



Studsvik Scandpower

December 2025 Newsletter



Opening Remarks

2025 has been an impactful year for the nuclear energy industry. Advanced reactors have broken ground, and unprecedented capital has flowed into the race to make the "next big thing" in nuclear energy, with the promise of advancements in safety, procurement convenience, and operational costs. Additionally, multiple governments around the globe have taken strong pro-nuclear energy stances and backed those up with funding and access to cheap financing for the first several projects to break ground in their countries.

At **Studsvik**, the team continues to develop advancements in code accuracy, features, and functions which make the lives of nuclear engineers just a little bit easier every day. In a continuous improvement culture, our job is never "done." Those lessons from our collective operational experience will translate directly to new reactors whether they be SMR LWRs (adoption of **CMS** among that crowd tripled in 2025!), or advanced non-LWRs. The Peacock development team now has a fully functional NQA-1 Monte Carlo continuous energy transport software with depletion capability which will meet the practical operational and licensing needs for real reactors. Expect that as the industry finalizes reactor designs, an accompanying nodal code for day-to-day use in the plant will also come forward. The **GARDEL** core monitoring team continues to work daily as more plants adopt the world's independent core monitoring and reactivity management tool in multiple countries.

For many of us, this time of year is also a time with family and friends to rest and celebrate. At **Studsvik**, we're thankful for the culture of partnership that we have with each other and our customers. This is a time to remember that we're all aligned around the same mission to make the operations and fueling of nuclear energy facilities as easy and efficient as possible as our way to contribute to an abundant society with reliable and clean energy. That mission drives us to look forward to 2026.

On behalf of the **Studsvik** team, we wish for you a happy holiday season and a new year of valuable challenges we can face together.

Sincerely,
Art Wharton
President /CEO, Studsvik Scandpower
President, Studsvik Americas



UGM 2025 Highlights

The annual Studsvik Scandpower User Group Meeting (UGM) was held in Prague, Czech Republic in October. The meeting brought together 85+ people from 13 countries and 55 utility customers.

Attendees learned about recent improvements in the CMS5 software suite as well as new developments including Peacock, COPERNICUS, and CONCORS.

Thank you to all of our customers for making the UGM a successful event!

Presentations from the meeting can be found on the Studsvik Support Site (login required) - <https://support.studsvikscandpower.com/>

Stay tuned for more information on UGM 2026!



Joel Rhodes, Retires after 35 years at Studsvik Scandpower

Joel D. Rhodes III, Ph.D., is the current Chief Technology Officer of Studsvik Scandpower. His sustained career contributions to the advancement of nuclear physics core simulation and analysis for real-world engineering applications in the global fleet of operating Light Water Reactors, primarily through his contributions and advancements in the CASMO and SIMULATE core neutronics codes which are used by ~ 50% of the global LWR fleet.



Joel's post-doctorate career began at Studsvik of America (later re-named Studsvik Scandpower) in 1991. He was a code developer for SIMULATE-3R which is used in all but 6 operator training simulators in the entire USA, SIMULATE-3K Kinetics code, and XIMAGE graphical user interface. He also served as the lead code developer for SIMULATE-3, which later became the most widely used LWR nodal code in the global nuclear energy industry. Joel also took over the lead of the CASMO-4 2D Lattice code and ushered it into new first principle methods to create the 2008 release of CASMO5. He has been instrumental in the application of nuclear data libraries for engineering applications using NJOY, and the advancement of depletion models for nuclear energy applications during his long career at Studsvik Scandpower. Joel's nuclear physics expertise spans both BWRs and PWRs and includes dozens of publications spanning his long career.

Joel has taken on leadership of the team of code developers at Studsvik Scandpower, including the generic US NRC approval of the CMS5 code package for use in safety-related calculations in all US PWRs in 2017. Joel led the charge on advancements and improvements in LWR modeling for real-world engineering applications including high enrichment and high burnup applications.

On behalf of the team, we would like to congratulate Joel on his well-deserved retirement!



1st Peacock Workshop at ANFM 2025

The Studsvik team hosted the 1st ever **Peacock** workshop at the Advances in Nuclear Fuel Management (ANFM 2025) conference in July.

Peacock is a 3D, continuous-energy, Monte Carlo code developed by Studsvik Scandpower, Inc. **Peacock** is intended to augment the current offerings from SSP to model advanced, next-generation nuclear reactors. The code allows modeling of general geometries and includes capabilities for depletion. **Peacock** is designed for efficient use on commonly available, consumer-grade computing architectures and includes shared-memory (OpenMP) parallelism.

If you are interested in finding out more about **Peacock**, please reach out to your Studsvik Commercial representative for more information.

New Hires

Join us in welcoming our new employees to the Studsvik Team!



Jessie Opalko

Kelsey Moyer

Kelsey Moyer joined Studsvik in September of 2025 as the Human Resource Generalist. After graduating high school, Kelsey earned her degree in Baking and Pastry Arts. After spending ten years working as a cake decorator and pastry chef, Kelsey made a career change and went back to school for human resource management.

While earning her associates degree, Kelsey worked at an international food export company as the sole member of the HR department. She spent four years in that role completing her associates degree, starting her bachelor's degree, and gaining real world experience. Kelsey has earned the Society of Human Resource Management Certified Professional certification and plans to earn her Senior Certified Professional in the future. Currently, Kelsey is scheduled to graduate in December of 2025 with her bachelor's degree in human resource management from Southern New Hampshire University. Kelsey and her boyfriend, Marc, reside in Bel Air, Maryland.

Jessie Opalko joined Studsvik Americas in December 2025 as VP & General Manager of the BlackStarTech product line. Jessie brings more than 17 years of experience in the commercial nuclear and energy industries across North America and internationally, with a career spanning engineering, project execution, customer and partner relationship management, contract negotiation, business strategy, corporate governance, and cross-functional leadership across stakeholder organizations.

Jessie holds a Bachelor of Mechanical Engineering from The Pennsylvania State University and an MBA from the University of Pittsburgh, Katz Graduate School of Business. Outside of work Jessie serves on the board for the Cystic Fibrosis Foundation of Western PA and was recently elected to her local public school district's board of directors. Jessie resides with her husband Andy, and daughters, Laila and Iris, in Pittsburgh, Pennsylvania.



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 commercial representative.

Software Compilation Environment Update

Studsvik is modernizing the compiler and operating system environment used for building its nuclear codes. The current CMS5 suite has been compiled using the Intel ifort 19 compiler on CentOS 7 (RHEL 7 compatible). As Intel has phased out ifort in favor of the newer ifx compiler, Studsvik is transitioning to ifx (IFX) version 2024.2.1. Future executables will be built on Rocky Linux 8, which is fully compatible with Red Hat Enterprise Linux 8.

The upcoming release of CASMO5 version 3.11.00 in December 2025 will be the first Studsvik code to adopt this new environment.

This upgrade ensures continued compatibility with the latest industry-standard tools, improved performance, and long-term support for our software products.



CASMO5 v3.11.00

December 2025

2D lattice physics transport code for PWR and BWR

(VVER capability available in a separate version)

- ✓ MCI Peacock input file generation
- ✓ Improved submesh support for complex MXN heavy reflectors
- ✓ Improved control rod depletion branches for PWRs (S5C BCR)
- ✓ Switch from ifort to ifx

HELIOS2 v2.04.02

December 2024

2D general geometry lattice physics transport code

- ✓ 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 v2.09.00

October 2025

3D steady state nodal simulator code for PWRs and BWRs

- ✓ Explicit LPRM/WRNM depletion model
- ✓ Automatic axial shift of bottom of the active core
- ✓ Speed-up of SDM and HWR calculations
- ✓ Updates of EPR-TMODE model

SIMULATE5-K v2.09.00

October 2025

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

- ✓ CMS5 waterside corrosion model: The purpose of the new model is to enhance predictions within the framework of the NRC Regulatory Guide 1.236.
- ✓ Updates to the evaluation of the cladding surface temperature for non-default heat transfer correlations
- ✓ Extension of the intra-pellet power profile tables up to 100 GWd/tU
- ✓ Improvement in the evaluation of the BWR interstitial bypass flow
- ✓ Improvements in the convergence of the power / thermal-hydraulic oscillations



CMSLink5 v1.24.00

October 2025

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

- ✓ PRM detector data included in the library

SNF v1.08.04

September 2025

3D spent nuclear fuel isotopics and decay heat tracking

- ✓ Extended sets of nuclear data uncertainties: MOX/UOX (Bu, Dns, Enr)
- ✓ Multi-pin model extensions. MTP library vs node-only library verification.
- ✓ Support for zero burnup in assembly and fuel pins analyses
- ✓ Extended database interface
- ✓ Target date, date of analyses from EOL in multi-assembly cases
- ✓ Cycle/exposure limits with autoQTR assemblies
- ✓ Several fixes related to multi-library/multi-unit cases and autoQTR assemblies
- ✓ Changes in axial sub-node material property during irradiation

 **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.

- ✓ 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



Current code versions for other Studsvik software include: CASMO5_VVER v3.10.00, SIMULATE5_VVER v2.09.00, S5POST v1.00.00, CMSView5 v2.00.01, NORDIC v3.03.00

Did You Know?

Did You Know... that SSP offers model review as a service to improve your CMS and CMS5 model results?

Studsvik Annual Customer Feedback Survey

Studsvik Scandpower is working to more actively engage with our customers and understand their preferences and needs as it relates to the products and services provided by Studsvik Scandpower. Please click the link below to complete a short survey.

Link to 2025 survey: [2025 SSP Survey](#)

We look forward to seeing your responses and working to adjust our priorities to best fulfill the brand promise of state-of-the-art nuclear fuel lifecycle software and support for the global nuclear energy fleet. Please respond by **January 15, 2026**.

Publications

Learn more about recent publications from the Studsvik Scandpower team!



"Decay Heat Power Uncertainty Quantification in Studsvik's System for Spent Fuel Analyses", Teodosi Simeonov, Charles Wemple, Joshua Hykes

Paper: <https://www.ans.org/pubs/journals/nse/article-59546/>

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Advances in Nuclear Fuel Management (ANFM 2025) – July 2025 – Clearwater Beach, FL

- Nuclear Data Usage at Studsvik Scandpower and Future Needs from ENDF/B-IX, C. A. Wemple (Studsvik), R. M. Ferrer (Studsvik), T. T. Simeonov (Studsvik), J. M. Hykes (Studsvik), W. C. Dawn (Studsvik), J. D. Rhodes (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3346/#paper_10520
- Studsvik's Core Management System 5: Overview and Recent Developments, R. Ferrer (Studsvik), J. Hykes (Studsvik), T. Bahadir (Studsvik), G. Grandi (Studsvik), T. Simeonov (Studsvik), J. Rhodes III (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3349/#paper_10530
- Simulating Challenging BWR Operation Conditions with CMS5, Petri Forslund Guimarães (Studsvik), Tamer Bahadir (Studsvik), Christian Jönsson (Studsvik), Joshua Hykes (Studsvik), Rodolfo Ferrer (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3350/#paper_10534
- Extension of the In-Core Shuffling Algorithm to PWRs in MARLA, Dave Knott (Studsvik), Christian Oyarzun (Studsvik), Tung D.C. Nguyen (Studsvik), Jeffrey Borkowski (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3334/#paper_10475
- COPERNICUS -- Optimization Code for PWR Design and Analysis, Tung D.C. Nguyen (Studsvik), Dave Knott (Studsvik), Christian Oyarzun (Studsvik), Jeffrey Borkowski (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3335/#paper_10476
- SIMULATE5–K Coupling Interface to Thermal-Hydraulics System Codes, Matthew Adler (Studsvik), Gerardo Grandi (Studsvik), Tamer Bahadir (Studsvik), Jeffrey Borkowski (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3353/#paper_10547
- The CONCORDS Software Method for Coupled Code Simulation, Matthew Adler (Studsvik), Jeffrey Borkowski (Studsvik), Lotfi Belblidia (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3334/#paper_10473
- Verification of CMS5 for Higher Enrichment and High Burnup PWR Core Design, Rodolfo Ferrer (Studsvik), William C. Dawn (Studsvik), Tamer Bahadir (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3351/#paper_10549
- Peacock: A Monte Carlo Transport Code with Depletion for Reactor Modeling, William C. Dawn (Studsvik), Charles Wemple (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3349/#paper_10529
- Comparison of CMS5 Predictions to KONVOI Neutron Flux Map Measurements, Emiliya L. Georgieva (Studsvik), Marcus Seidl (PreussenElektra), Tamer Bahadir (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3353/#paper_10546
- Validation of CMS5 against Otto Hahn Critical Experiment Benchmark, Tamer Bahadir (Studsvik), Rodolfo M. Ferrer (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3351/#paper_10550
- Benchmarking CASMO5 against Monte Carlo for PWR Lattices with Higher U-235 Enrichments, Joshua Hykes (Studsvik), Rodolfo Ferrer (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3351/#paper_10552
- CASMO5 Analysis of Kurchatov Critical Experiments with 7.5–10% Enrichment, Joshua Hykes (Studsvik), Rodolfo Ferrer (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3351/#paper_10553
- Benchmark of SIMULATE5–K Against Frigg Loop Experiments, Gerardo Grandi (Studsvik), Petra Mala (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3352/#paper_10554
- BWR Control Blade Depletion Modeling with SIMULATE5, Tamer Bahadir (Studsvik)
Paper: https://www.ans.org/meetings/anfm2025/session/view-3350/#paper_10535

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- CASMO5 Analysis of Select HTC Critical Experiments Simulating Burned Fuel", James Carnal (Univ. Tennessee, Knoxville), Joshua Hykes (Studsvik), Rodolfo Ferrer (Studsvik)



Paper: <https://www.ans.org/meetings/wc2025/session/view-3534/>

Upcoming Conferences and Events

Studsvik Scandpower staff are planning to attend a variety of industry events in 2026. We hope to see you there!



- **PowerPlantSim**, January 25–29, 2026 (San Diego, CA)
- **U.S. NIC Advanced Reactor Summit**, February 10–12, 2026 (Seattle, WA)
- **U.S. NRC RIC**, March 10–12, 2026 (Rockville, MD)
- **Canadian Nuclear Association 2026**, April 14–16, 2026 (Ottawa, Canada)
- **PHYSOR 2026**, April 19–23, 2026 (Turin, Italy)
- **ANS Annual Meeting**, May 31 – June 3, 2026 (Denver, CO)
- **Utilities Service Alliance Executive Summit**, June 23 – 26, 2026 (Chicago, IL)

Happy Holidays!

On behalf of the Studsvik Scandpower team, we want to wish you and your families a restful holiday season. We appreciate your business and look forward to working with you in 2026!



Studsvik

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