



**VI International Technological Forum**  
**“Innovations. Technologies. Manufacturing”**

April 15-17, 2019  
Rybinsk, Yaroslavl Region

**Dear participants,**

You are kindly invited to take part in the VI International Technological Forum. For this purpose it is necessary to register on the official site <http://itp-forum.ru>.

Contract details for organizational issues:

- Anna O. Bogdanova, Project Manager

E-mail: [anna.kovtun@uec-saturn.ru](mailto:anna.kovtun@uec-saturn.ru),

Telephone: (4855) 326-038, (916) 685-90-14

- Elena V. Korovkina, Leading Specialist

Telephone: (4855) 326-045.

**Forum Program**

**Monday, April 15**

<b>8.00-9.00</b>	<b>Gathering and registration of participants. Morning coffee</b>
<b>9.00-11.30</b>	<b>Start of sessions (to be defined)</b>
<b>11.30-12.00</b>	<b>Coffee break</b>
<b>12.00-13.45</b>	<b>Planetary meeting “Federated Factories of the Future in National Projects”</b>  Venue: Social-Cultural Center (OKTs) (89 Tchkalova St)
<b>14.00-18.30</b>	<b>Strategic session “Federated Factories of the Future in National Projects”</b> Moderator: to be defined. Venue: to be defined.
Coffee break: <b>16.00-16.30</b>	<b>Digital Production</b> Moderators: - Nikolay N. Sokolov, Chief Process Engineer, PJSC “UEC-Saturn”. Contact details: +7 (961) 155-08-15, <a href="mailto:nikolay.sokolov@uec-saturn.ru">nikolay.sokolov@uec-saturn.ru</a> - Andrey A. Koryazhkin, Head of Development Shop, PJSC “UEC-Saturn”. Contact details: +7 (961) 155-01-95, <a href="mailto:andrey.koryazhkin@uec-saturn.ru">andrey.koryazhkin@uec-saturn.ru</a>  Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).  Description 1. Quick-set tooling - Introduction of unified tooling based on standard elements. - Global introduction of reference systems with a zero point in all operations. - Introduction of automated assembly systems for tooling. 2. Modeling of manufacturing processes - Development of virtual models of equipment with a full functional set. - Development and introduction of virtual commissioning systems.

- Development of prognostic models of manufacturing processes.
- 3. Digital dispatching of production
  - Digitalization of workplaces, introduction of a common digital dispatching system.
  - Prompt situational forecasting and production flow redistribution based on real-time information
- 4. Chipping and visualization of production flows
  - Development and introduction of an electronic record keeping system for flows of parts, tooling, tools; total transition to electronic document management.
  - Introduction of a uniform chipping system.
  - Visualization of production flows.

### **Smart Preproduction Engineering for Industrialization of New Products**

Moderator: Sergey Yu. Denissov, Deputy Chief Engineer, Preproduction Engineering, UEC-Saturn.

Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

#### **Description**

- Application of a special-purpose business software for the planning and budgeting of Preproduction Engineering processes within JSC "UEC".
- Format of the integration of design documentation received for newly industrialized products within JSC "UEC".
- Creation of common corporate technical databases of Preproduction Engineering processes in UEC companies.
- Prospects of transition to the common information platform of Preproduction Engineering processes in UEC companies.
- Maintenance of Preproduction Engineering in the information environment of a CAPP (Computer-Aided Production Planning) system.
- Design of modular tooling and its usage in production.
- Modern trends of tooling design in UEC companies.
- Unification of locations for the installation and fastening of tooling to equipment.
- Modeling of Preproduction Engineering processes. Modern trends, development tendencies.

### **Smart Factory. Automation of the Traceability of Raw Materials and Parts in Production**

Moderator: Pavel G. Bekher, Manager of the Project "Digital Economy", UEC-Saturn.

Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

#### **Description**

- Technologies of machine-readable tags to trace parts in production in an engine-building company.
- Elaboration of the road map "Smart Factory. Automation of the Traceability of Raw Materials and Parts in Production Within UEC".

**Digital Factory. Digital Twins of Gas Turbine Engines (GTE)**

The expert panel is to be organized by UEC

Moderator:

Pavel V. Makarov, Deputy General Designer, Strength, Technical Expertise and Certification, Salut, UEC, Candidate of Engineering Science.

Contact details: +7 (499) 785-88-89, +7 (985) 295-84-85, [makarov-pv@salut.ru](mailto:makarov-pv@salut.ru)

Venue: Social-Cultural Center (OKTs) (89 Tchkalova St)

Description

Scope of application, requirements for plotting, requirements for IT-infrastructure.

**Closed session for UEC companies “Management of the Corporation’s Innovative Development”**

The session is to be organized by UEC

**The event is to be attended by United Engine Corporation companies only.**

Moderator:

Marina V. Kustova, Deputy Head of Innovative Development Department, UEC.

Venue: Social-Cultural Center (OKTs) (89 Tchkalova St)

**Strategic Session “Strategic Vision of the Development of Cities in the Context of Digital Economy of the Future”** with the participation of the Strategic Council of the town of Rybinsk

Timing: 14.00-16.00

The session is to be organized by the Rybinsk Administration.

Moderators:

- K.A. Antonovich – Technical Director, Spetsdorproekt LLC, Moscow
- M. Yu. Grudinin – General Director, Giprogor OJSC, Moscow

Venue: Social-Cultural Center (OKTs), Small “Red” meeting room (89 Tchkalova St).

Description

- Opening speech. Experience of the application of digital technologies in the municipal management in Rybinsk
- Intellectual systems of traffic control. Introduction of “smart traffic lights”;
- Introduction of energy-efficient public lighting. Intellectual transport system;
- Experience of the application of digital technologies in the municipal management in Rybinsk;
- Possibilities of using Geoportal of the Yaroslavl Region and the Regional Transport Navigation and Information System of the Yaroslavl Region for municipal management tasks;
- MyHome Project as a hardware and software solution for the implementation of the municipal services digitalization project “Smart City”;

	<ul style="list-style-type: none"> <li>- Digital Modeling of Cities;</li> <li>- Employment of information systems of city planning documentation to form a modern look of city areas.</li> <li>- Municipal information system as an instrument of efficient urban management.</li> </ul> <p><b>Development of Contemporary Children' and Teenagers' Engineering Competences as a Prioritized Activity of a <i>Municipal Educational System</i></b></p> <p>The session is to be organized by the Rybinsk Administration.</p> <p>Venue:</p> <ul style="list-style-type: none"> <li>- School No.26</li> <li>- Lyceum No.2</li> </ul> <p>Description</p> <ul style="list-style-type: none"> <li>- educational environment to meet vocational guidance challenges and to solve human resources problems;</li> <li>- improvement of the organization, quality and effectiveness of vocational guidance work through the integration of activities of different educational entities and the work of coordination boards of local authorities;</li> <li>- ensuring the optimum development level for individual peculiarities of children motivated to acquire polytechnic knowledge through the organization of industry-specific training and the development of pre-professional classes;</li> <li>- a senior pupil's pre-professional path: solving project problems of high-technology production;</li> <li>- establishment of an environment to put children's creative concepts and technical initiatives into practice from a preschool age;</li> <li>- from hobby to occupation: development of students' engineering competences through the cooperation of educational and industrial institutions.</li> </ul> <p><b>Risk-Oriented Management</b></p> <p>Moderator: Sergey A. Grishikhin, Project Manager, UEC-Saturn.  Contact details: +7 (961) 155-81-52, sergey.grishikhin@uec-saturn.ru</p> <p>Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).</p> <p>Description</p> <p>The expert panel "Risk-Oriented Management" is dedicated to processes of decision-making with allowance for risks. Leading risk managers of Russia will present their best practices of risk management with software applied to purchasing, project management, budgeting and taking personal decisions with due account for risks. The event will take place in the format of master classes for the audience's practical approbation of risk management methods and tools through a case study.</p> <p>The expected outcome of the expert panel is to promote the audience's understanding of mechanisms and plans of building risk-oriented business-processes.</p>
18.30-20.00	<b>Open lecture</b>
20.15	<b>Bus transfer to hotels</b>

Tuesday, April 16

7.30-8.00	<b>Bus transfer from hotels to venues</b>
8.00-9.00	<b>Gathering and registration of participants. Morning coffee</b>
9.00-18.00 Кофе-брейк: 11.00-11.30, 16.00-16.30  Обед: 13.00-14.00	<b>Strategic session “Human Resources for Digital Economy. <i>Technical Career Project</i>”</b> The strategic session is to be organized by UEC Venue: Social-Cultural Center (OKTs) (89 Tchkalova St) Moderator: to be defined.  <b>Digital Production</b> Moderators: - Nikolay N. Sokolov, Chief Process Engineer, UEC-Saturn. Contact details: +7 (961) 155-08-15, <a href="mailto:nikolay.sokolov@uec-saturn.ru">nikolay.sokolov@uec-saturn.ru</a> - Andrey A. Koryazhkin, Head of Development Shop, UEC-Saturn. Contact details: +7 (961) 155-01-95, <a href="mailto:andrey.koryazhkin@uec-saturn.ru">andrey.koryazhkin@uec-saturn.ru</a>  Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).  1. Modeling of edge cutting machining - Improvement or development of modeling systems capable to take into account the maximum amount of input data at the same time (profile model, progressive wear, cutting fluids, distortion, thermal processes etc) - Modeling of a machining process with advanced-design tools as well as consideration of the peculiarities of equipment used. 2. Modeling of special processes (electro-chemical machining, EDM, laser) - Development of individual modeling subsystems and systems considering the peculiarities of a specific machining method. - Integrated modeling capable to offer recommended machining modes as well as recommendations on tool selection. 3. Modeling of special processes (grinding, shot peening) - Development of dedicated modeling systems capable to take into account the maximum amount of input data at the same time. - Adaptation of current programs in order to create adequate process models 4. Optimization of control programs and adaptive processing - Modeling of machining processes with due account for physical processes, operating conditions and properties of machined material; - Computer-aided optimization of processes for different machining conditions; - Verification and introduction of a system with adaptive processing applied.  <b>Hybrid Electric Engine</b> The session is to be organized by UEC.  Moderator: to be defined.  Venue: Social-Cultural Center (OKTs) (89 Tchkalova St).

**Integration of Metal-Matrix and Ceramic-Matrix Composite Materials into a Gas Turbine Engine. Development of Reinforcing Components, a Matrix and a Manufacturing Process**

Moderators:

- Evgeny A. Bogachev, Head of Department, Kompozit JSC

Contact details: [eug-bogatchev@mail.ru](mailto:eug-bogatchev@mail.ru)

- Sergey A. Zavodov, Chief Metallurgist, Pilot Plant, UEC-Saturn.

Contact details: +7 (961) 155-07-12, [sergey.zavodov@uec-saturn.ru](mailto:sergey.zavodov@uec-saturn.ru)

- Svetlana M. Sokolova, Specialist, Chief Metallurgist Department, Pilot Plant, UEC-Saturn, +7 (961) 155-16-54, [svetlana.sokolova@uec-saturn.ru](mailto:svetlana.sokolova@uec-saturn.ru)

Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

Description

Key problems in the generation of composite materials: no facilities for the production of strengthening reinforcing fibers and their low mechanical properties. Currently the development and manufacture of new oxidation-resistant fibers SiC, SiCN, BN, Al<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub> should be reckoned as basic critical technologies.

**Advanced Finishing Technologies for Metals and Alloys**

Moderators:

- Sergey A. Lokhov, Chief Process Engineer, Pilot Plant, UEC-Saturn.

Contact details: +7 (961) 155-88-78, [sergey.lokhov@uec-saturn.ru](mailto:sergey.lokhov@uec-saturn.ru)

- Vladislav V. Pleshkun, Deputy Chief Process Engineer, Pilot Plant, UEC-Saturn.

Contact details: +7 (961) 155-21-44, [vladislav.pleshkun@uec-saturn.ru](mailto:vladislav.pleshkun@uec-saturn.ru)

Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

Ways of reaching the required quality level (roughness, dimensional accuracy, micro defects) for the superficial layer of internal and external structural elements of Gas Turbine Engine parts.

**New Solutions in Additive Manufacturing**

Moderators:

- Denis V. Fedosseev, Deputy Chief Engineer, Pilot Plant, Additive Technologies, UEC-Saturn.

Contact details: +7 (4855) 326-231, [denis.fedosseev@uec-saturn.ru](mailto:denis.fedosseev@uec-saturn.ru)

- Denis S. Podsoblyaev (AB-Universal).

Contact details: +7 (495) 380-05-15, [rp@abuniversal.ru](mailto:rp@abuniversal.ru)

Venue: Social-Cultural Center (OKTs) (89 Tchkalova St).

New solutions in large-size molding, speed molding, colloid jetting (binder jetting, nanoparticle jetting), customized solutions – advantages and disadvantages, level of technological availability, materials used.

**Manufacture of Polymer Composite GTE Parts**

Moderators:

- Vitaly A. Krupennikov, Leading Process Engineer, UEC-Saturn.

Contact details: +7 (920) 656-06-11, [vitaliy.krupennikov@uec-saturn.ru](mailto:vitaliy.krupennikov@uec-saturn.ru)

- Pavel A. Khilov, Leading Specialist, UEC-Saturn.  
Contact details: +7 (930) 120-46-10.  
Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

Issues to be discussed: import substitution of polymer composite materials as well as auxiliary materials (film adhesive, foaming adhesive, erosion-resistant film, sealant, putty etc), manufacturing methods of thermoplastic polymer composite parts, heat treatment of crystallizable thermoplastic polymer composites, inspection of internal structure).

### **Development of Thermal Barrier Coating Systems Efficient at Temperatures up to 1 400 °C**

Moderators:

- Aleksey M. Sassarin, Acting Head of Laboratory and Production Facility, UEC-Saturn.

Contact details: +7 (961) 155-45-95, [aleksei.sasarin@uec-saturn.ru](mailto:aleksei.sasarin@uec-saturn.ru)

- Mikhail A. Shevtsov, Process Engineer, UEC-Saturn.

Contact details: +7 (910) 977-39-13, [zhivi.dolgo.shevtsov@mail.ru](mailto:zhivi.dolgo.shevtsov@mail.ru)

Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

### **Smart Preproduction Engineering for Industrialization of New Products**

Moderator: Sergey Yu. Denissov, Deputy Chief Engineer, Preproduction Engineering, UEC-Saturn

Venue: Rybinsk Soloviev State Technical University (2 Plekhanova St).

Description

- Application of a special-purpose business software for the planning and budgeting of Preproduction Engineering processes within UEC.
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### **Digital Factory. Digital Twins of Gas Turbine Engines (GTE)**

Moderator:

Pavel V. Makarov, Deputy General Designer, Strength, Technical Expertise and Certification, Salut, UEC, Candidate of Engineering Science.

Contact details: +7 (499) 785-88-89, +7 (985) 295-84-85, [makarov-pv@salut.ru](mailto:makarov-pv@salut.ru)

Venue: Social-Cultural Center (OKTs) (89 Tchkalova St).

Description

- "road map" aimed at developing the Digital GTE Twin elaboration and improvement technology for a future period comprehensible to session attendees;

- approaches to the establishment of a common corporate standard for the elaboration and improvement of a Digital GTE Twin;

- proposals for the application of the Digital GTE Twin technology for purposes of armament, military and special-purpose products.

### **GTE Life Cycle Reliability Management**

The session is to be organized by UEC

**The event is to be attended by United Engine Corporation companies only.**

Moderator:

Sergey V. Sarychev, Safety and Reliability Expert, UEC-Saturn.

Contact details: +7 906 638-39-23, [sergey.sarychev@uec-saturn.ru](mailto:sergey.sarychev@uec-saturn.ru)

Venue: to be defined.

Description

Improvement of the reliability management system used for engines released in the RF. Industry guidelines and methods. Issues of unifying the organizational chart of reliability subdivisions in industry companies. End-to-end risk management system for GTE Life Cycle. Fail-safe analysis and forecasting at the stage of type certification (implementation of FMECA, FMES, FTA, CCA processes). GTE fleet operation models. Implementation of the FRACAS procedure during GTE fleet Life Cycle. Experience and development prospects. Generation of a common information space at UEC to share GTE safety and reliability information.

### **Development of Children' and Teenagers' Engineering Competences**

The session is to be organized by the Rybinsk Administration.

Venue:

- Derunov School No.12

- School No.30/Pre-school educational institution No.113

- Rybinsk Technical Creativity Centre / State institution of children's extended education in the Yaroslavl Region "Quantorium-76"

Description

- educational environment to meet vocational guidance challenges and to solve human resources problems;



	<ul style="list-style-type: none"> <li>- improvement of the organization, quality and effectiveness of vocational guidance work through the integration of activities of different educational entities and the work of coordination boards of local authorities;</li> <li>- ensuring the optimum development level for individual peculiarities of children motivated to acquire polytechnic knowledge through the organization of industry-specific training, development of pre-professional classes;</li> <li>- a senior pupil's pre-professional path: solving project problems of high-technology production;</li> <li>- creation of an environment to put children's creative concepts and technical initiatives into practice from a preschool age;</li> <li>- from hobby to occupation: development of students' engineering competences through the cooperation of educational and industrial institutions.</li> </ul>
<b>18.40</b>	<b>Bus transfer to hotel</b>

**Wednesday, April 17**

<b>10.00-11.00</b>	<b>Closing meeting</b> Debriefing
<b>11.00-11.30</b>	Coffee break
<b>11.30-13.00</b>	<b>Tour of Rybinsk</b>
<b>13.30-17.00</b>	<b>Tour of UEC-Saturn</b>

**The program to be confirmed**