

**ATT DWAR POTERI LI JSIRU
REGOLAMENTI FL-INTERESS NAZZJONALI
(KAP. 365)**

**Emenda għall-Manwal li jgib l-isem ta'
"Lista ta' Tagħmir Militari"
skond ir-regolament 2 tar-
Regolamenti ta' l-2001 dwar il-Kontroll fl-
Esportazzjoni ta' Tagħmir Militari**

Id-Direttur Generali (Kummerc) jixtieq javza lill-pubbliku generali li, b'effett immedjat, il-Manwal li gej li jgib l-isem "Lista ta' Tagħmir Militari" kif imfisser fir-regolament 2 tar-Regolamenti ta' l-2001 dwar il-Kontroll fl-Esportazzjoni ta' Tagħmir Militari (A.L. 269 ta' l-2001) għandu jissostitwixxi lill-Manwal ppublikat bin-N.G. 918 ta' l-2001:-

"LISTA TA' TAGHMIR MILITARY

GENERAL TECHNOLOGY NOTE

The export of 'technology' which is 'required' for the 'development', 'production' or 'use' of items listed in this Manual is controlled according to the provisions of the entries under the Military List of this Manual. This 'technology' remains under control even when applicable to any uncontrolled item.

Controls do not apply to that 'technology' which is the minimum necessary for the installation, operation, maintenance (checking) and repair of those items which are not controlled or whose export has been authorised.

Controls do not apply to 'technology' 'in the public domain', to 'basic scientific research' or to the minimum necessary information for patent applications.

GENERAL CHEMICAL NOTE

Chemicals are listed by name and CAS number. Chemicals of the same structural formula (including hydrates) are controlled regardless of name or CAS number. CAS numbers are shown to assist in identifying whether a particular chemical or mixture is controlled, irrespective of nomenclature. CAS numbers cannot be used as unique identifiers because some forms of the listed chemical have different CAS numbers, and mixtures containing a listed chemical may also have different CAS numbers.

DEFINITIONS

In this Manual:

"adapted for use in war" means any modification or selection (such as altering purity, shelf life, virulence, dissemination characteristics, or resistance to ultra violet (UV) radiation) designed to increase the effectiveness in producing casualties in humans or animals, degrading equipment or damaging

**NATIONAL INTEREST
(ENABLING POWERS) ACT
(CAP. 365)**

**Amendment to the Manual entitled
"List of Military Equipment"
in terms of regulation 2 of the
Military Equipment (Export Control)
Regulations, 2001**

The Director General (Commerce) notifies the general public that, with immediate effect, the following Manual entitled "List of Military Equipment" as defined in regulation 2 of the Military Equipment (Export Control) Regulations, 2001 (L.N. 269 of 2001) shall be substituting the Manual published in G.N. 918 of 2001:-

LIST OF MILITARY EQUIPMENT

crops or the environment;

"additives" means substances used in explosive formulations to improve their properties;

"anti-idiotypic antibodies" means antibodies which bind to the specific antigen binding sites of other antibodies;

"basic scientific research" means experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena or observable facts, not primarily directed towards a specific practical aim or objective;

"biocatalyst" means enzymes for special chemical or biochemical reactions and other biological compounds which bind to and accelerate the degradation of chemical warfare (CW) agents;

"biopolymer" means the following biological macromolecules:

- a. enzymes for specific chemical or biochemical reactions;
- b. antibodies, monoclonal, polyclonal or "anti-idiotypic";
- c. specially designed or specially processed "receptors";

"critical temperature" (sometimes referred to as the transition temperature) of a specific superconductive material means the temperature at which the specific material loses all resistance to the flow of direct electrical current;

"development" is related to all stages prior to serial production, such as: design, design research, design analyses, design concepts, assembly and testing of prototypes, pilot production schemes, design data, process of transforming design data into a product, configuration design, integration design, layouts;

"end-effectors" means grippers, active tooling units (that is, devices for applying motive power, process energy or sensing to the workpiece) and any other tooling that is attached to the baseplate on the end of a "robot" manipulator arm;

"expression vectors" means carriers (e.g., plasmid or virus) used to introduce genetic material into host cells;

"explosives" means solid, liquid or gaseous substances or mixtures of substances which, in their application as primary, booster, or main charges in warheads, demolition and other military applications, are required to detonate;

"first generation image intensifier tubes" mean electrostatically focused tubes, employing input and output fibre optic or glass face plates, multi-alkali photocathodes (S-20 or S-25), but not microchannel plate amplifiers;

"Handbook entitled "List of Dual-Use Items and Technology"" means "the Handbook" as defined in regulation 2(1) of the Dual-Use Items (Export Control) Regulations, 2001;

"in the public domain" means available without restriction upon further dissemination (no account being taken of restrictions arising solely from copyright);

"laser" means an assembly of components which produce both spatially and temporally coherent light which is amplified by stimulated emission of radiation;

"microprogramme" means a sequence of elementary instructions, maintained in a special storage, the execution of which is initiated by the introduction of a reference instruction into an instruction register;

"military explosives" means solid, liquid or gaseous substances or mixtures of substances which, in their application as primary, booster, or main charges in warheads, demolition and other military applications, are required to detonate;

"monoclonal antibodies" means proteins which bind to one antigenic site and are produced by a single clone of cells;

"nuclear reactor" means the items within or attached directly to the reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain, come into direct contact with or control the primary coolant of the reactor core;

"polyclonal antibodies" means a mixture of proteins which bind to the specific antigen and are produced by more than one clone of cells;

"production" means all production stages, such as: product engineering, manufacture, integration, assembly (mounting), inspection, testing, quality assurance;

"programme" means a sequence of instructions to carry out a process in, or convertible into, a form executable by an electronic computer;

"pyrotechnics" means mixtures of solid or liquid fuels and oxidisers which, when ignited, undergo an energetic chemical reaction at a controlled rate intended to produce specific time delays, or quantities of heat, noise, smoke, visible light or infrared radiation; pyrophorics are a subclass of pyrotechnics, which contain no oxidisers but ignite spontaneously on contact with air;

"receptors" means biological macromolecular structure capable of binding ligands, the binding of which affects physiological functions;

"required" as applied to "technology", refers to only that portion of "technology" which is peculiarly responsible for achieving or exceeding the controlled performance levels, characteristics or functions. Such "required" "technology" may be shared by different "goods";

"riot control agents" means substances which produce temporary, irritating or disabling physical effects which disappear within minutes of removal from exposure. There is no significant risk of permanent injury and medical treatment is rarely required;

"robot" means a manipulation mechanism, which may be of the continuous path or of the point-to-point variety, may use sensors, and which:

- a. Is multifunctional;
- b. Is capable of positioning or orienting material, parts, tools or special devices through variable movements in three dimensional space;
- c. Incorporates three or more closed or open loop servo-devices which may include stepping motors; and
- d. Has "user-accessible programmability" by means of the teach/playback method or by means of an electronic computer which may be a programmable logic controller, i.e., without mechanical intervention;

except:

- a. Manipulation mechanisms which are only manually/teleoperator controllable ;
- b. Fixed sequence manipulation mechanisms, which are automated moving devices, operating according to programmes where the motions are limited by fixed stops, such as pins or cams and the sequence of motions and the selection of paths or angles are not variable or changeable by mechanical, electronic or electrical means;

- c. Mechanically controlled variable sequence manipulation mechanisms, which are automated moving devices, operating according to programmes where the motions are limited by fixed, but adjustable stops, such as pins or cams and the sequence of motions and the selection of paths or angles are variable within the fixed programme pattern; variations or modifications of the programme pattern (e.g., changes of pins or exchanges of cams) in one or more motion axes are accomplished only through mechanical operations;
- d. Non-servo-controlled variable sequence manipulation mechanisms, which are automated moving devices, operating according to mechanically fixed programmed motions; the programme is variable but the sequence proceeds only by the binary signal from mechanically fixed electrical binary devices or adjustable stops;
- e. Stacker cranes defined as Cartesian coordinate manipulator systems manufactured as an integral part of a vertical array of storage bins and designed to access the contents of those bins for storage or retrieval;

"software" means one or more "programmes" or "microprogrammes" fixed in any tangible medium of expression;

"special gun-mounting" means any fixture designed to mount a gun;

"specially designed for military use" and "specially designed or modified for military use" mean items which have been specially designed or specially modified in such a way that the items may have military applications, and include also those items which, after having been so designed or modified, are intended to be used for any purpose;

"superconductive" in relation to materials (i.e., metals, alloys or compounds) means those which can lose all electrical resistance (i.e., which can attain infinite electrical conductivity and carry very large electrical currents without Joule heating); the superconductive state of a material is individually characterized by a "critical temperature", a critical magnetic field, which is a function of temperature, and a critical current density which is a function of both magnetic field and temperature;

"tear gases" means gases which produce temporary irritating or disabling effects which disappear within minutes of removal of exposure;

"technology" means specific information necessary for the "development", "production" or "use" of a product. The information may take forms such as blueprints, plans, diagrams, models, formulae, tables, engineering designs and specifications, manuals and instructions written or recorded on other media or devices such as disk, tape, read-only memories;

"use" means operation, installation (which includes on-site installation), maintenance, checking, repair, overhaul and refurbishing;

"user-accessible programmability" means the facility allowing a user to insert, modify or replace "programmes" by means other than:

- a. A physical change in wiring or interconnections; or
- b. The setting of function controls including entry of parameters.

MILITARY LIST

ML1. Smooth-bore weapons with a calibre of less than 20 mm, other arms and automatic weapons with a calibre of 12,7 mm (calibre 0,50 inches) or less, and accessories as follows, and specially designed components therefor:

(a) Rifles, carbines, revolvers, pistols, machine pistols and machine guns:

Note: ML1(a) does not control the following:

1. Muskets, rifles and carbines manufactured earlier than 1938;
2. Reproductions of muskets, rifles and carbines the originals of which were manufactured earlier than 1890;
3. Revolvers, pistols and machine guns manufactured earlier than 1890, and their reproductions;

(b) Smooth-bore weapons, as follows:

1. Smooth-bore weapons specially designed for military use;
2. Other smooth-bore weapons, as follows:
 - (a) Of the fully automatic type;
 - (b) Of the semi-automatic or pump-action type;
 - (c) Weapons using caseless ammunition;
 - (d) Silencers, special gun-mountings, clips, weapons sights and flash suppressers for arms controlled by sub-items ML1(a), ML1(b) or ML1(c).

Note 1: ML1 does not control smooth-bore weapons used for hunting or sporting purposes. These weapons must not be specially designed for military use or of the fully automatic firing type.

Note 2: ML1 does not control firearms specially designed for dummy ammunition and which are incapable of firing any controlled ammunition.

Note 3: ML1 does not control weapons using non-centre fire cased ammunition and which are not of the fully automatic firing type.

ML2. Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12,7 mm (calibre 0,50 inches), projectors and accessories, as follows, and specially designed components therefor:

(a) Guns, howitzers, cannon, mortars, anti-tank weapons, projectile launchers, military flame throwers, recoilless rifles and signature reduction devices therefor;

Note: ML2(a) includes injectors, metering devices, storage tanks and other specially designed components for use with liquid propelling charges for any of the equipment controlled by ML2(a).

(b) Military smoke, gas and pyrotechnic projectors or generators;

Note: ML2(b) does not control signal pistols.

(c) Weapons sights.

ML3. Ammunition and fuze setting devices, as follows, and specially designed components therefor:

- (a) Ammunition for the weapons controlled by ML1, ML2 or ML12;
- (b) Fuze setting devices specially designed for ammunition controlled by ML3(a).

Note 1: Specially designed components include:

- (a) Metal or plastic fabrications such as primer anvils, bullet cups, cartridge links, rotating bands and munitions metal parts;
- (b) Safing and arming devices, fuzes, sensors and initiation devices;
- (c) Power supplies with high one-time operational output;
- (d) Combustible cases for charges;
- (e) Submunitions including bomblets, minelets and terminally guided projectiles.

Note 2: ML3(a) does not control ammunition crimped without a projectile (blank star) and dummy ammunition with a pierced powder chamber.

Note 3: ML3(a) does not control cartridges specially designed for any of the following purposes:

- (a) Signalling;
- (b) Bird scaring; or
- (c) Lighting of gas flares at oil wells.

ML4. Bombs, torpedoes, rockets, missiles, other explosive devices and charges and related equipment and accessories, as follows, specially designed for military use, and specially designed components therefor:

Note: For guidance and navigation equipment, see ML11, Note g.

- (a) Bombs, torpedoes, grenades, smoke canisters, rockets, mines, missiles, depth charges, demolition-charges, demolition-devices and demolition-kits, 'pyrotechnic' devices, cartridges and simulators (i.e. equipment simulating the characteristics of any of these items);

Note: ML4(a) includes:

1. Smoke grenades, fire bombs, incendiary bombs and explosive devices;
2. Missile rocket nozzles and re-entry vehicle nosetips.

- (b) Equipment specially designed for the handling, control, activation, powering with one-time operational output, launching, laying, sweeping, discharging, decoying, jamming, detonation or detection of items controlled by ML4(a)

Note: ML4(b) includes:

1. *Mobile gas liquefying equipment capable of producing 1 000 kg or more per day of gas in liquid form;*
2. *Buoyant electric conducting cable suitable for sweeping magnetic mines.*

Technical Note: Hand-held devices, limited by design solely to the detection of metal objects and incapable of distinguishing between mines and other metal objects, are not considered to be specially designed for the detection of items controlled by ML4(a).

ML5. Fire control, and related alerting and warning equipment, and related systems, test and alignment and countermeasure equipment, as follows, specially designed for military use, and specially designed components and accessories therefor:

- (a) Weapon sights, bombing computers, gun laying equipment and weapon control systems;
- (b) Target acquisition, designation, range-finding, surveillance or tracking systems; detection, data fusion, recognition or identification equipment; and sensor integration equipment;
- (c) Countermeasure equipment for items controlled by ML5(a) or ML5(b);
- (d) Field test or alignment equipment, specially designed for items controlled by ML5(a) or ML5(b).

ML6. Ground vehicles and components, as follows:

N.B. For guidance and navigation equipment, see ML11, Note g.

- (a) Ground vehicles and components therefor, specially designed or modified for military use;

Technical Note: For the purposes of ML6(a) the term ground vehicles includes trailers.

- (b) All wheel-drive vehicles capable of off-road use which have been manufactured or fitted with materials to provide ballistic protection to level III (NIJ 0108.01, September 1985, or comparable national standard) or better.

N.B. See also ML13(a)

Note 1: ML6(a) includes:

- (a) *Tanks and other military armed vehicles and military vehicles fitted with mountings for arms or equipment for mine laying or the launching of munitions controlled under ML4;*
- (b) *Armoured vehicles;*
- (c) *Amphibious and deep water fording vehicles;*
- (d) *Recovery vehicles and vehicles for towing or transporting ammunition or weapon systems and associated load handling equipment.*

Note 2: Modification of a ground vehicle for military use controlled by ML6(a) entails a structural, electrical or mechanical change involving one or more specially designed military components. Such components include:

- (a) *Pneumatic tyre casings of a kind specially designed to be bullet-proof or to run when deflated;*

(b) Tyre inflation pressure control systems, operated from inside a moving vehicle;

(c) Armoured protection of vital parts, (e.g., fuel tanks or vehicle cabs);

(d) Special reinforcements or mountings for weapons;

(e) Black-out lighting.

Note 3: ML6 does not control civil automobiles, or trucks designed or modified for transporting money or valuables, having armoured or ballistic protection.

ML7. Chemical or biological toxic agents, 'tear gases', radioactive materials, related equipment, components, materials and 'technology' as follows:

(a) Biological agents and radioactive materials 'adapted for use in war' to produce casualties in humans or animals, degrade equipment or damage crops or the environment, and chemical warfare (CW) agents;

Note: ML7(a) includes the following:

1. CW nerve agents:

(a) *O-Alkyl (equal to or less than C10, including cycloalkyl) alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) — phosphonofluoridates, such as:*

— Sarin (GB): O-Isopropyl methylphosphonofluoridate (CAS 107-44-8); and

— Soman (GD): O-Pinacolyl methylphosphonofluoridate (CAS 96-64-0);

(b) *O-Alkyl (equal to or less than C10, including cycloalkyl) N,N-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphoramidocyanidates, such as:*

Tabun (GA): O-Ethyl N,N-dimethylphosphoramidocyanidate (CAS 77-81-6);

(c) *O-Alkyl (H or equal to or less than C10, including cycloalkyl) S-2-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl)-aminoethyl alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphonothiolates and corresponding alkylated, and protonated salts, such as:*

VX: O-Ethyl S-2-diisopropylaminoethyl methyl phosphonothiolate (CAS 50782-69-9);

2. CW vesicant agents:

(a) *Sulphur mustards, such as:*

2-Chloroethylchloromethylsulphide (CAS 2625-76-5);

Bis (2-chloroethyl) sulphide (CAS 505-60-2);

Bis (2-chloroethylthio) methane (CAS 63869-13-6);

1,2-bis (2-chloroethylthio) ethane (CAS 3563-36-8);

1,3-bis (2-chloroethylthio) -n-propane (CAS 63905-10-2);

1,4-bis (2-chloroethylthio) -n-butane (CAS 142868-93-7);

1,5-bis (2-chloroethylthio) -n-pentane (CAS 142868-94-8);

Bis (2-chloroethylthiomethyl) ether (CAS 63918-90-1);

Bis (2-chloroethylthioethyl) ether (CAS 63918-89-8);

(b) Lewisites, such as:

2-chlorovinylchloroarsine (CAS 541-25-3);

Tris (2-chlorovinyl) arsine (CAS 40334-70-1);

Bis (2-chlorovinyl) chloroarsine (CAS 40334-69-8);

(c) Nitrogen mustards, such as:

HN1: bis (2-chloroethyl) ethylamine (CAS 538-07-8);

HN2: bis (2-chloroethyl) methylamine (CAS 51-75-2);

HN3: tris (2-chloroethyl) amine (CAS 555-77-1);

3. CW incapacitating agents, such as:

3-Quinuclidinyl benzilate (BZ) (CAS 6581-06-2);

4. CW defoliants, such as:

Butyl 2-chloro-4-fluorophenoxyacetate (LNF); 2,4,5-trichlorophenoxyacetic acid mixed with 2,4-dichlorophenoxyacetic acid (Agent Orange).

(b) CW binary precursors and key precursors, as follows:

1. Alkyl (Methyl, Ethyl, n-Propyl or Isopropyl Phosphonyl Difluorides, such as:

DF: Methyl Phosphonyldifluoride (CAS 676-99-3);

2. O-Alkyl (H or equal to or less than C10, including cycloalkyl) O-2-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl) aminoethyl alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphonites and corresponding alkylated and protonated salts, such as:

QL: O-Ethyl-2-di-isopropylaminoethyl methylphosphonite (CAS 57856-11-8);

3. Chlorosarin: O-Isopropyl methylphosphonochloridate (CAS 1445-76-7);

4. Chlorosoman: O-Pinacolyl methylphosphonochloridate (CAS 7040-57-5);

(c) 'Tear gases' and 'riot control agents' including:

1. Bromobenzyl cyanide (CA) (CAS 5798-79-8);

2. o-Chlorobenzylidenemalononitrile (o-Chlorobenzalmalononitrile) (CS) (CAS 2698-41-1);

3. Phenylacyl chloride (ù-chloroacetophenone) (CN) (CAS 532-27-4);

4. Dibenz-(b,f)-1,4-oxazepine (CR) (CAS 257-07-8);

Note: ML7(c) does not control tear gases or riot control agents individually packaged for

personal self defence purposes.

(d) Equipment specially designed or modified for military use, for the dissemination of any of the following and specially designed components therefor:

1. Materials or agents controlled by ML7(a) or (c); or
2. CW made up of precursors controlled by ML7(b).

(e) Protective and decontamination equipment, specially designed components therefor, and specially formulated chemical mixtures, as follows:

1. Equipment specially designed or modified for military use, for defence against materials controlled by ML7(a) or (c) and specially designed components therefor;
2. Equipment specially designed or modified or modified for military use, for the decontamination of objects contaminated with materials controlled by ML7(a) and specially designed components therefor;
3. Chemical mixtures specially developed/formulated for the decontamination of objects contaminated with materials controlled by ML7(a);

Note: ML7(e)(1) includes:

(a) Air conditioning units specially designed or modified for nuclear, biological or chemical filtration;

(b) Protective clothing.

Note: For civil gas masks, protective and decontamination equipment see also entry IA004 in the Handbook entitled "List of Dual-Use Items and Technology".

(f) Equipment specially designed or modified for military use, for the detection or identification of materials controlled by ML7(a) or (c) and specially designed components therefor;

Note: ML7(f) does not control personal radiation monitoring dosimeters.

N.B. See also entry IA004 in the Handbook entitled "List of Dual-Use Items and Technology".

(g) 'Biopolymers' specially designed or processed for the detection or identification of CW agents controlled by ML7(a), and the cultures of specific cells used to produce them;

(h) 'Biocatalysts' for the decontamination or degradation of CW agents, and biological systems therefor, as follows:

1. 'Biocatalysts' specially designed for the decontamination or degradation of CW agents controlled by ML7(a) resulting from directed laboratory selection or genetic manipulation of biological systems;
2. Biological systems, as follows: 'expression vectors', viruses or cultures of cells containing the genetic information specific to the production of 'biocatalysts' controlled by ML7(h)(1);

(i) 'Technology' as follows:

1. 'Technology' for the 'development', 'production' or 'use' of toxicological agents, related equipment or components controlled by ML7(a) to ML7(f);
2. 'Technology' for the 'development', 'production' or 'use' of 'biopolymers' or cultures of specific cells controlled by ML7(g);
3. 'Technology' exclusively for the incorporation of 'biocatalysts', controlled by ML7(h)1., into military carrier substances or military material.

Note 1: ML7(a) and ML7(c) do not control:

- (a) Cyanogen chloride (CAS 506-77-4). See 1C450(a)5. in the Handbook entitled "List of Dual-Use Items and Technology";
- (b) Hydrocyanic acid (CAS 74-90-8);
- (c) Chlorine (CAS 7782-50-5);
- (d) Carbonyl chloride (phosgene) (CAS 75-44-5). See 1C450(a)4. in the Handbook entitled "List of Dual-Use Items and Technology";
- (e) Diphosgene (trichloromethyl-chloroformate) (CAS 503-38-8);
- (f) Ethyl bromoacetate (CAS 105-36-2);
- (g) Xylyl bromide, ortho: (CAS 89-92-9), meta: (CAS 620-13-3), para: (CAS 104-81-4);
- (h) Benzyl bromide (CAS 100-39-0);
- (i) Benzyl iodide (CAS 620-05-3);
- (j) Bromo acetone (CAS 598-31-2);
- (k) Cyanogen bromide (CAS 506-68-3);
- (l) Bromo methylethylketone (CAS 816-40-0);
- (m) Chloro acetone (CAS 78-95-5);
- (n) Ethyl iodoacetate (CAS 623-48-3);
- (o) Iodo acetone (CAS 3019-04-3);
- (p) Chloropicrin (CAS 76-06-2). See 1C450(a)7. in the Handbook entitled "List of Dual-Use Items and Technology".

Note 2: The 'technology', cultures of cells and biological systems listed in ML7(g), ML7(h)(2) and ML7(i)(3) are exclusive and these sub-items do not control 'technology', cells or biological systems for civil purposes, such as agricultural, pharmaceutical, medical, veterinary, environmental, waste management, or in the food industry.

ML8. 'Energetic materials', and related substances, as follows:

N.B. See also 1C011 in the Handbook entitled "List of Dual-Use Items and Technology"

Technical Notes:

1. For the purposes of this entry, mixture refers to a composition of two or more substances with at least one substance being listed in the ML8 sub-items.
2. Any substance listed in the ML8 sub-items is controlled by this list, even when utilized in an application other than that indicated. (e.g., TAGN is predominantly used as an explosive but

can also be used either as a fuel or an oxidizer.)

(a) 'Explosives', as follows, and mixtures thereof:

1. ADNBF (aminodinitrobenzofuroxan or 7-amino-4,6-dinitrobenzofurazane-1-oxide) (CAS 97096-78-1);
2. BNCP (cis-bis (5-nitrotetrazolato) tetra amine-cobalt (III) perchlorate) (CAS 117412-28-9);
3. CL-14 (diamino dinitrobenzofuroxan or 5,7-diamino-4,6-dinitrobenzofurazane-1-oxide) (CAS 117907-74-1);
4. CL-20 (HNIW or Hexanitrohexaazaisowurtzitane) (CAS 135285-90-4); chlathrates of CL-20 (see also ML8(g)(3) and (g)(4) for its 'precursors');
5. CP (2-(5-cyanotetrazolato) penta amine-cobalt (III) perchlorate) (CAS 70247-32-4);
6. DADE (1,1-diamino-2,2-dinitroethylene, FOX7);
7. DATB (diaminotrinitrobenzene) (CAS 1630-08-6);
8. DDFP (1,4-dinitrodifurazanopiperazine);
9. DDPO (2,6-diamino-3,5-dinitropyrazine-1-oxide, PZO) (CAS 194486-77-6);
10. DIPAM (3,3'-diamino-2,2',4,4',6,6'-hexanitrobiphenyl or dipicramide) (CAS 17215-44-0);
11. DNGU (DINGU or dinitroglycoluril) (CAS 55510-04-8);
12. Furazans, as follows:
 - (a) DAAOF (diaminoazoxyfurazan);
 - (b) DAAzF (diaminoazofurazan) (CAS 78644-90-3);
13. HMX and derivatives (see also ML8(g)(5) for its 'precursors'), as follows:
 - (a) HMX (Cyclotetramethylenetetranitramine, octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazine, 1,3,5,7-tetranitro-1,3,5,7-tetrazacyclooctane, octogen or octogene) (CAS 2691-41-0);
 - (b) difluoroaminated analogs of HMX;
 - (c) K-55 (2,4,6,8-tetranitro-2,4,6,8-tetraazabicyclo [3,3,0]-octanone-3, tetranitrosemiglycouril or keto-bicyclic HMX) (CAS 130256-72-3);
14. HNAD (hexanitroadamantane) (CAS 143850-71-9);
15. HNS (hexanitrostilbene) (CAS 20062-22-0);
16. Imidazoles, as follows:
 - (a) BNNII (Octahydro-2,5-bis(nitroimino)imidazo [4,5-d]imidazole);
 - (b) DNI (2,4-dinitroimidazole) (CAS 5213-49-0);
 - (c) FDIA (1-fluoro-2,4-dinitroimidazole);
 - (d) NTDNIA (N-(2-nitrotriazolo)-2,4-dinitroimidazole);
 - (e) PTIA (1-picryl-2,4,5-trinitroimidazole);

17. NTNMH (1-(2-nitrotriazolo)-2-dinitromethylene hydrazine);
18. NTO (ONTA or 3-nitro-1,2,4-triazol-5-one) (CAS 932-64-9);
19. Polynitrocubanes with more than four nitro groups;
20. PYX (2,6-Bis(picrylamino)-3,5-dinitropyridine) (CAS 38082-89-2);
21. RDX and derivatives, as follows:
 - (a) RDX (cyclotrimethylenetrinitramine, cyclonite, T4, hexahydro-1,3,5-trinitro-1,3,5-triazine, 1,3,5-trinitro-1,3,5-triaza-cyclohexane, hexogen or hexogene) (CAS 121-82-4);
 - (b) Keto-RDX (K-6 or 2,4,6-trinitro-2,4,6-triazacyclohexanone) (CAS 115029-35-1);
22. TAGN (triaminoguanidinenitrate) (CAS 4000-16-2);
23. TATB (triaminotrinitrobenzene) (CAS 3058-38-6) (see also ML8(g)7 for its 'precursors');
24. TEDDZ (3,3,7,7-tetrakis(difluoroamine) octahydro-1,5-dinitro-1,5-diazocine);
25. Tetrazoles, as follows:
 - (a) NTAT (nitrotriazol aminotetrazole);
 - (b) NTNT (1-N-(2-nitrotriazolo)-4-nitrotetrazole);
26. Tetryl (trinitrophenylmethylnitramine) (CAS 479-45-8);
27. TNAD (1,4,5,8-tetranitro-1,4,5,8-tetraazadecalin) (CAS 135877-16-6) (see also ML8(g)6 for its 'precursors');
28. TNAZ (1,3,3-trinitroazetidine) (CAS 97645-24-4) (see also ML8(g)2 for its 'precursors');
29. TNGU (SORGUYL or tetranitroglycoluril) (CAS 55510-03-7);
30. TNP (1,4,5,8-tetranitro-pyridazino[4,5-d]pyridazine) (CAS 229176-04-9);
31. Triazines, as follows:
 - (a) DNAM (2-oxy-4,6-dinitroamino-s-triazine) (CAS 19899-80-0);
 - (b) NNHT (2-nitroimino-5-nitro-hexahydro-1,3,5-triazine) (CAS 130400-13-4);
32. Triazoles, as follows:
 - (a) 5-azido-2-nitrotriazole;
 - (b) ADHTDN (4-amino-3,5-dihydrazino-1,2,4-triazole dinitramide) (CAS 1614-08-0);
 - (c) ADNT (1-amino-3,5-dinitro-1,2,4-triazole);
 - (d) BDNTA ([bis-dinitrotriazole]amine);
 - (e) DBT (3,3'-dinitro-5,5-bi-1,2,4-triazole) (CAS 30003-46-4);
 - (f) DNBT (dinitrobistriazole) (CAS 70890-46-9);
 - (g) NTDNA (2-nitrotriazole 5-dinitramide) (CAS 75393-84-9);

- (h) NTDNT (1-N-(2-nitrotriazolo) 3,5-dinitrotriazole);
- (i) PDNT (1-picryl-3,5-dinitrotriazole);
- (j) TACOT (tetranitrobenzotriazolobenzotriazole) (CAS 25243-36-1);

33. Any explosive not listed elsewhere in ML8(a) with a detonation velocity exceeding 8 700 m/s at maximum density or a detonation pressure exceeding 34 GPa (340 kbar);

34. Other organic explosives not listed elsewhere in ML8(a) yielding detonation pressures of 25 GPa (250 kbar) or more that will remain stable at temperatures of 523 K (250 °C) or higher for periods of 5 minutes or longer.

(b) 'Propellants', as follows:

1. Any United Nations (UN) Class 1.1 solid 'propellant' with a theoretical specific impulse (under standard conditions) of more than 250 seconds for non-metallized, or more than 270 seconds for aluminized compositions;
2. Any UN Class 1.3 solid 'propellant' with a theoretical specific impulse (under standard conditions) of more than 230 seconds for non-halogenized, 250 seconds for non-metallized compositions and 266 seconds for metallized compositions;
3. 'Propellants' having a force constant of more than 1 200 kJ/kg;
4. 'Propellants' that can sustain a steady-state linear burning rate of more than 38 mm/s under standard conditions (as measured in the form of an inhibited single strand) of 6,89 MPa (68,9 bar) pressure and 294 K (21 °C);
5. Elastomer modified cast double base (EMCDB) 'propellants' with extensibility at maximum stress of more than 5 % at 233 K (-40 °C);
6. Any 'propellant' containing substances listed in ML8(a)

(c) 'Pyrotechnics', fuels and related substances, as follows, and mixtures thereof:

1. Aircraft fuels specially formulated for military purposes;
2. Alane (aluminum hydride) (CAS 7784-21-6);
3. Carboranes; decaborane (CAS 17702-41-9); pentaboranes (CAS 19624-22-7 and 18433-84-6) and their derivatives;
4. Hydrazine and derivatives, as follows (see also ML8(d)8. and (d)9. for oxidising hydrazine derivatives):
 - (a) Hydrazine (CAS 302-01-2) in concentrations of 70 % or more;
 - (b) Monomethyl hydrazine (CAS 60-34-4);
 - (c) Symmetrical dimethyl hydrazine (CAS 540-73-8);
 - (d) Unsymmetrical dimethyl hydrazine (CAS 57-14-7);
5. Metal fuels in particle form whether spherical, atomized, spheroidal, flaked or ground, manufactured from material consisting of 99 % or more of any of the following:
 - (a) Metals and mixtures thereof, as follows:

1. Beryllium (CAS 7440-41-7) in particle sizes of less than 60 µm;
 2. Iron powder (CAS 7439-89-6) with particle size of 3 µm or less produced by reduction of iron oxide with hydrogen;
- (b) Mixtures, which contain any of the following:
1. Zirconium (CAS 7440-67-7), magnesium (CAS 7439-95-4) or alloys of these in particle sizes of less than 60 µm;
 2. Boron (CAS 7440-42-8) or boron carbide (CAS 12069-32-8) fuels of 85 % purity or higher and particle sizes of less than 60 µm;
6. Military materials containing thickeners for hydrocarbon fuels specially formulated for use in flame throwers or incendiary munitions, such as metal stearates or palmates (e.g. octal (CAS 637-12-7)) and M1, M2, and M3 thickeners;
 7. Perchlorates, chlorates and chromates composited with powdered metal or other high energy fuel components;
 8. Spherical aluminum powder (CAS 7429-90-5) with a particle size of 60 µm or less, manufactured from material with an aluminum content of 99 % or more;
 9. Titanium subhydride (TiH_n) of stoichiometry equivalent to n= 0,65-1,68.

Note 1: Aircraft fuels controlled by ML8(c)1. are finished products not their constituents.

Note 2: ML8(c)4.a. does not control hydrazine mixtures specially formulated for corrosion control.

Note 3: Explosives and fuels containing the metals or alloys listed in ML8(c)5. are controlled whether or not the metals or alloys are encapsulated in aluminum, magnesium, zirconium, or beryllium.

Note 4: ML8(c)(5)(b)2. does not control boron and boron carbide enriched with boron-10 (20 % or more of total boron-10 content.)

- (d) Oxidizers, as follows, and mixtures thereof:
1. ADN (ammonium dinitramide or SR 12) (CAS 140456-78-6);
 2. AP (ammonium perchlorate) (CAS 7790-98-9);
 3. Compounds composed of fluorine and any of the following:
 - (a) Other halogens;
 - (b) Oxygen; or
 - (c) Nitrogen;

Note: ML8(d)3 does not control chlorine trifluoride. See 1C238 in the Handbook entitled "List of Dual-Use Items and Technology":

4. DNAD (1,3-dinitro-1,3-diazetidene) (CAS 78246-06-7);
5. HAN (hydroxylammonium nitrate) (CAS 13465-08-2);
6. HAP (hydroxylammonium perchlorate) (CAS 15588-62-2);

7. HNF (hydrazinium nitroformate) (CAS 20773-28-8);
8. Hydrazine nitrate (CAS 37836-27-4);
9. Hydrazine perchlorate (CAS 27978-54-7);
10. Liquid oxidisers comprised of or containing inhibited red fuming nitric acid (IRFNA) (CAS 8007-58-7);

Note: ML8(d)10 does not control non-inhibited fuming nitric acid.

(e) Binders, plasticizers, monomers, polymers, as follows:

1. AMMO (azidomethylmethyloxetane and its polymers) (CAS 90683-29-7) (see also ML8(g)1 for its 'precursors');
2. BAMO (bisazidomethyloxetane and its polymers) (CAS 17607-20-4) (see also ML8(g)1 for its 'precursors');
3. BDNPA (bis (2,2-dinitropropyl)acetal) (CAS 5108-69-0);
4. BDNPF (bis (2,2-dinitropropyl)formal) (CAS 5917-61-3);
5. BTTN (butanetrioltrinitrate) (CAS 6659-60-5) (see also ML8(g)8 for its 'precursors');
6. Energetic monomers, plasticizers and polymers containing nitro, azido, nitrate, nitraza or difluoroamino groups specially formulated for military use;
7. FAMAO (3-difluoroaminomethyl-3-azidomethyl oxetane) and its polymers;
8. FEFO (bis-(2-fluoro-2,2-dinitroethyl) formal) (CAS 17003-79-1);
9. FPF-1 (poly-2,2,3,3,4,4-hexafluoropentane-1,5-diol formal) (CAS 376-90-9);
10. FPF-3 (poly-2,4,4,5,5,6,6-heptafluoro-2-tri-fluoromethyl-3-oxaheptane-1,7-diol formal);
11. GAP (glycidylazide polymer) (CAS 143178-24-9) and its derivatives;
12. HTPB (hydroxyl terminated polybutadiene) with a hydroxyl functionality equal to or greater than 2,2 and less than or equal to 2,4, a hydroxyl value of less than 0,77 meq/g, and a viscosity at 30 °C of less than 47 poise (CAS 69102-90-5);
13. Low (less than 10 000) molecular weight, alcohol functionalised, poly(epichlorohydrin); poly(epichlorohydrindiol) and triol;
14. NENAs (nitrateethylnitramine compounds) (CAS 17096-47-8, 85068-73-1, 82486-83-7, 82486-82-6 and 85954-06-9);
15. PGN (Poly-GLYN, Polyglycidylnitrat or Poly(Nitratomethyloxiran)) (CAS 27814-48-8),
16. Poly-NIMMO (poly nitratomethylmethyloxetane) or poly-NMMO (poly[3-Nitratomethyl-3-methyloxetane]) (CAS 84051-81-0);
17. Polynitroorthocarbonates;

18. TVOPA (1,2,3-tris[1,2-bis(difluoroamino)ethoxy] propane or tris vinoxyl propane adduct) (CAS 53159-39-0).

(f) Additives, as follows:

1. Basic copper salicylate (CAS 62320-94-9);
2. BHEGA (bis-(2-hydroxyethyl) glycolamide) (CAS 17409-41-5);
3. BNO (butadienenitrileoxide) (CAS 9003-18-3);
4. Ferrocene derivatives, as follows:
 - (a) Butacene (CAS 125856-62-4);
 - (b) Catocene (2,2-bis-ethylferrocenyl propane) (CAS 37206-42-1);
 - (c) Ferrocene carboxylic acids;
 - (d) n-butyl-ferrocene (CAS 319904-29-7);
 - (e) Other adducted polymer ferrocene derivatives;
5. Lead beta-resorcyate (CAS 20936-32-7);
6. Lead citrate (CAS 14450-60-3);
7. Lead-copper chelates of beta-resorcyate or salicylates (CAS 68411-07-4);
8. Lead maleate (CAS 19136-34-6);
9. Lead salicylate (CAS 15748-73-9);
10. Lead stannate (CAS 12036-31-6);
11. MAPO (tris-1-(2-methyl)aziridinyl phosphine oxide) (CAS 57-39-6); BOBBA 8 (bis(2-methyl aziridinyl) 2-(2-hydroxypropanoxy) propylamino phosphine oxide); and other MAPO derivatives;
12. Methyl BAPO (bis(2-methyl aziridinyl) methylamino phosphine oxide) (CAS 85068-72-0);
13. N-methyl-p-nitroaniline (CAS 100-15-2);
14. 3-Nitroazirane-1,5-pentane diisocyanate (CAS 7406-61-9);
15. Organo-metallic coupling agents, as follows:
 - (a) Neopentyl[diallyl]oxy, tri[diethyl]phosphato-titanate (CAS 103850-22-2); also known as titanium IV, 2,2[bis 2-propenolato-methyl, butanolato, tris (diethyl) phosphato] (CAS 110438-25-0); or LICA 12 (CAS 103850-22-2);
 - (b) Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris[diethyl] pyrophosphate or KR3538;
 - (c) Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris(diethyl)phosphate;
16. Polycyanodifluoroaminoethyleneoxide;
17. Polyfunctional aziridine amides with isophthalic, trimesic (BITA or butylene imine trimesamide), isocyanuric or trimethyladipic backbone structures and 2-methyl or 2-ethyl substitutions on the aziridine ring;
18. Propyleneimine (2-methylaziridine) (CAS 75-55-8);
19. Superfine iron oxide (Fe₂O₃) with a specific surface area more than 250 m²/g and an average particle size of 3,0 nm or less;

20. TEPAN (tetraethylenepentaamineacrylonitrile) (CAS 68412-45-3); cyanoethylated polyamines and their salts;
21. TEPANOL (tetraethylenepentaamineacrylonitrileglycidol) (CAS 68412-46-4); cyanoethylated polyamines adducted with glycidol and their salts;
22. TPB (triphenyl bismuth) (CAS 603-33-8).

(g) 'Precursors', as follows:

Note: In ML8(g) the references are to controlled 'Energetic Materials' manufactured from these substances.

1. BCMO (bischloromethyloxetane) (CAS 142173-26-0) (see also ML8(e)1. and (e)2.);
2. Dinitroazetidine-t-butyl salt (CAS 125735-38-8) (see also ML8(a)28.);
3. HBIW (hexabenzylhexaazaisowurtzitane) (CAS 124782-15-6) (see also ML8(a)4.);
4. TAIW (tetraacetyldibenzylhexaazaisowurtzitane) (see also ML8(a)4.);
5. TAT (1,3,5,7 tetraacetyl-1,3,5,7,-tetraaza cyclo-octane) (CAS 41378-98-7) (see also ML8(a)13.);
6. 1,4,5,8-tetraazadecalin (CAS 5409-42-7) (see also ML8(a)27.);
7. 1,3,5-trichlorobenzene (CAS 108-70-3) (see also ML8(a)23.);
8. 1,2,4-trihydroxybutane (1,2,4-butanetriol) (CAS 3068-00-6) (see also ML8(e)5.).

Note 5: For charges and devices see ML4.

Note 6: ML8 does not control the following substances unless they are compounded or mixed with the 'energetic material' mentioned in ML8(a) or powdered metals in ML8(c):

- (a) Ammonium picrate;
- (b) Black powder;
- (c) Hexanitrodiphenylamine;
- (d) Difluoroamine;
- (e) Nitrostarch;
- (f) Potassium nitrate;
- (g) Tetranitronaphthalene;
- (h) Trinitroanisol;
- (i) Trinitronaphthalene;
- (j) Trinitroxylene;
- (k) N-pyrrolidinone; 1-methyl-2-pyrrolidinone;
- (l) Dioctylmaleate;
- (m) Ethylhexylacrylat,
- (n) Triethylaluminium (TEA), trimethylaluminium (TMA), and other pyrophoric metal alkyls and aryls of lithium, sodium, magnesium, zinc or boron;
- (o) Nitrocellulose;
- (p) Nitroglycerin (or glyceroltrinitrate, trinitroglycerine) (NG);

- (q) 2,4,6-trinitrotoluene (TNT);
- (r) Ethylenediaminedinitrate (EDDN);
- (s) Pentaerythritoltetranitrate (PETN);
- (t) Lead azide, normal and basic lead styphnate, and primary explosives or priming compositions containing azides or azide complexes;
- (u) Triethyleneglycoldinitrate (TEGDN);
- (v) 2,4,6-trinitroresorcinol (styphnic acid);
- (w) Diethyldiphenyl urea; dimethyldiphenyl urea; methylethyldiphenyl urea [Centralites];
- (x) N,N-diphenylurea (unsymmetrical diphenylurea);
- (y) Methyl-N,N-diphenylurea (methyl unsymmetrical diphenylurea);
- (z) Ethyl-N,N-diphenylurea (ethyl unsymmetrical diphenylurea);
- (aa) 2-Nitrodiphenylamine (2-NDPA);
- (bb) 4-Nitrodiphenylamine (4-NDPA);
- (cc) 2,2-dinitropropanol;
- (dd) Nitroguanidine (see IC011(d) in the Handbook entitled "List of Dual-Use Items and Technology").

ML9. Vessels of war, special naval equipment and accessories, as follows, and components thereof, specially designed for military use:

N.B. For guidance and navigation equipment, see ML11, Note g.

- (a) Combatant vessels and vessels (surface or underwater) specially designed or modified for offensive or defensive action, whether or not converted to non military use, regardless of current state of repair or operating condition, and whether or not they contain weapon delivery systems or armour, and hulls or parts of hulls for such vessels;
- (b) Engines, as follows:
 1. Diesel engines specially designed for submarines with both of the following characteristics:
 - (a) A power output of 1,12 MW (1 500 hp) or more; and
 - (b) A rotary speed of 700 rpm or more;
 2. Electric motors specially designed for submarines having all of the following characteristics:
 - (a) A power output of more than 0,75 MW (1 000 hp);
 - (b) Quick reversing;
 - (c) Liquid cooled; and
 - (d) Totally enclosed;
 3. Non-magnetic diesel engines specially designed for military use with a power output of 37,3 kW (50 hp) or more and with a non-magnetic content in excess of 75 % of total

mass;

- (c) Underwater detection devices specially designed for military use and controls thereof;
- (d) Submarine and torpedo nets;
- (e) Not used;
- (f) Hull penetrators and connectors specially designed for military use that enable interaction with equipment external to a vessel;

Note: ML9(f) includes connectors for vessels which are of the single conductor, multi-conductor, coaxial or waveguide type, and hull penetrators for vessels, both of which are capable of remaining impervious to leakage from without and of retaining required characteristics at marine depths exceeding 100 m; and fibre-optic connectors and optical hull penetrators specially designed for 'laser' beam transmission regardless of depth. It does not include ordinary propulsive shaft and hydrodynamic control-rod hull penetrators.

- (g) Silent bearings, with gas or magnetic suspension, active signature or vibration suppression controls, and equipment containing those bearings, specially designed for military use.

ML10. 'Aircraft', unmanned airborne vehicles, aero-engines and 'aircraft' equipment, related equipment and components, specially designed or modified for military use, as follows:

Note: For guidance and navigation equipment, see ML11, Note g.

- (a) Combat 'aircraft' and specially designed components therefor;
- (b) Other 'aircraft' specially designed or modified for military use, including military reconnaissance, assault, military training, transporting and air dropping troops or military equipment, logistics support, and specially designed components therefor;
- (c) Unmanned airborne vehicles and related equipment, specially designed or modified for military use, as follows, and specially designed components therefor:
 - 1. Unmanned airborne vehicles including remotely piloted air vehicles (RPVs) and autonomous programmable vehicles;
 - 2. Associated launchers and ground support equipment;
 - 3. Related equipment for command and control.
- (d) Aero-engines specially designed or modified for military use, and specially designed components therefor;
- (e) Airborne equipment, including airborne refuelling equipment, specially designed for use with the 'aircraft' controlled by ML10(a) or ML10(b) or the aero-engines controlled by ML10(d), and specially designed components therefor;
- (f) Pressure refuellers, pressure refuelling equipment, equipment specially designed to facilitate operations in confined areas and ground equipment, developed specially for 'aircraft' controlled by ML10(a) or ML10(b), or for aero-engines controlled by ML10(d);
- (g) Military crash helmets and protective masks and specially designed components therefor, pressurised breathing equipment and partial pressure suits for use in 'aircraft', anti-g suits,

liquid oxygen converters used for 'aircraft' or missiles, and catapults and cartridge actuated devices for emergency escape of personnel from 'aircraft';

(h) Parachutes and related equipment, used for combat personnel, cargo dropping or 'aircraft' deceleration, as follows:

1. Parachutes for:

(a) Pin point dropping of rangers;

(b) Dropping of paratroopers;

2. Cargo parachutes;

3. Paragliders, drag parachutes, drogue parachutes for stabilisation and attitude control of dropping bodies, (e)(g) recovery capsules, ejection seats, bombs);

4. Drogue parachutes for use with ejection seat systems for deployment and inflation sequence regulation of emergency parachutes;

5. Recovery parachutes for guided missiles, drones or space vehicles;

6. Approach parachutes and landing deceleration parachutes;

7. Other military parachutes;

8. Equipment specially designed for high altitude parachutists (e)(g), suits, special helmets, breathing systems, navigation equipment);

(i) Automatic piloting systems for parachuted loads; equipment specially designed or modified for military use for controlled opening jumps at any height, including oxygen equipment.

Note 1: ML10(b) does not control 'aircraft' or variants of those 'aircraft' specially designed for military use which:

(a) Are not configured for military use and are not fitted with equipment or attachments specially designed or modified for military use; and

(b) Have been certified for civil use by the civil aviation authority in a participating state.

Note 2: ML10(d) does not control:

(a) Aero-engines designed or modified for military use which have been certified by civil aviation authorities in a participating state for use in 'civil aircraft', or specially designed components therefor;

(b) Reciprocating engines or specially designed components therefor, except those specially designed for unmanned airborne vehicles.

Note 3: The control in ML10(b) and ML10(d) on specially designed components and related equipment for non-military 'aircraft' or aero-engines modified for military use applies only to those military components and to military related equipment required for the modification to military use.

ML11. Electronic equipment, not controlled elsewhere in this Manual, specially designed for military use and specially designed components therefor.

Note: ML11 includes:

- (a) Electronic countermeasure and electronic counter-countermeasure equipment (i.e., equipment designed to introduce extraneous or erroneous signals into radar or radio communication receivers or otherwise hinder the reception, operation or effectiveness of adversary electronic receivers including their countermeasure equipment), including jamming and counter-jamming equipment;*
- (b) Frequency agile tubes;*
- (c) Electronic systems or equipment designed either for surveillance and monitoring of the electro-magnetic spectrum for military intelligence or security purposes or for counteracting such surveillance and monitoring;*
- (d) Underwater countermeasures, including acoustic and magnetic jamming and decoy, equipment designed to introduce extraneous or erroneous signals into sonar receivers;*
- (e) Data processing security equipment, data security equipment and transmission and signalling line security equipment, using ciphering processes;*
- (f) Identification, authentication and keyloader equipment and key management, manufacturing and distribution equipment;*
- (g) Guidance and navigation equipment.*

ML12. High velocity kinetic energy weapon systems and related equipment, as follows, and specially designed components therefor:

- (a) Kinetic energy weapon systems specially designed for destruction or effecting mission-abort of a target;*
- (b) Specially designed test and evaluation facilities and test models, including diagnostic instrumentation and targets, for dynamic testing of kinetic energy projectiles and systems.*

Note: For weapon systems using sub-calibre ammunition or employing solely chemical propulsion, and ammunition therefor, see ML1 to ML4.

Note 1: ML12 includes the following when specially designed for kinetic energy weapon systems:

- (a) Launch propulsion systems capable of accelerating masses larger than 0,1 g to velocities in excess of 1,6 km/s, in single or rapid fire modes;*
- (b) Prime power generation, electric armour, energy storage, thermal management, conditioning, switching or fuel-handling equipment; and electrical interfaces between power supply, gun and other turret electric drive functions;*
- (c) Target acquisition, tracking, fire control or damage assessment systems;*
- (d) Homing seeker, guidance or divert propulsion (lateral acceleration) systems for projectiles.*

Note 2: ML12 controls weapon systems using any of the following methods of propulsion:

- (a) Electromagnetic;*

(b) *Electrothermal*;

(c) *Plasma*;

(d) *Light gas*; or

(e) *Chemical (when used in combination with any of the above)*.

Note 3: ML12 does not control 'technology' for magnetic induction for continuous propulsion of civil transport devices.

ML13. Armoured or protective equipment and constructions and components, as follows:

(a) Armoured plate as follows:

1. Manufactured to comply with a military standard or specification; or
2. Suitable for military use;

(b) Constructions of metallic or non-metallic materials or combinations thereof specially designed to provide ballistic protection for military systems, and specially designed components therefor;

(c) Military helmets;

(d) Body armour and protective garments manufactured according to military standards or specifications, or equivalent, and specially designed components therefor

N.B. For 'fibrous or filamentary materials' used in the manufacture of body armour, see entry IC010 in the Handbook entitled "List of Dual-Use Items and Technology".

Note 1: ML13(b) includes materials specially designed to form explosive reactive armour or to construct military shelters.

Note 2: ML13(c) does not control conventional steel helmets, neither modified or designed to accept, nor equipped with any type of accessory device.

Note 3: ML13(d) does not control body armour or protective garments when accompanying their user for the user's own personal protection.

Note: See also entry IA005 in the Handbook entitled "List of Dual-Use Items and Technology".

ML14. Specialised equipment for military training or for simulating military scenarios, simulators specially designed for training in the use of any firearm or weapon controlled by ML1 or ML2, and specially designed components and accessories therefor.

Technical Note: The term 'specialised equipment for military training' includes military types of attack trainers, operational flight trainers, radar target trainers, radar target generators, gunnery training devices, anti-submarine warfare trainers, flight simulators (including human-rated centrifuges for pilot/astronaut training), radar trainers, instrument flight trainers, navigation trainers, missile launch trainers, target equipment, drone 'aircraft', armament trainers, pilotless 'aircraft' trainers, mobile training units and training equipment for ground military operations.

Note 1: ML14 includes image generating and interactive environment systems for simulators when specially designed or modified for military use.

Note 2: ML14 does not control equipment specially designed for training in the use of hunting or sporting weapons.

ML15. Imaging or countermeasure equipment, as follows, specially designed for military use, and specially designed components and accessories therefor:

- (a) Recorders and image processing equipment;
- (b) Cameras, photographic equipment and film processing equipment;
- (c) Image intensifier equipment;
- (d) Infrared or thermal imaging equipment;
- (e) Imaging radar sensor equipment;
- (f) Countermeasure or counter-countermeasure equipment for the equipment controlled by sub-items ML15(a) to ML15(e).

Note: ML15(f) includes equipment designed to degrade the operation or effectiveness of military imaging systems or to minimize such degrading effects.

Note 1: The term 'specially designed components' includes the following when specially designed for military use:

- (a) *Infrared image converter tubes;*
- (b) *Image intensifier tubes (other than first generation);*
- (c) *Microchannel plates;*
- (d) *Low-light-level television camera tubes;*
- (e) *Detector arrays (including electronic interconnection or read out systems);*
- (f) *Pyroelectric television camera tubes;*
- (g) *Cooling systems for imaging systems;*
- (h) *Electrically triggered shutters of the photochromic or electro-optical type having a shutter speed of less than 100 μ s, except in the case of shutters which are an essential part of a high speed camera;*
- (i) *Fibre optic image inverters;*
- (j) *Compound semiconductor photocathodes.*

Note 2: ML15 does not control 'first generation image intensifier tubes' or equipment specially designed to incorporate 'first generation image intensifier tubes'.

Note: For the status of weapons sights incorporating 'first generation image intensifier tubes' see entries ML1., ML2. and ML5(a).

Note: See also entries 6A002(a)2. and 6A002(b) in the Handbook entitled “List of Dual-Use Items and Technology”.

ML16. Forgings, castings and other unfinished products the use of which in a controlled product is identifiable by material composition, geometry or function, and which are specially designed for any products controlled by ML1 to ML4, ML6, ML9, ML10, ML12 or ML19.

ML17. Miscellaneous equipment, materials and libraries, as follows, and specially designed components therefor:

(a) Self-contained diving and underwater swimming apparatus, as follows:

1. Closed or semi-closed circuit (rebreathing) apparatus specially designed for military use (i.e. specially designed to be non magnetic);
2. Specially designed components for use in the conversion of open-circuit apparatus to military use;
3. Articles designed exclusively for military use with self-contained diving and underwater swimming apparatus;

(b) Construction equipment specially designed for military use;

(c) Fittings, coatings and treatments for signature suppression, specially designed for military use;

(d) Field engineer equipment specially designed for use in a combat zone;

(e) ‘Robots’, ‘robot’ controllers, and ‘robot’, ‘end-effectors’, having any of the following characteristics:

1. Specially designed for military use;
2. Incorporating means of protecting hydraulic lines against externally induced punctures caused by ballistic fragments (e.g., incorporating self-sealing lines) and designed to use hydraulic fluids with flash points higher than 839 K (566 °C); or
3. Specially designed or rated for operating in an electro-magnetic pulse (EMP) environment;

(f) Libraries (parametric technical databases) specially designed for military use with equipment controlled by the Military List in this Manual;

(g) Nuclear power generating equipment or propulsion equipment, including ‘nuclear reactors’, specially designed for military use and components therefor specially designed or modified for military use;

(h) Equipment and material, coated or treated for signature suppression, specially designed for military use, other than those controlled elsewhere in the Military List of this Manual;

(i) Simulators specially designed for military ‘nuclear reactors’;

(j) Mobile repair shops specially designed or modified to service military equipment;

- (k) Field generators specially designed or modified for military use;
- (l) Containers specially designed or modified for military use;
- (m) Ferries, other than those controlled elsewhere in the Military List of this Manual, bridges and pontoons, specially designed for military use;
- (n) Test models specially designed for the 'development' of items controlled by ML4, ML6, ML9 or ML10.

Technical Notes:

1. *For the purpose of ML17, the term 'library' (parametric technical database) means a collection of technical information of a military nature, reference to which may enhance the performance of military equipment or systems.*
2. *For the purpose of ML17, 'modified' means any structural, electrical, mechanical, or other change that provides a non-military item with military capabilities equivalent to an item which is specially designed for military use.*

ML18. Equipment for the production of products referred to in the Military List of this Manual, as follows:

- (a) Specially designed or modified production equipment for the production of products controlled by the Military List of this Manual, and specially designed components therefor;
- (b) Specially designed environmental test facilities and specially designed equipment therefor, for the certification, qualification or testing of products controlled by the Military List of this Manual.

Technical Note: For the purposes of ML18, the term 'production' includes design, examination, manufacture, testing and checking.

Note 1: ML18(a) and ML18(b) include the following equipment:

- (a) *Continuous nitrators;*
- (b) *Centrifugal testing apparatus or equipment having any of the following characteristics:*
 1. *Driven by a motor or motors having a total rated horsepower of more than 298 kW (400 hp);*
 2. *Capable of carrying a payload of 113 kg or more; or*
 3. *Capable of exerting a centrifugal acceleration of 8 g or more on a payload of 91 kg or more;*
- (c) *Dehydration presses;*
- (d) *Screw extruders specially designed or modified for military explosive extrusion;*
- (e) *Cutting machines for the sizing of extruded propellants;*
- (f) *Sweetie barrels (tumblers) 1,85 m or more in diameter and having over 227 kg product*

capacity;

(g) *Continuous mixers for solid propellants;*

(h) *Fluid energy mills for grinding or milling the ingredients of military explosives;*

(i) *Equipment to achieve both sphericity and uniform particle size in metal powder listed in ML8(c)8.;*

(j) *Convection current converters for the conversion of materials listed in ML8(c)3.*

Note 2:

(a) *The term 'products referred to in the Military List of this Manual' includes:*

1. *Products not controlled if inferior to specified concentrations as follows:*

(a) *Hydrazine (see ML8(c)4.);*

(b) *'Explosives' (see ML8);*

2. *Products not controlled if inferior to technical limits, (i.e., 'superconductive' materials not controlled by 1C005 in the Handbook entitled "List of Dual-Use Items and Technology"; 'superconductive' electromagnets not controlled by 3A001.e.3. in the Handbook entitled "List of Dual-Use Items and Technology"; 'superconductive' electrical equipment excluded from control under ML20(b);*

3. *Metal fuels and oxidants deposited in laminar form from the vapour phase (see ML8(c)5.);*

(b) *The term 'products referred to in the Military List of this Manual' does not include:*

1. *Signal pistols (see ML2(b));*

2. *The substances excluded from control under Note 3 to ML7;*

3. *Personal radiation monitoring dosimeters (see ML7(f) and masks for protection against specific industrial hazards, see also the Handbook entitled "List of Dual-Use Items and Technology";*

4. *Difluoroamine and potassium nitrate powder (see Note 6 to ML8);*

5. *Aero-engines excluded from control under ML10;*

6. *Conventional steel helmets not equipped with, or modified or designed to accept, any type of accessory device (see Note 2 to ML13);*

7. *Equipment fitted with industrial machinery, which is not controlled such as coating machinery not elsewhere specified and equipment for the casting of plastics;*

8. *Muskets, rifles and carbines dated earlier than 1938, reproductions of muskets, rifles and carbines dated earlier than 1890, revolvers, pistols and machine guns dated earlier than 1890, and their reproductions.*

Note 3: Note 2(b)8. of ML18 does not release from controls production equipment for non-

antique small arms, even if used to produce reproductions of antique small arms.

ML19. Directed energy weapon systems (DEW), related or countermeasure equipment and test models, as follows, and specially designed components therefor:

- (a) 'Laser' systems specially designed for destruction or effecting mission-abort of a target;
- (b) Particle beam systems capable of destruction or effecting mission-abort of a target;
- (c) High power radio-frequency (RF) systems capable of destruction or effecting mission-abort of a target;
- (d) Equipment specially designed for the detection or identification of, or defence against, systems controlled by ML19(a) to ML19(c);
- (e) Physical test models and related test results for the systems, equipment and components controlled by this Item.
- (f) Continuous wave or pulsed 'laser' systems specially designed to cause permanent blindness to unenhanced vision, i.e., to the naked eye or to the eye with corrective eyesight devices.

Note 1: Directed energy weapon systems controlled by ML19 include systems whose capability is derived from the controlled application of:

- (a) 'Lasers' of sufficient continuous wave or pulsed power to effect destruction similar to the manner of conventional ammunition;
- (b) Particle accelerators which project a charged or neutral particle beam with destructive power;
- (c) High pulsed power or high average power radio frequency beam transmitters which produce fields sufficiently intense to disable electronic circuitry at a distant target.

Note 2: ML19 includes the following when specially designed for directed energy weapon systems:

- (a) Prime power generation, energy storage, switching, power conditioning or fuel-handling equipment;
- (b) Target acquisition or tracking systems;
- (c) Systems capable of assessing target damage, destruction or mission-abort;
- (d) Beam-handling, propagation or pointing equipment;
- (e) Equipment with rapid beam slew capability for rapid multiple target operations;
- (f) Adaptive optics and phase conjugators;
- (g) Current injectors for negative hydrogen ion beams;
- (h) 'Space qualified' accelerator components;
- (i) Negative ion beam funnelling equipment;

(j) *Equipment for controlling and slewing a high energy ion beam;*

(k) *'Space qualified' foils for neutralising negative hydrogen isotope beams.*

ML20. Cryogenic and 'superconductive' equipment, as follows, and specially designed components and accessories therefor:

(a) Equipment specially designed or configured to be installed in a vehicle for military ground, marine, airborne or space applications, capable of operating while in motion and of producing or maintaining temperatures below 103 K (– 170 °C);

Note: ML20(a) includes mobile systems incorporating or employing accessories or components manufactured from non-metallic or nonelectrical conductive materials, such as plastics or epoxy-impregnated materials.

(b) 'Superconductive' electrical equipment (rotating machinery and transformers) specially designed or configured to be installed in a vehicle for military ground, marine, airborne or space applications, capable of operating while in motion.

Note: ML20(b) does not control direct-current hybrid homopolar generators that have single-pole normal metal armatures which rotate in a magnetic field produced by superconducting windings, provided those windings are the only superconducting component in the generator.

ML21. 'Software', as follows:

(a) 'Software' specially designed or modified for the 'development', 'production' or 'use' of equipment or materials controlled by the Military List of this Manual;

(b) Specific 'software', as follows:

1. 'Software' specially designed for:

(a) Modelling, simulation or evaluation of military weapon systems;

(b) 'Development', monitoring, maintenance or up-dating of 'software' embedded in military weapon systems;

(c) Modelling or simulating military operation scenarios, not controlled by ML14;

(d) Command, Communications, Control and Intelligence (C3I) or Command, Communications, Control, Computer and Intelligence (C4I) applications;

2. 'Software' for determining the effects of conventional, nuclear, chemical or biological warfare weapons.

3. 'Software', not controlled by ML21(a), (b)1. or (b)2., specially designed or modified to enable equipment not controlled by the Military List of this Manual to perform the military functions of equipment controlled by ML5, ML7(f), ML9(c), ML9(e), ML10(e), ML11, ML14, ML15, ML17(i), or ML18.

ML22. 'Technology' as follows:

(a) 'Technology' according to the General Technology Note of this Manual for the 'development', 'production' or 'use' of items controlled in the Military List of this Manual,

other than that 'technology' controlled in ML7.

- (b) 'Technology' specific to the design of, the assembly of components into, and the operation, maintenance and repair of complete production installations for products referred to in the Military List of this Manual, even if the components of such production installations are not controlled.

Note 1:

(a) The term 'products referred to in the Military List of this Manual' includes:

- 1. Products not controlled if inferior to specified concentrations as follows:*

(a) Hydrazine (see ML8(c)4.);

(b) 'Explosives' (see ML8);

- 2. Products not controlled if inferior to technical limits, (i.e., 'superconductive' materials not controlled by 1C005. in the Handbook entitled "List of Dual-Use Items and Technology"; 'superconductive' electromagnets not controlled by 3A001(e)3. in the Handbook entitled "List of Dual-Use Items and Technology"; 'superconductive' electrical equipment excluded from control under ML20(b);*

- 3. Metal fuels and oxidants deposited in laminar form from the vapour phase (see ML8(c)5.);*

(b) The term 'products referred to in the Military List of this Manual' does not include:

- 1. Signal pistols (see ML2(b);*

- 2. The substances excluded from control under Note 3 to ML7.;*

- 3. Personal radiation monitoring dosimeters (see ML7(f)) and masks for protection against specific industrial hazards, see also the Handbook entitled "List of Dual-Use Items and Technology";*

- 4. Difluoroamine and potassium nitrate powder (see Note 6 to ML8);*

- 5. Aero-engines excluded from control under ML10;*

- 6. Conventional steel helmets not equipped with, or modified or designed to accept, any type of accessory device (see Note 2 to ML13);*

- 7. Equipment fitted with industrial machinery, which is not controlled such as coating machinery not elsewhere specified and equipment for the casting of plastics;*

- 8. Muskets, rifles and carbines dated earlier than 1938, reproductions of muskets, rifles and carbines dated earlier than 1890, revolvers, pistols and machine guns dated earlier than 1890, and their reproductions.*

Note 2: Note 1(b)8. of ML22 does not release from control 'technology' for non antique small arms, even if used to produce reproductions of antique small arms.

Note 3: ML22 does not control 'technology' for civil purposes, such as agricultural, pharmaceutical, medical, veterinary, environmental, waste management, or in the food industry.

Note: See Note 2 to ML7."