



STUDSVIK POWERS ADVANCED TEST REACTOR SIMULATOR

The Idaho National Laboratory (INL) replaced its existing simulator for the Advanced Test Reactor (ATR) and selected Studsvik to provide the dynamic core module. The ATR software package uses HELIOS/RAMONA. RAMONA was implemented in lieu of S3R because of its coupling to HELIOS (used for by the ATR for its fuel design). The advantages of using Studsvik for the ATR include:

- The exact modeling of irregular geometries
- Asymmetric loading of advanced materials in test loops
- Post-processing of reaction rates for detector responses

CMSBUILDER NOW AVAILABLE

Studsvik has released version 1.00.00 of CMSBuilder, an easy to use Java based loading pattern design interface. CMSBuilder couples the advanced neutronics methodology of SIMULATE with a strong emphasis on ease-of-use and graphic visualization. Direct interaction with the nodal neutronics through the CMSBuilder system allows a core designer to evaluate multiple loading patterns in a short time. The designer gets feedback on crucial design changes in an easy-to-use graphical manner, as opposed to the inherently time-consuming “batch-mode” operation. As a result, CMSBuilder can substantially reduce the time needed to develop an acceptable loading pattern and can reduce the overall hours required for engineering. CMSBuilder uses either SIMULATE-3, or SIMULATE5. It is the next generation of core design tool that replaces the functionality of XIMAGE and expands it to use in CMS5 applications.

U.S. GOVERNMENT SOFTWARE CLASSIFICATION SUPPORTS EXPORTS

During 2019, Studsvik undertook a detailed review of its software products as they relate to U.S. government export controls. It was determined that Studsvik’s software is not within the scope of 10CFR810 export controls, which require lengthy intra-governmental reviews and greatly restrict the ability to sell the software into many potential markets. Instead, the products are governed by the U.S. Export Administration. This classification was confirmed with the U.S. Department of Commerce and the U.S. Department of Energy. The determination greatly expands the potential markets for Studsvik’s software, including China, the world’s third largest nuclear operator, where some 45 reactors are in operation and another dozen reactors are under construction. The reclassification opened the door for the sale of CMS5 and Helios-2 to the Nuclear Power Institute of China in late-2019.

2019 USERS GROUP MEETING MATERIALS AVAILABLE

Customers from around the world gathered in Dresden, Germany, in October 2019, for Studsvik's annual Users Group Meeting. Studsvik Group CEO, Camilla Hoflund, welcomed the attendees and discussed Studsvik's 70-year history of supporting the nuclear fuel lifecycle. Today, Studsvik group supports everything from nuclear fuel qualification, core design and analysis, the design and licensing of new reactor technologies, to decommissioning. Tom Marcille, Vice President of Reactor Technologies at Holtec International, provided the keynote address. Marcille drew upon his background as a reactor physicist and his experience at General Electric, Los Alamos National Laboratory, NuScale Power and Holtec to discuss the major advances in nuclear fuel and reactor software.

Studsvik's experts provided updates and insights and customers made presentations on their uses of Studsvik's products. The UGM concluded with workshops on CMS5-VVER and GARDEL. Presentations from the 2019 UGM are available to active Studsvik customers on the Studsvik Web site at <https://www.studsvik.com/our-solutions/nuclear-fuel--reactor-performance-optimisation/cms-users-group-meetings/#Username>. Login required.

SAN DIEGO SELECTED FOR 2020 USERS GROUP MEETING

Studsvik will hold its 2020 Users Group Meeting in San Diego, CA, on **October 5th – 8th, 2020**. Stay tuned for information on the timing, program and workshops, and for UGM and hotel registration.



CMS5 MAINTENANCE RELEASE

Studsvik Scandpower has released an update for its CMS5 software suite. As part of Studsvik's commitment to modeling the latest in advanced fuel designs, the most recent SIMULATE5 release (v1.19.00) now supports axially varying BWR water rods. Additional 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): <https://support.studsvikscandpower.com/hc/en-us>

This software has been qualified under the Studsvik, Inc. NQA1 1994, 10 CFR 50 Appendix B, 10 CFR 21 Quality Assurance Program.



CASMO5 v3.01.00

2D lattice physics transport code for PWR and BWR

CMSLINK5 v1.14.00

Linking code between C5 and S5/S3/S3K

SIMULATE v1.19.00

3D advanced nodal core simulator for PWR and BWR

CASMO5 v3.01.00_VVER

2D lattice physics transport code for VVER

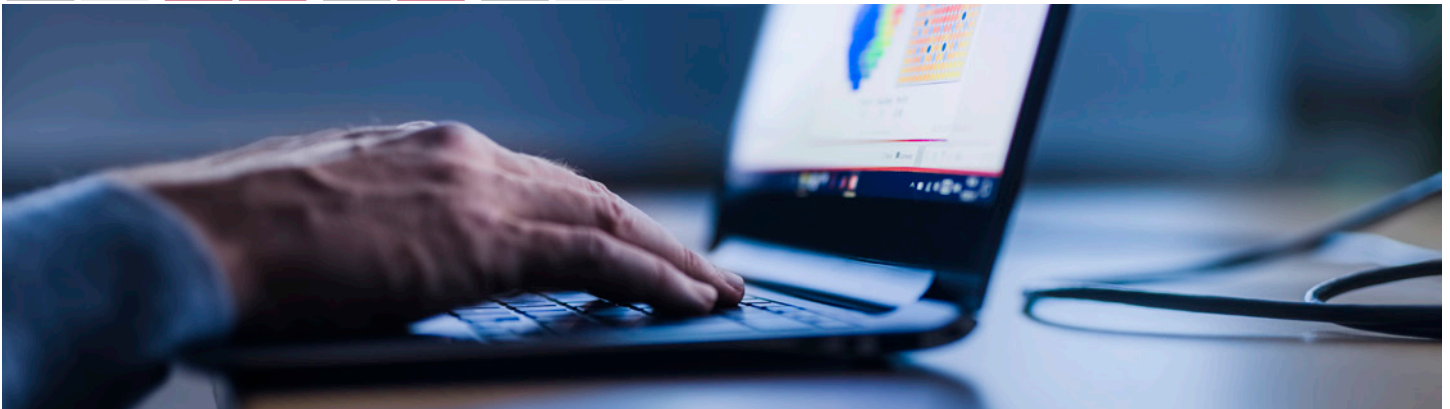
SIMULATE v1.19.00_VVER

3D advanced nodal core simulator for VVER

Current code versions for other Studsvik software include:

CASMO-4 v2.05.17, SIMULATE-3 v6.20.00, SIMULATE-3K v2.08.00, SNF v1.07.02, and HELIOS-2 v2.02.00.

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



STUDSVIK CAPABILITIES EXTEND TO ATF

Studsvik's software is capable of supporting the development, design and evaluation of Accident Tolerant Fuels. Studsvik experts Erin Wehlage, Director of Business Development / Senior Nuclear Engineer, and Phil Sharpe, PhD, Vice President of Innovation, will attend the EPRI ATF workshop in New Orleans, Feb. 18-21, 2020. To arrange a discussion on Studsvik software's ATF capabilities, please contact erin.wehlage@studsvik.com.

STUDSVIK EXPERTS TO PRESENT AT PHYSOR 2020 AND ANS SUMMER MEETING / RECENT PAPERS AVAILABLE

Several Studsvik experts will present at the PHYSOR 2020 conference (International Conference on the Physics of Reactors), March 29-April 2, 2020, and the ANS Summer Meeting, June 7-11, 2020. Studsvik will add the papers under the pertinent product category following the conferences.

PHYSOR 2020

- *“Generation and Initial Validation of a New CASMO5 ENDF/B-VIII.0 Nuclear Data Library”* Rodolfo Ferrer, Joel Rhodes
- *“BEAVRS Benchmark Evaluations with CASMO5 and SIMULATE5”* Tamer Bahadir
- *“Application of Studsvik’s CMS5 Code System to Accident-Tolerant Fuel Core Design and Analysis”* Gerardo Grandi, Rodolfo Ferrer, Tamer Bahadir
- *“Advances in Studsvik’s System for Spent Fuel Analysis”* Teodosi Simeonov, Charles Wemple
- *“Compression of Pinwise Nuclide Concentrations”* Joshua Hykes

ANS Summer Meeting

- *“Verification of Predicted Energy Deposition Using CASMO5 Coupled Neutron-Gamma Transport Solutions for Selected VERA Benchmark Problems”* Rodolfo Ferrer, Joshua Hykes and Charles Wemple
- *“Stability Analysis of CMFD Acceleration and Linear Prolongation for Weighted Linear Difference Schemes”* Rodolfo Ferrer

PREVIOUS CONFERENCES

The following presentations are now available on the Studsvik Support Site <https://support.studsvikscandpower.com> (login required).

- **M&C 2019** *“Development of a Spatially-Dependent Resonance Self-Shielding Method in CASMO5”* Rodolfo Ferrer, Joshua Hykes
- **ICNC 2019** *“SIMULATE5 Analysis of a Spent Fuel Pool”* Joshua Hykes, Tamer Bahadir, David Dean, Rodolfo Ferrer, Dave Knott, Joel Rhodes
- **GLOBAL / TOP FUEL 2019** *“Modeling of Base Irradiation Histories of LOCA Tests Using CMS5 and ENIGMA”* Gerardo Grandi, Joakim Karlsson
- **29th AER Symposium on VVER Reactor Physics and Reactor Safety 2019** *“Benchmark Testing of the Helios-2 Code System”* – Charles Wemple *“A Model for Impurity and Activation Isotopes in Studsvik’s System for SNF Analyses”* Teodosi Simeonov *“Validation of New CASMO5 ENDF/B-VIII.0 Nuclear Data Library with Hexagonal-Lattice Critical Experiments”* – Rodolfo Ferrer, Tamer Bahadir
- **RPHA19** (Reactor Physics Asia), *“BEAVRS Benchmark Evaluations with Studsvik CMS5 Code Package”* Tamer Bahadir, Masatoshi Yamasaki

