

**Studsvik**AUGUST 2023
NEWSLETTER

INTRODUCTION

On behalf of the Studsvik Scandpower team, I can say that we all hope you're having a great summer with productive work and restful family holidays and vacations.

We have a strong team with a wealth of experience across many reactor designs in various regulatory environments and can provide value in those lessons to your operating plants. Global nuclear energy policies are encouraging lately and indicate that we have a lot of work in continued operations and new reactor construction in order to meet global environmental stewardship goals.

Our core monitoring and reactivity management tool, **GARDEL**, has been gaining rapid adoption in industry and the user community in recent years. Additionally, the software itself is growing more mature and more robust in its growing exposure to the variety of unique operational processes and procedures among the varying utilities. Like **CASMO** and **SIMULATE**, no software like it has been so widely exposed to varying reactors, fuels, and operational procedures.

Every Utility we speak to tells us they're tight on resources, so we're focused on making your work faster, simpler, and cheaper to perform. You can find our team at various events including technical topical meetings and broader industry meetings such as the World Nuclear Association Symposium, and hope we run into you at one of those events.

Studsvik is here to continue delivering **state-of-the-art** software, applications, and support while helping you meet your future nuclear goals.

Sincerely,

Art Wharton

President of Studsvik Scandpower



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).

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.



CASMO5 v3.07.00 (May 2023)

2D lattice physics transport code for PWR and BWR (VVER capability available in a separate version)

Key Updates:

- Support of the optional, commercially-available ENDF/B-VIII gamma library gamma.e8r0.300.18.bin
- Enhanced spectral xenon branches for better MTC prediction at cold and intermediate temperatures while using the hot/unified library.
- Refinements to reduced BWR case matrix: S5C RED and REDC.



HELIOS2 v2.04.00 (May2023)

2D general geometry lattice physics transport code

Key Updates:

- Improved isotopic weighting factors for fission neutron emission
- Optional reduced burnup chains
- Multithreaded computation
- Linear source MoC solution
- Optional 8-family delayed neutron data



SIMULATE5 v2.04.00 (March 2023)

Linking code between CASMO5 and SIMULATE5/SIMULATE3/SIMULATE3K/SIMULATE5-K

Key Updates:

- Current xenon number density cross-section functionalization extended to optional tertiary void or TMO dependency with the BWR and PWR HOT libraries, which improves ITC predictions at



SIMULATE5-K v2.04.00 (April 2023)

3D transient analysis code for PWRs and BWRs

Key Features:

- Next generation multigroup analytical nodal code for the transient analysis of both

intermediate/warm temperatures without xenon.

- Supports decompression utility xz when the Card Image Files and/or the old libraries are xz-compressed.
- Temporary directory location is now user-configurable.

CMSLink 5 v1.21.00 (May 2023)

3D steady state nodal simulator code for PWRs and BWRs

Key Updates:

- New intra-pellet power profiles, generated by CASMO5
- Updates have been implemented to the BWR Shutdown Margin (SDM) Module and the PWR High Worth Rod Module, new screening options and use of mini-core for isotropic-buckling with BWR SDM.
- First control rod bank no longer needs to be part of the banks moving in overlap mode during CRDOVL search.
- New triggers, DIFA-O/DIFD-I, maximum absolute value of difference in A-O/D-I, are added to the ITE.SRC searches.
- Improved BWR T/H iterations to provide a better estimate of core void distribution when updating the history parameters (HVOID) during the predictor step depletion.

PWRs and BWRs.

- Transient version of SIMULATE5 (S5) provides fully consistent solutions between the steady-state and the initialization of the transient calculations.
- S5K tracks dynamically nodal concentration of fission products and accounts for the extraneous neutron sources (SE) due to spontaneous fissions, alpha-n interactions from actinide decay, and γ -n interactions from long-term fission product decay.
- Knowledge of the intra-nodal flux and power distributions within each node can be used to compute the pin-by-pin power for every axial level of every fuel pin in the core.
- S5K hydraulic model uses a five-equation model, vapor and liquid mass conservation, vapor and liquid energy conservation and mixture momentum conservation.
- For modeling thermal hydraulic feedback effects, S5K models all fuel pins within a node by the average pin.
- The average fuel pin is supplemented by tracking of the peak (hot) pin - permitting accurate estimation of peak fuel pin enthalpies. S5K has also the capability to explicitly

represent every fuel pin in
the reactor core



Current code versions for other Studsvik software include:

CASMO5_VVER v3.07.00,
SIMULATE5_VVER v2.04.00,
SIMULATE5-K_VVER v2.04.00,
SIMULATE-3 v6.24.00, SIMULATE-3K
v2.10.00, S5POST v1.00.00,
CMSBuilder v2.00.00, CMSView5
v1.0.6, NORDIC v3.03.00

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

SNF v1.08.01 (December 2022)

3D spent nuclear fuel isotopics and decay heat tracking

- ISO 10645:2022 methodology for decay heat power
- Multi-pin model extensions and support for VVER fuel
- POOL-file maintenance



UPCOMING CONFERENCES AND EVENTS

Studsvik Scandpower staff are planning to attend a variety of industry events throughout 2023 - feel free to contact us and chat about your favorite topics with us!

- ANS Utility Working Conference - August 6-8, 2023 (Marco Island, Florida)
- The International Conference of Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2023) - August 13-17, 2023 (Niagara Falls, Ontario, Canada)
- World Nuclear Symposium 2023 - September 6-8, 2023 (London, UK)



DID YOU KNOW?

Did You Know? That as CASMO5 modeling of new Accident Tolerant Fuel (ATF) designs improves, it can easily and conveniently model advanced coated or doped fuel and coated claddings with a single input card?

UGM 2023 RECAP

It was our pleasure to host the 2023 User Group Meeting in Budapest, Hungary and we had a lot to talk about since our last time in-person in Europe was in 2019 before the COVID-19 pandemic.

We want to thank our sponsor, PAKS, for hosting us in beautiful Budapest.

Thank you, PAKS!

We were honored to have József Elter, Deputy General Director, MVM Paks NPP Ltd, as the keynote speaker and to hear about the recent challenges and nuclear fuel related activities at MVM Paks Nuclear Power Plant. The technical presentations covered topics from recent Studsvik code and method updates to applications of our codes at various plants around the world. It's exciting to see the growth of Studsvik products and to hear direct feedback from our customers.

Thank you to all of the customers who took the time to not only participate but present your work to the community. You are what makes the UGM a success and a truly valuable experience for all. **See you at UGM 2024!**



INDUSTRY AWARD

Studsвик's Dr. Rodolfo Ferrer awarded the ANS Early Career Reactor Physicist Award!



Dr. Rodolfo M. Ferrer was recognized by the American Nuclear Society (ANS) Reactor Physics Division with the Early Career Reactor Physicist Award. This distinguished award acknowledged his leadership in the improvement of CASMO5 methods, particularly for the linear source scheme for the Method of Characteristics. The award was presented at the 2023 ANS Annual Meeting in Indianapolis, Indiana in June 2023.

Congratulations, Dr. Ferrer!

UPCOMING WEBINAR

Are you a **CMSBuilder** user? Do you support **BWRs**? Studsvik is planning a webinar covering a CMSBuilder demonstration and BWR applications for the Fall of 2023.

CMSBuilder simplifies core model development and execution with our highly flexible GUI interface and automation routines. Come learn about BWR applications at the upcoming webinar!

More information on the webinar will be shared in the near future.



NEW HIRE

Studsвик Scandpower expands team!



Keith Drudy joined the Studsvik Scandpower Leadership Team in February 2023. As the new Vice President of Market Development, Keith is responsible for managing existing key customer relationships and exploring growth areas for the business. Keith comes with over 20 years of experience working both in the supplier and utility sectors of the industry, and with a strong background in nuclear design, core monitoring, and methods development for PWRs, VVERs, and advanced reactors. He holds a bachelor's degree in Nuclear Engineering and Radiological Science from the University of Michigan, a master's degree in Nuclear Engineering from The Pennsylvania State University, and an MBA from the University of Alabama at Birmingham.



UGM 2024 ANNOUNCEMENT

Save-the-date: 2024 Studsvik User Group Meeting

The 2024 Studsvik Scandpower International Users Group Meeting (UGM) will be held in Miami, Florida!

We're looking forward to welcoming you July 29 – August 2, 2024 at the Hyatt Regency Miami to find out what's been going on with all of the state-of-the-art Studsvik codes and applications.

More information will be shared in 2024.

HELIOS INTRODUCTORY TRAINING COURSE

Studsvik Scandpower invites you to participate in a **HELIOS Introductory Training Course** held at the Studsvik Scandpower office in Hamburg, Germany.

Dates: October 9-13, 2023

Location: SSP office in Hamburg, Germany

Registration: The number of participants is limited, so please register early. To register, please visit: https://info.studsvik.com/e/1015762/e-YGMKb6EXWS/2q72x/175629342?h=X0wgKub9FlwiE078FPLtcD1iPzd39R_TneLP2a9Cx6g

Cost: There is a cost associated with the training.

Please contact Gerd Anton for pricing inquiries and any questions at: Gerd.Anton@studsvik.com

Note: Registration is not binding until commercial terms are agreed upon.

