

**Studsvik**

## Serpent-SSP: VTT and Studsvik Collaboration

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# Serpent-SSP – a QA version of Serpent

## Some recent and upcoming events

August 29 - September 1, 2022

11th Serpent User Group meeting in Carlsberg, Germany.

July 1, 2022

VTT and Studsvik Scandpower announce collaboration on the development and distribution of an NQA-1-2015 certified version of Serpent as part of SSP's software family (see [press release](#) for more information).

May 23, 2022

Serpent 2.2 available at the OECD / NEA Data Bank (Package-ID [NEA-1923/01](#))



Start

Published: 01-Jul-2022

Studsvik Scandpower and VTT Partner to Bring QA Serpent to Nuclear Industry To address the growing need for Quality Assured neutronic simulation in the Advanced Reactor market, Studsvik Scandpower, the global leader in neutronic simulation software, and VTT Technical Research Centre of Finland, the cutting-edge leader in the development of advanced

Press release from July 2022

## “Commercial grade dedication” – DIY approach

An acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used in a safety system or mission essential facility meets specified requirements. This assurance is achieved by identifying the critical characteristics of the item and verifying their acceptability by inspections, tests, or analyses **performed by the purchaser** or third party dedicating entity after delivery, supplemented as necessary by one or more of the following: commercial grade surveys, product inspections or witness at hold points at the manufacturer’s facility, and analysis of historical records for acceptable performance. [doe.gov]

## Some enjoy DIY, others not so much

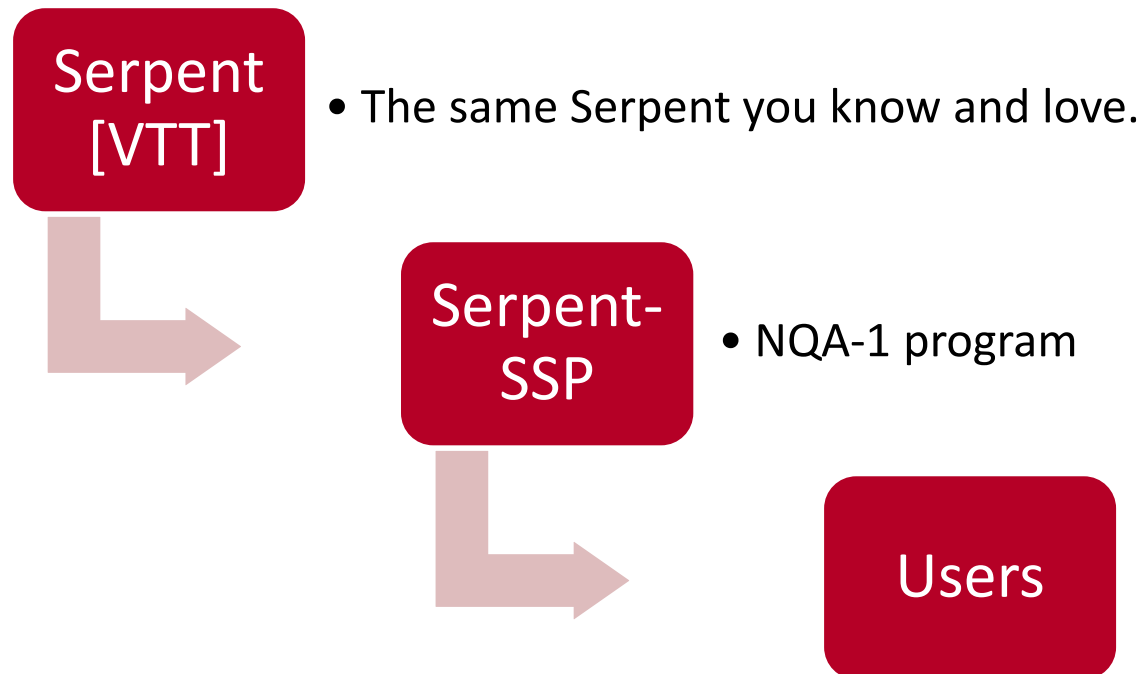


Should they call an electrician or plumber?

<https://innovativeplumbingpros.com/diy-plumbing-fail/>

## Studsvik will take on QA for Serpent-SSP.

- ~~Commercial grade dedication~~
- This will be under Studsvik's **NQA-1** and **10 CFR50 Appendix B** Quality Assurance program



## Studsvik has decades of experience managing the QA burden.

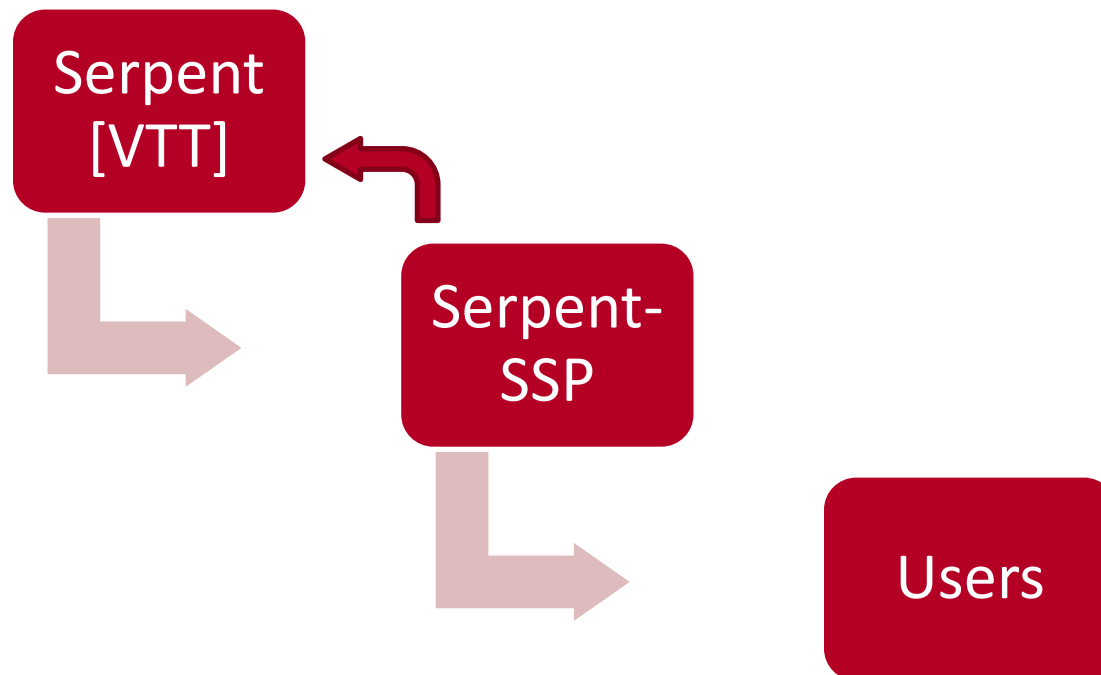
- 40 year track record in NQA-1
- Nuclear codes such as
  - CASMO, SIMULATE, HELIOS, GARDEL, S3K, S3R
- We have an existing QA program, including
  - QA personnel
  - Document library
  - Support for audits

## Support of Serpent-SSP

- Studsvik will provide the first line of support
  - Customer support is one of our top priorities – our responses need to be helpful and quick
- VTT will be available for more complex requests
- This will be a mechanism to prioritize development requests

# Code management

- Serpent-SSP will be a separate branch
  - Some Serpent-SSP code changes will flow upstream to Serpent
  - Some Serpent-SSP changes will not flow upstream





## Licensing

- A license for Serpent-SSP will be purchased with Studsvik
- A commercial Serpent license can still be purchased from VTT

Non-commercial research and educational use remains free of charge through VTT.

# Potential future applications of Serpent-SSP

## LWRs

- Serpent equivalent input generation from CASMO5
- Serpent as a reference/benchmark lattice code for SIMULATE
- Ex-core detectors or vessel fluence calculations
  - SIMULATE provides assembly-by-assembly source
  - Serpent performs transport calculation
- Spent fuel pool criticality –
  - Isotopics from SIMULATE/SNF
  - Transport by Serpent
- Neutron/gamma transport analysis of casks

## Outside of traditional nuclear power

- Medical
- Space