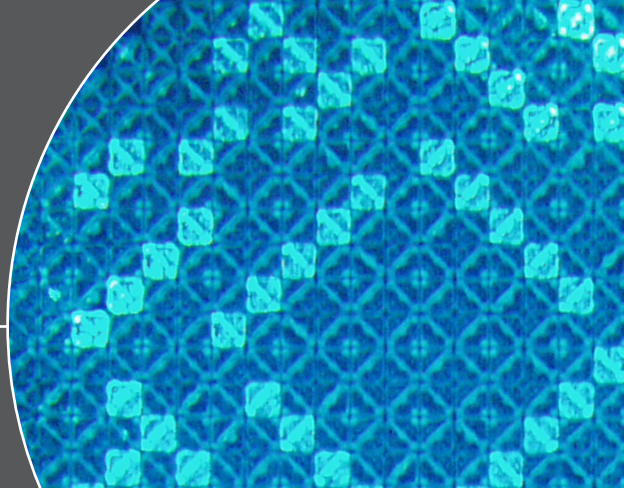
Studsvik

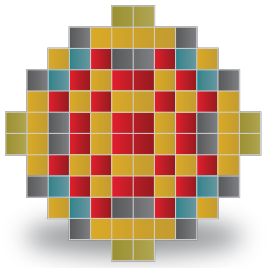
SIMULATE5

NUCLEAR FUEL ANALYSIS SOFTWARE



Next-Generation Nodal Code for Light Water Reactors

SIMULATE5 is a 3D, steady-state, multi-group nodal code for the analysis of both PWRs and BWRs. SIMULATE5 delivers vendor independence and unparalleled accuracy for advanced core designs with increased heterogeneity and aggressive operating strategies.



Truly Advanced

Highly heterogeneous cores and aggressive operating strategies have pushed existing reactor analysis methods to their limit.

Studsvik, the global leader in reactor analysis software, has developed SIMULATE5 to address these deficiencies and meet the demands of current and future core designs with technical advancements not found in any other analysis package.

The newly designed SIMULATE5 neutronics engine includes a generalized multi-group diffusion model with a first-order transport correction.

A built-in microscopic depletion model with more than 50 explicit nuclides improves the treatment of history effects, shutdown cooling, and as-built loading discrepancies.

Radial and axial heterogeneities are treated using a proprietary submeshing scheme to overcome the shortfalls of spatially-averaged cross-sections and discontinuity factors.

SIMULATE5 includes more complete thermal-hydraulic modeling outside of the core by extending the T-H model from the lower to upper tie plates in PWRs and including the entire vessel loop in BWRs.

Many advanced BWR thermal-hydraulic models have been synthesized into a generic solver, ensuring accuracy even in complex scenarios, such as PWR voiding.

Momentum equation solvers allow cross flow modeling – between assemblies in PWRs and within assemblies in BWRs.

Proven Results

Studsvik's 25 years of experience producing flexible, highly accurate software solutions for the nuclear power industry is reflected in the state-of-the-art reactor physics methods and engineering features in SIMULATE5.

Fully capable of modeling all types of PWRs and BWRs with first-principle neutronic and thermal hydraulic calculations, SIMULATE5 provides a robust, single solution to core design and core analysis requirements.

Driven by CASMO5

SIMULATE5's advanced neutronics engine demands more accurate physics models for assemblies containing high mixed-oxide (MOX) or burnable poison concentrations.

CASMO5 has been developed specifically to support the increased requirements of SIMULATE5. Together, they comprise the most advanced light water reactor physics analysis system in the world.