

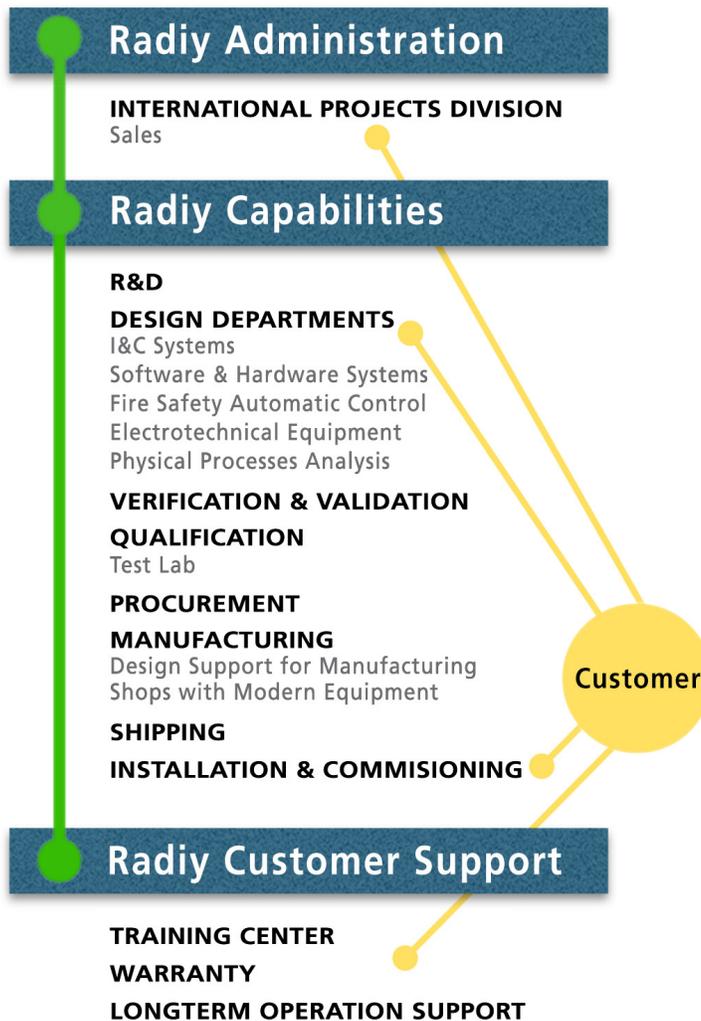


RadICS Platform



High Quality Development, Manufacturing and Delivery

The RadICS Platform is robust, flexible, and scalable. It provides state-of-the-art functions, services, and safeguards for both safety and non-safety applications in the nuclear industry. The RadICS Platform components are designed to the latest IEC standards for safety-related service and the highest classified nuclear systems. The RadICS Platform consists of a Logic Module, basic input/output modules, and specialty modules all housed in a seismically qualified chassis.



Research & Production Corporation (RPC) Radiy is a leading Ukrainian designer and supplier of advanced I&C systems for NPPs. RPC Radiy has a broad range of technical capabilities and high degree of vertical integration: design, procurement, manufacturing, testing, and installation support. RPC Radiy is the designer and manufacturer of the RadICS Platform equipment. The RPC Radiy Quality Management System (QMS) governs the design and manufacture of the RadICS Platform equipment. The RPC Radiy QMS is based on ISO 9001:2015.

Radiy Quality Management System (QMS)

- ◆ Between 1994 and 2003, Radiy developed and implemented a QMS that conformed to the requirements of ISO 9000 series standards
- ◆ In February 2004, Radiy passed the certification audit by the Ukrainian State Agency, which certified compliance with requirements of national standard DSTU ISO 9001- 2001.
- ◆ In 2009, Radiy introduced an updated QMS that aligned with 10 CFR Part 50, Appendix B, and ASME NQA-1-2008 to prepare for a broader international presence.

International Quality Program Reviews

- ◆ In January 2005, the QMS was certified in the International Certification System by TÜV Rheinland InterCert for compliance with requirements of international standard ISO 9001:2008. The certificate was updated by TÜV Rheinland InterCert in 2013. The certificate's scope included design, manufacturing, installation, and maintenance of instrumentation and control systems and the fire alarm system, including systems and equipment important to safety for nuclear power plants.
- ◆ OPG audited Radiy's quality program on 27-Feb – 07-Mar-2019. The purpose of the audit was to establish the extent to which the quality program is implemented and the effectiveness of it. The scope of the audit was for Reverse engineering, design and manufacturing of printed circuit boards, chassis, power supplies and cabling, and associated spare parts.
- ◆ The audit was conducted to the requirements of CSA Standard N299.2-16 Quality assurance program requirements for the supply of items and services for nuclear power plants, Category 2. In 2014, the RPC Radiy QMS was assessed by Hungarian nuclear utility MVM Paks Nuclear Power Plant. The audit concluded that RPC Radiy is in full compliance with requirements to perform work for I&C systems and components classified into safety categories 2 and 3.
- ◆ In 2015, Radiy started work with ISO Ingenierie to align Radiy's platform and applications against regulatory requirements in France.
- ◆ In 2016, Global Quality Assurance, Inc. (GQA) completed a third-party evaluation to assess the adequacy of the Radics Quality Assurance Program documents for meeting 10 CFR Part 50 Appendix B and 10 CFR Part 21.
- ◆ In 2016, the QMS was certified by Quality Austria for compliance with requirements of international standard ISO 9001:2015.

Radiy Corporate Values

Responsive to customers needs & following regulatory requirements

Adapting to evolving technologies & market demands

Dedicated to continuous Improvements

Integrated in global nuclear community by exchanging experience

Creating values for our customers in the process of day-to-day operations

Supporting each other to achieve strategic objectives of the company

International Technical Reviews

The RadICS Digital I&C Platform that was certified by exida as an IEC 61508 SIL 3 capable digital I&C platform intended for nuclear safety applications. This certification by qualified third-party certification agency that the Radics product has been designed and developed in accordance with the IEC standard, verified that a rigorous process was used for the hardware and software design, as well as, the manufacturing and quality control processes.

Radics LLC Organization

Radics is a wholly owned LLC established in 2012. Radics LLC is a leading provider of advanced digital instrumentation and control systems and services for nuclear industry at the global market. The company's business focus is the design and delivery of I&C systems for NPPs using the RadICS Platform equipment for international markets. Radics LLC team is committed to provide advantageous digital instrumentation and control solutions to our customers, ensuring safety performance of nuclear facilities

The Radics Quality Assurance Program Description (QAPD) governs the system design, integration, and delivery of I&C systems for nuclear power plants using the RadICS Platform equipment. Radics QAPD is based on 10 CFR Part 50 Appendix B and ASME NQA-1-2008 and the NQA-1a-2009 Addenda, as endorsed by NRC Regulatory Guide 1.28.

Radics LLC Quality Implementation

In 2015, Radiy started work with GQA to fully align Radics LLC QMS, implementing procedures, and training with 10 CFR Part 50, Appendix B, and ASME NQA-1- 2008/NQA-1a-2009 in preparation for submittal of the RadICS Platform Topical Report to NRC. The GQA third party audit completed in the third quarter 2016.

Radics LLC staff has been trained and certified on the following topics:

- ◆ Internal/external auditing topics and techniques
- ◆ Organization safety culture, root cause determination and problem-solving techniques
- ◆ Means to identify and deal with counterfeit, fraudulent, suspect items
- ◆ Commercial grade item dedication

Equipment Qualification and Commercial Grade Dedication

Environmental qualification testing of the RadICS Platform Qualification Test Specimen performed in accordance with:

- ◆ Regulatory Guide 1.209 and IEEE Standard 323-2003
- ◆ Regulatory Guide 1.152, Revision 3, and IEEE Standard 7-4.3.2-2003
- ◆ EPRI TR-107330

Seismic qualification testing performed in accordance with Regulatory Guide 1.100 and IEEE Standard 344-1987 to the generic seismic spectra provided in EPRI TR-107330.

Electromagnetic compatibility qualification testing performed in accordance with Regulatory Guide RG 1.180, Revision 1.

Commercial Grade Dedication (CGD) for RadICS Platform based on established guidance:

- ◆ EPRI TR-106439 for the CGD of the platform
- ◆ EPRI TR-107330 for the equipment qualification tests

Maintenance of RadICS Platform commercial dedication (required by IEEE 7-4.3.2 Section 5.4.2.3) is accomplished by Radics LLC QAPD certified to meet 10 CFR Part 50 Appendix B requirements.

Qualification testing of the RadICS Platform Test Specimen used to support CGD. EPRI TR-107330 used to define the qualification test methods and the critical characteristics to demonstrate acceptable performance during the tests. Testing demonstrates that the RadICS Platform functioned correctly during and after exposure to the series of stress tests outlined in EPRI TR-107330.

In 2019, the U.S. Nuclear Regulatory Commission approved the RadICS I&C Platform for use in safety-related systems in nuclear power plants.

For more than 20 years Radiy has provided advanced instrumentation and control (I&C) solutions for nuclear power plant modernization and new build projects in the global market. Radiy's main I&C product, the RadICS I&C Platform, was developed specifically for use in nuclear power plants. It is the only FPGA-based I&C platform with a SIL 3 certification in a single channel configuration. Radics, a wholly owned LLC, provides delivery services for the RadICS I&C Platform for international markets to meet local regulatory requirements. Radiy also offers industrial control systems, electrical equipment, and reverse engineering services.



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