

JSC VSMPO

V.V.URVANTSEV

Director, Quality and Certification

A.N. STROSHKOV

Marketing Development and Sales  
Manager

**PRESENTATION OF THE VSMPO QUALITY SYSTEM  
AND STATUS FOR THE QUALITY SYSTEM, MANUFACTURING  
PROCESSES AND PRODUCTS APPROVAL BY RUSSIAN AND FOREIGN  
CUSTOMERS  
as on July 01, 2002.**

Verkhnyaya Salda Metallurgical Production Association (VSMPO) is the world largest integrated manufacturer of ingots and all types of semiproducts in titanium alloys. The plant also produces ingots, extruded extra large panels and shapes, tubes, round forgings in aluminium alloys, hot-rolled plates and cold-rolled stainless steel sheets, high-percentage ferrotitanium and master alloys for titanium and aluminium alloys melting. With the development of conversion processes in the Russian Federation, the plant found itself in a very difficult situation resulting from the sharp decline in the demand for titanium products for military applications. One of the ways for the company to resolve the situation was to integrate with the world economy and to enter the world titanium market, which could be accomplished only through the manufacture of high-quality products with the consistency of quality proved via certification of the Quality System, manufacturing processes and products.

VSMPO was set up in 1933 as the first company in Russia to specialise in the manufacture of the metallurgical semi-products in aluminium and magnesium-based light alloys, primarily for aircraft applications. The first titanium ingot was melted at VSMPO in 1957, at the end of the 1970-ies the capacities for manufacture of titanium alloys exceeding the world titanium manufacturers' capabilities were launched. The main VSMPO Customers remain the highly-developed branches: aerospace industry, rocket construction, ship-building. That is why, throughout its history the plant maintained a sufficiently high level of products quality and had all the required manufacturing and testing equipment, adequately trained and highly qualified working and engineering personnel and the integrated system for products quality control. However, new market conditions in which the plant had to operate required updating of the existing system and its bringing in line with the requirements of international quality standards pertaining to the quality system approval.

In order to achieve this, in the year of 1992 at VSMPO there was appointed a management representative - Quality & Certification Director to ensure development, introduction and maintenance of the Quality System (QS), and the Quality Service originated. The Quality Service incorporates the following departments:

-Technical Department for control of Quality System documentation of the second level (factory standards, product specifications, GOSTs, international, national and Customers' standards, etc.), development of QS procedures, fulfilment of activities on processes and product quality review, development of actions aimed at quality improvement;

- Technical Control Management designated to ensure the receiving inspection of materials, technical control of products and production processes and release inspection of finished products;
- Central Control and Testing Laboratory for production release testing;
- Chief Metrologist Service for production metrological support;
- Quality & Certification Centre for survey of the Quality System's functioning via internal audits, verification of the efficiency of corrective and preventive actions to eliminate the found nonconformances and fulfilment of activities aimed at the System development.

VSMPO management organisational pattern is shown in Annex № 1.

The Quality Service developed the Quality Policy P 07510017-1 and had it approved by the General Director of the plant, basic factory standards on each QS element, Quality Manual R 07510017-1 meeting the requirements of ISO-9002 and the standards of the majority of the world leading aircraft manufacturers. Key managing officials and managers of main control departments confirmed in writing their understanding of the requirements of these documents and readiness to contribute to their implementation and Quality System improvement; they also undertook that they would never take any decisions or actions, which run contrary to the Quality Policy.

The established in August 1993 Quality System was approved by TUV - CERT company, Germany (certificate valid for three years with annual surveillance audit). This company performed repeated Quality System certification in August 1996 and 1999 caused by expiration of the quality certificate validity. During these surveillance audits and QS re-certification the certificate scope was extended and production of high-grade ferrotitanium and master alloys for melting of titanium and aluminium alloys was added, and in 1999 the USA division of TUV-CERT approved our QS for the compliance with the requirements of the USA national aerospace standard AS-9000.

Quality Management System is planned to be implemented and approved as complying with the introduced international standard ISO 9001:2000 and aerospace standards AS 9100 and EN 9100 based on ISO 9001:2000.

At the moment VSMPO QS covers the manufacture of the following types of products: ingots and all kinds of metallurgical semiproducts from titanium alloys; ingots, rings from Ti alloys and steels, extruded panels and sections, tubes from aluminium alloys; hot- and cold-rolled sheets and plates, welded tubes from stainless steels; forgings and die-forgings from heat-resistant alloys; high-grade ferrotitanium and master alloys for melting of titanium and aluminium alloys. The above product is stated in the certificate for VSMPO Quality System.

Additionally, taking into account the aircraft application of the basic assortment of manufactured products, the company carried out a large scope of certification activities with overseas companies, mainly from the aerospace sector. As distinct from the certification by the third parties to ISO 9002, the certification to aerospace requirements includes the following:

- Certification is carried out by the second party only, i.e. by the customer, with every customer having its own package of standards for suppliers' assessment, the requirements of which for the Quality System are much more stringent than ISO 9000 series requirements;

- Process evaluation procedures and process audits are carried out, specific requirements are placed for production practices, special and hazardous processes. Additionally, in most cases a fixed process agreement is concluded with the Customer which “freezes” the product manufacturing practices, i.e. no modifications can be introduced into the process without the substantiation and co-ordination with the Customer in accordance with the specific procedure ;

- The agreed list of special processes which are subject to specific control and certification is issued;

- Status of technology, equipment, qualification and certification of NDT personnel is assessed through a separate audit, with the Supplier having an approved international Level III NDT specialist being an obligatory condition for the certification to this Section;

- The procedures, equipment and test laboratory personnel are assessed. “Round Robin” tests for alloy chemistry check and determination of mechanical properties of semiproducts are performed aiming at evaluating the compatibility of the test results obtained by the Customer and the Supplier;

- The certification of Subcontractors is required (VSMPO subcontractors are suppliers of sponge, master alloys, pure metals and materials for alloys and master alloys production), which in most cases is performed with the participation of the Customer’s specialists. Moreover, the development and implementation of the agreed production practices for the manufacture of spongetitanium and master alloys are required, the control of which is similar to that for Ti alloy ingots and semiproducts.

Delivery of samples from products under approval and overall test of their quality always take place prior to the certification activities. All initial lots thoroughly inspected for Quality both by the Customer and the Supplier, in some cases the manufacture of the initial lots is witnessed by the Customer’s representatives.

With the existing level of technology, qualification of workers and technical personnel and with the integrated Quality Assurance System in place, the fulfilment of the above specific requirements, placed by the aerospace companies, proved to be feasible for the company, although it required institution of corrective actions on the nonconformances raised during the audits, along with the substantial amount of activities associated with translation, review and implementation of customers’, national, industry and factory standards. The number of standards currently used by the company amounts to 1310 .

At present VSMPO Quality System is approved by 13 certification centres and by the Customers:

- TUV-CERT – to ISO 9002: 1994 standard;
- TUV-CERT – to AS 9000 standards;
- CAA – to BCAR A8-4 standard;
- Boeing – to D6-82479 standard;
- General Electric Aircraft Engines – to S-1000 standard;
- Snecma – to RG Aero 84 standard;
- Rolls Royce – to CQC 103 standard;

- Rolls Laval – to BS EN ISO 9002:1994 standard;
- Airbus UK – to AUK/SA/001 standard;
- Fine Tubes – to ISO9002 :1994 standard;
- Daimler-Chrysler Aerospace – to BDLI QSF-B;
- Tital – to ISO 9002 and SMS B 08 100 standard;
- Pratt and Whitney – to ASQR – 01 standard;

In 2000 VSMPO Quality System was audited by the US Federal Aviation Administration (FAA) and as a result of this audit VSMPO Quality System was proved to be in compliance with the requirements of D1-9000 and AS9000 standards and now VSMPO products could be supplied to the US aviation market.

At the moment VSMPO is an approved supplier of many types of Titanium and Aluminium semi-products. The complete list of certificates and types of products is given in Annex № 2.

The certification activities performed made it possible for VSMPO to enter the World Titanium Market and establish a long-term and secure position there. It would be suffice to note that in 2001 volume of VSMPO titanium products sales was 11.01% more than volume of sales of all the American companies in the aggregate, and 31.37% more than that of the Japanese companies.

Certification activities are currently being carried out by Pratt & Whitney, Boeing General Electric, Aerospatiale, Snecma, British Aerospace, Rolls-Royce, Chem-Tronics and other companies, aiming at increasing of the range of approved metallurgical semi-products in titanium, aluminium and heat-resistant alloys.

Aiming at more extensive participation in the marketing of Ti-products for off-shore oil and gas production and purification, the company is planning to have certification programmes developed with such companies as API (USA), and Det Norske Veritas (Norway).

A representative agency of the state-owned company “AVIATEKHPRIEMKA” has been set up by the company to implement independent examination of the aerospace application product quality, including production practices, control procedures and test methods. A representative agency of the Control and Acceptance Inspection board of “Rosenergoatom” concern has been set up to meet similar purposes as regards specially licensed products, supplied to the companies working for the Ministry of Atomic Power of Russian Federation.

In view of signing of intergovernmental Agreement between the USA and RF in 1998, and the protocol of mutual acknowledgement of certification on the part of FAA (USA) and “AVIAREGISTR” MAK (Russia), certification of manufacturing processes and products designated for aircraft industry in Russia and countries of CIS (Commonwealth of Independent States) was carried out by the Certification Centre “Materials” accredited by MAK Aviation Register on the basis of the agreement for the division of authorities between MAK Aviation

Register and Gosstandard of Russian Federation. In June 1998 the audit was carried out which completed the first stage of the certification programme - the accreditation of the Central Inspection and Test laboratory of the plant and the certificate of accreditation # AR MAK/STsM/005/TsKIL was granted, in 1999 the second stage of the certification program was completed - Quality System and manufacture of products from titanium, aluminium and heat-resistant alloys.

All the laboratories of the company, directly or indirectly participating in the control of product quality and conditions of manufacture, have been accredited to operate within the system of Gosstandard of Russian Federation, including the following:

- Central inspection and test laboratory for production release testing for all complete range of VSMPO products;
- Ecological laboratory for inspection of sanitary conditions at the work stations and in manufacturing shops, for control of production waste and technological air and water pollution, aimed at environmental protection;
- Radiological laboratory for inspection of radioactivity of the purchased raw materials, final products and condition of the environment from the point of view of freedom from radiation;
- Central Metrological laboratory for the right to perform control and calibration activities on the working measuring tools.

All the products and services provided by the company, which are subject to the mandatory certification in accordance with the legislation of Russian Federation, have been approved by the Russian Gosstandard organisation (kitchen utensils in stainless steel, disks of automobile wheels, heating radiators, heat exchangers, ball cocks, garden tools, flameproof keys in high-resistance aluminium alloys, horticultural sundry, car maintenance, building structures, furniture, food products, etc.). At present the company is holding 48 certificates for the above products and services, along with 15 certificates for production of consumer goods. In the nearest future the company is planning to establish and implement a specific Quality System for such products manufacture in order to avoid spending a considerable amount of time and resources on maintaining certificates for the manufacture of specific types of consumer products.

In 2003-2004 the company plans to develop and approve to the requirements of MS ISO 9001:2000 its Quality Management System for the manufacture of high-performance products for atomic, power generation and chemical industries, and its Environment Control System complying with the requirements of MS ISO 14001.

For the last 5 years the company has received several awards for the commitment to the continuous quality improvement, active participation in the exploration of the world market of metallurgical semis in titanium, aluminium, special alloys, ferrotitanium and for the successful development of economic activities.

**Annex:**

List of quality certificates, applicable processes and main products of VSMPO.

**List of Certificates on 01.08.2002**

#	Organisation, country	Certificate No	Issue date	Validity Period	Scope
1	2	3	4	5	6
01	TUV-CERT, Germany	No. 09-100- 95260	17.01.00	31.01.03	QS. Production of ingots in Ti and Al alloys, rolled, forged and die-forged semi-products in Ti, Al and heat resistant alloys. Stainless steel sheet, ferrotitanium, master alloys, thin-walled welded tubes in Ti-alloys and stainless steels. DIN EN ISO 9002.
02	TUV Rheinland, USA	not referenced	14.03.99		QS. Production of ingots in Ti and Al alloys, rolled, forged and die-forged semi-products in Ti, Al and heat resistant alloys. Stainless steel sheet, ferrotitanium, master alloys, thin-walled welded tubes in Ti-alloys and stainless steels. AS 9000
03	TUV Rheinland, Berlin	Technical report No. BD-94/457	09.07.01	31.07.03	Approval of VSMPO as a manufacturer of sheets, seamless tubes, bars and forgings in Ti and its alloys, extruded shapes and forgings in Al and its alloys, thin-walled welded tubes in Ti-alloys and stainless steels as per AD-WO/TRD 100 technical requirements.
04	CAA, UK	No. AI/9635/98	10.10.99		Approval as per BCAR A8-4 section. Titanium alloy ingots, billets, bars, sheets, plates, seamless tubes, extrusions and forgings. Aluminium extrusions.
05	Boeing, USA	Letter No. 6- 5900-GJP-448	29.06.01		VSMPO QS meets D6-82479 requirements.
06	Boeing, USA	Report on process approval	22.07.97		002 Quality System of Manufacturer to D1-4426
06	Boeing, USA	Report on process approval	22.07.97		152 Heat Treatment of Ti and Ti alloys to MIL-H-81200

06	Boeing USA	Report on process approval	22.07.97		436 Ultrasonic Inspection of Flat Shapes to MIL-STD-2154/ MIL-I-8950
06	Boeing USA	Report on process approval	22.07.97		437 Ultrasonic Inspection of Rounds and Shapes Required Compensation to MIL-STD-2154/MIL-I-8950
06	Boeing USA	Report on process approval	22.07.97		550 Control of Designated Parts-Forging Production to D6-1276 only
06	Boeing USA	Report on process approval	22.07.97		670 6Al 4V Ingots
06	Boeing USA	Report on process approval	22.07.97		671 6Al-4V Ti Stock Block Bar and Die-Forgings to AMS 4928
06	Boeing USA	Report on process approval	22.07.97		672 6Al 4V Stock, Bars and Die Forgings to MIL-T-9047
06	Boeing USA	Report on process approval	22.07.97		673 6Al 4V Forgings. Premium Quality to BMS 7-247
06	Boeing USA	Report on process approval	22.07.97		674 6Al 4V Titanium Sheet and Plate to AMS 4911
06	Boeing USA	Report on process approval	22.07.97		675 6Al 4V Titanium Sheet and Plate to MIL-T-9046
06	Boeing USA	Report on process approval	22.07.97		678 6Al- 6V-2 Sn Ingots
06	Boeing USA	Report on process approval	22.07.97		683 10V-2Fe-3Al Forged Stock/Forged Bar, Die-Forgings to BMS 7-260 (QPL)
06	Boeing USA	Report on process approval	22.07.97		685 10V-2Fe-3Al Ingot and Billet to BMS 7-260

06	Boeing USA	Report on process approval	22.07.97		686 6Al-2Sn-4Zr-2Mo Titanium Ingot
06	Boeing USA	Report on process approval	22.07.97		801 Testing for Hydrogen in Titanium
06	Boeing USA	Report on process approval	22.07.97		802 Mechanical Testing to ASTM-E-8
06	Boeing USA	Report on process approval	22.07.97		803 Metallurgical Testing
06	Boeing USA	Report on process approval	22.07.97		807 Fracture Toughness Testing to ASTM-E-399
06	Boeing USA	Report on process approval	22.07.97		851 Qualification of NDT personnel (approved international Level III USI specialist) to BSS 7698 /BSS 7639/, MIL-STD-410
06	Boeing USA	Report on process approval	22.07.97		Ti-6Al-4V Thick Section Forged Block to BMS 7-348A (QPL)
06	Boeing USA	Report on process approval	22.07.97		6Al-4V Sheets. Premium Quality to BMS 7-347A (QPL)
06	Boeing USA	Supplier List	22.05.02		VSMPO is recognized as a supplier approved for the production of sheets with the thicknesses of 0.063; 0.071; 0.080; 0.090; 0.125 inch.
07	McDonnell Douglas, USA	Qualified Product List QPL	18.05.00		Manufacture of titanium ingots 6Al-4V alloy to DMS 2242 and manufacture of titanium die-forging stock from 6Al-4V alloy to DMS 1583 for civil aircrafts only.
08	BFGoodrich	RQSD	01.06.00		Manufacture of plates, sheets up to 0.125 inches incl. to AMS 4911



09	Shultz Steel, USA	Certificate of Approval	12.04.02	01.01.04	To VSMPO for successfully confirming to the requirements of WI 600-1 during a Quality Evaluation performed through December 2000.
10	Wyman Gordon, USA	Approval Resolution	22.09.93		QS is acceptable for supplies to Wyman Gordon
11	Fortech, France	No. F36/02	22.03.02	22.05.05	Approval of VSMPO as a supplier of ingots, bars and forged stock in Ti alloys, aerospace grade to DQC 06-01F.
12	Timet, USA	No. 95100	19.10.95		Products from standard industrial alloys.
13	Tital, Germany	No. 600	08.04.02	08.04.05	VSMPO Quality System is in compliance with ISO 9002 and SMS B 08.100
14	Otto Fuchs, Germany	05.1-dr/te-vl	20.01.98		VSMPO is approved as a supplier of raw materials for forging in 6Al-4V alloy.
15	AIRBUS, UK Ltd.	AUK/SA/30083	20.05.02		Quality Management System Certificate for the compliance with AUK/SA/001-3. Manufacture and supply of Aluminium and Titanium Alloy Ingot, Forged Billet and Rolled Bar, Plate and Sheet in accordance with Airbus specifications and British Standards. (Letter of Conformance No. D38/SAA/JL/2121)
15	AIRBUS, UK Ltd.	AUK/SA/10125	20.05.02		Quality Management System Certificate for the compliance with AUK/SA/001-1. 11 <u>Miscellaneous Manufacture</u> 11u Forgings (Non Ferrous Alloys) and applicable processes and tests (Letter of conformance No. D38/SAA/JL/2120).
16	Aerospatiale, France	Gc/phl/ML No. 694.039/95	30.03.95		Manufacture of TA6V plates 4.7-80 mm thick, and TA6V, T40 sheets 1.0-4.7 mm thick
16	Aerospatiale, France	Gc/ML No. 068.1275/97	30.10.97		TA6V plates, thickness > 2.5 mm to ASNA 3200, TA6V bars to ASNA 3307, T40 T40 bars to ASNA 3305

16	Aerospatiale, France	Gc/ML No. 068.868/99	30.03.99		TA6V sheets, thickness > 1.2 mm to ASNA 3200
16	Aerospatiale, France	Gc/ML No. 068.868/99	07.02.96		Plates in TA6V (all thicknesses) - ASNA 3304 G
16	Aerospatiale, France	not referenced	30.07.98	31.12.2001	Certificate with approval of VSMPO Test Laboratory to perform the following: - wet chemistry; - spark emission spectrometry; - hydrogen analysis; - micrography; - macrography; - hardness test.
17	Daimler-Chrysler Aerospace, DASA, Germany	Fax-RIA45- 148/99	27.07.99	31.10.2001	Compliance of Quality Assurance with the requirements of Federal Union of Aviation, Space and Equipment (BDLI), technical and organisational requirements as per QCF-B, DIN/ISO 9002 (EN29002)
17	Daimler-Chrysler Aerospace, DASA, Germany	Approval of Product Quality	17.04.98		VSMPO was granted the quality status 2 in accordance with QA-procedure QVA-V06-02-00 for: - Ti6Al-4V Sheets and Plates (4-100 mm thickness), according to DIN 3.7164.1, DIN 65039, LN 9297 and ZBF 470268 for Machining Applications. - Ti6Al-4V Bars (13-150 mm diameter), according to DIN 3.7164.1, DIN 65040, DIN 65174 and ZBF 504514 for Machining Applications
17	Daimler-Chrysler Aerospace, DASA, Germany	No. WQ10192, rev.1	01.04.99		Manufacture of CP titanium sheets (0.8-1.0 mm thickness) to the requirements of LN 9297, ZBF 470268, DIN 65039.
17	Daimler-Chrysler Aerospace, DASA, Germany	No. WQ10383, rev. 1	20.04.1999		Manufacture of sheets of Ti6Al4V (thickness from 0.8 to 2.4 mm and from 4.0 to 6.0 mm) to LN 9297, DIN 65039
17	Daimler-Chrysler Aerospace, DASA, Germany	No. WQ10191, rev. 1	03.03.1999		Manufacture of titanium plates (thickness from 6 to 100 mm) of standard quality to DIN 65039, EN 2955/A1, LN 9297, ZBF 470268 B/97.
18	Bombardier, Canada	not referenced	25.07.98		VSMPO is included into EMCM-001 as a supplier of raw materials. Titanium sheet and plate manufacture is approved to MIL-T-9046

19	Dynamet Inc., USA	not referenced	15.06.01		Dynamet Inc. has approved VSMPO as a supplier of Ti6Al-7Nb, Ti6Al-4V, Ti-6Al-4ELI alloy products.
20	Westland Helicopters, UK	not referenced	27.03.01		Manufacture of titanium sheets to BS TA59, MIL-T-9046, AMS 4911.
21	Gulfstream, USA	not referenced	30.07.98	16.02.2001	VSMPO is approved for supply of quality raw material
22	General Electric Aircraft Engines, USA	not referenced	01.03.98	31.12.01	VSMPO Quality System in compliance with the requirements of S-1000-C
22	General Electric Aircraft Engines, USA	not referenced	30.10.95		VSMPO approval as category 1 supplier
22	General Electric Aircraft Engines, USA	not referenced	01.09.99	01.09.02	Special Process Certificate: Conversion of ingot into billet (SAL-1); Melting of titanium (SAL-1); Blue etching AMS 2642;
22	General Electric Aircraft Engines, USA	not referenced	01.03.01	01.03.02	Special Processes Certificate: FB - Forging - Non rotating parts only BB-1 - Aluminum Heat Treatment to AMS 2750 and AMS 2770 BH-1 - Titanium Heat Treatment to AMS 2750 and AMS 2801, MIL-H-81200 AI - Materials Testing to S-400: Mechanical testing: A - room temperature tensile; C - stress rupture; Chemistry: titanium and aluminium alloys only: D - wet chemistry; F - instrumental analysis. G - carbon; J - nitrogen; K - oxygen; I - hydrogen. Metallography: All types code C: Macrohardness code M.
22	General Electric Aircraft Engines, USA	not referenced	30.11.97		Special processes certificate: Titanium master alloys.

22	General Electric Aircraft Engines, USA	not referenced	27.08.01	30.06.04	UST of bars to P3TF34 CL - A and CL - B. Supplier standards MK-46-07-004-C-2001, MK-46-07-003-C-2001, MK-46-07-019-C-2001 Manufacture of bars of 6-4 alloy - to C50TF22; 8-1-1 alloy - to C50TF26; 4-4-2 alloy - to C50TF113.
23	SNECMA, France	Audit report	27.07.98		Quality System is in compliance with RG Aero 0084.
23	SNECMA, France	No. 363	04.10.99	31.12.02	Approval of VSMPO Laboratory for: - room temperature tensile; - spectral analysis; - hydrogen analysis; - carbon analysis; - oxygen analysis; - microstructure examination; - macrostructure examination; - heat treatment of specimens; - blue etch inspection.
23	SNECMA, France	No. 0475	03.05.02	31.05.05	Ultrasonic inspection to DMC 0022. Heat treatment to DMP 11.
23	SNECMA, France		24.12.99		Titanium alloy bars and forging stock, bars for machining to CAFM/L-10, DMD 0700-0799.
24	Fine Tubes, UK	Certificate of conformance	26.07.02	30.07.03	VSMPO QS meets the requirements of ISO 9002 and 125G specification.
25	Rolls-Royce, UK	No. 88360	17.07.01		VSMPO QS meets CQC 103 requirements Manufacture of Ti bars 18-92 mm in dia. to MSRR8610 and ingots to MSRR 8652/8614. Supply of materials listed in MLC 101 to MSRR9951: - cut out of specimens, - mechanical testing defined in CME 5021 and MSRR 9922, - chemical analysis to MSRR9920, - control of classified parts RPS 707, RPS 709, RPS 953, RPS 707-QCTP EL 6336
25	Rolls-Royce, UK		29.10.01		Manufacture of billets from Ti6Al4V to MSRR8614 and MSRR8652
25	Rolls-Royce, UK	Letter from RR dated 27.09.01	27.09.01		Manufacture of sheets from coiled stock to MSRR8608

25	Rolls-Royce, UK		01.10.01		Manufacture of sheets 0,7 - 4,0mm according to MSRR 8632
26	Rolls-Laval, UK	not referenced	20.04.00	30.04.03	VSMPO is approved as complying with the Quality requirements for suppliers to Rolls-Laval Heat Exchangers Ltd. to BS EN ISO 9002: 1994. The scope of approval: manufacture and supply of sheet, plate and forgings in titanium alloys for which approved methods of manufacture are held.
27	Honeywell Aerospace, USA	not referenced	07.09.000		VSMPO is approved: to manufacture forgings and forging stock of 6Al-4V alloy for blades and vanes to EMS 54924, bars of 6Al-4V alloy to EMS 52325, and to perform heat treatment of titanium alloys to MIL-H-81200.
27	Honeywell Aerospace, USA	not referenced	17.08.00		VSMPO is approved to perform UST to EMS 52321 and approve and qualify NDT personnel to EMS 52349.
27	Honeywell Aerospace, USA	not referenced	01.02.00	28.02.05	Sergey Troitsky has met the requirements as a Supplier Level III in UT in accordance with the requirements of ASA NDE 001 and EMS 52349.
27	Honeywell Aerospace, USA	not referenced	23.04.01		Metal Testing Laboratory is approved as complying with EMS 52353 and LHG 1335.
28	Pratt & Whitney, USA				Quality System is in compliance with ASQR-01.
28	Pratt & Whitney, USA	not referenced	30.10.995		Ultrasonic inspection (SIM-11)
28	Pratt & Whitney, USA	not referenced	30.12.95		Certificate of approval of Sergey Troitsky as level III ultrasonic specialist to SIM-11
28	Pratt & Whitney, USA	No. I 98-1, form F203	07.07.98		Manufacture of 750 mm dia ingots to PWA 1228 - for compressor blades. Associated documents: MP 39.001.UT-98, Rev. E
28	Pratt & Whitney, USA	No. I 98-2, form F203	07.07.98		Manufacture of 2" max. dia bars to PWA 1228 - for compressor blades. Associated documents: MP 39.002.UT-98, Rev. B

28	Pratt & Whitney, USA	form 4692	21.08.01		Approval of forging of P/N 1S1084402 Disk. Comp. 2 stage per process sheet PWA 1228 and MP 39.016.UT-oo Rev.C
28	Pratt & Whitney, USA	form 4692	03.03.02		Approval of forging of P/N 1S1084406 Disk. Comp. 6 stage per process sheet PWA 1228 and MP 39.011.UT-oo Rev.C
29	Messier-Dowty	No. 8948	03.01.01		E - Forging Manufacture, J2 - Non-Destructive Testing Laboratory, R1 - Raw Material Manufacturers of Metallic Materials.
30	Singapore Technologies Engineering	Letter QA/QS/02/10	18.02.02	31.03.04	VSMPO is approved as an authorized supplier of titanium sheets.
31	Russian Marine Navigation Register	Supplier Approval Certificate No. 96.004.010	22.09.99	22.09.03	VSMPO is recognised as a manufacturer of: - plates and sheets to TU 1-5-357-95; - forgings and bars to OST V 5.9325-79, OST 1.92062-90; - solid-rolled tubes to OST 1 90050-72; - welded tubes to GOST 24890-81.
32	Interstate Aviation Committee. Aviaregister.	Certificate for Materials Manufacture No. SPM-4	02.09.98	17.12.03	Manufacture of titanium and aluminium semi-products for aircraft industry (die-forgings, forgings, bars, coils, sheets, plates, shapes, tubes, ingots, electrodes, foil, panels, strips).
32	Interstate Aviation Committee. Aviaregister.	Certificate for Test Lab Accreditation No. AP МАК/СІІМ/005/ІКІІІ	17.12.01	17.10.03	Certificate for VSMPO Test Lab to perform tests within the accreditation scope
33	GOST (State Standard of Russia) (SARK)	Certificate for Radiation Control Lab Accreditation No. 41222-97	09.02.01	09.02.04	VSMPO radiation and pollution control service is recognised as competent and independent to implement radioactivity measurements in accordance with the specified sphere of accreditation.

34	GOST (State Standard of Russia)	Certificate for Test Lab No. POCC RU.	03.10.01	03.10.04	Certificate for VSMPO Test Lab to perform tests within the accreditation scope
35	VNIIMS (Russian Research and Development Institute of Machine-Building)	Certificate for metrological service accreditation No. 054023	28.07.98	03.07.2002	Accreditation certificate for calibration activities.
36	GOST (State Standard of Russia)	Certificate for Analytical Lab No. POCC RU.	18.07.00	30.06.05	Certificate for VSMPO Analytical Lab to perform tests within the accreditation scope (control of atmospheric air, air venting, surface and sewage water, chemical agents and physical properties of workplaces, labour severity and hardness).
37	Astrium	Audit Report No. 09-01	10.09.01		Forged hemispheres and rings 3.7164 ENN 230E.

Certificates of QS: **13**

Processes certified: **99**

Types of products certified: **73**

**Acting Manager, Quality and Certification Department**

**A.V. Klimov**