HAPPY HOLIDAYS FROM OUR PRESIDENT

As the holiday season approaches and many of our customers are taking some time to engage with their families and celebratory traditions, the team at Studsvik Scandpower wishes you all the joy, peace, reconnection, and rest that you can gain over the holiday season. Studsvik Scandpower appreciates the ability to provide software and services in neutronics modeling that improve the lives and tasks of nuclear engineers around the globe as they aim to provide abundant, reliable, and clean nuclear energy to their communities as good stewards of the environment. We value being the trusted advisor in reactor physics for customers around the globe.

The holiday season marks the end of the calendar year and of Studsvik's fiscal year, so we're looking forward to 2022 and beyond. Historic low gas prices and historic high government subsidies for wind and solar generation have distorted electricity markets and provided extreme challenges to our customers which didn't exist 20 years ago. Studsvik has advanced our simulation codes to ensure that nuclear engineers can effectively design and analyze their nuclear fuel inventory in reasonable runtimes. With the market pressures on customers around the world going forward, Studsvik aims to engage with customers on their latest circumstances and challenges that could be helped with software calculations and/or automation and with new products. When your teams gather back for the new year and are considering new challenges and improvement initiatives in reactor design, safety, and operations, please think of Studsvik – we're ready to meet new challenges and solve your hardest problems.

Robert Whittle,

President & CEO

STUDSVIK ADDS DEPTH, EXPERTISE

Studsvik continues to add to the depth and diversity of experience on its team with the addition of two new members.

Petri Forslund Guimarães joined Studsvik Scandpower Västerås office in September 2021 as a Software and Methods Developer. He has over 25 years of experience in developing numerical software at Westinghouse for both for BWR and PWR applications. Petri will mainly support SIMULATE5 development efforts but will also participate in Engineering Consulting Projects for Studsvik customers. Petri has a Master of Science degree in Engineering Physics and Computer Science from Helsinki University of Technology and a Licentiate of Engineering Physics degree in Reactor Physics from Chalmers University of Technology.

Alina Reyzelman joined Studsvik Scandpower in August 2021 as a Senior Vice President of Global Sales. Alina embarked on a career in the energy industry back in 2000. For over 20 years, Alina has worked for international conglomerates such as TNK-BP, Shell, and Wood Mackenzie, where she has assumed senior roles in business development, sales & marketing. Alina holds bachelor's degree in Business Administration from Eastern Oklahoma University, Master's degree in Economics and Investment from Moscow University, MPhil in political science from University of London, UK. In her new position, Alina is responsible for strategic business development and technical sales, while providing support for colleagues around the globe.

STUDSVIK SCANDPOWER HOLDS ITS FIRST HYBRID INTERNATIONAL USERS GROUP MEETING

Studsvik planned to hold its 2020 International Users Group Meeting (UGM) in San Diego but had to cancel the physical UGM and made it virtual. After executing its first virtual UGM successfully, and since most companies still prohibited travel for all of 2021, Studsvik decided to make the 2021 event a hybrid meeting with in-person attendees at the Catamaran Hotel in San Diego and virtual attendees online. Studsvik strived to deliver as much of the value, knowledge, and interaction customers expect from the UGM. Studsvik utilized customer feedback from the last virtual meeting to add more interactive opportunities. Lunch time sessions called "Meet the Experts" were added to allow in-person and virtual customers time to ask questions in a more informal environment with Studsvik software developers.

Since in-person attendance was expected to be much lower than in previous years, Studsvik turned this into an opportunity to invite industry counterparts like Blue Wave AI Labs and EPRI. Although the meeting was only for two days, 11 customers made presentations and the allotted Q&A time was fully used with questions and comments from our customers. Over 110 attendees logged into the virtual meeting, which is many more attendees than we'd expect in person.

Studsvik thanks all in-person and virtual UGM attendees and appreciates patience with our hybrid meeting technology and execution, nothing replaces an in-person UGM. Initial customer feedback from the 2021 hybrid UGM is positive and since the virtual portion of the meeting allows more customers to attend, Studsvik will most likely continue to offer a virtual option for the annual UGM.

PRODUCT LIFECYCLE ANNOUNCEMENT

Studsvik announced many future initiatives during its 2021 Hybrid UGM, including its increased focus on modernizing its product portfolio. Studsvik Scandpower is committed to meeting its brand promise of providing "Always State of the Art" neutronics modeling software that simplifies the job of nuclear engineers around the globe, making it easy for the world to benefit from clean nuclear energy. Studsvik Scandpower developers are focusing on solving and anticipating the hardest problems of modern nuclear utility operations using the CMS5 code platform, which is capable of modeling more advanced materials, fuels, and geometries. To enable that focus on advanced technology fuels, including high enrichment and high burnup capabilities, Studsvik Scandpower has ceased all development on the following last-generation software:

- CASMO-3 originally released in 1986; replaced by **CASMO5** released in 2008

- CASMO-4 originally released in 1995; replaced by **CASMO5** released in 2008

- SIMULATE-3 originally released in 1986; replaced by **SIMULATE5** released in 2008

- HELIOS-1 originally released in 1997; replaced by **HELIOS-2** released in 2009

Customers under a perpetual license for the last-generation software listed above will maintain perpetual rights to use the software. Customer support on these codes will continue and reported bugs to Studsvik will be evaluated for applicable reporting of defects and non- compliance under 10CFR21 for appropriate notification under Maintenance, Support, & Error Reporting contracts for the foreseeable future.

New features in applications like GARDEL, MARLA and CMSBuilder may not be backward compatible with CASMO-4 and SIMULATE-3. While GARDEL, MARLA and CMSBuilder will still operate with CASMO-4 and SIMULATE-3, customers may not experience the benefit from new features developed in these application codes going forward.

Studsvik Scandpower encourages all customers to start investigating the opportunity to move to the latest versions of the software to take advantage of the newest design and analysis tools which have been created specifically to improve the role of nuclear engineers and reactor engineers. The implications of transitioning to new and developing versions of our software are different for each customer. Commercial account managers will be reaching out to each customer before the end year to start developing transition plans. If you have questions or concerns in the meantime, do not hesitate to reach out to your account manager or Erin Wehlage at **erin.wehlage@studsvik.com**.

CMS5 MAINTENANCE RELEASE

Studsvik Scandpower continues to release updates for its CMS5 software suite. Highlights of new features and capabilities, and 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.

CASMO

CASMO5 v3.04.00

- 2D lattice physics transport code for PWR and BWR
- Linear prolongation CMFD acceleration
- Extended TFU and BOR branches for BWR S5C
- Extended TMO branches for PWR S5C
- Added detector base depletions for PWR S5C

CMSLINK5 v1.17.00

Linking code between C5 and S5/S3/S3K

SIMULATE

SIMULATE5 v1.22.00

3D steady state nodal simulator code for PWR and BWR

- PWR and BWR PRM Tube/Detector Tube History Model
- Improvements to BWR Non-Uniform Water Rod modeling
- Maximum number of allowed segment types and fuel types are increased to 3200 and 999 respectively
- Various parameters are added to the HERMES database for square geometries.

SIMULATE5 v1.22.00_VVER

3D steady-state nodal simulator code for VVER

- HERMES database capability extended to VVERs
- Maximum number of allowed segment types and fuel types are increased to 3200 and 999 respectively

CMS VVER

CASMO5 v3.04.00

2D lattice physics transport code for VVER

- Extended TMO branches for S5C.
- Added detector base depletions for S5C

CMSBUILDER

CMSBuilder v1.04.00

Graphical bundle and core design software for use with CASMO5 and SIMULATE5.

- Ability to create a "Burnup Window" core loading pattern project
- Ability for user to change core loading pattern project cross section library
- Ability to disable automatic SIMULATE calculations for each new core loading pattern
- Ability to import/export the Loading Pattern Library between core loading projects
- SIMULATE cases for pool information run at user-selected restart point(s)

MARLA

MARLA v3.05.00

- Coupled MARLA to Safeguards
- Extensive improvements to automation of bridge moves and fuel placement
- Extended shuffle statistics package to include wait times for allowing the transfer tube to cycle from one building to the other
- Automated the movement of fuel for gamma scanning campaigns, fuel inspection campaigns, channel bow measurement campaigns, and sipping campaigns

Current code versions for other Studsvik software include:
HELIOS2 v2.03.02, SIMULATE-3 v6.23.01, SIMULATE-3K v2.10.00, SNF v1.07.05, S5POST v1.00.00, and CMSView5 v1.0.6.

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

STUDSVIK HOSTS 2021 NUPIC AUDIT

Studsvik Scandpower successfully completed the first NUPIC audit of our software QA program since the Covid19 pandemic. Seven auditors from various NUPIC nuclear utility members visited our Idaho Falls office in November for the 5-day audit. The NUPIC audit confirms our software QA program satisfies all the requirements of 10 CFR 50 App. B (all 18 sections), 10CFR 21 (Reporting of Defects), and NQA-1 1994 (Part 1 and 2).

STUDSVIK'S CMS5 AND GARDEL SOFTWARE FEATURED DURING 2021 ICAPP CONGRESS

Studsvik Scandpower hosted a software workshop during the 2021 International Congress on Advances in Nuclear Power Plants (ICAPP 2021), October 16 - 20, 2021, Abu Dhabi, UAE. The workshop was done remotely in two parts. The first part covered CASMO5 (Studsvik's 2D lattice physics code), SIMULATE5 (Studsvik's 3D nodal simulator code), and a demonstration of CMSBuilder (point-and-click loading pattern design tool). A demonstration of Studsvik's online core monitoring system, GARDEL, was presented during the second part of the workshop. The registered participants were from utilities, universities, service providing companies, regulators, and governmental organisations across the world. Studsvik Scandpower would like to thank all the workshop participants.

WANT TO SPEED UP YOUR CASMO5 CALCULATIONS? JOIN US FOR OUR UPCOMING WEBINAR JAN. 18

For some users, CASMO5 runtimes can be a bottleneck in their workflow, especially for those doing design iteration with CASMO5. To address these concerns, several improvements have been made to CASMO5 in the last few years, including: (1) serial runtime optimization, (2) parallel computations for MxN calculations, and (3) parallel S3C/S5C capability. While these subjects have been presented at several previous UGMs, this webinar will cover all these improvements in one place. We will survey the implementation of the parallel improvements, and then focus on how users can decide which parallel options are best suited to their needs. The mechanics of how to enable these features will be presented so that users can begin using these features immediately. **The webinar is scheduled for 10-11 AM (EST) on Tuesday, January 18, 2022. Registration to open January 3, 2022.**

UPCOMING EVENTS

November 29 – December 15, 2021:

Studsvik Customer Annual Survey opens and is active. Please participate by using the link below. ***Participants in the survey will automatically be registered for a raffle of holiday gift baskets.***

SURVEY

November 30 – December 31, 2021:

Holiday gift to Studsvik CMS Customers. Contact Studsvik for a Free 6-month trial of CMSBuilder, Studsvik's new point-and- click graphical fuel and core loading pattern design tool. Customers must have SIMULATE3 or SIMULATE5, an active maintenance and support plan, and complete a short questionnaire to receive the software. Please contact **Alina Reyzelman** (SVP of Global Sales) or your commercial account manager.

December 1 – December 3, 2021:

Studsvik leadership attends the ANS Winter Meeting in Washington D.C. Please contact **Robert Whittle, Alina Reyzelman, Erin Wehlage,** or **Art Wharton** to set up a coffee or happy hour meeting.

January 18, 2022:

Virtual Webinar on speeding up CASMO5 run times with Joshua Hykes. (See info above)

HAPPY HOLIDAYS, MERRY CHRISTMAS, AND HAPPY NEW YEAR TO YOU AND YOUR FAMILY FROM ALL OF US AT STUDSVIK SCANDPOWER. WE WISH YOU THE BEST TIMES IN 2022.