

## **LEGISLATIVE COUNCIL BRIEF**

Import and Export Ordinance  
(Chapter 60)

### **IMPORT AND EXPORT (STRATEGIC COMMODITIES) REGULATIONS (AMENDMENT OF SCHEDULE 1) ORDER 2006**

#### **INTRODUCTION**

The Director-General of Trade and Industry (DGTI) has made the Import and Export (Strategic Commodities) Regulations (Amendment of Schedule 1) Order 2006 (“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 the 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), the Australia Group (AG), the Missile Technology Control Regime (MTCR), the Nuclear Suppliers Group (NSG), and the Chemical Weapons Convention (CWC). The Government follows closely the developments in the international scene with regard to 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 to the Regulations was last amended in June 2004.

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 WA, AG and MTCR to their respective control lists up to end-2005. The major changes are set out below.

- (a) the WA (which governs controls over dual-use industrial goods and conventional weapons) has revised its control over a number of items. The changes include removal of control over microprocessors that have multiple data or instruction bus or serial communication ports, certain types of optical weapon sights, a non-fluorinated polymeric substance and some test equipment of semiconductor devices; relaxation of the control thresholds for digital computers from 190,000 million theoretical operations per second (Mtops) to 0.75 Weighted TeraFLOPS and analogue-to-digital converter integrated circuits; and imposition of control on optical detectors that employ silicon focal plane arrays, infrared focal plane arrays based on microbolometer materials, jamming equipment that are designed to interfere with cellular mobile telecommunication services and encryption equipment designed to use quantum cryptography;
- (b) the AG (which maintains controls over chemical and biological weapons agents and precursors as well as their production equipment and technology) has imposed control on additional chemicals that may be used as toxic chemical agents, plant pathogens, and airborne spraying or fogging systems capable of dispersing biological agents in aerosol form; and

- (c) the MTCR (which focuses on controls of transfer of missile technology and equipment) has revised its control over a few items. The revisions include clarification of the scope of control on fuel substances used as propellants, and imposition of control on liquid propellant tanks.

## **LEGISLATIVE TIMETABLE**

6. The Order will be gazetted on 4 May 2006 and tabled at the Legislative Council on 10 May 2006.

## **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. A press release will be issued on the day when the Order is published in the Gazette on 4 May 2006. TID will announce the revised control list through trade circulars, general advisory service and its web portal on the day of gazettal. A spokesman will be available for answering media enquiries.

## **ENQUIRIES**

10. For enquiries on this brief, please contact Mr. Billy Au, Principal Trade Officer of TID, at 2398 5554.

Trade and Industry Department  
27 April 2006

**IMPORT AND EXPORT  
(STRATEGIC COMMODITIES) REGULATIONS  
(AMENDMENT OF SCHEDULE 1) ORDER 2006**

**ANNEXES**

Annex A - The Order

Annex B - Economic Implications

IMPORT AND EXPORT (STRATEGIC COMMODITIES) REGULATIONS  
(AMENDMENT OF SCHEDULE 1) ORDER 2006

(Made by the Director-General of Trade and Industry  
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) by repealing "*MUNITIONS LIST*";
- (b) by repealing the General Technology Note for the Munitions List;
- (c) by adding -

*"MUNITIONS LIST"*

before ML1;

- (d) in the Munitions List, in ML1, in the Notes, by adding -

"4. ML1(d) does not control optical weapons sights without electronic image processing, with a magnification of 4 times or less, provided they are not specially designed or modified for military use.";

- (e) in the Munitions List, in ML4, in the N.B., by repealing "see Note (g)" and substituting "see Note 7";
- (f) in the Munitions List, in ML6 -
  - (i) in the N.B. where it first appears, by repealing "see Note (g)" and substituting "see Note 7";
  - (ii) in the English text, by repealing "All wheel-drive vehicles" and substituting "All-wheel drive vehicles";
- (g) in the Munitions List, in ML7 -
  - (i) by repealing "'tear gases", radioactive materials, related equipment, components, materials and "technology"' and substituting "'riot control agents", radioactive materials, related equipment, components and materials";
  - (ii) by renumbering ML7(b), ML7(c), ML7(d), ML7(e), ML7(f), ML7(g), ML7(h) and ML7(i) as ML7(c), ML7(d), ML7(e), ML7(f), ML7(g), ML7(h), ML7(i) and ML7(j) respectively;
  - (iii) by repealing ML7(a) and substituting -
    - "(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;"

(iv) by adding -

“(b) Chemical warfare (CW) agents including:

(1) CW nerve agents:

(a) O-Alkyl (equal to or less than C<sub>10</sub>, 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<sub>10</sub>, 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<sub>10</sub>, 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-di-isopropylaminoethyl methyl phosphonothiolate (CAS 50782-69-9);

(2) CW vesicant agents:

(a) Sulphur mustards, such as:

- (1) 2-Chloroethylchloromethylsulphide (CAS 2625-76-5);
- (2) Bis(2-chloroethyl)sulphide (CAS 505-60-2);
- (3) Bis(2-chloroethylthio)methane (CAS 63869-13-6);
- (4) 1,2-bis (2-chloroethylthio) ethane (CAS 3563-36-8);
- (5) 1,3-bis (2-chloroethylthio) -n-propane (CAS 63905-10-2);



(6) 1,4-bis (2-chloroethylthio) -n-butane  
(CAS 142868-93-7);

(7) 1,5-bis (2-chloroethylthio) -n-pentane (CAS 142868-94-8);

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

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

(b) Lewisites, such as:

(1) 2-chlorovinyl dichloroarsine  
(CAS 541-25-3);

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

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

(c) Nitrogen mustards, such as:

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

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

- (3) 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:
  - (a) Butyl 2-chloro-4-fluorophenoxyacetate (LNF);
  - (b) 2,4,5-trichlorophenoxyacetic acid mixed with 2,4-dichlorophenoxyacetic acid (Agent Orange);";
- (v) by repealing ML7(d) and substituting -
  - "(d) "Riot control agents", active constituent chemicals and combinations thereof including:
    - (1)  $\alpha$ -Bromobenzeneacetonitrile (Bromobenzyl cyanide) (CA) (CAS 5798-79-8);
    - (2) [(2-chlorophenyl) methylene] propanedinitrile (o-Chlorobenzylidenemalononitrile) (CS) (CAS 2698-41-1);
    - (3) 2-Chloro-1-phenylethanone, Phenylacetyl chloride (o-chloroacetophenone) (CN) (CAS 532-

27-4);

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

(5) 10-Chloro-5, 10-dihydrophenarsazine  
(Phenarsazine chloride) (Adamsite)  
(DM) (CAS 578-94-9);

(6) N-Nonanoylmorpholine (MPA) (CAS  
5299-64-9);

*Notes:*

1. ML7(d) does not control "riot control agents" individually packaged for personal self defence purposes.

2. ML7(d) does not control active constituent chemicals, and combinations thereof identified and packaged for food production or medical purposes.";

(vi) in ML7(e) -

(A) by repealing "or ML7(c)" and substituting  
", ML7(b) or ML7(d)";

(B) by repealing "ML7(b)" and substituting  
"ML7(c)";

(vii) in ML7(f) -

(A) in ML7(f) (1), by repealing "or ML7(c)"  
and substituting ", ML7(b) or ML7(d)";

- (B) in ML7(f) (2) and (3), by repealing  
"ML7(a)" and substituting "ML7(a) or  
ML7(b)";
- (C) in the Note, by repealing "ML7(e) (1)" and  
substituting "ML7(f) (1)";
- (viii) in ML7(g) -
  - (A) by repealing "or ML7(c)" and substituting  
", ML7(b) or ML7(d)";
  - (B) in the Note, by repealing "ML7(f)" and  
substituting "ML7(g)";
- (ix) in ML7(h), by repealing "ML7(a)" and  
substituting "ML7(b)";
- (x) in ML7(i) -
  - (A) by repealing "ML7(a)" and substituting  
"ML7(b)";
  - (B) by repealing "ML7(h) (1)" and substituting  
"ML7(i) (1)";
- (xi) by repealing ML7(j);
- (xii) in Note 1 -
  - (A) by repealing "and ML7(c)" and  
substituting ", ML7(b) and ML7(d)";
  - (B) by repealing Note 1(f);
- (xiii) in Note 2 -
  - (A) by repealing ""technology", " where it  
twice appears;

- (B) by repealing "ML7(g), ML7(h)(2) and ML7(i)(3)" and substituting "ML7(h) and ML7(i)(2)";
- (h) in the Munitions List, in ML8 -
  - (i) in ML8(d)(3), by repealing the Note and substituting -  
"Notes:  
1. ML8(d)(3) does not control Chlorine Trifluoride.  
2. ML8(d)(3) does not control Nitrogen Trifluoride in its gaseous state.";
  - (ii) in ML8(f)(4)(d), by repealing "(CAS 319904-29-7)" and substituting "(CAS 31904-29-7)";
- (i) in the Munitions List, in ML9, in the N.B., by repealing "see Note (g)" and substituting "see Note 7";
- (j) in the Munitions List, in ML10 -
  - (i) by adding "'lighter-than-air vehicles'," after "'Aircraft,'";
  - (ii) in the N.B., by repealing "see Note (g)" and substituting "see Note 7";
  - (iii) in ML10(a), in the Chinese text, by repealing "部件" and substituting "零件";
  - (iv) in ML10(b) -
    - (A) by adding "and 'lighter-than-air vehicles'" after "Other 'aircraft'";

- (B) in the Chinese text, by repealing “部件”  
and substituting “零件”;
- (v) in ML10(c) -
  - (A) in the Chinese text, by repealing “部件”  
and substituting “零件”;
  - (B) in ML10(c)(1), by repealing “and  
autonomous programmable vehicles” and  
substituting “, autonomous programmable  
vehicles and “lighter-than-air vehicles””;
- (vi) in ML10(d), in the Chinese text, by repealing  
“部件” and substituting “零件”;
- (vii) in ML10(e), in the Chinese text, by repealing  
“部件” and substituting “零件”;
- (viii) in ML10(h), by adding “, and specially  
designed components therefor” after “as  
follows”;
- (k) in the Munitions List, by repealing ML11 and  
substituting -
  - “ML11        Electronic equipment, not controlled  
elsewhere in the Munitions List, as  
follows, and specially designed  
components therefor:
    - (a) Electronic equipment specially  
designed for military use;

*Note:*

ML11(a) includes:

1. Electronic countermeasure and electronic counter-countermeasure equipment (i.e., equipment designed to introduce extraneous or erroneous signals into radar or radio communication receivers or otherwise hinder the reception, operation or effectiveness of adversary electronic receivers including their countermeasure equipment), including jamming and counter-jamming equipment;
2. Frequency agile tubes;
3. Electronic systems or equipment designed either for surveillance and monitoring of the electro-magnetic spectrum for military intelligence or security purposes, or for counteracting such surveillance and monitoring;

4. Underwater countermeasures, including acoustic and magnetic jamming and decoy equipment designed to introduce extraneous or erroneous signals into sonar receivers;
5. Data processing security equipment, data security equipment and transmission and signalling line security equipment, using ciphering processes;
6. Identification, authentication and keyloader equipment and key management, manufacturing and distribution equipment;
7. Guidance and navigation equipment.

(b) Global Navigation Satellite Systems (GNSS) jamming equipment;";

- (l) in the Munitions List, in ML12, by repealing Note 3;
- (m) in the Munitions List, in ML17 -
  - (i) in ML17(m), by repealing "and" at the end;
  - (ii) in ML17(n), by adding "and" at the end;



(iii) by adding -

“(o) Laser protection equipment (e.g., eye and sensor protection) specially designed for military use;”;

(n) in the Munitions List, in ML18 -

(i) in Note 2(b)(2), by repealing “Note 3” and substituting “Note 1”;

(ii) in Note 2(b)(3), by repealing “see ML7(f)” and substituting “see ML7(g)”;

(o) in the Munitions List, in ML21(b)(3), by repealing “ML7(f)” and substituting “ML7(g)”;

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

“ML22           “Technology” as follows:

(a) “Technology”, other than that specified in ML22(b), which is “required” for the “development”, “production” or “use” of items controlled in the Munitions List;

(b) “Technology” as follows:

(1) “Technology” “required” for the design of, the assembly of components into, and the operation, maintenance and repair of complete production installations for items

controlled in the Munitions List, even if the components of such production installations are not controlled;

- (2) "Technology" "required" for the "development" and "production" of small arms even if used to produce reproductions of antique small arms;
- (3) "Technology" "required" for the "development", "production" or "use" of toxicological agents, related equipment or components controlled by ML7(a) to ML7(g);
- (4) "Technology" "required" for the "development", "production" or "use" of "biopolymers" or cultures of specific cells controlled by ML7(h);
- (5) "Technology" "required" exclusively for the incorporation of "biocatalysts", controlled by ML7(i)(1), into military carrier substances or military material;

*Notes:*

1. "Technology" "required" for the "development", "production" or "use" of items controlled in the Munitions List remains under control even when applicable to any uncontrolled item.
2. ML22 does not control "technology" as follows:
  - (a) Which is the minimum necessary for the installation, operation, maintenance (checking) and repair of those items which are not controlled or whose export has been authorized;
  - (b) Which is "in the public domain", "basic scientific research" or the minimum necessary information for patent applications;
  - (c) For magnetic induction for continuous propulsion of civil transport devices."

- (q) in the Dual-use Goods List, in Category 1, in sub-category 1A -
  - (i) in 1A102, by repealing "specified in" where it twice appears and substituting "controlled by";
  - (ii) in 1A202, by repealing "specified in" wherever it appears and substituting "controlled by";
- (r) in the Dual-use Goods List, in Category 1, in sub-category 1B -
  - (i) in 1B102, by repealing "specified in" wherever it appears and substituting "controlled by";
  - (ii) in 1B115, by repealing "specified in" wherever it appears and substituting "controlled by";
  - (iii) in 1B119, by repealing "specified in" and substituting "controlled by";
  - (iv) in 1B201, by repealing "specified in" wherever it appears and substituting "controlled by";
  - (v) in 1B229(b), by repealing "specified in" and substituting "controlled by";
- (s) in the Dual-use Goods List, in Category 1, in sub-category 1C -
  - (i) in 1C001(c) -
    - (A) by repealing "bulk electrical conductivity" and substituting "'bulk electrical conductivity'";
    - (B) by repealing "sheet (surface) resistivity" where it first appears and

substituting ``sheet (surface)  
resistivity'';

- (C) in the Technical Note, by repealing "Bulk electrical conductivity and sheet (surface) resistivity" and substituting "Bulk electrical conductivity" and 'sheet (surface) resistivity'";

(ii) in 1C008 -

- (A) in 1C008(a)(4), by repealing "determined using the dry method described in ASTM D-3418";
- (B) in 1C008(b), by repealing "ASTM D-648, method A," and substituting "ISO 75-3 (2004),";
- (C) by repealing 1C008(c)(1);
- (D) in 1C008(f), by adding "having a glass transition temperature ( $T_g$ ) exceeding 513 K (240°C)" after "Polybiphenylenethersulphone";
- (E) in the Technical Note, by repealing "ASTM D-3418 using the dry method" and substituting "ISO 11357-2 (1999) or national equivalents";

(iii) in 1C101 -

- (A) by repealing ""missiles"" and substituting ``missiles'';

(B) by adding at the end -

*Technical Note:*

In 1C101, 'missiles' means complete rocket systems and "unmanned aerial vehicle" systems capable of a range exceeding 300 km.";

(iv) in 1C102, by repealing "specified in" where it twice appears and substituting "controlled by";

(v) in 1C107 -

(A) by repealing "specified in" and substituting "controlled by";

(B) by repealing 1C107(a) and substituting -

"(a) Fine grain graphites with a bulk density of at least 1.72 g/cc measured at 15°C and having a grain size of  $100 \times 10^{-6}$  m (100  $\mu$ m) or less, usable for rocket nozzles and re-entry vehicle nose tips, which can be machined to any of the following products:

(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; or

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

*N.B.:*

See also 0C004.”;

- (C) in 1C107(c), by repealing “at frequencies  
from 100 Hz to 10 000 MHz” and  
substituting “at any frequency from 100  
MHz to 100 GHz”;
- (vi) in 1C111 -
- (A) in 1C111(a), by adding -
- “(4) Hydrazine derivatives, other than  
those controlled by the Munitions  
List, usable as rocket fuel  
substances;”;
- (B) in 1C111(c)(1), by repealing “Butacene”  
and substituting “carboranes, decaboranes,  
pentaboranes and derivatives thereof”;
- (C) by repealing 1C111(c)(6) and  
substituting -
- “(6) Ferrocene derivatives as follows:
- (a) See the Munitions List for  
catocene;

- (b) Ethyl ferrocene;
  - (c) Propyl ferrocene;
  - (d) See the Munitions List for n-butyl ferrocene;
  - (e) Pentyl ferrocene;
  - (f) Dicyclopentyl ferrocene;
  - (g) Dicyclohexyl ferrocene;
  - (h) Diethyl ferrocene;
  - (i) Dipropyl ferrocene;
  - (j) Dibutyl ferrocene;
  - (k) Dihexyl ferrocene;
  - (l) Acetyl ferrocenes;
  - (m) See the Munitions List for ferrocene carboxylic acids;
  - (n) See the Munitions List for butacene;
  - (o) Other ferrocene derivatives usable as rocket propellant burning rate modifiers, other than those controlled by the Munitions List;";
- (D) in the Note to 1C111, by repealing "specified in" and substituting "controlled by";
- (vii) in 1C116, by repealing "of 1 500 MPa or greater" and substituting "equal to or greater



- than 1.5 GPa”;
- (viii) in 1C202, by repealing “specified in” and substituting “controlled by”;
- (ix) in 1C210, by repealing “specified in” where it twice appears and substituting “controlled by”;
- (x) in 1C216, by repealing “specified in” and substituting “controlled by”;
- (xi) in 1C240, by repealing “specified in” where it twice appears and substituting “controlled by”;
- (xii) in 1C350 -
- (A) in 1C350(29), in the English text, by repealing “o-Ethyl-2-diisopropylaminoethyl” and substituting “o-Ethyl-2-di-isopropylaminoethyl”;
- (B) by adding -
- “(55) Methyl phosphonic acid (993-13-5);
- (56) Diethyl methylphosphonate (683-08-9);
- (57) N,N-Dimethyl aminophosphoryl dichloride (677-43-0);
- (58) Triisopropyl phosphite (116-17-6);
- (59) Ethyl diethanolamine (139-87-7);
- (60) O,O-Diethyl phosphorothioate (2465-65-8);
- (61) O,O-Diethyl phosphorodithioate (298-06-6);

(62) Sodium hexafluorosilicate (16893-85-9);

(63) Methyl phosphonothioic dichloride (676-98-2);";

(xiii) in 1C351, by repealing -

*"except:*

Any goods controlled by 1C351 in the form of a "vaccine" or "immunotoxin"."

and substituting -

*"Note:*

1C351 does not control "vaccines" or "immunotoxins".";

(xiv) in 1C352, by repealing -

*"except:*

Any goods controlled by 1C352 in the form of a "vaccine"."

and substituting -

*"Note:*

1C352 does not control "vaccines".";

(xv) in 1C353, by repealing the Technical Notes and substituting -

*"Technical Notes:*

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

2. Nucleic acid sequences associated with the pathogenicity of any of the "microorganisms" controlled by 1C351(a) to (c) or 1C352 or 1C354 mean any sequence specific to the relevant listed "microorganism":

- that in itself or through its transcribed or translated products represents a significant hazard to human, animal or plant health; or
- that is known to enhance the ability of a "microorganism" controlled by 1C351(a) to (c) or 1C352 or 1C354, or any other organism into which it may be inserted or otherwise integrated, to cause serious harm to human, animal or plant health.

3. 1C353 does not apply to nucleic acid sequences associated with the pathogenicity of enterohaemorrhagic *Escherichia coli*, serotype O157 and other verotoxin producing strains, other than those coding for the verotoxin, or for its sub-units.";

(xvi) in 1C354 -

(A) by renumbering 1C354(a) and 1C354(b) as 1C354(b) and 1C354(c) respectively;

(B) by adding -

“(a) Viruses, whether natural, enhanced or modified, either in the form of “isolated live cultures” or as material (including living material) which has been deliberately inoculated or contaminated with such cultures, as follows:

- (1) Potato Andean latent tymovirus;
- (2) Potato spindle tuber viroid;”;

(C) in 1C354(b), by adding -

- “(3) *Xanthomonas oryzae* pv. *oryzae* (*Pseudomonas campestris* pv. *oryzae*);
- (4) *Clavibacter michiganensis* subsp. *Sepedonicus* (*Corynebacterium michiganensis* subsp. *Sepedonicum* or *Corynebacterium Sepedonicum*);
- (5) *Ralstonia solanacearum* Races 2 and 3 (*Pseudomonas solanacearum* Races 2 and 3 or *Burkholderia solanacearum* Races 2 and 3);”;

- (xvii) in 1C450, by repealing "Chemicals as follows:"  
and substituting "Toxic chemicals and toxic  
chemical precursors, as follows:";
- (t) in the Dual-use Goods List, in Category 1, in sub-  
category 1D, in 1D101, by repealing "specified in"  
and substituting "controlled by";
- (u) in the Dual-use Goods List, in Category 2, in sub-  
category 2B -
  - (i) by repealing Technical Note 2 to this sub-  
category and substituting -
    - "2. For the purposes of 2B, the number of  
axes which can be coordinated  
simultaneously for "contouring control"  
is the number of axes along or around  
which, during processing of a workpiece,  
simultaneous and interrelated motions are  
performed between the workpiece and a  
tool. This does not include any  
additional axes along or around which  
other relative motions within the machine  
are performed, such as:
      - (a) Wheel-dressing systems in grinding  
machines;
      - (b) Parallel rotary axes designed for  
mounting of separate workpieces;

- (c) Co-linear rotary axes designed for manipulating the same workpiece by holding it in a chuck from different ends.”;
- (ii) in 2B001(c), by repealing Note 2 and substituting -
  - “2. Machines designed specifically as jig grinders that do not have a z-axis or a w-axis, with a positioning accuracy with “all compensations available” less (better) than 3  $\mu\text{m}$  according to ISO 230/2 (1997) or national equivalents.”;
- (iii) in 2B002, by repealing “Numerically controlled machine tools using a magnetorheological finishing (MRF) process;” and substituting -
  - “Numerically controlled machine tools using a magnetorheological finishing (MRF) process equipped to produce non-spherical surfaces and having any of the following characteristics:
    - (a) Finishing the form to less (better) than 1.0  $\mu\text{m}$ ; or
    - (b) Finishing to a roughness less (better) than 100 nm rms;”;
- (iv) in 2B005 -
  - (A) in 2B005(a), by repealing ““Stored programme controlled” chemical” and

- substituting "Chemical";
- (B) in 2B005(b), by repealing ""Stored programme controlled" ion" and substituting "Ion";
- (C) in 2B005(c), by repealing ""Stored programme controlled" electron" and substituting "Electron";
- (D) in 2B005(d), by repealing ""Stored programme controlled" plasma" and substituting "Plasma";
- (E) in 2B005(e), by repealing ""Stored programme controlled" sputter" and substituting "Sputter";
- (F) in 2B005(f), by repealing ""Stored programme controlled" cathodic" and substituting "Cathodic";
- (G) in 2B005(g), by repealing ""Stored programme controlled" ion" and substituting "Ion";
- (v) in 2B006 -
  - (A) by repealing "and equipment, as follows" and substituting ", equipment and "electronic assemblies", as follows";
  - (B) in 2B006(a), by repealing ", "numerically controlled" or "stored programme controlled"" and substituting "or

"numerically controlled";

(C) in 2B006(b) (1), by adding before the  
Note -

"(d) "Electronic assemblies" specially  
designed to provide feedback  
capability in systems controlled by  
2B006(b) (1) (c) ;";

(D) in the Note, by repealing "without closed  
or open loop feedback" and substituting  
"with an automatic control system that is  
designed to use no feedback techniques";

(vi) in 2B104 -

(A) by repealing "specified in" and  
substituting "controlled by";

(B) in 2B104(a), by repealing "of 69 MPa or  
greater" and substituting "equal to or  
greater than 69 MPa";

(vii) in 2B105, by repealing "specified in" and  
substituting "controlled by";

(viii) in 2B109, by repealing "specified in" wherever  
it appears and substituting "controlled by";

(ix) in 2B116 -



- (A) in 2B116(a), by repealing "at 10 g rms or more over the entire range 20 Hz to 2 000 Hz and imparting forces of 50 kN, measured 'bare table', or greater" and substituting "at an acceleration equal to or greater than 10 g rms between 20 Hz to 2 kHz and imparting forces equal to or greater than 50 kN, measured 'bare table'";
- (B) in 2B116(c), by repealing "of 50 kN, measured 'bare table', or greater" and substituting "equal to or greater than 50 kN, measured 'bare table'";
- (C) in 2B116(d), by repealing "of 50 kN, measured 'bare table', or greater" and substituting "equal to or greater than 50 kN, measured 'bare table'";
- (x) in 2B117, by repealing "specified in" and substituting "controlled by";
- (xi) in 2B119(b), by repealing "specified in" and substituting "controlled by";
- (xii) in 2B121, by repealing "specified in" and substituting "controlled by";

- (xiii) in Note (b) to 2B201(a), by repealing "0.03 mm" and substituting "30  $\mu\text{m}$ ";
- (xiv) in 2B204, by repealing "specified in" where it twice appears and substituting "controlled by";
- (xv) in 2B206, by repealing "those specified in" and substituting "those controlled by";
- (xvi) in 2B207, by repealing "specified in" where it twice appears and substituting "controlled by";
- (xvii) in 2B209, by repealing "specified in" and substituting "controlled by";
- (xviii) in 2B226(b), by repealing "specified in" and substituting "controlled by";
- (xix) in 2B227(c), by repealing "specified in" and substituting "controlled by";
- (xx) in 2B350 -
  - (A) in 2B350(b), by repealing "specified in" and substituting "controlled by";
  - (B) in 2B350(i), by repealing ", canned drive, magnetic drive, bellows or diaphragm pumps," and substituting "and seal-less pumps";
- (xxi) in 2B351(a), by repealing "specified in" and substituting "controlled by";
- (xxii) in 2B352, by repealing 2B352(d) and substituting -

"(d) Cross (tangential) flow filtration

equipment and component as follows:

(1) Cross (tangential) flow filtration equipment capable of separation of pathogenic "microorganisms", viruses, "toxins" or cell cultures, without the propagation of aerosols, and having both of the following characteristics:

- (a) A total filtration area equal to or greater than 1 m<sup>2</sup>; and
- (b) Capable of being 'sterilised' or 'disinfected' in-situ;

*Technical Note:*

In 2B352(d)(1)(b), 'sterilised' denotes the elimination of all viable microbes from the equipment through the use of either physical (e.g. steam) or chemical agents. 'Disinfected' denotes the destruction of potential microbial infectivity in the equipment through the use of chemical agents with a germicidal effect. Disinfection and sterilisation are distinct

from sanitization, the latter referring to cleaning procedures designed to lower the microbial content of equipment without necessarily achieving elimination of all microbial infectivity or viability.

- (2) Cross (tangential) flow filtration components (e.g. modules, elements, cassettes, cartridges, units or plates) with filtration area equal to or greater than 0.2 m<sup>2</sup> for each component and designed for use in cross (tangential) flow filtration equipment controlled by 2B352(d);

*Note:*

2B352(d) does not control reverse osmosis equipment, as specified by the manufacturer.”;

- (v) in the Dual-use Goods List, in Category 2, in sub-category 2D, in 2D101, by repealing “specified in” and substituting “controlled by”;
- (w) in the Dual-use Goods List, in Category 2, in sub-category 2E, in 2E101, by repealing “specified in” and substituting “controlled by”;

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

(i) in 3A001 -

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

“(3) “Microprocessor microcircuits”, “microcomputer microcircuits” and microcontroller microcircuits, manufactured from a compound semiconductor and operating at a clock frequency exceeding 40 MHz;

*Note:*

3A001(a) (3) includes digital signal processors, digital array processors and digital coprocessors.”;

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

“(a) Analogue-to-digital converters having any of the following:

(1) A resolution of 8 bit or more, but less than 10 bit, with an output rate greater than 500 million words per second;

(2) A resolution of 10 bit or more, but less than 12 bit, with an output rate greater than 200

million words per second;

(3) A resolution of 12 bit with an output rate greater than 50

million words per second;

(4) A resolution of more than 12 bit but equal to or less than

14 bit with an output rate greater than 5 million words

per second; or

(5) A resolution of more than 14 bit with an output rate greater

than 1 million words per second;”;

(C) in 3A001(a)(5), by repealing the Technical Notes and substituting -

*“Technical Notes:*

1. A resolution of n bit corresponds to a quantisation of  $2^n$  levels.
2. The number of bits in the output word is equal to the resolution of the analogue-to-digital converter.
3. The output rate is the maximum output rate of the converter, regardless of architecture or oversampling. Vendors may also refer to the output rate as sampling rate,

conversion rate or throughput rate.

It is often specified in megahertz (MHz) or mega samples per second (MSPS).

4. For the purpose of measuring output rate, one output word per second is equivalent to one Hertz or one sample per second.”;

(D) in 3A001(b)(2), by repealing Note 2 and substituting -

“2. The control status of the MMIC whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001(b)(2)(a) to 3A001(b)(2)(f), is determined by the lowest average output power control threshold.”;

(E) in 3A001(b)(3), by repealing “Microwave” and substituting “Discrete microwave”;

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

“Note:

The control status of a transistor whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by

3A001(b)(3)(a) to 3A001(b)(3)(e), is determined by the lowest average output power control threshold.”;

(G) in 3A001(b)(4)(f), by adding at the end -

“*Technical Note:*

3.2 GHz should be used as the lowest operating frequency ( $f_{\text{GHz}}$ ) in the formula in 3A001(b)(4)(f)(3), for amplifiers that have a rated operation range extending downward to 3.2 GHz and below  $[d \leq 15 \text{cm} * \text{GHz} / 3.2 \text{ GHz}]$ .”;

(H) in 3A001(b)(4), by repealing Note 2 and substituting -

“2. The control status of an item whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001(b)(4)(a) to 3A001(b)(4)(e), is determined by the lowest average output power control threshold.”;

(ii) by repealing 3A002(c) and substituting -

“(c) Radio frequency “signal analysers”, as follows:



- (1) "Signal analysers" capable of analysing any frequencies exceeding 31.8 GHz but not exceeding 37.5 GHz and having a 3 dB resolution bandwidth (RBW) exceeding 10 MHz;
- (2) "Signal analysers" capable of analysing frequencies exceeding 43.5 GHz;
- (3) "Dynamic signal analysers" having a "real-time bandwidth" exceeding 500 kHz;

*Note:*

3A002(c) (3) does not control those "dynamic signal analysers" using only constant percentage bandwidth filters (also known as octave or fractional octave filters).";

- (iii) in 3A201, by repealing "specified in" and substituting "controlled by";
- (iv) in 3A225, by repealing "specified in" and substituting "controlled by";
- (v) in 3A226, by repealing "specified in" and substituting "controlled by";
- (vi) in 3A227, by repealing "specified in" and substituting "controlled by";

(vii) in 3A229(a), by repealing "specified in" and substituting "controlled by";

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

(i) by repealing 3B001(a)(1) and substituting -

"(1) Equipment capable of producing a layer of any material other than silicon with a thickness uniform to less than  $\pm 2.5\%$  across a distance of 75 mm or more;"

(ii) in 3B001(c)(1)(a), by repealing "0.3  $\mu\text{m}$ " and substituting "180 nm";

(iii) in 3B001(c)(2)(a), by repealing "0.3  $\mu\text{m}$ " and substituting "180 nm";

(iv) in 3B001(f)(1)(a), by repealing "350" and substituting "245";

(v) in 3B001(f)(1)(b) -

(A) by repealing "0.35  $\mu\text{m}$ " and substituting "180 nm";

(B) in the Technical Note, by repealing " $\mu\text{m}$ " and substituting "nm";

(C) in the Technical Note, by repealing "0.7" and substituting "0.45";

(vi) in 3B002 -

(A) by repealing ""Stored programme controlled" test" and substituting "Test";

(B) by repealing 3B002(b);

- (z) in the Dual-use Goods List, in Category 4, in sub-category 4A -
  - (i) by repealing 4A003(b) and substituting -
    - “(b) “Digital computers” having an “Adjusted Peak Performance” (“APP”) exceeding 0.75 Weighted TeraFLOPS (WT);”;
  - (ii) in 4A003(c) -
    - (A) by repealing ““computing elements” (“CEs”) so that the “CTP”” and substituting “processors so that the “APP””;
    - (B) in Note 1, by repealing “4A003(d) or”;
  - (iii) in 4A101, by adding “, “unmanned aerial vehicles” controlled by 9A012” after “9A004”;
  - (iv) in 4A102, by adding “, “unmanned aerial vehicles” controlled by 9A012” after “9A004”;
- (za) in the Dual-use Goods List, in Category 4, in sub-category 4D -
  - (i) in 4D001(b) (1), by repealing “a “composite theoretical performance” (“CTP”) exceeding 28 000 Mtops” and substituting “an “Adjusted Peak Performance” (“APP”) exceeding 0.04 Weighted TeraFLOPS (WT)”;
  - (ii) in 4D001(b) (2), by repealing ““computing elements” (“CEs”) so that the “CTP”” and substituting “processors so that the “APP””;

(zb) in the Dual-use Goods List, in Category 4, in subcategory 4E -

- (i) in 4E001(b)(1), by repealing "a "composite theoretical performance" ("CTP") exceeding 28 000 Mtops" and substituting "an "Adjusted Peak Performance" ("APP") exceeding 0.04 Weighted TeraFLOPS (WT)";
- (ii) in 4E001(b)(2), by repealing ""computing elements" ("CEs") so that the "CTP"" and substituting "processors so that the "APP"";
- (iii) by adding at the end -

"TECHNICAL NOTE ON "ADJUSTED PEAK  
PERFORMANCE" ("APP")

"APP" is an adjusted peak rate at which "digital computers" perform 64-bit or larger floating point additions and multiplications.

*Abbreviations used in this Technical Note:*

n     number of processors in the "digital  
       computer"

i     processor number (i, ...n)

$t_i$    processor cycle time ( $t_i = 1/F_i$ )

$F_i$    processor frequency

$R_i$    peak floating point calculating rate

$W_i$    architecture adjustment factor

"APP" is expressed in Weighted TeraFLOPS (WT), in units of  $10^{12}$  adjusted floating point operations per second.

*Outline of the "APP" calculation method:*

1. For each processor  $i$ , determine the peak number of 64-bit or larger floating point operations,  $FPO_i$ , performed per cycle for each processor in the "digital computer".

*Note:* In determining FPO, include only 64-bit or larger floating point additions or multiplications or both. All floating point operations must be expressed in operations per processor cycle; operations requiring multiple cycles may be expressed in fractional results per cycle. For processors not capable of performing calculations on floating point operands of 64-bits or more, the effective calculating rate  $R$  is zero.

2. Calculate the floating point rate  $R$  for each processor

$$R_i = \text{FPO}_i / t_i$$

3. Calculate "APP"

$$\text{"APP"} = W_1 \times R_1 + W_2 \times R_2 + \dots + W_n \times R_n$$

4. For 'vector processors',  $W_i = 0.9$ . For non-'vector processors',  $W_i = 0.3$ .

*Notes:*

1. For processors that perform compound operations in a cycle, such as addition and multiplication, each operation is counted.
2. For a pipelined processor, the effective calculating rate  $R$  is the faster of the pipelined rate, once the pipeline is full, or the non-pipelined rate.
3. The calculating rate  $R$  of each contributing processor is to be calculated at its maximum value theoretically possible before the

"APP" of the combination is derived. Simultaneous operations are assumed to exist when the computer manufacturer claims concurrent, parallel, or simultaneous operation or execution in a manual or brochure for the computer.

4. Do not include processors that are limited to input/output and peripheral functions (e.g., disk drive, communication and video display) when calculating "APP".
  
5. "APP" values are not to be calculated for processor combinations interconnected by "Local Area Networks", Wide Area Networks, Input/Output shared connections/devices, Input/Output controllers and any communication interconnection implemented by "software".

6. "APP" values must be calculated for  
1) processor combinations containing  
processors specially designed to  
enhance performance by aggregation,  
operating simultaneously and sharing  
memory; or 2) multiple  
memory/processor combinations  
operating simultaneously utilizing  
specially designed hardware.

7. A 'vector processor' is defined as a  
processor with built-in instructions  
that perform multiple calculations  
on floating-point vectors (one-  
dimensional arrays of 64-bit or  
larger numbers) simultaneously, and  
having at least 2 vector functional  
units and at least 8 vector  
registers of at least 64 elements  
each.";

(zc) in the Dual-use Goods List, in Category 5, in sub-  
category 5A1 -

(i) in 5A001 -

(A) in 5A001(b) (3), by adding "not controlled  
by 5A001(b) (4), and" before "having any";



(B) by repealing 5A001(b)(4) and substituting -

“(4) Being radio equipment employing ultra-wideband modulation techniques, having user programmable channelizing codes, scrambling codes or network identification codes, and having any of the following characteristics:

(a) A bandwidth exceeding 500 MHz;

or

(b) A “fractional bandwidth” of 20% or more.”;

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

(I) by repealing “provide voice coding” and substituting “provide ‘voice coding’”;

(II) by repealing the Technical Note and substituting -

*“Technical Notes:*

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

2. For the purpose of 5A001(b)(6), 'voice coding' is defined as the technique to take samples of human voice and then convert these samples into a digital signal, taking into account specific characteristics of human speech.”;

(D) in 5A001(d), by repealing “31” and substituting “31.8”;

(E) by adding -

“(e) Radio direction finding equipment operating at frequencies above 30 MHz and having all of the following characteristics, and specially designed components therefor:

(1) “Instantaneous bandwidth” of 10 MHz or more; *and*

(2) Capable of finding a line of bearing (LOB) to non-cooperating radio transmitters with a signal duration of less than 1 ms;

(f) Jamming equipment specially designed or modified to intentionally and selectively interfere with, deny,

inhibit, degrade or seduce cellular mobile telecommunications services, and having any of the following characteristics, and specially designed components therefor:

- (1) Simulating the functions of Radio Access Network (RAN) equipment; or
- (2) Detecting and exploiting specific characteristics of the mobile telecommunications protocol employed (e.g., GSM);

*N.B.:*

For GNSS jamming equipment, see the Munitions List.”;

- (ii) by repealing 5A101 and substituting -
- “5A101 Telemetering and telecontrol equipment, including ground equipment, designed or modified for ‘missiles’;

*Technical Note:*

In 5A101, ‘missiles’ means complete rocket systems and “unmanned aerial vehicle” systems capable of a range exceeding 300 km.

*Note:*

5A101 does not control:

- (a) Equipment designed or modified for manned aircraft or satellites;
- (b) Ground based equipment designed or modified for terrestrial or marine applications;
- (c) Equipment designed for commercial, civil or safety of life (e.g. data integrity, flight safety) GNSS services.”;

(zd) in the Dual-use Goods List, in Category 5, in sub-category 5D1 -

(i) by repealing 5D001(c) and substituting -

“(c) Specific “software” specially designed or modified to provide characteristics, functions or features of equipment controlled by 5A001 or 5B001;”;

(ii) in 5D101, by repealing “specified in” and substituting “controlled by”;

(ze) in the Dual-use Goods List, in Category 5, in sub-category 5A2 -

(i) in 5A002(a)(5), by adding “not controlled by 5A002(a)(6)” after ““spread spectrum” systems”;

(ii) by repealing 5A002(a)(6) and substituting -

“(6) Designed or modified to use cryptographic techniques to generate channelizing codes, scrambling codes or network identification codes, for systems using ultra-wideband modulation techniques, and having any of the following characteristics:

(a) A bandwidth exceeding 500 MHz; or

(b) A “fractional bandwidth” of 20% or more;”;

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

“(9) Designed or modified to use “quantum cryptography”;

*Technical Note:*

“Quantum cryptography” is also known as quantum key distribution (QKD).”;

(iv) in 5A002(a) -

(A) in Note (c)(2)(b), by repealing “or”;

(B) in Note (c)(3), by adding “or” at the end;

(c) in Note (c), by adding -

“(4) Encryption or decryption or both for protection of libraries, design attributes, or associated data for the design of semiconductor devices

or integrated circuits;”;

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

(i) in 6A001(a)(2)(a), in the Note, by repealing everything after “of the other equipment.” and substituting -

“(1) Incorporating continuous flexible sensing elements;

(2) Incorporating flexible assemblies of discrete sensing elements with either a diameter or length less than 20 mm and with a separation between elements of less than 20 mm;

(3) Having any of the following sensing elements:

(a) Optical fibres;

(b) ‘Piezoelectric polymer films’ other than polyvinylidene fluoride (PVDF) and its copolymers {P(VDF-TrFE) and P(VDF-TFE)}; or

(c) ‘Flexible piezoelectric composites’;

(4) A hydrophone sensitivity better than -180 dB at any depth with no acceleration compensation;

- (5) When designed to operate at depths exceeding 35 m with acceleration compensation; or
- (6) Designed for operation at depths exceeding 1 000 m;

*Technical Notes:*

1. 'Piezoelectric polymer film' sensing elements consist of polarized polymer film that is stretched over and attached to a supporting frame or spool (mandrel).
2. 'Flexible piezoelectric composite' sensing elements consist of piezoelectric ceramic particles or fibres combined with an electrically insulating, acoustically transparent rubber, polymer or epoxy compound, where the compound is an integral part of the sensing elements.
3. Hydrophone sensitivity is defined as twenty times the logarithm to the base 10 of the ratio of rms output voltage to a 1 V rms reference, when the hydrophone sensor, without a pre-amplifier, is placed in a plane wave acoustic field with an rms pressure of 1  $\mu$ Pa. For example, a hydrophone of -160 dB (reference 1 V per  $\mu$ Pa) would yield an

output voltage of  $10^{-8}$  V in such a field, while one of -180 dB sensitivity would yield only  $10^{-9}$  V output. Thus, -160 dB is better than -180 dB.”;

- (ii) in 6A002(a), by repealing the Note and substituting -

“Note:

6A002(a) does not control germanium or silicon photodevices.

N.B.:

Silicon and other material based ‘microbolometer’ non-“space-qualified” “focal plane arrays” are only controlled by 6A002(a)(3)(f).”;

- (iii) in 6A002(a)(3) -

- (A) by adding before the Technical Notes -

“N.B.:

Silicon and other material based ‘microbolometer’ non-“space-qualified” “focal plane arrays” are only controlled by 6A002(a)(3)(f).”;

- (B) by repealing Note 2(a);

- (C) by renumbering Note 2(b) and Note 2(c) as Note 2(a) and Note 2(b) respectively;



(D) by adding at the end of 6A002(a)(3)(c) -

*"N.B.:*

Silicon and other material based  
'microbolometer' non-"space-qualified"  
"focal plane arrays" are only controlled  
by 6A002(a)(3)(f).";

(E) by adding -

"(f) Non-"space-qualified" non-linear (2-  
dimensional) infrared "focal plane  
arrays" based on 'microbolometer'  
material having individual elements  
with an unfiltered response in the  
wavelength range equal to or  
exceeding 8 000 nm but not exceeding  
14 000 nm;

*Technical Note:*

For the purposes of 6A002(a)(3)(f),  
'microbolometer' is defined as a  
thermal imaging detector that, as a  
result of a temperature change in  
the detector caused by the  
absorption of infrared radiation, is  
used to generate any usable signal.";

(iv) by repealing 6A003(b)(4) and substituting -

“(4) Imaging cameras incorporating “focal plane arrays” having any of the following:

(a) Incorporating “focal plane arrays” controlled by 6A002(a)(3)(a) to 6A002(a)(3)(e); or

(b) Incorporating “focal plane arrays” controlled by 6A002(a)(3)(f);

*Notes:*

1. Imaging cameras described in 6A003(b)(4) include “focal plane arrays” combined with sufficient “signal processing” electronics, beyond the read out integrated circuit, to enable as a minimum the output of an analogue or digital signal once power is supplied.
2. 6A003(b)(4)(a) does not control imaging cameras incorporating linear “focal plane arrays” with twelve elements or fewer, not employing time-delay-and-integration within the element, designed for any of the following:

- (a) Industrial or civilian intrusion alarm, traffic or industrial movement control or counting systems;
  - (b) Industrial equipment used for inspection or monitoring of heat flows in buildings, equipment or industrial processes;
  - (c) Industrial equipment used for inspection, sorting or analysis of the properties of materials;
  - (d) Equipment specially designed for laboratory use; or
  - (e) Medical equipment.
3. 6A003(b)(4)(b) does not control imaging cameras having any of the following characteristics:
- (a) A maximum frame rate equal to or less than 9 Hz;
  - (b) Having all of the following:
    - (1) Having a minimum horizontal or vertical Instantaneous-Field-of-View (IFOV) of at least 10 mrad/pixel (milliradians/

pixel);

- (2) Incorporating a fixed focal-length lens that is not designed to be removed;
- (3) Not incorporating a 'direct view' display; and

*Technical Note:*

'Direct view' refers to an imaging camera operating in the infrared spectrum that presents a visual image to a human observer using a near-to-eye micro display incorporating any light-security mechanism.

- (4) Having any of the following:
  - (a) No facility to obtain a viewable image of the detected field-of-view;
  - (b) The camera is designed for a single kind of application and designed not to be user modified; or

*Technical Note:*

Instantaneous-Field-of-View (IFOV)

specified in Note 3(b) is the lesser figure of the Horizontal FOV or the Vertical FOV.

Horizontal IFOV =  
horizontal Field of View (FOV)/number of horizontal detector elements;

Vertical IFOV =  
vertical Field of View (FOV)/number of vertical detector elements;

- (c) Where the camera is specially designed for installation into a civilian passenger land vehicle of less than three tonnes (gross vehicle weight) and having all of the following:

(1) Is only operable when installed in any of the following:

(a) The civilian passenger land vehicle for which it was intended; or

(b) A specially designed, authorized maintenance test facility; and

(2) Incorporates an active mechanism that forces the camera not to function when it is removed from

the vehicle for  
which it was  
intended;”;

(v) by repealing 6A006 and substituting -

“6A006        “Magnetometers”, “magnetic  
                 gradiometers”, “intrinsic magnetic  
                 gradiometers”, underwater electric  
                 field sensors, and compensation  
                 systems, and specially designed  
                 components therefor, as follows:

*Note:*

6A006 does not control instruments  
specially designed for fishery  
applications or biomagnetic  
measurements for medical diagnostics.

(a) “Magnetometers” and subsystems,  
as follows:

(1) Using “superconductive”

(SQUID) “technology” and

having any of the

following characteristics:

(a) SQUID systems

designed for

stationary operation,

without specially

designed subsystems

designed to reduce  
in-motion noise, and  
having a "noise  
level" (sensitivity)  
equal to or lower  
(better) than 50 fT  
(rms) per square root  
Hz at a frequency of  
1 Hz; or

(b) SQUID systems having  
an in-motion-  
"magnetometer" "noise  
level" (sensitivity)  
lower (better) than  
20 pT (rms) per  
square root Hz at a  
frequency of 1 Hz and  
specially designed to  
reduce in-motion  
noise;

(2) Using optically pumped or  
nuclear precession  
(proton/Overhauser)  
"technology" having a  
"noise level" (sensitivity)  
lower (better) than 20 pT



(rms) per square root Hz;

- (3) Using fluxgate  
"technology" having a  
"noise level" (sensitivity)  
equal to or lower (better)  
than 10 pT (rms) per  
square root Hz at a  
frequency of 1 Hz;
- (4) Induction coil  
"magnetometers" having a  
"noise level" (sensitivity)  
lower (better) than any of  
the following:
- (a) 0.05 nT (rms)/square  
root Hz at  
frequencies of less  
than 1 Hz;
- (b)  $1 \times 10^{-3}$  nT  
(rms)/square root Hz  
at frequencies of 1  
Hz or more but not  
exceeding 10 Hz; or
- (c)  $1 \times 10^{-4}$  nT  
(rms)/square root Hz  
at frequencies  
exceeding 10 Hz;

- (5) Fibre optic "magnetometers" having a "noise level" (sensitivity) lower (better) than 1 nT (rms) per square root Hz;
- (b) Underwater electric field sensors having a "noise level" (sensitivity) lower (better) than 8 nanovolt per meter per square root Hz when measured at 1 Hz;
- (c) "Magnetic gradiometers", as follows:
  - (1) "Magnetic gradiometers" using multiple "magnetometers" controlled by 6A006(a);
  - (2) Fibre optic "intrinsic magnetic gradiometers" having a magnetic gradient field "noise level" (sensitivity) lower (better) than 0.3 nT/m (rms) per square root Hz;

- (3) "Intrinsic magnetic gradiometers", using "technology" other than fibre-optic "technology", having a magnetic gradient field "noise level" (sensitivity) lower (better) than 0.015 nT/m (rms) per square root Hz;
  - (d) Compensation systems for magnetic or underwater electric field sensors resulting in a performance equal to or better than the control parameters of 6A006(a), 6A006(b) or 6A006(c);";
- (vi) in 6A102, by repealing "specified in" and substituting "controlled by";
- (vii) in 6A108 -
  - (A) in 6A108(a), by adding ", "unmanned aerial vehicles" controlled by 9A012" after "9A004";
  - (B) in 6A108(b), by repealing "'missiles" or unmanned aerial vehicles specified in 9A012" and substituting "'missiles'";

(C) in 6A108(b)(2), by adding at the end -

*Technical Note:*

In 6A108(b), 'missiles' means complete rocket systems and "unmanned aerial vehicle" systems capable of a range exceeding 300 km.";

(viii) in 6A203(b), by repealing "specified in" wherever it appears and substituting "controlled by";

(ix) in 6A205, by repealing "specified in" and substituting "controlled by";

(zg) in the Dual-use Goods List, in Category 6, in sub-category 6D -

(i) in 6D003(b) -

(A) in 6D003(b)(1), by adding "and electric field" before "compensation";

(B) in 6D003(b)(2), by adding "and electric field" after "magnetic";

(ii) in 6D103 -

(A) by repealing "'missiles" or unmanned aerial vehicles specified in 9A012" and substituting "'missiles'";

(B) by adding at the end -

*Technical Note:*

In 6D103, 'missiles' means complete rocket systems and "unmanned aerial

vehicle" systems capable of a range  
exceeding 300 km.";

(zh) in the Dual-use Goods List, in Category 6, in sub-  
category 6E, by repealing 6E003 and substituting -  
"6E003 Other "technology", as follows:

(a) (1) Optical surface coating and  
treatment "technology"  
"required" to achieve  
uniformity of 99.5% or better  
for optical coatings 500 mm or  
more in diameter or major axis  
length and with a total loss  
(absorption and scatter) of  
less than  $5 \times 10^{-3}$ ;

*N.B.:*

See also 2E003(f).

(2) Optical fabrication  
"technology" using single point  
diamond turning techniques to  
produce surface finish  
accuracies of better than 10 nm  
rms on non-planar surfaces  
exceeding  $0.5 \text{ m}^2$ ;

(b) "Technology" "required" for the  
"development", "production" or "use"  
of specially designed diagnostic

instruments or targets in test facilities for "SHPL" testing or testing or evaluation of materials irradiated by "SHPL" beams;"

(zi) in the Dual-use Goods List, in Category 7, in subcategory 7A -

(i) in 7A002 -

(A) in 7A002(a), by repealing "three months" and substituting "one month";

(B) in 7A002(a)(1), by repealing "10" and substituting "12";

(C) in 7A002(a)(2), by repealing "10 g to 100 g inclusive; or" and substituting "12 g to 100 g inclusive;"

(D) by renumbering 7A002(b) as 7A002(c);

(E) by adding -

"(b) An 'angle random walk' of less (better) than or equal to 0.0035 degree per square root hour;

*Note:*

7A002(b) does not control spinning mass gyros (spinning mass gyros are gyros which use a continually rotating mass to sense angular motion).

*Technical Note:*

For the purpose of 7A002(b), 'angle random walk' is the angular error build-up with time that is due to white noise in angular rate. (IEEE STD 528-2001);";

- (ii) by repealing 7A007;
  - (iii) by repealing 7A101 and substituting -
    - "7A101 Accelerometers, other than those controlled by 7A001, as follows, and specially designed components therefor:
      - (a) Linear accelerometers, designed for use in inertial navigation systems or in guidance systems of all types, usable in 'missiles', and having all of the following characteristics, and specially designed components therefor:
        - (1) 'Scale factor'
        - 'repeatability' less (better) than 1 250 ppm;
- and*

- (2) 'Bias' 'repeatability'  
less (better) than 1 250  
micro g;

*Technical Notes:*

- (1) In 7A101(a), 'missiles'  
means complete rocket  
systems and "unmanned  
aerial vehicle" systems  
capable of a range  
exceeding 300 km.
- (2) 'Scale factor' is defined  
as the ratio of change in  
output to a change in the  
input.
- (3) The measurement of 'bias'  
and 'scale factor' refers  
to one sigma standard  
deviation with respect to  
a fixed calibration over a  
period of one year.
- (4) 'Repeatability' is defined  
according to IEEE Standard  
528-2001 as follows: The  
closeness of agreement  
among repeated  
measurements of the same



variable under the same operating conditions when changes in conditions or non-operating periods occur between measurements.

*Note:*

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

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

(iv) in 7A102 -

- (A) by repealing ""missiles"" and substituting "'missiles'";

- (B) by adding at the end -

*Technical Note:*

In 7A102, 'missiles' means complete rocket systems and "unmanned aerial vehicle" systems capable of a range exceeding 300 km.";

(v) in 7A103 -

(A) in 7A103(b), by repealing "unmanned aerial vehicles specified in" and substituting ""unmanned aerial vehicles" controlled by";

(B) by repealing 7A103(c) and substituting -

"(c) 'Integrated navigation systems', designed or modified for 'missiles' and capable of providing a navigational accuracy of 200 m "Circle of Equal Probability" (CEP) or less;

*Technical Note:*

(1) An 'integrated navigation system' typically incorporates the following components:

(a) An inertial measurement device (e.g. an attitude and heading reference system, inertial reference unit, or inertial navigation system);

(b) One or more external sensors used to update the position or velocity or both, either periodically

or continuously throughout the flight (e.g. satellite navigation receiver, radar altimeter, or Doppler radar); and

(c) Integration hardware and software.

(2) In 7A103(c), 'missiles' means complete rocket systems and "unmanned aerial vehicle" systems capable of a range exceeding 300 km.";

(vi) in 7A105 -

(A) in 7A105(a), by repealing "specified in 9A004, unmanned aerial vehicles specified in 9A012 or sounding rockets specified in" and substituting "controlled by 9A004, "unmanned aerial vehicles" controlled by 9A012 or sounding rockets controlled by";

(B) in 7A105(b), by repealing "(1 165 nautical miles/hour)";

(vii) in 7A106, by repealing ", unmanned aerial vehicles specified in 9A012";

(viii) in 7A115, by repealing ", unmanned aerial vehicles specified in 9A012";

- (ix) in 7A116 -
  - (A) by repealing “, unmanned aerial vehicles specified in 9A012”;
  - (B) in 7A116(c), by repealing “specified in” and substituting “controlled by”;
  - (C) in 7A116(c), by repealing “of more than” and substituting “greater than”;
- (zj) in the Dual-use Goods List, in Category 7, in subcategory 7B, in 7B103 -
  - (i) in 7B103(a), by repealing “specified in” and substituting “controlled by”;
  - (ii) in 7B103(b), by repealing “specified in” where it twice appears and substituting “controlled by”;
- (zk) in the Dual-use Goods List, in Category 7, in subcategory 7D -
  - (i) in 7D101, by repealing “specified in” and substituting “controlled by”;
  - (ii) in 7D102, by repealing “specified in” wherever it appears and substituting “controlled by”;
  - (iii) in 7D103, by repealing “unmanned aerial vehicles specified in” and substituting “unmanned aerial vehicles” controlled by”;
- (zl) in the Dual-use Goods List, in Category 7, in subcategory 7E, in 7E101, by repealing “specified in” and substituting “controlled by”;

(zm) in the Dual-use Goods List, in Category 8, in sub-category 8A, in 8A002 -

(i) in 8A002(f), by adding at the end -

*Note:*

8A002(f) does not control digital cameras specially designed for consumer purposes, other than those employing electronic image multiplication techniques.”;

(ii) in 8A002(h), by repealing “stored programme controlled”;

(iii) in 8A002(i)(2), by repealing “stored programme controlled” where it twice appears;

(zn) in the Dual-use Goods List, in Category 9, in sub-category 9A -

(i) by repealing 9A001 and substituting -

“9A001 Aero gas turbine engines having any of the following:

*N.B.:*

See also 9A101.

(a) Incorporating any of the technologies controlled by 9E003(a); or

*Note:*

9A001(a) does not control aero gas turbine engines which meet all of the following:

1. Certified by the civil aviation authority in a "Participating State"; *and*
  2. Intended to power non-military manned "aircraft" for which one of the following has been issued by a "Participating State" for the "aircraft" with this specific engine type:
    - (a) A civil Type Certificate; *or*
    - (b) An equivalent document recognized by the International Civil Aviation Organisation (ICAO).
- (b) Designed to power an "aircraft" designed to cruise at Mach 1 or higher for more than 30 minutes;";
- (ii) in 9A002, by repealing "Marine gas turbine engines" and substituting "'Marine gas turbine engines'";

(iii) by repealing 9A012 and substituting -

“9A012        “Unmanned Aerial Vehicles” (“UAVs”),  
associated systems, equipment and  
components as follows:

(a) “UAVs” having any of the  
following:

(1) An autonomous flight  
control and navigation  
capability (e.g. an  
autopilot with an Inertial  
Navigation System); or

(2) Capability of controlled  
flight out of the direct  
visual range involving a  
human operator (e.g.,  
televisual remote control);

(b) Associated systems, equipment  
and components as follows:

(1) Equipment specially  
designed for remotely  
controlling the “UAVs”  
controlled by 9A012(a);

(2) Guidance or control  
systems, other than those  
controlled in Category 7,  
specially designed for

integration into "UAVs"

controlled by 9A012(a);

(3) Equipment and components

specially designed to

convert a manned

"aircraft" to a "UAV"

controlled by 9A012(a);

*Note:*

9A012 does not control model

aircraft.";

(iv) in 9A101, by repealing "usable in "missiles"";

(v) in 9A105(b), by repealing "specified in" and substituting "controlled by";

(vi) in 9A106 -

(A) in 9A106(d), by repealing "of more than" and substituting "greater than";

(B) in Note (a) to 9A106(d), by repealing "of 24 litres per minute or greater, at an absolute pressure of 7 MPa or greater" and substituting "equal to or greater than 24 litres per minute, at an absolute pressure equal to or greater than 7 MPa";

(C) by adding -



- “(e) Liquid propellant tanks specially designed for propellants controlled by 1C111, or other liquid propellants used in the systems controlled by 9A004 or 9A104;”;
- (vii) in 9A107, by repealing “of 0.841 MNs or greater” and substituting “equal to or greater than  $8.41 \times 10^5$  Ns”;
- (viii) by repealing 9A109 and substituting -
- “9A109 Hybrid rocket motors, usable in ‘missiles’, other than those controlled by 9A009, and specially designed components therefor;
- Technical Note:*
- In 9A109, ‘missiles’ means complete rocket systems and “unmanned aerial vehicle” systems capable of a range exceeding 300 km.
- N.B.:*
- See also 9A119.”;
- (ix) in 9A110, by repealing “specified in” wherever it appears and substituting “controlled by”;
- (x) in 9A115 -

- (A) in 9A115(a), by repealing "specified in 9A004, unmanned aerial vehicles specified in 9A012 or sounding rockets specified in" and substituting "controlled by 9A004, "unmanned aerial vehicles" controlled by 9A012 or sounding rockets controlled by";
- (B) in 9A115(b), by repealing "specified in 9A004 or sounding rockets specified in" and substituting "controlled by 9A004, "unmanned aerial vehicles" controlled by 9A012 or sounding rockets controlled by";

(xi) by adding -

"9A350       Spraying or fogging systems, specially designed or modified for fitting to "aircraft", "lighter-than-air vehicles" or "unmanned aerial vehicles" controlled by 9A012, and specially designed components therefor, as follows:

- (a) Complete spraying or fogging systems capable of delivering, from a liquid suspension, an initial droplet the 'VMD' of which is less than 50 microns at a flow rate of greater than two litres per minute;

- (b) Spray booms or arrays of 'aerosol generating units' capable of delivering, from a liquid suspension, an initial droplet the 'VMD' of which is less than 50 microns at a flow rate of greater than two litres per minute;
- (c) 'Aerosol generating units' specially designed for fitting to systems controlled by 9A350 (a) and 9A350 (b);

*Notes:*

1. 'Aerosol generating units' are devices specially designed or modified for fitting to "aircraft" such as nozzles, rotary drum atomizers and similar devices.
2. 9A350 does not control spraying or fogging systems and components that are demonstrated not to be capable of delivering biological agents in the form of infectious aerosols.

*Technical Notes:*

1. Droplet size for spray equipment or nozzles specially designed for use on "aircraft", "lighter-than-air vehicles" or "unmanned aerial vehicles" controlled by 9A012 should be measured using either of the following:
  - (a) Doppler laser method;
  - (b) Forward laser diffraction method.

2. In 9A350, 'VMD' means Volume Median Diameter and, for water-based system, this equates to Mass Median Diameter (MMD).";

(zo) in the Dual-use Goods List, in Category 9, in sub-category 9B -

(i) by adding -

"9B010 Equipment specially designed for the "production" of "UAVs" and associated systems, equipment and components controlled by 9A012;";

(ii) in 9B106 -

(A) in 9B106(a)(1), by repealing "of 10 g rms or greater between 20 Hz and 2 000 Hz and

imparting forces of 5 kN or greater" and substituting "equal to or greater than 10 g rms, measured 'bare table', between 20 Hz and 2 kHz imparting forces equal to or greater than 5 kN";

(B) in 9B106(a)(2), by repealing "of 15 000 m or greater" and substituting "equal to or greater than 15 km";

(C) in 9B106(a), by adding at the end -

*Technical Note:*

9B106(a) describes systems that are capable of generating a vibration environment with a single wave (e.g., a sine wave) and systems capable of generating a broadband random vibration (i.e. power spectrum).";

(D) in 9B106(b), by repealing "Anechoic" and substituting "Environmental";

(E) in 9B106(b)(1), by repealing "(referenced to 20 micropascals) or with a rated power output of 4 kW or greater" and substituting "(referenced to  $2 \times 10^{-5}$  N/m<sup>2</sup>) or with a total rated acoustic power output of 4 kW or greater";

(F) in 9B106(b)(2), by repealing "of 15 000 m or greater" and substituting "equal to or

greater than 15 km”;

(G) by adding at the end -

“Note:

In 9B106, ‘bare table’ means a flat table, or surface, with no fixture or fittings.”;

(iii) in 9B117 -

(A) by repealing “rockets or rocket motors” and substituting “rockets, motors or engines”;

(B) in 9B117(a), by repealing “The capacity to handle more than 90 kN of thrust” and substituting “The capacity to handle solid or liquid propellant rockets, motors or engines having a thrust greater than 90 kN”;

(zp) in the Dual-use Goods List, in Category 9, in sub-category 9C, in 9C110, by repealing “specified in” where it twice appears and substituting “controlled by”;

(zq) in the Dual-use Goods List, in Category 9, in sub-category 9D -

(i) in 9D004, by adding -

“(e) “Software” specially designed or modified for the “use” of “UAVs” and associated systems, equipment and components controlled by 9A012;”;

- (ii) in 9D103, by adding ", "unmanned aerial vehicles" controlled by 9A012" after "9A004";
  - (iii) in 9D104, by repealing "specified in" and substituting "controlled by";
  - (iv) in 9D105, by repealing "specified in 9A004 or sounding rockets specified in" and substituting "controlled by 9A004, "unmanned aerial vehicles" controlled by 9A012 or sounding rockets controlled by";
- (zr) in the Dual-use Goods List, in Category 9, in sub-category 9E -
- (i) in 9E001, by repealing "9A011" and substituting "9A012";
  - (ii) by repealing 9E003(a)(11) and substituting -  
"(11) Hollow fan blades;";
  - (iii) in 9E102, by adding ""unmanned aerial vehicles" controlled by 9A012" after "9A004,";
- (zs) in the Definitions of Terms -
- (i) in the definition of "Allocated by the ITU", by repealing "ITU Radio Regulations (Edition 1998)" and substituting "current edition of the ITU Radio Regulations";
  - (ii) in the definition of "Electronic assemblies", by repealing "3 4 5" and substituting "2 3 4 5";
  - (iii) in the definition of "Real time bandwidth", by

repealing "Real time" and substituting "Real-time";

- (iv) by repealing the definition of "Riot control agents" and substituting -

"ML7 "Riot control agents" (暴動控制劑)

Substances which, under the expected conditions of use for riot control purposes, produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure. (Tear gases are a subset of "riot control agents".);

- (v) by repealing the definition of "Stored programme controlled";
- (vi) by repealing the definition of "Tear gases";
- (vii) in the definition of "Technology", by repealing "Controlled "technology" is defined in the General Technology Note and in the Dual-Use Goods List" and substituting "Controlled "technology" for the Dual-Use Goods List is defined in the General Technology Note and in the Dual-Use Goods List.



Controlled "technology" for the Munitions List is specified in ML22";

(viii) by repealing the definition of "Time-modulated ultra-wideband";

(ix) by adding -

"ML10 "Lighter-than-air vehicles" (輕於空氣載具)

Balloons and airships that rely on hot air or on lighter-than-air gases such as helium or hydrogen for their lift.

5 "Quantum cryptography" (量子密碼技術)

A family of techniques for the establishment of a shared key for "cryptography" by measuring the quantum-mechanical properties of a physical system (including those physical properties explicitly governed by quantum optics, quantum field theory, or quantum electrodynamics).

9 "Unmanned aerial vehicle" ("UAV") (無人駕駛飛行載具)

Any "aircraft" capable of initiating flight and

sustaining controlled flight  
and navigation without any  
human presence on board.”.

Director-General of Trade  
and Industry

25 April 2006

**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.

**IMPORT AND EXPORT  
(STRATEGIC COMMODITIES) REGULATIONS  
(AMENDMENT OF SCHEDULE 1) ORDER 2006**

**ECONOMIC IMPLICATIONS**

**ECONOMIC IMPLICATIONS**

The Order will facilitate the trade by removing outdated restrictions on trade in strategic commodities. In particular, the removal of control over microprocessors that have multiple data or instruction bus or serial communication ports will relieve the trade from the burden of applying for import and export licences for such commonly traded products. The relaxation of the control thresholds for digital computers will also be welcomed by the trade. On the other hand, the imposition of new controls should not have significant effects on general traders as the items concerned are not commonly traded by the importers and exporters of Hong Kong.