pengikutnya. Atau, hanya pelaksanaan yang memerlukan kepada program keislaman yang cukup di segi pendidikan, latihan akhlak, pembersihan jiwa dan sebagainya.

Keduanya pelaksanaan yang memerlukan tekanan dan kuasa dari luar diri muslim itu sendiri, iaitu pelaksanaan itu memerlukan kuasa daripada yang menjalankannya. Kuasa itu tidak lain adalah kuasa yang memerintah negara. Kalau dikaji undang-undang Islam itu, maka sebahagian besar pelaksanaannya bergantung kepada kuasa pemerintah. Jika keadaannya sedemikian maka kuasa politik penting untuk mempertahankan kehidupan serta sistem keislaman itu dari tekanan dan penghinaan dari pihak lain, sambil menghapuskan kemungkaran serta menegakkan kebenaran. Ia akan memberi pertolongan yang besar dalam pelaksanaan undang-undang yang memerlukan pelaksanaannya kepada kekuasaan negara.

Perkembangan SYARIAH dan pelaksanaannya bergantung rapat dengan kuasa pemerintahan. Hal ini jelas dari bukti sejarah yang menunjukkan bahawa Nabi Muhammad SAW sewaktu berada di Madinah merupakan pemimpin dalam urusan keagamaan dan kenegaraan. Pelaksanaan undang-undang dijalankan dengan kuasa yang ada pada baginda. Begitu juga halnya dengan khalifah-khalifah yang memegang tugas memimpin umat selepas wafat Rasulullah SAW. Kuasa pemerintahan yang menentukan penggubahan dan pelaksanaan undang-undang adalah kenyataan yang mesti diterima, bukan sahaja dari segi SYARIAH, malahan juga undang-undang sekular.

Tanpa kuasa ini pelaksanaan SYARIAH tidak akan tercapai dengan sepenuhnya. Sebab itulah perjuangan Nabi Muhammad SAW bukan hanya

terhad kepada penyampaian kesedaran keagamaan (dakwah) sahaja. Perjuangan baginda diteruskan sehingga tercapai tujuan mewujudkan sebuah negara yang berlandaskan SYARIAH dengan sepenuhnya. Kuasa politik yang bercorak Islam itu berjaya melicinkan perjalanan dan pelaksanaan undang-undang tanpa sebarang gangguan. Kedudukan syarak pula menjadi kuat dan stabil.

PELAKSANAAN SYARIAH DI MALAYSIA

Ramai yang meragukan kemampuan Islam untuk dilaksanakan di negara ini. Keraguan itu timbul bukan saja dari golongan orang-orang bukan Islam, malah dari golongan yang dipanggil pemimpin. Ini mungkin disebabkan negara ini mempunyai penduduk yang terdiri dari berbilang kaum dan agama.

Sebenarnya jika kita memahami Islam itu secara jelas tentang skopnya dan pelaksanaannya, maka keraguan itu tidak sepatutnya timbul. Ini adalah disebabkan Islam itu diturunkan untuk menyusunkan masyarakat manusia, dan memberi layanan perlindungan kepada segenap pihak. Kalau undang-undang Islam ini dapat dilaksanakan dalam masyarakat yang berbilang bangsa serta agama di zaman keagungan Islam, maka apakah bezanya manusia dahulu dengan manusia yang ada pada hari ini? Manusia tetap manusia dan masalah yang dihadapi adalah sama. Jika berbeza pun cuma dari segi bentuknya sahaja. Undang-undang Islam cukup untuk mengatur dan menyusun kehidupan manusia seluruhnya. Kebebasan beragama bagi orang-orang yang bukan Islam diberikan sepenuhnya. Oleh itu tidak ada sebab mengapa Islam tidak dapat dilaksanakan di negara ini.

Dipandang dari sudut sejarah, Islam telah bertapak di negara ini sejak beratus-ratus tahun dahulu. Dalam jangka masa tersebut ia telah memainkan peranan yang besar membentuk pemikiran dan kebudayaan penduduk-penduduk negara ini. Dalam hubungan ini, Prof Ahmad Ibrahim dalam kerta kerjanya yang berjudul 'Ke Arah mengembalikan Hukum-hukum Islam di Malaysia' yang dibentangkan di Seminar Islam dan Kebudayaan Melayu di UKM tidak lama dahulu menegaskan, "Negara Melayu sebelum campur tangan British, mempunyai undang-undang asasi atau undang-undang negeri yang berlandaskan undang-undang Islam. Ia meliputi semua bidang seperti undang-undang keluarga, jenayah, tanah, sivil dan termasuk undang-undang acara dan keterangan. Maka melihatkan sejarah perkembangan dan pelaksanaannya telah pun berlaku, maka amatlah sesuai undang-undang ini dilaksanakan semula selepas tercicir disebabkan pengaruh luar yang mendatang."

Penganut-penganut Islam di Malaysia masih merupakan golongan majoriti di negara ini. Pada kebiasaannya, undang-undang yang dijalankan dalam sesebuah negara itu mengikut bilangan majoriti, manakala golongan minoriti menurut sahaja. Yang demikian tidaklah tepat di negara ini jika undang-undang Islam itu diketepikan.

Memandangkan kepada fakta-fakta yang dijelaskan maka tidak ada sebab undang-undang Islam tidak dapat dilaksanakan di negara ini. Halangan-halangan yang ditimbulkan tentang keraguan terhadap kemampuan undang-undang Islam itu adalah dilahirkan oleh golongan-golongan yang tidak memahami dan tidak mahu cuba memahaminya.

Namun, perpaduan antara semua umat di negara ini iaitu antara umat Islam dan bukan Islam amat diperlukan sebelum undang-undang Islam boleh dilaksanakan sepenuhnya. Umat Islam di negara ini perlu diberi kesedaran keagamaan dengan membentuk keyakinan mereka terhadap konsep tauhid. Ini akan tercapai dengan penerapan nilai-nilai Islam secara berperingkat-peringkat dari alam persekolahan sehinggalah berkembang kepada soal pentadbiran dan pemerintahan negara. Setelah kesedaran Islam dicapai di semua peringkat maka masalah penerimaan undang-undang Islam tidak akan timbul lagi. Nabi Muhammad SAW telah membina aqidah Islam yang syumul dan kukuh

selama tiga belas tahun sebelum dapat melahirkan sebuah masyarakat Islam yang sejati.

PENUTUP

Peranan yang dimainkan oleh SYARIAH dalam pembentukan masyarakat Islam amat besar. Ia merupakan alat yang paling berkesan bagi melahirkan identiti masyarakat Islam dalam ertikata sebenarnya.

Kesedaran keagamaan yang diberikan secara lisan atau tulisan tidak berupaya sepenuhnya memberi kesedaran untuk semua golongan patuh kepada ajaran Islam. Malah masih banyak golongan yang memerlukan tindakan undang-undang untuk mematuhi ajaran Allah. Dan ini hanya dapat dikuatkuasakan oleh pemerintah.

Pembentukan masyarakat Islam dan kestabilannya tidak akan tercapai sepenuhnya, jika hanya dengan memberi kesedaran keagamaan tanpa disertai oleh undang-undang yang dikuatkuasakan oleh pemerintah. Keteguhan dan kestabilan masyarakat Islam dapat dicapai apabila kedua-duanya itu berjalan serentak. Kesempurnaan Islam akan tercapai apabila kesedaran keagamaan penuh di dada setiap muslim serta pelaksanaan hukum berjalan penuh dalam menyusun kegiatan masyarakat.



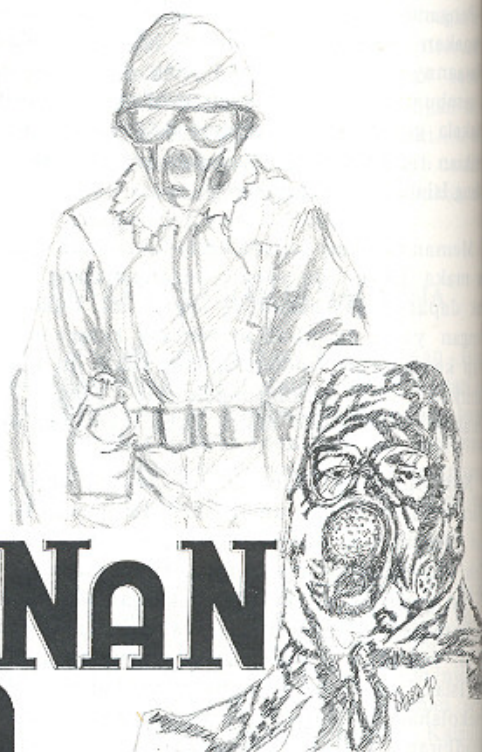
Kapt Abd. Rahim bin Mohamad telah ditauliahkan ke dalam Kor Jurutera Letrik dan Jentera pada 23 Jun 79. Kini beliau memegang jawatan Jurulatih Kanan, Cawangan Pegawai di SJLJ mulai 1 Januari 88 setelah menamatkan pengajian Diploma Kejuruteraan Jentera di UTM. Tulisan ini merupakan hasil pendedahan beliau kepada seminar-seminar Islam yang dianjurkan oleh UTM.

"Tiga mata yang tidak akan melihat api neraka; mata yang sentiasa berjaga-jaga di medan perang (Fi Sabilillah), mata yang sentiasa menangis kerana takut kepada Allah dan mata yang menahan penglihatan kepada larangan Allah."

— Maksud Al-Hadith riwayat Ath-Thabrini

Kapt Dr BOHARI M YAMIN dan
Lt Prof Madya Dr
MOHD WAHID SAMSUDDIN

PERTAHANAN Kimia



Walaupun apa pun objektif sesuatu peperangan matlamatnya adalah sama. Satu pihak akan cuba mengalahkan dan menundukkan pihak yang lain. Serangan atau peperangan selalunya dirancang dan mungkin juga ada yang berlaku secara tiba-tiba. Apa saja senjata yang digunakan, kesan fizikalnya adalah pemusnahan jiwa, harta benda dan apa saja di permukaan bumi ini. Pergaduhan dan peperangan adalah satu lumrah dalam sejarah kehidupan manusia.

Untuk mencapai kejayaan dalam peperangan, dunia telah membelanjakan begitu banyak wang membina senjata mengikut konsep yang paling berkesan. Kemajuan teknologi hari ini jelas menunjukkan betapa sofistikatednya senjata moden yang berkesan dan menggerunkan telah direka oleh manusia. Oleh kerana sejarah perkembangan manusia tetap merangkumi pergaduhan dan perdamaian, perlumbaan membuat senjata dalam apa bentuk atau cara guna tetap berterusan kononnya bagi mengimbangkan kekuatan supaya perdamaian dalam apa bentuk pergolakan akan terjamin.

Dalam konteks mempertahankan keamanan dan kestabilan, hampir seluruh negara di dunia ini mempunyai skema pertahanan yang sentiasa dipertingkatkan. Bagi negara membangun seperti

Malaysia skema tersebut sangat bergantung kepada negara maju baik daripada aspek taktik, latihan dan terutamanya persenjataan. Beberapa pertunjukan senjata moden telah diadakan di beberapa buah negara rantau ini termasuk di Ibu Negara kita Kuala Lumpur. Objektif pertunjukan itu tentunya telah maklum. Begitu banyak gambaran dan dokumentasi mengenai senjata dalam pertahanan dipertunjukkan. Sekali pandang ia bukan rahsia tetapi pembeliananya tidaklah semudah membeli sebuah protosaga.

Di samping senjata berat seperti yang digambarkan di atas, senjata kimia juga merupakan senjata yang berkesan dan amat menyeksa. Oleh yang demikian ia begitu dirahsiakan dan jarang dipertontonkan. Penggunaannya dalam peperangan tidak dapat dinafikan dan penyelidikan serta pengeluarannya dilindungi di bawah program perlindungan atau dikenali sebagai Pertahanan Kimia (PK). Buat pertama kali tulisan ini cuba meninjau aspek sejarah dan pengenalan mengenai Pertahanan Kimia.

SEJARAH RINGKAS

Perancis merupakan negara pertama menggunakan senjata kimia pada tahun 1914 sebagai gas pemedih mata. Walau bagaimanapun peperangan

kimia bermula semasa peperangan dunia pertama iaitu pada tahun 1915 apabila pihak Jerman dituduh menggunakan gas klorin dalam pertempuran di Ypres. Kesannya cukup dahsyat di mana 180,000 orang cedera dan 8,000 lagi nyawa terkorban di kalangan Tentera Bersekutu. Jumlah tersebut dilaporkan adalah 9% daripada jumlah kecederaan dan 1.5% daripada jumlah kematian anggota British. Serang balas antara dua pihak memperhebatkan lagi perang kimia di mana fosgen dan campuran fosgen dan klorin digunakan.

Banyak bahan kimia diuji dengan berkesan seperti dikloroetilsulfida yang dikenali sebagai gas mustard dan agen saraf. Amerika pada masa yang sama mengkaji satu gas beracun yang baru dikenali sebagai Lewisit yang sama aktif dengan gas mustard tetapi boleh bertindak dengan lebih cepat. Anggaran jumlah kecederaan keseluruhan oleh senjata kimia ialah 1.3 juta orang iaitu lebih kurang 20 peratus.

Perjanjian 'Geneva Protocol 1925' yang ditandatangani oleh 40 buah negara bagi mengharamkan penggunaan senjata kimia boleh dikatakan gagal. Langkah yang diambil di Geneva tidak tegas dan bersungguh-sungguh. Ini jelas pada syarat perjanjian tersebut yang memberi hak kepada sesebuah negara menyerang balas dengan senjata kimia juga jika ia diserang dengan senjata kimia. Terdapat juga negara yang tidak terikat dengan perjanjian itu. Apa yang sangat ketara selepas perjanjian tersebut ialah penyelidikan dalam bidang ini kian meningkat baik dari segi pengembangan kimia tersebut, mahu pun kaedah perlindungannya. Britain misalnya terkenal dengan 'Chemical Defence Establishment' di Porton Down yang sering dikaitkan dengan banyak peperangan rahsia dan peperangan kuman bagi melindungi tentera British daripada agen kimia dan biologi.

Dalam Peperangan Dunia Kedua tahap pertahanan kimia boleh dikatakan cukup tinggi hasil daripada penyelidikan yang giat. Pada masa yang sama senjata biologi bagi mencemar air telah berkembang. Akibatnya Negara Jerman dan Negara-Negara Bersekutu cukup berhati-hati terhadap peperangan kimia kerana kedua-dua pihak memiliki senjata tersebut.

Banyak laporan yang melibatkan peperangan kimia di Barat telah didokumentasikan. Di rantau Asia pula Jepun telah pun menguji senjata kimia dan biologi di kem-kem tahanan semasa penempatan di Negeri China pada tahun 1931. Kesan bahan toksik dimasukkan ke dalam makanan orang tawanan dan perhatian terhadap perubahan fizikal dan mental dibuat. Ujian Jepun mengenai senjata bio-

logi diketahui oleh Rusia semasa perbincangan di mahkamah peperangan di Khabarovsk. Siberia pada tahun 1949. Ini diikuti dengan keterangan yang dikeluarkan oleh pihak Jepun sendiri pada tahun 1976.

Keupayaan senjata kimia dan biologi telah mendorong kuasa tentera Amerika, Britain, Perancis dan Rusia melipatgandakan penyelidikan, pengembangan serta pengeluaran agen-agen kimia baru yang lebih aktif. Pada tahun 1950 agen VX, gas saraf yang lebih kuat daripada Tabun, Sarin dan Soman diperkenalkan. Ia tahan lebih lama di udara dan tanah sehingga tempat semburan tidak dapat dilintasi untuk beberapa lama selepas perlepasan. Kesan khusus terhadap fisiologi tubuh manusia telah dikenal pasti di mana ia menyerang enzim asetilkolinestrase yang mengawal pengecutan otot. Ia juga akan memberi kesan jangka panjang. Pada tahun 1968 ujian perlepasan gas saraf di Utah, Amerika dilaporkan telah membunuh 6,000 ekor kambing biri-biri lebih kurang 30 batu dari kawasan semburan. Perubahan arah angin telah mengubah matlamat ujian. Sudah tentu Kongres Amerika seterusnya mendesak agar stok dihapuskan dan pengeluaran bahan diharamkan.

Pada tahun yang sama perundingan detente oleh 'UN Committee on Disarmament' bagi mengharamkan semua bentuk senjata kimia dan biologi diadakan di Geneva. Pada tahun 1972, 'Biological and Toxin Weapon Convention' mengharamkan pengeluaran dan penghimpunan senjata kimia kecuali untuk tujuan penyelidikan, perlindungan atau keselamatan negara. Sekali lagi keadaan politik yang agak konservatif melumpuhkan perundingan dan melahirkan semula perlumbaan senjata. Maka kini wujud pula senjata kimia moden gas saraf biner dan rekaan biologi atau bioteknologi baru yang lazim disebut sebagai 'recombinant DNA' dan manipulasi genetik.

Jelas sekali arahan perjanjian tidak dipatuhi. Secara rahsia biaya penyelidikan diberi kepada sekurang-kurangnya 52 buah kolej dan universiti untuk penyelidikan senjata kimia dan biologi. Ujian halusinogenik (BZ), perlepasan awan bakteria, zinkum dan kadmium sulfida di ladang-ladang, bandar, terowong bawah tanah di Amerika dan di peperangan kecil benua Asia dilakukan.

PEPERANGAN KIMIA DI BENUA ASIA

Oleh kerana penggunaan senjata kimia sangat dirahsiakan, maka sedikit sangat laporan mengenai peperangan kimia di Asia dilaporkan pada masa lepas. Kesan peperangan, liputan media dan perjanjian banyak melibatkan negara maju sebelah

Barat. Namun demikian penggunaan oleh pihak-pihak Jepun dan Bersekutu bukanlah lagi menjadi satu rahsia.

Mingguan Malaysia 24 Jun 1984 menulis tentang penggunaan racun rumpai yang mengandungi dioksin oleh pihak British di tepi jalan raya di Tanah Melayu bagi membantu gerakan memburu kominis. Semburan racun rumpai natrium trikloroasetat (STAC), asid 2, 4-diklorofenoksiasetik (2, 4-D) dan 2, 4, 5-troklorofenoksiasetik (2, 4, 5-T) dilakukan dengan alasan memusnahkan tempat persembunyian musuh pada masa darurat dahulu. Walaupun bahaya racun rumpai tersebut terhadap kehidupan manusia dinafikan, kehadiran bersama 2, 3, 7, 8-tetraklorodibenzo-p-dioksin atau ringkasnya dioksin adalah berbahaya. Dioksin dilaporkan menyebabkan penyakit kulit yang serius dipanggil khloacne, barah dan kecacatan jantina. E K Woodford dan H G H Kearns telah menulis keterangan lengkap ujian penyemburan racun rumpai berkenaan. Syarikat ICI memang berpengalaman dalam racun rumpai. Sesuatu yang jelas ialah ujian kesan STCA, Triokson dan klorofenil N'N dimetilurea telah diuji ke atas tanaman pengganas seperti ubi kayu, ubi keledek dan jagung pada bulan Februari 1953 oleh pihak British. Sebulan kemudian penyemburan udara ke atas tanaman pengganas dimulakan di bawah arahan Jeneral Sir Gerald Templer, Pesuruhjaya Tinggi dan Pengarah Gerakan Tanah Melayu pada masa itu.

Tidak ada kajian kesan dioksin dan racun rumpai terhadap tumbuhan dan kehidupan manusia dan haiwan serta tanah di negara kita dibuat. Walaupun tanpa data yang kuat, bilangan sakit kulit dan kecederaan semasa latihan peperangan konvensional yang diberi nama "Kerengga" di jalan Kota Tinggi memberi kemungkinan kesan racun yang dimaksudkan. Hutan yang tebal telah ditebang maka cuaca panas akan membantu kereaktifan resapan racun ke dalam anggota. Walaupun ia satu bayangan, kemungkinan tetap kemungkinan apatah lagi kawasan ladang tebu tersebut mungkin telah disemur racun lalang dan sebagainya. Laporan atau kajian saintifik atau data demikian daripada pihak pengusaha ladang tidak diperolehi atau mungkin tidak terdapat lagi.

Penglibatan veteran British dari Tanah Melayu dalam penyemburan racun yang setara dengan racun agen oren di Vietnam sering dikaitkan. Jenama Trioxone telah disemur dengan kadar 2,300 liter setiap hektar hingga 90,000 liter dan 140 tan STCA dengan anggaran \$1.4 juta bagi kawasan seluas 500 hektar. Bukti daripada kajian saintifik dan kikisan tanah sering dijadikan hujah.

Operasi 'Ranch Hand' yang bermula pada 1 Januari 1962 iaitu menyembur agen oren, biru putih yang menyebabkan daun pokok gugur didokumentasikan dengan luas. Agen tem adalah sejenis herbisid yang mengandungi hormon pembesaran. Selepas sembilan tahun kemudian, juta gelen bahan kimia tersebut telah disemur atas lebih kurang 20 peratus hutan di Vietnam termasuk 36 peratus hutan bakau.

Sangat jelas ketidaktegasan undang-undang pengharaman senjata kimia telah dipeng oleh Amerika semasa perang Vietnam pada tahun 60an dan 70an. Kira-kira 200,000 tan dan CS lakrimatori (gas pemedih mata), psikobenzil, senjata napalm dan racun tumbuhan oren digunakan dengan meluasnya. Lima ekar tanah dikatakan telah rosak; tidak digunakan untuk pertanian dan ternakan kerana racun neptotoksin dan dioksin.

Pada tahun 1981, Alexander Haig, Setiausaha Negara Amerika Syarikat sempena lawatan ke Berlin telah mengemukakan bukti peperangan menggunakan senjata kimia dan biologi oleh kerajaan Laos, Kampuchea dan juga Afghanistan kepada penentang kerajaan. Penggunaan toksin yang dikenali sebagai "hujan kuning" ditimbulkan, sebenarnya berlaku dalam dialog itu tidak diketahui sepenuhnya. Penggunaan senjata kimia dalam perang Iraq dan Iran sering ditimbulkan masa kini. Kini terdapat 15 buah negara yang diketahui memiliki senjata kimia.

RUSIA 1987

Pada bulan Oktober 1987 Soviet Union menjemput perwakilan daripada 40 buah negara yang terlibat dalam 'Conference on Disarmament' di Geneva melawat Shikany di mana terletak senjataan peperangan kimia. Agen kimia yang dipamerkan ialah Lewisite, mustard, sarin, soman dan VX serta sistem pengendalian dari tahun 1950 hingga 1950. Persoalan yang menarik dari perjumpaan seperti ini ialah kenapa terlalu banyak pendalihan di meja rundingan dan ketiadaan bantahan sejak berabad yang lalu.

SENJATA KIMIA

Senjata berat memberi kesan kejutan gegaran letupan dan logam yang masuk ke dalam anggota yang terkena tembakan. Bahan kimia di sini digunakan untuk menghasilkan letupan seterusnya memberi daya atau kuasa untuk peperangan atau butiran logam menyembur keluar dari pantas menuju sasaran. Pembikinannya mengandungi beberapa aspek atau bahagian dalam ser

itu. Ia boleh dikatakan rumit dan pengendaliannya juga mempunyai darjah kerumitan yang berbeza. Meriam kapal misalnya tidak semudah repal M16 atau senjata MGKA (GPMG) baik dari segi mengendalikannya, menyimpannya dan juga membaik pulihkannya. Semua komponen dalam senjata itu penting.

Senjata kimia amat berbeza kerana apa yang terpenting ialah pemilihan bahan kimia beracun yang efektif. Sesiapa pun yang memiliki bahan kimia tersebut sememangnya sudah mampu menggunakannya. Soal pengendalian seperti bagaimana hendak digunakan terhadap musuh adalah perkara yang kedua. Kalau ia gas tentu cara yang mudah disembur atau dilepaskan melalui tiub atau dibekaskan seperti peluru meriam dan dihantar dengan tembakan meriam. Kalau bahan itu cecair atau serbuk ia boleh disembur melalui udara. Ringkasnya, teknologi pembekasan dan pengen-

dalian boleh dalam bentuk yang mudah atau rumit bergantung kepada keperluan. Apa juga teknologi yang digunakan yang sangat penting dan ditakuti ialah jenis bahan kimia yang digunakan. Ini berbeza dengan senjata yang lazim kita gunakan. Senjata MGKA lebih digeruni oleh musuh daripada repal M16 misalnya. Peluru adalah perkara kedua kerana banyak peluru tanpa senjata yang bermutu tidak bermakna.

Oleh yang demikian banyak penyelidikan tertumpu kepada bahan kimia itu sendiri. Aspek sifat bahan, pengeluaran, kesan terhadap hidupan dan berbagai lagi yang berbentuk ofensif dan defensif dikaji. Oleh yang demikian eloklah kita mengenali beberapa bahan kimia yang begitu banyak di muka bumi ini baik yang asli atau direka cipta dan yang telah dikenal pasti keberkesanannya iaitu yang telah digunakan dalam peperangan-peperangan masa lampau.

JADUAL 1

Beberapa agen kimia yang digunakan dalam Peperangan Dunia Pertama

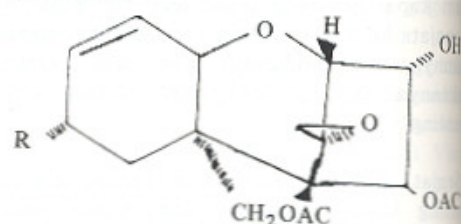
Nama biasa		Formula	LCt 50	LD 50
Agen darah				
AC	Hidrogen sianida	HCN	1000 (1 min)	1.0
CK	Sianogen klorida	CNCl	11000 (10 min)	—
Agen Cekik (choking)				
CG	Fosgen	COC1 ₂	3200	—
Melecut atau gelembung				
H	Mustard	(C1CH ₂ CH ₂) ₂ S	1500	0.2
L	Lewisit	C1CH=CHAsCl ₂	1200	0.5
HN-3	Mustard Nitrogen	(C1CH ₂ CH ₂) ₃ N	—	—
Agen saraf				
GA	Tabun	$\begin{array}{c} \text{C}_2\text{H}_5\text{O} \\ \diagdown \\ \text{P}=\text{O} \\ \diagup \\ (\text{CH}_3)_2\text{N}-\text{CN} \end{array}$	150	0.08
GB	Sarin	$\begin{array}{c} \text{C}_3\text{H}_7\text{O} \\ \diagdown \\ \text{P}=\text{O} \\ \diagup \\ \text{CH}_3-\text{F} \end{array}$	100	0.025
GD	Soman	$\begin{array}{c} (\text{CH}_3)_3\text{CCH}(\text{CH}_3)\text{O} \\ \diagdown \\ \text{P}=\text{O} \\ \diagup \\ \text{CH}_3-\text{F} \end{array}$	50	0.007
VX	—	$\begin{array}{c} \text{C}_2\text{H}_5\text{O} \\ \diagdown \\ \text{P}=\text{O} \\ \diagup \\ \text{H}_3\text{C}-\text{SCH}_2\text{CH}_2\text{N}(\text{C}_3\text{H}_7)_2 \end{array}$	—	—

Beberapa agen kimia yang telah digunakan dalam peperangan dunia pertama adalah seperti dalam Jadual 1. LC₅₀ ialah kepekatan gas dan tempoh pendedahan yang boleh membunuh 50% populasi yang terdedah. Unitnya ialah mg min m⁻³. LD₅₀ ialah dos yang boleh membunuh 50% populasi dalam unit mg per kg.

Gas dan cecair digunakan dengan banyak dalam Perang Dunia Pertama. Gas seperti klorin dan fosgen akan memberi kesan fisiologi pada paru-paru dan cecair seperti mustard memberi kesan pada kulit. Agen saraf organofosforus telah dibuat semasa Perang Dunai Kedua tetapi tidak digunakan kerana kedua-dua pihak memilikinya. Ia adalah cecair pada suhu normal tetapi boleh terwap pada keadaan yang berbeza. VX mempunyai kesan pada kulit di mana satu titik yang beratnya 2 mg jika meresap ke dalam kulit akan menyebabkan kematian.

Keupayaan sesuatu agen kimia itu bergantung maklumat yang ada mengenai agen itu. Ini bermakna penyelidikan offensif perlu dibuat. Salah satu ujian yang telah dibuat ialah toksin 'tricho-

thecene mycotoxin' yang juga dikenali sebagai 'hujan kuning'.



Trichothecene mycotoxin

dikenali sebagai T-2 bila,
O

$R = (CH_3)_2CHCH_2CO-$

Alexander Haig pernah menuduh Soviet Union menggunakan T-2 di Laos dan Kampuchea. Beberapa tanda akibatnya ialah kulit kelihatan merah dan yang paling teruk ia menyebabkan 'acute toxic aleukia (ATA)'. Seseorang itu akan muntah, hilang selera, mendapat cirit-birit, menderita pendarahan dan kehilangan sel darah putih. Kesan fisiologi gas saraf dapat dikenal pasti seperti dalam Jadual II.

JADUAL II Sifat-sifat dan Kesan Fisiologi Gas Saraf Terhadap Manusia

Bil.	Nama biasa/kod	Nama kimia	Keadaan fizikal pada S.T.P.	Kesan-kesan fisiologi pada manusia	Bentuk perlepasan	Kadar tindak balas	Dos (mgm-min/m ³)
1.	Tabun (GA)	Sianodimetilamino-etoksifosfinoksida	Cecair tak berwarna ke warna perang	Bila bernafas mangsa berpeluh: loya, kejang urat, sesak nafas, koma, getaran sehingga mati akibat kelemahan.	wap/cecair	serta-merta ke 15 minit	400
2.	Sarin (GB)	floroisopropoksimetil-fosfinoksida	Cecair tak berwarna	Sama seperti tabun dengan tindakan primer kepada sistem saraf	wap/cecair	serta-merta ke 15 minit	100
3.	Soman (GD)	florometilpina-koli-loksi-fosfinoksida	Cecair tak berwarna	Sama seperti tabun tetapi bertindak lebih cepat dalam kepekatan kecil	wap/cecair	serta-merta ke 15 minit	50
4.	VX	etil-s-2-diisopropilamino-etilmetil fosforotiolat		Sama seperti tabun tetapi tindakan lebih cepat lagi daripada soman	cecair aerosol	serta-merta	10

* Dos (mgm-min/m³) agen yang berkemungkinan membunuh 50% daripada manusia yang terdedah kepadanya jika tiada dilindungi.

PERTAHANAN KIMIA

Sama ada sesuatu negara itu perlu mengadakan unit pertahanan kimia secara bersungguh-sungguh bergantung kepada keadaan dan suasana. Ia akan menjadi keutamaan apabila sesebuah negara itu diserang dengan senjata kimia. Maka kita tidak hairan kenapa peperangan kimia (PK) bermula dari Barat. Dasar mempertahankan dan memperkembangkan pengaruh telah membawa PK ke Asia Tenggara.

Kita patut bersedia dan sekurang-kurangnya mempunyai pengetahuan yang sistematik dalam konsep pertahanan negara dan keselamatan awam. Aktiviti perindustrian dalam sektor awam juga memerlukan langkah keselamatan yang boleh dikaitkan. Industri getah misalnya memerlukan gas klorin bagi tujuan modifikasi barangan. Peristiwa yang masih segar ialah pada 2 Disember 1984 di Bhopal, India di mana lebih kurang 2,500 orang mati dan 90,000 orang cedera akibat letupan kilang kimia yang menghasilkan metilisosianat dan bahan perantaraan bagi membuatnya iaitu fosgen.

PROGRAM PERTAHANAN KIMIA

Dalam dunia teknologi yang senantiasa berkak, aspek pertahanan sedemikian memang terkandung dalam mana-mana sistem pertahanan. Yang mungkin berbeza ialah darjah atau tahap penglibatan peranannya. Walau bagaimanapun, program Pertahanan Kimia tetap akan mengandungi empat aspek penting bagi melindungi askar kita daripada serangan senjata kimia.

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- Sistem pengesanan atau pemantauan senjata kimia dan amaran bahaya.
- Langkah perlindungan seperti pakaian perlindungan dan reka bentuk alat pernafasan.
- Pembersihan permukaan yang dicemari.
- Langkah perubatan bagi membantu mereka yang terdedah kepada senjata kimia.

Berapa banyakkah kepakaran, pengetahuan, maklumat dan pengalaman yang kita miliki sebagai satu organisasi yang dinamik dan kemas kini? Negara maju mempunyai satu badan atau agensi khas yang khusus mengkaji skema pertahanan bentuk ini sama ada untuk pertahanan atau senjata dalam tarik tali politik. Umum mengetahui teknologi ini sekurang-kurangnya diuji lagi atau dijual kepada negara yang sekarang sedang berperang.

Kemajuan teknologi boleh membuat sesuatu agen kimia itu sukar dikesan. Empat belas rakyat yang mati yang dikatakan oleh makanan beracun di Ipoh baru-baru ini sudah cukup menunjukkan betapa rumit sesuatu racun yang dijangka untuk dikenal pasti. Sebaliknya kerja-kerja tersebut boleh dijadikan asas atau maklumat untuk masa depan.

Negara kita mempunyai sumber kimia beracun, baik daripada tumbuhan semulajadi ataupun sumber hasil bumi yang dipelbagaikan, yang boleh dijadikan penyelidikan. Banyak juga kajian sumber ini telah dikenal pasti sejak pemerintahan British lagi. Maka terpujalah kepada pihak tertentu bagi menentukan dasar dan falsafah serta keutamaan sekurang-kurangnya pergantungan kepada negara luar dapat dikurangkan.

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Kapt Dr Bohari Mohd Yamin dilahirkan pada tahun 1950 di Negeri Sembilan. Beliau memperolehi BSc dari Universiti Malaya pada tahun 1973 dan PhD dari Universiti London pada tahun 1977. Memasuki PALAPES pada tahun 1978 dan ditauliahkan pada tahun 1980. Kini menyandang jawatan Ketua Kompeni dalam PALAPES UKM. Berjawatan Profesor Madya di Jabatan Kimia UKM; giat dalam penyelidikan organo logam dan aspek gunaan. Memenangi dua kali hadiah Commonwealth Fellowship untuk membuat penyelidikan pada tahun 1983 di Universiti Essex dan pada tahun 1989 di Universiti Oxford. Beliau juga memenangi hadiah Zamalah Berita Harian bagi menulis buku yang berkaitan dengan penyelidikannya.



Dr Mohd Wahid Samsudin dilahirkan di Sungai Sumun, Perak pada tahun 1951. Mendapat pendidikan hingga ke peringkat PhD pada tahun 1977. Melibatkan diri di dalam PALAPES awal tahun 1985 hingga sekarang sebagai Ketua Platoon. Di samping tugas sebagai Ketua Jabatan Kimia, UKM; aktif dalam penyelidikan sintesis sebatian organik dan Natural Product Chemistry.

Hai orang-orang yang beriman, jika kamu menolong Allah (agamaNya) nescaya Dia menolong kamu dan menetapkan pendirian kamu.

— Al-Quran Surah Muhammad
Ayat 7

The Rest for the AR

KOL MOHD ARIS BIN S



Ability and Procedure Replenishment of ARTILLERY AMMUNITION

Ammunition replenishment is yet to be fully and properly exercised and tested. All these while such an activity was carried out on a token form in so far as all the field exercises that artillery units have taken part. As such, there is a tendency that this phenomena will pose artillery commanders with the problems of replenishment.

This article attempts to discuss basic issues relating to such problems and suggests basic procedures that could be tested during field exercises.

INTRODUCTION

In all the field exercises that the field units have taken part so far, replenishment of gun ammunition has not been fully and properly exercised. The lack of empty ammunition boxes to simulate the actual ammunition and the shortage of the first and second line transports are usually the convenient excuses for not exercising it. As a result, many of us are unsure of the procedure and there is a tendency that this will pose artillery commanders with problems of ammunition replenishment. Thus there is a need for a well-defined organizational and environmental doctrine that can be tested during field exercises.

THE IMPORTANCE OF A CLEAR PROCEDURE

Clausewitz once said, as confusion is in the nature of war a clear procedure well-rehearsed will inevitably help to smoothen the friction of war.

Artillery ammunition replenishment procedure for example cannot be treated lightly for the following reasons:

- Artillery ammunitions are very bulky and highly dangerous. The handling of artillery ammunitions requires a special care and the ammunitions need to be stored properly.
- Ammunition dumps and convoys are attractive targets, and the destruction of which may jeopardise the success of the operations.
- The replenishment system involves many agencies. The absence of proper coordination can lead to chaos.
- Transportation of artillery ammunition will cause tremendous strain on the vehicle resources of a formation. It requires 30 three-ton vehicles to lift one first-line ammunition of a 105 mm regiment.



A range of Artillery ammunition

RESPONSIBILITY

In discussing the responsibility towards ammunition replenishment, the current doctrine only gives very general, and at times very unclear, guidelines. This paper, will attempt to discuss such responsibility along the following outlines:

- Who is responsible for determining the amount of ammunition required for a particular operation?
- Who is responsible for formulating the logistic plan for the supply and replenishment of ammunition?
- Who is responsible for the implementation of the ammunition logistic plan?
- Who is responsible for the control of the ammunition replenishment plan?

Determining The Amount Of Ammunition

- The supported arm commanders are responsible for formulating the overall plan for an operation. The various combat support commanders translate the overall operational plan into their specialist plan. Being the specialists in their own fields, the combat support commanders are indeed responsible for working out the details of the specialist equipment required to support the operation. In this respect, therefore, the artillery commanders will have to work out the details of the expected ammunition expenditure. Even though

the supported arm commanders are responsible for the operations as a whole, the artillery commanders will be made accountable for the determination of ammunition required.

- There is no magic formula for the calculation of ammunition required for a specific operation. His experience, past records and his comparative studies of the past campaign can assist an artillery commander in arriving at some reasonable figures. The total amount of ammunition so calculated is then translated in terms of first line scale. It is this scale that is communicated to the units. The units then will translate this scale into the number of rounds for subsequent demand to the ordnance depot.

Formulating The Logistic Plan

- At the divisional level, the logistic staff of the Divisional Artillery HQ (Div Arty HQ) will formulate the artillery ammunition logistic plan. The Div Arty HQ logistic staff will then discuss the plan with the division's general logistic staff to determine the feasibility of the artillery plan within the context of the overall divisional logistic plan. The artillery logistic plan must take into consideration of the following:

- The immediate and future ammunition requirements.
- The present and future locations of the fighting and logistic units.



VIPs at the scene of the inaugural firing of 155 mm FH 70 at 'Railway Track Gemas'. Among them are the late Deputy Chief of the Army (third from right) and the former Director of Artillery (second from right).



A crane is normally used in a loading and unloading works

- The mode of transportation available.
- The nature of the terrain and climatic conditions.
- The safety and security aspects of moving large amounts of ammunition.
- The control arrangement to ensure the ammunition arrives at the intended locations on time.

* At the brigade level, the Artillery Tactical HQ (Arty Tac HQ) staff of the in direct support artillery Regiment will prepare the logistic plan. The plan is then discussed with the brigade's logistic staff for approval by the commander. During the early preparation of the plan, it is advisable for the Arty Tac HQ staff to consult the Regiment Second in Command (2 i/c). This is necessary because at the regimental level the battle is very fluid and the deployment of batteries is done by the regiment's 2 i/c. The implementation of the logistic plan would be much simpler and quicker if the 2 i/c is kept informed from the very beginning with the artillery ammunition plan.

Implementing The Ammunition Logistic Plan.

Many agencies are involved in the implementation of this logistic plan. For the purpose of our dis-

cussion, the implementation process is divided into three stages:

● Stage 1. From The DMA To the BMA.

Once the logistic plan is approved by the general officer commanding (GOC), the Div HQ logistic staff will issue out the logistic orders. The envisaged activities, thereafter would be as follows:

- The Div HQ will detail units to provide the escorts and the fatigues.
- The ordnance depot will prepare the ammunition to be issued.
- The Service Corps will provide the required number of transport and co-ordinate the implementation of the plan throughout.
- The Military Police will provide the traffic controllers.
- Before the move the escort commander will give out his movement orders.

● Stage 2. Action At The BMA.

Since the BMA is usually crowded, understaffed and is also very close to the front line, it is not advisable to dump artillery ammunition there. It would, therefore, be desirable for the ammunition convoy to transit at the BMA as short



A gun tower fully laden with ammunition is pulling a 155mm gun.



The first 155mm FH70 ammunition ever being fired in Malaysia

as possible. The envisaged activities at the BMA would be as follows:

- On being notified that the ammunition convoy has departed the DMA, the Officer Commanding BMA (OC BMA) will organise a reception party and a regulating centre at or near the vicinity of the BMA.
- The OC BMA will formulate the ammunition distribution plan. In formulating this plan he will be advised and assisted by the quartermasters (QMs) of the affected artillery units within the brigade area.
- Once the convoy arrives at the BMA, its personnels are rested. OC BMA will be responsible to arrange escorts and fatigue party and to exercise any forms of control for subsequent move forward of the BMA. The manpower requirement for the escorts and fatigue party will have to come from the units within the brigade. To avoid double handling, there is no necessity to transfer the ammunition to the brigade's organic transport. The vehicles from the DMA will still be used in this move.
- The Technical QM or his representative will lead the convoy to the unit area.

● **Stage 3. Action At The Unit Line.** It may be realised that gun batteries are not grouped together. Depending on the phases of the war the batteries may be on the move or at temporary positions. Therefore to avoid double handling of ammunition and unnecessary delay the ammunition convoy must transit at the unit regulating centre. The envisaged activities at the unit are as follows:

- On being notified that the convoy has departed the BMA, the Regimental Command Post (RCP) will organise a unit regulating centre. This centre may be commanded by the Regimental Sergeant Major (RSM). The RQM will be present.
- The gun batteries will send the BQMSs to the centre, and communications are established.
- When the convoy arrives, the vehicles are put into hides. The drivers and the escorts are rested while the ammunition is being checked by the RQMS and the BQMSs. The distribution of the ammunitions to the batteries is done here. There is no necessity to off-load all the ammunition. The same vehicles can be used to carry the ammunition to the positions.
- The RQMS and the BQMSs are responsible to carry out all the necessary documentation at the centre. Once everything is in order and the drivers and the escorts have been rested, the BQMSs



Unloading ammunition from a carrier fitted with a hydraulic power system

can lead their respective ammunition vehicles to the gun positions. Before moving off, it is advisable to communicate with the gun positions to confirm their current locations.

The Control Of The Ammunition Replenishment Plan. The purpose of the control is to ensure that the implementation is in accordance with the plan. The control system should be able to measure the progress of the plan, detect any deviations and to indicate corrective actions. The movement of ammunition convoy is a secret operation as to avoid disruptions by the enemy. Failure to exercise good control can result in guns having no ammunition to fire at crucial moments. The movement of the ammunition convoy must be treated as an operational move and the responsibility for controlling the move lies with the "G" staff of the Div HQ working together with the "G" staff of the Div Arty HQ. The control mechanism should take the followings into consideration:

- Communications must be established at the following agencies to facilitate progress report:

- Div HQ as control.
- DMA.

- BMA.
- Regulating centres.
- Within the convoy itself.
- Affected units.

- Only units into which areas the convoy would be passing need be notified.
- The convoy should be given priority of routes.
- In order not to put "all the eggs into one basket," avoid moving in one big convoy at one time along the same route. This may appear as being easier said than done, but in the interest of security, this may be the only viable solution.
- Location state, in code, must be sent in by the convoy commander at specific time or location.
- Communications on the move must be kept to the very minimum.
- The convoy should not be easily identified as an ammunition carrying convo.

DUMPING OF AMMUNITION

Dumping of ammunition should be considered under the following circumstances:

- When expenditure of ammunition is expected to be high.
- When the means of transportation are limited or when there is a shortage of transport for a long duration.
- When adverse weather condition is expected to hamper the movement of vehicles.

Dumping of ammunition should not be on a fixed regular basis because it has great security implications. The likely places where dumping can be done during the various phases of war are as follows:

- **In The Advance Phase.** In this phase, the batteries are highly mobile moving forward. Batteries can change locations every four hours. In such a fluid situation, if dumping is necessary, it should be done at the BMA. Certain amounts of ammunition should be on wheels ready to move forward as and when they are required.
- **In The Attack and Defence Phases.** Once the main gun positions have been determined,

dumping can be done at the main gun position and at the BMA.

- **In The Withdrawal Phase.** This is the reverse of the advance. Limited dumpings should be carried out at the temporary gun position along the line of withdrawal. The ammunition should be on wheels so that it can be moved quickly as the situation changes. It is important that the ammunitions should neither fall into the enemy's hands nor they be destroyed due to the lack of vehicles to move them.

CONCLUSION

Ammunition in war, is a much sought after commodity both by us and the enemy. Like everything else in the Army, the smooth flow of ammunitions from the logistic depots to units depends very much on the competency of those people concerned in the handling of ammunitions and the understanding of the procedure.

The proposed procedure is based on our concept of operation. It does not attempt to provide a total answer but rather a theoretical framework to be tested during exercises. It is hoped that more detailed and comprehensive procedure suitable to our organization and environment could be formulated.

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Kol Aris bin Salim is one of the most prolific contributors to this journal. He was commissioned into the Artillery Corps on 17 Dec 63. Throughout his career he has held various appointments at regimental, formation and ministry levels, including a tour as the Commandant of Artillery School. He is currently the Commander of Divisional Artillery.

'In war, when a commander becomes so bereft of reason and perspective that he fails to understand the dependence of arms on Divine guidance, he no longer deserves victory.'

— Gen Douglas Mac Arthur

SATU CARA KEARAH ME 'COMBAT' PO ANGGOTA TENTER

KOL LAHADZIR BIN SALLEH

Taktik pasukan infantri di dalam peperangan melawan komunis semenjak darurat dahulu hinggalah ke hari ini tidak banyak berubah. Pada amnya ia merupakan "intensive patrolling". Gerakan-gerakan dijalankan dalam hutan rimba yang terletak jauh dari kemudahan-kemudahan jalan raya. Walaupun ada kalanya kemudahan tersebut boleh didapati, tetapi oleh kerana kehendak-kehendak operasi, maka segala keperluan setiap individu terpaksa dipikul sendiri setiap masa. Sejak wujudnya bantuan udara yang merupakan 'airdrop' atau pendaratan helikopter, sekarang ini, tugas mereka menjadi lebih senang jika dibandingkan dengan masa darurat dahulu. Mereka tidak lagi perlu keluar masuk semata-mata untuk mendapatkan bekalan. Walaupun demikian kehendak-kehendak operasi yang mementingkan pergerakan secara sulit masih menghadkan corak penyampaian bantuan kepada mereka.

Kemajuan yang telah dicapai dari segi persenjataan dan peralatan telah meningkatkan keupayaan 'combat power' setiap individu sekarang ini. Repal M16 telah menggantikan SLR yang lebih panjang dan berat, juga 'spike proof combat boot' yang tahan lebih lama telah menggantikan 'jungle boot'. Ini juga dengan sendirinya meningkatkan 'combat power' dengan membolehkan bergerak lebih selesa tanpa memikul keperluan yang berat-berat. Namun demikian hingga sekarang ini masih didapati seseorang askar infantri perlu memikul pek yang besar dan berat semasa 'masuk hutan'. Hal ini bolehlah dikaitkan dengan keperluan membawa bekalan secukupnya bagi tempoh masa operasi hingga hari pembekalan semula tiba. Pada kebiasaannya setiap anggota perlu membawa bekalan secukupnya untuk 10 hari hingga ke 14 hari. Hitung panjang, berat ransum untuk 10 hari ialah 14kg. Isipadunya pula memenuhi ruang yang luas di dalam

pek. Keadaan ini dengan sendirinya pula mengkan 'combat power' si pembawanya kerana ia tidak dapat bergerak dengan lebih cergas dan pantas. Pada kebiasaannya anggota-anggota tidak membawa kesemuanya ransum yang dibekalkan untuk mengurangkan beratnya. Mereka memilih dan membawa apa yang diperlukan sahaja dan meninggalkan yang lain. Oleh yang demikian mereka tidak mendapat khasiat daripada makanan seperti yang sepatutnya.

Jika dipandang dari segi zahirnya, 'normal combat ration' tersebut telah tidak berubah selayaknya diwujudkan lebih daripada 25 tahun yang lepas, sama ada dari segi kuantiti, berat atau bentuknya. Pada hakikatnya sifat-sifat 'normal combat ration' ini juga mempengaruhi 'combat power' setiap individu dengan menghadkan kebolehan bergerak. Sungguhpun banyak usaha telah dijalankan dari segi mempelbagaikan citarasa ransum tersebut sejak tahun 70an lagi, tetapi dari segi berat dan bentuk ia masih lagi berada di dalam tin yang serupa. Dari segi lauk-pauk, kesemuanya dibekalkan di dalam tin mengikut saiz dan berat yang dapat dilihat hingga ke hari ini. Adalah aneh dari bahawa komponen kering di dalam 'normal combat ration' tersebut tidak boleh lagi di baiki dari segi berat dan isipadu tanpa membatalkan kuantitinya. Dalam keadaan ini, apa yang boleh di baiki hanyalah dari segi pembungkusan sahaja. Tetapi lauk-pauk di dalam tin tersebut dirasakan boleh dimantapkan lagi, khususnya mengurangkan berat dan isipadunya tanpa merangsang citarasa, khasiat dan kalorinya. Keadaan boleh dilaksanakan memandang bahawa kandungan tin-tin lauk-pauk tersebut semuanya mengandung kuah yang cair. Pendeknya boleh dikatakan kandungan air lauk-pauk tersebut berada ditengah-tengah yang tinggi. Sekiranya kandungan air di dalam

ATKAN ER

tin-tin tersebut boleh dikurangkan maka sudah pastilah berat keseluruhan pek turut dapat dikurangkan.

Sehubungan dengan pandangan tersebut satu kajian secara ringkas telah diadakan ke atas lauk-pauk 'normal combat ration' yang dibekalkan masa kini. Lima belas tin lauk yang terdapat di dalam lima bungkus ransum kombatan jenis B1, B2, C1, E2 dan F1 telah diuji oleh lima orang secara berasingan. Jenis lauk-pauk yang telah dianalisis isi kandungannya sebelum diuji dan selepas diuji adalah seperti pada rajah di bawah. Apa yang dilakukan semasa kajian tersebut hanyalah dengan memekatkan kandungan tin-tin dengan membuka dan memanaskannya hingga ia menjadi pekat. Setelah sejuk, lauk-pauk ini ditambah air dan dipanaskan semula dan dimakan. Pada amnya adalah didapati rasa lauk-lauk tidak berubah. Data dari kajian ini adalah seperti ditunjukkan di dalam rajah yang sama.

Sepertimana yang dijangkakan, adalah didapati bahawa hasil kajian boleh dirumuskan seperti berikut:

- Rasa tidak berubah.
- Purata berat berkurangan sebanyak 26% bagi semua kandungan dalam tin.
- Purata isi kandungan berkurangan sebanyak 26%.
- Saiz tin boleh dikecilkan hingga 26% mengikut isi kandungannya.
- Kajian tidak dapat memastikan kekurangan berat tin yang telah dikosongkan (displaced).

Memandangkan bahawa perubahan ini adalah di dalam keupayaan teknologi masa kini dan juga hasilnya yang memberi manfaat, maka kajian seterusnya harus diadakan ke arah ini khusus untuk meningkatkan 'combat power' anggota infantri di hari muka.



KAJIAN RANSUM 'NORMAL COMBAT RATION'

Bil.	Jenis	Sukatan yang diluluskan		Sukatan Sebelum Diuji				Sukatan Selepas Diuji				Peratus Kurang		Catatan
		Berat	Paras	Berat Sebenar	Lebih/ Kurang		Sebenar		Kurang		Berat	Paras		
					Berat	Paras	Berat	Paras	Berat	Paras				
1.	Ikan Tomato	300gm	78mm	385gm	+85gm (28%)	-	250gm	43mm	135gm	35mm	35%	44%		
2.	Kari Ikan:													
	• Tin Pertama	300gm	78mm	380gm	+80gm (26%)	-	280gm	56mm	100gm	22mm	26%	28%		
	• Tin Kedua	300gm	78mm	370gm	+70gm (23%)	-	290gm	61mm	80gm	17mm	21%	21%		
3.	Kari Kambing:													
	• Tin Pertama	300gm	78mm	390gm	+90gm (30%)	-	320gm	67mm	70gm	11mm	17%	14%		
	• Tin Kedua	300gm	78mm	370gm	+70gm (23%)	-	300gm	61mm	70gm	17mm	23%	21%		
	• Tin Ketiga	300gm	78mm	370gm	+70gm (23%)	-	280gm	56mm	90gm	22mm	24%	28%		
	• Tin Keempat	300gm	78mm	380gm	+80gm (26%)	-	270gm	53mm	110gm	25mm	28%	32%		

4.	Kari Lembu:	300gm	78mm	370gm	+70gm (23%)	—	290gm	53mm	80gm	25mm	21%	32%
	● Tin Pertama	300gm	78mm	370gm	+70gm (23%)	—	290gm	53mm	80gm	25mm	21%	32%
	● Tin Kedua	300 gm	78 mm	370gm	+70gm (23%)	—	210gm	50mm	160gm	28mm	43%	35%
5.	Kari Ayam:	300gm	78mm	400gm	+100gm (33%)	—	300gm	59mm	100gm	19mm	25%	24%
	● Tin Pertama	300gm	78mm	400gm	+100gm (33%)	—	295gm	62mm	65gm	16mm	18%	20%
	● Tin Kedua	300 gm	78 mm	360gm	+60gm (20%)	—	210gm	67mm	100gm	11mm	32%	14%
6.	Kacang Panjang Masak Lemak	300gm	78mm	310gm	+10gm (3.3%)	—	290mm	59mm	80gm	19mm	21%	24%
7.	Kacang Panggang (Processed Peas):	300gm	78mm	370gm	+70gm (23%)	—	200gm	65mm	90gm	13mm	31%	16%
	● Tin Pertama	300gm	78mm	290gm	—10gm (3.3%)	—	240gm	48mm	130gm	30mm	35%	38%
	● Tin Kedua	300gm	78mm	370gm	+70gm (23%)	—	310gm	53mm	70gm	25mm	18%	32%
	● Tin Ketiga	300gm	78mm	380gm	+80gm (26%)	—	270.93gm	57.06mm	95.62gm	20.93mm	26.12%	26.43%
	Purata Berat/Susut	—	—	366.56gm	+66.56gm (21.87%)	—	270.93gm	57.06mm	95.62gm	20.93mm	26.12%	26.43%

Kol Lahadzir bin Salleh merupakan salah seorang Pegawai Kanan yang berpengalaman luas. Beliau telah memegang beberapa jawatan termasuk pemerintah di pelbagai peringkat pasukan infantri, serta pegawai staf di formasi dan Kementerian. Kini beliau menjadi Ketua Pegawai Turus Gerak, Majlis Keselamatan Negara.

It used to be that people needed products to survive. Now products need people to survive.

— Nicholas Johnson



APPLICATION OF EDUCATIONAL TECHNOLOGY

MEJ LOO CHAI SOON

EDUCATIONAL TECHNOLOGY

Educational technology is not only about audio-visual aids and electrical gadgetry used in a teaching situation. But it is as wide as education itself. Essentially, it is the application of scientific methods to an educative process, a rational and problem-solving approach to education, a way of thinking scientifically and systematically about the teaching - learning process (Rowntree, 1979).

Education comprises many subsystems. All of which facilitate and work towards the single most important subsystem called the learning process. Hence, the educational technology approach is also known as systems approach (Rowntree, 1979).

In the context of education, educational technology has a multitude of applications. But the emphasis here is on the curriculum development for academic teaching in the military training establishments.

CURRICULUM DEVELOPMENT

Basically, an academic instructor needs to establish what he wants to achieve with the trainees. Then he decides the means and resources to succeed. Finally, he assesses to what extent he has been successful in his attempts. In other words, the planning of learning activities intended to bring about certain changes in the trainees and the assessment of the extent to which these changes have taken place is meant by curriculum development (Nicholls, 1983).

ACADEMIC TEACHING

An academic teaching in a military training establishment plays a supportive role. It provides the foundation and enhances learning in the later phase of the professional military training. The mode and direction of an academic teaching are therefore invariably dictated by the military needs it complements. In this connection, a curriculum for an academic teaching must be derived from the military training that it supports. Only then can teaching be aligned to the actual training needs. This will also ensure relevancy and continuity of teaching from the academic to the professional phase.

There are no specific textbooks or BRs to cater for academic teachings. Academic instructors themselves have to plan and develop the required curriculum. In the face of rapid technical advances in the MAF, we can no longer be traditionalists, accepting blindly what have been adopted by our orthodox predecessors. We must be able to innovate, plan and develop the relevant curricula to meet the changing needs.

At present, we are still lacking in a theoretical framework to formulate a curriculum for an academic teaching. More often than not, curriculum development is carried out on an intuitive basis. As such, there are doubts as to whether the existing curricula for the academic teaching are effective in their supportive roles.

Hence, it is imperative that a development

model be designed to serve dual functions: one is for developing academic curricula and the other is to verify the relevancy of the existing academic syllabi used. Such a model is suggested in figure 1.

MODEL

The development model is cyclic in nature. It is a dynamic and continuous process. Improvements are made to other phases through the 'feedback-loops' of the Evaluation Phase. The ring signifies the constraints imposed by the situation under which teaching and training are carried out. The constraints can influence and limit every development phase. The effects cannot be ignored. However, the broken ring suggests that such constraints are not immutable. The development model is further amplified in figure 2, followed by the explanatory notes:

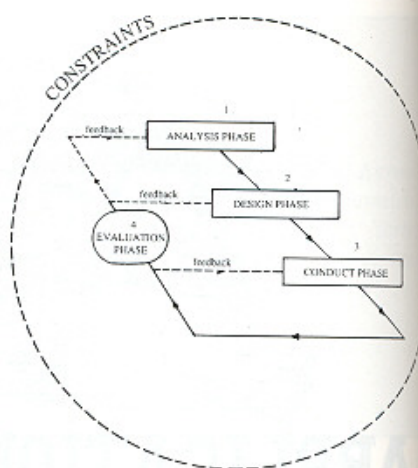


Figure 1. Suggested Curriculum Development Model For Academic Teaching

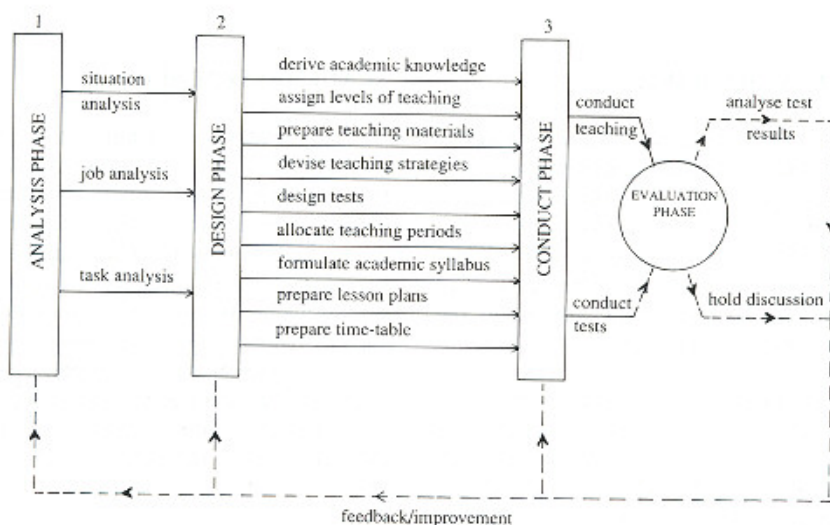


Figure 2. Amplified Development Model

ANALYSIS PHASE

Situation Analysis

Examine the overall objectives of a particular military training which the academic teaching supports.

● Consider the following constraints:

- The teaching and training facilities available.
- The material, equipment and human resources required.

- The space, time and finances allowed.
- The expectation of the organisation the trainees and the instructors.
- The quality of both the trainees and the instructors.
- The entry knowledge and skills of the trainees concerned.

Job Analysis

- Analyse the jobs that the trainees are to perform on completion of the military training

question. This is done by breaking the job into its constituents, namely duties, tasks and subtasks.

• The following sources of information are of great help.

- Direct observation of the job being performed in the field.
- Relevant training manuals and publications
- Personal knowledge and experience of the military instructors.
- Formal or informal interviews, discussions with the job-holders, job-supervisors and job-specialists.

Task Analysis

• Identify the military knowledge and skills required to achieve the respective tasks analysed.

• Based on the guide in Annex A, assign the appropriate levels of military training to those knowledge and skills identified above.

• This is to ensure the optimum use of the military training resources.

DESIGN PHASE

• Derive the academic knowledge to enhance the learning or those military knowledge identified earlier.

• Based on the guide in Annex B, assign the appropriate attainment levels to demarcate the extent to which a particular academic knowledge needs to be dealt with. This is to avoid under-teaching which renders academic teaching ineffective. On the other hand, over-teaching can result in the waste of academic resources.

• Prepare relevant materials to impart the academic knowledge derived above.

• Devise teaching strategies, methods and learning activities.

• Allocate the number of teaching periods required.

• Design tests for assessment and evaluation purposes.

• Formulate the required academic syllabus. Subsequently, work out the rest of the curriculum concerned.

• Prepare lesson plans for classroom teaching.

• Draw up timetable.

CONDUCT PHASE

• Based on the lesson plans, conduct classroom teachings.

• Conduct tests as designed.

EVALUATION PHASE

• Analyse test results to assess trainees' academic performance and progress.

• If necessary, revise and improve the whole curriculum through the four development phases.

Composition

Figure 3 suggests the basic composition of an academic curriculum in support of military training. The syllabus is directly derived from the military training it complements. It also serves as a blueprint for working out the other elements of the curriculum.

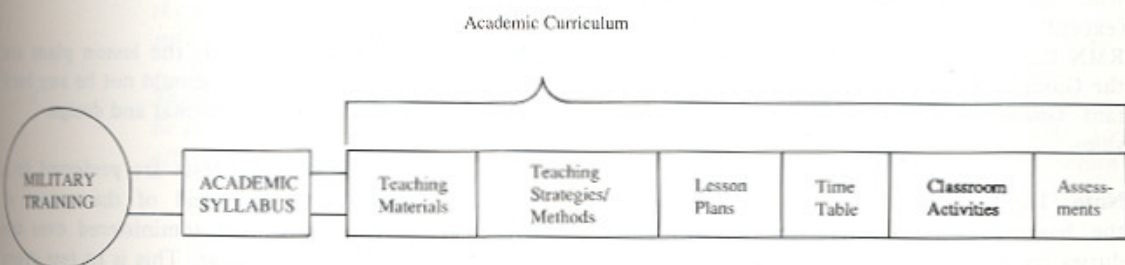


Figure 3. Composition Of an Academic Curriculum

Working Team

An academic instructor cannot by himself develop the required curriculum. The job analysts should comprise personnel directly involved in military training, preferably military instructors teaching professional subjects. There must be one other job specialist to advise, verify and authenticate the analysis done.

AN ILLUSTRATION

In KD PELANDOK Training Centre, the Gunnery Department had requested that the cadet-officers attend academic classes prior to learning the professional gunnery subjects. Subsequently, the development model was used to formulate the required curriculum for an academic teaching. The mechanics involved is as follows:

WORKING TEAM

Job Analysts:

- Mej Loo Chai Soon (academic instructor).
- Lt Kdr Ghazi bin Ismail (G) TLDM (Gunnery Instructor).
- Lt Kdr Abd Malek bin Abu Hassan (G) TLDM (Gunnery instructor).

Job Specialist

- Kept Abu Bakar bin Abd Jamal (G) TLDM.
- Lt Kdr Syed Abu Bakar bin Syed Burhan Al Cadery (G) TLDM.

ANALYSIS PHASE

Situation Analysis:

- **Training Objectives.** The Officer's School is to train the Cadets and Midshipmen to be General Duty Officers of the ranks Acting/Sub-Lieutenants who are competent to take up appointments (except those of the Technical Branch) on board RMN Capital and Small ships. On the other hand, the Gunnery Department is to train them as 'Assistant Gunnery Officers' on board RMN Capital ships.

Note: The General Duty Officers have been given the basic gunnery training to perform gunnery duties on board the ships. However, they are only qualified to assist the Specialist Gunnery Officers on board the Capital ships. 'Assistant' is just an

appointment deliberately created to facilitate subsequent job and task analysis.

- **Constraints:** Nil.

Job Analysis: See Annex C.

Task Analysis: See Annex D.

DESIGN PHASE

See Annex E for the academic syllabus so developed. Other elements of the curriculum had been subsequently worked out.

CONDUCT PHASE

To be carried out.

EVALUATION PHASE

To be carried out.

GENERAL REMARKS

- **Academic Syllabus.** Note that the syllabus statements are written in performance terms, using verbs that describe what the academic instructors are supposed to teach and the trainees are to learn. Both the instructors and the trainees will know what to expect of each other, making the teaching learning process more effective.

- **Teaching Materials.** The teaching materials must be based on the academic syllabus. Additional facts should be gleaned from the relevant gunnery Branch and Training Manuals. In this way, academic teaching can be enriched and supplemented. As far as possible, gunnery examples and illustrations ought to be used in teaching the theories in principle involved.

- **Teaching Methods.** Teaching and learning activities are to be varied accordingly. For instance, academic teaching can be conducted on board ships where the radar and gunnery systems can readily be used as excellent aids.

- **Lesson Plans.** As long as the lesson plans are relevant and effective, there should not be any hard and fast rules as regards the format and design.

- **Assessments.** Progress tests are preferred to single examination at the end of the course. A number of tests should be administered over the entire duration of the course. This is to test every part of the syllabus and enable the trainees' performance to be monitored as the classes progress.

At the same time, remedial actions can be taken at the end of each test should the trainees fail to meet the levels as prescribed in the syllabus.

- **Amendments.** Should there be any change to the needs of the professional gunnery training, amendments made must be documented through the four development phases.

CONCLUSION

The suggested development model depicts a logical process in building an academic curriculum in support of military training. It is also a systems approach to an educative process and an application of educational technology. Curriculum development offers opportunities of putting theories to test in a realistic situation. It should be part of the academic instructors' professional responsibilities. However, it is not the prerogatives of an academic instructor to develop a curriculum to com-

plement a particular military training. Such efforts must be jointly undertaken with those military instructors concerned. Only then can the academic teaching be relevant and effective.

In view of the modernisation programmes being introduced into the MAF, academic teachings will inevitably play a more active role in the near future. It will not be effective if there is not a sound basis for the curriculum development process. Perhaps the Education Corps should have already anticipated the future military needs and possessed personnel trained in the field of curriculum development. Nevertheless, it is suggested that a Curriculum Development Wing be set up under the auspices of the proposed School of Education. The Wing can undertake to develop curricula for academic teaching in all the military training establishments. At the same time, the existing curricula can also be reviewed to ascertain their relevancy and effectiveness.

ANNEX A

LEVELS OF PROFESSIONAL TRAINING/TEACHING

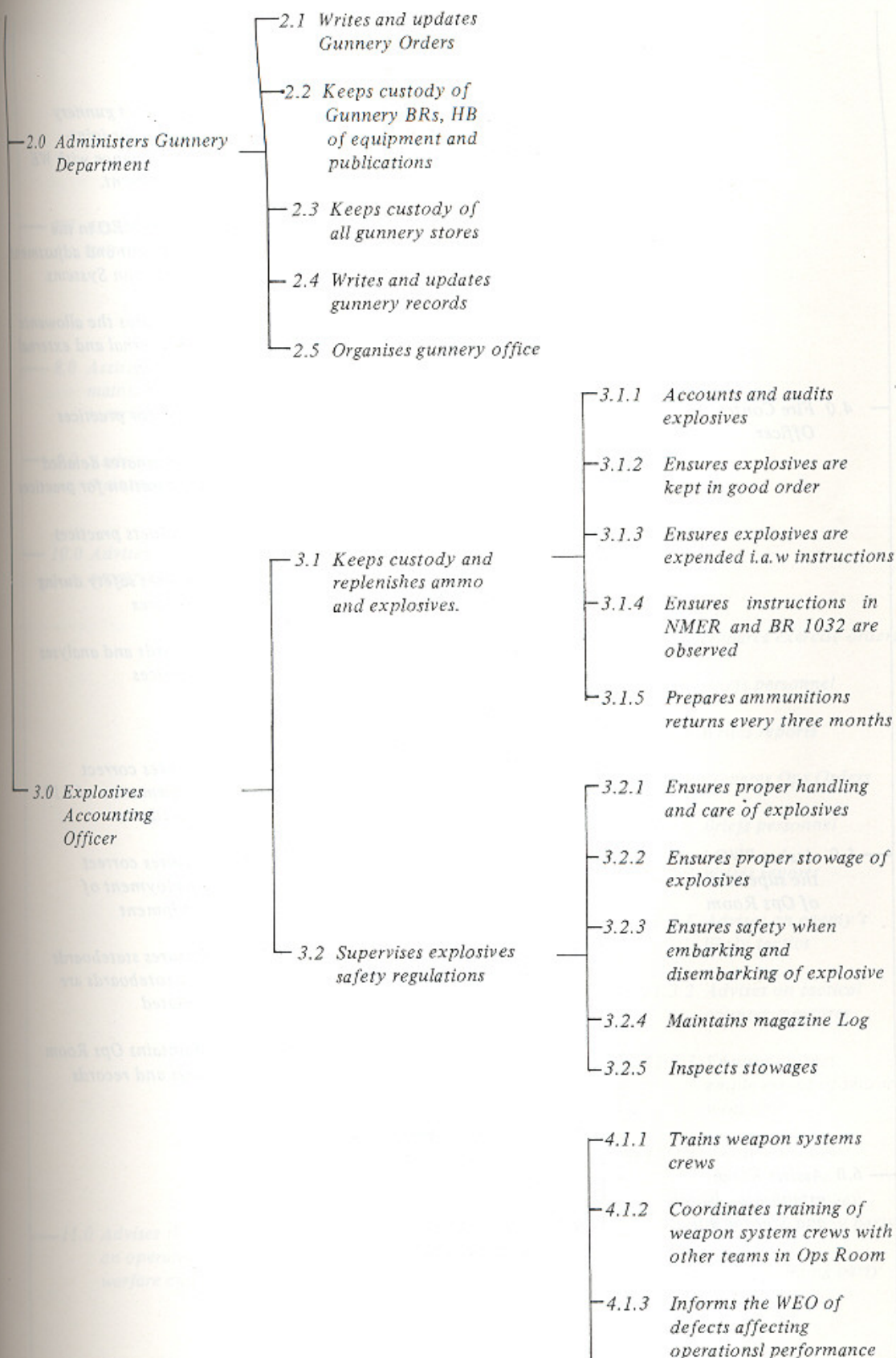
LEVEL	DEFINITION	REMARKS
0	<i>The task does not require teaching/training at this time or teaching/training has been given previously.</i>	<i>No teaching/training to be given.</i>
1	<i>The task is described or demonstrated as part of the job but the trainees are not expected to perform the task after having been taught the knowledge and skills.</i>	<i>Familiarisation training/teaching is given but not to job standard.</i>
2	<i>Having been taught/trained, the trainee must demonstrate that he can perform the task correctly although not with the speed or polished skill required.</i>	<i>The knowledge and skills taught are tested but not to the job standard.</i>
3	<i>Having been taught/trained, the trainee must demonstrate that he can perform the task at the level of accuracy and speed required in the job.</i>	<i>The knowledge and skills taught are to job standard.</i>
4	<i>The trainees must overlearn i.e. he must be given additional practice on the task after he has reached level 3.</i>	<i>The knowledge and skills taught are tested and then continuously re-tested to produce higher retention learning.</i>

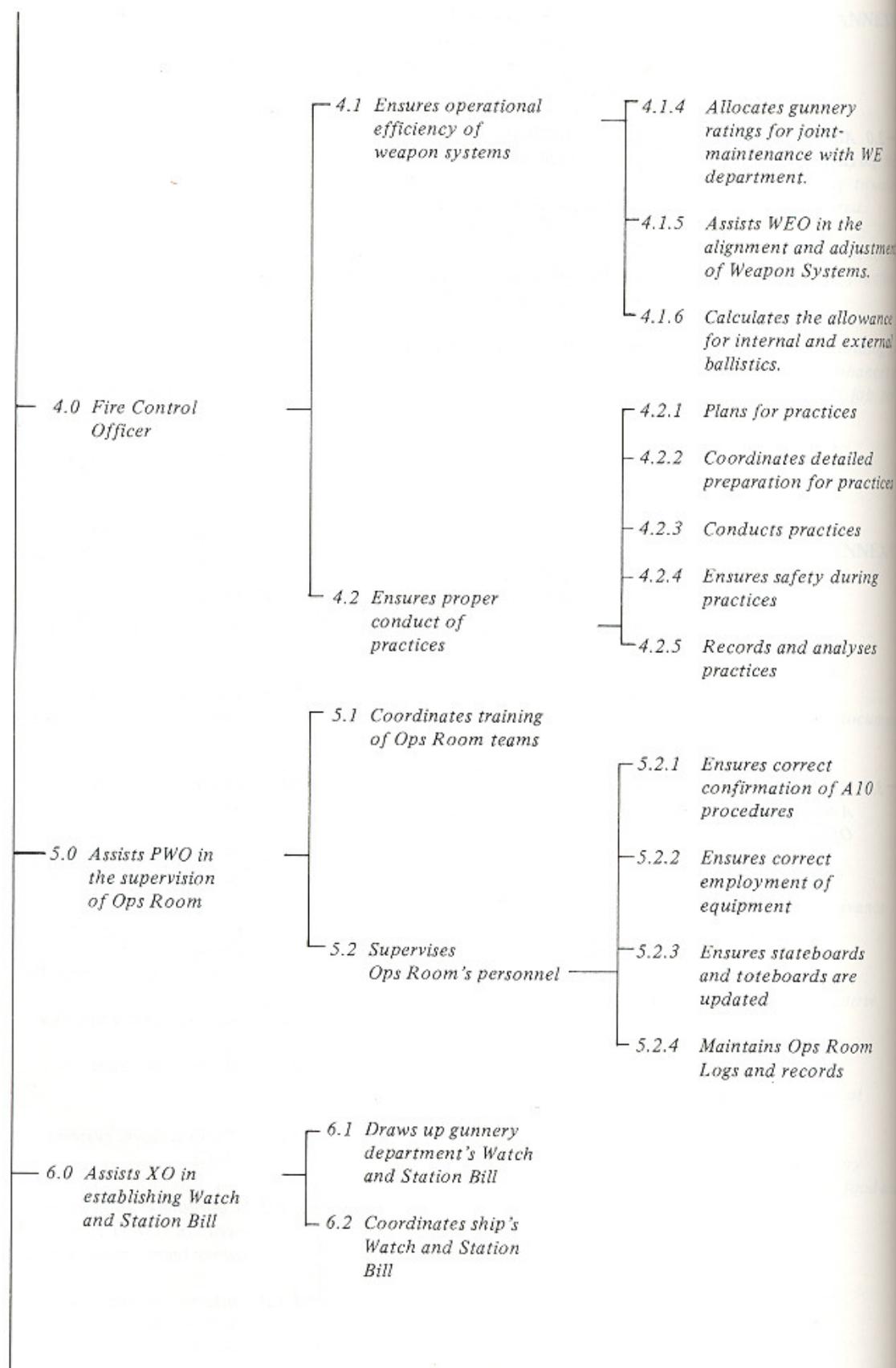
ATTAINMENT LEVELS FOR AN ACADEMIC TEACHING

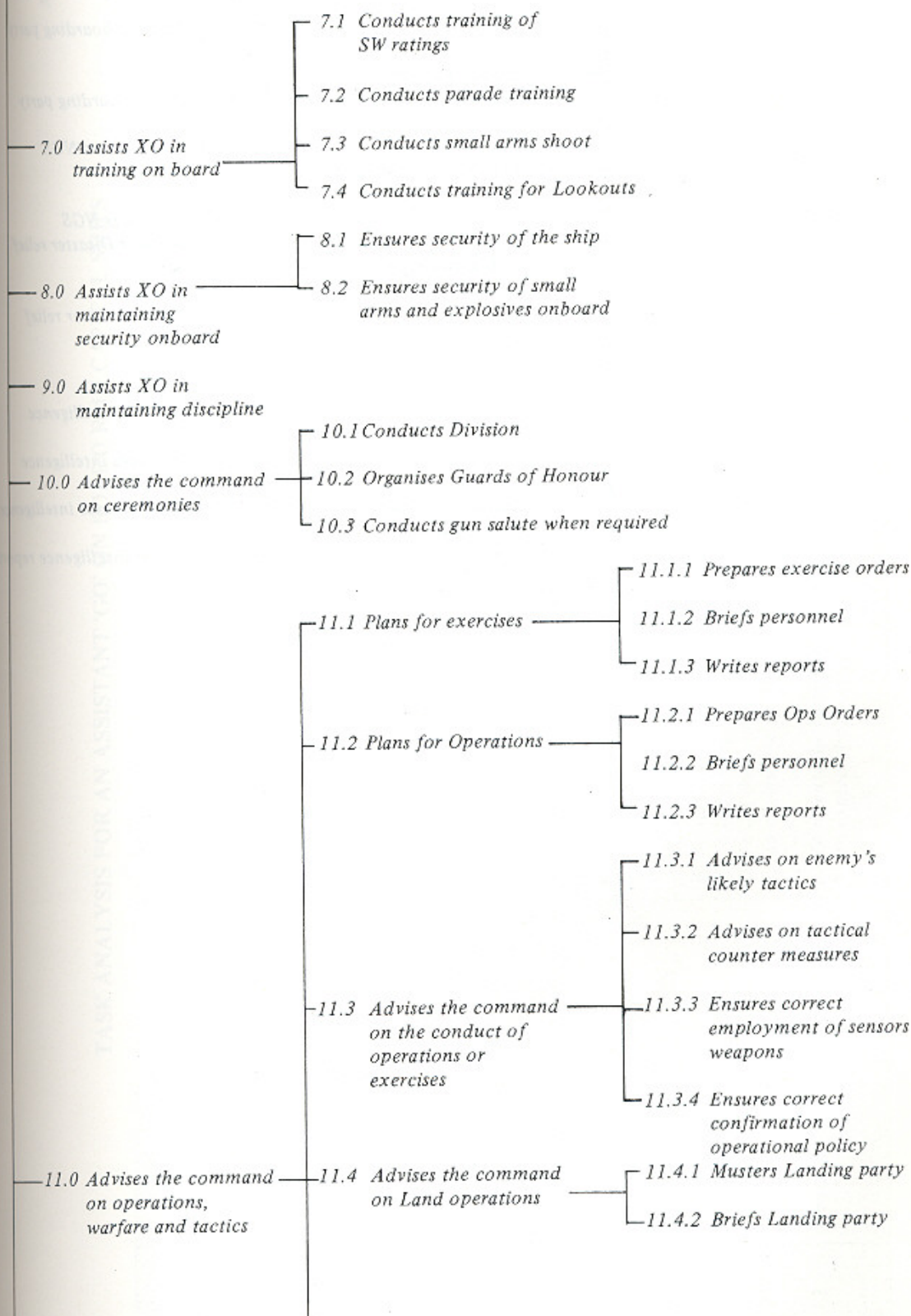
LEVEL	DESCRIPTION
A	The trainees must demonstrate thorough knowledge and understanding in applying principles of the subject matter. The knowledge is significant in contributing towards the practical performance of the job concerned. A high level of test result is required.
B	The trainees are to have good knowledge and understanding in describing the essence of the subject matter. The knowledge is significant in contributing towards the practical performance of the job concerned. A high level of test result is required.
C	The trainees are expected to possess the elementary knowledge and understanding explaining the general concept of the subject matter. The knowledge only enhances better appreciation of the job concerned. It is unlikely to affect the practical job performance. It does not require a high level of test result.

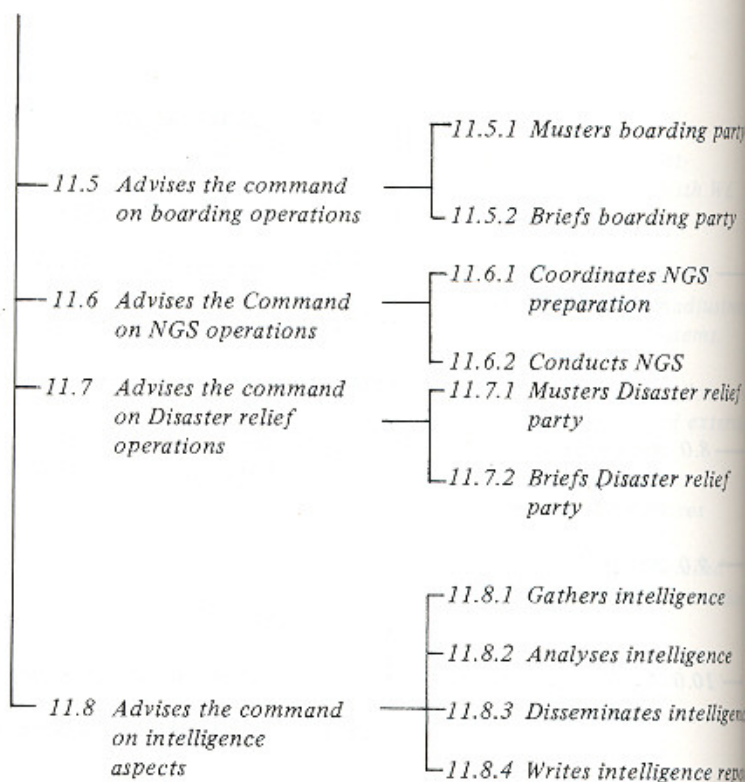
JOB ANALYSIS FOR AN ASSISTANT GUNNERY OFFICER
ON BOARD RMN CAPITAL SHIPS

JOB	DUTY	TASK	SUB-TASK
	1.0 Divisional Officer for sw ratings	1.1 Maintains ratings' service documents	1.1.1 Updates service documents
			1.1.2 Writes reports
		1.2 Recommends ratings for advancements and course	1.2.1 Assesses ratings' performance
			1.2.2 Prepares ratings' documents for advance ments
			1.2.3 Prepares ratings' documents for course
		1.3 Looks after ratings' welfare	1.3.1 Counsels ratings
			1.3.2 Represent ratings at Captains' Table
			1.3.3 Ensures satisfactory accommodation, food, clothing









TASK ANALYSIS FOR AN ASSISTANT 'GO' ON BOARD RMN CAPITAL SHIPS

Task No.	Task Descriptions	Knowledge and Skills (c)	Level of Training (d)	Academic Involvement (e)
(a)	(b)			
1.1.1	Updates service documents	a. To list the contents of service documents. b. To state how the entries are made. c. To list the occasions to update service documents. d. To list the authorities for making entries into service documents.		
1.1.2	Writes reports	a. To list the types of reports. b. To explain and illustrate how reports are written. c. To explain and illustrate how adverse report procedures are carried out. d. To list the occasions to write reports.		
1.2.1	Assesses ratings' performance	a. To list the duties of SW ratings onboard. b. To explain how assessment is done.		
1.2.2	Prepares ratings' documents for courses	a. To state the training scheme of the SW ratings. b. To list the requirements for courses. c. To list the forms and documents required for courses. d. To state the actions to be taken when a rating fails the course.		
1.2.3	Prepares ratings' documents for advancements	a. To state the advancement policy of the SW ratings. b. To state the advancement authorities in RMN. c. To list the requirements for advancement. d. To list the forms and documents to be prepared for advancement. e. To explain the readvancement procedures.		
1.3.1	Counsels ratings	a. To discuss the basic principle in counselling. b. To explain the procedure in stating a complaint.		

(a)	(b)	(c)	(d)	(e)
1.3.2	Represents rating at Captain's table	a. To state the duties of a Divisional Officer at Captain's table.		
1.3.3	Ensures satisfactory accommodation, food and clothings.	a. To state the rating's entitlement on food, accommodation and clothings. b. To state the requirements of Kit List. c. To explain the occasions and procedures in conducting Kit Muster.		
2.1	Writes and Updates Gunnery Orders.	a. To explain the purpose of Gunnery Orders. b. To explain how gunnery orders are compiled. c. To list and explain the contents of Gunnery War Orders. d. To list and explain the contents of Gunnery Standing Orders. e. To list and explain the contents of Gunnery Admin Orders. f. To list and explain the contents of Gunnery Safety Orders. g. To list and explain the contents of Bridge Safety Guide. h. To name the personnel required to read Gunnery Orders. i. To state the occasions personnel are required to read Gunnery Orders. j. To state the occasions and the authorities to amend Gunnery Orders.		
2.2	Keeps custody of Gunnery BRs, HBs of equipment and publications.	a. To list all the gunnery BRs, HBs and publications. b. To state the authority to obtain/keep BRs. c. To explain the procedures involved in obtaining BRs, HBs and publications. d. To state the authority for amending BRs, HBs and publications. e. To explain the procedures of obtaining amendments.		
2.3	Keeps custody of all gunnery stores.	a. To identify and name the gunnery items from general naval items. b. To state the authority to obtain/keep gunnery items. c. To explain the procedures in obtaining gunnery items. d. To explain the accounting procedures of gunnery items. e. To explain how reports on loss and damage of gunnery items are written.		
2.4	Writes and updates gunnery records.	a. To list all the records maintained by Gunnery Department. b. To state and explain the purpose of each record. c. To describe the contents of each record. d. To prepare the records for Captain's signature.		

(a)	(b)	(c)	(d)	(e)
2.5	Organises Gunnery Office	a. To draw up duty rosters for Gunnery Department personnel. b. To list out the duties of: (1) Gunnery Officer (2) Assistant Gunnery Officer (3) Gunnery Instructor (4) Gunnery Sweepers/Armourer for weapon maintenance. (5) Gunnery yeoman/seaman's writer. c. To list down the conditions for SW ratings to be considered for special duties and excused list.		
3.1.1	Accounts and Audits explosives	a. To name the sources of supply of explosives in RMN and MAF. b. To state the authority for the demand of explosives. c. To list and explain the demand procedures for explosives. d. To state the actions to be taken on receipt of explosives. e. To explain the procedures in keeping the explosives account. f. To state the occasions to inspect and examine the account. g. To list the duties of an explosive accountant.		
3.1.2	Ensures explosives are kept in good order.	As per task 3.2.1.		
3.1.3	Ensures explosives are expended i.a.w instructions.	a. To state the authority to expend ammunitions. b. To explain the procedure to record expenditure of ammo. c. To list and name the various forms used to record expenditure of ammunitions.		
3.1.4	Ensures instructions in NMER and BR 1032 are observed.	As per task 3.2.1.		
3.1.5	Prepares ammunitions return every three months.	a. To explain ammunitions return. b. To state the reasons for ammunitions return. c. To explain the procedures involved in preparing Ammunitions Return. d. To list the contents of ammunitions return.		

(a)	(b)	(c)	(d)	(e)
3.2.1	Ensures proper handling and care of explosives.	a. To state the factors affecting the serviceability of explosives. b. To explain the effects of the factors on the ammunitions. c. To explain the terms 'Lotting and Batching' and state their objectives respectively. d. To list the precautions to be taken when handling ammunitions. e. To list the steps to be taken for caring and maintaining ammunitions. f. To list the steps to be taken for care of explosives kept in Ready use Locker. g. To state the occasions for conducting periodic inspection on explosives.		*Development of Propellants. *Physical and mechanical properties of propellants.
3.2.2	Ensures proper stowage of explosives.	a. To state the classification and SHIPCAT of explosives. b. To recognise the compartment designed for stowage of explosives. c. To list the requirement for stowages.		
3.2.3	Ensures safety when embarking and disembarking explosives.	a. To explain the radio and static hazard. b. To list the preparations and factors to be considered before embarking or disembarking of explosives. c. To list the precautions to be taken when: (1) Ammunitions are alongside. (2) Embarking and disembarking in wet weather. (3) Embarking while on shore supply. (4) Embarking while transferring inflammable liquid. d. To state the correct methods of handling explosives. e. To list the points to be observed when inspecting explosives on receipt.		
3.2.4	Maintains Magazine Log.	a. To state the purpose of the log. b. To list the different categories of key. c. To state the conditions and regulations for issuing keys. d. To explain how records of inspection is entered in the log. e. To state the occasions to inspect the log.		
3.2.5	Inspects stowage.	a. To state the general regulations on the inspections of stowage. b. To list the points to be considered when inspecting stowage.		

(a)	(b)	(c)	(d)	(e)
4.1.1	Trains Weapon System Crew	a. To state the purpose of training. b. To classify methods of training. c. To explain the importance of drill. d. To discuss the important aspects of conducting individual training for: (1) Weapon Directors. (2) Weapon Controllers. (3) Missile/Gun Directors (Blind) (4) Missile/Gun Directors (Visual) (5) Weapons crews. e. To discuss the important aspects in training of crews for: (1) Guns and Guided Weapons drill. (2) Fire Control - AA. (3) Fire Control - Surface. (4) Starshell Control. (5) Ammunitions Supply. (6) Weapons directions.		
4.1.2	Coordinates training of Weapon Systems Crew with other teams in Ops Room.	a. To state the objectives of ships training. b. To list down the factors to be considered when preparing for ship training. c. To state the objectives of shake down and operational sea training. d. To explain the objectives of: (1) Basic Operational Sea Training. (2) Continuous Operational Sea Training. (3) Operation Readiness Inspections.		
4.1.3	Informs the WEO of defects affecting operational performance	a. To state the objectives of Performance checks. b. To state the objectives of Daily User Test. c. To list down the points to consider and requirements before carrying out Daily User Test. d. To list down the preparation before firing.		
4.1.4	Allocates gunnery ratings for joint maintenance with WE department.	a. To list the criteria for selecting ratings for weapons maintenance. b. To explain how maintenance schedule of weapons is kept.		

(a)	(b)	(c)	(d)	(e)
3.2.1	Ensures proper handling and care of explosives.	a. To state the factors affecting the servability of explosives. b. To explain the effects of the factors on the ammunitions. c. To explain the terms 'Lotting and Batching' and state their objectives respectively. d. To list the precautions to be taken when handling ammunitions e. To list the steps to be taken for caring and maintaining ammunitions. f. To list the steps to be taken for care of explosives kept in Ready use Locker. g. To state the occasions for conducting periodic inspection on explosives.		*Development of Propellants. *Physical and mechanical properties of propellants.
3.2.2	Ensures proper stowage of explosives.	a. To state the classification and SHIPCAT of explosives. b. To recognise the compartment designed for stowage of explosives. c. To list the requirement for stowages.		
3.2.3	Ensures safety when embarking and disembarking explosives.	a. To explain the radio and static hazard. b. To list the preparations and factors to be considered before embarking or disembarking of explosives. c. To list the precautions to be taken when: (1) Ammunitions are alongside. (2) Embarking and disembarking in wet weather. (3) Embarking while on shore supply. (4) Embarking while transferring inflammable liquid. d. To state the correct methods of handling explosives. e. To list the points to be observed when inspecting explosives on receipt.		
3.2.4	Maintains Magazine Log.	a. To state the purpose of the log. b. To list the different categories of key. c. To state the conditions and regulations for issuing keys. d. To explain how records of inspection is entered in the log. e. To state the occasions to inspect the log.		
3.2.5	Inspects stowage.	a. To state the general regulations on the inspections of stowage. b. To list the points to be considered when inspecting stowage.		

(a)	(b)	(c)	(d)	(e)
4.1.1	Trains Weapon System Crew	a. To state the purpose of training. b. To classify methods of training. c. To explain the importance of drill. d. To discuss the important aspects of conducting individual training for: (1) Weapon Directors. (2) Weapon Controllers. (3) Missile/Gun Directors (Blind) (4) Missile/Gun Directors (Visual) (5) Weapons crews. e. To discuss the important aspects in training of crews for: (1) Guns and Guided Weapons drill. (2) Fire Control – A.A. (3) Fire Control – Surface. (4) Starshell Control. (5) Ammunitions Supply. (6) Weapons directions.		
4.1.2	Coordinates training of Weapon Systems Crew with other teams in Ops Room.	a. To state the objectives of ships training. b. To list down the factors to be considered when preparing for ship training. c. To state the objectives of shake down and operational sea training. d. To explain the objectives of: (1) Basic Operational Sea Training. (2) Continuous Operational Sea Training. (3) Operation Readiness Inspections.		
4.1.3	Informs the WEO of defects affecting operational performance	a. To state the objectives of Performance checks. b. To state the objectives of Daily User Test. c. To list down the points to consider and requirements before carrying out Daily User Test. d. To list down the preparation before firing.		
4.1.4	Allocates gunnery ratings for joint maintenance with WE department.	a. To list the criteria for selecting ratings for weapons maintenance. b. To explain how maintenance schedule of weapons is kept.		

(a)	(b)	(c)	(d)	(e)
4.1.5	Assists WEO in the alignment and adjustment of Weapon System	a. To state the aim of Gunnery radar alignment. b. To state and explain the methods of Gunnery radar alignment c. To state the aim of Radar Check Test. d. To state and explain the methods of Radar Check Test. e. To state and explain the Weapon System alignment principle. f. To list and explain methods of alignment.		Basic Radar Principle.
4.1.6	Calculates the allowance Internal and external ballistics.	a. To state the effects of ballistic on the trajectory of projectile. b. To list the factors affecting internal ballistics. c. To explain how corrections are done for internal ballistics. d. To list the factor affecting external ballistics. e. To list the sources of informations for external ballistic data: (1) Range Table. (2) Barrel History Sheet. (3) Ballistic messages. f. To state and explain the methods of Compiling Range Table. g. To list the information that can be obtained from the Range Table. h. To state the purpose of Barrel History Sheet. i. To list the information that can be obtained from Barrel History Sheet. j. To state the objectives of Ballistic Message/BALMET. k. To list and explain the contents of the Ballistic Message and BALMET.		
4.2.1	Plans for Practices	a. To list down the pre-planning information required. b. To list down the requirements with planning for practices. c. To identify and name the type of targets to be used. d. To write up firing practice orders.		
4.2.2	Coordinates detailed preparations for practices.	a. To list down the contents for pre-practice briefing. b. To explain the instructions to be given to personnel involved. c. To list down all checks and test to be carried out.		

(a)	(b)	(c)	(d)	(e)
4.2.3	Conducts practices	a. To state the aim of each practice. b. To list the correct procedures to be carried out for each practice. c. To state the correct Command and Control Orders.		
4.2.4	Ensures safety during practices.	a. To draw up the Command Safety Team Organisation. b. To list down the responsibility of each member. c. To explain the precautions to be taken on internal safety. d. To explain the precautions to be taken on external safety. e. To list down the safety rules for each type of practices.		
4.2.5	Records and analyses practices.	a. To state the objectives of recording. b. To list down the methods of recording. c. To list down the equipment used for recording. d. To explain the operations of marking rake. e. To list down the requirements of human recorders. f. To state the aim and principle of analysis. g. To list down and explain each type of analysis.		Statistics: *Frequency distributions. *Measures of Central Tendency. *Measures of Dispersion. *Elementary Probability Theory. *Standard Normal Distribution curves.
5.1	Coordinates training of Ops Room team	a. To explain the functions of AIO b. To list the duties of each member of AIO team. c. To list down the types of exercises for training of AIO teams. d. To explain the objective of Command Team Training (CTT). e. To discuss the important aspects in carrying out CTT.		

(a)	(b)	(c)	(d)	(e)
5.2.1	Ensures correct confirmation of AIO procedures.	a. To list down the sources of information in AIO. b. To explain the processing of AIO informations. c. To explain the process of picture compilations. d. To state the general principle in plotting. e. To differentiate the different types of plot. f. To state the purpose of ECR and Raid Reports.		
5.2.2	Ensures correct employment of equipments.	a. To list down all the equipment in Ops Room. b. To state the functions of such equipment. c. To identify and list the capabilities and limitations of each equipment.		* Basic Radar Principle
5.2.3	Ensures stateboards and toteboards are updated.	a. To list all the stateboards/toteboards available in Ops Room. b. To list and explain the contents of each board.		
5.2.4	Maintains Ops Room Log and records.	a. To state the objectives of logging. b. To state and explain logging procedures. c. To state the need for record. d. To list down types of records required.		
6.1	Draws up gunnery Department Watch and Station bill.	a. To state the purpose of Watch and Station bill. b. To list down all factors to be considered before drawing up Watch and Station Bill: (1) Scheme of Complement. (2) Quarter Bill. (3) Normal list. (4) Types of organisation. (5) Watchkeeping system. (6) Degrees of readiness. (7) Stations for key personnel (8) Special duties and excused list.		

(a)	(b)	(c)	(d)	(e)
6.2	Coordinates ship's Batch and Station Bill.	As per Task 6.1.		
7.1	Conducts training for SW ratings.	As per Task 1.1.		
7.2	Conducts parade training	a. To state the objectives of Parade Training. b. To explain the methods of conducting Parade Training. c. To list down and explain how each drill in Parade Training is carried out.		
7.3	Conducts small arms shoot	a. To recognise and name the different types of small arms. b. To list down all the safety rules when handling small arms. c. To list down all the capabilities and limitations of each. d. To state the objective of small arms training. e. To list down the sequence of training in small arms. f. To list down the steps involved in the preparation of small arm shoot. g. To state and explain the procedure involved in conducting small arm shoot. h. To list down the safety requirements at the range. i. To explain the contents of Range Orders.		
7.4	Conducts training for Lookouts	a. To state the functions of lookout. b. To differentiate the types of lookout. c. To list down the methods of searching/routine for each type of lookout. d. To list down the advantages of lookout. e. To state the use of binoculars. f. To list down the care of binoculars.		

(a)	(b)	(c)	(d)	(e)
8.1	<i>Ensures the security of the ship</i>	a. To state the principle in security. b. To recognise and state the threats to security. c. To list the security measures taken onboard ship. d. To state the meaning of breach of security. e. To list the actions taken in the event of Breach of security. f. To list down the contents of security Standing Orders.		
8.2	<i>Ensures security of small arms and explosives.</i>	a. To differentiate the different types of keys onboard. b. To explain the procedures of issue and return of keys. c. To differentiate different types of record for each type of keys. d. To list down the precautions taken to ensure safety of small arms. e. To list down the precautions taken to ensure safety of ammunitions. f. To list down the records kept to ensure security of small arms and ammunitions. g. To state the occasions when to inspect and check on keys, small arms and ammunitions.		
9.0	<i>Assists XO in maintaining discipline.</i>	<i>As per Divisional and Admin module.</i>		
10.1	<i>Conducts Division</i>	a. To state the objectives of division. b. To differentiate the types of division. c. To list and explain the procedures in different types of Division. d. To explain how a rehearsal is conducted.		
10.2	<i>Organises Guards of Honour</i>	a. To state the policy on Guard of Honour. b. To differentiate the types of Guard of Honour. c. To list and explain the procedures to be carried out for each type of Guard of Honour. d. To explain how a rehearsal is conducted.		

(a)	(b)	(c)	(d)	(e)
10.3	Conducts Gun Salute when required.	a. To state the objective of Gun Salute. b. To list the different types of Gun salute. c. To list and explain gun salutes procedure. d. To explain how rehearsals are conducted. e. To list down the types of saluting gun in the RMN.		
11.1.1	Prepares exercise orders.	a. To list down different types of exercises. b. To state the objectives of each exercise. c. To list down the steps to be taken in the preparation of exercises. d. To list and explain the procedures of carrying out exercises. e. To explain how exercise orders are written i.a.w format.		
11.1.2	Briefs personnel.	As per Task 11.1.1		
11.1.3	Writes reports	a. To identify and state the weakness of the exercise. b. To explain how weaknesses and recommendations are written on the report of the exercise.		
11.2.1	Prepares Operation Orders	a. To list down the different types of Operations. b. To state the objectives of each operation. c. To list down steps to be taken in the preparation of the exercise. d. To explain the procedures of conducting the operations. e. To explain how operations orders are written i.a.w format required.		
11.2.2	Briefs personnel	As per Task 11.2.1.		
11.2.3	Writes reports	a. To identify and state the weaknesses of the operations. b. To explain how reports are written on the weakness and recommendations.		

(a)	(b)	(c)	(d)	(e)
11.3.1	<i>Advise on enemy likely tactics</i>	a. To explain and illustrate how an appreciation is to be written on the enemy. b. To identify and state the tactics likely to be employed by the enemy in surface warfare.		Basic Radar Principle
11.3.2	<i>Advise on tactical counter measures.</i>	a. To list down the factors affecting tactics. b. To state the applications of principle of war. c. To list down factors to be considered in Surface Warfare. d. To explain how SAG procedures is carried out.		
11.3.3	<i>Ensures correct employment of sensors and weapons.</i>	a. To state the objectives of EMCOW plan b. To state the objectives of EW Tasking. c. To state the art of Weapon Directions. d. To list down the methods of target detection. e. To list down the methods of identifications. f. To state target selection rules. g. To list down the safety rules in wartime engagements.		
11.3.4	<i>Ensures correct confirmation of operational policy.</i>	a. To explain the enforcement of policy as per Task 11.2.3.		
11.4.1	<i>Must Landing party</i>	a. To list down the factors involved in deciding the size of a landing party.		
11.4.2	<i>Briefs Landing Party</i>	a. To list and explain different tasks in Landing operations. b. To explain how maintenance of essential services is conducted. c. To explain how manning of road blocks and Control Points are conducted. d. To explain how to conduct search on vehicles and personnel. e. To explain how dominations from rooftop are carried out.		

(a)	(b)	(c)	(d)	(e)
11.5.1	Musters Boarding Party	f. To explain how guarding of Vulnerable Point is carried out. g. To explain how patrols in urban areas are conducted. h. To explain how escort duties are carried out. i. To explain how Cordon and Search are conducted. j. To explain how crowd dispersals are conducted. k. To list down the safety precautions to be taken during each task.		Simple Trigonometry
11.5.2	Brief's Boarding Party	a. To list down factors to be considered when selecting boarding party. b. To state the responsibilities of each member of the boarding party.		
11.6.1	Coordinates NGS preparations	a. To state the objectives of Boarding operations. b. To list down the factors affecting boarding operations. c. To list down the steps to be taken in the preparations of boarding operations. d. To explain how boarding operations are carried out. e. To explain how boarding certificates are written. f. To discuss the important aspects in training of boarding party.		
11.6.2	Conducts NGS.	a. To state the objectives of NGS. b. To list down the advantages and disadvantages of NGS. c. To list down the steps taken in the preparation of NGS.		
		a. To explain how NGS is conducted. b. To list down the safety precautions to be taken when conducting NGS. c. To explain how NGS analysis is conducted.		

(a)	(b)	(c)	(d)	(e)
11.7.1	Musters Disaster Relief Party	a. To list down the factors affecting the size of the party. b. To state the functions of each personnel. c. To list down the equipment required.		
11.7.2	Briefs Disaster Relief Party	a. To list down the causes of disaster. b. To state the objectives of Disaster Relief Party. c. To list down the preliminary requirements of Disaster Relief Operations. d. To explain how rescue works and demolitions are conducted. e. To list down the medical arrangements of Disaster Relief Party.		
11.8.1	Gathers intelligence	a. Define and explain intelligence. b. List down the steps involved in intelligence planning. c. Define and explain "collection of intelligence". d. List down and explain the sources and agencies of intelligence.		
11.8.2	Analyses intelligence	a. Define 'processing'. b. List and explain the three activities involved in 'processing'.		
11.8.3	Disseminate intelligence	a. Define 'dissemination'. b. List and explain the principle governing 'dissemination'. c. List and explain the methods of 'dissemination'.		
11.8.4	Writes intelligence reports	a. To explain how reports are written according to the required format.		

ANNEX E

PROPOSED ACADEMIC SYLLABUS FOR GUNNERY TRAINING

COURSE: Officer's Training

Subject: Gunnery (Academic)

PERIODS: 71

Task No.	Syllabus Statements	Level	Period
(a)	(b)	(c)	(d)

3.2.1 PROPELLANTS

Briefly outline and discuss the following aspects:

B

- | | |
|---|---|
| • the early development. | 1 |
| • the later development. | 1 |
| • the modern development. | 1 |
| • the types now in use in the RMN. | 1 |
| • the 'surface theories' and the 'vapour-phase theories' on the burning of propellants. | 2 |

Explain and illustrate the following physical and mechanical properties of propellants:

B

- | | |
|---------------------------------|---|
| • density | ½ |
| • porosity | ½ |
| • extensibility | ½ |
| • tensile strength | ½ |
| • Young's Modulus of elasticity | ½ |
| • viscosity | ½ |
| • compressibility | ½ |
| • degree of gelatinisation | ½ |

PROGRESS TEST (1)

2

(a)	(b)	(c)	(d)
4.1.5	BASIC RADAR	B	
5.2.2	<i>Briefly outline and discuss the following aspects about</i>		
11.3.3	<i>RADAR:</i>		
	• <i>how RADAR was discovered.</i> • <i>the use of Primary and Secondary RADAR.</i> • <i>how the range, angles of bearing, elevation and height are measured by Pulsed and Frequency-modulated Continuous Wave (FMCW) RADAR respectively.</i>		1 2 3
	<i>How the Doppler RADAR makes use of the 'Doppler Effect' to:</i>		
	• <i>indicate the presence of moving objects.</i> • <i>indicate the component radial velocity of moving objects.</i> • <i>indicate whether an object is approaching or receding.</i>		1 1 1
	<i>Explain and illustrate:</i>		
	• <i>the factors affecting the operation of RADAR.</i> • <i>the types of Beam-Shaping elements and their respective functions.</i> • <i>the types of RADAR displays.</i>		2 1 1
	<i>PROGRESS TEST (2)</i>		2
	<i>PROGRESS TEST (3)</i>		2
4.2.5	STATISTICS	B	
	<i>Frequency Distributions:</i>		
	• <i>illustrate and explain frequency distributions and relative frequency distributions.</i> • <i>list and explain the general rules for forming frequency distributions.</i> • <i>illustrate and explain the 2 graphical representations of frequency distributions and relative frequency distribution, namely:</i> — <i>a histogram or frequency histogram.</i> — <i>a frequency polygon.</i>		2 1 2

(a)	(b)	(c)	(d)
Measures Of Central Tendency:			
Define and illustrate the meanings of the following averages:			2
• arithmetic mean • median • mode			
Illustrate the empirical relation between the above averages.			1
Measure of Dispersion:			
Define and illustrate the following variations:			3
• range • mean deviation • standard deviation • variance			
PROGRESS TEST (4)			2
PROGRESS TEST (5)			2
Elementary Probability Theory			
Illustrate and explain:			
• classical definition probability.			$\frac{1}{2}$
• relative frequency definition of probability.			$\frac{1}{2}$
Illustrate and explain Conditional Probability for:			1
• independent and dependent events. • mutually exclusive events.			
Illustrate and explain:			1
• Discrete Probability Distributions. • Continuous Probability Distributions.			
Illustrate and interpret the Normal Distribution Curves.			$1\frac{1}{2}$
Illustrate and explain the use of tables to determine the area (probability) under the Standard Normal Curves.			2
PROGRESS TEST (6)			2

(a)	(b)	(c)	(d)
11.6.1	SIMPLE TRIGONOMETRY	A	
	<i>Illustrate and explain the following trigonometrical ratios for angles less than 90:</i>		1
	• sine • cosine • tangent • cosecant • secant		
	<i>Illustrate and explain angles of any magnitude can be represented in the four quadrants of a circle.</i>		$\frac{1}{2}$
	<i>With the aid of a 4-figure table, illustrate and explain how trigonometrical ratios of angles of any magnitude can be obtained from the four quadrants.</i>		2
	<i>Apply the following rules in solving non right-angled Δs:</i>		4
	• Sine Rule • Cosine Rule		
	PROGRESS TEST (7)		2
	VECTOR AND SCALAR QUANTITY	A	
	<i>Explain and differentiate a vector from a scalar quantity, using suitable examples.</i>		1
	<i>Illustrate and explain the graphical representations of vectors.</i>		1
	<i>Illustrate and explain the following graphically and by calculations:</i>		2
	• the Addition of vectors by Parallelogram and Triangle Methods. • the Subtraction of vectors.		
	<i>Provide exercises and examples involving the applications of Addition and Subtraction of vectors (velocities) in solving naval gunnery problems.</i>		4
	PROGRESS TEST (8)		2
PROGRESS TEST = 16 periods			Teaching periods =

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Mejar Loo Chai Soon graduated from the RMC Boy's Wing in 1974. He was commissioned into the KPA (AJAR) in 1979, after having obtained his BSc (Hons) with Education from the University of Malaya. Prior to his appointment as Staff Officer II (Education) HQ 1 Div, he had served in the Recruit Training Centre and the Officers' Training School in Pangkalan TLDM, Lumut.

Perhaps the most valuable result of all education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not.

- Thomas Henry Huxley



JOMINI AND CLAUSEWITZ THE INTERPRETERS OF NAPOLEON: *contributions and contrasts*

MEJ NORDIN BIN MOHD YUNUS

INTRODUCTION

Jomini the Swiss and Clausewitz the Prussian, presented one of the most amazing studies of human nature in modern military history – with similarities and violent contrasts. Both were career soldiers, both possessed analytical and penetrating intellects. Each had disappointment in the quest for high rank and military fame. Jomini failed to hold independent command in the Imperial Army. Clausewitz too failed in his own right.

Both spent the bulk of their military years in the staff. Each progressed from minor staff appointments to positions of chiefs of staff of an army corps. Jomini served as Chief of Staff of Marshal Ney and Clausewitz performed the same duties in the Prussian Army Corps.

Strangely, both were forced by circumstances

to change their allegiance and serve in a foreign army. Jomini left the Grand Armée because he was sore with General Berthier. Clausewitz rather than the Prussian Army than be bounced by the terms of the peace treaty between Frederick William III and Napoleon.

More startling, both joined the Russian Army. Jomini went to serve under Czar Alexander in 1812. Clausewitz went to the Imperial Russian Forces the same year.

Jomini, however, remained in the Russian service for the rest of his military career. Clausewitz was back in the Prussian Forces after two years. Both fought the battles of the Napoleonic era. Both were, from the military and intellectual standpoint, the products of that period. It is with good reason that both Jomini and Clausewitz are known to readers of military literature as "Interpreters of Napoleon".



JOMINI: THE THEORY ON WAR

THEORY

Jomini analysed and defined the various kinds of warfare and describe different kinds of military operations. His disentangled from tactics and logistics, showed the importance of strategic planning and established the fundamental principles.

His first historic and most significant work was 'TRATTE' produced in 1804-1816. Subsequently he published five more books on military history. But the final one was 'The Summary of the Art of War' published in 1838 where the consolidation of the doctrine and the theory of previous products shifted carefully and was evaluated clearly. The theory on war in discussion is based on this 'The Summary of the Art of War'

PHILOSOPHY OF WAR

What is war? To Jomini, 'War is not a science, but an art'. What is his philosophy on war? His philosophy on war is the occupation of territory: the dominance of territory. To be powerful is to gain more territory. He adopted 'hold objectives' points, which looked to nothing less than the capture or destruction of the whole armies.

Jomini quoted: "The System of Napoleon was to march twenty five miles a day, to fight, and then to camp in quiet. He (Napoleon) told me that he knew not any other methods of conducting war other than this". Great truths were demonstrated by Napoleon's wars, such as:

- Napoleon marched through Vienna in 1997.
- He invaded Italy.
- He invaded Prussia in 1806.
- He invaded Austria.

- He invaded Russia in the Moscow campaign of 1814.

STRATEGY

Jomini defined strategy as "the art of making war on the map, and comprehending the whole theatre of operations". In short, it means that strategy decides where to act.

Jomini emphasized that war is always to be conducted according to the great principles of the art: but great discretion must be exercised in the nature of the operations to be undertaken. His significant development was the employment of aggressive, mobile and combative strategy instead of slow strategy of siegecraft.

His principles of strategy are:

- **Base of Operations.** A base of operation is the portion of the country from which the army obtains its reinforcements and resources, from which it starts when it takes the offensive, to which it retreats when necessary, by which it is supported when it takes position to cover the country defensively.
- **Decisive Strategic Points.** Points where greatest injury to the enemy is created with least risk to oneself.
- **Good Direction to the Line of Operation.** The line of advance.
- **The Line of manoeuvre.**
- **Mobility and Rapid Continuous Marches.** Jomini quoted "A general who moves his masses rapidly and continually and gives them proper direction, may be confident of both gaining victories and securing great results there from".

GRAND TACTICS AND TACTICS

Grand Tactics is the art of posting the troops upon the battlefields according to the characteristics of the ground; of bringing them into action, and the act of fighting upon the ground. In short Grand Tactics decides the manner of execution and employment of troops. Jomini discussed a lot of tactics and principles in the scope of military arts. Many of those tactics were applied in the Napoleonic battles.

In his Grand Tactics, Jomini introduced different order of battles. He abolished 'entrenchman warfare'. Perhaps he was labelled as an advocate

of geometrical method of war. He portrayed all his battles in diagrams. Examples such as:

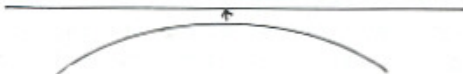
- Parallel order — (present extended line)



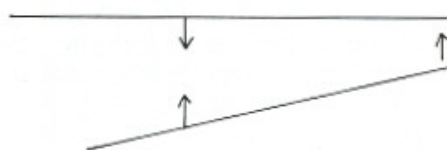
- Concave order — (envelopment by the wings)



- Convex order — (upon passage of a river)



He also emphasized on the placing of maximum force at the decisive point as the "guiding principles of strategy and tactics". This, he explained as "oblique order".



Separate or Combined Use of the Three Arms.

Jomini accurately perceived the significant development in the use of various arms. His advice in this regard is as valid until today as it was when he originally wrote. His view on the massing of artillery upon a decisive point and the employment of mobile cavalry to open the way is further enhanced today. Jomini witnessed the new power of artillery and cavalry in most operations of the Napoleonic battles. Jomini stressed on the supporting arms: "The infantry is undoubtedly the most important arms; as Queen of the Battle, without proper support is quite ineffective". The result could be witnessed in the Battles of Waterloo and Leipsic.

Passage of Rivers and Other Streams. Passage in itself is a tactical operation, but choosing the point is strategical. The art of building military bridges is a special branch of military science.

Retreats and Pursuits. Jomini remarked: "Retreats are certainly the most difficult operation in war". This remark is true. Our modern warfare still could not conceive how an army ever succeed in retreating. He quoted, "if the theory of war leaves any points unprovided for, that of retreats is certainly one of them."

Intelligence. Reconnaissances and other means of gaining correct information on the movement of the enemy are but one of the theories brooded about by Jomini.

LOGISTICS

Another factor in his theory on war is on Logistics. Since he rose from a storeman, I suppose he established logistics as one of his grand theories on war. Jomini wrote the word logistic derived from the title 'Major General des logis' (translated German as Quartermaster) an officer whose duty formally was to lodge and camp troops, to lead the direction to the marching columns and to locate them on the ground.

Logistics and supply were serious problems for Jomini. His writing on this subject indicates that he understood the importance of supply in a scheme of mobile and expensive warfare. Modern field commanders are still struggling with the problems that bothered Jomini more than a century ago.

Jomini realised the error made by Napoleon in the Battle of Leipsic, for in such a low ground, wooded and cut up by small streams, it was highly important to have a number of bridges and prepared the banks. These could have saved a lot of lives and the guns and carriages that were abandoned.



CLAUSEWITZ: THE THEORY ON WAR

THEORY

Clausewitz witnessed unique changes were taking place. He experienced the old forms of war in 1793 and 1806 and the new in 1812, 1813, 1814 and 1815. He had seen at first hand how useful

the old against the new; and had taken part in the Prussian struggle to combat France's modern and massive armies. In the three books on were contained these experiences. The other eight volumes produced by his wife were based on his memoirs. Clausewitz formulated a general Theory of War and stressed on philosophy and politics.

PHILOSOPHY OF WAR

Clausewitz defined 'War is an act of violence intended to compel our opponent to fulfill our will'. From this definition it means that every war ought to end in a complete victory of one side over the other.

A war is moderated by a number of influences. A war is a product of politics and the result of the failure of diplomacy to resolve differences. Once diplomacy failed, conflicting parties would decide whether or not to go on war. Clausewitz's philosophy finds repeated echoes in the Soviet military. Lenin's remarks on Clausewitz on war was "Politics is the reason and war is only the tools".

In his philosophy on war, Clausewitz gave priority to the civilian authority over the matter. The military is supposed to serve the state. Clausewitz was saying, in effect, "give the war to the people. The state is the people".

WHAT IS HIS PHILOSOPHY ON WAR

Clausewitz believed in inhibition of territories and men. So he introduced the 3-Triad: the government, the armed forces and the people. The government establishes the political purpose, the military provides the means for achieving the political end and the people provide the will, the 'engines' of war. All three are indispensable legs of Clausewitz's strategic triad.

- **The Role of Political Leaders.** Clausewitz illustrated how political leaders and their policies can have an impact on the operational conduct of war. He quoted, "No one starts a war — or rather no one in his senses ought to do so — without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it. The former is its political purposes; the latter, its operational objective. This is the governing principle which will set its course, prescribe the scale of means and effort which are required and make its influence felt throughout — down to the smallest operational details".

• The Role of Military Leaders.

— Political leaders are paramount because the policy itself is the guiding intelligence and war is only the instrument. Clausewitz argued that no "other possibility exists then, than to subordinate the military point of view to the political".

— Military leaders should help shape the policy. Clausewitz contended that military leaders should not be subjected to the capriciousness of some government policies.

• Friction of War

— "Everything in war is very simple, but the simplest thing is difficult". In war, sometimes, things do not turn out as expected. There are countless minor incidents that we never really foresee. Examples: a battalion is made up of individuals, the least important of whom may chance to delay things and make them go wrong.

— Clausewitz termed 'friction' was the only concept that distinguished real wars from wars on paper. Frictions were caused by the danger of war, the war's demanding physical effort and the presence of unclear informations.

STRATEGY

Clausewitz defined strategy as, "the employment of the battle as the means towards the attainment of the object of the war". In short: the use of engagements for the purpose of the war.

The strategists define the aims or draft the plans of the war, decide on the campaigns and engagements.

Proper Focus on The Armed Forces. Clausewitz said that there was no higher and simpler law of strategy than to concentrate the force on the enemy's weak link; his strategic centre of gravity. This was his first principles of strategy.

Economy of Force. Clausewitz's corrected idea of concentration of force was the concept of economy of force. Clausewitz explained on the effective use of force at the right place. He said "no part of the whole force is idle".

GRAND TACTICS AND TACTICS

His philosophy on this subject was lengthy. The prominent points are as follows:

* **Defence.** His concept of Grand Tactics is Defence. Defence is a stronger form of warfare. He argued that it is easier to hold the ground than to take it. Clausewitz's pictures of defence as consisting of two parts: wait for the blow and parrying it; the counter attack. He said, "so the defensive form of war is not a simple shield, but a shield made up of a well directed blow".

Offensive. Clausewitz wrote, "once the defender has gained an important advantage, defence as such has done its work. Then, it is time for a sudden powerful transition to the offensive — the flashing sword of vengeance. This is the culminating point of a battle."

Numerical Superiority. "The best strategy" wrote Clausewitz "is always to be very strong: first in general than at the decisive point. Superiority of number in a given engagement is only one of the factors that determines victory."

• **Surprise.** It is still more important to remember that almost the only advantage of the attacks rest on its initial surprise. Speed and impetus are its strongest elements and are usually indispensable if we are to defeat the enemy.

• **Morale and Will.** The element of morale is more important than the supplies, said Clausewitz. He said war was dangerous; so dangerous that no one who had not taken part in it could conceive what it was like.

He quoted the French Army and Napoleon. The revolutionary French Army comprised neither professionals nor conscripts who understood what they were fighting for, but 'patriots' — a new concept in the European politics. At first, the French soldiers were defending themselves against the revolutionists. Soon they became offensive. The success kept their morale high and the adoration for Napoleon Bonaparte was tremendous. At any rate, whether the French fought for the Revolution, or for France, for liberty or for an empire, the high-pitched morale of the French soldier was a new factor in war.

Napoleon understood this new factor well. He nurtured and intensified the enthusiasm of his

men by dramatic speeches. He was not concerned with tactics, the economy and the human resources. His aim was to destroy the opposing force.

SUMMARY: THEIR THEORIES ON WAR

We would rather expect that any theories formulated within that era (during the period of Napoleon) would more or less be the same. But in reality, it did not happen that way. There were significant differences, especially, between the two. I will discuss briefly, their fundamental differences.

Jomini was more concerned with the immediate character of war as it exists and so dealt more with the tangible and less with the philosophical. Jomini wrote principally as a practitioner rather than as a philosopher of war.

Clausewitz roamed within the psychological and philosophical domains of a battle, peering into the metaphysical darkness — more on theory and philosophy.

Both wrote on tactical and strategical methods and each appreciated the great importance of morale. Clausewitz advocated the simplicity of plans and emphasized the friction of war. Likewise Jomini's simplicity in battle planning was a cardinal virtue.

Jomini was an advocate of geometrical battle method. It is true some of Jomini's diagrammatic movements are no longer valid in terms of current battle doctrine. They became outdated not because they were geometrical in nature but rather because of the changes in weapons and techniques. Jomini realised that mobile wars made it impossible for a nation to adopt a defensive philosophy. He quoted "a nation that takes the offensive will win the war".

Clausewitz emphasized on defences and active defences in winning the war. He insisted that it is easier to hold the ground than to take it.

Jomini seriously appreciated the problems of supply. He understood the importance of supplies in mobile and expensive warfare. In Jomini's mind supplies were closely interwoven into the entire patterns of the war and have the influence on strategical and tactical operations. Clausewitz attempted to separate supplies from the business of war. Clausewitz was of the opinion too that supplies do not belong to the fighting itself but to the maintenance — care of the sick and care of the equipment.

It had been said that "Napoleon was the god of war and Jomini and Clausewitz were his prophets". Lastly my interpretation of these two

gentlemen is: Jomini was a tactician on war and Clausewitz was a philosopher on war.



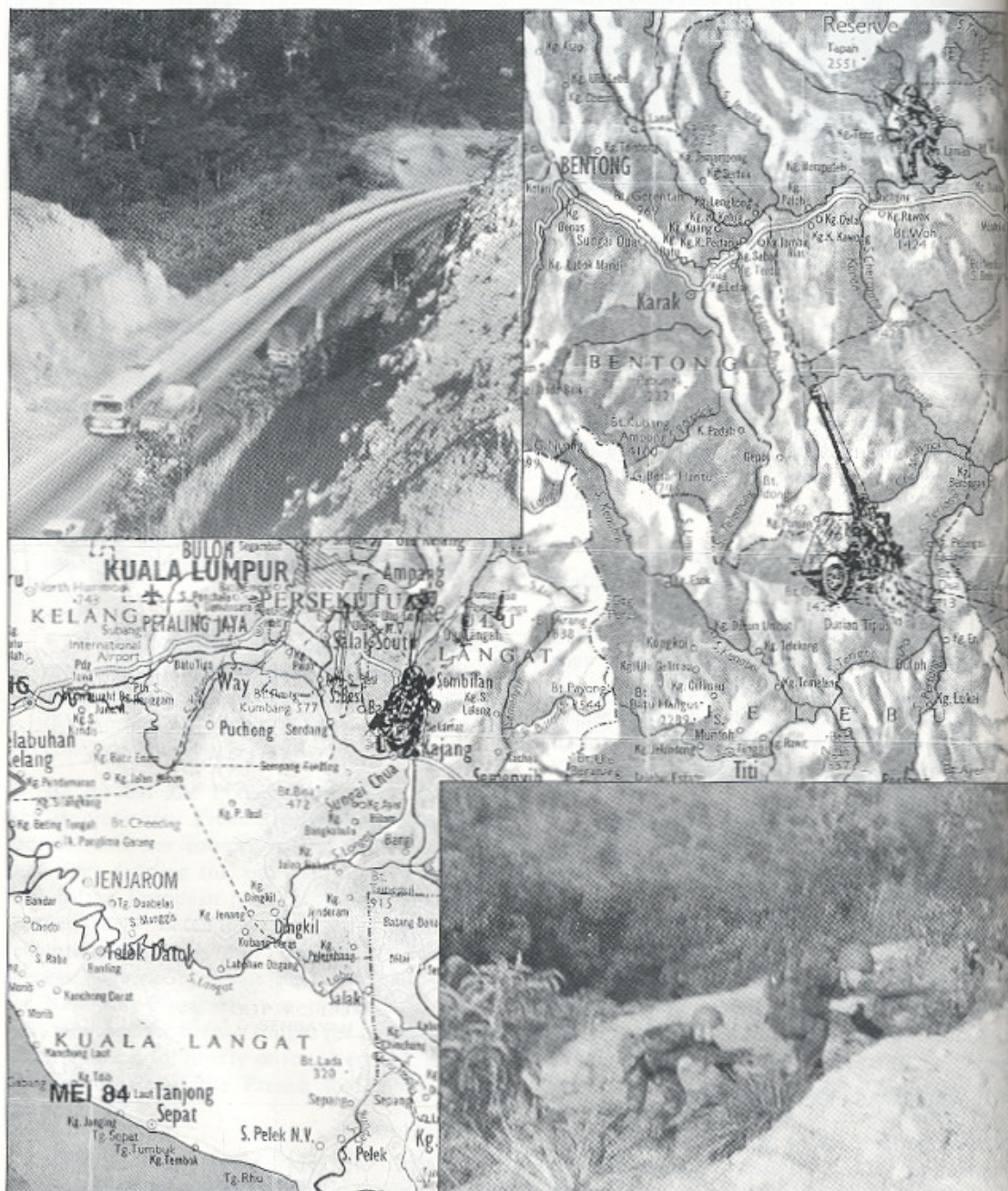
Mej Nordin bin Mohd Yunus was commissioned into the Malaysian Artillery on 13 Oct 72. He has held various command and staff appointments at regimental and ministry levels. His last appointment was a Battery Commander of the Locating Regiment. Currently Mej Nordin is attending staff course at Haigate.

ABLE WAS I ERE I SAW ELBA.

Napoleon Bonaparte

THREATS IN THE REAR AREAS

MEJ DAUD BIN OTHMAN



"Do not reveal where you plan to attack, so that the enemy will have to prepare to defend several possible places, thereby, further scattering their forces and weakening their resistance at any one point. If they concentrate on defending their rear, their front will be weak; if they concentrate in front, their rear will be vulnerable to attack. If they strengthen the defence of their right flank, the left will be weak, and if they strengthen the left, the right will suffer. If they spread their forces in all directions, their defence will be weak all round" —Chinese Art of War.

INTRODUCTION

We have often been complacent about our rear areas. The thought of the rear being always safe and secured, always lingers in everybody's mind. Why shouldn't it be? After all, those areas are in our territory. The FEBA is at the front. In a confrontation, no army will face it back to the enemy. Therefore, whatever it may arise, the army prefers to encounter its opponents frontally, thus, leaving the rear areas free from such threat. This thought has become a stigma. Less emphasis is given to the security and the deployment at the rear either in our doctrine or during our manoeuvre training.

The rear area begins at the rear of the main battle area and extends through the communications zone. Rear area units and facilities are vulnerable to attacks because of their role in supporting the fighting units. The absence of combat forces but instead the presence of large numbers of support units make the rear area attractive to the opponents.

Future encounters will be fought deep, close-in and in the rear. Attacks will be carried out on the entire depth and width of a battlefield to achieve victory. These attacks will introduce threat forces with tremendous destructive capabilities either in direct contact at the fronts or in the rear battlefields.

In the past, combat operations in the rear areas were vulnerable to attacks. As such, defence became difficult, and support lines became disruptive. In Burma during World War II, the American Merrill's Marauders and the British Chindits tied down several Japanese Divisions in rear battle missions. Likewise, the Japanese applied their Hammer and Anvil tactics by establishing blockades at the rear of the British fighting echelons. The Germans, too,

established special Assault Divisions with their main functions were mainly to infiltrate into the allied rear areas and conduct rear battles. The defence of the northern states of Peninsular Malaya during the Japanese thrust was bounded by the vulnerability of threat from the rear particularly through Kroh — Baling — Sg. Petani areas.

These examples provide significant insights into the capabilities of a well structured threat operating in the rear areas. Improved warfare technology and tactics used in a battlefield will reveal the full capabilities of small forces that may operate independently from the main force in the rear. Thus, the forces that have developed to attack the rear areas encompass a wide range of organisations, sizes and tactics.

THE IMPORTANCE OF REAR AREAS

In offensive operations, it is of a tactical advantage to conduct operations in the enemy's rear areas as part of the overall offensive plan. A quotation from a Chinese military science says that, "if the enemies are powerful, extra care must be taken in one's preparations. Know and avoid the enemy's strong points. Attack their weaknesses. If they are angry, provoke them further. Pretend to be weak to make them arrogant and over confident. When they are eager for action, weary them with delays. When they are muted, try to create discord and internal dissension. Attack where and when least expected".

The rear battle threat could be in the terms of supporting operations for current or future attacks. The activities in the rear areas are designed to create fear, panic and confusion resulting in a loss of confidence and morale of the combat force in the front line. These actions are designed to disrupt combat service support operations throughout all echelons or rear areas through independent activities or operations that support efforts in the close-in battle area. When the lifeline of a combat unit has been severed by rear area missions, the combat ability in the front lines will be affected tremendously. Combat troops will be without enough ammunitions to spare, tanks and vehicles will be without petrol to manoeuvre and troops will be without food and water to sustain their combat survivability. The Coupde Grace could be exerted with ease by the aggressor when such situation arises.

THE THREAT

The threat in the rear battles comes in many forms and sizes. The quantum of force depends on

the tactical and strategical aspects of the situation. A force may comprise a small troop of a company strength or equivalent. In this particular case, possibly, the force has got a specific secondary mission in conjunction with the main threat. A bigger scale of force could be categorised as a battalion sized or larger. The mission conducted by these forces will be more deliberate and purposeful.

The threat forces in rear the battles could come from the following structures:

- Ground force deliberate operations.
- Infiltration operations.
- Heliborne operations.
- Airborne operations.
- Amphibious operations.

Ground Force Deliberate Operations. Most armies have reconnaissance elements, be they mechanized, armoured, or infantry groupings within their force structures. Their primary mission is to conduct reconnaissance of the enemy rear area and to provide intelligence on enemy's troops disposition. Specially organized reconnaissance group may be directed to raid installations or to conduct ambushes, although their primary mission is to collect intelligence and informations. They may also conduct specific missions such as to capture prisoners or documents, to locate unit positions or movements and specific reserve locations as may be so directed.

Sympathisers, enemy controlled agents and terrorists will also constitute a significant threat to the rear areas. Sympathisers are the most difficult to neutralise because their activities will be at random and unpredictable. Some of their actions include arsons, sabotages and the thefts of supplies and materials. Enemy controlled agents are like thorns in the flesh. Their primary missions include espionage, interdictions and subversions. Most of the time they work undercover, as such the threat is more distinct. They usually merge with the enemy and take advantage of these stressed situations to uphold their course. Their actions will be directed against military convoys, fire support bases, patrols, isolated locations, administrative and logistic installations.

A joint ground force manoeuvre is one of the principal threats in the rear areas. It may be used to

exploit a specific breakthrough in the close battle. This unit may range in size from a reinforced company, to a reinforced battalion or a brigade. They may be part of the main force executing a secondary mission in a battle or as a force on an independent mission. This unit represents a significant threat to the rear area. Aircraft, tanks, artillery will often support this deliberate ground operation.

Infiltration Operations. North Korean forces have used the concept of infiltration to move battalions sized and larger units into the enemy rear area. The unit will infiltrate as small elements through the main battle area and assemble at an RV (a key terrain feature) at a designated time. This tactics provides an element of surprise that may create significant problems to the rear areas.

Heliborne Operations. During a heliborne operation forces and their equipment are transported by helicopters to enable them to engage more effectively in ground combats. Typical heliborne missions are normally terrain orientated but may be tailored to attack command elements or communication facilities. It has the capability to assault from any direction and the ability to strike the objectives in the rear areas. The high mobility of a heliborne operation allows it to rapidly concentrate and redeploy troops. Additional missions suitable for the heliborne forces are ambushes, raids, sabotage and laying or clearing mine-fields in the rear areas.

Airborne Operations. Airborne forces are used to project combat power deep into the enemy's rear areas. The insertion may support the rapid advance of a large combined-arms forces that may be conducting an attack into the enemy rear areas. An airborne assault is normally directed against specific objectives such as command posts, logistic facilities, communication sites, airfields, bridge-heads or river crossing sites. The strike by these elite forces, paratroopers will have a significant impact on the battle or campaign.

Amphibious Operations. Never discard sea-borne threats when manoeuvring close to sea. Many navies of the world have initiated extensive training and developments of their naval infantry. The developments indirectly indicate definite sea-borne threats against critical rear area ports and coastal facilities. These naval infantry have the capability to conduct tactical landings with highly mobile force and high speed landing ships. With these assets, it makes them very elusive in an encounter battle, posing much difficulty to troops defending

in area. Beside conducting an independent mission, a seaborne strike may be conducted in support of an inland ground force operation.

SUPPORTING THE THREAT FORCES

Tactical Air Force. The air force will provide ground forces with air supports against enemy units, command and control headquarters, reserve and logistic facilities. The air supports will include attack helicopters, attack aircrafts and fighter bombers. Among these assets, combat helicopters will be fully employed in supports of offensive operations in the rear areas.

Long Range Artillery. A long range artillery has a range of 30 to 40 Km. Certain doctrines, like the Soviets, require the artillery to mass fire in advance of a major attack. These fires will shift from the forward edge of the battle area (FEBA) to the rear area as the battle progresses. Artillery observers accompany the attacking force and will shift the artillery as necessary to destroy the command and control elements and logistic facilities.

Missiles And Rockets. Missiles and rockets will augment artillery fire. These weapons can deliver high explosives and chemicals against distant targets. These weapons will support major offensives. They are targeted against artillery units, control systems, command posts radar stations, reserve and combat supports and combat service support areas.

Mines Laying. Mines provide another system for disruption of the rear area. Anti-personnel and anti-tank mines can be delivered by vehicles, aircrafts, artillery or individual soldiers. The mines will be used to isolate facilities, to deny avenues of approach, and to restrict forward support.

COUNTERING THE THREAT

Commanders of the support units in the rear areas are responsible to make decisions just like any combat commanders. Besides they still have their support mission to fulfill. What is the acceptable risk they can take to complete their mission? Each commander of rear support units must be able to make that decision and coordinate his mission with his rear battle responsibilities.

The objectives of countering the threat in rear areas are to:

- Secure the rear areas and facilities,
- Prevent or minimise enemy interferences with command, control and communications.

- Prevent or minimise disruptions of combat supports and combat service supports forward.
- Provide unimpeded movements of friendly units throughout the rear areas.
- Search, fix and destroy any enemy incursions in the rear areas.

To ensure an uninterrupted support of the main effort, and the protection of the rear areas, certain tasks have to be considered. The keys to countering rear threats are sound planning, early warnings and the rapid deployments of sufficient forces and resources to counter the threat. The tasks that have to be considered will be discussed below.

Secure Forward Support. Rear area operations must secure and sustain combat supports and combat administrative supports for forward combat units. This must be accomplished without seriously degrading the capability of the support command in accomplishing its primary mission.

Detection. To detect the enemy is the responsibility of every soldier in the rear areas. This task is accomplished by observation, reconnaissance and surveillance during all weather and light conditions patrolling road networks and key terrains throughout the rear areas. Transport personnel, maintenance support teams and all users and movers in the rear area must provide information about any and all unusual or suspicious activities. The extensive use of all measures to counter enemy incursions is mandatory. Detection efforts include patrolling, picketing, troops occupying key terrains, the use of day and night observation devices, remote sensors, and other detection equipment and methods. These provide early warnings of infiltration attempts by the enemy. They also help to prevent reactions towards false alarms such as movements by friendly persons, defectors or refugees.

Delay. Rear area operations must sufficiently hinder the enemy's progress after detection to provide adequate time for friendly forces to react. This is done by establishing a base of fire and by employing mines, boobytraps, wires, aircraft interdiction or other obstacles to slow down, impede or canalize the enemy's movement. A new weapon system, the scatterable mines, makes an effective rapidly emplaced obstacle system. After infiltration attempts have been detected along existing or reinforcing obstacles, scatterable mines can be used to block the enemy's withdrawal, to restrict his lateral movement or to strengthen the obstacles.

Destruction. After the infiltration attempt is detected and delayed, the enemy must be destroyed as quickly as possible. This is accomplished by air, land or sea forces that kill, capture or repel the enemy with all appropriate available fire power and manoeuvre resources.

CONCLUSION

Rear area operations consist of those actions taken by all units singly or in a combined effort, to secure the force, neutralise or defeat enemy operations in the rear area and ensure freedom of action in the deep and close in battle. It is a system designed to endure continuous supports. In turn it requires combat forces to contain the threat in the rear areas. In any case, the commander must ensure rear area operations continue through-

out offensive operations. The loss of combat ports and combat administrative supports in an offensive operation through direct attacks or incursions in the rear can steal the momentum from an offensive manoeuvre. Sustained offensive manoeuvres over long line of communications require a tactical combat force be assigned to the rear battle to ensure the momentum of the offensive is maintained.

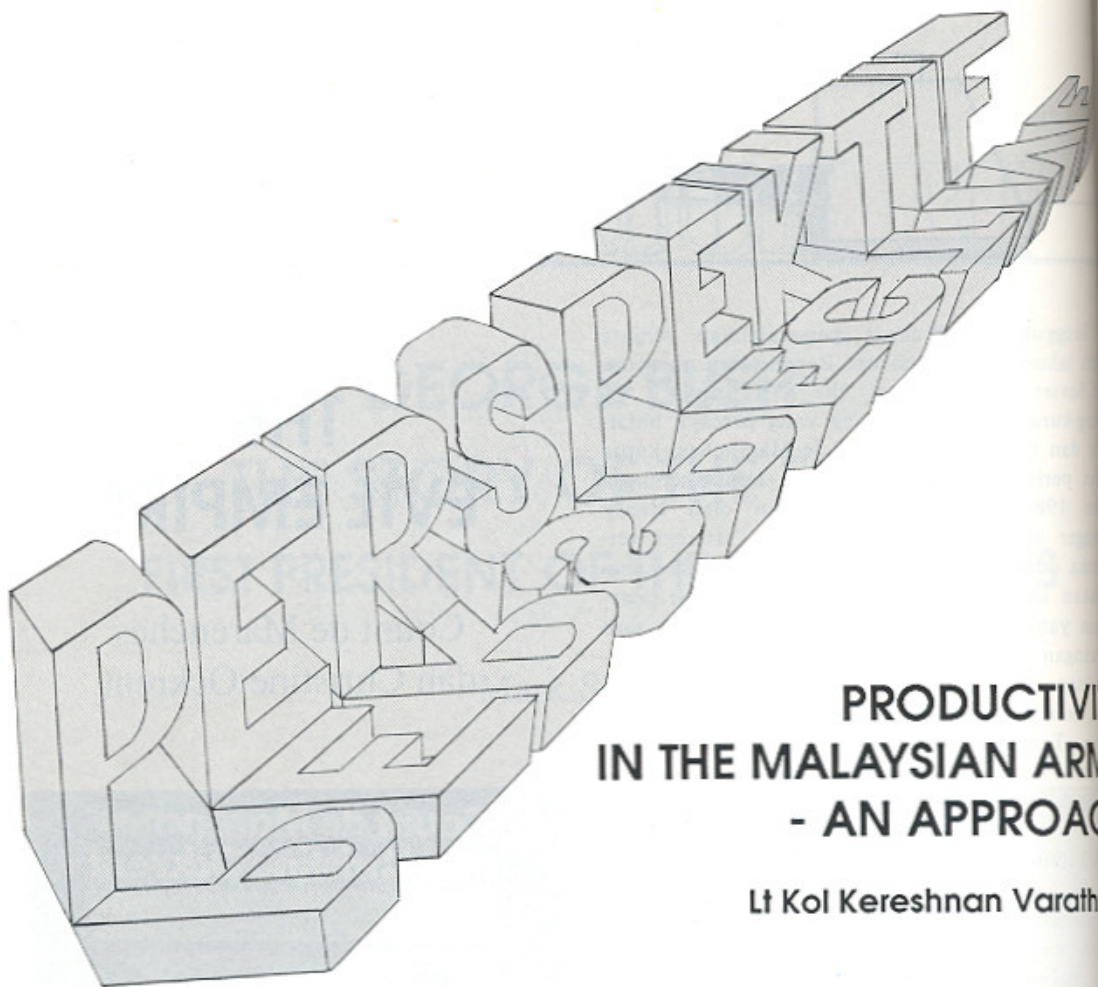
The rear battle represents a critical fight for an army. The air and land battles cannot be won solely by fighting the rear battle, but it could well be lost in the rear. Therefore, it is important that field commanders and combat support and combat administrative support commanders focus their training toward base defence and rear area operations along with their continued support mission.



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In the council of government we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military industrial complex. The potential for the disastrous rise of misplaced power exists and will persist.

— Dwight D Eisenhower



PRODUCTIVITY IN THE MALAYSIAN ARMY - AN APPROACH

Lt Kol Keresnhan Varatharajan

GENERAL

Productivity is today's buzz-word for survival. The country's public administrative machineries, bodies like MAMPU, have plunged into productivity in a very positive way. The Army has also given serious thoughts to this and is very concerned with giving the 'mostest out of the leastest' or as most would agree to increase P in the light of $P = O / I$. Output (O) and Input (I) have a correlation to efficiency and effectiveness. Most of the time, without battering an eyelid, we would agree that we are effective but are we efficient? On the other hand, we also have the problems of measuring outputs in a non-profit organization like the Army.

In the area of job-skills that require repetitive and cyclical flow of effort and in one that does not require changing knowledge skills, the standards or norms can be easily identified. Standard values are very important to the establishing of efficiency

and productivity. The Army is aware that billions of bits of raw data are required to establish norms, values and in the same vein it believes that productivity is also a dependent on the will and spirit of the workers.

A simple approach to measuring productivity can be seen in the manhours put towards fulfilling the individual's charter of duty or the individual's not hold the tests of productivity but is definitely a quantifiable data that may in turn rise to many pertinent questions. Some of the questions can be the message of 'am I really earning the pay in honesty?' This is the WILL and SPIRIT that the concept of productivity is hoping to evolve, at least for a start.

CATEGORY

In our daily official chore, be it in the field or in a workshop, we perform tasks that require

knowledge or 'hand on' skills. Whilst some got exhausted by thinking and planning or thinking and thinking only, others get exhausted by employing physical energy. Again the chore are either aptly related to your main task (or to your job description) or could be remotely related to your career. Some of the daily chore is all a reality and they have withstood the time. Using a simplistic approach, we could categorise supporting/organizational tasks and the usual personnel tasks. In the strictest sense, aligning our thoughts to the Blake and Mouton Management Grid of the goal-better example, our chore should only support and help overcome our own tasks in relation to our job description. But in an era of materialistic realization and egoistic endeavours, within the frame-work of democratism, our daily chore will spill away from our own job description. The analogy year substantiates the fact idealism and realism seldom meet.

The pertinent question, within the stated backdrop, is whether it is possible to categorise our daily tasks. The answer is 'yes' and we could go one step further and say that we can even quantify time as a raw input. A suggested method is to record all effort, be it physical or knowledge based, in terms of time utilised. Then to identify them as was job-related, then break it down further into was job related, then break it down further into main tasks or supportive to your main tasks. If the tasks still cannot be categorised accurately then it could be the organizational task. If the task on the other hand, does not fall into the above mentioned categories then it could or rather should fall into personal need category. One could classify all daily tasks performed into Category A (stands for main tasks), Category B (for job-related tasks) and Category C (for personal need). I suppose with a little bit of practice this categorising skill can be perfected.

CONCEPT

Productivity is nothing new to most of us. It can be considered as a new package with the same all contents. The exciting part of the concept of productivity is the WILL and SPIRIT of the Army to forge ahead amidst the myriad of uncertainties. As portrayed in the earlier discussion that productive indicators and standard times or norms are very susceptible to splitting of hairs. This is especially so in the area of knowledge-based tasks. The changing scenarios and organizational inadequacy contribute to further disagreements. This then has led us to the cross-roads. What shall we do next? If you have read this far, I hope you will not turn back. Think positively. The Army is moving in the right direction. What we lack in statistical methodology and its related abundance of raw data can actually be replaced, by the concept of SPIRIT and WILL. If one performs his tasks honestly and objectively then productivity can also be harnessed to achieve the desired results. In the worst case it can be concluded that we are awakening, in the future, from the angle of Organizational Development.

Based on the rationale portrayed it is possible to embark on productivity measures and what one requires is moral courage and some basic arithmetic. The next step is to record your daily performed tasks without fail in the right column and measure time utilised accurately. Fear not men but the Almighty.

* The writer was a graduate of RMC, commissioned into the Armoured Corps in 1965. He completed his Staff College course in 1981 and was involved in the production of the inaugural issue of this journal while serving as SO 2 Doctrine. He holds a Diploma in Management and is pursuing his MBA with Henley.