Studsvik

Studsvik Scandpower

July 2025 Newsletter

Opening Remarks

We've been saying it a lot lately:

Today is a good day to be a nuke.

At Studsvik Scandpower, we've been busy in implementing robust core monitoring for PWR and BWR customers, refining the industry-leading transient analysis code S5K more than doubling the SMR LWR customer base in the first half of 2025, and engaging with

advanced reactor use cases to ensure that the Peacock Monte Carlo code is set to perform real work by real engineers, on real reactors as they get built.

How do we know that a new reactor design is a serious one? Freeware and Open Source are for paper reactors. NQA-1 quality codes with support, maintenance, development, and error reporting are for real, operating reactors. Many of us saw the so-called "renaissance" of 20 years ago fizzle out. Today, the market signals are large, clear, and in neon lights. All of us as nuclear professionals are about to get a lot more busy.

If you have feedback on new things we could develop which would provide broad benefit to the industry, my response to that is "good ideas are welcome here." We're here to make sure your operations run as well as possible, and for the love of the game. We're also looking forward to seeing many of you at the 2025 User Group Meeting in October. If you haven't seen that invitation, let us know.

Sincerely,
Art Wharton, SSP President and CEO

UGM 2025

Join us for the annual Users Group Meeting (UGM) October 19–22 in Prague, Czech Republic!

Registration is now open for the UGM!

Visit the UGM website for information on the meeting, registration, hotel information, and more.

Link: SSP UGM Website

Dr. Joel Rhodes receives prestigious award at the ANS Annual Meeting in Chicago, IL.

Dr. Joel Rhodes was awarded the Walter H. Zinn Medal in recognition of outstanding technical leadership in the development, production, distribution, and support of the Studsvik Core Management System (CMS), which is extensively used throughout the world for steady-state and transient reactor physics analysis.

The Walter H. Zinn Medal recognizes an individual for outstanding contributions to the advancement or implementation of nuclear technology. This award is to recognize notable and sustained technical contributions and leadership.

Congratulations, Dr. Rhodes!

New Hires to the Scandpower Team

Join us in welcoming the new employees to the Scandpower Team!

Stephen Love

Steve Love joined Studsvik Scandpower in May of 2025 as Director of Business Development, focusing on the BlackStarTech product line. Steve comes to Studsvik with 45 years of experience in the commercial nuclear industry spanning plant construction, nuclear waste, decommissioning, business development/client management, international marketing, SMR development, and engineering. He received a BS in mechanical engineering from LeTourneau University, an executive MBA from Wake Forest, and completed a program in International Business Development from Oxford University. Steve and his wife, Debbie, reside in Wilmington, NC.

Austin Sanders

Austin joined Studsvik Scandpower as a software engineer in July 2025. His background is in computer science, and he holds a BS in Applied Computer Science, an MS in Computer Science, and an MS in Informatics and Computing from Northern Arizona University. Austin has 10 years of experience as a software engineer, and he has spent most of his career in scientific computing and aerospace. In his new role with Studsvik Scandpower's GARDEL team, he will contribute to the design, implementation, and testing of reactor core modeling tools.

Thomas Liljenquist

Thomas Liljenquist joined the Studsvik Scandpower in March 2025 as an IT Engineer. His primary responsibility is providing IT support and administration. Thomas comes to Scandpower with over 20 years of experience as a System Administrator, Network Engineer. He received his bachelors degree at Western Governers University.

HELIOS2 Training Course

Studsvik Scandpower invites you to participate in a HELIOS2 Introductory Training Course held at the Studsvik Scandpower Office in Hamburg, Germany.

Dates: October 13 - 17, 2025

Location: Studsvik Scandpower Office,
Rathausallee 28, DE-22846 Norderstedt (Hamburg), Germany

Materials: Training materials, computers, room, etc. are organized by Studsvik.

Instructors: Chuck Wemple and Teo Simeonov

Cost: There is a fee per participant for the training course. Lunches and training materials are included.

To register for the training course, please visit: HELIOS2 Registration Form

HELIOS2

Code Updates

Studsvik Scandpower continues to release updates for its CMS5 software suite.

Highlights of new features and capabilities, as well as minor software corrections available in these new versions, can be found in the Changes and Release Notes documents in the "Software Updates" section of the Studsvik Support Site (login required) - https://support.studsvikscandpower.com/

CMS5 software has been qualified under the Studsvik, Inc. NQA1 1994, 10 CFR 50 Appendix B, 10 CFR 21 Quality Assurance Program and HELIOS2 under ISO-9001.

If you would like to receive an update to your software under your current software maintenance agreement, please contact your Studsvik representative.

CASMO5

HELIOS2

CASMO5 v3.10.00

May 2025

2D lattice physics transport code for PWR and BWR

(VVER capability available in a separate version)

HELIOS2 v2.04.02

January 2025

2D general geometry lattice physics transport code

- Support for the commercially available E8R1 neutron data library
- Substantial runtime improvements for REF and S5C MXN cases
- Improved isotopic weighting factors for fission neutron emission
- Optional reduced burnup chains
- Multithreaded computation
- Linear source Method of Characterization (MoC) solution
- Optional 8-family delayed neutron data

SIMULATE5

S5K

SIMULATE5 v2.08.00

April 2025

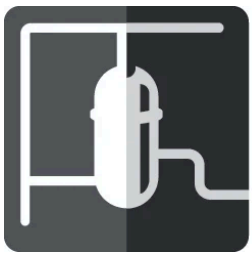
3D steady state nodal simulator code for PWRs and BWRs

SIMULATE5-K v2.07.02

December 2024

Advanced, multi-group nodal code for transient analysis of LWRs using SIMULATE5 methodology.

- The limitation for a maximum of two segments per node has been removed for BWRs
- Updates implemented concerning the EPR T-MODE operation
- Corrected S5 SER-10 and 12
- Various new edits to the output and summary files
- Void correlations and subcooled boiling models: Three void correlations are recognized now by S5K, namely: EPSIM, Ozaki and Malnes. The void correlation and the subcooled boiling model can be selected independently of each other.
- Void correlation for water rods and common bypass: The Bestion void correlation has been implemented for the non-active flow paths.
- Reactivity components evaluation: Implementation of reactivity calculation model based on the exact perturbation theory. In the neutron balance equation, the reaction rates are estimated by cross-section perturbations weighted with the adjoint flux. The adjoint flux is computed at the beginning of the transient. The forward flux is calculated at each cross-section perturbation.
- Improved the evaluation of heat transfer coefficients at very low flow conditions.



CMS LWR

SNF

CMSLink5 v1.23.00

August 2024

Linking code between CASMO5 and SIMULATE5/3, SIMULATE5-K/3-K

SNF v1.08.03

March 2025

3D spent nuclear fuel isotopics and decay heat tracking

- New calculational capability to enable the tracking of Co-60 inserted into PWR guide tubes.
- Multi-pin model extensions
- Support for zero-burnup in assembly and fuel pin analyses
- Extended database interface
- Reactivation of lim_HSTEP and lim_CYXPO including autoQTR assemblies

CMSBuilder

CMSBuilder v2.02.00

March 2025

A graphical fuel management and loading pattern design suite that provides core design engineers with a sophisticated interface to simplify assembly design, fuel shuffling and loading pattern evaluation.

SIMULATE-3K v2.12.00

November 2024

An advanced, two-group nodal code for transient analysis of LWRs using SIMULATE-3 methodology.

- ✔ Label-based shuffling support
- ✔ Octant core symmetry autoloading
- ✔ In-place rotations for PWR assemblies
- ✔ Additional assembly color coding assignment flexibility
- ✔ Allow user to adjust quick start values
- ✔ Export core ranking to ASCII file
- ✔ Auto-save latest loading pattern on close
- ✔ Correction in the evaluation of the fuel thermal conductivity using the external material tables

- Correction in the evaluation of the energy per fission in the decay heat model
- Improvements for Sandwich Type Shielding assembly

Current code versions for other Studsvik software include: CASMO5_VVER v3.10.00, SIMULATE5_VVER v2.08.00, SIMULATE-3 v6.24.00, S5POST v1.00.00, CMSView5 v2.00.01, NORDIC v3.03.00

Did You Know?

Did You Know...that the CASMO5 ENDF/B-VII.1 cross section library allows CASMO5 to calculate long (multi-year) outages much better than CASMO-4 with the ENDF/B-IV based L-library due to improved nuclear data?

This can also be particularly important when bringing back an assembly from the spent fuel pool with a long residency time. In addition, the microscopic depletion-based shutdown cooling model implemented in SIMULATE5 enables more accurate modeling of back-to-back mid-cycle outages that follow a multi-year-long refueling outage.

Publications

Learn more about recent publications from the Studsvik Scandpower team!

ANS Student Conference 2025 – April 2025, Albuquerque, NM

- Benchmarking Project Peacock Against the ICSBEP Benchmarks and MCNP - William Madsen (Brigham Young Univ., Studsvik Intern), William C. Dawn (Studsvik), Charles A. Wemple (Studsvik)

Paper: https://www.ans.org/meetings/student2025/sessions/attachment/paper-12247/

International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2025) – April 2025 – Denver, CO

- Verification of CASMO5 for Higher Enrichment and High Burnup Lattice Physics Analyses - Petri Forslund Guimarães (Studsvik), Joshua Hykes (Studsvik), Rodolfo Ferrer (Studsvik)
  Paper: https://www.ans.org/meetings/mc2025/sessions/attachment/paper-12222/version-2/
- Application of CASMO5 Nuclear Data Uncertainty Quantification to Similarity Analysis Using Integral Indices - Rodolfo Ferrer (Studsvik), Joshua Hykes (Studsvik)
  Paper: https://www.ans.org/meetings/mc2025/sessions/attachment/paper-12020/version-2/
- LDR Lite Benchmark Core Analysis Exercise with CASMO5 and SIMULATE5 - Emiliya L. Georgieva (Studsvik), Tamer Bahadir (Studsvik)
  Paper: https://www.ans.org/meetings/mc2025/sessions/attachment/paper-12068/version-2/
- Peacock: A Monte Carlo Code with Shared Memory Paralellism for Consumer-Grade Computing Architectures - William C. Dawn (Studsvik)
  Paper: https://www.ans.org/meetings/mc2025/sessions/attachment/paper-12043/version-2/

Studsvik Gains US Regulatory support for Fuel Software for the Nuclear Industry

Studsvik achieves regulatory milestone with the US Nuclear Regulatory Commission (“NRC”), on the acceptance to review the Studsvik Scandpower Topical Report (“TR”) Supplement for applicability to existing and future nuclear energy customers. This key achievement solidifies Studsvik’ s position in the industry as a global leader through its state-of-the-art software codes by supporting customers’ regulatory filings as the industry now pursues longer cycles, further power uprates, and longer operational lives.

The NRC has accepted Studsvik Scandpower’s licensed TR Supplement on the validity and applicability of Studsvik Core Management System 5 (CMS5) neutronics simulation software for use in Small Modular Reactors (“SMRs”), and extension to new enrichment and burnup capabilities being proposed for the industry. This action is expected to conclude in 2026 and will enable the industry to pursue both fuel efficiency initiatives and the new construction of SMRs in the United States.

“This confirms Studsvik Scandpower’s position in the industry as a leader in nuclear fuel software for today’s existing power plants and tomorrow’s future reactor designs”, says W. A. “Art” Wharton III, Business Area President of Studsvik Scandpower.

Studsvik Scandpower TR “SSP-14-P01/028-TR Supplement 1, Generic Application of the Studsvik Scandpower Topical Report: Supplement for Extended Enrichment, Burnup, and SMRs,” was officially accepted for review by the US NRC on March 21, 2025. The NRC staff determined that it provides sufficient information to conduct a detailed technical review. Specifically, this demonstrates the application and data range for U-235 enrichment up to and including 10 wt%, maximum rod-average burnup, up to and including 80 GWd/MTU, and provides clarification and confirmation on applicability to light water pressurized SMRs.

Studsvik Scandpower received approval for the original TR in 2017 for use in traditional PWR operations.

Link to article: Studsvik Gains US Regulatory support for Fuel Software for the Nuclear Industry

Past BlackStarTech Webinar

Did you miss the **BlackStarTech** webinar? No problem, you can watch the video and learn more about the newly expanded Studsvik portfolio- the BlackStarTech product line.

The webinar covered **BlackStarTech's** offerings for reliable and resilient power, battery, broadband communications, and lighting solutions.

The addition of **BlackStarTech's** mission-critical energy storage, lighting, and broadband IoT solutions leverages Studsvik's strength in "physics first," high-quality software applications while aligning with its long-held positioning as a key partner in supporting nuclear station resiliency.

BlackStarTech's hardware and Studsvik's firmware and monitoring software, will more effectively modernize, connect, innovate, and extend the life of nuclear plants globally, while offering enhanced solutions to new generation technologies. The integrated technology suite enables productivity, cost savings, and operational risk management solutions across numerous nuclear facilities throughout the US.

The presentation and video can be found on our support site, or you can use the link below to watch the webinar.

Link: BlackStarTech Webinar

If you want to learn more about **BlackStarTech**, please reach out to your Studsvik commercial representative.

Upcoming Conferences and Events

Studsvik Scandpower staff are planning to attend a variety of industry events in 2025. We hope to see you there!

- **World Nuclear Association Symposium,** September 3–5, 2025 (London, UK)
- **NEXC**, September 8–11, 2025 (Atlanta, GA)
- **IAEA General Conference,** September 15–16, 2025 (Vienna, Austria)
- **1st International Conference on LWR Fuel Performance, Modelling and Experimental Support,** September 14–19, 2025 (Nessebar, Bulgaria)
- **TopFuel 2025,** October 5–9, 2025 (Nashville, TN)
- **Studsvik's User Group Meeting**, October 19–23, 2025 (Prague, Czech Republic)
- **World Nuclear Exhibition**, November 4–6, 2025 (Paris, France)
- **ANS Winter Meeting**, November 9–12, 2025 (Washington, DC)

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