File Ref. : TRA CR 1506/2

LEGISLATIVE COUNCIL BRIEF

Import and Export Ordinance
(Chapter 60)

IMPORT AND EXPORT (STRATEGIC COMMODITIES) REGULATIONS (AMENDMENT OF SCHEDULE 1) ORDER 2004

INTRODUCTION

The Director-General of Trade and Industry (DGTI) has made the Import and Export (Strategic Commodities) Regulations (Amendment of Schedule 1) Order 2004 ("the Order") to amend Schedule 1 to the Import and Export (Strategic Commodities) Regulations ("the Regulations") in order to reflect the latest changes adopted by various international non-proliferation regimes in their control lists of strategic commodities. The Order is at Annex A.

A

JUSTIFICATIONS

2. The Regulations enable Hong Kong to impose licensing controls on the import, export, transshipment, and in some cases, transit of strategic commodities. The licensing system is administered by the Trade and Industry Department (TID) and enforced by the Customs and Excise Department.

3. Schedule 1 to the Regulations sets out strategic commodities which include materials, equipment, software and technology capable of use for both industrial and military purposes. The Schedule has been drawn up on the basis of the control lists adopted by the various international non-proliferation regimes and convention, i.e. the Wassenaar Arrangement (WA), Australia Group (AG), Missile Technology Control Regime (MTCR), Nuclear Suppliers Group (NSG), and Chemical Weapons Convention (CWC). The Government follows closely the developments in the international scene as regards the controls over strategic commodities. The Schedule is under constant review and, where appropriate, is amended to take into account the most up-to-date control lists made by the international regimes and convention. Schedule 1 of the Regulations was last substantially amended in July 2001.

4. Under section 6B of the Import and Export Ordinance, DGTI may, by order published in the Gazette, replace the Schedules to the Regulations or amend them to add or remove an article or class of articles to or from the Schedules to the Regulations.

THE ORDER

5. The Order amends Schedule 1 to the Regulations to reflect the revisions adopted by the WA, MTCR, AG and NSG to their respective control lists up to end-2003. The major changes are as follows :

(a) the WA (which governs controls over dual-use industrial goods and conventional weapons) has revised its controls over a number of items, which include the removal of control on general purpose microprocessors, graphics accelerators and graphics coprocessors used in computers; relaxation of control threshold of digital computers from 28,000 to 190,000 million theoretical operations per second (Mtops); strengthened controls on radiation hardened integrated circuits, certain types of microwave electronic devices, semiconductor lasers and navigation equipment; and the imposition of control on radio equipment employing the new technology on time-modulated ultra-wideband techniques;

(b) the MTCR (which focuses on controls of transfer of missile technology and equipment) has revised, amongst other things, its controls on rocket nozzles, reentry vehicle nose tips, lightweight turbojet and turbofan engines usable in missiles;

(c) the AG (which maintains controls over chemical and biological weapons agents, precursors and production equipment and technology) has made changes to its controls over certain chemical manufacturing equipment, fermenters and freeze drying equipment, and added more control items on viruses and toxins; and

(d) the NSG (which governs controls over nuclear weapons and nuclear related dual-use materials, equipment and technology) has reformatted some clauses in its control list to maintain consistency with other control regimes.

LEGISLATIVE TIMETABLE

6. The Order will be tabled at the Legislative Council on 5 May 2004.

IMPLICATIONS OF THE PROPOSAL

B 7. The Order has economic implications as set out at Annex B. The Order is in conformity with the Basic Law, including the provisions concerning human rights. It will not affect the binding effect of the Regulations. It has no financial, civil service, productivity, environmental or sustainability implications.

PUBLIC CONSULTATION

8. The amendments made by the Order are technical in nature. Public consultation is therefore considered not necessary.

PUBLICITY

9. The Order will be published in the Gazette on 30 April 2004. TID will issue a press release on the same day and inform traders of the details of the amended Schedule through circulars and general advisory service. The amended Schedule will also be uploaded on the website of the Government. A spokesman will be available for answering media enquiries.

ENQUIRIES

10. For any enquiries on this brief, please contact Ms Peony Leung, Principal Trade Officer of the Trade and Industry Department, at 2398 5554.

Trade and Industry Department
28 April 2004

IMPORT AND EXPORT (STRATEGIC COMMODITIES) REGULATIONS (AMENDMENT OF SCHEDULE 1) ORDER 2004

ANNEXES

Annex A - The Order

Annex B - Economic Implications

Annex A

IMPORT AND EXPORT (STRATEGIC COMMODITIES) REGULATIONS (AMENDMENT OF SCHEDULE 1) ORDER 2004

(Made under section 6B of the Import and Export Ordinance (Cap. 60))

1. Commencement

Subject to section 6B of the Ordinance, this Order shall come into operation on a day to be appointed by the Director-General of Trade and Industry by notice published in the Gazette.

2. Strategic commodities

Schedule 1 to the Import and Export (Strategic Commodities) Regulations (Cap. 60 sub. leg. G) is amended –

(a) in the Munitions List, by repealing Note 2 and substituting -

"2. 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.";

(b) in the Munitions List, in ML1 –

(i) by repealing "Arms" and substituting "Smooth-bore weapons with a calibre of less than 20 mm, other arms";

(ii) by repealing ML1(b) and substituting –

"(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;";

(iii) by repealing the Technical Note;

(c) in the Munitions List, in ML2, by repealing "Armament or weapons" and substituting "Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament";

(d) in the Munitions List, in ML3 –

(i) by repealing "Ammunition, and specially designed components therefor, for the weapons controlled by ML1, ML2 or ML12;" and substituting –

"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);";

(ii) in Note 2, by repealing "ML3" and substituting "ML3(a)";

(iii) in Note 3, by repealing "ML3" and substituting "ML3(a)";

(e) in the Munitions List, in ML4 –

(i) by adding "other explosive devices and charges" before "and related";

(ii) by adding before ML4(a) –

"***N.B.:***

For guidance and navigation equipment, see Note (g) to ML11.";

(iii) in ML4(a), by repealing "military";

(f) in the Munitions List, in ML6 –

(i) by repealing "Ground vehicles and components therefor specially designed or modified for military use;" and the Technical Note and substituting -

"Ground vehicles and components, as follows:

N.B.:

For guidance and navigation equipment, see Note (g) to ML11.

(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).";

(ii) in Note 1, by repealing "ML6" and substituting "ML6(a)";

(iii) in Note 2, by adding "controlled by ML6(a)" after "use";

(iv) in Note 2(d), by repealing "for mountings for weapons." and substituting "or mountings for weapons;";

(v) in Note 2, by adding –

"(e) Black-out lighting.";

(vi) by repealing Note 3 and substituting –

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

(g) in the Munitions List, by repealing ML7 and substituting –

"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 C_{10}, 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 C_{10}, 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 C_{10}, 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-chlorovinyldichloroarsine (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 C_{10}, 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 (ω-chloroacetophenone) (CN) (CAS 532-27-4);

(4) Dibenz-(b,f)-1,4-oxazephine (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 ML7(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 ML7(c), and specially designed components therefor;

(2) Equipment, specially designed 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:

1. Air conditioning units specially designed or modified for nuclear, biological or chemical filtration;

2. Protective clothing.

N.B.:

For civil gas masks, protective and decontamination equipment, see also 1A004 of the Dual-use Goods List.

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

Note:

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

N.B.:

See also 1A004 of the Dual-use Goods List.

(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;

Notes:

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

(a) Cyanogen chloride (CAS 506-77-4);

(b) Hydrocyanic acid (CAS 74-90-8);

(c) Chlorine (CAS 7782-50-5);

(d) Carbonyl chloride (phosgene) (CAS 75-44-5);

(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).

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.";

(h) in the Munitions List, by repealing ML8 and substituting –

"ML8 "Energetic materials", and related substances, as follows:

N.B.:

See also 1C011 of the Dual-use Goods List.

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 ML8(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-tetraza-cyclooctane, 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-tetrabis(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 532 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 compositions, 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 compositions, 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 ML8(d)(9) for oxidizing 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;

(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.

(4) DNAD (1,3-dinitro-1,3-diazetidine) (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 oxidizers 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 functionalized, poly(epichlorohydrin); poly(epichlorohydrindiol) and triol;

(14) NENAs (nitratoethylnitramine compounds) (CAS 17096-47-8, 85068-73-1, 82486-83-7, 82486-82-6 and 85954-06-9);

(15) PGN (poly-GLYN, polyglycidylnitrate) or poly(nitratomethyl oxirane) (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 vinoxy 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-resorcylate (CAS 20936-32-7);

(6) Lead citrate (CAS 14450-60-3);

(7) Lead-copper chelates of beta-resorcylate 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-Nitraza-1,5-pentane diisocyanate (CAS 7406-61-9);

(15) Organo-metallic coupling agents, as follows:

(a) Neopentyl[diallyl]oxy, tri[dioctyl]phosphato-titanate (CAS 103850-22-2); also known as titanium IV, 2,2[bis 2-propenolato-methyl, butanolato, tris (dioctyl) phosphato] (CAS 110438-25-0); or LICA 12 (CAS 103850-22-2);

(b) Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris[dioctyl] pyrophosphate or KR3538;

(c) Titanium IV, [(2-propenolato-1)methyl, n-propanolatomethyl] butanolato-1, tris(dioctyl)phosphate;

(16) Polycyanodifluoroamin

oethyleneoxide;

(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 (Fe_2O_3) with a specific surface area more than 250 m^2/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:

N.B.:

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 ML8(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));

Notes:

1. Aircaft fuels controlled by ML8(c)(1) are finished products not their constituents.
2. ML8(c)(4)(a) does not control hydrazine mixtures specially formulated for corrosion control.
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 aluminium, magnesium, zirconium, or beryllium.
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).

5. For charges and devices, see ML4.

6. ML8 does not control the following substances unless they are compounded or mixed with the "energetic materials" 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) Ethylhexylacrylate;

   (n) Triethylaluminium (TEA), trimethylaluminium (TMA), and other pyrophoric metal alkyls and aryls of lithium, sodium, magnesium, zinc or boron;

   (o) Nitrocelluose;

(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; dimethylidiphenyl 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 also 1C011(d) of the Dual-use Goods List).";

(i) in the Munitions List, in ML9 –

(i) by adding before ML9(a) –

"*N.B.:*

For guidance and navigation equipment, see Note (g) to ML11.";

(ii) by repealing ML9(e) and substituting –

"(e) Deleted;";

(j) in the Munitions List, in ML10 -

(i) by adding before ML10(a) –

"*N.B.:*

For guidance and navigation equipment, see Note (g) to ML11.";

(ii) in ML10(a), by repealing "components therefor specially designed or modified for military use" and substituting "specially designed components therefor";

(iii) in ML10(b), by repealing "components therefor specially designed or modified for military

use" and substituting "specially designed components therefor";

(iv) in ML10(c), by repealing "components therefor specially designed or modified for military use" and substituting "specially designed components therefor";

(v) by renumbering ML10(c) and ML10(d) as ML10(d) and ML10(c) respectively;

(vi) in ML10(e), by repealing "ML10(c), and components therefor specially designed or modified for military use" and substituting "ML10(d), and specially designed components therefor";

(vii) in ML10(f), by repealing "ML10(c)" and substituting "ML10(d)";

(viii) by repealing ML10(g) and substituting –

"(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";";

(ix) in ML10(h) -

(A) by adding "and related equipment," after "Parachutes" where it first appears;

(B) by adding -

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

(x) in Notes 2 and 3, by repealing "ML10(c)" and substituting "ML10(d)";

(xi) in Note 2(b), by adding ", except those specially designed for unmanned airborne vehicles" after "therefor";

(k) in the Munitions List, in ML11 –

(i) in Note (f), by repealing the full stop and substituting a semicolon;

(ii) in the Note, by adding –

"(g) Guidance and navigation equipment.";

(l) in the Munitions List, in ML13 –

(i) in ML13(d), by repealing "flak suits" and substituting "protective garments";

(ii) in ML13(d), by adding –

"*N.B.:*

For "fibrous or filamentary materials"

used in the manufacture of body armour, see 1C010 of the Dual-use Goods List.";

(iii) by repealing Note 3 and substituting –

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

(m) in the Munitions List, in ML14 -

(i) by adding "simulators specially designed for training in the use of any firearm or weapon controlled by ML1 or ML2," after "scenarios,";

(ii) in the Technical Note, by repealing "and mobile training units" and substituting ", mobile training units and training equipment for ground military operations";

(iii) by repealing the Note and substituting -

"*Notes:*

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

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

(n) in the Munitions List, in ML15, in Note 2, in the N.B., by adding ", ML2" after "ML1";

(o) in the Munitions List, in ML17 -

(i) in ML17(j), by adding "or modified" after "designed";

(ii) in ML17(k), by adding "or modified" after "designed";

(iii) in ML17(*l*), by adding "or modified" after "designed";

(iv) by repealing ML17(m) and substituting -

"(m) Ferries, other than those controlled elsewhere in the Munitions List, bridges and pontoons, specially designed for military use; ***and***";

(v) by repealing "***Note***" and substituting "***Notes***";

(vi) in the Technical Notes, by renumbering the Note as Note 1;

(vii) in the Technical Notes, by adding –

"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.";

(p) in the Munitions List, in ML18 -

(i) by repealing "and "technology"";

(ii) by adding after ML18(b) -

"*Technical Note:*

For the purposes of ML18, the term 'production' includes design, examination, manufacture, testing and checking.";

(iii) by repealing ML18(c) and ML18(d);

(iv) in Note 1(***i***), by repealing "ML8(a)(1)" and substituting "ML8(c)(8)";

(v) in Note 1(j), by repealing "ML8(a)(6)" and substituting "ML8(c)(3)";

(vi) in Note 1, by repealing the Technical Note;

(vii) in Note 2(a)(1)(a), by repealing "ML8(a)(18)" and substituting "ML8(c)(4)";

(viii) in Note 2(a)(1)(b), by repealing "Military explosives" and substituting "Explosives";

(ix) in Note 2(a)(3), by repealing "ML8(a)(2)" and substituting "ML8(c)(5)";

(x) by repealing Note 2(b)(4) and substituting -

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

(xi) in Note 3, by repealing ""technology" or";

(xii) by repealing everything after Note 3;

(q) in the Munitions List, by repealing ML22 and substituting -

"ML22 "Technology" as follows:

(a) "Technology" according to the General Technology Note of the Munitions List for the "development", "production" or "use" of items controlled in the Munitions List, 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 Munitions List, even if the components of such production installations are not controlled;

Notes:

1. (a) The term 'products referred to in the Munitions List' 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 of the Dual-use Goods List; "superconductive" electromagnets not controlled by 3A001(e)(3) of the Dual-use Goods List; "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 Munitions List' does not include:

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

(2) The substances excluded from control under Note 1 to ML7;

(3) Personal radiation monitoring dosimeters (see ML7(f)) and masks for protection against specific industrial hazards (see also Dual-use Goods List);

(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.

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

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

N.B.:

See Note 2 to ML7.";

(r) in the Dual-use Goods List, in the General Software Note -

(i) in entry (1)(a)(2), by repealing "*or*" at the end;

(ii) by renumbering entry (1)(a)(3) as entry (1)(a)(4);

(iii) in entry (1)(a), by adding -

"(3) Electronic transactions; *or*";

(s) in the Dual-use Goods List, in Category 1, in sub-category 1A -

(i) in 1A001, by repealing "COMPONENTS MADE FROM FLUORINATED COMPOUNDS, AS FOLLOWS" and substituting "Components made from fluorinated compounds, as follows";

(ii) in 1A002, by repealing 1A002(b)(2) and substituting -

"(2) Materials controlled by 1C010(c);

Note:

1A002(b) does not control finished or semi-finished items specially designed for purely civilian applications as follows:

(a) Sporting goods;

(b) Automotive industry;

(c) Machine tool industry;

(d) Medical applications.";

(iii) in 1A002, by repealing the Notes and substituting –

"*Note:*

1A002 does not control composite structures or laminates made from epoxy resin impregnated carbon "fibrous or filamentary materials" for the repair of aircraft structures or laminates, provided the size does not exceed 1 m^2.";

(iv) in 1A005 –

(A) by repealing the text beginning "***N.B.***" and substituting –

"***N.B.:***

See also the Munitions List.

For "fibrous or filamentary materials" used in the manufacture of body armour, see 1C010.";

(B) by repealing Note 1 and substituting –

"1. 1A005 does not control body armour or protective garments when accompanying their user for the user's own personal protection.";

(v) by repealing 1A202 and substituting -

"1A202 Composite structures, other than those specified in 1A002, in the form of tubes and having both of the following characteristics:

N.B.:

See also 9A010 and 9A110.

(a) An inside diameter of between 75 mm and 400 mm; ***and***

(b) Made with any of the "fibrous or filamentary materials" specified in 1C010(a) or 1C010(b) or 1C210(a) or with carbon prepreg materials specified in 1C210(c);";

(t) in the Dual-use Goods List, in Category 1, in sub-category 1B -

(i) in 1B001(c), by adding before the Note -

"***Technical Note:***

For the purpose of 1B001(c) the technique of interlacing includes knitting.";

(ii) in 1B002, by adding –

"***N.B.:***

See also 1B102.";

(iii) in 1B101(d), by repealing "9A110" and substituting "9C110";

(iv) by adding -

"1B102 Metal powder "production equipment", other than that specified in 1B002, and components as follows:

N.B.:

See also 1B115(b).

(a) Metal powder "production equipment" usable for the "production", in a controlled environment, of spherical or atomized materials specified in 1C011(a), 1C011(b), 1C111(a)(1), 1C111(a)(2) or in the Munitions List;

(b) Specially designed components for "production equipment" specified in 1B002 or 1B102(a);

Note:

1B102 includes:

(a) Plasma generators (high frequency arc-jet) usable for obtaining sputtered or spherical metallic powders with organization of the process in an argon-water environment;

(b) Electroburst equipment usable for obtaining sputtered or spherical metallic powders with organization of the process in an argon-water environment;

(c) Equipment usable for the "production" of spherical aluminium powders by powdering a melt in an inert medium (e.g. nitrogen).";

(v) by repealing 1B115 and substituting -

"1B115 Equipment, other than that specified in 1B002 or 1B102, for the "production" of

propellants or propellant constituents, as follows, and specially designed components therefor:

(a) "Production equipment" for the "production", handling or acceptance testing of liquid propellants or propellant constituents specified in 1C011(a), 1C011(b), 1C111 or in the Munitions List;

(b) "Production equipment" for the "production", handling, mixing, curing, casting, pressing, machining, extruding or acceptance testing of solid propellants or propellant constituents specified in 1C011(a), 1C011(b), 1C111 or in the Munitions List;

Note:

1B115(b) does not control batch mixers, continuous

mixers or fluid energy mills. For the control of batch mixers, continuous mixers and fluid energy mills, see 1B117, 1B118 and 1B119.

Notes:

1. For equipment specially designed for the production of military goods, see the Munitions List.
2. 1B115 does not control equipment for the "production", handling and acceptance testing of boron carbide.";

(vi) by repealing 1B117 and substituting -

"1B117 Batch mixers with provision for mixing under vacuum in the range of zero to 13.326 kPa and with temperature control capability of the mixing chamber and having all of the following, and specially designed components therefor:

(a) A total volumetric capacity of 110 litres or more; *and*

(b) At least one mixing/kneading shaft mounted off centre;";

(vii) by adding -

"1B118 Continuous mixers with provision for mixing under vacuum in the range of zero to 13.326 kPa and with temperature control capability of the mixing chamber and having any of the following, and specially designed components therefor:

(a) Two or more mixing or kneading shafts; *or*

(b) A single rotating shaft which oscillates and having kneading teeth/pins on the shaft as well as inside the casing of the mixing chamber;";

(viii) by adding -

"1B119 Fluid energy mills usable for grinding or milling substances specified in 1C011(a), 1C011(b), 1C111 or in the Munitions List, and specially designed components therefor;";

(ix) in 1B225, by repealing "a production" and substituting "an output";

(x) in 1B228(b), by repealing "(5 to 50 atmospheres)";

(xi) by repealing 1B230 and substituting -

"1B230 Pumps capable of circulating solutions of concentrated or dilute potassium amide catalyst in liquid ammonia (KNH_2 /NH_3), having all of the following characteristics:

(a) Airtight (i.e., hermetically sealed);

(b) A capacity greater than 8.5 m^3/h; ***and***

(c) Either of the following characteristics:

(1) For concentrated potassium amide solutions (1% or

greater), an operating pressure of 1.5 to 60 MPa; *or*

(2) For dilute potassium amide solutions (less than 1%), an operating pressure of 20 to 60 MPa;";

(xii) in 1B231, by repealing ", plant or equipment" and substituting "or plants, and equipment therefor";

(xiii) by repealing 1B232 and substituting -

"1B232 Turboexpanders or turboexpander-compressor sets having both of the following characteristics:

(a) Designed for operation with an outlet temperature of 35 K (-238°C) or less; *and*

(b) Designed for a throughput of hydrogen gas of 1 000 kg/h or greater;";

(xiv) in 1B233, by repealing ", plant or equipment" and substituting "or plants, and equipment therefor";

(xv) in 1B233(b)(2), by repealing "and/or" and substituting "or";

(u) in the Dual-use Goods List, in Category 1, in sub-category 1C -

(i) in entry (a), by repealing "atomising" and substituting "atomizing";

(ii) in 1C002(c)(2), by repealing "atomisation" wherever it appears and substituting "atomization";

(iii) in 1C010(d)(2), by repealing "*and*" and substituting "and";

(iv) in 1C011(a), by repealing "atomised" and substituting "atomized";

(v) in 1C107(a), by repealing "tips;" and substituting –

"tips, as follows:

(1) Cylinders having a diameter of 120 mm or greater and a length of 50 mm or greater;

(2) Tubes having an inner diameter of 65 mm or greater and a wall thickness of 25 mm or greater and a length of 50 mm or greater;

(3) Blocks having a size of 120 mm x 120 mm x 50 mm or greater;";

(vi) in 1C111(a)(3) -

(A) by repealing "oxidisers" and substituting "oxidizers";

(B) by adding -

"(d) Mixed Oxides of Nitrogen (MON);

Technical Note:

Mixed Oxides of Nitrogen (MON) are solutions of Nitric Oxide (NO) in Dinitrogen Tetroxide/Nitrogen Dioxide (N_2O_4/NO_2) that can be used in missile systems. There are a range of compositions that can be denoted as MONi or MONij, where i and j are integers representing the percentage of Nitric Oxide in the mixture (e.g. MON3 contains 3% Nitric Oxide, MON25 25% Nitric Oxide. An upper limit is MON40, 40% by weight).

Note:

1C111(a)(3)(d) does not control Nitrogen Trifluoride (NF_3) in a gaseous state as it is not

usable for missile applications.

(e) See the Munitions List for Inhibited Red Fuming Nitric Acid (IRFNA);

(f) See the Munitions List and 1C238 for compounds composed of fluorine and one or more of other halogens, oxygen or nitrogen;";

(vii) by repealing 1C111(c)(1) and substituting -

"(1) See the Munitions List for Butacene;";

(viii) in 1C111, by repealing the Notes and substituting -

"*Note:*

For propellants and constituent chemicals for propellants not specified in 1C111, see the Munitions List.";

(ix) in 1C118, by adding "all of the following" after "having";

(x) by repealing 1C202 and substituting -

"1C202 Alloys, other than those specified in 1C002(b)(3) or (b)(4), as follows:

(a) Aluminium alloys having both of the following characteristics:

(1) 'Capable of' an ultimate tensile strength of 460 MPa or more at 293 K (20°C); *and*

(2) In the form of tubes or cylindrical solid forms (including forgings) with an outside diameter of more than 75 mm;

(b) Titanium alloys having both of the following characteristics:

(1) 'Capable of' an ultimate tensile strength of 900 MPa or more at 293 K (20°C); *and*

(2) In the form of tubes or cylindrical solid forms (including forgings) with an

outside diameter of more than 75 mm;

Technical Note:

The phrase alloys 'capable of' encompasses alloys before or after heat treatment.";

(xi) by repealing 1C210 and substituting -

"1C210 'Fibrous or filamentary materials' or prepregs, other than those specified in 1C010(a), (b) or (e), as follows:

(a) Carbon or aramid 'fibrous or filamentary materials' having either of the following characteristics:

(1) A "specific modulus" of 12.7×10^6 m or greater; *or*

(2) A "specific tensile strength" of 235×10^3 m or greater;

Note:

1C210(a) does not control aramid 'fibrous or filamentary materials' having 0.25 percent or more by weight of an ester based fibre surface modifier.

(b) Glass 'fibrous or filamentary materials' having both of the following characteristics:

(1) A "specific modulus" of 3.18×10^6 m or greater; *and*

(2) A "specific tensile strength" of 76.2×10^3 m or greater;

(c) Thermoset resin impregnated continuous "yarns", "rovings", "tows" or "tapes" with a width of 15 mm or less (prepregs), made from carbon or glass 'fibrous or filamentary

materials' specified in 1C210(a) or (b);

Technical Note:

The resin forms the matrix of the composite.

Note:

In 1C210, 'fibrous or filamentary materials' is restricted to continuous "monofilaments", "yarns", "rovings", "tows" or "tapes".";

(xii) by repealing 1C216 and substituting -

"1C216 Maraging steel, other than that specified in 1C116, 'capable of' an ultimate tensile strength of 2 050 MPa or more at 293 K (20°C);

Note:

1C216 does not control forms in which all linear dimensions are 75 mm or less.

Technical Note:

The phrase maraging steel 'capable of' encompasses maraging steel before or after heat treatment.";

(xiii) by repealing 1C226 and substituting -

"1C226 Tungsten, tungsten carbide, and alloys containing more than 90% tungsten by weight, having both of the following characteristics:

(a) In forms with a hollow cylindrical symmetry (including cylinder segments) with an inside diameter between 100 mm and 300 mm; *and*

(b) A mass greater than 20 kg;

Note:

1C226 does not control manufactures specially designed as weights or gamma-ray collimators.";

(xiv) by repealing 1C227 and substituting -

"1C227 Calcium having both of the following characteristics:

(a) Containing less than 1 000 parts per million by weight of metallic impurities other than magnesium; *and*

(b) Containing less than 10 parts per million by weight of boron;";

(xv) by repealing 1C228 and substituting -

"1C228 Magnesium having both of the following characteristics:

(a) Containing less than 200 parts per million by weight of metallic impurities other than calcium; *and*

(b) Containing less than 10 parts per million by weight of boron;";

(xvi) by repealing 1C229 and substituting -

"1C229 Bismuth having both of the following characteristics:

(a) A purity of 99.99% or greater by weight; *and*

(b) Containing less than 10 parts per million by weight of silver;";

(xvii) in 1C230 –

(A) by repealing the Note;

(B) by repealing everything before 1C230(a) and substituting –

"1C230 Beryllium metal, alloys containing more than 50% beryllium by weight, beryllium compounds, manufactures thereof, and waste or scrap of any of the foregoing;

Note:

1C230 does not control the following:";

(C) in Note (c), by repealing the semicolon at the end and substituting a full stop;

(xviii) by repealing 1C232 and substituting -

"1C232 Helium-3 (^{3}He), mixtures containing helium-3, and products or devices containing any of the foregoing;

Note:

1C232 does not control a product or device containing less than 1 g of helium-3.";

(xix) by repealing 1C233 and substituting -

"1C233 Lithium enriched in the lithium-6 (^{6}Li) isotope to

greater than its natural isotopic abundance, and products or devices containing enriched lithium, as follows: elemental lithium, alloys, compounds, mixtures containing lithium, manufactures thereof, waste or scrap of any of the foregoing;

Note:

1C233 does not control thermoluminescent dosimeters.

Technical Note:

The natural isotopic abundance of lithium-6 is approximately 6.5 weight per cent (7.5 atom per cent).";

(xx) by repealing 1C234 and substituting -

"1C234 Zirconium with a hafnium content of less than 1 part hafnium to 500 parts zirconium by weight, as follows: metal, alloys containing more than 50% zirconium by weight, compounds, manufactures thereof, waste or scrap of any of the foregoing;

Note:

1C234 does not control zirconium in the form of foil having a thickness of 0.10 mm or less.";

(xxi) by repealing 1C235 and substituting -

"1C235 Tritium, tritium compounds, mixtures containing tritium in which the ratio of tritium to hydrogen atoms exceeds 1 part in 1 000, and products or devices containing any of the foregoing;

Note:

1C235 does not control a product or device containing less than 1.48×10^3 GBq (40 Ci) of tritium.";

(xxii) by repealing 1C236 and substituting -

"1C236 Alpha-emitting radionuclides having an alpha half-life of 10 days or greater but less than 200 years, in the following forms:

(a) Elemental;

(b) Compounds having a total alpha activity of 37 GBq/kg (1 Ci/kg) or greater;

(c) Mixtures having a total alpha activity of 37 GBq/kg (1 Ci/kg) or greater;

(d) Products or devices containing any of the foregoing;

Note:

1C236 does not control a product or device containing less than 3.7 GBq (100 millicuries) of alpha activity.";

(xxiii) by repealing 1C237 and substituting -

"1C237 Radium-226 (^{226}Ra), radium-226 alloys, radium-226 compounds, mixtures containing radium-226, manufactures thereof, and products or devices containing any of the foregoing;

Note:

1C237 does not control the following:

(a) Medical applicators;

(b) A product or device containing less than 0.37 GBq (10 millicuries) of radium-226.";

(xxiv) by repealing 1C240 and substituting -

"1C240 Nickel powder and porous nickel metal, other than those specified in 0C005, as follows:

(a) Nickel powder having both of the following characteristics:

(1) A nickel purity content of 99.0% or greater by weight; *and*

(2) A mean particle size of less than 10 micrometres measured by American Society for Testing and Materials (ASTM) B330 standard;

(b) Porous nickel metal produced from materials specified in 1C240(a);

Note:

1C240 does not control the following:

(a) Filamentary nickel powders;

(b) Single porous nickel sheets with an area of 1 000 cm^2 per sheet or less.

Technical Note:

1C240(b) refers to porous metal formed by compacting and sintering the materials in 1C240(a) to form a metal material with fine pores interconnected throughout the structure.";

(xxv) in 1C350(23), by adding "in the Munitions List" after "(753-98-0)";

(xxvi) in 1C351, by repealing the text beginning "***N.B.***" wherever it appears;

(xxvii) in 1C351(a), by adding –

"(21) Kyasanur Forest virus;

(22) Louping ill virus;

(23) Murray Valley encephalitis virus;

(24) Omsk haemorrhagic fever virus;

(25) Oropouche virus;

(26) Powassan virus;

(27) Rocio virus;

(28) St Louis encephalitis virus;

(29) Hendra virus (Equine morbillivirus);

(30) South American haemorrhagic fever (Sabia, Flexal, Guanarito);

(31) Pulmonary & renal syndrome-haemorrhagic fever viruses (Seoul, Dobrava, Puumala, Sin Nombre);

(32) Nipah virus;";

(xxviii) in 1C351(c), by adding –

"(14) Clostridium perfringens, epsilon toxin producing types;

Note:

1C351(c)(14) is limited to epsilon toxin producing strains of Clostridium perfringens, it does not control other Clostridium perfringens strains to be used as

positive control cultures for food testing and quality control.

(15) Enterohaemorrhagic Escherichia coli, serotype O157 and other verotoxin producing serotypes;";

(xxix) in 1C351(d), by adding -

"(12) Abrin;

(13) Cholera toxin;

(14) Diacetoxyscirpenol toxin;

(15) T-2 toxin;

(16) HT-2 toxin;

(17) Modeccin toxin;

(18) Volkensin toxin;

(19) Viscum Album Lectin 1 (Viscumin);";

(xxx) in 1C352(a)(2)(b), by repealing "EC Directive 92/40/EC (O.J.L.16 23.1.92 p.19)" and substituting "Directive 92/40/EEC (O.J.L. 167, 22.6.1992, p.1)";

(xxxi) in 1C352(a), by adding –

"(16) Lumpy skin disease virus;

(17) African horse sickness virus;";

(xxxii) in 1C353, by repealing "Genetically-modified "microorganisms"" and substituting "Genetic elements and genetically modified organisms";

(xxxiii) in 1C353(a), by repealing ""microorganisms"" and substituting "organisms";

(xxxiv) in 1C353(b), by repealing ""microorganisms"" and substituting "organisms";

(xxxv) in 1C353, by adding after 1C353(b) -

"*Technical Notes:*

1. Genetic elements includes, inter alia, chromosomes, genomes, plasmids, transposons and vectors whether genetically modified or unmodified.

2. 1C353 does not apply to nucleic acid sequences associated with the pathogenicity of enterohaemorrhagic coli, serotype O157 and other verotoxin producing strains, other than those coding for the verotoxin, or for its sub-units.";

(xxxvi) by repealing 1C450(c);

(v) in the Dual-use Goods List, in Category 1, in sub-category 1D, in 1D101, by repealing "1B115 or 1B117" and substituting "1B102, 1B115 or 1B117 to 1B119";

(w) in the Dual-use Goods List, in Category 1, in sub-category 1E, in 1E101, by repealing "1B115, 1B116, 1B117, 1C001, 1C007, 1C011, 1C101, 1C107, 1C111 to 1C118" and substituting "1B102, 1B115 to 1B119, 1C001, 1C101, 1C107, 1C111 to 1C117";

(x) in the Dual-use Goods List, in Category 2, in sub-category 2A -

(i) in 2A001(a) -

(A) by adding "all" before "tolerances";

(B) by adding "both" before "rings";

(C) by repealing ", balls or rollers" and substituting "and rolling elements (ISO 5593)";

(ii) in 2A001(b), by adding "all" before "tolerances";

(iii) by repealing 2A225 and substituting -

"2A225 Crucibles made of materials resistant to liquid actinide metals, as follows:

(a) Crucibles having both of the following characteristics:

(1) A volume of between 150 cm^3 and 8 000 cm^3; *and*

(2) Made of or coated with any of the following materials, having a purity of 98% or greater by weight:

(a) Calcium fluoride (CaF_2);

(b) Calcium zirconate (metazirconate) ($CaZrO_3$);

(c) Cerium sulphide (Ce_2S_3);

(d) Erbium oxide (erbia) (Er_2O_3);

(e) Hafnium oxide (hafnia) (HfO_2);

(f) Magnesium oxide (MgO);

(g) Nitrided niobium-titanium-tungsten alloy (approximately

50% Nb, 30% Ti, 20% W);

(h) Yttrium oxide (yttria) (Y_2O_3);

or

(i) Zirconium oxide (zirconia) (ZrO_2);

(b) Crucibles having both of the following characteristics:

(1) A volume of between 50 cm^3 and 2 000 cm^3;

and

(2) Made of or lined with tantalum, having a purity of 99.9% or greater by weight;

(c) Crucibles having all of the following characteristics:

(1) A volume of between 50 cm^3 and 2 000 cm^3;

(2) Made of or lined with tantalum, having a purity of 98% or

greater by weight;

and

(3) Coated with tantalum carbide, nitride, boride, or any combination thereof;";

(iv) by repealing 2A226 and substituting -

"2A226 Valves having all of the following characteristics:

(a) A 'nominal size' of 5 mm or greater;

(b) Having a bellows seal; *and*

(c) Wholly made of or lined with aluminium, aluminium alloy, nickel, or nickel alloy containing more than 60% nickel by weight;

Technical Note:

For valves with different inlet and outlet diameters, the 'nominal size' in 2A226 refers to the smallest diameter.";

(y) in the Dual-use Goods List, in Category 2, in sub-category 2B -

(i) in 2B001, by repealing "and any combination

thereof,";

(ii) in 2B001, by adding ", and any combination thereof and specially designed components therefor" after ""numerical control"";

(iii) in 2B001, in the Notes, by adding –

"3. A machine tool having at least two of the three turning, milling or grinding capabilities (e.g., a turning machine with milling capability), must be evaluated against each applicable entry 2B001(a), (b) or (c).";

(iv) in 2B001(a)(1), by repealing "all compensations available" and substituting ""all compensations available"";

(v) in 2B001(b)(3), by repealing "all compensations available" and substituting ""all compensations available"";

(vi) in 2B001(c) -

(A) by repealing Notes 3 and 4;

(B) by renumbering Note 5 as Note 3;

(vii) by adding –

"2B002 Numerically controlled machine tools using a magnetorheological finishing (MRF) process;

Technical Note:

For the purposes of 2B002, 'MRF' is a material removal process using an abrasive magnetic fluid whose viscosity is controlled by a magnetic field.";

(viii) by repealing 2B006(a) and substituting -

"(a) Computer controlled, "numerically controlled" or "stored programme controlled" coordinate measuring machines (CMM), having a three dimensional (volumetric) maximum permissible error of indication (MPEE) at any point within the operating range of the machine (i.e., within the length of axes) equal to or less (better) than 1.7 + L/1 000 µm (L is the measured length in mm), tested according to ISO 10360-2 (2001);

N.B.:

See also 2B206.";

(ix) in 2B006(b)(1), by repealing "Linear measuring instruments having any of the following:" and substituting -

"Linear displacement measuring instruments having any of the following:

Technical Note:

For the purpose of 2B006(b)(1), 'linear displacement' means the change of distance between the measuring probe and the measured object.";

(x) in 2B006(b)(2), by adding "displacement" after "Angular";

(xi) in 2B006(b)(2), in the Note, by adding "(e.g., laser light)" after "light";

(xii) in 2B006 -

(A) by repealing "*Notes*" and substituting "*Note*";

(B) in the Note to 2B006, by repealing "1. Machine" and substituting "Machine";

(C) in the Note to 2B006, by repealing everything after "function.";

(xiii) by adding -

"2B119 Balancing machines and related equipment, as follows:

N.B.:

See also 2B219.

(a) Balancing machines having all of the following characteristics:

(1) Not capable of balancing rotors/assemblies having a mass greater than 3 kg;

(2) Capable of balancing rotors/assemblies at speeds greater than 12 500 rpm;

(3) Capable of correcting unbalance in two planes or more; *and*

(4) Capable of balancing to a residual specific unbalance of 0.2 g mm per kg of rotor mass;

Note:

2B119(a) does not control balancing machines designed or modified for dental or other medical equipment.

(b) Indicator heads designed or modified for use with

machines specified in 2B119(a);

Technical Note:

Indicator heads are sometimes known as balancing instrumentation.

2B120 Motion simulators or rate tables having all of the following characteristics:

(a) Two axes or more;

(b) Slip rings capable of transmitting electrical power and/or signal information; *and*

(c) Having any of the following characteristics:

(1) For any single axis having both of the following characteristics:

(a) Capable of rates of 400 degrees/s or more, or 30 degrees/s or less; *and*

(b) A rate resolution equal to or less than 6 degrees/s and an accuracy equal to or less than 0.6 degrees/s;

(2) Having a worst-case rate stability equal to or better (less) than plus or minus 0.05% averaged over 10 degrees or more;

or

(3) A positioning accuracy equal to or better than 5 arc second;

Note:

2B120 does not control rotary tables designed or modified for machine tools or for medical equipment. For controls on machine tool rotary tables, see 2B008.

2B121 Positioning tables (equipment capable of precise rotary positioning in any axes), other than those specified in 2B120, having all of the following characteristics:

(a) Two axes or more; *and*

(b) A positioning accuracy equal to or better than 5 arc second;

Note:

2B121 does not control rotary tables designed or modified for machine tools or for medical equipment. For controls on machine tool rotary tables, see 2B008.

2B122 Centrifuges capable of imparting accelerations above 100 g and having slip rings capable of transmitting electrical power and signal information;";

(xiv) by repealing 2B201(a)(1) and substituting -

"(1) Positioning accuracies with "all compensations available" equal to or less (better) than 6 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; *or*";

(xv) in the Note to 2B201(a), by repealing "0.030" and substituting "0.03";

(xvi) in 2B201(b) –

(A) by repealing 2B201(b)1 and substituting -

"(1) Positioning accuracies with "all compensations available" equal to or less (better) than 4 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; *or*";

(B) by repealing "2." and substituting "(2)";

(xvii) by repealing 2B206 and substituting -

"2B206 Dimensional inspection machines, instruments or systems, other than those specified in 2B006, as follows:

(a) Computer controlled or numerically controlled dimensional inspection

machines having both of the following characteristics:

(1) Two or more axes; *and*

(2) A one-dimensional length "measurement uncertainty" equal to or less (better) than (1.25 + L/1 000) µm tested with a probe of an "accuracy" of less (better) than 0.2 µm (L is the measured length in millimeters) (Ref.: VDI/VDE 2617 Parts 1 and 2);

(b) Systems for simultaneously linear-angular inspection of hemishells, having both of the following characteristics:

(1) "Measurement uncertainty" along any linear axis equal to or less (better)

than 3.5 µm per 5 mm; *and*

(2) "Angular position deviation" equal to or less than 0.02°;

Notes:

1. Machine tools that can be used as measuring machines are controlled if they meet or exceed the criteria specified for the machine tool function or the measuring machine function.
2. A machine specified in 2B206 is controlled if it exceeds the control threshold anywhere within its operating range.

Technical Notes:

1. The probe used in determining the measurement uncertainty of a dimensional inspection system shall be described

in VDI/VDE 2617 Parts 2, 3 and 4.

2. All parameters of measurement values in 2B206 represent plus/minus i.e., not total band.";

(xviii) in 2B209, by repealing everything before 2B209(b) and substituting -

"2B209 Flow forming machines, spin forming machines capable of flow forming functions, other than those specified in 2B009 or 2B109, and mandrels, as follows:

(a) Machines having both of the following characteristics:

(1) Three or more rollers (active or guiding);

and

(2) Which, according to the manufacturer's technical specification, can be equipped with "numerical control"

units or a computer control;";

(xix) in the Note to 2B209, by repealing "2B209" and substituting "2B209(a)";

(xx) by repealing 2B219(a)(1) and substituting –

"(1) Swing or journal diameter greater than 75 mm;";

(xxi) by repealing 2B219(b)(1) and substituting –

"(1) Journal diameter greater than 75 mm;";

(xxii) in 2B219(b)(3), by repealing "of 0.01 kg mm/kg per plane or better" and substituting "equal to or less than 0.01 kg x mm/kg per plane";

(xxiii) in 2B225, by adding "*Technical*" before "*Note*";

(xxiv) by repealing 2B226 and substituting –

"2B226 Controlled atmosphere (vacuum or inert gas) induction furnaces, and power supplies therefor, as follows:

N.B.:

See also 3B.

(a) Furnaces having all of the following characteristics:

(1) Capable of operation above 1 123 K (850°C);

(2) Induction coils 600 mm or less in diameter; *and*

(3) Designed for power inputs of 5 kW or more;

(b) Power supplies, with a specified power output of 5 kW or more, specially designed for furnaces specified in 2B226(a);

Note:

2B226(a) does not control furnaces designed for the processing of semiconductor wafers.";

(xxv) by repealing 2B227 and substituting -

"2B227 Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:

(a) Arc remelt and casting furnaces having both of the following characteristics:

(1) Consumable electrode capacities between 1 000 cm^3 and 20 000 cm^3; *and*

(2) Capable of operating with melting temperatures above 1 973 K (1 700°C);

(b) Electron beam melting furnaces and plasma atomization and melting furnaces, having both of the following characteristics:

(1) A power of 50 kW or greater; *and*

(2) Capable of operating with melting temperatures above 1 473 K (1 200°C);

(c) Computer control and monitoring systems specially configured for any of the furnaces specified in 2B227(a) or 2B227(b);";

(xxvi) by repealing 2B228 and substituting -

"2B228 Rotor fabrication or assembly equipment, rotor straightening equipment, bellows-forming mandrels and dies, as follows:

(a) Rotor assembly equipment for assembly of gas centrifuge rotor tube sections, baffles, and end caps;

Note:

2B228(a) includes precision mandrels, clamps, and shrink fit machines.

(b) Rotor straightening equipment for alignment of gas centrifuge rotor tube sections to a common axis;

Technical Note:

In 2B228(b), such equipment normally consists of precision measuring probes linked to a computer that subsequently controls the

action of, for example, pneumatic rams used for aligning the rotor tube sections.

(c) Bellows-forming mandrels and dies for producing single-convolution bellows;

Technical Note:

In 2B228(c), the bellows have all of the following characteristics:

1. Inside diameter between 75 mm and 400 mm;
2. Length equal to or greater than 12.7 mm;
3. Single convolution depth greater than 2 mm; *and*
4. Made of high-strength aluminium alloys, maraging steel or high strength "fibrous or

filamentary materials".";

(xxvii) in 2B230, by repealing everything before "*Technical*" and substituting -

"2B230 "Pressure transducers" capable of measuring absolute pressures at any point in the range 0 to 13 kPa and having both of the following characteristics:

(a) Pressure sensing elements made of or protected by aluminium, aluminium alloy, nickel or nickel alloy with more than 60% nickel by weight; *and*

(b) Having either of the following characteristics:

(1) A full scale of less than 13 kPa and an 'accuracy' of better than ±1% of full-scale; *or*

(2) A full scale of 13 kPa or greater and an 'accuracy' of better than ±130 Pa;";

(xxviii) by repealing 2B231 and substituting -

"2B231 Vacuum pumps having all of the following characteristics:

(a) Input throat size equal to or greater than 380 mm;

(b) Pumping speed equal to or greater than 15 m^3/s; ***and***

(c) Capable of producing an ultimate vacuum better than 13 mPa;

Technical Notes:

1. The pumping speed is determined at the measurement point with nitrogen gas or air.

2. The ultimate vacuum is determined at the input of the pump with the input of the pump blocked off.";

(xxix) in 2B232 –

(A) by repealing "gun" where it first appears and substituting "guns";

(B) by repealing "electrothermal or" and substituting "and electrothermal types, and";

(xxx) in 2B350, by repealing "and equipment," and substituting ", equipment and components,";

(xxxi) in 2B350(b), by adding "specified in 2B350(a); and impellers, blades or shafts designed for such agitators," after "reactors";

(xxxii) in 2B350(d), by repealing "of less than 20 m^2" and substituting "greater than 0.15 m^2, and less than 20 m^2; and tubes, plates, coils or blocks (cores) designed for such heat exchangers or condensers";

(xxxiii) in 2B350(d)(4), by adding "or 'carbon graphite'" after "Graphite";

(xxxiv) in 2B350(e), by adding "; and liquid distributers, vapour distributers or liquid collectors designed for such distillation or absorption columns" after "0.1 m";

(xxxv) in 2B350(e)(4), by adding "or 'carbon graphite'" after "Graphite";

(xxxvi) in 2B350(g), by repealing "Multiple seal valves incorporating a leak detection port, bellows-seal valves, non-return (check) valves or diaphragm valves" and substituting "Valves with nominal sizes greater than 10 mm and casings (valve bodies) or preformed casing liners designed for such valves";

(xxxvii) in 2B350(h)(4), by adding "or 'carbon graphite'" after "Graphite";

(xxxviii) in 2B350(*i*), by adding "; and casings (pump bodies), preformed casing liners, impellers, rotors or jet pump nozzles designed for such pumps" after "conditions)";

(xxxix) in 2B350(*i*)(6), by adding "or 'carbon graphite'" after "Graphite";

(xl) in 2B350, by adding after 2B350(j) -

"*Technical Note:*

'Carbon graphite' is a composition of amorphous carbon and graphite, in which the graphite content is 8% or more by weight.";

(xli) by repealing 2B351(a) and substituting -

"(a) Designed for continuous operation and usable for the detection of chemical warfare agents or chemicals specified in 1C350, at concentrations of less than 0.3 mg/m^3; *or*";

(xlii) in 2B352(a), in the Technical Note, by repealing "(Geneva, 1983)" and substituting "(2^{nd} edition, Geneva, 1993)";

(xliii) in 2B352(b), by repealing "100" and substituting "20";

(xliv) in 2B352(c)(3), by repealing "Double or multiple" and substituting "One or more";

(xlv) in 2B352(d)(1), by repealing "5" and substituting "1";

(xlvi) in 2B352(e), by repealing "50" and substituting "10";

(xlvii) by repealing 2B352(f) and substituting -

"(f) Protective and containment equipment, as follows:

(1) Protective full or half suits, or hoods dependent upon a tethered external air supply and operating under positive pressure;

Note:

2B352(f)(1) does not control suits designed to be worn with self-contained breathing apparatus.

(2) Class III biological safety cabinets or isolators with similar performance standards;

Note:

In 2B352(f)(2), isolators include flexible isolators, dry boxes, anaerobic chambers, glove boxes and laminar flow hoods (closed with vertical flow).";

(xlviii) in 2B352(g), by adding ", viruses" after "microorganisms"";

(z) in the Dual-use Goods List, in Category 2, in sub-category 2D -

(i) in 2D002 –

(A) by repealing "*Note*" and substituting "*Notes*";

(B) by renumbering the Note as Note 1;

(C) in the Notes, by adding -

"2. 2D002 does not control "software" for items controlled by 2B002. See 2D001 for control of "software" for items controlled by 2B002.";

(ii) by repealing 2D101 and substituting -

"2D101 "Software" specially designed or modified for the "use" of equipment specified in 2B104, 2B105, 2B109, 2B116, 2B117 or 2B119 to 2B122;

N.B.:

See also 9D004.";

(za) in the Dual-use Goods List, in Category 2, in sub-category 2E –

(i) under the heading "TABLE - DEPOSITION TECHNIQUES – NOTES", in note 17, by adding "; or moulds for casting or moulding of plastics, manufactured from alloys containing less than 5% beryllium" after "devices";

(ii) under the heading "TABLE - DEPOSITION TECHNIQUES – STATEMENT OF UNDERSTANDING", in paragraph 5(f), by repealing "ion" and substituting "Ion";

(iii) by repealing 2E101 and substituting -

"2E101	"Technology" according to the General Technology Note for the "use" of equipment or "software" specified in 2B004, 2B009, 2B104, 2B109, 2B116, 2B119 to 2B122 or 2D101;";

(zb) in the Dual-use Goods List, in Category 3, in sub-category 3A -

(i) in 3A001(a)(1)(a), by repealing "*or*" at the end;

(ii) in 3A001(a)(1)(b), by adding "*or*" at the end;

(iii) in 3A001(a)(1), by adding -

"(c) a fluence (integrated flux) of neutrons (1 MeV equivalent) of 5 x 10^{13} n/cm^2 or higher on silicon, or its equivalent for other materials;

Note:

3A001(a)(1)(c) does not apply to Metal Insulator Semiconductors (MIS).";

(iv) by repealing 3A001(a)(3)(a) and substituting -

"(a) Deleted;";

(v) in 3A001(a)(5)(a)(2), by repealing "200 ns; *or*" and substituting "20 ns;";

(vi) by repealing 3A001(a)(5)(a)(3) and substituting -

"(3) A resolution of more than 12 bit but equal to or less than 14 bit with a total conversion time of less than 200 ns; *or*";

(vii) in 3A001(a)(5)(a), by adding -

"(4) A resolution of more than 14 bit with a total conversion time of less than 1 microsecond;";

(viii) in 3A001(a)(7)(b), by repealing "0.4" and substituting "0.1";

(ix) in 3A001(b)(1), by repealing the Note and substituting -

"*Notes:*

1. 3A001(b)(1) does not control tubes designed or rated for operation in any frequency band which meets both of the following characteristics:
   (a) Does not exceed 31.8 GHz; *and*
   (b) Is "allocated by the ITU" for radio-communications services, but not for radio-determination.
2. 3A001(b)(1) does not control non-"space qualified" tubes which meet both of the following characteristics:
   (a) An average output power equal to or less than 50 W; *and*
   (b) Designed or rated for operation in any frequency band which meets both of the following characteristics:
      (1) Exceeds 31.8 GHz but does not exceed 43.5 GHz; *and*
      (2) Is "allocated by the ITU" for radio-communications services, but not for radio-determination.";

(x) in 3A001(b)(1)(a)(1), by repealing "31" and substituting "31.8";

(xi) by repealing 3A001(b)(2) and substituting –

"(2) Microwave monolithic integrated circuits (MMIC) power amplifiers having any of the following:

(a) Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and with an average output power greater than 4 W (36 dBm) with a "fractional bandwidth" greater than 15%;

(b) Rated for operation at frequencies exceeding 6 GHz up to and including 16 GHz and with an average output power greater than 1 W (30 dBm) with a "fractional bandwidth" greater than 10%;

(c) Rated for operation at frequencies exceeding 16 GHz up to and including 31.8 GHz and with an average output power

greater than 0.8 W (29 dBm) with a "fractional bandwidth" greater than 10%;

(d) Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz;

(e) Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and with an average output power greater than 0.25 W (24 dBm) with a "fractional bandwidth" greater than 10%; *or*

(f) Rated for operation at frequencies exceeding 43.5 GHz;

Notes:

1. 3A001(b)(2) does not control broadcast satellite equipment designed or rated to operate in the frequency range of 40.5 to 42.5 GHz.

2. The control status of the MMIC whose operating frequency spans more than one frequency range, as defined by 3A001(b)(2), is determined by the lowest

average output power control threshold.

3. Notes 1 and 2 to sub-category 3A of Category 3 mean that 3A001(b)(2) does not control MMICs if they are specially designed for other applications, e.g., telecommunications, radar, automobiles.";

(xii) by repealing 3A001(b)(3) and substituting –

"(3) Microwave transistors having any of the following:

(a) Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and having an average output power greater than 60 W (47.8 dBm);

(b) Rated for operation at frequencies exceeding 6 GHz up to and including 31.8 GHz and having an average output power greater than 20 W (43 dBm);

(c) Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz and having an average output

power greater than 0.5 W (27 dBm);

(d) Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and having an average output power greater than 1 W (30 dBm);

or

(e) Rated for operation at frequencies exceeding 43.5 GHz;

Note:

The control status of an item whose operating frequency spans more than one frequency range, as defined by 3A001(b)(3), is determined by the lowest average output power control threshold.";

(xiii) by repealing 3A001(b)(4) and substituting –

"(4) Microwave solid state amplifiers and microwave assemblies/modules containing microwave amplifiers having any of the following:

(a) Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and with an average output power

greater than 60 W (47.8 dBm) with a "fractional bandwidth" greater than 15%;

(b) Rated for operation at frequencies exceeding 6 GHz up to and including 31.8 GHz and with an average output power greater than 15 W (42 dBm) with a "fractional bandwidth" greater than 10%;

(c) Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz;

(d) Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and with an average output power greater than 1 W (30 dBm) with a "fractional bandwidth" greater than 10%;

(e) Rated for operation at frequencies exceeding 43.5 GHz;

or

(f) Rated for operation at frequencies above 3 GHz and having all of the following:

(1) An average output power (in watts), P, greater than 150 divided by the maximum operating frequency (in GHz) squared [$P>150\ W*GHz^2/f_{GHz}^2$];

(2) A "fractional bandwidth" of 5% or greater; *and*

(3) Any two sides perpendicular to one another with length d (in cm) equal to or less than 15 divided by the lowest operating frequency in GHz [$d \leq 15\ cm*GHz/f_{GHz}$];

N.B.:

MMIC power amplifiers should be evaluated against the criteria in 3A001(b)(2).

Notes:

1. 3A001(b)(4) does not control broadcast satellite equipment designed or rated to operate in the frequency range of 40.5 to 42.5 GHz.

2. The control status of an item whose operating frequency spans more than one frequency range, as defined by 3A001(b)(4), is determined by the lowest average output power control threshold.";

(xiv) by repealing 3A001(b)(6) and substituting –

"(6) Deleted;";

(xv) in 3A002(a)(2), in the Note, by adding ", the ETSI" after "the EBU";

(xvi) in 3A002(a)(5)(a), by repealing "Digitising" and substituting "Digitizing";

(xvii) in 3A002(a), by adding -

"(6) Digital instrumentation data recorders, using magnetic disk storage technique, having all of the following:

(a) Digitizing rates equal to or more than 100 million samples per second and a resolution of 8 bits or more; *and*

(b) A continuous throughput of 1 Gbit/s or more;";

(xviii) in 3A002(c), by repealing ""Signal analysers"" where it first appears and substituting "Radio frequency "signal analysers"";

(xix) in 3A002(c)(1), by repealing "frequencies exceeding 31" and substituting "any frequency exceeding 31.8 GHz but less than 37.5 GHz or exceeding 43.5";

(xx) by repealing 3A002(d)(1) and substituting –

"(1) A maximum synthesised frequency exceeding 31.8 GHz but not exceeding 43.5 GHz and rated to generate a pulse duration of less than 100 ns;";

(xxi) by renumbering 3A002(d)(2) and 3A002(d)(3) as 3A002(d)(3) and 3A002(d)(4) respectively;

(xxii) in 3A002(d), by adding –

"(2) A maximum synthesised frequency exceeding 43.5 GHz;";

(xxiii) in 3A002(d), by adding before the Note –

"*Technical Note:*

For the purposes of 3A002(d)(1), 'pulse duration' is defined as the time interval between the leading edge of the pulse achieving 90% of the peak and the trailing edge of the pulse achieving 10% of the peak.";

(xxiv) in 3A002(e), by repealing "40" and substituting "43.5";

(xxv) in 3A002(f)(1), by repealing "40" and substituting "43.5";

(xxvi) by adding –

"3A003 Spray cooling thermal management systems employing closed loop fluid handling and reconditioning equipment in a sealed enclosure where a dielectric fluid is sprayed onto electronic components using specially designed spray nozzles that are designed to maintain electronic components within their operating temperature range, and specially designed components therefor;";

(xxvii) in 3A201, by repealing everything before the Note to 3A201(b) and substituting -

"3A201 Electronic components, other than those specified in 3A001, as follows:

(a) Capacitors having either of the following sets of characteristics:

(1) (a) Voltage rating greater than 1.4 kV;

(b) Energy storage greater than 10 J;

(c) Capacitance greater than 0.5 µF; *and*

(d) Series inductance less than 50 nH; *or*

(2) (a) Voltage rating greater than 750 V;

(b) Capacitance greater than 0.25 µF; *and*

(c) Series inductance less than 10 nH;

(b) Superconducting solenoidal electromagnets having all of the following characteristics:

(1) Capable of creating magnetic fields greater than 2 T;

(2) A ratio of length to inner diameter greater than 2;

(3) Inner diameter greater than 300 mm; *and*

(4) Magnetic field uniform to better than 1% over the central 50% of the inner volume;";

(xxviii) in 3A201(b), in the Note -

(A) by repealing "as parts of" and substituting "'as parts of'";

(B) by repealing ""部分"" and substituting "'部分'";

(xxix) by repealing 3A201(c) and substituting -

"(c) Flash X-ray generators or pulsed electron accelerators having either of the following sets of characteristics:

(1) (a) An accelerator peak electron energy of 500 keV or greater but less than 25 MeV; *and*

(b) With a 'figure of merit' (K) of 0.25 or greater; *or*

(2) (a) An accelerator peak electron energy of 25 MeV or greater; *and*

(b) A 'peak power' greater than 50 MW;

Note:

3A201(c) does not control accelerators that are component parts of devices designed for purposes other than electron beam or X-ray radiation (e.g. electron microscopy) nor those designed for medical purposes.

Technical Notes:

1. The 'figure of merit' (K) is defined as:

   $K = 1.7 \times 10^3 V^{2.65} Q$

   V is the peak electron energy in million electron volts.

   If the accelerator beam pulse duration is less than or equal to 1 μs, then Q is the total accelerated charge in Coulombs.

   If the accelerator beam pulse duration is greater than 1 μs, then Q is the maximum accelerated charge in 1 μs.

   Q equals the integral of i with respect to t, over the lesser of 1 μs or the time duration of the beam pulse ($Q = \int i dt$), where i is beam current in amperes and t is time in seconds.

2. 'Peak power' = (peak potential in volts) × (peak beam current in amperes).

3. In machines based on microwave accelerating cavities, the time

duration of the beam pulse is the lesser of 1 µs or the duration of the bunched beam packet resulting from one microwave modulator pulse.

4. In machines based on microwave accelerating cavities, the peak beam current is the average current in the time duration of a bunched beam packet.";

(xxx) by repealing 3A225 and substituting -

"3A225 Frequency changers or generators, other than those specified in 0B001(b)(13), having all of the following characteristics:

(a) Multiphase output capable of providing a power of 40 W or greater;

(b) Capable of operating in the frequency range between 600 and 2 000 Hz;

(c) Total harmonic distortion better (less) than 10%;

and

(d) Frequency control better (less) than 0.1%;

Technical Note:

Frequency changers in 3A225 are also known as converters or inverters.";

(xxxi) by repealing 3A226 and substituting -

"3A226 High-power direct current power supplies, other than those specified in 0B001(j)(6), having both of the following characteristics:

(a) Capable of continuously producing, over a time period of 8 hours, 100 V or greater with current output of 500 A or greater; *and*

(b) Current or voltage stability better than 0.1% over a time period of 8 hours;";

(xxxii) by repealing 3A227 and substituting -

"3A227 High-voltage direct current power supplies, other than those specified in 0B001(j)(5),

having both of the following characteristics:

(a) Capable of continuously producing, over a time period of 8 hours, 20 kV or greater with current output of 1 A or greater; *and*

(b) Current or voltage stability better than 0.1% over a time period of 8 hours;";

(xxxiii) by repealing 3A228 and substituting -

"3A228 Switching devices, as follows:

(a) Cold-cathode tubes, whether gas filled or not, operating similarly to a spark gap, having all of the following characteristics:

(1) Containing three or more electrodes;

(2) Anode peak voltage rating of 2.5 kV or more;

(3) Anode peak current rating of 100 A or more; *and*

(4) Anode delay time of 10 µs or less;

Note:

3A228 includes gas krytron tubes and vacuum sprytron tubes.

(b) Triggered spark-gaps having both of the following characteristics:

(1) An anode delay time of 15 µs or less; *and*

(2) Rated for a peak current of 500 A or more;

(c) Modules or assemblies with a fast switching function having all of the following characteristics:

(1) Anode peak voltage rating greater than 2 kV;

(2) Anode peak current rating of 500 A or more; *and*

(3) Turn-on time of 1 µs or less;";

(xxxiv) by repealing 3A229 and substituting -

"3A229 Firing sets and equivalent high-current pulse generators as follows:

N.B.:

See also Munitions List.

(a) Explosive detonator firing sets designed to drive multiple controlled detonators specified in 3A232;

(b) Modular electrical pulse generators (pulsers) having all of the following characteristics:

(1) Designed for portable, mobile, or ruggedized-use;

(2) Enclosed in a dust-tight enclosure;

(3) Capable of delivering their energy in less than 15 µs;

(4) Having an output greater than 100 A;

(5) Having a 'rise time' of less than 10 µs into loads of less than 40 ohms;

(6) No dimension greater than 254 mm;

(7) Weight less than 25 kg; *and*

(8) Specified for use over an extended temperature range 223 K (-50°C) to 373 K (100°C) or specified as suitable for aerospace applications;

Note:

3A229(b) includes xenon flash-lamp drivers.

Technical Note:

In 3A229(b)(5), 'rise time' is defined as the time interval from 10% to 90% current amplitude when driving a resistive load.";

(xxxv) in 3A230, by repealing everything before the Technical Note and substituting -

"3A230 High-speed pulse generators having both of the following characteristics:

(a) Output voltage greater than 6 V into a resistive load of less than 55 ohms; *and*

(b) 'Pulse transition time' less than 500 ps;";

(xxxvi) by repealing 3A231 and substituting -

"3A231 Neutron generator systems, including tubes, having both of the following characteristics:

(a) Designed for operation without an external vacuum system; *and*

(b) Utilizing electrostatic acceleration to induce a tritium-deuterium nuclear reaction;";

(zc) in the Dual-use Goods List, in Category 3, in sub-category 3B -

(i) in 3B001(a), by repealing ""Stored programme controlled" equipment" and substituting "Equipment";

(ii) by repealing 3B001(a)(1) and substituting –

"(1) Equipment capable of producing any of the following:

(a) A silicon layer with a thickness uniform to less than ± 2.5% across a distance of 200 mm or more; *or*

(b) A layer of any material other than silicon with a thickness uniform to less than ± 2.5% across a distance of 75 mm or more;";

(iii) in 3B001(b), by repealing ""Stored programme controlled" equipment" and substituting "Equipment";

(iv) by repealing 3B001(b)(4) and substituting –

"(4) A beam energy of 65 keV or more and a beam current of 45 mA or more for high energy oxygen implant into a heated semiconductor material "substrate";";

(v) in 3B001(c), by repealing ""Stored programme controlled" anisotropic" and substituting "Anisotropic";

(vi) in 3B001(d), by repealing ""Stored programme controlled" plasma" and substituting "Plasma";

(vii) by repealing 3B001(d)(1) and substituting –

"(1) Equipment with cassette-to-cassette operation and load-locks, and designed according to the manufacturer's specifications or optimized for use in the production of semiconductor devices with critical dimensions of 180 nm or less;";

(viii) by repealing 3B001(d)(2) and substituting –

"(2) Equipment specially designed for equipment controlled by 3B001(e) and designed according to the manufacturer's specifications or optimized for use in the production

of semiconductor devices with critical dimensions of 180 nm or less;";

(ix) in 3B001(e), by repealing ""Stored programme controlled" automatic" and substituting "Automatic";

(x) in 3B001(f), by repealing ""Stored programme controlled" lithography" and substituting "Lithography";

(xi) in 3B001(f)(1)(b), by repealing "0.5" and substituting "0.35";

(xii) in 3B001(h), by adding –

"*Note:*

3B001(h) does not control multi-layer masks with a phase shift layer designed for the fabrication of memory devices not controlled by 3A001.";

(xiii) in 3B002(a), by repealing "31" and substituting "31.8";

(xiv) in 3B002(b), by repealing "333" and substituting "667";

(zd) in the Dual-use Goods List, in Category 3, in sub-category 3C, in 3C002(a), by repealing "optimised" and substituting "optimized";

(ze) in the Dual-use Goods List, in Category 3, in sub-category 3D –

(i) by repealing 3D002 and substituting –

"3D002 "Software" specially designed for the "use" of any of the following:

(a) Equipment controlled by 3B001(a) to 3B001(f); *or*

(b) Equipment controlled by 3B002;";

(ii) by repealing 3D003 and substituting –

"3D003 Physics-based simulation "software" specially designed for the "development" of lithographic, etching or deposition processes for translating masking patterns into specific topographical patterns in conductors, dielectrics or semiconductor materials;

Technical Note:

'Physics-based' in 3D003 means using computations to determine a sequence of physical cause and effect events based on

physical properties (e.g., temperature, pressure, diffusion constants and semiconductor materials properties).

Note:

Libraries, design attributes or associated data for the design of semiconductor devices or integrated circuits are considered as "technology".";

(iii) by adding –

"3D004 "Software" specially designed for the "development" of the equipment controlled by 3A003;";

(zf) in the Dual-use Goods List, in Category 3, in sub-category 3E -

(i) in 3E001, by adding –

"*Note:*

3E001 does not control "technology" for the "production" of equipment or components controlled by 3A003.";

(ii) in 3E002, by repealing the Note and substituting –

"*Note:*

3E001 and 3E002 do not control "technology" for the "development" or "production" of integrated circuits controlled by 3A001(a)(3) to 3A001(a)(12), having all of the following:

1. Using "technology" of 0.5 µm or more*; and*

2. Not incorporating multi-layer structures.

Technical Note:

The term multi-layer structures in Note 2 above does not include devices incorporating a maximum of three metal layers and three polysilicon layers.";

(iii) in 3E003(b), by adding –

"*Note:*

3E003(b) does not control technology for high electron mobility transistors (HEMT) operating at frequencies lower than 31.8 GHz and hetero-junction bipolar transistors (HBT) operating at frequencies lower than 31.8 GHz.";

(iv) in 3E003, by adding -

"(g) Electronic vacuum tubes operating at frequencies of 31.8 GHz or higher;";

(zg) in the Dual-use Goods List, in Category 4, in sub-category 4A -

(i) in 4A001(a)(2)(b), by repealing "(Si)/sec" and substituting "(Si)/s";

(ii) by repealing 4A002 and substituting –

"4A002 Deleted;";

(iii) in 4A003(b), by repealing "28 000" and substituting "190 000";

(iv) in 4A003(c), by repealing everything from "爲將" to "4A003(b)的限制;" and substituting "爲聚合"計算元件"("CEs")致使聚合物的"CTP"超過項目4A003(b)的限制從而增強性能而特別設計或改裝的"電子組件";";

(v) by repealing 4A003(d) and substituting -

"(d) Deleted;";

(zh) in the Dual-use Goods List, in Category 4, in sub-category 4D -

(i) by renumbering 4D001 as 4D001(a);

(ii) in 4D001, by adding -

"(b) "Software", other than that controlled by 4D001(a), specially designed or modified for the "development" or "production" of:

(1) "Digital computers" having a "composite theoretical performance" ("CTP") exceeding 28 000 Mtops; *or*

(2) "Electronic assemblies" specially designed or modified for enhancing performance by aggregation of "computing elements" ("CEs") so that the "CTP" of the aggregation exceeds the limit in 4D001(b)(1);";

(iii) by repealing 4D003(d) and substituting -

"(d) Deleted;";

(zi) in the Dual-use Goods List, in Category 4, in sub-category 4E -

(i) by renumbering 4E001 as 4E001(a);

(ii) in 4E001, by adding -

"(b) "Technology", other than that controlled by 4E001(a), specially designed or modified for the "development" or "production" of:

(1) "Digital computers" having a "composite theoretical performance" ("CTP") exceeding 28 000 Mtops; *or*

(2) "Electronic assemblies" specially designed or modified for enhancing performance by aggregation of "computing elements" ("CEs") so that the "CTP" of the aggregation exceeds the limit in 4E001(b)(1);";

(zj) in the Dual-use Goods List, in Category 5, in Part 1, in sub-category 5A1 -

(i) in 5A001(b)(2)(b)(2), by repealing "1.5 MHz to 30 MHz frequency range or 250 W or more in the 30 MHz to 87.5 MHz frequency range" and substituting "frequency range of 1.5 MHz or more but less than 30 MHz, or 250 W or more in the frequency range of 30 MHz or more but not exceeding 87.5 MHz";

(ii) by renumbering 5A001(b)(4) and 5A001(b)(5) as 5A001(b)(5) and 5A001(b)(6) respectively;

(iii) in 5A001(b), by adding -

"(4) Being radio equipment employing "time-modulated ultra-wideband" techniques, having user programmable channelizing or scrambling codes;";

(iv) in 5A001(b)(5), in the Note, by repealing "5A001(b)(4)" and substituting "5A001(b)(5)";

(v) in 5A001(b)(6) -

(A) by adding "output" after "coding";

(B) by adding -

"*Technical Note:*

For variable rate voice coding, 5A001(b)(6) applies to the voice coding output of continuous speech.";

(vi) by repealing 5A101 and substituting –

"5A101 Telemetry and telecontrol equipment, including ground equipment, designed or modified for space launch vehicles specified in 9A004, unmanned aerial vehicles specified in 9A012 or sounding rockets specified in 9A104;

Notes:

1. 5A101 does not control equipment designed or modified for manned aircraft or satellites.
2. 5A101 does not control ground based equipment designed or modified for terrestrial or marine

applications.

3. 5A101 does not control equipment designed for commercial, civil or 'Safety of Life' (e.g. data integrity, flight safety) GNSS services.

4. 5A101 does not control equipment specially designed to be used for remote control of model planes, boats or vehicles and having an electric field strength of not more than 200 μV/m at a distance of 500 m.";

(zk) in the Dual-use Goods List, in Category 5, in Part 1, in sub-category 5B1 -

(i) in 5B001(a), in the Note, by repealing "not using semiconductor "lasers"";

(ii) in 5B001(b), by repealing ""stored programme controlled"";

(iii) in 5B001(b)(1), by repealing ", including "Asynchronous Transfer Mode" ("ATM"),";

(iv) in 5B001(b)(1), by repealing "1.5" and substituting "15";

(v) in 5B001(b)(1), by adding –

"*Technical Note:*

For switching equipment, the "total digital transfer rate" is measured at the highest speed port or line.";

(vi) in 5B001(b)(4), by repealing "128" and substituting "256";

(vii) in 5B001(b)(5), by repealing "either non-associated or quasi-associated" and substituting "non-associated";

(zl) in the Dual-use Goods List, in Category 5, in Part 1, in sub-category 5D1 -

(i) in 5D001(d), by repealing ""stored programme controlled"";

(ii) in 5D001(d)(1), by repealing ", including "Asynchronous Transfer Mode" ("ATM"),";

(iii) in 5D001(d)(1), by repealing "1.5" and substituting "15";

(iv) in 5D001(d)(1), by adding –

"*Technical Note:*

For switching equipment, the "total digital transfer rate" is measured at the highest speed port or line.";

(v) in 5D001(d)(4), by repealing "128" and substituting "256";

(vi) by adding -

"5D101 "Software" specially designed or modified for the "use" of equipment specified in 5A101;";

(zm) in the Dual-use Goods List, in Category 5, in Part 1, in sub-category 5E1 -

(i) by repealing 5E001(b)(3) and substituting -

"(3) "Technology" for the "development" of digital cellular radio base station receiving equipment whose reception capabilities that allow multi-band, multi-channel, multi-mode, multi-coding algorithm or multi-protocol operation can be modified by changes in "software";";

(ii) in 5E001(c), by repealing ""stored programme controlled"";

(iii) in 5E001(c)(1), by repealing ", including "Asynchronous Transfer Mode" ("ATM"),";

(iv) in 5E001(c)(1), by repealing "1.5" and substituting "15";

(v) in 5E001(c)(1), by adding –

"*Technical Note:*

For switching equipment, the "total digital transfer rate" is measured at the

highest speed port or line.";

(vi) in 5E001(c)(4)(a), by repealing "128" and substituting "256";

(vii) in 5E001(c)(4)(b), by repealing "31" and substituting "31.8";

(viii) in 5E001(c)(5), by repealing "either non-associated or quasi-associated" and substituting "non-associated";

(zn) in the Dual-use Goods List, in Category 5, in Part 2, in sub-category 5A2 -

(i) by repealing 5A002(a)(6) and substituting –

"(6) Deleted;";

(ii) by renumbering 5A002(a)(6) and 5A002(a)(7) as 5A002(a)(7) and 5A002(a)(8) respectively;

(iii) in 5A002(a), by adding -

"(6) Designed or modified to use cryptographic techniques to generate channelizing or scrambling codes for "time-modulated ultra-wideband" systems;";

(iv) in 5A002(a), by repealing Note (a) and substituting -

"(a) "Personalized smart cards":

(1) Where the cryptographic capability is restricted for use in equipment or systems

excluded from control under 5A002 Notes (b) to (f); *or*

(2) For general public-use applications where the cryptographic capability is not user-accessible and it is specially designed and limited to allow protection of personal data stored within;

N.B.:

If a "personalized smart card" has multiple functions, the control status of each function is assessed individually.";

(v) in 5A002(a), in Note (c)(3), by repealing "One-time copying" and substituting "Copying control";

(zo) in the Dual-use Goods List, in Category 5, in Part 2, in sub-category 5B2, by repealing "INSPECTIONAND" and substituting "INSPECTION AND";

(zp) in the Dual-use Goods List, in Category 6, in sub-category 6A -

(i) in 6A001(a)(2)(a)(2)(a), by adding "*or*" at the end;

(ii) by repealing 6A001(a)(2)(a)(2)(b);

(iii) by renumbering 6A001(a)(2)(a)(2)(c) as 6A001(a)(2)(a)(2)(b);

(iv) in 6A001(a)(2)(b)(1), by adding "or able to be modified to have hydrophone group spacing of less than 12.5 m" after "12.5 m";

(v) in 6A001(a)(2)(b)(2), in the Technical Note, by repealing "6A001(a)(2)(b)(2)" and substituting "6A001(a)(2)(b)";

(vi) in 6A002, by repealing "Space-qualified" and "space-qualified" wherever they appear and substituting "Space qualified" and "space qualified" respectively;

(vii) in 6A002(a)(2)(a)(2), by repealing "15" and substituting "12";

(viii) in 6A002(a)(2)(a)(3), by repealing "Photocathodes, as follows" and substituting "Any of the following photocathodes";

(ix) in 6A002(a)(2)(a)(3)(a), by repealing "240" and substituting "350";

(x) in 6A002(a)(2)(a)(3)(c), in the Note, by repealing "control" and substituting "apply to";

(xi) in 6A002(a)(2)(b)(1), by repealing "15" and substituting "12";

(xii) in 6A002(a)(2)(b)(3), in the Note, by repealing "control" and substituting "apply to";

(xiii) in 6A002(a)(3), by repealing the Technical Note and substituting -

"*Technical Notes:*

1. Linear or two-dimensional multi-element detector arrays are referred to as "focal plane arrays".

2. For the purposes of 6A002(a)(3) 'cross-scan direction' is defined as the axis parallel to the linear array of detector elements and the 'scan direction' is defined as the axis perpendicular to the linear array of detector elements.";

(xiv) in 6A002(a)(3)(c), by repealing "Non-"space qualified"" and substituting "Non-"space qualified" non-linear (2-dimensional)";

(xv) in 6A002(a)(3), by adding -

"(d) Non-"space qualified" linear (1-dimensional) "focal plane arrays", having all of the following:

(1) Individual elements with a peak response in the wavelength

range exceeding 1 200 nm but not exceeding 2 500 nm; *and*

(2) Any of the following:

(a) A ratio of scan direction dimension of the detector element to the cross-scan direction dimension of the detector element of less than 3.8; *or*

(b) Signal processing in the element (SPRITE);

(e) Non-"space qualified" linear (1-dimensional) "focal plane arrays", having individual elements with a peak response in the wavelength range exceeding 2 500 nm but not exceeding 30 000 nm;";

(xvi) by repealing 6A003(b)(1) and substituting –

"(1) Video cameras incorporating solid state sensors, having a peak response in the wavelength range exceeding 10 nm but not exceeding 30 000 nm and having all of the following:

(a) Having any of the following:

(1) More than 4 x 10^6 "active pixels" per solid state array for monochrome (black and white) cameras;

(2) More than 4 x 10^6 "active pixels" per solid state array for colour cameras incorporating three solid state arrays; *or*

(3) More than 12 x 10^6 "active pixels" for solid state array colour cameras incorporating one solid state array; *and*

(b) Having any of the following:

(1) Optical mirrors controlled by 6A004(a);

(2) Optical control equipment controlled by 6A004(d); *or*

(3) The capability for annotating internally generated camera tracking data;

Technical Notes:

1. For the purpose of this entry, digital video cameras should be evaluated by the maximum number of "active pixels" used for capturing moving images.

2. For the purpose of this entry, camera tracking data is the information necessary to define camera line of sight orientation with respect to the earth. This includes:

   (a) the horizontal angle the camera line of sight makes with respect to the earth's magnetic field direction; *and*

   (b) the vertical angle between the camera line of sight and the earth's horizon.";

(xvii) by renumbering 6A003(b)(2)(a) and 6A003(b)(2)(b) as 6A003(b)(2)(b) and 6A003(b)(2)(c) respectively;

(xviii) in 6A003(b)(2), by adding -

"(a) A peak response in the wavelength range exceeding 10 nm but not exceeding 30 000 nm;";

(xix) in 6A004, by repealing "Space-qualified" and "space-qualified" and substituting "Space qualified" and "space qualified" respectively;

(xx) by repealing 6A005(b) and substituting -

"(b) Semiconductor "lasers", as follows:

Notes:

1. 6A005(b) includes semiconductor "lasers" having optical output connectors (e.g. fibre optic pigtails).

2. The control status of semiconductor "lasers" specially designed for other equipment is determined by the control status of the other equipment.

(1) Individual single-transverse mode semiconductor "lasers", having any of the following:

(a) A wavelength equal to or less than 1 510 nm, and having an average or CW output power exceeding 1.5

W; *or*

(b) A wavelength greater than 1 510 nm, and having an average or CW output power exceeding 500 mW;

(2) Individual, multiple-transverse mode semiconductor "lasers", having any of the following:

(a) A wavelength of less than 1 400 nm, and having an average or CW output power exceeding 10 W;

(b) A wavelength equal to or greater than 1 400 nm and less than 1 900 nm, and having an average or CW output power exceeding 2.5 W; *or*

(c) A wavelength equal to or greater than 1 900 nm, and having an average or CW output power exceeding 1 W;

(3) Individual semiconductor "laser" arrays, having any of the following:

(a) A wavelength of less than 1 400 nm, and having an average or CW output power exceeding 80 W;

(b) A wavelength equal to or greater than 1 400 nm and less than 1 900 nm, and having an average or CW output power exceeding 25 W; *or*

(c) A wavelength equal to or greater than 1 900 nm, and having an average or CW output power exceeding 10 W;

(4) Array stacks of semiconductor "lasers" containing at least one array that is controlled under 6A005(b)(3);

Technical Notes:

1. Semiconductor "lasers" are commonly called "laser" diodes.

2. An 'array' consists of multiple semiconductor "laser" emitters fabricated as a single chip so that the centres of the emitted

light beams are on parallel paths.

3. An 'array stack' is fabricated by stacking, or otherwise assembling, 'arrays' so that the centres of the emitted light beams are on parallel paths.";

(xxi) in 6A006(a), by repealing "or nuclear precession (proton/Overhauser)" and substituting ", nuclear precession (proton/Overhauser) or triaxial fluxgate";

(xxii) in 6A008(j), by repealing "Space-qualified" and substituting "Space qualified";

(xxiii) in 6A102, by repealing "detectors, other than those controlled by 6A002, for use in" and substituting "'detectors', other than those specified in 6A002, specially designed or modified for";

(xxiv) in 6A102, in the Technical Note, by repealing "detector" and substituting "'detector'";

(xxv) in 6A107(a), by repealing "0.7 mgal" and substituting "7 x 10^{-6} m/s^2 (0.7 milligal)";

(xxvi) in 6A108(a), by adding -

"*Note:*

6A108(a) includes the following:

(a) Terrain contour mapping equipment;

(b) Imaging sensor equipment;

(c) Scene mapping and correlation (both digital and analogue) equipment;

(d) Doppler navigation radar equipment.";

(xxvii) in 6A108(b), by adding "or unmanned aerial vehicles specified in 9A012" after ""missiles"";

(xxviii) by repealing 6A202 and substituting -

"6A202 Photomultiplier tubes having both of the following characteristics:

(a) Photocathode area of greater than 20 cm^2; *and*

(b) Anode pulse rise time of less than 1 ns;";

(xxix) in 6A205, by repealing everything before 6A205(f)(1) and substituting -

"6A205 "Lasers", "laser" amplifiers and oscillators, other than those specified in 0B001(g)(5), 0B001(h)(6) and 6A005, as follows:

(a) Argon ion "lasers" having both of the following characteristics:

(1) Operating at wavelengths between 400 nm and 515 nm; *and*

(2) An average output power greater than 40 W;

(b) Tunable pulsed single-mode dye laser oscillators having all of the following characteristics:

(1) Operating at wavelengths between 300 nm and 800 nm;

(2) An average output power greater than 1 W;

(3) A repetition rate greater than 1 kHz; *and*

(4) Pulse width less than 100 ns;

(c) Tunable pulsed dye laser amplifiers and oscillators having all of the following characteristics:

(1) Operating at wavelengths between 300 nm and 800 nm;

(2) An average output power greater than 30 W;

(3) A repetition rate greater than 1 kHz; *and*

(4) Pulse width less than 100 ns;

Note:

6A205(c) does not control single mode oscillators.

(d) Pulsed carbon dioxide "lasers" having all of the following characteristics:

(1) Operating at wavelengths between 9 000 nm and 11 000 nm;

(2) A repetition rate greater than 250 Hz;

(3) An average output power greater than 500 W; *and*

(4) Pulse width less than 200 ns;

(e) Para-hydrogen Raman shifters designed to operate at 16 micrometre output wavelength and at a repetition rate greater than 250 Hz;

(f) Pulse-excited, Q-switched neodymium-doped (other than glass) "lasers", having all of the following characteristics:";

(xxx) by repealing 6A225 and substituting -

"6A225 Velocity interferometers for measuring velocities exceeding 1 km/s during time intervals of less than 10 microseconds;

Note:

6A225 includes velocity interferometers such as VISARs (Velocity interferometer systems for any reflector) and DLIs (Doppler laser interferometers).";

(zq) in the Dual-use Goods List, in Category 6, in sub-category 6C, in 6C002(b), by repealing everything after 6C002(b)(2) and substituting –

"(3) Mercury cadmium telluride (HgCdTe) of any purity level;

Technical Note:

Mole fraction is defined as the ratio of moles of ZnTe to the sum of the moles of CdTe and ZnTe present in the crystal.";

(zr) in the Dual-use Goods List, in Category 6, in sub-category 6D, in 6D103, by adding "or unmanned aerial vehicles specified in 9A012" after ""missiles"";

(zs) in the Dual-use Goods List, in Category 6, in sub-category 6E, in 6E003(f), by adding "non-triaxial" before "fluxgate" where it twice appears;

(zt) in the Dual-use Goods List, in Category 7, in sub-category 7A -

(i) in the N.B., by repealing everything after "Category 6.";

(ii) by repealing 7A003 and substituting -

"7A003 Inertial Navigation Systems (INS) and specially designed components, as follows:

N.B.:

See also 7A103.

(a) Inertial navigation systems (gimballed or strapdown) and inertial equipment designed for "aircraft", land vehicles, vessels (surface or underwater) or "spacecraft" for attitude, guidance or control, having any of the following characteristics, and specially designed components therefor:

(1) Navigation error (free inertial) subsequent to normal alignment of 0.8 nautical mile per

hour (nm/hr) Circular Error Probable (CEP) or less (better); *or*

(2) Specified to function at linear acceleration levels exceeding 10 g;

(b) Hybrid Inertial Navigation Systems embedded with Global Navigation Satellite System(s) (GNSS) or with "Data-Based Referenced Navigation" ("DBRN") System(s) for attitude, guidance or control, subsequent to normal alignment, having an INS navigation position accuracy, after loss of GNSS or "DBRN" for a period of up to 4 minutes, of less (better) than 10 m Circular Error Probable (CEP);

(c) Inertial equipment for Azimuth, Heading, or North Pointing having any of the following characteristics, and specially designed components therefor:

(1) Designed to have an Azimuth, Heading, or North Pointing accuracy equal to, or less (better) than 6 arc minutes RMS at 45 degrees latitude; *or*

(2) Designed to have a non-operating shock level of 900 g or greater at a duration of 1-msec, or greater;

Notes:

1. The parameters of 7A003(a) and 7A003(b) are applicable with any of the following environmental conditions:

(1) Input random vibration with an overall magnitude of 7.7 g rms in the first half hour and a total test duration of one and one half hour per axis in each of the three perpendicular axes, when the random vibration meets the following:

(a) A constant power spectral density (PSD) value of 0.04 g^2/Hz over a frequency interval of 15 to 1 000 Hz; ***and***

(b) The PSD attenuates with frequency from 0.04 g^2/Hz to 0.01 g^2/Hz over a frequency

interval from 1 000 to 2 000 Hz;

(2) A roll and yaw rate of equal to or more than +2.62 rad (radian)/s (150 deg/s); *or*

(3) According to national standards equivalent to Note 1(1) or (2).

2. 7A003 does not control inertial navigation systems which are certified for use on "civil aircraft" by civil authorities of a "participating state".

3. 7A003(c)(1) does not control theodolite systems incorporating inertial equipment specially designed for civil surveying purposes.

Technical Notes:

1. 7A003(b) refers to systems in which an INS and other independent navigation aids are built into a single unit (embedded) in order to achieve improved performance.
2. 'Circular Error Probable' ('CEP') – In a circular normal distribution, the radius of the circle containing 50 percent of the individual measurements being made, or the radius of the circle within which there is a 50 percent probability of being located.";

(iii) by repealing 7A101 and substituting -

"7A101 Accelerometers, other than those specified in 7A001, as follows, and specially designed components therefor:

(a) Accelerometers with a threshold of 0.05 g or less, or a linearity error within 0.25% of full scale output, or both, which are designed for use in inertial navigation systems or in guidance systems;

Note:

7A101(a) does not specify accelerometers which are specially designed and developed as MWD (Measurement While Drilling) Sensors for use in downhole well service operations.

(b) Continuous output accelerometers specified to function at acceleration levels exceeding 100 g;";

(iv) in 7A103(b), by adding ", unmanned aerial vehicles specified in 9A012" after "9A004";

(v) in 7A103, by adding -

"(c) 'Integrated navigation systems', designed or modified for space launch vehicles specified in 9A004, unmanned aerial vehicles specified in 9A012 or sounding rockets specified in 9A104 and capable of providing a navigational accuracy of 200 m Circle of Equal Probability (CEP) or less;

Technical Note:

An 'integrated navigation system' typically incorporates the following components:

1. An inertial measurement device (e.g. an attitude and heading reference system, inertial reference unit, or inertial navigation system);
2. One or more external sensors used to update the position and/or velocity, either periodically or continuously throughout the flight (e.g. satellite navigation receiver,

radar altimeter, and/or Doppler radar); *and*

3. Integration hardware and software.";

(vi) by repealing 7A105 and substituting -

"7A105 Receiving equipment for Global Navigation Satellite Systems (GNSS; e.g. GPS, GLONASS or Galileo), having any of the following characteristics, and specially designed components therefor:

(a) Designed or modified for use in space launch vehicles specified in 9A004, unmanned aerial vehicles specified in 9A012 or sounding rockets specified in 9A104; *or*

(b) Designed or modified for airborne applications and having any of the following characteristics:

(1) Capable of providing navigation information at speeds

in excess of 600 m/s (1 165 nautical miles/hour);

(2) Employing decryption, designed or modified for military or governmental services, to gain access to GNSS secured signal/data;

or

(3) Being specially designed to employ anti-jam features (e.g. null steering antenna or electronically steerable antenna) to function in an environment of active or passive countermeasures;

Note:

7A105(b)(2) and 7A105(b)(3) do not control equipment designed for

commercial, civil or 'Safety of Life' (e.g. data integrity, flight safety) GNSS services.";

(vii) in 7A106, by adding ", unmanned aerial vehicles specified in 9A012" after "9A004";

(viii) in 7A115 –

(A) by adding ", unmanned aerial vehicles specified in 9A012" after "9A004";

(B) in Note (b), by adding "(both active and passive)" after "equipment";

(C) in Note (c), by repealing "Interferometer" and substituting "Passive interferometer";

(ix) in 7A116 –

(A) by adding "and servo valves" after "Flight control systems";

(B) by adding "use in" after "for";

(C) by adding ", unmanned aerial vehicles specified in 9A012" after "9A004";

(x) in 7A116, by adding -

"(c) Flight control servo valves designed or modified for the systems specified in 7A116(a) or 7A116(b) and designed or modified to operate in a vibration environment of more

than 10 g rms over the entire range between 20 Hz and 2 kHz;";

(zu) in the Dual-use Goods List, in Category 7, in sub-category 7B -

(i) by repealing 7B003 and substituting -

"7B003 Equipment specially designed for the "production" of equipment controlled by 7A;

Note:

7B003 includes:

(a) Gyro tuning test stations;

(b) Gyro dynamic balance stations;

(c) Gyro run-in/motor test stations;

(d) Gyro evacuation and fill stations;

(e) Centrifuge fixtures for gyro bearings;

(f) Accelerometer axis align stations.";

(ii) by repealing 7B101;

(iii) by repealing 7B102 and substituting -

"7B102 Reflectometers specially designed to characterize mirrors, for "laser" gyros,

having a measurement accuracy of 50 ppm or less (better);";

(iv) by repealing 7B103 and substituting -

"7B103 "Production facilities" and "production equipment" as follows:

(a) "Production facilities" specially designed for equipment specified in 7A117;

(b) "Production equipment", and other test, calibration and alignment equipment, other than that specified in 7B001 to 7B003, designed or modified to be used with equipment specified in 7A;";

(v) by repealing 7B104;

(zv) in the Dual-use Goods List, in Category 7, in sub-category 7D -

(i) in 7D003(b), by repealing "navigation data";

(ii) in 7D003(b)(1), by adding "data" after "velocity";

(iii) by repealing 7D003(b)(3) and substituting -

"(3) Data from "Data-Based Referenced Navigation" ("DBRN") Systems;";

(iv) by repealing 7D101 and substituting -

"7D101 "Software" specially designed or modified for the "use" of equipment specified in 7A001 to 7A006, 7A101 to 7A106, 7A115, 7A116(a), 7A116(b), 7B001, 7B002, 7B003, 7B102 or 7B103;";

(v) in 7D102, by adding -

"(c) Integration "software" designed or modified for the equipment specified in 7A103(c);

Note:

A common form of integration "software" employs Kalman filtering.";

(vi) in 7D103, by adding ", unmanned aerial vehicles specified in 9A012" after "9A004";

(zw) in the Dual-use Goods List, in Category 7, in sub-category 7E, by repealing 7E101 and substituting -

"7E101 "Technology" according to the General Technology Note for the "use" of equipment specified in 7A001 to 7A006, 7A101 to 7A106,

7A115 to 7A117, 7B001, 7B002, 7B003, 7B102, 7B103, 7D101 to 7D103;";

(zx) in the Dual-use Goods List, in Category 9, in sub-category 9A -

(i) by adding -

"9A012 Unmanned aerial vehicles having any of the following:

(a) An autonomous flight control and navigation capability (e.g. an autopilot with an Inertial Navigation System); *or*

(b) Capability of controlled-flight out of the direct vision range involving a human operator (e.g. televisual remote control);

Note:

9A012 does not control model aircraft.";

(ii) in 9A101(a)(1), by repealing "1 000" and substituting "400";

(iii) by repealing 9A101(a)(2) and substituting -

"(2) Specific fuel consumption of 0.15 kg/N/hr or less (at maximum continuous power at sea level static and standard conditions); *or*";

(iv) in 9A106(d), by repealing "oxidiser" and substituting "oxidizer";

(v) by repealing 9A115 and substituting –

"9A115 Launch support equipment as follows:

(a) Equipment and devices for handling, control, activation or launching, and designed or modified for space launch vehicles specified in 9A004, unmanned aerial vehicles specified in 9A012 or sounding rockets specified in 9A104;

(b) Vehicles for transport, handling, control, activation or launching, and designed or modified for space launch vehicles specified in 9A004 or sounding rockets specified

in 9A104;";

(zy) in the Dual-use Goods List, in Category 9, in sub-category 9E, by repealing 9E003(e) and substituting –

"(e) "Technology" for the "development" or "production" of reciprocating diesel engine ground vehicle propulsion systems having all of the following:

(1) A box volume of 1.2 m^3 or less;

(2) An overall power output of more than 750 kW based on 80/1269/EEC, ISO 2534 or national equivalents; ***and***

(3) A power density of more than 700 kW/m^3 of box volume;

Technical Note:

Box volume: The product of three perpendicular dimensions is measured in the following way:

Length: The length of the crankshaft from front flange to flywheel face;

Width: The widest of the following:

(a) The outside dimension from valve cover to valve cover;

(b) The dimensions of the outside edges of the cylinder heads; *or*

(c) The diameter of the flywheel housing;

Height: The largest of the following:

(a) The dimension of the crankshaft centre-line to the top plane of the valve cover (or cylinder head) plus twice the stroke; *or*

(b) The diameter of the flywheel housing.

(f) "Technology" "required" for the "production" of specially designed components, as follows, for high output diesel engines:

(1) "Technology" "required" for the "production" of engine systems having all of the following components employing ceramics materials controlled by 1C007:

(a) Cylinder liners;

(b) Pistons;

(c) Cylinder heads; *and*

(d) One or more other components (including exhaust ports, turbochargers, valve guides, valve assemblies or insulated fuel injectors);

(2) "Technology" "required" for the "production" of turbocharger systems, with single-stage compressors having all of the following:

(a) Operating at pressure ratios of 4:1 or higher;

(b) A mass flow in the range from 30 to 130 kg per minute; *and*

(c) Variable flow area capability within the compressor or turbine sections;

(3) "Technology" "required" for the "production" of fuel injection systems with a specially designed multifuel (e.g., diesel or jet fuel) capability covering a viscosity range from diesel fuel (2.5 cSt at 310.8 K (37.8°C)) down to gasoline fuel (0.5 cSt at 310.8 K (37.8°C)), having both of the following:

(a) Injection amount in excess of 230 mm^3 per injection per cylinder; *and*

(b) Specially designed electronic control features for switching governor characteristics automatically depending on fuel property to provide the same torque characteristics by using the appropriate sensors;

(g) "Technology" "required" for the "development" or "production" of high output diesel engines for solid, gas phase or liquid film (or combinations thereof) cylinder wall lubrication, permitting operation to temperatures exceeding 723 K (450°C), measured on the cylinder wall at the top limit of travel of the top ring of the piston;

Technical Note:

High output diesel engines: diesel engines with a specified brake mean effective pressure of 1.8 MPa or more at a speed of 2 300 rpm, provided the rated speed is 2 300 rpm or more.";

(zz) in the Definitions of Terms –

(i) by repealing the definitions of "Adaptive control", "Asynchronous transfer mode" ("ATM") and "ATM";

(ii) in the definition of "Gas atomisation", by repealing "atomisation" and substituting "atomization";

(iii) by repealing the definition of "Global interrupt latency time";

(iv) in the definition of "Military explosives" –

(A) by repealing "Military explosives" (軍用炸藥)" and substituting "Explosives" (炸藥)";

(B) by repealing "military";

(v) in the definition of "Military pyrotechnic(s)", by repealing "Military pyrotechnic(s)" (各種軍用焰火訊號彈)" and substituting "Pyrotechnic(s)" (焰火訊號彈)";

(vi) in the definition of "Precursors" –

(A) by repealing "military";

(B) in the Chinese text, by repealing "光質" and substituting "先質";

(vii) in the definition of "Rotary atomisation", by repealing "atomisation" and substituting "atomization";

(viii) in the definition of "Vacuum atomisation", by repealing "atomisation" and substituting "atomization";

(ix) by adding -

"7 "Data-Based Referenced Navigation" ("DBRN") Systems (資料庫參考導航("DBRN")系統)

Systems which use various sources of previously measured geo-mapping data integrated to provide accurate navigation information under dynamic conditions. Data sources include bathymetric maps, stellar maps, gravity maps, magnetic maps or 3-D digital terrain maps.

ML 8 "Energetic materials" (高能物料)

Substances or mixtures that react chemically to release energy required for their intended application. "Explosives", "pyrotechnics" and

"propellants" are subclasses of energetic materials.

ML 8 "Propellants" (推進劑)

Substances or mixtures that react chemically to produce large volumes of hot gases at controlled rates to perform mechanical work.

5 "Time-modulated ultra-wideband" (時間調變超寬頻)

The technique in which very short precisely time-controlled RF pulses are modulated in accordance with communications data by shifting pulse positions (usually called Pulse Position Modulation, PPM) channelized or scrambled in accordance with pseudo-random noise codes by PPM, then transmitted and received

in the direct pulse form without using any carrier frequencies, consequently having extremely low power density over ultra-wide frequency bands. It is also known as Impulse Radio.".

Kevin C.M. HO
Director-General of Trade and Industry

26 April 2004

Explanatory Note

This Order revises Schedule 1 to the Import and Export (Strategic Commodities) Regulations (Cap. 60 sub. leg. G) to reflect the latest changes in the control lists of strategic commodities adopted by various international non-proliferation regimes.

Annex B

IMPORT AND EXPORT (STRATEGIC COMMODITIES) REGULATIONS (AMENDMENT OF SCHEDULE 1) ORDER 2004

ECONOMIC IMPLICATIONS

ECONOMIC IMPLICATIONS

The Order will facilitate the trade by removing outdated restrictions on trade in strategic commodities. In particular, many traders will benefit from the de-control of general purpose microprocessors as their burden of applying for import and export licences for such commonly traded products will be relieved. For the new controls to be imposed, the effects of them on traders should not be significant as the items concerned are not commonly traded by the import/export trade of Hong Kong.