

# Core Management System 5 (CMS5)

Studsvik's Core Management System 5 (CMS5) enables customers to be self-sufficient in their core design and analysis for LWR plants.

## Decades of Development and Operational Experience

Studsvik's nuclear fuel lattice code, CASMO5, and nodal simulator code, SIMULATE5, work together as CMS5 to provide the foundation for state-of-the-art core design for light water reactors (LWRs).

CMS5 builds upon the 40 years of operational experience gained by the use of previous generations of CASMO and SIMULATE codes in over 200 light water reactors. CMS5, comprised of CASMO5 and SIMULATE5 leverages modern computing power to increase accuracy and precision without the need of supercomputers to model known industry issues learned from decades of experience in commercial plants. Furthermore, CMS5 contains additional functions specifically built around industry experience.

## Flexibility for the Global Fleet

CMS5 supports the operation of all commercial light water reactor designs: PWRs, BWRs, and SMRs for square lattices. (Studsvik's CMS5-VVER supports VVER plant designs with hexagonal lattices.)

Studsvik's software is independent of nuclear reactor, fuel, and used fuel storage cask vendors. By using Studsvik's independent design and planning tools, engineering staff gain the ability to control the design of cores, fuel needs, and assessment of multiple suppliers, which provides flexibility and negotiation leverage.

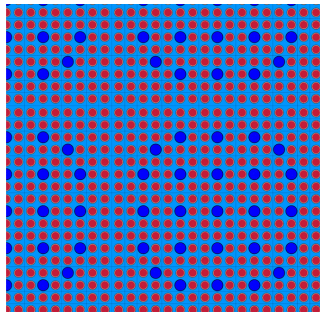
## Efficiency, Accuracy, and the Future

CMS5 provides highly accurate predictions at any point during the operational fuel cycle for rapid evaluation of core behaviors so that engineers are always prepared to respond to changes and issues.

CMS5 combines pin-by-pin reconstruction accuracy with optimal functions for real engineering work to ensure there is an efficient calculation for both planned operations and unplanned analyses.

CMS5 evolves in parallel with industry fuel designs. If it's new, the development will be included in CMS5.

**CMS5 enables nuclear power plant operators to efficiently and accurately manage the entire nuclear fuel lifecycle.**

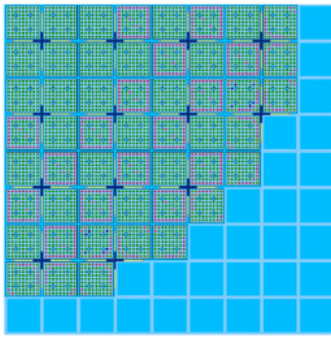


## CASMO5

CASMO5 is Studsvik's 2D lattice code for modeling square LWR nuclear fuel. The 2D transport solution is based on Method of Characteristics (Linear Source) and uses the latest libraries - ENDF/B-VII.1 and ENDF/B-VIII.0 in a 586 energy-group structure.

CASMO5 generates few-group cross-section data for SIMULATE5 and supports efforts in the following areas:

- Fuel management
- Core follow
- Plant operations
- Reload physics
- Spent nuclear fuel management



## SIMULATE5

SIMULATE5 is Studsvik's 3D, steady-state, multigroup nodal simulator code for the analysis of LWRs. SIMULATE5 delivers vendor independence and unparalleled accuracy for advanced core designs with increased heterogeneity and aggressive operating strategies.

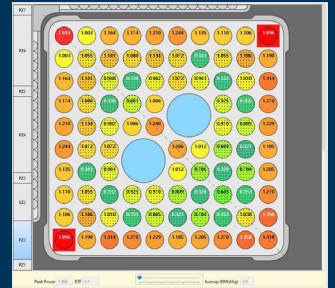
SIMULATE5 efficiently and accurately analyzes core loading pattern designs even with complicated core designs. It is built to meet the needs of reactor engineers and core designers, with functionality to support startup physics testing, power maneuver guidance, thermal limit assessment, shutdown margin calculations, and much more.

The SIMULATE5 model supports fuel studies and validates vendor-predicted cycle lengths, ensuring the maximum return on your fuel investment.

## CMSBuilder

CMSBuilder is Studsvik's point-and-click graphical loading pattern design tool. The GUI allows core designers to design and evaluate multiple loading patterns in a short period of time.

Leveraging the power of CASMO5 and SIMULATE5, Studsvik's industry-leading nuclear reactor analysis software, CMSBuilder enables engineers to design and evaluate loading patterns in a convenient environment. CMSBuilder is built into to the CMS5 system, which means that the final core design can be immediately handed to other engineers for downstream analysis.



## S5K

Studsvik's nodal code for LWR transient analysis, SIMULATE5-K, delivers neutronic and thermal-hydraulic analysis with licensing-grade accuracy. S5K is a best-estimate nodal reactor analysis tool that employs advanced core neutronics coupled with detailed thermal-hydraulic channel models for a wide range of transients for LWR reactor designs.

S5K helps operating utilities address key industry regulatory issues. S5K uses the same high-fidelity nodal methods as SIMULATE5 and solves the time-dependent multi-group neutron diffusion equations. In addition, S5K is capable of modeling transients for safety analyses such as reactivity insertion accidents and boron dilution events.

## Unparalleled Customer Support

Studsvik's technical support is built on putting the needs of its customers first.

- 24-hour response time
- Easy ticketing system
- On-line support portals
- Access to technical documentation
- Active and growing user communities of practice

## For further information please contact:

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