

Horizon Test Facility

Short description of the facility:

Tube dimensions of the HORIZON model steam generator and Loviisa VVER-440 steam generators are approximately same. Thus it can be assumed that experiments give realistic results.

Table. Main dimensions of the HORIZON facility and the Loviisa VVER-440 reactor steam generators.

Geometries	HORIZON	Loviisa NPP
Primary side volume	67.48 dm ³	10.29 m ³
Secondary side volume	452.46 dm ³	3 69 m ³
Number of tubes	38	5536
Number of tubes	8.78 m	9.26 m
Average tube length*	16 x 1.5 mm	16 x 1.4 mm
Tube outer diameter x wall thickness	78 mm	136 mm
Surface area of the tubes	16.46 m ²	2502 m ²

* Penetrations through the tubesheet in HORIZON and through the collector wall in Loviisa NPP included

In addition to the steam generator section itself, the HORIZON facility includes a lot of equipment needed for steam and aerosol generation, and for measuring the thermal-hydraulic parameters as well as the aerosols concentrations.

The inlet and outlet chamber aerosol mass concentration is monitored with Tapered Element Oscillating Microbalance (TEOM) on-line mass monitor and the particle size distribution is measured on-line with the Electrical Low Pressure Impactor (ELPI). Aerosol sampling system includes heated sampling lines, two diluters (first diluter in system pressure is computer controlled and uses heated dilution air), pressure reducer and sampling valves. It is possible to change sampling point between inlet and outlet chambers.

The figure below represents the steam generator model which is the test section of the facility. Click the picture to enlarge it.

