NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

APR 2022

RUSSIA SANCTIONS: GUIDANCE NOTE FOR NEW ZEALAND BUSINESSES

Export prohibitions on dual use items

This note provides guidance to New Zealand businesses in relation to export prohibitions on dual use items to Russia. This guidance relates to the Russia Sanctions Act 2022 (the Act) and Russia Sanctions Regulations 2022 (the Regulations) and should be read in conjunction with them.

This note does not constitute legal advice. It is not intended to provide guidance in relation to compliance with other international sanctions regimes relating to Russia.

Introduction

The explanatory notes below outline the particular products (including components, parts and accessories) and related applications of concern that informed the listed export prohibitions in Schedule 3 of the Russia Sanctions Regulations that come into force on 25 April 2022.

These particular products and applications of concern are ones with potential for dual-use in military applications or that are related to strategic industries closely connected to military activities or capabilities.

For a complete list of prohibited items by HS Code see the Russia Sanctions Register.

Group 1

Electronic devices and "components"

a. "Microprocessor microcircuits", "microcomputer microcircuits", and microcontroller microcircuits having any of the following:

a.1. A performance speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more; a.2. A clock frequency rate exceeding 25 MHz; *or* a.3. More than one data or instruction bus or serial communication port that provides a direct external interconnection between parallel "microprocessor microcircuits" with a transfer rate of 2.5 Mbyte/s;

b. Storage integrated circuits, as follows:

b.1. Electrical erasable programmable read-only memories (EEPROMs) with a storage capacity;

b.1.a. Exceeding 16 Mbits per package for flash memory types; *or*

b.1.b. Exceeding either of the following limits for all other EEPROM types:

b.1.b.1. Exceeding 1 Mbit per package; *or* b.1.b.2. Exceeding 256 kbit per package and a maximum access time of less than 80 ns;

b.2. Static random access memories (SRAMs) with a storage capacity:

b.2.a. Exceeding 1 Mbit per package; *or* b.2.b. Exceeding 256 kbit per package and a maximum access time of less than 25 ns;

c. Analog-to-digital converters having any of the following:

c.1. A resolution of 8 bit or more, but less than 12 bit, with an output rate greater than 200 million words per second; c.2. A resolution of 12 bit with an output rate greater than 105 million words per second; c.3. A resolution of more than 12 bit but equal to or less than 14 bit with an output rate greater than 10 million words per second; *or* c.4. A resolution of more than 14 bit with an output rate greater than 2.5 million words per second;

d. Field programmable logic devices having a maximum number of single-ended digital input/outputs between 200 and 700;

e. Fast Fourier Transform (FFT) processors having a rated execution time for a 1,024 point complex FFT of less than 1 ms;

f. Custom integrated circuits for which either the function is unknown, or the control status of the equipment in which the integrated circuits will be used is unknown to the manufacturer, having any of the following:

f.1. More than 144 terminals; *or* f.2. A typical "basic propagation delay time" of less than 0.4 ns;

g. Traveling-wave “vacuum electronic devices,” pulsed or continuous wave, as follows:

g.1. Coupled cavity devices, or derivatives thereof;

g.2. Helix devices based on helix, folded waveguide, or serpentine waveguide circuits, *or* derivatives thereof, with any of the following:

g.2.a. An “instantaneous bandwidth” of half an octave or more; *and* g.2.b. The product of the rated average output power (expressed in kW) and the maximum operating frequency (expressed in GHz) of more than 0.2; g.2.c. An “instantaneous bandwidth” of less than half an octave; *and* g.2.d. The product of the rated average output power (expressed in kW) and the maximum operating frequency (expressed in GHz) of more than 0.4;

h. Flexible waveguides designed for use at frequencies exceeding 40 GHz;

i. Surface acoustic wave and surface skimming (shallow bulk) acoustic wave devices (i.e., “signal processing” devices employing elastic waves in materials), having either of the following:

i.1. A carrier frequency exceeding 1 GHz; *or*

i.2. A carrier frequency of 1 GHz or less; *and*

i.2.a. A frequency side-lobe rejection exceeding 55 Db; i.2.b. A product of the maximum delay time and bandwidth (time in microseconds and bandwidth in MHz) of more than 100; *or* i.2.c. A dispersive delay of more than 10 microseconds;

j. Cells as follows:

j.1. Primary cells having an energy density of 550 Wh/kg or less at 293 K (20ºC);

j.2. Secondary cells having an energy density of 350 Wh/kg or less at 293 K (20ºC);

k.1. Maximum energy delivered during the discharge divided by the duration of the discharge of more than 500 kJ per minute;

k.2. Inner diameter of the current carrying windings of more than 250 mm; *and*

k.3. Rated for a magnetic induction of more than 8T or “overall current density” in the winding of more than 300 A/mm^2;

l. Circuits or systems for electromagnetic energy storage, containing “components” manufactured from “superconductive” materials “specially designed” for operation at temperatures below the “critical temperature” of at least one of their “superconductive” constituents, having all of the following:

l.1. Resonant operating frequencies exceeding 1 MHz;

l.2. A stored energy density of 1 MJ/M^3 or more; *and*

l.3. A discharge time of less than 1 ms;

m. Hydrogen/hydrogen-isotope thyratrons of ceramic-metal construction and rate for a peak current of 500 A or more;

n. Digital integrated circuits based on any compound semiconductor having an equivalent gate count of more than 300 (2 input gates);

o. Solar cells, cell-interconnect-coverglass (CIC) assemblies, solar panels, and solar arrays, which are “space qualified” and not elsewhere controlled.

General purpose electronic equipment

a. Electronic test equipment, not elsewhere specified.

b. Digital instrumentation magnetic tape data recorders having any of the following characteristics;

b.1. A maximum digital interface transfer rate exceeding 60 Mbit/s and employing helical scan techniques; b.2. A maximum digital interface transfer rate exceeding 120 Mbit/s and employing fixed head techniques; *or* b.3. "Space qualified";

c. Equipment, with a maximum digital interface transfer rate exceeding 60 Mbit/s, designed to convert digital video magnetic tape recorders for use as digital instrumentation data recorders;

d. Non-modular analog oscilloscopes having a bandwidth of 1 GHz or greater;

e. Modular analog oscilloscope systems having either of the following characteristics:

e.1. A mainframe with a bandwidth of 1 GHz or greater; *or* e.2. Plug-in modules with an individual bandwidth of 4 GHz or greater;

f. Analog sampling oscilloscopes for the analysis of recurring phenomena with an effective bandwidth greater than 4 GHz;

g. Digital oscilloscopes and transient recorders, using analog-to-digital conversion techniques, capable of storing transients by sequentially sampling single-shot inputs at successive intervals of less than 1 ns (greater than 1 giga-sample per second), digitizing to 8 bits or greater resolution and storing 256 or more samples.

Note: This controls the following "specially designed" "parts" and "components" for analog oscilloscopes: 1. Plug-in units; 2. External amplifiers; 3. Pre-amplifiers; 4. Sampling devices; and 5. Cathode ray tubes.

Specific processing equipment, not elsewhere specified, as follows (see list of items)

a. Frequency changers capable of operating in the frequency range from 300 up to 600 Hz, not elsewhere specified;

b. Mass spectrometers not elsewhere specified;

c. All flash x-ray machines, and "parts" or "components" of pulsed power systems designed thereof, including Marx generators, high power pulse shaping networks, high voltage capacitors, and triggers;

d. Pulse amplifiers, not elsewhere specified;

e. Electronic equipment for time delay generation or time interval measurement, as follows:

e.1. Digital time delay generators with a resolution of 50 nanoseconds or less over time intervals of 1 microsecond or greater; *or*

e.2. Multi-channel (three or more) or modular time interval meter and chronometry equipment with resolution of 50 nanoseconds or less over time intervals of 1 microsecond or greater;

f. Chromatography and spectrometry analytical instruments.

Equipment for the manufacture of electronic "parts," "components" and materials, and "specially designed" "parts," "components" and "accessories"

a. Equipment "specially designed" for the manufacture of electron tubes, optical elements and "specially designed" "parts" and "components" therefor controlled by 3A001 or 3A991;

b. Equipment "specially designed" for the manufacture of semiconductor devices, integrated circuits and "electronic assemblies", as follows, and systems incorporating or having the characteristics of such equipment:

Note: *also controls equipment used or modified for use in the manufacture of other devices, such as imaging devices, electro-optical devices, acoustic-wave devices.*

b.1. Equipment for the processing of materials for the manufacture of devices, “parts” and “components” as follows:

b.1.a. Equipment for producing polycrystalline silicon and materials;

b.1.b. Equipment “specially designed” for purifying or processing III/V and II/VI semiconductor materials under this group;

b.1.c. Crystal pullers and furnaces, as follows:

b.1.c.1. Annealing or recrystallizing equipment other than constant temperature furnaces employing high rates of energy transfer capable of processing wafers at a rate exceeding 0.005 m^2 per minute;

b.1.c.2. “Stored program controlled” crystal pullers having any of the following characteristics:

b.1.c.2.a. Rechargeable without replacing the crucible container; b.1.c.2.b. Capable of operation at pressures above 2.5 x 10^5 Pa; *or* b.1.c.2.c. Capable of pulling crystals of a diameter exceeding 100 mm;

b.1.d. “Stored program controlled” equipment for epitaxial growth having any of the following characteristics:

b.1.d.1. Capable of producing silicon layer with a thickness uniform to less than ▯▯2.5% across a distance of 200 mm or more; b.1.d.2. Capable of producing a layer of any material other than silicon with a thickness uniformity across the wafer of equal to or better than ▯ 3.5%; *or* b.1.d.3. Rotation of individual wafers during processing;

b.1.e. Molecular beam epitaxial growth equipment;

b.1.f. Magnetically enhanced ‘sputtering’ equipment with “specially designed” integral load locks capable of transferring wafers in an isolated vacuum environment;

b.1.g. Equipment “specially desi ned” for ion implantation, ion-enhanced or photo-enhanced diffusion, having any of the following characteristics:

b.1.g.1. Patterning capability; b.1.g.2. Beam energy (accelerating voltage) exceeding 200 keV; b.1.g.3 Optimized to operate at a beam energy (accelerating voltage) of less than 10 keV; *or* b.1.g.4. Capable of high energy oxygen implant into a heated “substrate”;

b.1.h. “Stored program controlled” equipment for the selective removal (etching) by means of anisotropic dry methods (e.g., plasma), as follows:

b.1.h.1. Batch types having either of the following:

b.1.h.1.a. End-point detection, other than optical emission spectroscopy types; *or* b.1.h.1.b. Reactor operational (etching) pressure of 26.66 Pa or less;

b.1.h.2. Single wafer types having any of the following:

b.1.h.2.a. End-point detection, other than optical emission spectroscopy types; b.1.h.2.b. Reactor operational (etching) pressure of 26.66 Pa or less; *or* b.1.h.2.c. Cassette-to-cassette and load locks wafer handling;

Notes: *1. “Batch types” refers to machines not “specially designed” for production processing of single wafers. Such machines can process two or more wafers simultaneously with common process parameters, e.g., RF power, temperature, etch gas species, flow rates.*

2. "Single wafer types" refers to machines "specially designed" for production processing of single wafers. These machines may use automatic wafer handling techniques to load a single wafer into the equipment for processing. The definition includes equipment that can load and process several wafers but where the etching parameters, e.g., RF power or end point, can be independently determined for each individual wafer.

b.1.i. "Chemical vapor deposition" (CVD) equipment, e.g., plasma-enhanced CVD (PECVD) or photo-enhanced CVD, for semiconductor device manufacturing, having either of the following capabilities, for deposition of oxides, nitrides, metals or polysilicon:

b.1.i.1. "Chemical vapor deposition" equipment operating below 10^5 Pa; *or*

b.1.i.2. PECVD equipment operating either below 60 Pa (450 millitorr) or having automatic cassette-to-cassette and load lock wafer handling;

b.1.j. Electron beam systems "specially designed" or modified for mask making or semiconductor device processing having any of the following characteristics:

b.1.j.1. Electrostatic beam deflection; b.1.j.2. Shaped, non-Gaussian beam profile; b.1.j.3. Digital-to-analog conversion rate exceeding 3 MHz; b.1.j.4. Digital-to-analog conversion accuracy exceeding 12 bit; *or* b.1.j.5. Target-to-beam position feedback control precision of 1 micrometer or finer;

b.1.k. Surface finishing equipment for the processing of semiconductor wafers as follows:

b.1.k.1. "Specially designed" equipment for backside processing of wafers thinner than 100 micrometer and the subsequent separation thereof; *or*

b.1.k.2. "Specially designed" equipment for achieving a surface roughness of the active surface of a processed wafer with a two-sigma value of 2 micrometer or less, total indicator reading (TIR);

b.1.l. Interconnection equipment which includes common single or multiple vacuum chambers "specially designed" to permit the integration of equipment under this group;

b.1.m. "Stored program controlled" equipment using "lasers" for the repair or trimming of "monolithic integrated circuits" with either of the following characteristics:

b.1.m.1. Positioning accuracy less than □ 1 micrometer; *or* b.1.m.2. Spot size (kerf width) less than 3 micrometer.

b.2. Masks, mask "substrates," mask-making equipment and image transfer equipment for the manufacture of devices, "parts" and "components" as specified in the heading of 3B991, as follows:

Note: *The term "masks" refers to those used in electron beam lithography, X-ray lithography, and ultraviolet lithography, as well as the usual ultraviolet and visible photo-lithography.*

b.2.a. Finished masks, reticles and designs therefor, except:

b.2.a.1. Finished masks or reticles for the production of unembargoed integrated circuits; *or*

b.2.a.2. Masks or reticles, having both of the following characteristics:

b.2.a.2.a. Their design is based on geometries of 2.5 micrometer or more; *and* b.2.a.2.b. The design does not include special features to alter the intended use by means of production equipment or "software";

b.2.b. Mask "substrates" as follows:

b.2.b.1. Hard surface (e.g., chromium, silicon, molybdenum) coated "substrates" (e.g., glass, quartz, sapphire) for the preparation of masks having dimensions exceeding 125 mm x 125 mm; *or*

b.2.b.2. "Substrates" "specially designed" for X-ray masks;

b.2.c. Equipment, other than general purpose computers, “specially designed” for computer aided design (CAD) of semiconductor devices or integrated circuits;

b.2.d. Equipment or machines, as follows, for mask or reticle fabrication:

b.2.d.1. Photo-optical step and repeat cameras capable of producing arrays larger than 100 mm x 100 mm, or capable of producing a single exposure larger than 6 mm x 6 mm in the image (i.e., focal) plane, or capable of producing line widths of less than 2.5 micrometer in the photoresist on the “substrate”;

b.2.d.2. Mask or reticle fabrication equipment using ion or “laser” beam lithography capable of producing line widths of less than 2.5 micrometer; *or*

b.2.d.3. Equipment or holders for altering masks or reticles or adding pellicles to remove defects;

b.2.e. “Stored program controlled” equipment for the inspection of masks, reticles or pellicles with:

b.2.e.1. A resolution of 0.25 micrometer or finer; *and* b.2.e.2. A precision of 0.75 micrometer or finer over a distance in one or two coordinates of 63.5 mm or more;

b.2.f. Align and expose equipment for wafer production using photo-optical or X-ray methods, e.g., lithography equipment, including both projection image transfer equipment and step and repeat (direct step on wafer) or step and scan (scanner) equipment, capable of performing any of the following functions:

b.2.f.1. Production of a pattern size of less than 2.5 micrometer;

b.2.f.2. Alignment with a precision finer than ± 0.25 micrometer (3 sigma);

b.2.f.3. Machine-to-machine overlay no better than ± 0.3 micrometer; *or*

b.2.f.4. A light source wavelength shorter than 400 nm;

b.2.g. Electron beam, ion beam or X-ray equipment for projection image transfer capable of producing patterns less than 2.5 micrometer;

b.2.h. Equipment using “lasers” for direct write on wafers capable of producing patterns less than 2.5 micrometer.

b.3. Equipment for the assembly of integrated circuits, as follows:

b.3.a. “Stored program controlled” die bonders having all of the following characteristics:

b.3.a.1. “Specially designed” for “hybrid integrated circuits”; b.3.a.2. X-Y stage positioning travel exceeding 37.5 x 37.5 mm; *and* b.3.a.3. Placement accuracy in the X-Y plane of finer than ± 10 micrometer;

b.3.b. “Stored program controlled” equipment for producing multiple bonds in a single operation (e.g., beam lead bonders, chip carrier bonders, tape bonders);

b.3.c. Semi-automatic or automatic hot cap sealers, in which the cap is heated locally to a higher temperature than the body of the package, “specially designed” for ceramic microcircuit packages and that have a throughput equal to or more than one package per minute.

b.4. Filters for clean rooms capable of providing an air environment of 10 or less particles of 0.3 micrometer or smaller per 0.02832 m^3 and filter materials.

Equipment for the inspection or testing of electronic "components" and materials, and "specially designed" "parts," "components" and "accessories"

a. Equipment "specially designed" for the inspection or testing of electron tubes, optical elements and "specially designed" "parts" and "components" under this group;

b. Equipment "specially designed" for the inspection or testing of semiconductor devices, integrated circuits and "electronic assemblies", as follows, and systems incorporating or having the characteristics of such equipment:

Note: *also controls equipment used or modified for use in the inspection or testing of other devices, such as imaging devices, electro-optical devices, acoustic-wave devices.*

b.1. "Stored program controlled" inspection equipment for the automatic detection of defects, errors or contaminants of 0.6 micrometer or less in or on processed wafers, "substrates", other than printed circuit boards or chips, using optical image acquisition techniques for pattern comparison;

b.2. "Specially designed" "stored program controlled" measuring and analysis equipment, as follows:

b.2.a. "Specially designed" for the measurement of oxygen or carbon content in semiconductor materials;

b.2.b. Equipment for line width measurement with a resolution of 1 micrometer or finer;

b.2.c. "Specially designed" flatness measurement instruments capable of measuring deviations from flatness of 10 micrometer or less with a resolution of 1 micrometer or finer.

b.3. "Stored program controlled" wafer probing equipment having any of the following characteristics:
b.3.a. Positioning accuracy finer than 3.5 micrometer; b.3.b. Capable of testing devices having more than 68 terminals; *or* b.3.c. Capable of testing at a frequency exceeding 1 GHz;

b.4. Test equipment as follows:

b.4.a. "Stored program controlled" equipment "specially designed" for testing discrete semiconductor devices and unencapsulated dice, capable of testing at frequencies exceeding 18 GHz;

Technical Note: *Discrete semiconductor devices include photocells and solar cells.*

b.4.b. "Stored program controlled" equipment "specially designed" for testing integrated circuits and "electronic assemblies" thereof, capable of functional testing:

b.4.b.1. At a 'pattern rate' exceeding 20 MHz; *or* b.4.b.2. At a 'pattern rate' exceeding 10 MHz but not exceeding 20 MHz and capable of testing packages of more than 68 terminals.

Note: *'pattern rate' is defined as the maximum frequency of digital operation of a tester. It is therefore equivalent to the highest data rate that a tester can provide in non-multiplexed mode. It is also referred to as test speed, maximum digital frequency or maximum digital speed.*

b.4.c. Equipment "specially designed" for determining the performance of focal-plane arrays at wavelengths of more than 1,200 nm, using "stored program controlled" measurements or computer aided evaluation and having any of the following characteristics:

b.4.c.1. Using scanning light spot diameters of less than 0.12 mm; b.4.c.2. Designed for measuring photosensitive performance parameters and for evaluating frequency response, modulation transfer function, uniformity of responsivity or noise; *or* b.4.c.3. Designed for evaluating arrays capable of creating images with more than 32 x 32 line elements;

b.5. Electron beam test systems designed for operation at 3 keV or below, or "laser" beam systems, for non-contactive probing of powered-up semiconductor devices having any of the following:

b.5.a. Stroboscopic capability with either beam blanking or detector strobing; b.5.b. An electron spectrometer for voltage measurements with a resolution of less than 0.5 V; *or* b.5.c. Electrical tests fixtures for performance analysis of integrated circuits;

b.6. "Stored program controlled" multifunctional focused ion beam systems "specially designed" for manufacturing, repairing, physical layout analysis and testing of masks or semiconductor devices and having either of the following characteristics:

b.6.a. Target-to-beam position feedback control precision of 1 micrometer or finer; *or* b.6.b. Digital-to-analog conversion accuracy exceeding 12 bit;

b.7. Particle measuring systems employing "lasers" designed for measuring particle size and concentration in air having both of the following characteristics:

b.7.a. Capable of measuring particle sizes of 0.2 micrometer or less at a flow rate of 0.02832 m^3 per minute or more; *and* b.7.b. Capable of characterizing Class 10 clean air or better.

Positive resists designed for semiconductor lithography specially adjusted (optimized) for use at wavelengths between 370 and 193 nm.

"Software" "specially designed" for the "development", "production", or "use" of electronic devices, "parts" or "components", general purpose electronic equipment, or manufacturing and test equipment; or "software" "specially designed" for the "use" of equipment under this group.

"Technology" for the "development," "production" or "use" of electronic devices, "parts" or "components", general purpose electronic equipment, or manufacturing and test equipment, or materials under this group.

Group 2

Computers, "electronic assemblies" and related equipment, not elsewhere controlled and "specially designed" "parts" and "components" (see list of items)

a. Electronic computers and related equipment, and "electronic assemblies" and "specially designed" "parts" and "components", rated for operation at an ambient temperature above 343 K (70°C);

b. "Digital computers", including equipment of "signal processing" or image enhancement", having an "Adjusted Peak Performance" ("APP") equal to or greater than 0.0128 Weighted TeraFLOPS (WT);

c. "Electronic assemblies" that are "specially designed" or modified to enhance performance by aggregation of processors, as follows:

c.1. Designed to be capable of aggregation in configurations of 16 or more processors;

Note 1: applies only to "electronic assemblies" and programmable interconnections with a "APP" not exceeding the limits in 4A994.b, when shipped as unintegrated "electronic assemblies".

d. Equipment for "signal processing" or "image enhancement" having an "Adjusted Peak Performance" ("APP") equal to or greater than 0.0128 Weighted TeraFLOPS WT;

e. Equipment containing "terminal interface equipment" exceeding the limits in Group 3;

f. Equipment “specially designed” to provide external interconnection of “digital computers” or associated equipment that allows communications at data rates exceeding 80 Mbyte/s.

g. “Hybrid computers” and “electronic assemblies” and “specially designed” “parts” and “components” therefor containing analog-to-digital converters having all of the following characteristics:

g.1. 32 channels or more; and g.2. A resolution of 14 bit (plus sign bit) or more with a conversion rate of 200,000 conversions/s or more.

“Program” proof and validation “software,” “software” allowing the automatic generation of “source codes,” and operating system “software” that are “specially designed” for “real-time processing” equipment (see list of items)

Related Definitions: “Global interrupt latency time” is the time taken by the computer system to recognize an interrupt due to the event, service the interrupt and perform a context switch to an alternate memory-resident task waiting on the interrupt.

Items:

a. “Programme” proof and validation “software” using mathematical and analytical techniques and designed or modified for “programmes” having more than 500,000 “source code” instructions;

b. “Software” allowing the automatic generation of “source codes” from data acquired on line from external sensors; *or*

c. Operating system “software” “specially designed” for “real-time processing” equipment that guarantees a “global interrupt latency time” of less than 20 microseconds.

Software” other than that controlled above “specially designed” or modified for the “development”, “production”, or “use” of equipment under this group.

“Technology” for the “development,” “production,” or “use” of equipment, or “software” under this group.

“Technology” for the “development” or “production” of equipment designed for “multi-data-stream processing.”

Group 3, Part 1

Telecommunication equipment, (see list of items)

a. Any type of telecommunications equipment, not elsewhere controlled, “specially designed” to operate outside the temperature range from 219 K (-54 °C) to 397 K (124 °C).

b. Telecommunication transmission equipment and systems, and “specially designed” “parts,” “components” and “accessories”, having any of the following characteristics, functions or features:

Note: Telecommunication transmission equipment:

a. Categorized as follows, or combinations thereof:

1. Radio equipment (e.g., transmitters, receivers and transceivers); 2. Line terminating equipment; 3. Intermediate amplifier equipment; 4. Repeater equipment; 5. Regenerator equipment; 6. Translation encoders (transcoders); 7. Multiplex equipment (statistical mutiplex included); 8. Modulators/demodulators (modems); 9. Transmultiplex equipment (see CCITT Rec. G701); 10. “Stored

program controlled" digital crossconnection equipment; 11. 'Gateways' and bridges; 12. "Media access units"; and

b. Designed for use in single or multi-channel communication via any of the following:

1. Wire (line); 2. Coaxial cable; 3. Optical fiber cable; 4. Electromagnetic radiation; or

5. Underwater acoustic wave propagation.

b.1. Employing digital techniques, including digital processing of analog signals, and designed to operate at a "digital transfer rate" at the highest multiplex level exceeding 45 Mbit/s or a "total digital transfer rate" exceeding 90 Mbit/s;

b.2. Modems using the 'bandwidth of one voice channel' with a "data signaling rate" exceeding 9,600 bits per second;

b.3. Being "stored program controlled" digital cross connect equipment with "digital transfer rate" exceeding 8.5 Mbit/s per port.

b.4. Being equipment containing any of the following:

b.4.a. 'Network access controllers' and their related common medium having a "digital transfer rate" exceeding 33 Mbit/s; *or* b.4.b. "Communication channel controllers" with a digital output having a "data signaling rate" exceeding 64,000 bit/s per channel;

b.5. Employing a "laser" and having any of the following characteristics:

b.5.a. A transmission wavelength exceeding 1,000 nm; *or* b.5.b. Employing analog techniques and having a bandwidth exceeding 45 MHz;

b.5.c. Employing coherent optical transmission or coherent optical detection techniques (also called optical heterodyne or homodyne techniques);

b.5.d. Employing wavelength division multiplexing techniques; *or*

b.5.e. Performing "optical amplification";

b.6. Radio equipment operating at input or output frequencies exceeding:

b.6.a. 31 GHz for satellite-earth station applications; *or* b.6.b. 26.5 GHz for other applications;

b.7. Being radio equipment employing any of the following:

b.7.a. Quadrature-amplitude-modulation (QAM) techniques above level 4 if the "total digital transfer rate" exceeds 8.5 Mbit/s;

b.7.b. QAM techniques above level 16 if the "total digital transfer rate" is equal to or less than 8.5 Mbit/s;

b.7.c. Other digital modulation techniques and having a "spectral efficiency" exceeding 3 bit/s/Hz; or

b.7.d. Operating in the 1.5 MHz to 87.5 MHz band and incorporating adaptive techniques providing more than 15 dB suppression of an interfering signal.

Note: Statistical multiplexers with digital input and digital output which provide switching are treated as "stored program controlled" switches.

c.1. "Data (message) switching" equipment or systems designed for "packet-mode operation" and "parts," electronic assemblies and "components, not elsewhere specified

c.2. Routing or switching of 'datagram' packets;

c.5. Multi-level priority and pre-emption for circuit switching;

c.6. Designed for automatic hand-off of cellular radio calls to other cellular switches or automatic connection to a centralized subscriber data base common to more than one switch;

c.7. Containing “stored program controlled” digital cross connect equipment with “digital transfer rate” exceeding 8.5 Mbit/s per port.

c.8. “Common channel signaling” operating in either non-associated or quasi-associated mode of operation;

c.9. ‘Dynamic adaptive routing’;

c.10. Being packet switches, circuit switches and routers with ports or lines exceeding any of the following:

c.10.a. A “data signaling rate” of 64,000 bit/s per channel for a ‘communications channel controller’;

c.10.b. A “digital transfer rate” of 33 Mbit/s for a ‘network access controller’ and related common media;

c.11. “Optical switching”;

c.12. Employing ‘Asynchronous Transfer Mode’ (‘ATM’) techniques.

d. Optical fibres and optical fibre cables of more than 50 m in length designed for single mode operation;

e. Centralized network control having all of the following characteristics:

e.1. Receives data from the nodes; *and* e.2. Process these data in order to provide control of traffic not requiring operator decisions, and thereby performing ‘dynamic adaptive routing’;

f. Phased array antennas, operating above 10.5 GHz, containing active elements and distributed “parts” or “components,” and designed to permit electronic control of beam shaping and pointing, except for landing systems with instruments meeting International Civil Aviation Organization (ICAO) standards (microwave landing systems (MLS)).

g. Mobile communications equipment, not elsewhere specified, and “parts,” electronic assemblies and “components”; *or*

h. Radio relay communications equipment designed for use at frequencies equal to or exceeding 19.7 GHz and “parts” and “components”, not elsewhere specified.

Telecommunications test equipment, not elsewhere specified

Preforms of glass or of any other material optimized for the manufacture of optical fibres

“Software” “specially designed” or modified for the “development,” “production” or “use” of equipment under this group, and dynamic adaptive routing software as follows (see list of items)

a. “Software”, other than in machine-executable form, “specially designed” for “dynamic adaptive routing”.

“Technology” for the “development”, “production” or “use” of equipment, or “software” under this group, and other “technologies” as follows (see list of Items)

a. Specific “technologies” as follows:

a.1. “Technology” for the processing and application of coatings to optical fiber “specially designed” to make it suitable for underwater use;

a.2. “Technology” for the “development” of equipment employing ‘Synchronous Digital Hierarchy’ (‘SDH’) or ‘Synchronous Optical Network’ (‘SONET’) techniques.

Group 3, Part 2

Equipment as follows:

a. Commodities classified as mass market encryption commodities in accordance with Cryptography Note below.

“Information Security” “software” as follows (see list of Items)

a. “Software” classified as mass market encryption software in accordance with Cryptography Note below.

“Information Security” “technology”:

a. “Technology”, not elsewhere specified, for the “use” of mass market commodities or mass market “software” under this group.

Group 4

Marine or terrestrial acoustic equipment, not elsewhere specified, capable of detecting or locating underwater objects or features or positioning surface vessels or underwater vehicles; and “specially designed” “parts” and “components,” not elsewhere specified

Optical Sensors as follows (see list of items)

a. Image intensifier tubes and “specially designed” “components”, as follows:

a.1. Image intensifier tubes having all the following:

a.1.a. A peak response in wavelength range exceeding 400 nm, but not exceeding 1,050 nm;

a.1.b. A microchannel plate for electron image amplification with a hole pitch (center-to-center spacing) of less than 25 micrometers; *and*

a.1.c. Having any of the following:

a.1.c.1. An S-20, S-25 or multialkali photocathode; *or* 1.c.2. A GaAs or GaInAs photocathode;

a.2. “Specially designed” microchannel plates having both of the following characteristics:

a.2.a. 15,000 or more hollow tubes per plate; *and* a.2.b. Hole pitch (center-to-center spacing) of less than 25 micrometers.

b. Direct view imaging equipment operating in the visible or infrared spectrum, incorporating image intensifier tubes having the characteristics listed in 6A992.a.1.

Certain Cameras and Camera uses

Optics as follows (see list of items)

a. Optical filters:

a.1. For wavelengths longer than 250 nm, comprised of multi-layer optical coatings and having either of the following:

a.1.a. Bandwidths equal to or less than 1 nm Full Width Half Intensity (FWHI) and peak transmission of 90% or more; *or*

a.1.b. Bandwidths equal to or less than 0.1 nm FWHI and peak transmission of 50% or more;

a.2. For wavelengths longer than 250 nm, and having all of the following:

a.2.a. Tunable over a spectral range of 500 nm or more;

a.2.b. Instantaneous optical bandpass of 1.25 nm or less;

a.2.c. Wavelength resettable within 0.1 ms to an accuracy of 1 nm or better within the tunable spectral range; *and*

a.2.d. A single peak transmission of 91% or more;

a.3. Optical opacity switches (filters) with a field of view of 30° or wider and a response time equal to or less than 1 ns;

b. "Fluoride fibre" cable, or optical fibres, having an attenuation of less than 4 dB/km in the wavelength range exceeding 1,000 nm but not exceeding 3,000 nm.

"Lasers" as follows (see list of items)

a. Carbon dioxide (CO_2) "lasers" having any of the following:

a.1. A CW output power exceeding 10 kW;

a.2. A pulsed output with a "pulse duration" exceeding 10 microseconds; *and*

a.2.a. An average output power exceeding 10 kW; *or*

a.2.b. A pulsed "peak power" exceeding 100 kW; *or*

a.3. A pulsed output with a "pulse duration" equal to or less than 10 microseconds; *and*

a.3.a. A pulse energy exceeding 5 J per pulse and "peak power" exceeding 2.5 kW; *or*

a.3.b. An average output power exceeding 2.5 kW;

b. Semiconductor lasers, as follows:

b.1. Individual, single-transverse mode semiconductor "lasers" having:

b.1.a. An average output power exceeding 100 mW; *or* b.1.b. A wavelength exceeding 1,050 nm;

b.2. Individual, multiple-transverse mode semiconductor "lasers", or arrays of individual semiconductor "lasers", having a wavelength exceeding 1,050 nm;

c. Ruby "lasers" having an output energy exceeding 20 J per pulse;

d. Non-"tunable" "pulsed lasers" having an output wavelength exceeding 975 nm but not exceeding 1,150 nm and having any of the following:

d.1. A "pulse duration" equal to or exceeding 1 ns but not exceeding 1 µs, and having any of the following:

d.1.a. A single transverse mode output and having any of the following:

d.1.a.1. A 'wall-plug efficiency' exceeding 12% and an "average output power" exceeding 10 W and capable of operating at a pulse repetition frequency greater than 1kHz; *or* d.1.a.2. An "average output power" exceeding 20 W; *or*

d.1.b. A multiple transverse mode output and having any of the following:

d.1.b.1. A 'wall-plug efficiency' exceeding 18% and an "average output power" exceeding 30W;

d.1.b.2. A "peak power" exceeding 200 MW; *or* 1.b.3. An "average output power" exceeding 50 W; *or*

d.2. A "pulse duration" exceeding 1 μs and having any of the following:

d.2.a. A single transverse mode output and having any of the following:

d.2.a.1. A 'wall-plug efficiency' exceeding 12% and an "average output power" exceeding 10 W and capable of operating at a pulse repetition frequency greater than 1 kHz; *or* d.2.a.2. An "average output power" exceeding 20 W; *or*

d.2.b. A multiple transverse mode output and having any of the following:

d.2.b.1. A 'wall-plug efficiency' exceeding 18% and an "average output power" exceeding 30 W; *or* d.2.b.2. An "average output power" exceeding 500 W;

e. Non-"tunable" continuous wave "(CW) lasers", having an output wavelength exceeding 975 nm but not exceeding 1,150nm and having any of the following:

e.1. A single transverse mode output and having any of the following:

e.1.a. A 'wall-plug efficiency' exceeding 12% and an "average output power" exceeding 10 W and capable of operating at a pulse repetition frequency greater than 1 kHz; *or* e.1.b. An "average output power" exceeding 50 W; *or*

e.2. A multiple transverse mode output and having any of the following:

e.2.a. A 'wall-plug efficiency' exceeding 18% and an "average output power" exceeding 30 W; *or*

e.2.b. An "average output power" exceeding 500 W;

f. Non-"tunable" "lasers", having a wavelength exceeding 1,400 nm, but not exceeding 1555 nm *and* having any of the following:

f.1. An output energy exceeding 100 mJ per pulse and a pulsed "peak power" exceeding 1 W; *or*

f.2. An average or CW output power exceeding 1 W;

g. Free electron "lasers."

"Magnetometers", "Superconductive" electromagnetic sensors, and "specially designed" "components", as follows (see list of items)

a. "Magnetometers", not elsewhere specified, having a 'sensitivity' lower (better) than 1.0 nT (rms) per square root Hz.

Technical Note: 'sensitivity' (noise level) is the root mean square of the device-limited noise floor which is the lowest signal that can be measured.

b. "Superconductive" electromagnetic sensors, "components" manufactured from "superconductive" materials:

b.1. Designed for operation at temperatures below the "critical temperature" of at least one of their "superconductive" constituents (including Josephson effect devices or "superconductive" quantum interference devices (SQUIDS));

b.2. Designed for sensing electromagnetic field variations at frequencies of 1 KHz or less; *and*

b.3. Having any of the following characteristics:

b.3.a. Incorporating thin-film SQUIDS with a minimum feature size of less than 2 µm and with associated input and output coupling circuits; b.3.b. Designed to operate with a magnetic field slew rate exceeding 1 x 10^6 magnetic flux quanta per second; b.3.c. Designed to function without magnetic shielding in the earth's ambient magnetic field; *or* b.3.d. Having a temperature coefficient less (smaller) than 0.1 magnetic flux quantum/K.

Gravity meters (gravimeters) for ground use, not elsewhere specified, as follows (see list of items)

a. Having a static accuracy of less (better) than 100 microgal; *or*

b. Being of the quartz element (Worden) type.

Radar systems, equipment and major "components," not elsewhere specified, and "specially designed" "components", as follows (see list of items)

a. Airborne radar equipment, not elsewhere specified, and "specially designed" "components".

b. "Space-qualified" "laser" radar or Light Detection and Ranging (LIDAR) equipment "specially designed" for surveying or for meteorological observation.

c. Millimeter wave enhanced vision radar imaging systems "specially designed" for rotary wing aircraft and having all of the following:

c.1. Operates at a frequency of 94 GHz; c.2. An average output power of less than 20 mW; c.3. Radar beam width of 1 degree; and c.4. Operating range equal to or greater than 1500 m.

Specific processing equipment, as follows (see list of items)

a. Seismic detection equipment not controlled in paragraph c.

b. Radiation hardened TV cameras, not elsewhere specified.

c. Seismic intrusion detection systems that detect, classify and determine the bearing on the source of a detected signal.

Equipment, including tools, dies, fixtures or gauges, and other "specially designed" "parts," "components" and "accessories", "specially designed" or modified for any of the following (see list of items)

a. For the manufacture or inspection of:

a.1. Free electron "laser" magnet wigglers;

a.2. Free electron "laser" photo injectors;

b. For the adjustment, to required tolerances, of the longitudinal magnetic field of free electron "lasers".

Optical sensing fibres that are modified structurally to have a 'beat length' of less than 500 mm (high birefringence) or optical sensor materials not elsewhere described and having a zinc content of equal to or more than 6% by 'mole fraction.'

*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. 2) 'Beat length' is the distance over which two orthogonally polarized signals, initially in phase, must pass in order to achieve a 2 Pi radian(s) phase difference.

Optical materials, as follows (see list of items)

a. Low optical absorption materials, as follows:

a.1. Bulk fluoride compounds containing ingredients with a purity of 99.999% or better; *or*

Note: includes fluorides of zirconium or aluminum and variants.

a.2. Bulk fluoride glass made from compounds controlled by 6C004.e.1;

b. 'Optical fibre preforms' made from bulk fluoride compounds containing ingredients with a purity of 99.999% or better, "specially designed" for the manufacture of 'fluoride fibres'.

"Software," not elsewhere specified, "specially designed" for the "development", "production", or "use" of commodities under this group.

"Software" "specially designed" for the "development" or "production" of equipment under this group.

Other "software," as follows (see list of items)

a. Air Traffic Control (ATC) "software" application "programs" hosted on general purpose computers located at Air Traffic Control centers, and capable of automatically handing over primary radar target data (if not correlated with secondary surveillance radar (SSR) data) from the host ATC center to another ATC center.

b. "Software" "specially designed" for seismic intrusion detection systems.

c. "Source Code" "specially designed" for seismic intrusion detection systems.

"Technology" for the "development", "production" or "use" of equipment under this group.

"Technology" for the "development" or "production" of equipment, materials or "software" under this group.

Other "technology" as follows (see list of items)

a. Optical fabrication technologies for serially producing optical "parts" and "components" at a rate exceeding 10 m^2 of surface area per year on any single spindle and having all of the following:

a.1. Area exceeding 1 m^2; *and* a.2. Surface figure exceeding λ/10 (rms) at the designed wavelength;

b. "Technology" for optical filters with a bandwidth equal to or less than 10 nm, a field of view (FOV) exceeding 40° and a resolution exceeding 0.75 line pairs per milliradian;

c. "Technology" for the "development" or "production" of cameras as indicated above;

d. "Technology" "required" for the "development" or "production" of non-triaxial fluxgate "magnetometers" or non-triaxial fluxgate "magnetometer" systems, having any of the following:

d.1. 'Sensitivity' lower (better) than 0.05 nT (rms) per square root Hz at frequencies of less than 1 Hz; *or* d.2. 'Sensitivity' lower (better) than 1 x 10^{-3} nT (rms) per square root Hz at frequencies of 1 Hz or more.

e. "Technology" "required" for the "development" or "production" of infrared up-conversion devices having all of the following:

e.1. A response in the wavelength range exceeding 700 nm but not exceeding 1500 nm; and e.2. A combination of an infrared photodector, light emitting diode (OLED), and nanocrystal to convert infrared light into visible light.

Note: 'sensitivity' (or noise level) is the root mean square of the device-limited noise floor which is the lowest signal that can be measured.

Group 5

Other navigation direction finding equipment, airborne communication equipment, all aircraft inertial navigation systems, and other avionic equipment, including "parts" and "components," not elsewhere specified.

Other equipment for the test, inspection, or "production" of navigation and avionics equipment.

"Software", not elsewhere specified, for the "development", "production", or "use" of navigation, airborne communication and other avionics.

"Technology," not elsewhere specified, for the "development," "production" or "use" of navigation, airborne communication, and other avionics equipment.

Group 6

Vessels, marine systems or equipment, and "specially designed" "parts" and "components", and marine boilers and "parts," "components," "accessories," and "attachments" (see list of items)

a. Underwater vision systems, as follows:

a.1. Television systems (comprising camera, lights, monitoring and signal transmission equipment) having a limiting resolution when measured in air of more than 500 lines and "specially designed" or modified for remote operation with a submersible vehicle; *or*

a.2. Underwater television cameras having a limiting resolution when measured in air of more than 700 lines;

Note: Limiting resolution in television is a measure of horizontal resolution usually expressed in terms of the maximum number of lines per picture height discriminated on a test chart, using IEEE Standard 208/1960 or any equivalent standard.

b. Photographic still cameras "specially designed" or modified for underwater use, having a film format of 35 mm or larger, and having autofocusing or remote focusing "specially designed" for underwater use;

c. Stroboscopic light systems, "specially designed" or modified for underwater use, capable of a light output energy of more than 300 J per flash;

d. Other underwater camera equipment, not elsewhere specified;

e. Other submersible systems, not elsewhere specified;

f. Vessels, not elsewhere specified, including inflatable boats, and "specially designed" "parts" and "components", not elsewhere specified;

g. Marine engines (both inboard and outboard) and submarine engines, not elsewhere specified; and "specially designed" "parts" and "components", not elsewhere specified;

h. Other self-contained underwater breathing apparatus (scuba gear) and related equipment, not elsewhere specified;

i. inflation cartridges, compasses, masks, fins, weight belts, and dive computers;

j. Underwater lights and propulsion equipment;

k. Air compressors and filtration systems "specially designed" for filling air cylinders.

l. Marine boilers designed to have any of the following characteristics:

l.1. Heat release rate (at maximum rating) equal to or in excess of 190,000 BTU per hour per cubic foot of furnace volume; *or* l.2. Ratio of steam generated in pounds per hour (at maximum rating) to the dry weight of the boiler in pounds equal to or in excess of 0.83.

m. Major "components," "accessories," and "attachments" for marine boilers described above.

"Software" "specially designed" or modified for the "development", "production" or "use" of equipment under this group.

"Software" "specially designed" for the operation of unmanned submersible vehicles used in the oil and gas industry.

"Technology" for the "development", "production" or "use" of equipment under this group.

Group 7

Diesel engines, not elsewhere specified, and tractors and "specially designed" "parts" and "components", not elsewhere specified (see list of items)

a. Diesel engines, not elsewhere specified, for trucks, tractors, and automotive applications of continuous brake horsepower of 400 BHP (298 kW) or greater (performance based on SAE J1349 standard conditions of 100 Kpa and 25°)

b. Off highway wheel tractors of carriage capacity 9 mt (20,000 lbs) or more; and major "components" and "accessories," not elsewhere specified.

c. On-highway tractors, with single or tandem rear axles rated for 9 mt per axel (20,000 lbs.) or greater and "specially designed" major "components".

"Aircraft", not elsewhere specified, and gas turbine engines and "parts" and "components," not elsewhere specified (see list of items)

a. Military aircraft, demilitarized (not specifically equipped or modified for military operation), as follows:

a.1 Cargo aircraft bearing "C" designations and numbered C-45 through C-118 inclusive, C-121 through C-125 inclusive, and C-131, using reciprocating engines only.

a.2 Trainer aircraft bearing "T" designations and using reciprocating engines or turboprop engines with less than 600 horsepower (s.h.p.).

a.3 Utility aircraft bearing "U" designations and using reciprocating engines only.

a.4 All liaison aircraft bearing an "L" designation.

a.5 All observation aircraft bearing "O" designations and using reciprocating engines.

b. Aircraft not elsewhere specified;

c. Aero gas turbine engines, and "parts" and "components" "specially designed".

d. “Parts” and “components,” “specially designed” for “aircraft,” not elsewhere specified.

e. Pressurised aircraft breathing equipment, not elsewhere specified; *and* “parts” and “components” “specially designed”, not elsewhere specified.

Complete canopies, harnesses, and platforms and electronic release mechanisms, except such types as are in normal sporting use.

Vibration test equipment and “specially designed” “parts” and “components,” not elsewhere specified.

“Specially designed” “equipment,” tooling or fixtures for manufacturing or measuring gas turbine blades, vanes or tip shroud castings, as follows (see list of items)

a. Automated equipment using non-mechanical methods for measuring airfoil wall thickness;

b. Tooling, fixtures or measuring equipment for the “laser”, water jet or ECM/EDM hole drilling processes controlled by 9.E.3.c;

c. Ceramic core leaching equipment;

d. Ceramic core manufacturing equipment or tools;

e. Ceramic shell wax pattern preparation equipment;

f. Ceramic shell burn out or firing equipment.

“Software”, not elsewhere specified, for the “development” or “production” of equipment under this group.

“Technology”, not elsewhere specified, for the “development” or “production” or “use” of equipment under this group.

Other “technology”, as follows (see list of items)

a. Rotor blade tip clearance control systems employing active compensating casing “technology” limited to a design and development data base; *or*

b. Gas bearing for turbine engine rotor assemblies.

Other relevant information

We advise New Zealand businesses to take all reasonable precautions and exercise due diligence to comply with New Zealand sanctions laws at all times when processing transactions.