DECREE
OF THE PRESIDENT OF THE RUSSIAN FEDERATION
NO. 1194 OF AUGUST 16, 1996
ON CONTROL OVER EXPORTING FROM THE RUSSIAN FEDERATION
OF EQUIPMENT, MATERIALS AND KNOW-HOW USED FOR
CREATION OF MISSILE WEAPONRY
(with the Amendments and Additions of January 4, 1999)

This Decree shall be abolished 3 months after the day of the official publication of Decree of the President of the Russian Federation No. 1005 of August 8, 2001

Order *of the State Customs Committee of the Russian Federation No. 698 of November 19, 1996 was issued to implement the present Decision*

In accordance with Article 16 of the Federal Law on the State Regulation of Foreign Trade Activities (Code of Law of the Russian Federation, 42, Article 3923, 1995) and with the purpose of observing international obligations of the Russian Federation for non-proliferation of missile means of delivery of mass destruction weapons I hereby resolve:

1. To adopt the List of equipment, materials and know-how used for the creation of missile weaponry subject to control when exported (attached) submitted by the Government of the Russian Federation.

2. The Government of the Russian Federation shall bring its regulatory acts in conformity with the present Decree.

The corresponding amendments were introduced by Decision *of the Government of the Russian Federation No. 1100 of September 13, 1996*

3. The codes of goods nomenclature for foreign economic activities specified in the List of equipment, materials and know-how used for the creation of missile weaponry subject to control when exported may be updated when necessary by the State Customs Committee of the Russian Federation with the consent from the Federal Service of Russia for Currency and Export Control.

4. The Order of the President of the Russian Federation No. 193-rp of April 25, 1995 On the Control over Exporting from the Russian Federation of Equipment, Materials and Know-How Used for Creation of Missile Weaponry (Code of Law of the Russian Federation, No. 18, item 1645, 1995) is hereby repealed.

5. The present Decree (excluding Item 2) shall come into force in three months from the date of official publishing thereof.

President of the Russian Federation — Boris Yeltsin
Moscow, the Kremlin

List
of Equipment, Materials, and Technologies Used in Production of Missile Weapons Export of Which is Controlled
(Endorsed by the Decree of the President of the Russian Federation No. 1194 of August 16, 1996)

Item No.	Description	CC FEA Code number

Category 1

Table 1

I.1. Equipment

I.1.1. Finished missile systems (ballistic missiles, carrier and research rockets) capable of delivering a payload of at least 500 kg to the range of 300 km and more	880250000; 930690
I.1.2. Atmospheric unmanned flying vehicles (winged missiles, radio-controlled target and reconnaissance planes) capable of delivering a payload of at least 500 kg to the range of 300 km and more	880220-880250; 930690

Referring a particular commodity or technology to commodities and technologies subject to export control shall be determined as compliance of technical characteristics of this commodity or technology with the technical description given in column (Description) of the present List

I.1.3. Specially designed production facilities used to develop and produce missiles and unmanned flying vehicles indicated in Items I.1.1-I.1.2.

Definitions:

Conformably to this List:

1. "Development" includes all stages of work up to serial production, such as:

designing;
design research;
analysis of design options;
working out design concepts;
assembly and testing of prototypes (pilot samples);
patterns of experimental production;
technical documentation;
procedure of transfer of technical documentation for production;
defining design outline;
configuration layout;
modelling;

2. "Production" includes all stages of production, such as:

organization and adjustment of production process;
manufacture;

assembly;
process control;
testing;
means of quality control;

3. "Production facilities" include equipment and specially developed software united inside a building to develop a prototype or implement one or a number of production stages

4. "Production equipment" includes process tools, templates, stands,

mandrels, moulds, dies, holding devices, aligning devices, testing and measuring equipment, other machines and their parts specially designed or modified to develop or implement one or more of production stages

5. "Application" ("use") means:
operation;
start-up and adjustment works;
maintenance;
repair (including overhauls);
reconstruction;
modernization;

6. "Specially developed (specially designed)" refers to equipment and its parts, materials and technologies which, as a result of development (design works), have acquired exclusive properties isolating them for use for definite, predetermined purposes. For example, the equipment is considered as specially designed only in case it does not have other functions or uses. Similarly, production equipment shall be considered as specially designed only in case it cannot be used to make any other types of product.

7. "Fit" or **"capable"** refers to suitable, for definite use, equipment and its parts, materials, and technologies which can also be used for other purposes without changing configuration, modification, or certification. For example, any memory module certified for products of military destination may be fit for use in a guidance system

8. "Designed or modified" refers to equipment or its parts, materials and technologies which, as a result of design works or modification, have acquired definite properties making them fit for use for certain definite purposes. Designed or modified equipment or their parts, materials, or technologies may also have other applications. For example, a pump with a titanium coating possessing properties of resistance to corrosion can be used not only with a rocket fuel, but also with other liquids

I.1.4. Individual stages of missiles and unmanned flying vehicles (including boosters), fit for use in systems indicated in Items I.1.1 and I.1.2	880390; 930690
I.1.5. Nose parts (warheads) and recoverable payloads of missiles or warheads of unmanned flying vehicles fit for use in systems indicated in Items I.1.1 and I.1.2 and equipment specially designed for them with the exception of those designed for non-combat use in the presence of conditions indicated in Note 2 to the List	880390990; 930690
I.1.5.1. Fairings and disposable shields (protective covers) of nose parts (warheads) of missiles and unmanned flying vehicles of materials made on the basis of organic matrices (polyamide, polyimide, polybutylenterephthalate, polycarbonate, phenoformaldehyde)	880390990; 930690
I.1.5.2. Fairings of nose parts (warheads) of missiles and unmanned flying vehicles of materials made on the basis of	880390990; 930690

magnesium and titanium alloys	
I.1.5.3. Disposable shields (protective covers) of nose parts (warheads) of missiles and unmanned flying vehicles of heat-insulating materials made on the basis of silica and quartz fibers	880390990; 930690
I.1.5.4. Disposable shields (protective covers) of nose parts (warheads) of missiles and unmanned flying vehicles of carbon-silicon composite materials capable of operation in the temperature range of 1,900°K to 3,800°K, which contain boron, silicon, titanium, zirconium, hafnium carbides	880390990; 930690
I.1.5.5. Bodies of nose parts (warheads) of missiles, including the caps, shields (protective covers), including disposable ones, made of "carbon-carbon" composite materials	880390990; 930690
I.1.5.6. Bodies of nose parts (warheads) and bodies of missiles and unmanned flying vehicles with heat-protecting and multifunctional coatings containing polyisobutylene, fluoroplastics, boron, crystals of silicon carbide, and aluminium oxide	880390990; 930690
I.1.5.7. Bodies of nose parts (warheads) of missiles and bodies of unmanned flying vehicles with heat absorbers or their components made of light heat-resistant materials on the basis of graphites (pyrographites), siliconized graphites, and also graphites alloyed with beryllium, tungsten, niobium, molybdenum	880390990; 930690
I.1.5.8. Heat-insulation and multifunctional shields of glass fabric made of glass fiber containing up to 50% (by weight), in a mixture or separately, of any of the following heavy elements: neodymium, praseodymium, lanthanum, cerium, dysprosium, ytterbium	880390990; 930690
I.1.5.9. Bodies of nose parts (warheads), fairings of missiles and unmanned flying vehicles with radio-absorbing coatings	880390990; 930690
I.1.6. Sets of electronic equipment specially designed or modified for use in nose parts (warheads) of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2	880390100; 930690
I.1.7. Guidance systems fit for use in systems indicated in Items I.1.1 and I.1.2 capable of delivering a payload with accuracy no worse than 3.33% of the range (i.e. probable circular deflection (PCD) of 10 km or less for the range of at least 300 km) with the exception of those designed for missiles and unmanned flying vehicles with the range of up to 300 km in the presence of conditions indicated in Note 2 to the List	880390100; 930690
I.1.8. Liquid-propellant rocket engines with the total impulse of 1.1x106 N.s (100 t.s, 2.5x105 lb.s) and over fit	841210900

for use in systems indicated in Items I.1.1 and I.1.2

I.1.9. Solid-propellant rocket engines with the total impulse of 1.1x106 N.s (100 t.s, 2.5x105 lb.s) and over fit for use in systems indicated in Items I.1.1 and I.1.2 — 841210900

I.1.10. Thrust vector control systems fit for use in systems indicated in Items I.1.1 and I.1.2 with the exception of those designed for missiles and unmanned flying vehicles not included in Items I.1.1 and I.1.2 in the presence of conditions indicated in Note 2 to the List — 841290300

Note 1

1.1. Probable circular deflection (PCD) is a characteristic of accuracy and is a radius of a circle the center of which coincides with the termination point, and which includes 50% of the points of fall of the warheads

1.2. Instrumentation of the guidance system combines the process of measurement and computation of coordinates and velocity of the missile (navigation parameters) with the process of computation and issue of commands for the guidance system to correct the trajectory

1.3. Examples of thrust vector control methods covered in Item I.1.10 include use of variable-geometry nozzles, liquid or secondary gas injection into the nozzle, engine or nozzle rotation, exhaust gas deflection with gas vanes or probes, use of thrust shields (trimmers)

Decree of the President of the Russian Federation No. 7 of January 4, 1999 supplemented the Note after Item I.1.10 of the present List with the Item 1.4

Amendments are carried into effect since three months from the day of official publication of the Decree

1.4. Fluid missile engines specified under Item I.1.8 developed or modified to be used in satellites can be considered as equipment qualifying under Category II if these subsystems are exported as accompanied with an obligation concerning the said end use and in quantities corresponding to such end use and have all the below characteristics:

nozzle neck diameter of 20 mm or less;

combustion chamber pressure of 1.5 MPa (15 atmospheres) or less.

I.1.11. Charge detonator safety, cocking, demolition and combat component (armament) triggering mechanisms of the nose part (warhead) of missiles and unmanned flying vehicles fit for use in systems indicated in Items I.1.1 and I.1.2 with the exception of those designed for systems not covered in Items I.1.1, I.1.2 in the presence of conditions indicated in Note 2 to the List — 880390100; 930690

Note 2

Objects exempted under Items I.1.5, I.1.7, I.1.10, and I.1.11 may be regarded as Category II equipment if exported under conditions of guaranteed use for declared purposes, with the exported amount not permitting their use in missile weapon systems

I.1.12. Specially designed production facilities and specially designed production equipment for development and

production of missile and unmanned flying vehicle subsystems listed in Items I.1.4-I.1.11

Table 2

I.2. Technologies

Definitions:

Conformably to this List:

1. "Design and production technology (technology)" means special information necessary to develop, produce, and utilize the item. This information may have the form of "technical aid" or "technical data"

2. "Technical aid" may have such forms as:

instructions;
professional development measures;
training;
mastering of practical techniques;
consultation services

3. "Technical data" may be presented in such forms as:

drawings and their copies;
charts;
diagrams;
models;
formulas;
technical projects and specification;
guides and instructions in the form of descriptions or records on magnetic disks, tapes, and read-only memory (ROM) modules

Note 3

3.1. Permission to export (transfer, exchange) any object (material or equipment) from the given List envisages a simultaneous submission to the end user of the minimum information on the design and production process in amount necessary to install, start up, operate, and repair this object

3.2. The given definition of technology does not apply to "generally available technology" or "fundamental scientific research"

The "generally available technology", conformably to this List, means technology not eligible for any restrictions with respect to its further dissemination. (Copyright restrictions cannot affect the "generally available" status of the technology).

"Fundamental scientific research" means experimental or theoretical works carried out primarily to obtain new knowledge about fundamental principles of phenomena and observed facts, and not for achieving a particular practical objective

I.2.1. Design and production technology of finished missile systems and unmanned flying vehicles indicated in Items I.1.1 and I.1.2

I.2.2. Design and production technology of individual missile stages and unmanned flying vehicles (including boosters) fit for use in systems indicated in Items I.1.1 and I.1.2

I.2.3. Design and production technology of nose parts (warheads) or recoverable payloads of missiles and warheads of unmanned flying vehicles with equipment deployed in them, fit for use in systems indicated in Items I.1.1 and I.1.2

I.2.4. Design and production technology of electronic equipment specially designed or modified for use in nose parts (warheads) of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2

I.2.5. Design and production technology of guidance systems fit for use in systems indicated in Items I.1.1 and I.1.2 capable of delivering a payload with accuracy of no worse than 3.33% of the range

I.2.6. Design and production technology of liquid-propellant rocket engines with the total impulse of 1.1x106 N.s (100 t.s, 2.5x105 lb.s) and over fit for use in systems indicated in Items I.1.1 and I.1.2

I.2.7. Design and production technology of solid-propellant rocket engines with the total impulse of 1.1x106 N.s (100 t.s, 2.5x105 lb.s) and over fit for use in systems indicated in Items I.1.1 and I.1.2

I.2.8. Design and production technology of thrust vector control systems fit for use in systems indicated in Items I.1.1 and I.1.2

I.2.9. Design and production technology of the charge detonator safety, cocking, demolition and combat component (armament) triggering mechanisms of the nose part (warhead) of missiles and unmanned flying vehicles fit for use in systems indicated in Items I.1.1 and I.1.2

I.2.10. Design and production technology of fairings and disposable shields (protective covers) of nose parts (warheads) of missiles and unmanned flying vehicles of materials made on the basis of organic matrices (polyamide, polyimide, polybutylene terephthalate, polycarbonate, phenolformaldehyde)

I.2.11. Design and production technology of fairings of nose parts (warheads) of missiles and unmanned flying vehicles of materials made on the basis of magnesium and titanium alloys

I.2.12. Design and production technology of disposable shields (protective covers) of nose parts (warheads) of missiles and unmanned flying vehicles of heat- insulation materials made on the basis of silica and quartz fibers

I.2.13. Design and production technology of disposable shields (protective covers) of nose parts (warheads) of missiles and unmanned flying vehicles of carbo-silicon

composite materials capable of operation in the 1,900 K to 3,800 K temperature range, containing boron, silicon, titanium, zirconium, hafnium carbides

I.2.14. Design and production technology of bodies of nose parts (warheads) of missiles, including caps, of shields (protective covers), including disposable ones, made of "carbon-carbon" composite materials

I.2.15. Design and production technology of bodies of nose parts (warheads) and bodies of missiles and unmanned flying vehicles with heat-protective and multifunctional coatings containing polyisobutylene, fluoroplastics, boron, crystals of silicon carbide and aluminium oxide

I.2.16. Design and production technology of bodies of nose parts (warheads) of missiles and unmanned flying vehicles with heat absorbers or their components of light heat-resistant materials made on the basis of graphites (pyrographites), siliconized graphites, as well as graphites alloyed with beryllium, tungsten, niobium, molybdenum

I.2.17. Production technology of heat-protective and multifunctional shields of glass fabric made of glass fiber containing up to 50% (by weight), in a mixture or separately, of any of the following heavy elements: neodymium, praseodymium, lanthanum, cerium, dysprosium, ytterbium

I.2.18. Design and production technology of bodies of nose parts (warheads), fairings of missiles and unmanned flying vehicles with radio-absorbing coatings

Category II

Table 3

II.1. Materials

II.1.1. Propellants and their components used in missiles and unmanned flying vehicles

II.1.1.1. Hydrazine of over 70% concentration and its derivatives including monomethyl hydrazine	282510000
II.1.1.2. Asymmetric dimethyl hydrazine	292800000
II.1.1.3. Liquid oxidizers:	
II.1.1.3.1. Nitrous anhydride (dinitrogene trioxide)	281129300
II.1.1.3.2. Nitric dioxide/nitric tetroxide (nitrogen dioxide/dinitrogen tetroxide);	281129300
II.1.1.3.3. Nitric anhydride (dinitrogen pentoxide);	281129300

II.1.1.3.4. Inhibited red fuming nitric acid;	280800000
II.1.1.3.5. Compounds containing fluorine and one or more atoms of other halogens, oxygen, or nitrogen	2812; 2826
II.1.1.4. Oxidizers of mixed solid rocket propellants:	
II.1.1.4.1. Ammonium perchlorate;	282990100
II.1.1.4.2. Ammonium salt of dinitrase acid (ammonium dinitramide (ADN))	284290900
II.1.1.5. Perchlorates, chlorates, and chromates mixed with metallic powder or other high-energy propellant components	282919000; 282990900; 284150000
II.1.1.6. Aluminium powder of 97% purity and over (by weight) in spherical particles of 500-mcm diameter and less	760310000

Decree *of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.1.1.7 of the present List*

Amendments are carried into effect since three months from the day of official publication *of the Decree*

See text of the Item in previous wording

II.1.1.7. Zirconium, beryllium, magnesium, boron and alloys thereof	810910100;
in the form of particles having dimensions of less than 500 x 10 (-6) m (500 mcm)	811211100;
of spherical, spheroidal, scaly or granulated shape, having the contents of any of the said metals of 97 per cent and more by weight	810430000; 280450100"
II.1.1.8. Nitramines:	
II.1.1.8.1. Octogen;	293369900; 360200000
II.1.1.8.2. Hexogen;	293369100; 360200000
II.1.1.9. Polybutadiene with carboxyl terminal radicals	400220000
II.1.1.10. Polybutadiene with hydroxyl terminal radicals	400220000
II.1.1.11. Glycidazide	291090000; 292990000
II.1.1.12. Polybutadiene acrylic acid	400220000
II.1.1.13. Polybutadiene nitroacrylic acid	400259000
II.1.1.14. Catalytic and inhibiting additives to solid propellants:	

II.1.1.14.1. Bismuth triphenyl	293100900
II.1.1.15. Modifying components regulating the burning rate of mixed solid propellants:	
II.1.1.15.1. Ferrocene;	293100900
II.1.1.15.2. N-butyl-ferrocene (butacene);	293100900
II.1.1.15.3. Diethylferrocene (DAF) (catocene);	293100900
II.1.1.15.4. Octoxylylferrocene;	293100900
II.1.1.15.5. Lithium fluoride	282619000
II.1.1.16. Nitroesters and nitroplasticizers:	
II.1.1.16.1. Trinitropropane triol;	290550900
II.1.1.16.2. Trimethylolethanetrinitrate;	290550900
II.1.1.16.3. Dinitroethylene glycol;	290550900
II.1.1.16.4. 1,2,4-butane triol trinitrate;	290550900
II.1.1.16.5. Dinitrotriethylene glycol	290550900
II.1.1.17. Stabilizers of solid propellants:	
II.1.1.17.1. 2-nitrodiphenylamine;	292144000
II.1.1.17.2. N-methyl-para-nitrophenylamine	292142100
II.1.1.18. Carboranes, decarboranes, pentaboranes, and their derivatives	284990100; 285000100
II.1.1.19. Binding additives to propellants:	
II.1.1.19.1. Tris-(1-(2-methyl)-aziridinyl)-phosphor oxide;	293390900
II.1.1.19.2. Trimesol-(1-(2-ethyl)-aziridine);	293390900
II.1.1.19.3. "Tepanol" - product of reaction of tetraethylenepentamine, acrylonitrile, and glycidol;	382390980
II.1.1.19.4. "Tepan" - product of reaction of tetlenpentamine and acrylonitirile;	382390980
II.1.1.19.5. Multifunctional aziridine-amines of isophtalic, trimesic, isocyanuric, or trimethyladipic acids containing dimethyl or diethyl aziridine radicals	82390980
II.1.1.20. High-energy liquid propellants, such as boron-containing suspensions with specific efficiency of 9,500 kcal/kg (40x106 J/kg) and higher	290110100; 290219900; 294200000

II.1.1.21. Mixed (composite) propellants including those obtained through a modification of dual-basis propellants and charges fixed rigidly to the body of the rocket engine, as well as insert charges of solid rocket propellant fit for use in systems indicated in Items I.1.1 and I.1.2 — 360200000; 930690100

II.1.2. Construction materials fit for use in systems indicated in Items I.1.1 and I.1.2

II.1.2.1. Maraging steels (with increased content of nickel, low content of carbon, and replacement elements or elements causing isolation from solid solution for strengthening) with the maximum strength of 150 kg/mm2 or more at 20°C — 7219; 7220; 730441900; 730449100

Decree of the President of the Russian Federation No. 7 of January 4, 1999 supplemented the present List with Item II.1.2.1a

Amendments are carried into effect since three months from the day of official publication of the Decree

II.1.2.1a. Titanium-alloyed duplex stainless steel fit for the systems specified under Items I.1.1 and I.1.2 and having:
all the below characteristics:
weight content of chromium of 17 - 23 per cent and of nickel of 4.5 - 7 per cent and ferritic-austenitic microstructure (also known as two-phase microstructure) containing 10 per cent and more of austenite by volume;
and any of the following shapes:
ingots or billets having the dimensions of 100 mm or more or bigger in each measurement;
sheets having the width of 600 mm or more and the thickness of 3 mm or less;
pipes having the diameter of 600 mm or more and wall thickness of 3 mm or less — 7218; 7219; 730441900; 730449990"

Note 4

High-alloy steels are used in the form of sheets, plates, or tubes with the wall thickness of 5 mm or less

II.1.2.2. Tungsten and its alloys in the form of spherical or pulverized particles of 500-mcm diameter and less and 97% and more purity (by weight) — 810110000

II.1.2.3. Molybdenum and its alloys in the form of spherical or pulverized particles of 500-mcm diameter and less and 97% and more purity (by weight) — 810210000

II.1.2.4. Composite materials, stratified plates (laminates) and items of them specially designed for use in systems indicated in Items I.1.1 and I.1.2 and subsystems indicated in Items I.1.4, I.1.5, I.1.8-I.1.10, polymer-impregnated fibrous prepregs, as well as metal-coated preformed fibrous

blanks (preforms) used to make indicated materials on the basis of organic or metallic matrices using reinforcement fibers which have specific pull strength of more than 7.62x104 m and specific elastic modulus of more than 3.18x106 m:

II.1.2.4.1. Made on the basis of polyamide, polyimide, polybutylen terephthalate, polycarbonate, phenol-formaldehyde matrices;	392690100
II.1.2.4.2. On the basis of magnesium matrices;	392690100
II.1.2.4.3. On the basis of titanium matrices;	392690100
II.1.2.4.4. On fibrous basis of quartz threads (frames);	392690100; 681599100
II.1.2.4.5. On fibrous base of carbon threads (frames);	3801; 392690100; 690310000
II.1.2.4.6. On fibrous base of boron threads (frames);	280450100; 392690100
II.1.2.4.7. On fibrous base of aluminium oxide;	281820000; 392690100
II.1.2.4.8. On fibrous base of silicon carbide;	284920000; 690310000
II.1.2.4.9. On fibrous base of tungsten wire;	810192000
II.1.2.4.10. On fibrous base of molybdenum wire;	810292000
II.1.2.3.11. On fibrous base of titanium wire;	10890300; 810890700

Note 5

Export control under Item II.1.2.4 applies to polymer-impregnated fibre-based prepregs with the glass-transition temperature after treatment of more than +145°C

II.1.2.5. Composite materials in the form of intricate geometric shape items (cylinders, spheres, ellipsoids, cones, turi, and so on) designed to make bodies of solid-propellant rocket engines, nozzle blocks, and their elements from:	
II.1.2.5.1. Carbon-filled plastics;	3801; 392690100
II.1.2.5.2. Fiber-glass plastic;	701910; 701920

II.1.2.5.3. Organic plastics	392690100
II.1.2.6. Composite materials of the "carbon-carbon" type designed for missile systems including:	3801
II.1.2.6.1. Carbon-carbon materials with spatial reinforcement structure (more than 2 reinforcement dimensions) or fibrous reinforced graphite;	
II.1.2.6.2. Carbon-carbon materials for thin-wall structural elements obtained by winding and lining	
II.1.2.7. Fine-textured graphite recrystallized in large amounts (with volumetric density of at least 1.72 g/cm3 measured at +15°C and particle size of 100 mcm and less)	
II.1.2.8. Ceramics composite materials with permittivity of less than 6 at 100 Hz to 10 GHz designed for use in radio transparent fairings (inserts) of antennas of missiles and unmanned flying vehicles	280450100; 284920000; 285000300
II.1.2.9. Heat- and erosion-resistant radio transparent materials and coatings including those made on the basis of mineral glass-fiber plastics of MSP-K type, which ensure radio transparent fairing (insert) resistance to heat up to 1x103 kcal/m2.s with exposure up to 1 s combined with excessive pressure impulse of more than 0.5 kg/cm2	7019
II.1.2.10. Glass fabrics and glass fiber containing up to 50% (by weight), in a mixture or separately, of any of the following heavy elements: neodymium, praseodymium, lanthanum, cerium, dysprosium, ytterbium	7019
II.1.2.11. Three-dimensional intermediate products made on the basis of unfired ceramics reinforced with silicon carbide and fit for mechanical treatment and use in warhead caps	880390990; 930690
II.1.3. Materials designed to reduce legibility and reflected irradiation energy in the radio-, ultraviolet-, infrared-, or sound-frequency ranges fit for use in systems indicated in Category I, including:	
II.1.3.1. Heat-resistant radio-absorbing materials of the gradient and/or interference type including those made on the basis of organic silicon binders and special fillers (metal powders, soot, ferrites, ferrous carbonyl) which preserve magnetic and dielectric properties at +350°C or higher and have a wave reflection factor of 10% to 30%;	391000000
II.1.3.2. Coatings including dyes made on the basis of organosilicon binders specially designed to reduce or limit rigidly reflection or emission in the microwave (0.1-10 mm), as well as infrared (0.7-100 mcm) or ultraviolet (from 10-2 to 0.35 mcm) frequency range with the exception of coatings used specially for temperature control systems in artificial	81519000; 391000000

earth satellites (AES)

II.2. Equipment

II.2.1. Finished missile systems (ballistic missile systems, carrier and research rockets) not covered in Item I.1.1 capable of delivering a payload to the range of 300 km and more	880250000; 930690
II.2.2. Atmospheric unmanned flying vehicles (including winged missiles, radio-controlled target and reconnaissance planes) not covered in Item I.1.2 capable of delivering a payload to the range of 300 km and more	880220-880250000; 930690
II.2.3. Individual stages of missiles and unmanned flying vehicles (including boosters) used in systems indicated in Items II.2.1 and II.2.2 not included in Item I.1.4	880390; 930690
II.2.4. Inter-stage sections and stage connecting and disconnecting mechanisms of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2	880390990; 930690
II.2.5. Specially designed production facilities and specially designed production equipment for development and production of individual stages, inter-stage sections, and stage connecting and disconnecting mechanisms indicated in Items II.2.2 and II.2.4	
II.2.6. Engines and their parts fit for use in missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2, as well as specially designed for them production facilities and production equipment	
II.2.6.1. Solid- and liquid-propellant rocket engines with the total (overall) impulse of 8.41x105 N.s (76.4 t.s, 1.91x105 lb.s) or more, however, no less than 1.1x106 N.s (100 t.s, 2.5x105 lb.s);	841210
II.2.6.2. Light turbojet and turbofan engines including twin- spool engines fit for use in systems indicated in Item I.1.2	
II.2.6.2.1. Engines with the maximum thrust of more than 1,000 N (except for engines with the maximum thrust of more than 8,890 N designed for civilian use according to technical specification) and with specific propellant consumption of 0.13 kg/N/h or less (at sea-level under static and standard conditions);	841111900
II.2.6.2.2. Engines specially designed or modified for systems indicated in Item I.1.2 regardless of thrust or specific propellant consumption parameter values	841111900

Note 6

Engines indicated in Item II.2.6.2 may be exported as a part of the piloted flying vehicle or in amounts necessary to replace engine units of piloted flying vehicles

II.2.6.3. Ramjet engines, including supersonic-burning ramjet engines, pulsejet engines, variable-cycle engines, including burning control devices and parts specially designed for them — 841210900

II.2.6.4. Bodies of solid-propellant rocket engines and nozzles for them — 930690

II.2.6.5. Internal lining — 841290300; 880390990

Note 7

Internal lining is designed to fill the space between the elements of the solid-propellant engine and its body or heat-insulation coating and is usually a liquid polymer made on the basis of a dispersion of fireproof or insulation materials, for example, carbon with a filler of polybutadiene with hydroxyl terminal radicals, or of another polymer with additional, dosed vulcanizing agents, which are sprayed or swept over the inside surface of the body

II.2.6.6. Insulation of solid-propellant rocket engines — 841290300; 880390990

Note 8

Insulation is used as an element of rocket engine, i.e. its body, nozzle inlet, diaphragms, including vulcanized or semi-vulcanized rubber support elements containing heat-insulation or fireproof materials. It may be consolidated with shoes or shields to relieve tension

II.2.6.7. Propellant consumption control systems for liquid and gel propellants (including oxidizer) designed or modified for operation in the presence of overloads exceeding 10 g (root-mean-square value) in the frequency range of 20 to 2,000 Hz — 902610910; 902690900; 903281900

II.2.6.8. Parts specially designed for systems indicated in Item II.2.6.7:

II.2.6.8.1. Servovalves designed for consumption values of 24 l/min and more at absolute pressure of 7 MPA (70 atm) or more with the rate of response of the power drive no worse than 100 mcs; — 848110900; 902690900; 903281900

II.2.6.8.2. Pumps for liquid components of the propellant with the shaft revolution rate equal or exceeding 8,000 rpm or with outlet pressure no less than 7 MPa (70 atm) — 841319

Note 9

Systems or their parts indicated in Items II.2.6.7 and II.2.6.8 may be exported as a part of the AES's or in amounts necessary to replace AES blocks

II.2.6.9. Hybrid rocket engines and their specially designed parts — 841210900; 841290300

Definition:

A hybrid rocket engine is an engine operating on a propellant one of components of which is in a solid, and the other, in a liquid state

II.2.6.10. Specially designed production facilities and production equipment used to make engines and their parts indicated in Items II.2.6.1-II.2.6.9

II.2.6.11. Numerical-control roll and bending machine-tools or machine tools of the mentioned type which, according to maker specification, can be outfitted with blocks of numerical or computer control providing such control over more than two axes simultaneously — 846390100; 846390900

Note 10

Machine-tools which use mixed methods of rolling shall also be regarded as rolling machine-tools

Note 11

Item II.2.6.11 does not include machine-tools not fit for making engines and their parts (for example, engine bodies) for systems indicated in Items I.1.1 and I.1.2

II.2.6.12. Numeric control units for rolling and bending machine-tools permitting simultaneous control in more than two interpolation axes of coordinates while moving over a contour — 853710100; 853710990

II.2.7. Equipment for production, servicing, and acceptance testing of solid and liquid propellants and their components:

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.2.7.1 of the present List
Amendments are carried into effect since three months from the day of official publication of the Decree
See text of the Item in previous wording

II.2.7.1. Dosing and continuous mixers with systems permitting mixing in vacuum in the 0 to 13.326 kPa (0.13 atm) pressure range and temperature control in the mixing chamber: — 847982000

II.2.7.1.1 dosing blenders of the total volume of 110 l or more having at least one steering drive located off the

blender's center;

II.2.7.1.2 continuous-operation blenders with two or more steering drives, providing access to the blending chamber;

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.2.7.2 of the present List
Amendments are carried into effect since three months from the day of official publication of the Decree
See text of the Item in previous wording

II.2.7.2. Equipment intended for manufacturing metal powder of spherical or spheroidal shape in controlled media specified under Items II.1.1.6 or II.1.1.7:

II.2.7.2.1. plasma generator (high-frequency arc) used for producing dispersed or spherical metal powder with the organization of the process in argon-hydrogen medium electrical explosion plants used; 845630900

II.2.7.2.2. to produce dispersed or spherical metal powders with the organization of the process in argon-hydrogen media; 845630900

II.2.7.2.3. plants used to produce spherical aluminum powders by dispersing melt in inert medium (for instance nitrogen) 842489800"

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.2.7.3 of the present List
Amendments are carried into effect since three months from the day of official publication of the Decree
See text of the Item in previous wording

II.2.7.3. Mills with circulating energy carrier intended to crush or grind the components specified under Items II.1.1.4.1 - II.1.1.19.5 847982000"

II.2.7.4. Equipment for non-destructive monitoring of solidity and quality of continuity of solid propellants and charges of them indicated in Item II.1.1.21; 02219000; 902229000

II.2.7.5. Continuous-operation chemical reaction vessels (autoclaves, columns for high-temperature catalytic decomposition, oxidation or reduction, hydration, enrichment by distillation) for obtaining hydrazine, asymmetric dimethyl hydrazine, pentaborane, nitrous anhydride, nitric tetroxide, nitric anhydride, inhibited red fuming nitric acid, compounds containing fluorine and one or more atoms of other halogens, oxygen or nitrogen, as well as for obtaining high-energy propellants, including boron- containing ones, with specific efficiency of 9,500 kcal/kg (40x106 J/kg) or more; 847989800

II.2.7.6. Stationary storage reservoirs of cylindrical or 730900300;

spherical form made as a single-piece or plated with high-alloy steel with increased content of nickel and low content of carbon or with aluminium, with the volume of more than 3 m3, outfitted with locking devices, thermostatic control system, trays, and special means to neutralize vapors of chemically active or toxic liquid components of rocket propellants;	761100000
II.2.7.7. Transportable reservoirs of cylindrical form made as a single-piece or plated with high-alloy steel with increased content of nickel and low level of carbon or with aluminium, with the volume of more than 2 m3, outfitted with locking devices, thermostatic control system, and special means to neutralize vapors of chemically active or toxic liquid components of rocket propellants;	860900900; 871631000
II.2.7.8. Stationary and mobile fuelling systems of displacement or pumping type outfitted with dosing system, fine-purification filters (20 mcm) designed to operate with chemically active and toxic liquid or gaseous substances, with output capacity of at least 2 m3/min;	847989900; 870590900; 871631000
II.2.7.9. Mobile (motorized) systems for collection, neutralization, and burning of liquid and gaseous chemically active and toxic compounds of rocket propellant, with efficient capacity of at least 2 m3/min	870590900
II.2.8. Equipment and auxiliaries for making composite structures fit for use in structural elements of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2	
II.2.8.1. Thread winding machines permitting fiber feeding, spinning, and winding to be programmed and coordinated in three or more axes, fit for making composite structures or laminated plastics from fiber and fibrous materials	844630000
II.2.8.2. Numerical control units for thread winding machines indicated in Item II.2.8.1	853710100; 853710990
II.2.8.3. Tape winding machines permitting tape and layer feeding and winding control to be programmed and coordinated in two or more axes, fit for making structural elements of missiles and flying vehicles made from composite materials	844630000
II.2.8.4. Numerical control units for tape winding machines indicated in Item II.2.8.3	853710100; 853710990
II.2.8.5. Multi-directional, multi-axes winding or tape laying machines permitting to obtain a volumetric, multidimensional fabric, including adapters and interchangeable headpieces for weaving, interlacing, intertwining or lacing of fibers, fit for making composite structures with the exception of textile machines not outfitted (not modified) for above mentioned finite use	844621000; 844790000

II.2.8.6. Equipment designed or modified for modification of polymer fibers (such as polyacrylonitrile, artificial silk, polycarbosilane) including special devices for fibre stretching	845610000; 845690000; 851580900
II.2.8.7. Equipment designed or modified for settling vapors of chemical elements or their compounds on heated fiber structures	841780900
II.2.8.8. Equipment designed or modified for making fireproof ceramics by wet winding	844590000; 845180900
II.2.8.9. Equipment specially designed or modified for special treatment of fiber surfaces or for making pre-impregnated materials (prepregs) and preformed blanks (preforms)	845180900; 847759100; 847759900

Note 12

When considering export opportunities for objects indicated in Items II.2.8.1, II.2.8.3, II.2.8.5-II.2.8.9, it should be taken into account that export control also applies to devices for stretching, coating application, cutting, punching out

II.2.8.10. Numeric control units designed for programmed control of fiber modification regimes or roasting fireproof ceramics, including temporal metering of quality and quantity of processing agents, as well as temperature, pressure, and content monitoring of the chamber inner environment	853710000; 853710990
II.2.8.11. Specially designed nozzles for pyrolytic application of coatings by feeding gaseous agents which decompose at temperatures from +1,300°C to +2,900°C and pressure range from 1 to 150 mmHg	842420100
II.2.8.12. Numeric control units designed for packing and pyrolysis control of the nozzles of rocket engines or warhead caps made of composite materials	853710100; 853710900
II.2.8.13. Isostatic presses with the inner diameter of the chamber working space of 254 mm (10 inches) and more, capable of developing a maximum working pressure of 700 atm or more and obtaining and maintaining a controlled temperature level of +600°C and higher	846299
II.2.8.14. Furnaces for settling vapors of chemical elements designed or modified for packing composite carbon- carbon materials	841780900

Note 13

When considering export opportunities for objects indicated in Items II.2.8.1-II.2.8.14, it should be taken into account that export control

applies also to mandrels, press-forms, devices for stretching, coating application, cutting, punching out, tools and auxiliaries for pressing, thermal treatment, casting, hardening or connecting of tapes, composite structures and materials produced from them

II.2.9. Instrumentation and systems of flight, navigation, and orientation control, production and testing equipment and specially designed parts for them

II.2.9.1. On-board equipment integrated in flight-control systems including gyrostabilizing or autopilot devices designed or modified for use in missiles or unmanned flying vehicles indicated in Items I.1.1 and I.1.2 — 901420900

Note 14

On-board flight-control equipment - as a general case - shall include, besides gyrostabilizer (autopilot), on-board digital computational complex, commutational amplification and conversion equipment, electrical power supply system, on-board cable network, outer measuring devices (astrovision devices, radio-correction equipment, radio altimeters, radar coordinators)

II.2.9.2. Inertia or other equipment using accelerometers indicated in Items II.2.9.5 or II.2.9.6, or gyroscopic devices indicated in Items II.2.9.7 or II.2.9.8 — 901420900

II.2.9.3. Gyroastrocompasses and other instruments used to determine location or orientation of the flying vehicle (missile) by automatic tracking of celestial bodies — 901480000

Note 15

Gyroastrocompasses include a gyroplatform with astrosensors, telescopes, and computational equipment located on it

II.2.9.4. On-board satellite navigation equipment for determining the current location or orientation by automatic AES tracking designed or modified for use in systems indicated in Items I.1.1 and I.1.2 — 901480000

Note 16

Satellite navigation equipment includes a decimetric wavelength radio range receiver, airial feeder device, computer, power source, commutational and conversion equipment

II.2.9.5. Accelerometers of various type with the sensitivity of 0.05 g and less or a linear error of not more than 0.25% of the full measuring scale of the output signal, designed for use in inertia navigation systems or guidance systems of any type — 901480900

Note 17

Accelerometers (sensors) specially designed and intended for well drilling do not fall in the scope of Item II.2.9.5

II.2.9.6. Accelerometers of any type capable of operation at acceleration values of over 100 g 903289

II.2.9.7. Gyroscopes of any type capable of operation at acceleration values of over 100 g 903289

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.2.9.8 of the present List
Amendments are carried into effect since three months from the day of official publication of the Decree
See text of the Item in previous wording

II.2.9.8. All types of gyros fit for use in the systems specified under Items I.1.1 and I.1.2, with rated drift rate stability of less than 0.5 of angle degree per hour (1 sigma) at normal gravity 930690. 903289; 880390990; 930690"

Notes 18

Drift speed is defined as referring to difference in deviations of actually observed from required values. It includes a stochastic and a systematic component and is expressed as an angular displacement equivalent of the gyroscope axis per unit of time against inertial space

Note 19

Stability is defined as a standard deviation (1 sigma) of a variation of a particular parameter from its calibrated value measured under constant temperature conditions. Stability may be expressed as a function of time

Note 20

Equipment indicated in Items II.2.9.1-II.2.9.8 may be exported as an integral part, or in amounts necessary to replace units of piloted flying vehicles, AES's, ground vehicles or seagoing vessels

II.2.9.9. Specially designed production and control instruments for navigation and flight control equipment and systems indicated in Items II.2.9.1-II.2.9.8, including:

II.2.9.9.1. Equipment for production and control of ring-laser gyroscopes or mirror characteristics control with the maximum level of accuracy being the one shown in parenthesis or higher, including: 903180

II.2.9.9.1.1. Linear scatter meter (10 ppm);

II.2.9.9.1.2. Reflectometer (50 ppm);

II.2.9.9.1.3. Profilometer (5 П)

II.2.9.9.2. Equipment for production and control of inertia systems or equipment making part of them, including:

II.2.9.9.2.1. Control and testing equipment for checking operation of inertia measuring unit; 903180

II.2.9.9.2.2. Control and testing equipment for checking operation of gyrostabilized platform; 903180

II.2.9.9.2.3. Servicing stand for stabilizing element of inertia measuring unit; 903120000

II.2.9.9.2.4. Balancing stand for gyrostabilized platform of inertia measuring unit; 903110000

II.2.9.9.2.5. Installation for gyroscope checking and fine-tuning; 903120000

II.2.9.9.2.6. Installation for gyroscope dynamic balancing; 903110000

II.2.9.9.2.7. Installation for checking gyroscope motor; 903180

II.2.9.9.2.8. Installation for filling and pumping-out of the gyroscope working agent; 841381900

II.2.9.9.2.9. Centrifugal stand for checking gyroscope supports; 903120000

II.2.9.9.2.10. Accelerometer axis adjustment station; 903120000

II.2.9.9.2.11. Installation for checking accelerometer 903120000

Decree of the President of the Russian Federation No. 7 of January 4, 1999 supplemented the present List with Items II.2.9.9.3 - II.2.9.9.7 and Notes 20a

Amendments are carried into effect since three months from the day of official publication of the Decree

II.2.9.9.3. balancing machines having all the below characteristics: 903110000
unfit for balancing rotors/gyros with the weight of above 3 kg;
fit for balancing rotors/gyros at speeds of above 12,500 rpm;
capable of correcting unbalance on two planes and more;
capable of balancing to the level of residual unbalance of 0.2 g mm per kilogram of the weight of the rotor;

II.2.9.9.4. indicator heads (also known as balancing instrument equipment) elaborated or modified for use with the machines specified under Item II.2.9.9.3; 903190900

II.2.9.9.5. dynamic rotating plates (equipment capable of simulating motion) having two or more axes; contact rings capable of transmitting electricity and/or data signals; and 903120000

having any of the below characteristics:
the worst rotation stability equal or better (less) than plus or minus 0.05 degrees per revolution averaged at an interval of 10 degrees or more;
the positioning precision equal or better than 5 angle seconds;
for any discrete axis: revolution speed of 400 degrees per second or more or 30 degrees per second and less; revolution speed resolution equal or less than 6 degrees per second, with precision equal or less than 0.6 degrees per second;

II.2.9.9.6. positioning plates (equipment capable of precision rotation positioning in any axes) having two or more axes and positioning precision equal or better than 5 angle seconds; 903120000

II.2.9.9.7. centrifuges capable of acceleration of over 100 g and featuring a slide ring capable of transmitting electricity and data signals 903120000

Note 20a.

1. Under Item II.2.9.9.3 no control extends to the balancing machines elaborated or modified for dental and other medical purposes.
2. Under Item II.2.9.9.5 and II.2.9.9.6 no control extends to rotating (swivel) plates elaborated or modified for machine tool equipment or for medical purposes.
3. Under Item II.2.9.9.5 no control extends to speed plates and the compliance of the positioning plates' characteristics is assessed as per Item II.2.9.9.6.

II.2.10. Flight stabilization systems designed or modified for use in missiles or unmanned flying vehicles indicated in Items I.1.1 and I.1.2 and equipment specially designed for their checking, calibration, and adjustment, including:

II.2.10.1. Drives of flight stabilization systems indicated in Item II.2.10, including:

II.2.10.1.1. Hydraulic drives; 903281900

II.2.10.1.2. Mechanical drives; 903289

II.2.10.1.3. Electrooptical drives; 903289

II.2.10.1.4. Electromechanical drives 903289

II.2.10.2. Equipment for position control of missiles and unmanned flying vehicles in space, including: 903289

II.2.10.2.1. Gyrostabilizers or autopilots; 903289

II.2.10.2.2. Steering machines; 903289

II.2.10.2.3. Analogue-digital computational devices (on-board computational complex) 847110900

Note 21

Equipment indicated in Item II.2.10 may be exported as an integral part or in amounts necessary to replace units of piloted flying vehicles or AES's

II.2.10.3. Specially designed equipment for testing, calibration, and adjustment of flight stabilization systems indicated in Items II.2.10.1-II.2.10.2 903110000; 903120000; 903180

II.2.11. On-board radioelectronic equipment and its parts designed or modified for use in systems indicated in Items I.1.1 and I.1.2

II.2.11.1. Radar stations including radar altimeters and Doppler navigation radars 852610900

II.2.11.2. Laser radar systems including altimeters 852610900; 901320000

Note 22

Export control shall apply to laser radar systems capable of signal emission, scanning, signal reception and processing for distance and direction determination, as well as of target selection by location, velocity radial component, and reflection parameters

II.2.11.3. Radiometers of centimeter, millimeter radiowavelength or optical range capable of reproducing the image of the Earth surface 852610900

II.2.11.4. Passive sensors for direction (bearing) determination from sources of electromagnetic radiation or terrain characteristics 901420900

II.2.11.5. Passive interferometers 852610900

II.2.11.6. Active and passive image reproduction sensors 852610900

II.2.11.7. Devices designed to reduce legibility and reflected irradiation energy in the radio-, ultraviolet-, infrared-, or sound-frequency ranges fit for use in systems indicated in Category I 880390990; 930690

II.2.11.8. Terrain mapping equipment including analogue and digital correlators 52610900

II.2.11.9. Receivers of signals of satellite navigation systems: 852691900; 901420190

II.2.11.9.1. Capable of providing navigational information at speeds over 515 m/s (1,060 nautical miles per hour) at

heights of more than 18 km (60,000 ft);

II.2.11.9.2. Designed or modified for use in systems indicated in Item I.1.2

Note 23

Equipment indicated in Items II.2.11.1-II.2.11.9 may be exported as an integral part or in amounts necessary to replace units of piloted flying vehicles or AES's

II.2.11.10. Electronic devices and their parts specially designed for military use and operation at temperatures of more than +125°C, including:

II.2.11.10.1. Radiofuses; 360300900

II.2.11.10.2. Avalanche transit time diodes or Gunn diodes 854110990

II.2.11.11. Analogue and digital computers or digital differential analyzers capable of prolonged operation at temperatures below -45°C and above +55°C or possessing an increased radiation resistance 47110; 847120

Notes 24

Increased radiation resistance of the element base or equipment means inherent in the design or revealed in testing ability to withstand radiation exposure of the total level of 5x105 rad and higher (Si)

Note 25

Equipment indicated in Item II.2.11.11 may be exported as an integral part or in amounts necessary to replace units of piloted flying vehicles or AES's

II.2.11.12. Analogue-to-digital converters developed or modified to military requirements which have:

Decree *of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Items II.2.11.12.1 and II.2.11.12.2 of the present List*
Amendments are carried into effect since three months from the day of official publication *of the Decree*
See text of the Items in previous wording

II.2.11.12.1. sealed high radiation-proof microchips for analog-digital conversion with a resolution of 8 bit or more quantization corresponding to 8 bit or more for binary system coding operable at temperatures below minus 54 degrees C and above plus 125 degrees C 854230650; 854230950; 854240900

II.2.11.12.2. printed plate or module electrical components for input analog-digital conversion with a resolution of 8 bit or more quantization corresponding to 8 854250000; 854389900"

bits or more for binary system coding, operable at temperatures below minus 54 degrees C and above plus 125 degrees C and including integral microchips with the characteristics specified under Item II.2.11.12.1.	
II.2.11.13. Specially designed integrated circuits with increased radiation resistance	854211; 854219
II.2.11.14. Radio transparent fairings (inserts) capable of withstanding a thermal shock of more than 1x103 kcal/m2 with exposure time not more than 1 s combined with excessive pressure impulse of more than 0.5 kg/cm2	880390990
II.2.12. Equipment for compiling terrain prototype maps	852610900
II.2.13. Launch testing equipment and means used in the operation of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2	
II.2.13.1. Control and testing equipment and instruments designed or modified for servicing, action control, pre-start checking and launching of missiles and unmanned flying vehicles	903180990
II.2.13.2. Radio receivers of combat control systems operating in the ultra-short-, short-, medium-, and long-wave ranges with the impulse power level of at least 10 kW and probability of failure-free operation of more than 0.9	852510900
II.2.13.3. Sets of instruments (radio direction finders, gravimeters, gyrocompasses) of initial azimuthal orientation including satellite navigation equipment with angular error of 1° and less	901410900; 901420900
II.2.13.4. Tracking systems using encoded signal translators installed in missiles or unmanned flying vehicles working in combination with ground or airborne reference tie systems or space navigation systems permitting real-time measuring of current coordinates and velocity	903290
II.2.13.5. Range determination stations integrated into optical or infrared surveillance systems with the angular resolution better than 3 mrad, operating range of 30 km and more, with linear resolution better than 10 m (root-mean-square value) and velocity resolution better than 3 m/s	852610
II.2.13.6. Specially designed radar stations for measuring effective scattering surfaces	852610
II.2.13.7. Military vehicles designed or modified to transport, prepare, service, control, and launch missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2	870590900
II.2.13.8. Transportation and launching containers	870590900

Definition

A transportation and launching container is a unit including a closed shell, mostly of cylindrical shape, mechanisms for suspending a missile or unmanned flying vehicle inside the container, and, in some cases, control and testing equipment, aiming instruments, as well as hydraulic, gas, and electric line connectors

II.2.13.9. Gravimeters, gravimetric gradient meters (gradientometers) and their special parts developed or modified for airborne or seaborne application with accuracy equal to 0.7 mGal (7x10-6 m/s2) and higher and providing a stable measuring regime within no more than 2 min	903290
II.2.13.10. Telemetering and remote control equipment fit for use in systems indicated in Items I.1.1 and I.1.2	852510900; 854380900; 903040900
II.2.14. Testing devices and equipment for missiles and unmanned flying vehicles and their main subsystems	
II.2.14.1. Vibration tables using feedback or closed-circuit methods including a digital controller, capable of producing vibration loads of 10 g (root-mean-square value) and more at frequencies of 20 to 2,000 Hz and with push force of 50 kN (5 t) and more, measured under "clean table" conditions, and parts for them:	903120000
II.2.14.1.1. Digital controllers with the frequency band more than 5 kHz designed for use in vibration tables indicated in Item II.2.14.1, working in combination with specially developed software;	853710000; 853710990
II.2.14.1.2. Vibration pushers (vibrators) with respective boosters or without them capable of applying a force of 50 kN (5 t) and more, measured under "clean table" conditions, and fit for use in vibration tables indicated in Item II.2.14.1;	903190900
II.2.14.1.3. Individual auxiliary and electronic units forming, altogether, a finished vibration table capable of producing a force of 50 kN (5 t) and more, measured under "clean table" conditions, and fit for use in vibration tables indicated in Item II.2.14.1	903190900
II.2.14.2. Wind tunnels with flow velocity of 0.9 M and more	903120000
II.2.14.3. Testing berths (stands) fit for servicing solid- or liquid-propellant missiles or their engines with the thrust of over 90 kN (9 t) or for simultaneous three-axis measuring of thrust vector components	903120000
II.2.14.4. Climate or echo-free chambers capable of imitating the following external flight conditions:	903120000

II.2.14.4.1. Altitude of 15 km and more and vibration loads of 10 g (root-mean-square value) or more with the frequency of 20 to 2,000 Hz and push force of 5 kN (0,5 t) and more;

II.2.14.4.2. Altitude of 15 km and more and acoustic environment with the level of sound pressure of 140 db and higher (corresponding to sound pressure of 2x10-5 N/m2) or with output power of 4 kW and more for echo-free chambers;

II.2.14.4.3. Temperature of -50°C to +125°C and vibration loads of 10 g (root-mean-square value) or more with the frequency of 20 to 2,000 Hz and push force of 5 kN (0.5 t) or more;

II.2.14.4.4. Temperature of -50°C to +125°C and acoustic environment with the level of sound pressure of 140 db and higher (which corresponds to sound pressure of 2x10-5 N/m2) or with output power of 4 kW and more for echo-free chambers

II.2.14.5. Accelerators capable of generating electromagnetic radiation of 2 Mev and more produced by braking radiation of accelerated electrons and systems containing such accelerators — 854380

Note 26

Equipment indicated in Item II.2.14.5 shall not include equipment specially designed for medical purposes

II.2.14.6. Sensors (detectors) fit for use in systems indicated in Items I.1.1 and I.1.2 to protect on-board equipment from destructive factors of a nuclear explosion — 903010900

Definition

A sensor (detector) is defined as a mechanical, electric, optical or chemical device which can automatically identify and record or register an electric or electromagnetic signal, radioactive emission, or changes in such parameters as pressure or temperature

Table 4

II.3. Technologies

II.3.1. Design and production technology of finished missile systems (ballistic missile systems, carrier and research rockets) not covered in Item I.1.1 capable of delivering a payload to the range of 300 km and more

II.3.2. Design and production technology of atmospheric unmanned flying vehicles (including winged missiles, radio-controlled target and reconnaissance planes) not covered in Item I.1.2 capable of delivering a payload to the range of 300 km and more

II.3.3. Design and production technology of individual stages of missiles and unmanned flying vehicles (including boosters) used in systems indicated in Items I.1.1 and I.1.2 not covered in Item I.1.4

II.3.4. Design and production technology of inter-stage sections and stage connecting and disconnecting mechanisms of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2

II.3.5. Design and production technology of engines and their parts fit for use in missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2

II.3.5.1. Design and production technology of solid- and liquid-propellant rocket engines with the total (overall) impulse of 8.41x105 N.s (76.4 t.s, 1.91x105 lb.s) or more, however, no less than 1.1x106 N.s (100 t.s, 2.5x105 lb.s)

II.3.5.2. Design and production technology of light turbojet and turbofan engines including twin-spool engines fit for use in systems indicated in Item I.1.2:

II.3.5.2.1. Which have maximum thrust of more than 1,000 N (except for engines with the maximum thrust of more than 8.890 N designed for civilian use according to technical specification) and with specific propellant consumption of 0.13 kg/N/h or less (at sea-level under static and standard conditions);

II.3.5.2.2. Specially designed or modified for systems indicated in Item I.1.2 regardless of thrust or specific propellant consumption parameter values

II.3.5.3. Design and production technology of ramjet engines, including supersonic-burning ramjet engines, pulsejet engines, variable-cycle engines, including burning control devices and parts specially designed for them

II.3.5.4. Design and production technology of bodies of solid- propellant rocket engines and nozzles for them

II.3.5.5. Design and production technology of internal lining indicated in Item II.2.6.5

II.3.5.6. Design and production technology of insulation for solid-propellant rocket engines indicated in Item II.2.6.6

II.3.5.7. Design and production technology of propellant consumption control systems for liquid and gel propellants (including oxidizer) designed or modified for operation in the presence of overloads exceeding 10 g (root-mean-square value) in the frequency range of 20 to 2,000 Hz

II.3.5.8. Design and production technology of parts specially designed for systems indicated in Item II.2.6.7:

II.3.5.8.1. Servovalves designed for consumption values of 24 l/min and more at absolute pressure of 7 MPA (70 atm) or more with the rate of response of the power drive no worse than 100 mcs;

II.3.5.8.2. Pumps for liquid components of propellant with the shaft revolution rate equal or exceeding 8,000 rpm or with outlet pressure no less than 7 MPa (70 atm)

II.3.5.9. Design and production technology of hybrid rocket engines and their specially designed parts

II.3.5.10. Design and production technology of numerical-control roll and bending machine-tools or machine tools of the mentioned type which, according to maker specification, can be outfitted with blocks of numeric or computer control providing such control over more than two axes simultaneously, indicated in Item II.2.6.11

II.3.5.11. Software of numeric control units for rolling and bending machine-tools permitting simultaneous control in more than two interpolation axes of coordinates while moving over a contour

II.3.6. Production technology of propellants and their components:

II.3.6.1. Production technology of hydrazine of over 70% concentration and its derivatives

II.3.6.2. Production technology of asymmetric dimethyl hydrazine and monomethyl hydrazine

II.3.6.3. Production technology of liquid oxidizers:

II.3.6.3.1. Nitrous anhydride (dinitrogene trioxide);

II.3.6.3.2. Nitric dioxide/nitric tetroxide (nitrogen dioxide/dinitrogen tetroxide);

II.3.6.3.3. Nitric anhydride (dinitrogen pentoxide);

II.3.6.3.4. Inhibited red fuming nitric acid;

II.3.6.3.5. Compounds containing fluorine and one or more atoms of other halogens, oxygen, or nitrogen

II.3.6.4. Design and production technology of continuous operation chemical reaction vessels (columns for high-temperature catalytic decomposition, oxidation or reduction, hydration, enrichment by distillation) for obtaining hydrazine, asymmetric dimethyl hydrazine, pentaborane,

nitrous anhydride, nitric tetroxide, nitric anhydride, inhibited red fuming nitric acid, compounds containing fluorine and one or more atoms of other halogens, oxygen or nitrogen, as well as for obtaining high-energy propellants, such as boron-containing suspensions, with specific efficiency of 9,500 kcal/kg (40x106 J/kg) or more;

II.3.6.5. Design and production technology of stationary storage reservoirs of cylindrical or spherical form made as a single-piece or plated with high-alloy steel with increased content of nickel and low content of carbon or with aluminium, with the volume of more than 3 m3, outfitted with locking devices, thermostatic control system, trays, and special means to neutralize vapors of chemically active or toxic liquid components of rocket propellants;

II.3.6.6. Design and production technology of transportable reservoirs of cylindrical form made as a single-piece or plated with high-alloy steel with increased content of nickel and low level of carbon or with aluminium, with the volume of more than 2 m3, outfitted with locking devices, thermostatic control system, and special means to neutralize vapors of chemically active or toxic liquid components of rocket propellants;

II.3.6.7. Design and production technology of mobile (motorized) systems for collection, neutralization, and burning of liquid and gaseous chemically active and toxic components of rocket propellants, with effective capacity of at least 2 m3/min

II.3.6.8. Production technology of oxidizers of mixed solid rocket propellants:

II.3.6.8.1. Production technology of ammonium perchlorate;

II.3.6.8.2. Ammonium salt of dinitrase acid (ammonium dinitramide ADN))

II.3.6.9. Production technology of perchlorates, chlorates, and chromates mixed with metallic powder or other high-energy propellant components

II.3.6.10. Production technology of aluminium powder of 97% purity and over (by weight) in spherical particles of 500-mcm diameter and less

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.3.6.11 of the present List

Amendments are carried into effect since three months from the day of official publication of the Decree

See text of the Item in previous wording

II.3.6.11. The design and manufacturing know-how of equipment intended to manufacture metal powders of spherical

or spheroidal shape in controlled medium specified under Items II.1.1.6 or II.1.1.7:.

II.3.6.11.1. the design and manufacturing know-how of plasma generators (high-frequency arc) used to produce dispersed or spherical metal powders with the organization of the process in argon-hydrogen medium;

II.3.6.11.2. the design and manufacturing know-how of electrical explosion plants used to produce dispersed or spherical metal powders with the organization of the process in argon-hydrogen medium

II.3.6.11.3. the design and manufacturing know-how of plants used to produce spherical aluminum powders by dispersing melt in inert medium (for instance nitrogen)".

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.3.6.12 of the present List
Amendments are carried into effect since three months from the day of official publication of the Decree
See text of the Item in previous wording

II.3.6.12. The know-how of the manufacturing powders of zirconium, beryllium, magnesium, boron and alloys thereof in the form of particles with the dimensions of less than 500 x 10 (-6) m (500 mcm) having sherical, spheroidal, scaly or granulated form with the content of any of the said metals of 97 per cent and more by weight.

II.3.6.13. Production technology of nitramines:

II.3.6.13.1. Octogen;

II.3.6.13.2. Hexogen;

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.3.6.14 of the present List
Amendments are carried into effect since three months from the day of official publication of the Decree
See text of the Item in previous wording

II.3.6.14. The design and manufacturing know-how of mills with circulating energy carrier intended to crush or grind the components specified under Items II.1.1.4.1 - II.1.1.19.5.

II.3.6.15. Production technology of polybutadiene with carboxyl terminal radicals

II.3.6.16. Production technology of polybutadiene with hydroxyl terminal radicals

II.3.6.17. Production technology of glycidazide

II.3.6.18. Production technology of polybutadiene acrylic acid

II.3.6.19. Production technology of polybutadiene nitroacrylic acid

II.3.6.20. Production technology of catalytic and inhibiting additives to solid propellants:

II.3.6.20.1. Bismuth triphenyl

II.3.6.21. Production technology of modified components regulating the burning rate of mixed solid propellants:

II.3.6.21.1. Ferrocene;

II.3.6.21.2. Diethylferrocene (DAF) (catocene);

II.3.6.21.3. Octoxylylferrocene;

II.3.6.21.4. N-butyl-ferrocene (butacene);

II.3.6.21.5. Lithium fluoride

II.3.6.22. Production technology of nitroesters and nitroplasticizers:

II.3.6.22.1. Trinitropropane triol

II.3.6.22.2. Trimethylolethane trinitrate;

II.3.6.22.3. Dinitroethylene glycol;

II.3.6.22.4. 1, 2, 4-butane triol trinitrate;

II.3.6.22.5. Dinitrotriethylene glycol

II.3.6.23. Production technology of stabilizers of solid propellants:

II.3.6.23.1. 2-nitrodiphenylamine;

II.3.6.23.2. N-methyl-para-nitrophenylamine

II.3.6.24. Production technology of carboranes, decarboranes, pentaboranes and their derivatives

II.3.6.25. Production technology of binding additives to propellants:

II.3.6.25.1. Tris-(1-(2-methyl)-aziridinyl)-phosphor oxide;

II.3.6.25.2. Trimesol-(1-(2-ethyl) aziridine;

II.3.6.25.3. "Tepane" - product of reaction of tetlenpentamine and acrylonitrile;

II.3.6.25.4. "Tepanol" - product of reaction of tetraethylenepentamine, acrylonitrile and glycidol;

II.3.6.25.5. Multifunctional aziridine-amines of isophthalic, trimesic, isocianuric and trimethyladipic acids containing dimethyl or diethyl aziridine radicals

II.3.6.26. Production technology of high-energy liquid propellants, such as boron-containing suspensions, with specific efficiency of 9,500 kcal/kg (40x106 J/kg) or more;

II.3.6.27. Production technology of mixed (composite) propellants, mixed propellants obtained trough modification of dual-base propellants and charges fixed rigidly to the body of the rocket engine, as well as insert charges of solid rocket propellant fit for use in systems indicated in Items I.1.1 and I.1.2

Decree of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Item II.3.6.28 of the present List

Amendments are carried into effect since three months from the day of official publication of the Decree

See text of the Item in previous wording

II.3.6.28. Design and production technology of dosing and continuous mixers with systems permitting mixing in vacuum in the 0 to 13.326 kPa (0.13 atm) pressure range and temperature control in the mixing chamber:

II.3.6.28.1. dosing blenders with the total volume of 110 l or more featuring at least one steering drive located off the blender's center;

II.3.6.28.2. continuous-operation blenders featuring two or more steering drives providing access to the blending chamber.

II.3.6.29. Design and production technology of equipment for non-destructive monitoring of solidity and quality of continuity of solid propellants and charges of them indicated in Item II.1.1.21

II.3.6.30. Design and production technology of stationary and mobile fuelling systems of displacement or pumping type outfitted with a dosing system, fine-purification filters (20 mcm) designed to operate with chemically active and toxic liquid or gaseous substances, with output capacity of at least 2 m3/min;

II.3.7. Production technology of structural materials fit for use in systems indicated in Items I.1.1 and I.1.2

II.3.7.1. Production technology of maraging steels (with increased content of nickel, low content of carbon, and

replacement elements or elements causing isolation from solid solution for strengthening) with maximum strength of 150 kg/mm2 or more at 20°C

Decree of the President of the Russian Federation No. 7 of January 4, 1999 supplemented the present List with Item II.3.7.1a
Amendments are carried into effect since three months from the day of official publication of the Decree

II.3.7.1a. The manufacturing know-how of titanium-alloyed duplex stainless steel fit for the systems specified under Items I.1.1 and I.1.2 and having
all the below characteristics:
the weight content of chromium 17 - 23 per cent and of nickel 4.5 - 7 per cent and ferritic-austenitic microstructure (also known as two-phase microstructure) containing 10 and more per cent of austenite by volume; and any of the following shapes:
ingots or billets having the dimensions of 100 mm or more in any measurement;
sheets having the width of 600 mm or more and the thickness of 3 mm or less;
pipes having the diameter of 600 mm or more and the wall thickness of 3 mm or less.

II.3.7.2. Production technology of tungsten and its alloys in the form of spherical or pulverized particles of 500-mcm diameter and less and 97% and more purity (by weight)

II.3.7.3. Production technology of molybdenum and its alloys in the form of spherical or pulverized particles of 500-mcm diameter and less and 97% and more purity (by weight)

II.3.7.4. Production technology of composite materials, stratified plates (laminates) and items of them specially designed for use in systems indicated in Items I.1.1 and I.1.2 and subsystems indicated in Items I.1.5, I.1.8-I.1.10, polymer-impregnated fibrous prepregs, as well as metal-coated preformed fibrous blanks (preforms) used to make indicated materials on the basis of organic or metallic matrices using reinforcement fibers which have specific pull strength of more than 7.62x104 m and specific elastic modulus of more than 3.18x106 m:

II.3.7.4.1. Made on the basis of polyamide, polyimide, polybutylen terephthalate, polycarbonate, phenol-formaldehyde matrices;

II.3.7.4.2. On the basis of magnesium matrices;

II.3.7.4.3. On the basis of titanium matrices;

II.3.7.4.4. On fibrous basis of quartz threads (frames);

II.3.7.4.5. On fibrous basis of carbon threads (frames);

II.3.7.4.6. On fibrous basis of boron threads (frames);

II.3.7.4.7. On fibrous base of aluminium oxide;

II.3.7.4.8. On fibrous base of silicon carbide;

II.3.7.4.9. On fibrous base of tungsten wire;

II.3.7.4.10. On fibrous base of molybdenum wire;

II.3.7.4.11. On fibrous base of titanium wire

II.3.7.5. Production technology of composite materials in the form of intricate geometric shape items (cylinders, spheres, ellipsoids, cones, turi, and so on) designed to make bodies of solid-propellant rocket engines, nozzle blocks, and their elements from:

II.3.7.5.1. Carbon-filled plastics;

II.3.7.5.2. Fiber-glass plastic;

II.3.7.5.3. Organic plastics

II.3.7.6. Production technology of composite carbon-carbon materials with spatial reinforcement structure (more than 2 reinforcement dimensions) or fibrous reinforced graphite;

II.3.7.7. Production technology of composite carbon-carbon materials for thin-wall structural elements obtained by winding and lining

II.3.7.8. Production technology of fine-textured graphite recrystallized in large amounts (with volumetric density of at least 1.72 g/cm3 measured at +15°C and particle size of 100 mcm and less)

II.3.7.9. Design and production technology of tape winding machines permitting tape and layer feeding and winding control to be programmed and coordinated in two or more axes, fit for making structural elements of missiles and flying vehicles made from composite materials

II.3.7.10. Software for tape winding machines permitting tape and layer feeding and winding control to be programmed and coordinated in two or more axes

II.3.7.11. Design and production technology of multi-directional, multi-axes winding or tape laying machines permitting to obtain a volumetric, multidimensional fabric, including adapters and interchangeable headpieces for weaving, interlacing, intertwining or lacing of fibers, fit for making composite structures with the exception of textile machines not outfitted (not modified) for the above

mentioned finite use

II.3.7.11.1. Software for multidirectional, multi-axes winding or tape laying machines permitting to obtain a volumetric, multidimensional fabric, indicated in Item II.2.8.5

II.3.7.12. Design and production technology of thread winding machines permitting fiber feeding, spinning, and winding to be programmed and coordinated in three or more axes, fit for making composite structures or laminated plastics from fiber and fibrous materials

II.3.7.13. Software for thread winding machines permitting fiber feeding, spinning, and winding to be programmed and coordinated in three or more axes

II.3.7.14. Production technology of materials with pyrolytic sublayer coating made by feeding gaseous agents decomposing at temperatures from +1,300°C to +2,900°C and pressure range from 1 to 150 mmHg (including data on gas interaction, speed of their discharge, procedure of process and parameter control)

II.3.7.15. Design and production technology of nozzles specially designed for pyrolytic application of coatings by feeding gaseous agents decomposing at temperatures from +1,300°C to +2,900°C and pressure range from 1 to 150 mmHg

II.3.7.16. Production technology and software for numerical control units designed for packing and pyrolysis control of the nozzles of rocket engines or warhead caps made of composite materials

II.3.7.17. Design and production technology of isostatic presses with the inner diameter of the chamber working space of 254 mm (10 inches) and more, capable of developing a maximum working pressure of 700 atm or more and obtaining and maintaining a controlled temperature level of +600°C and higher

II.3.7.18. Design and production technology of furnaces for settling vapors of chemical elements designed or modified for packing composite carbon-carbon materials

II.3.7.19. Technical data (including process conditions) and description of technological processes developed for maintaining specified temperatures, pressures, and atmospheric composition in autoclaves or hydroclaves used in production of composite materials or their partial treatment

II.3.7.20. Production technology of ceramics composite materials with permittivity of less than 6 at 100 Hz to 10 GHz designed for use in radio transparent fairings (inserts) of antennas of missiles and unmanned flying vehicles

II.3.7.21. Production technology of three-dimensional intermediate products made on the basis of unfired ceramics reinforced with silicon carbide and fit for mechanical treatment and use in warhead caps

II.3.7.22. Design and production technology of equipment designed or modified for settling vapors of chemical elements or their compounds on heated fiber structures

II.3.7.23. Design and production technology of equipment designed or modified for modification of polymer fibers (such as polyacrylonitrile, artificial silk, polycarbosilane) including special devices for fibre stretching

II.3.7.24. Design and production technology of equipment designed or modified for making fireproof ceramics by wet winding

II.3.7.25. Software for programmed control of fiber modification or fireproof ceramics roasting regimes, including temporal metering of quality and quantity of the processing agents, as well as temperature, pressure, and content monitoring of the chamber inner environment

II.3.7.26. Design and production technology of equipment specially designed or modified for special treatment of fiber surfaces or for making pre-impregnated materials (prepregs) and preformed blanks (preforms)

II.3.7.27. Production technology of heat- and erosion-resistant radio transparent materials and coatings including those made on the basis of mineral glass-fiber plastics of MSP-K type, which ensure radio transparent fairing (insert) resistance to heat flow up to 1x103 kcal/m2.s with exposure up to 1 s combined with excessive pressure impulse of more than 0.5 kg/cm2

II.3.7.28. Production technology of glass fabrics and glass fiber containing up to 50% (by weight), in a mixture or separately, of any of the following heavy elements: neodymium, praseodymium, lanthanum, cerium, dysprosium, ytterbium

II.3.8. Production technology of materials designed to reduce legibility and reflected irradiation energy in the radio-, ultraviolet-, infrared-, or sound-frequency ranges fit for use in systems indicated in Category I of the List

II.3.8.1. Production technology of heat-resistant radio-absorbing materials of the gradient and/or interference type including those made on the basis of organic silicon binders and special fillers (metal powders, soot, ferrites, ferrous carbonyl) which preserve magnetic and dielectric properties

at +350°C or higher and have a wave reflection factor of 10% to 30%

II.3.8.2. Production technology of coatings, including dyes made on the basis of organosilicon binders, specially designed to reduce or limit rigidly reflection or emission in the microwave (0.1-10 mm), as well as infrared (0.7-100 mcm) or ultraviolet (from 10-2 to 0.35 mcm) frequency range

II.3.9. Design and production technology of equipment and systems of flight, navigation, and orientation control, production and testing equipment and specially designed parts for them

II.3.9.1. Design and production technology of on-board equipment integrated in flight-control systems including gyrostabilizing or autopilot devices designed or modified for use in missiles or unmanned flying vehicles indicated in Items I.1.1 and I.1.2

II.3.9.2. Design and production technology of inertia or other equipment using accelerometers indicated in Items II.2.9.5 or II.2.9.6, or gyroscopic devices indicated in Items II.2.9.7 or II.2.9.8

II.3.9.3. Software specially developed for inertia or other equipment using accelerometers indicated in Items II.2.9.5 or II.2.9.6, or gyroscopic devices indicated in Items II.2.9.7 or II.2.9.8

II.3.9.4. Design and production technology of gyroastrocompasses and other instruments used to determine location or orientation of the flying vehicle (missile) by automatic tracking of celestial bodies

II.3.9.5. Design and production technology of on-board satellite navigation equipment indicated in Item II.2.9.4

II.3.9.6. Design and production technology of accelerometers of various type with the sensitivity of 0.05% and less or linear error of 0.25% of the full measuring scale of the output signal, designed for use in inertia navigation systems or guidance systems of any type

II.3.9.7. Design and production technology of accelerometers of any type capable of operation at acceleration values of over 100 g

II.3.9.8. Design and production technology of gyroscopes of any type capable of operation at acceleration values of over 100 g

II.3.9.9. Design and production technology of all types of gyroscopes indicated in Item II.2.9.8

II.3.9.10. Design and production technology of specially designed production and control equipment for equipment and navigation and flight control systems indicated in Item II.2.9.9

II.3.10. Design and production technology of flight stabilization systems designed or modified for use in missiles or unmanned flying vehicles indicated in Items I.1.1 and I.1.2 and equipment specially designed for their checking, calibration, and adjustment, including:

II.3.10.1. Design and production technology of drives of flight stabilization systems including: hydraulic, mechanical, electrooptical, electromechanical

II.3.10.2. Design and production technology of equipment designed for position and orientation control of missiles and unmanned flying vehicles in space, including:

II.3.10.2.1. Gyrostabilizers or autopilots;

II.3.10.2.2. Steering machines;

II.3.10.2.3. Analogue-digital computational devices (on-board computational complex)

II.3.10.3. Design and production technology of specially designed equipment for checking, calibration, and adjustment of flight stabilization systems indicated in Item II.2.10;

II.3.10.4. Design and connection technology of the body of the flying vehicle, engine, carrying and control surfaces used to optimize aerodynamic parameters of unmanned flying vehicles in all flight regimes;

II.3.10.5. Methods of control, guidance and flight data integration (processing) into a single measuring system of flight stabilization to optimize the flight of the missile and unmanned flying vehicle along the trajectory

II.3.11. Design and production technology of on-board radioelectronic equipment and its parts designed or modified for use in systems indicated in Items I.1.1 and I.1.2

II.3.11.1. Design and production technology of radar stations including radar altimeters and Doppler navigation radars

II.3.11.2. Design and production technology of laser radar systems including altimeters

II.3.11.3. Design and production technology of radiometers of centimeter, millimeter, radiowavelength, or optical range, capable of reproducing the image of the Earth surface

II.3.11.4. Design and production technology of passive sensors for direction (bearing) determination relying on sources of electromagnetic radiation or terrain characteristics

II.3.11.5. Design and production technology of passive interferometers

II.3.11.6. Design and production technology of active and passive sensors of image reproduction

II.3.11.7. Design and production technology of devices designed to reduce legibility and reflected irradiation energy in the radio-, ultraviolet-, infrared-, or sound-frequency ranges fit for use in systems indicated in Category I of the List

II.3.11.8. Design and production technology of equipment for terrain mapping, analogue and digital correlators

II.3.11.9. Design and production technology of receivers of signals of satellite navigation systems:

II.3.11.9.1. Capable of providing navigational information at velocities of over 515 m/s (1,060 nautical miles per hour) at altitudes of over 18 km (60,000 ft);

II.3.11.9.2. Designed or modified for use in systems indicated in Item I.1.2

II.3.11.10. Design and production technology of electronic devices and their parts specially designed for military use and operation at temperatures of more than +125°C, including:

II.3.11.10.1. Radiofuses;

II.3.11.10.2. Avalanche transit time diodes or Gunn diodes

II.3.11.11. Design and production technology of on-board analogue and digital computers or digital differential analyzers capable of prolonged operation at temperatures below -45°C and above +55°C or possessing increased radiation resistance

II.3.11.12. Design and production technology of analogue-to-digital converters developed or modified to military requirements, which have:

Decree *of the President of the Russian Federation No. 7 of January 4, 1999 introduced amendments to Items II.3.11.12.1 and II.3.11.12.2 of the present List*

Amendments are carried into effect since three months from the day of official publication *of the Decree*

See text of the Item in previous wording

II.3.11.12.1. sealed high radiation-proof microchips for analog-digital conversion with a resolution of 8 bit or more quantization corresponding to 8 bit or more for binary system coding operable at temperatures below minus 54 degrees C and above plus 125 degrees C

II.3.11.12.2. printed plate or module electrical components for input analog-digital conversion with a resolution of 8 bit or more quantization corresponding to 8 bits or more for binary system coding, operable at temperatures below minus 54 degrees C and above plus 125 degrees C and including integral microchips with the characteristics specified under Item II.2.11.12.1.

II.3.11.13. Design technology of on-board equipment and electrical power supply subsystem improving resistance to electromagnetic impulse and external electromagnetic interference:

II.3.11.13.1. Design technology of screening systems;

II.3.11.13.2. Methods of selecting a rational configuration of electric circuits and subsystems protected against exposure to electromagnetic impulse and electromagnetic interference from external sources;

II.3.11.13.3. Methods of selecting criteria of protection efficiency of on-board radioelectronic equipment and electrical sybsystems against exposure to electromagnetic impulse and electromagnetic interference from external sources

II.3.12. Design and production technology of equipment used for compiling terrain prototype maps

II.3.13. Software for analogue-digital image input and output devices and computers designed for compiling terrain prototype maps

II.3.14. Design and production technology of specially developed integrated circuits with improved radiation resistance

II.3.15. Design and production technology of sensors (detectors) fit for use in systems indicated in Items I.1.1 and I.1.2 to protect on-board equipment from destructive factors of a nuclear explosion

II.3.16. Design and production technology of radio transparent fairings (inserts) capable of withstanding a thermal shock of more than 1x103 kcal/m2 with exposure time not more than 1 s combined with excessive pressure impulse of more than 0.5 kg/cm2

II.3.17. Production and application technology of polymer

composites made on the basis of organosilicon binders filled with microspheres of lanthanum, neodymium, and tin

II.3.18. Design and production technology of launch testing equipment and means used in the operation of missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2

II.3.18.1. Design and production technology of control and testing equipment and instruments designed or modified for servicing, action control, pre-start checking and launching of missiles and unmanned flying vehicles

II.3.18.2. Design and production technology of radio receivers of combat control systems operating in the ultra-short-, short-, medium-, and long-wave ranges with the impulse power level of at least 10 kW and probability of failure-free operation of more than 0.9

II.3.18.3. Design and production technology of transportation and launching containers

II.3.18.4. Design and production technology of tracking systems using encoded signal translators installed in missiles or unmanned flying vehicles, working in combination with ground or airborne reference tie systems or space navigation systems permitting real- time measuring of current coordinates and velocity

II.3.18.5. Design and production technology of gravimeters, gravimetric gradient meters (gradientometers), and their special parts developed or modified for airborne or seaborne application with accuracy equal to 0.7 mGal (7x10-6 m/s2) and higher, and providing a stable measuring regime within no more than 2 min

II.3.18.6. Design and production technology of range determination stations integrated into optical or infrared surveillance systems with the angular resolution better than 3 mrad, operating range of 30 km and more, with linear resolution better than 10 m (root-mean-square value), and velocity resolution better than 3 m/s

II.3.18.7. Design and production technology of specially designed radar stations for measuring effective scattering surfaces

II.3.18.8. Design and production technology of sets of instruments (radio direction finders, gravimeters, gyrocompasses) of initial azimuthal orientation including satellite navigation equipment with angular error of 1° and less

II.3.18.9. Design and production technology of telemetering and remote control equipment fit for use in systems indicated in Items I.1.1 and I.1.2

II.3.18.10. Design and production technology of military vehicles designed or modified to transport, prepare, service, control, and launch missiles and unmanned flying vehicles indicated in Items I.1.1 and I.1.2

II.3.19. Specially developed software or data bases for signature reduction analysis

II.3.20. Design and production technology of testing devices and equipment for missiles and unmanned flying vehicles and their main subsystems

II.3.20.1. Design and production technology of vibration tables using feedback or closed-circuit methods, including a digital controller, capable of producing vibration loads of 10 g (root-mean-square value) and more at frequencies of 20 to 2,000 Hz and with push force of 50 kN (5 t) and more, measured under "clean table" conditions

II.3.20.2. Design and production technology of digital controllers with the frequency band width of more than 5 kHz, designed for use in vibration tables indicated in Item II.2.14.1, working in combination with specially developed software

II.3.20.3. Design and production technology of vibration pushers (vibrators) with respective boosters or without them capable of applying a force of 50 kN (5 t) and more, measured under "clean table" conditions, and fit for use in vibration tables indicated in Item II.2.14.1

II.3.20.4. Design and production technology of individual auxiliary and electronic units forming, altogether, a finished vibration table capable of producing a force of 50 kN (5 t) and more, measured under "clean table" conditions, and fit for use in vibration tables indicated in Item II.2.14.1

II.3.20.5. Design and production technology of wind tunnels with flow velocity of 0.9 M and more

II.3.20.6. Design and production technology of testing berths (stands) fit for servicing solid- or liquid-propellant missiles or their engines with the thrust over 10 t, or for simultaneous three-axis measuring of thrust vector components

II.3.20.7. Design and production technology of climate or echo- free chambers capable of imitating external flight conditions indicated in Item II.2.14.4

II.3.20.8. Software for testing devices and equipment indicated in Items II.2.14.1-II.2.14.5

II.3.20.9. Design and production technology of accelerators capable of generating electromagnetic radiation of 2 Mev and more produced by braking radiation of accelerated electrons and systems containing such accelerators

II.3.20.10. Specially developed software for computers, including hybrid (analogue-digital) ones, intended for modelling, imitation, and automated designing of missiles and unmanned flying vehicles, their individual stages, engine assemblies, and other systems given in Category I of the List

Note 27

Modelling shall include, in particular, aerodynamic and thermodynamic analysis of systems

II.3.20.11. Software for processing the recorded post-flight information permitting to determine the position of the flying vehicle against the flight trajectory