

CV - detailed, 2026.004

Name: Antanas Romas
 Title: Simulation and Nuclear Engineer (Specialist)
 Birthdate: 1973-01-23
 Telephone: +46 760 212 640
 Email: Antanas.Romas@antranova.se



Summary

Experienced and multidisciplinary simulation and nuclear power engineer with specialist expertise in reactor physics, thermal-hydraulics, reactor safety and advanced model development. Has developed almost all 3D reactor models used in Sweden's full-scope simulator fleet for BWR and PWR facilities, with roles as technical lead architect, project manager and model developer. Technical architect behind several innovative simulation solutions, such as RDV visualization, MCS2SIM methodology and automated V&V. Used to working in multidisciplinary teams with a focus on technical accuracy, educational efficiency and regulatory compliance. Solid programming experience and documented ability to lead complex development projects from idea to implemented solution. Uses AI tools and language models as an integrated support in analysis, model development, documentation, troubleshooting and automation - with a focus on efficiency, quality enhancement and knowledge transfer. With a rare combination of deep technical expertise, proven project management skills and educational insight, I deliver simulation solutions that unite safety, efficiency and learning.

Competence profile

- Reactor Physics and Thermohydraulic Modelling (RELAP5-3D, S3R, SIMULATE-3, MAAP5, TRACE)
- Full-scope simulators (GSE: SimExec/JADE, L3-HARRIS: Orchid, WSC/CW: 3KeyMaster)
- Probabilistic and Deterministic safety analysis (RELAP5-MOD, TRACE and RiskSpectrum)
- Development of advanced tools (RDV, MCS2SIM, V&V)
- Programming and engineering modelling
- AI usage in analysis, documentation and engineering modelling

Employment history

Year	Employer	Position
2026 - present	Antranova Engineering AB	Founder and Specialist Engineer
2015 - present	KSU/Vattenfall AB (VPS/KSU)	Simulation and Nuclear Power Engineer (Specialist)
2009 - 2015	GSE Power Systems AB	Simulation and Nuclear Power Engineer (Specialist)
2005 - 2009	LearningWell AB	Simulation and Nuclear Power Engineer (Specialist)
2000 - 2005	ES-konsult AB	Specialist in nuclear engineering, analysis and consulting
1995 - 2000	KTH, Royal Institute of Technology	Researcher, Nuclear Safety Analyst

1994 - 1995	Ignalina Nuclear Power Plant	Summer trainee in reactor operations (part of engineering studies)
-------------	------------------------------	--

Education

Year	Institution	Obtained degree/diploma
Oct/95 - May/00	KTH Royal Institute of Technology, Stockholm, Sweden	Lic. Eng. Licentiate of Engineering in Nuclear Power Safety, Dissertation: <i>Development, Validation and Application of an RBMK Reactor Physics Capability at KTH</i>
Sep/91 - Jul/95	KTU Kaunas University of Technology, Kaunas, Lithuania	B.Sc. Bachelor's Degree in Mechanical Engineering with a specialization in Nuclear Engineering
Sep/88 - Jun/91	Gymnasium, Šilalė, Lithuania	

Language competence

Language	Understanding	Speak	Writing
Lithuanian	Mother tongue	Mother tongue	Mother tongue
Swedish	Fluent	Fluent	Very good
English	Fluent	Fluent	Very good
Russian	Fluent	Very good	Good

IT competencies

Designation	IT competencies
Operating system:	Windows, UNIX, Linux
Programming language:	FORTRAN, VBA, Python, Java
Office Software:	Expert Users, VBA Programming
Technical Software:	CASMO, HELIOS, SIMULATE, ARROTTA, CORETRAN, PARCS, RELAP5, RELAP5-3D, TRACE, MAAP5, SNAP, RiskSpectrum, Matlab, Femlab, Scilab, EES, AptPlot, Orchid L3-HARRIS, SimExec, JTopmeret, RELAP5-HD, PSA-HD, DesignEP, Apros, Sketchup, 3KeyMaster, OpenModelica, DWSIM, FreeCAD, Jupyter Notebooks

Membership and community involvement

- **Member of Sveriges Ingenjörer** - the Swedish Association of Graduate Engineers (trade union for professional engineers), since 2001.
- **Swedish Nuclear Society (SKS)** - member of the national forum for professional exchange and development in peaceful nuclear technology.
- **Member of the Swedish Association of Response Engineers (Insatsingenjörernas Riksförbund IIR)** - a network for engineers with preparedness and response roles.
- **Member of the Swedish Civil Defence Association (Civilförsvarsförbundet CFF)** - a non-profit organization for civil crisis preparedness and total defence.
- **Volunteer in the Volunteer Resource Group (Frivilliga Resursgruppen FRG) Nyköping** - agreement with the Sörmland's Coast Rescue Service for support in community crises and special events.

Permissions and certificates

- **Driving licence** - AM, A1, A2, A, B, C1, C
- **Ski slope groomer operator**: *Certificate of Training* No. U 066-4 (issued by SLAO 2011-03-01)

Portfolio of reactor model projects - technology, role and client

Reactor/Simulator/Year	Technology and Calculation Software	Role	Client/Country
------------------------	-------------------------------------	------	----------------

Oskarshamn-1 <i>O1-FSIM, 2011</i>	HDS: 1×RELAP5-HD, S3R, SIMULATE-3, RDV1	Project Manager, Specialist Developer	OKG/KSU, Sweden
Oskarshamn-2 <i>O2-FSIM, 2008</i>	RT: 1×RELAP5-RT, S3R, SIMULATE-3, RDV1	Specialist maintenance, modifications	OKG/KSU, Sweden
Oskarshamn-3 <i>O3-FSIM, 2020</i>	HDS: 1×RELAP5-HD, S3R, SIMULATE-3, RDV1	Project Manager, Specialist Developer	OKG/KSU, Sweden
Forsmark-12 <i>F12-FSIM, 2022</i>	HDS: 1×RELAP5-HD, S3R, SIMULATE-3, RDV1	Project Manager, Specialist Developer	FKA/KSU, Sweden
Forsmark-12 <i>F12-HSIM, 2016</i>	HDS: MAAP5.03/5.05 standalone	Project Manager, Specialist Developer	FKA/KSU, Sweden
Forsmark-3 <i>F3-FSIM, 2022</i>	RT: 1×RELAP5-RT, S3R, SIMULATE-3	Specialist maintenance, modifications	FKA/KSU, Sweden
Ringhals-1 <i>R1-FSIM, 2010</i>	HDS: 1×RELAP5-HD, S3R, SIMULATE-3, RDV1	Project Manager, Specialist Developer	RAB/KSU, Sweden
Ringhals-2 <i>R2-FSIM-HSIM-I, 2013</i>	HDS: 2×RELAP5-HD, S3R, RDV1, GARDEL/SIMULATE-3, MAAP5.01 Integrated	Project Manager, Specialist Developer	RAB/KSU, Sweden
Ringhals-3 <i>R3-FSIM, 2017</i>	HDS: 2×RELAP5-HD, S3R, RDV1, GARDEL/SIMULATE-3	Project Manager, Specialist Developer	RAB/KSU, Sweden
Ringhals-3, upgraded <i>R3-FSIM-HSIM-I, 2024</i>	HDS: 2×RELAP5-HD, S3R, RDV1 and RDV2, GARDEL/SIMULATE-3, MAAP5.05 Integrated	Specialist Developer	RAB/KSU, Sweden
Ringhals-3 <i>R3-HSIM-F, 2025</i>	HDS: MAAP5.05 standalone, RDV2	Specialist Developer	RAB/KSU, Sweden
Ringhals-4 <i>R4-FSIM, 2018</i>	HDS: 2×RELAP5-HD, S3R, RDV1, GARDEL/SIMULATE-3	Project Manager, Specialist Developer	RAB/KSU, Sweden
Borssele <i>D53-FSIM, 2014</i>	HDS: 1×RELAP5-HD, S3R	Lead specialist and sub-developer	EPZ/KSG, Germany/Netherlands
D43, D45, D46 <i>D43, D45, D46-FSIM, 2014</i>	HDS: 2×RELAP5-HD, S3R	Specialist Consultant	KSG, Germany
Gundremmingen <i>S2-FSIM, 2012</i>	HDS: 1×RELAP5-HD, S3R	Specialist Consultant	KSG, Germany
Tokai, <i>Tokai-2-FSIM-HSIM, 2010</i>	HDS: 1×RELAP5-HD, REMARK, MAAP4	Lead specialist and sub-developer	JAPC, Japan
Tsuruga <i>Tsuruga-2-FSIM-HSIM, 2010</i>	HDS: 2×RELAP5-HD, REMARK, MAAP4	Lead specialist and sub-developer	JAPC, Japan
JMTR <i>JMTR-FSIM, 2012</i>	HDS: 1×RELAP5-HD, REMARK	Specialist Developer	JMTR, Japan

Explanation: **FSIM/FSS** - full-scope simulator, **HSIM** - severe accident simulator, **HSIM-I** - integrated severe accident simulator into FSIM, **HSIM-F** - stand-alone severe accident simulator, **Specialist Developer** - architect of the reactor model, fully developed using own methodology and proprietary development tools.

Innovation portfolio - technical solutions and method development

Innovation	Year	Description
<i>RBMK Neutron Cross-Sectional Library for ARROTTA</i>	1997	Designed a custom neutron cross-sectional library for RBMK reactors, fully compatible with the ARROTTA code. This enabled for the advanced RBMK analysis using Western computational tools outside the former Soviet sphere. Previously, only the Russian tool STEPAN was available for this purpose.
<i>Financial monitoring tool (Excel, 12-month rolling forecast)</i>	2003	Designed a dynamic follow-up tool in Excel for 12-month rolling financial forecasts. The tool improved forecast accuracy, identified early deviations and provided decision support for corrective actions in the company's performance management.
<i>Tools for automated RELAP5 input generation</i>	2003	Developed an application for automated generation of RELAP5 input files, with system nodalization tailored for water hammer calculation fidelity. The application includes automatic creation of force calculation definitions using RELAP5's "Control Variables" in

		all relevant components. In addition, all the necessary data for post-processing were generated with AptPlot, which enables efficient and reproducible analysis of dynamic loads.
<i>RDV-1: Real-time Simulation Visualization Algorithm</i>	2005	Invented and implemented <i>RDV-1</i> , an algorithm for real-time visualization of simulations in full-scope simulators. The algorithm enables graphical presentation of calculated field variables in dynamically changing component models. <i>RDV-1</i> formed the basis for the standardized visualization tool Real Data Viewer (RDV) used in Swedish nuclear power simulators.
<i>Code generator for HDS-BOP semi-automatic integration</i>	2009	Created a tool that semi-automatically generates FORTRAN code for efficient integration of BOP and HDS models into full-scope simulators. The solution simplified and accelerated the integration process between different model types within simulator platforms, reducing development time and increasing quality in model coupling.
<i>MCS2SIM: Methodology for integrating PSA results into full-scope simulators</i>	2013	Invented and developed <i>MCS2SIM</i> , a methodology that enables the integration of results from probabilistic safety analyses (PSA) directly into full-scope simulators. The method links PSA data to deterministic simulator events, enabling realistic verification of accident sequences and improving safety analysis and training. Used for R1, R2 and R3 at Ringhals (RAB/Vattenfall).
<i>Automated V&V module for full-scope simulators</i>	2016	Introduced a methodology and developed a tool for automatic verification and validation (V&V) of the simulator's scenarios. The solution ensured that the simulator systems meet the relevant ANSI/ANS standards and that no regressive or safety-critical errors are introduced during model updates - an important contribution to robust quality assurance in operator training.
<i>KSUSimLAB - library with educational reactor technology labs</i>	2025	Created <i>KSUSimLAB</i> , a library of standalone Part Scope Simulators for in-depth training of nuclear power specialists. The library contains pedagogically structured models based on principle simulators, stand-alone reactor models, RELAP5-based phenomenon simulations and interactive mini-simulators developed in Jupyter Notebooks.

Professional experience - detailed overview

Year	Enterprise	Description
2015 - present	KSU	Working with continuous quality improvements of full-scope simulators in operation at KSU, Sweden. Responsible for identifying, analyzing and addressing improvement needs in reactor models and other simulation modules. The work is conducted in close collaboration with multidisciplinary teams to ensure that the simulators meet high demands on technical accuracy, educational quality and operational reliability. Role: Specialist in reactor simulation. Client: KSU, Sweden.
2025	KSU	Developed training content for the BWRX-300 Global Training Program, Science Fundamentals. The work included the development of educational material in basic nuclear engineering subjects with a special focus on thermodynamics. I was responsible for structuring, formulating, and visualizing content explaining thermodynamic principles, component functions (such as turbines, pumps, heat exchangers, and condensers), as well as thermodynamic cycles relevant to the BWRX-300 reactor. The material was designed to be educational, technically correct and adapted for global use in digital learning environments. Role: Content Developer. Client: GE Hitachi (GEH), Sweden.
2025	KSU	Developed training packages and carried out retraining of instructors with a focus on reactor technology. Responsible for the development of training materials and part-scope simulators for instructor retraining in reactor physics and thermohydraulics. Created the <i>KSUSimLAB</i> application a library of part-scope simulators that strengthens the practical training of nuclear power personnel. Within the same framework, I developed a concept for mini-labs in reactor technology based on Python and Jupyter Notebooks. Conducted retraining of instructors in advanced reactor design, reactor physics, thermohydraulics and the use of the <i>KSUSimLAB</i> package. Role: Training Developer, Simulator Developer and Instructor for Trainers. Client: KSU, Sweden.
2025	KSU	Responsible for the implementation and operation of the GE Hitachi BWRX-300 Desktop Simulator at KSU in Nyköping. The work included technical adaptation, support and further development of the simulator environment for use in the global training program.

		<p>Role: Specialist in reactor simulation. Client: GE Hitachi (GEH), Sweden.</p>
2024	KSU	<p>Participated in the introduction of GE Hitachi (GE-H) and became certified to develop and implement the global training program for BWRX-300 and be responsible for managing the BWRX-300 Desktop Simulator in Sweden. The work included content development, technical adaptation and operational support for the simulator. Role: Certified Content Developer and Simulator Manager for the BWRX-300 program in Sweden. Client: GE Hitachi (GEH), Sweden.</p>
2024	KSU	<p>Enhanced the Ringhals-3 (R3) full-scope simulator by implementing automated simulation of severe accident scenarios. Developed simulation scenarios for validation of <i>Severe Accident Management Guidelines</i> (SAMG) and collaborated with RAB's Severe Accident Management Team and Westinghouse specialists to enable the implementation of specific R3-SAMG validations in the full-scope simulation graphical simulator (R3-GSIM). Role: Specialist in reactor simulations and severe accident analysis, responsible for the development of accident scenarios and simulator runs during live validation exercises in R3-GSIM. Client: RAB, Sweden.</p>
2024	KSU	<p>Upgraded Forsmark 1 (F1) full-scope simulator with new core cycle based on F1C44. The work included the implementation of updated neutron physical data and adaptation of the reactor model to reproduce cycle-specific core properties in a realistic and educational way. Role: Specialist in reactor simulation. Client: FKA/KSU, Sweden.</p>
2024	KSU	<p>Reviewed and further developed a digital training module in reactor physics to ensure technical correctness, pedagogical structure and user-friendliness. The work included content review, suggestions for improvement, and updating materials for increased training effectiveness. Role: Subject matter expert in reactor physics. Client: KSU, Sweden.</p>
2024	KSU	<p>Represented KSU at various marketing events, where I actively participated in discussions and communicated the organization's goals, offerings and technical competence to potential customers and partners. Conducted presentations with a special focus on highlighting KSU's simulator competence and development opportunities in education, technology and simulation. Role: Technical representative and ambassador for simulator competence. Client: KSU, Sweden.</p>
2023	KSU	<p>Benchmarked RELAP5-HD (KSU) and TRACE (RAB) against emergency shutdown (SCRAM) data in Ringhals-3. Conducted a benchmarking study of RELAP5-HD and TRACE simulations against actual measurement data from reactor SCRAM in R3 (Ringhals-3). The aim was to evaluate how well the simulation models reproduce emergency shutdown (SCRAM) processes, identify driving mechanisms and suggest and implement model improvements in the full-scope simulator. The results included improved understanding of the dynamics of SCRAM, especially in the steam generator systems, as well as introduced modifications that strengthened the educational value of the simulator for operator training. Role: Specialist in reactor simulation. Client: RAB/KSU, Sweden.</p>
2022 - 2025	KSU	<p>Developed advanced simulation models for severe accident simulations in the Ringhals-3 (R3) full-scope simulator and in a stand-alone severe accident simulator. The models were based on MAAP 5.05 and integrated into the SimExec simulation environment to enable realistic simulations of severe accidents. A modern, universal and flexible graphical user interface was developed in the project under the name RDV-2. The code for RDV-2 was developed by LearningWell, while I was responsible for the specification, functional design, testing, and conceptual design of its user interface. The software was designed as a generic tool for visualization of simulation data from different models and simulator platforms. Role: Specialist in reactor simulation and severe accident analysis. Client: RAB/KSU, Sweden.</p>

2022	KSU	<p>Upgraded the core model of the Forsmark 3 (F3) full-scope simulator to the CA11 equilibrium core with ATRIUM-11 fuel configuration. The work included implementing the homogenized ATRIUM-11 fuel configuration and updating the neutron physical data, to ensure that the simulator accurately reflects the behaviour of the reactor during the ATRIUM-11 fuel cycle.</p> <p>Role: Specialist in reactor simulation.</p> <p>Client: FKA/KSU, Sweden.</p>
2022	KSU	<p>Developed a concept for future educational methods by combining classroom teaching with individualized on-line training. The focus was on the development of online labs and part-scope simulations, with the aim of raising the level of the learning taxonomy and increasing pedagogical efficiency in technical education.</p> <p>Role: Specialist simulator developer.</p> <p>Client: KSU, Sweden.</p>
2022	KSU	<p>Worked on improvements to the reactor model for the D53 full-scope simulator (Borssele nuclear power plant, Netherlands). The focus was on increasing the accuracy of the reactor physics and thermohydraulics models to achieve increased realism in the simulator's response to normal operation, transient processes and accidents.</p> <p>Role: Consultant and specialist in reactor simulation.</p> <p>Client: EPZ/KSG, Germany.</p>
2021 - 2022	KSU	<p>Designed the 3D reactor model for the Forsmark-12 (F12) full-scope simulator. The model was developed using RELAP5-HD, S3R and SIMULATE-3 and was designed to accurately reproduce reactor dynamics in normal operation, transient processes and accident scenarios.</p> <p>Role: Project manager and specialist in reactor simulation.</p> <p>Client: FKA/KSU, Sweden.</p>
2021	KSU	<p>Developed a new generation of automated V&V capabilities for full-scope simulators at KSU. The system aimed to streamline and quality assure continuous verification against requirement specifications, ANSI standards and plant data.</p> <p>Role: Specialist simulator developer.</p> <p>Client: KSU, Sweden.</p>
2021	KSU	<p>Developed part-scope simulators for various applications, including stand-alone reactor models as well as visualization and modeling of BOP systems. The aim was to develop educational and cost-effective tools for operator training and technical analysis.</p> <p>Role: Specialist simulator developer.</p> <p>Client: KSU, Sweden.</p>
2020	KSU	<p>Designed FMT-Sim - a prototype of a plug-in for the full-scope simulator - for simulating the transport of contaminant solids in process systems connected to a nuclear reactor. The purpose of FMT-Sim is to provide an increased understanding of the impact of material transport on the systems' function and long-term reliability.</p> <p>Role: Specialist simulator developer.</p> <p>Client: OKG/KSU, Sweden.</p>
2020	KSU	<p>Upgraded F12HSIM - stand-alone severe accident simulator for Forsmark 1 and 2 - based on the MAAP code. Performed upgrade of the simulator's severe accident model from MAAP version 5.03 to 5.05, including customization of interfaces, model parameters and scenario management. The aim was to ensure continued technical relevance and to strengthen the simulator's capacity for analysis of severe accidents.</p> <p>Role: Specialist in reactor simulation.</p> <p>Client: FKA/KSU, Sweden.</p>
2018	KSU	<p>Upgraded the F2 core model to cycle F2C36 in the Forsmark 12 (F12) full-scope simulator. The work included implementing the current fuel configuration and updating neutron physical data to ensure that the simulator mirrors reactor cycle F2C36 with high accuracy.</p> <p>Role: Specialist in reactor simulation.</p> <p>Client: FKA/KSU, Sweden.</p>
2018 - 2020	KSU	<p>Developed the 3D reactor model for the Oskarshamn-3 (O3) full-scope simulator. Developed an advanced 3D reactor model for Oskarshamn-3 based on RELAP5-HD, S3R and SIMULATE-3. The model covers normal operating conditions, transient processes and accident scenarios, and was developed to enable realistic, high-resolution simulation for operator training</p>

		<p>and safety analysis. With the stand-alone O3 model, investigations were carried out that answered key questions such as (1) the cause of power spikes when restarting a 313 pump during power operation and (2) the impact on Fin, Grov and Hård measurements of the water level in the downcomer in the case of feedwater supply accident. The work resulted in in-depth analysis reports that gave OKG new insights into the plant's behaviour and contributed to increased safety in operations.</p> <p>Role: Project manager and specialist in reactor simulation and safety analysis. Client: OKG/KSU, Sweden.</p>
2018 - 2020	KSU	<p>Redesigned and improved the reactor model for the D53 full-scope simulator (Borssele Nuclear Power Plant, Netherlands). Implemented extensive improvements to the existing reactor model and its physics description to increase the accuracy and educational realism of the simulator. The work included adaptations to operating conditions, improved transient simulation and extended validation against plant data.</p> <p>Role: Specialist in reactor simulation. Client: EPZ/KSG, Germany.</p>
2018	KSU	<p>Analysis of level control in steam generators at start-up in Ringhals-4 (AREVA design). Conducted an in-depth analysis of the reasons why reactor operators in R4 had difficulties maintaining control of the water level in the steam generators during start-up. Using the R4 reactor model, the dynamics of the AREVA-designed steam generators was analysed, with particular focus on why the NR (Narrow Range) level exhibited delayed and difficult-to-interpret behaviour. The study resulted in a clear explanation of the underlying mechanisms and a recommendation to always use the WR (Wide Range) level measurement as the primary indicator during start-up. The work contributed to the development and implementation of an automated level control function based on the WR signal.</p> <p>Role: Specialist in reactor simulation. Client: RAB/KSU, Sweden.</p>
2017 - 2018	KSU	<p>Developed a 3D reactor model for the Ringhals-4 (R4) full-scope simulator. The model was designed with two instances of RELAP5-HD, along with S3R and GARDEL/SIMULATE-3, to cover the reactor's normal operation, transient progression, and accident dynamics. The aim was to create a realistic and pedagogically effective simulator for operator training and as support for safety analyses.</p> <p>Role: Project manager and specialist in reactor simulation. Client: RAB/KSU, Sweden.</p>
2017	KSU	<p>Improved and upgraded the 3D reactor model in the Ringhals-1 (R1) full-scope simulator. The work included quality improvements of the existing model with a focus on physical accuracy, numerical stability and pedagogical functionality. The improvements were aimed at increasing the simulator's usability for operator training and technical analysis.</p> <p>Role: Specialist in reactor simulation. Client: RAB/KSU, Sweden.</p>
2017	KSU	<p>Developed training materials and methodology to train instructors in the use of modern simulation and visualization tools. Conducted training according to the principle "Train-the-Trainer" to ensure that the instructors could effectively apply the tools in operator training. The focus was on the practical application of simulation platforms, visualization interfaces and pedagogical techniques.</p> <p>Role: Instructor trainer. Client: KSU, Sweden.</p>
2016 - 2017	KSU	<p>Developed a 3D reactor model for the Ringhals-3 (R3) full-scope simulator. The model was designed with two instances of RELAP5-HD, along with S3R and GARDEL/SIMULATE-3, to cover the reactor's normal operation, transient progression, and accident dynamics. The aim was to create a realistic and pedagogically effective simulator for operator training and as support for safety analyses.</p> <p>Role: Project manager and specialist in reactor simulation. Client: RAB/KSU, Sweden.</p>
2017 - 20__	BRF Mistletoe and samf. Kanntorp	<p>Steering board member and project & technical manager, BRF Misteln and the Kanntorp Community Association, Nyköping (since 2017).</p> <p>Responsible for planning, procurement, and execution of technical projects involving water and sewage systems, heating, electricity, ventilation, and property maintenance (residential buildings, garages, and environmental structures), as well as external infrastructure including snow removal. Leads projects from concept to operational status, including budgeting and financial follow-up for major investments. Also responsible for external communication through digital channels and the association's website: www.kanntorp.com.</p>

		<p>Role: Project and technical manager, board member. Client: BRF Misteln and Samfällighetsförening Kanntorp, Nyköping, Sweden.</p>
2016 - 2017	KSU	<p>Implemented the automated verification and validation system Automated Scenario Testing (AST) in the full-scope simulators for R1, R3 and R4. AST enables robust and operational verification against ANSI-standard test cases and validation using transient data from the actual nuclear power plants. The system ensures continuous quality assurance of simulator performance under a wide range of scenarios. Role: Specialist developer of V&V systems. Client: KSU, Sweden.</p>
2016 - 2017	KSU	<p>Developed training material for the course “Advanced Process Dynamics for BWR and PWR” and conducted training for staff from the Swedish Radiation Safety Authority (SSM). The course focused on dynamic system behaviour during normal operation, transients, and accident conditions in both boiling water reactors (BWR) and pressurized water reactors (PWR). The training aimed to strengthen participants’ understanding of reactor system responses and improve their ability to evaluate dynamic safety-related phenomena. Role: Project manager, specialist and instructor. Client: KSU, Sweden.</p>
2015 - 2018	KSU	<p>Developed various techniques for visualizing simulation models in full-scope simulators. The work focused on enhancing pedagogical effectiveness and user experience by introducing visual representations of dynamic processes and system behaviours. These improvements contributed to more intuitive and educationally valuable simulator interfaces. Role: Specialist simulator developer. Client: KSU, Sweden.</p>
2015 - 2020	KSU	<p>Invented and developed part-scope simulators, along with a methodology for cost-effective design using minimal resources. The purpose of the part-scope simulators was to facilitate and streamline learning of complex processes and phenomena through focused training on specific systems or processes. Role: Innovator and specialist in reactor simulation. Client: KSU, Sweden.</p>
2015 - 2016	KSU	<p>Designed the standalone Severe Accident Simulator F12HSIM for Forsmark-2 (F2), based on the MAAP 5.03 code integrated into the SimExec environment. The simulator was developed for advanced analysis and training in severe accident scenarios and is currently used by the accident management organization at Forsmarks Kraftgrupp AB (FKA). Role: Project manager and specialist in reactor simulation. Client: FKA/KSU, Sweden.</p>
2015 - 2016	KSU	<p>Upgraded the reactor models for Oskarshamn-1 (O1) and Ringhals-1 (R1) to full 3D reactor models. Implemented extensive enhancements to the physical modelling and dynamic response to improve the accuracy, realism, and pedagogical value of the simulators. These upgrades significantly strengthened the models’ ability to represent operational and transient behaviour. Role: Specialist in reactor simulation. Client: KSU, Sweden</p>
2014	GSE	<p>Trained engineers in Japan to enable the development of DesignEP and PSA-HD applications (based on MAAP5.01 in SimExec) for the simulation of serious accidents and severe accidents. The training aimed to build up domestic expertise in advanced severe accident simulation. Role: Specialist, instructor. Client: ORDC, Japan.</p>
2014	GSE	<p>Provided expert support to the Advanced Modelling Team (AMT) for quality improvement of reactor models in the full-scope simulators D43, D45, and D46. Consulted colleagues within the Advanced Modelling Team (AMT) and contributed with problem solving and quality improvement measures in the reactor models for D43, D45 and D46 full-scope simulators. The models were developed by AMT in Baltimore using RELAP5-HD and S3R, integrated into the SimExec simulation environment. My effort focused on transferring experiences and improvement strategies that were previously developed in Swedish simulator projects. Role: Specialist in reactor simulation. Client: KSG, Germany.</p>
2014	GSE	<p>Developed the first version of the 3D reactor model for the D53 full-scope simulator (Borssele Nuclear Power Plant, Netherlands). The model was developed using RELAP5-HD and S3R, integrated into the SimExec simulation environment.</p>

		<p>Role: Specialist in reactor simulation. Client: EPZ/KSG, Germany.</p>
2014	GSE	<p>Applied the MCS2SIM method for live safety studies of reactor units R1, R2 and R3. The analyses resulted in a report with identified technical risks, which was submitted to RAB. The method showed great potential for identifying and understanding serious security threats, and is considered to be particularly suitable for further development with AI technology. Role: Innovator, project manager and specialist Client: RAB, Vattenfall, Sweden</p>
2013	GSE	<p>Invented and developed MCS2SIM - an innovative method for safety analysis by applying PSA results in full-scope simulators. The method enables deterministic safety analysis (DSA) of potential accident sequences to identify latent safety threats before they lead to incidents or accidents. A pilot study was conducted using the Ringhals-1 (R1) simulator, which confirmed the method's potential. Role: Innovator, project manager and specialist. Client: RAB, Vattenfall, Sweden.</p>
2013	GSE	<p>Completed final implementation of the reactor models for Tsuruga-2 and Tokai-2 full-scope simulators. The models were developed using RELAP5-HD and REMARK. For the simulation of severe accident sequences, the MAAP4 code was integrated into the simulation environment. The work ensured that the models met the JAPC's requirements for accuracy, performance and educational relevance. Role: Specialist in reactor simulation. Client: JAPC, Japan.</p>
2011 - 2013	GSE	<p>Developed the 3D reactor model for the Ringhals-2 (R2) full-scope simulator. The model was designed using RELAP5-HD, S3R and GARDEL/SIMULATE-3 to cover the reactor's normal operation, transient and accident dynamics. For the simulation of accidents and severe accidents, the MAAP5 code was integrated. The purpose of the work was to create a realistic and pedagogically effective simulator for operator training and support for safety analysis. Role: Project manager and specialist in reactor simulation. Client: RAB/KSU, Sweden.</p>
2011 - 2012	GSE	<p>Developed reactor model for JMTR (Japan Materials Testing Reactor) full-scope simulator. The model was developed using RELAP5-HD and REMARK and is designed to enable simulation of planned experiments prior to implementation in the actual reactor. The simulation is used to predict progress, ensure experiment design and verify boundary conditions for research purposes. Role: Specialist in reactor simulation. Client: JMTR, Japan.</p>
2012	GSE	<p>Participated in the development of the 3D reactor model for the S2 full-scope simulator at the Gundremmingen nuclear power plant, Germany. The model was built using RELAP5-HD and S3R and adapted to reflect the reactor dynamics of a German BWR plant. The work included both thermohydraulic and neutron physical modelling, and was carried out in close collaboration with the customer's technical team. Role: Consultant and specialist in BWR reactor model development Client: KSG, Germany.</p>
2010 - 2011	GSE	<p>Developed the 3D reactor model for the Oskarshamn-1 (O1) full-scope simulator. The model was developed using RELAP5-HD, S3R and SIMULATE-3 and integrated into the SimExec-HDS simulation environment. The work included both neutron dynamic and thermohydraulic modelling of the reactor core and was a central part of the modernisation of the O1 simulator. Role: Project manager and specialist in reactor simulation. Client: OKG/KSU, Sweden.</p>
2010	GSE	<p>Developed and led the project for the main process models for the Oskarshamn-1 (O1) full-scope simulator. The work was carried out using the simulation platform JTopmeret/SimExec and included development, quality assurance and integration of the main process models in the full-scope simulator. Role: Project manager and specialist in simulator development. Client: OKG/KSU, Sweden.</p>
2009 - 2010	GSE	<p>Lead specialist engineer and developer of the initial reactor models for Tsuruga-2 and Tokai-2 full-scope simulators in Japan. Responsible for the design and implementation of reactor models using RELAP5-HD and REMARK. To enable simulation of severe accident processes, MAAP4 was integrated into the</p>

		simulation environment. The work was carried out in close cooperation with JAPC's technical experts. Role: Specialist in reactor simulation. Client: Japan Atomic Power Company (JAPC), Japan.
2009 - 2010	GSE	Developed the first version of the 3D reactor model for Ringhals-1 (R1). The model was created using RELAP5-HD, S3R, and SIMULATE-3, and integrated into the SimExec simulation environment. This work marked the pilot implementation of a BWR reactor model based on HDS technology, developed by the Advanced Modeling Team (AMT) at GSE Systems in Baltimore, USA. As a member of the AMT, I was responsible for developing the first-ever BWR reactor model using this technology - a task not previously accomplished. Role: Project manager and specialist in reactor simulation. Client: RAB/KSU, Sweden.
2008	GSE	Developed condenser model for Ringhals-1 (R1) full-scope simulator. The work included modelling of the 413/443 condenser systems with the help of the JTopmer computer program. The model was implemented to ensure correct transient response and system integration into the simulator's main process model. Role: Specialist simulation engineer. Client: KSU, Sweden.
2008 - 2009	LearningWell	Modernized Oskarshamn-2 (O2) full-scope simulator. The work was carried out within the framework of the PLEX project and included adapting the simulator to the modernized plant's new systems, control and monitoring technology, and updated process design. Role: Specialist simulation engineer. Client: KSU, Sweden.
2007	LearningWell	Developed and modernized Oskarshamn-3 (O3) full-scope simulator. The work was carried out within the framework of the PULS project. The O3 reactor was upgraded from 109% to 129% of rated reactor power, and the simulator was adapted to reflect the modernizations carried out in the actual nuclear power plant. Role: Specialist simulation engineer. Client: KSU, Sweden.
2007	LearningWell	Developed new simulation models for systems 423, 424 and 425 in Oskarshamn-2 (O2) full-scope simulator. The work was carried out in connection with the replacement of a new generator and the implementation of Siemens' delivered I&C technology. Role: Specialist simulation engineer. Client: KSU, Sweden.
2005 - 2007	LearningWell	Invented, developed, and implemented algorithms for Real Data Viewer (RDV-1). Developed RDV-1, which is used as standard software for modern visualization of reactor models in full-scope simulators in Sweden. The work included specification, algorithm development and implementation of visualization solutions. Role: Innovator and requirements engineer. Client: LearningWell, Sweden.
2005 - 2009	LearningWell	Taught nuclear power plant staff in reactor physics, thermodynamics and thermohydraulics. Carried out training in basic reactor physics, thermodynamics and thermohydraulics for personnel at Swedish nuclear power plants. The assignment was carried out as a consultant for KSU. Role: Consultant instructor/teacher. Client: KSU, Sweden.
2005 - 2009	LearningWell	Developed and modernized Oskarshamn-2 (O2) full-scope simulator. Complete redesign of the simulator was carried out using modern simulator technology from CAE/L3-HARRIS, based on the Rose/Orchid simulation platform integrated into the SimExec simulation environment. Role: Specialist simulation engineer. Client: KSU, Sweden.
2005 - 2015	Friluftsförbundet Nyköping	Non-profit technical support for the operation and development of the slalom slope. On a voluntary basis, I contributed with technical support to the development, operation and maintenance of the slalom slope at Ryssbergsbacken in Nyköping. The work included the planning and implementation of technical development projects, repairs and maintenance of water, snow production and lift systems, as well as the handling and maintenance of snow groomers. I also developed training materials covering all technical systems and was responsible for onboarding and hands-on training of new volunteers.

		<p>Role: Volunteer technician/engineer for the operation and maintenance of the slalom slope's machinery.</p> <p>Client: Friluftsförbundet Nyköping, Ryssbergsbacken, Sweden.</p>
2004	ES-konsult	<p>Validation and verification of the ASTRID code against MAAP4.</p> <p>The aim of the work was to ensure the reliability of the ASTRID code by comparison with MAAP4. ASTRID has been developed to predict the behaviour of radioactive nuclides - including activity levels and dose rates - in the event of hypothetical severe accidents in nuclear facilities.</p> <p>Role: Calculation engineer, analyst.</p> <p>Client: SKI, Sweden.</p>
2004	ES-konsult	<p>Revised and updated technical system descriptions for Oskarshamn-3 (O3). The work included technical reviewing and updating of existing documentation to ensure compliance with the current plant configuration.</p> <p>Role: Specialist engineer.</p> <p>Client: OKG, Sweden.</p>
2004	ES-konsult	<p>Conducted an independent review and evaluation of changes in Safety Technical Specifications (STF), chapter 4, for Oskarshamn-2 (O2).</p> <p>The work included technical assessment of proposed changes to the plant's safety analysis documentation.</p> <p>Role: Specialist engineer.</p> <p>Client: OKG, Sweden.</p>
2004	ES-konsult	<p>Developed an Excel-based application (with VBA macros) for Impact Vector Analysis, used in the assessment of Common Cause Failures (CCF).</p> <p>The tool supports probabilistic safety assessment (PSA) by identifying and visualizing the impact of potential CCF scenarios, aiding in the evaluation of system vulnerabilities.</p> <p>Role: PSA specialist, VBA Programmer.</p> <p>Client: SKI, Sweden.</p>
2003	ES-konsult	<p>Contributed technical solutions and calculations to the modernization of a plant operated by Skellefteå Kraft AB, focusing on electricity and wood pellet production. The work involved solving technical challenges, optimizing processes, and providing engineering support through calculations related to plant operations and modernization efforts.</p> <p>Role: Consultant, problem solver, calculation engineer.</p> <p>Client: Skellefteå Kraft AB, Sweden.</p>
2003	ES-konsult	<p>Performed analyses of water hammer and dynamic forces during start-up of system 322 at Oskarshamn-2 (O2) and Barsebäck-2 (B2). The calculations were performed using RELAP5 and aimed to evaluate the mechanical loads on the system's components under transient conditions.</p> <p>Role: Calculation engineer, analyst.</p> <p>Client: OKG, Sweden.</p>
2002 - 2003	ES-konsult	<p>Conducted a probability safety analysis (PSA) of the Studsvik nuclear facility (reactors R2 and R2-0). The analysis was based on established methods such as Accident Mode and Effects Analysis (FMEA), Fault Tree (FT) and Event Tree (ET). Modelling and quantitative evaluation were carried out using the software RiskSpectrum.</p> <p>Role: PSA Security Analyst.</p> <p>Client: Studsvik AB, Sweden.</p>
2002	ES-konsult	<p>Continued work on the Leningrad In-Depth Safety Assessment (LISA) for reactor unit 2 at the Leningrad Nuclear Power Plant (LNPP), Russia. The purpose of the analysis was to enable licensing for continued operation by identifying security deficiencies and suggesting improvement measures in accordance with international requirements.</p> <p>Role: Engineer - Nuclear Power Safety Specialist.</p> <p>Client: SKI, Sweden.</p>
2002 - 2004	ES-konsult	<p>Member of the Board of Directors of ES-konsult (2002-2004).</p> <p>Contributed to strategic decisions and the long-term business development of the technology and consulting business. Participated in regular board meetings with a focus on the company's strategic direction, business goals, financial management and risk management. Participated in decisions regarding investments, skills supply, quality assurance and marketing strategies. Supported the management team in technical and strategic issues and worked to ensure sustainable growth and innovation capacity. Developed a 12-month ongoing financial monitoring tool that improved forecast accuracy and enabled early corrective action in case of deviations.</p> <p>Role: Board member.</p> <p>Client: ES-konsult, Sweden.</p>

2001 - 2002	ES-konsult	<p>Performed design calculations for the new spray emergency core cooling system in Oskarshamn-2 (O2, core spray in system 323). The calculations, performed using RELAP5, included nozzle dimensioning and analysis of dynamic forces caused by water hammer affecting system components during system 323 start-up.</p> <p>Role: Calculation engineer, design designer. Client: Westinghouse Electric Sweden AB, Sweden.</p>
2001	ES-konsult	<p>Validated and verified RELAP5-based calculations against experimental data from the HDR test program conducted in Germany.</p> <p>The objective was to assess the reliability and accuracy of the RELAP5 computational model in simulating thermohydraulic phenomena in nuclear systems.</p> <p>Role: Calculation engineer, analyst. Client: SKI, Sweden.</p>
2001	ES-konsult	<p>Analysed a hypothetical Loss-of-Coolant Accident (LOCA) scenario in system 313 at the Oskarshamn-2 (O2) reactor. The analysis, performed using the RELAP5 code, aimed to estimate the mechanical forces acting on the core shroud and reactor pressure vessel in the event of such an accident.</p> <p>Role: Calculation engineer, analyst. Client: OKG, Sweden.</p>
2000 - 2001	ES-konsult	<p>Developed the initial design concept for low- and intermediate-level radioactive waste management at the Ignalina Nuclear Power Plant, Lithuania. The proposed solution was based on established practices and proven methods from Swedish nuclear power plants, adapted to the conditions at Ignalina.</p> <p>Role: Engineer - nuclear power safety analyst. Client: SKI, Sweden.</p>
2000 - 2001	ES-konsult	<p>Conducted a Leningrad In-Depth Safety Assessment (LISA) safety analysis. The purpose of the analysis was to enable the licensing of reactor unit 2 at the Leningrad Nuclear Power Plant (LNPP), Russia, for continued operation.</p> <p>Role: Engineer - nuclear power safety analyst. Client: SKI, Sweden.</p>
2001 - 2004	ES-konsult	<p>Responsible for IT operations at ES-konsult. Duties included operation, maintenance, and backup of servers and workstations, management of IT security, and implementation and administration of firewalls and VPN solutions.</p> <p>Role: IT manager. Client: ES-konsult, Sweden.</p>
1998 - 2000	KTH	<p>Conducted analyses of hypothetical incidents and accident scenarios in RBMK reactors as part of nuclear safety research. The work contributed to international safety evaluations of Soviet-designed reactors during post-Soviet collaboration programs.</p> <p>Role: Research student (licentiate level) and researcher. Client: SKI/SIP, Nuclear Power Safety Dept., KTH, Sweden.</p>
1997 - 2000	KTH	<p>Conducted analyses of new nuclear fuel containing the erbium isotope ¹⁶⁷Er, which is used in modern RBMK reactors. The fuel reduces or eliminates the positive reactivity coefficient in the event of vapor formation (void effect), especially at the beginning of the fuel's burn-out. The analysis was carried out using CASMO and HELIOS.</p> <p>Role: Research student (licentiate level) and researcher. Client: SKI/SIP, Nuclear Power Safety Dept., KTH, Sweden.</p>
1996 - 2000	KTH	<p>Developed computational methods and software to enable studies of neutron dynamics in RBMK-1500 reactors. The work included the adaptation of the ARROTTA neutron dynamics code to RBMK reactor physics, derivation of neutron cross-sections using CASMO, WIMS and HELIOS, and the development of a specially adapted neutron cross-section library. This allowed for the application of Western computational codes for simulation of the RBMK reactor. The work resulted in a technical licentiate thesis titled "<i>Development, Validation and Application of an RBMK Reactor Physics Capability at KTH</i>".</p> <p>Role: Research student (licentiate level) and researcher. Client: SKI/SIP, Nuclear Power Safety Dept., KTH, Sweden.</p>
1995 - 1996	KTH	<p>Developed an analytical computational model for studies of the Accident Localization System (ALS) in the RBMK-1500 reactor at the Ignalina Nuclear Power Plant, Lithuania. The model supported investigations into the performance and integrity of the ALS under hypothetical accident conditions.</p> <p>Role: Research student (licentiate level) and researcher. Client: SKI/SIP, Nuclear Power Safety Dept., KTH, Sweden.</p>

1995	Ignalina Nuclear Power Plant	<p>Summer internship in control room operations at the Ignalina Nuclear Power Plant. Completed an internship as part of his education at Kaunas University of Technology (KTU). The practice took place in the control room and provided insight into reactor operation, monitoring of process systems, as well as operator procedures and safety procedures at the RBMK reactor. Role: Intern (engineering assistant). Client: Ignalina Nuclear Power Plant, Lithuania.</p>
1994	Ignalina Nuclear Power Plant	<p>Summer internship in nuclear fuel reloading operations at the Ignalina nuclear power plant. Participated in practical work with a focus on fuel management and reloading processes in the reactor hall. The internship provided in-depth insight into procedures, safety procedures and technical systems related to fuel change in RBMK reactors. Role: Intern (engineering assistant). Client: Ignalina Nuclear Power Plant, Lithuania.</p>
1992	Kaunas Flying Club	<p>Active member of the Kaunas Flying Club with practical experience as an assistant aircraft mechanic for JAK-52 aircraft. Participated in basic reparations, maintenance, pre-flight preparation, and technical supervision. Simultaneously began practical flight training under the club's instruction, gaining introductory experience in powered flight. Role: Volunteer aircraft mechanic. Client: Kaunas Flying Club, Kaunas, Lithuania.</p>
1989 - 1991	Šilutė Gliding Club	<p>Performed supervision and maintenance of gliders, including the L-13 Blanik. Tasks included minor repairs, pre- and post-flight inspections, as well as towing and parking of aircraft. Simultaneously active in the club's youth program, receiving basic training in aviation, aerodynamics, and flight safety. Role: Volunteer aircraft mechanic. Client: Šilutė Gliding Club, Šilutė, Lithuania.</p>
1989 - 1991	Private car repair shop	<p>Worked as a car mechanic during school breaks and summers. Carried out repairs, service and maintenance of passenger cars within the framework of a small private workshop business. Role: Car mechanic. Client: Private car repair shop, Šilalė, Lithuania.</p>
1988 - 1991	Šilalė 1st Upper Secondary School	<p>Laboratory assistant in physics laboratory. Responsible for preparing physics experiments, handling measuring instruments, and setting up equipment for practical exercises. Role: Laboratory assistant. Client: Upper secondary school, Šilalė, Lithuania.</p>