



# PRESIDENT'S ADDRESS



**Dr. LEONID ZILBERBURG,**  
President

## Dear Colleagues!

**Bee Pitron** is a Russian leading scientific industrial and engineering enterprise founded in 1992 for introduction of world high technologies into the national industry. Later on it transformed into international group of companies able to provide an engineering service based on deep technical knowledge, IT-expertise and PLM-competences all over the world.

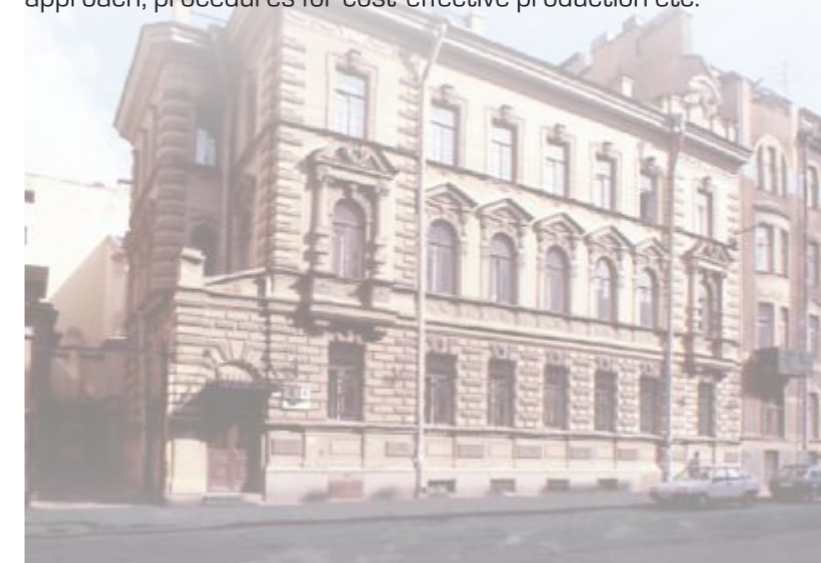
Having started with implementing 3D-systems for design and preparation of production facilities, Bee Pitron has mastered technologies for electrical equipping of sophisticated complexes and systems based on the state-of-the-art solutions of the leading world and national companies. Now the partners of our company are the recognized world leaders such as TE Connectivity, Nexans, Amphenol, Glenair, Adaptaflex, E-T-A and many others. Electrical interconnections are developed and designed at the captive design bureau, and the products are manufactured by qualified personnel at the production workshops fitted with up-to-date tools and equipment.

**Bee Pitron** has accumulated a considerable experience in developing, prototyping and delivery of production sets of electrical interconnections; and the company has significantly expanded a circle of its partners and suppliers. The captive design bureau is capable of implementing board interconnect system up to the world standard of research and development with use of advanced techniques of design, simulation and engineering analyses.

**Bee Pitron** provides for supplying and implementation of information technologies at all stages of product life cycle for research institutes, design bureaus and enterprises of various industries and construction sector.

Among our company's customers there are above 300 enterprises of Russia, Ukraine, Kazakhstan, Uzbekistan, Israel, Estonia and Germany.

**Bee Pitron** has experience in development and implementation of large-scale system projects for strategic development of industry groups and individual companies. Our company has resources and experience for keeping projects of modern engineering centers, enterprises reengineering, implementing process and design approach, procedures for cost-effective production etc.



**1992** – founding Bee Pitron engineering company

**1995** – signing agency contract with Raychem Electronics as a leading company for the time being

**2000** – commencement of own production

**2006** – FSB, FAR and ISO 9001 licenses obtained

**2008** – harness assembly shop opened in Vyborg

**2010** – FSA (space agency) license obtained

**2011** – FS licenses on government defense order and second supplier certificate obtained

**2012** – celebrating 20th anniversary of Bee Pitron company



# INDUSTRIES AND CLIENTS



**Aviation**



United Aircraft Corporation, JSC



**Helicopters**



Russian Helicopters, JSC



**Heavy-duty machinery**



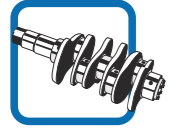
GAS Group, JSC



**Railway transport**



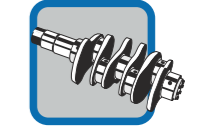
Transmashholding, JSC



**Engine building**



United Engine Corporation, JSC



**Shipbuilding**



United Shipbuilding Corporation, JSC



**Telecommunications and data transmission**



KRET (Concern Radio-Electronic Technology), JSC



**Aerospace**



Roscosmos, Russian Federal Space Agency



**Oil and Gas**



Gazprom, JSC  
LUKOIL, JSC



**Nuclear waste utilization**



Rosatom, State Atomic Energy Corporation  
AESK, Atomic Energy and Building Corporation



**Automotive**

General Motors Company  
Nissan Manufacturing Rus, LLC





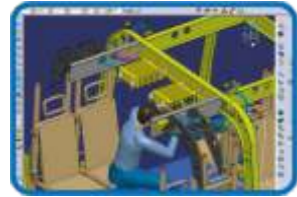
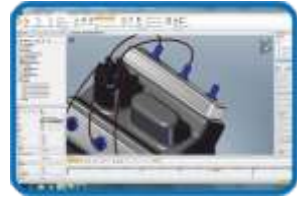
electrical interconnects and data transmission lines for any sophisticated systems

## INTERCONNECT

Comprehensive computer-aided design and manufacturing system for interconnect development



- ▶ Digital model of interconnect system provides integration of harness electrical circuit and its design with reference to object design
- ▶ Automated test of electrical connections, harness topology, design solutions minimizes the risk of manufacturing errors
- ▶ The extendable components library provides the initial data for calculation of weight, diameters of harness branches, amount of consumables and factory labor consumption
- ▶ Annotations of the design and engineering documents are configurable to be complaint to the GOST national standards and company standards
- ▶ Special integrated module for RAMS- (Reliability, Availability, Maintainability and Safety) analysis
- ▶ Interconnect supports design process planning and management, offers configurable integration with project management, ERP-, and MRP-systems



Method I

Harness design based on available topology and electrical diagram

Method II

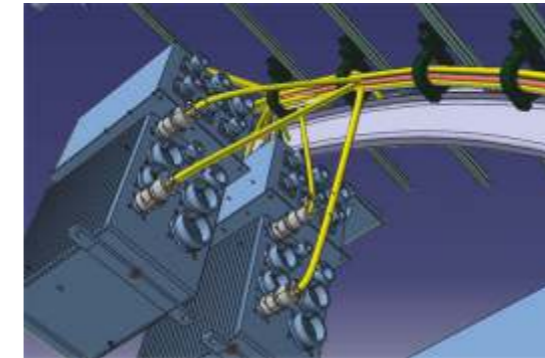
Development of harnesses based on 3D model of the frame, equipment layout and electrical schematic diagram

Method III

Complex interconnect system development and harness design from a 3D product mock-up and its functional diagram

## COLLABORATIVE INTERCONNECT DESIGN

Using of Bee Pitron's design and engineering facilities



- ▶ Developing a digital mock-up based on detailed design documents, its verification and correction
- ▶ Selecting electrical wiring harness and cable assemblies routes on a structural 3D model of the frame
- ▶ Dividing into harnesses based on electrical schematic diagrams
- ▶ Selecting materials compliant to engineering and design requirements
- ▶ Developing a 3D model of interconnection
- ▶ Issuing design and manufacturing documentation

## END-TO-END DESIGN SYSTEM

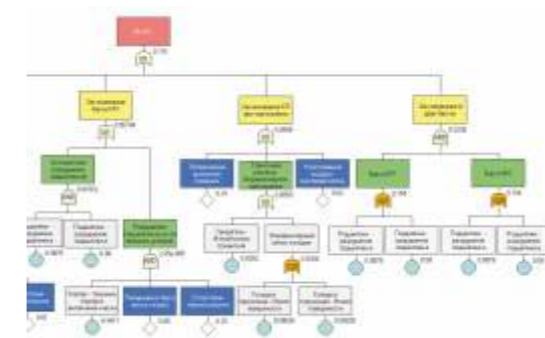
Between design bureaus and production facilities



- ▶ Equipping the work places with CAD/CAM/CAE and PLM software solutions
- ▶ Implementation of integrated digital environment for product lifecycle management
- ▶ Development of standard design procedures and process reengineering
- ▶ Standards and technical documentation execution
- ▶ Technical and information support of engineering processes

## RELIABILITY

RAMS/LCC: integrated reliability analysis and lifecycle cost management



- ▶ RAMS (Reliability, Availability, Maintainability and Safety) analysis for complicated engineering systems, identifying failure patterns
- ▶ LCC (Life Cycle Cost) calculation – evaluation of full cost for production, acquisition and operation of product to choose optimal solutions at any stage of the life cycle

CATIA  
ENOVIA

A.L.D.

1C  
ФИРМА "1С"

see electrical  
harness



## Advanced technologies of on-board interconnection

**HF assemblies** with very low attenuation, phase stable assemblies  
**Data buses** as per Can Bus and Mil-STD-1553 standards  
**Data transmission lines** as per Fibre Channel and Ethernet standards

**Assemblies** based on single-mode and multimode optical fiber  
**Receiving and transmitting modules**

### Cable Assemblies

**Harness sealing** with heat-shrinkable components by TE Connectivity

**Electromagnetic compatibility** by filtering connector contacts and wraparound cable shielding with metal braid

### Electrical Harnesses

**Mechanical protection** against cuts and wear by braiding with different threads and stainless wire, as well as conduits of light and strong materials

**Harness weight and overall dimensions reduction technologies**  
Using of up-to-date materials reduces cable size, so the harness with the same functions is more compact and light

**Flat cables braiding**  
Wires and cables of various diameters are bound with capron, aramid and tinsel threads at Bee Pitron workshop

### Flat Cables

**Rectangular connectors**  
Various wires can be terminated in connectors by flat cables





# MANUFACTURING

electrical harnesses, cable assemblies  
and digital data transmission lines

## PROTOTYPING AND SERIAL PRODUCTION

Development and manufacture of electrical harnesses  
and cable assemblies



- Harnesses mocking up
- Automatic and semi-automatic wire processing systems
- Automated check of harnesses mounting ("gold harnesses" testing)
- Manufacture of data bus modules (MIL-STD-1553 compliant)
- Manufacture of fiber-optic cable assemblies, receiving and transmitting modules, splitters for WDM systems
- Development of electrical distribution units

## ADVANCED TECHNOLOGY TRANSFER

Interconnection manufacturing and testing



- Harness and data lines manufacturing process engineering
- Selecting and supplying tools and equipment for designated technology implementation
- Supply of prefabricated assembly kits
- Personnel trainings in handling advanced materials, equipment, and software
- Development of interactive instructions to install and operate on-board interconnections

## LOCALISATION

Development of hardware under the import substitution program



- New extra flexible power cables
- Lightning protection systems and components
- Optical components and modules
- Specific combined connectors
- Shielding and protective braids, overmolding
- UHF cables (assemblies) and phase stable cable assemblies
- On-site automated interconnection testing tools

## TESTS AND SPECIAL MEASUREMENTS

Electrical interconnections and data transmission lines



- Testing the data transmission lines as per "eye diagram" and bit error value within a frequency range of up to 3 GHz
- Measurement of S-parameters of RF cable assemblies within a frequency range of up to 18 GHz
- Measurement of electrical and magnetic fields intensity within a frequency range of 5 Hz – 3 GHz
- Testing the cable systems for compliance with 6th category (TIA-568-B)
- Testing the data transmission lines for compliance with MIL-STD 1553
- Measurement of attenuation and making reflectograms of fiber-optic data lines
- Harness lightning protection monitoring

## ON-SITE SERVICES



- Installation of electrical wire harness assemblies at customer's site
- Integration of wiring into interior structures and harness modification
- Harness assemblies maintenance, repair and upgrade
- On-board cable system testing





# SUPPLIES

components, materials and equipment for electrical harnesses manufacturing

	<b>Wires and cables</b>		
	<b>Cable protection systems</b>		
	<b>Connectors</b>		
	<b>Connector accessories</b>		
	<b>Electrical interconnect products</b>		
	<b>Circuit breakers, relays</b>		
	<b>Identification</b>		
	<b>Harness accessories</b>		
	<b>Adhesives and sealants</b>		
	<b>Tools and equipment</b>		

# PARTNERS

We are proud of long-term and reliable relations with our partners – the best manufacturers of electrical hardware



# CERTIFICATES AND LICENSES

Contacts:



License for development of aviation equipment



License for production of aviation equipment



License for space activities



ISO 9001 certificate



Dassault Systemes authorisation letter



A.L.D. (Advanced Logistics Development) authorisation letter

ST.-PETERSBURG

191014

4, Vilensky Lane, RUSSIA

tel.: +7(812) 740-1800

fax: +7(812) 272-3869

WWW.BEEPITRON.COM

MOSCOW

105082

5, B.Pochtovaia, RUSSIA

tel.: +7(495) 601-9373

fax: +7(495) 601-9372

WWW.BEEPITRON.COM