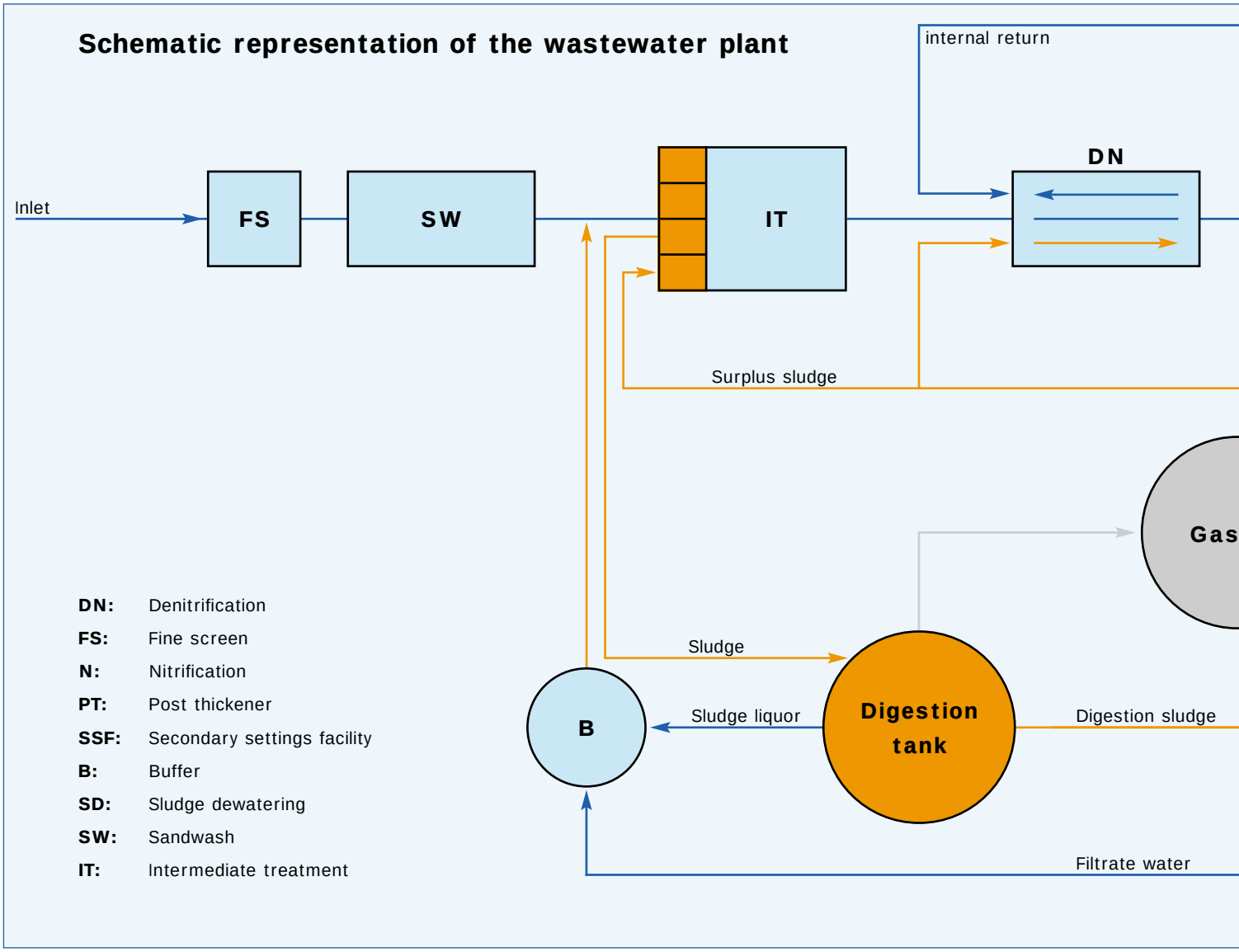


Around the clock operation: The TOC-

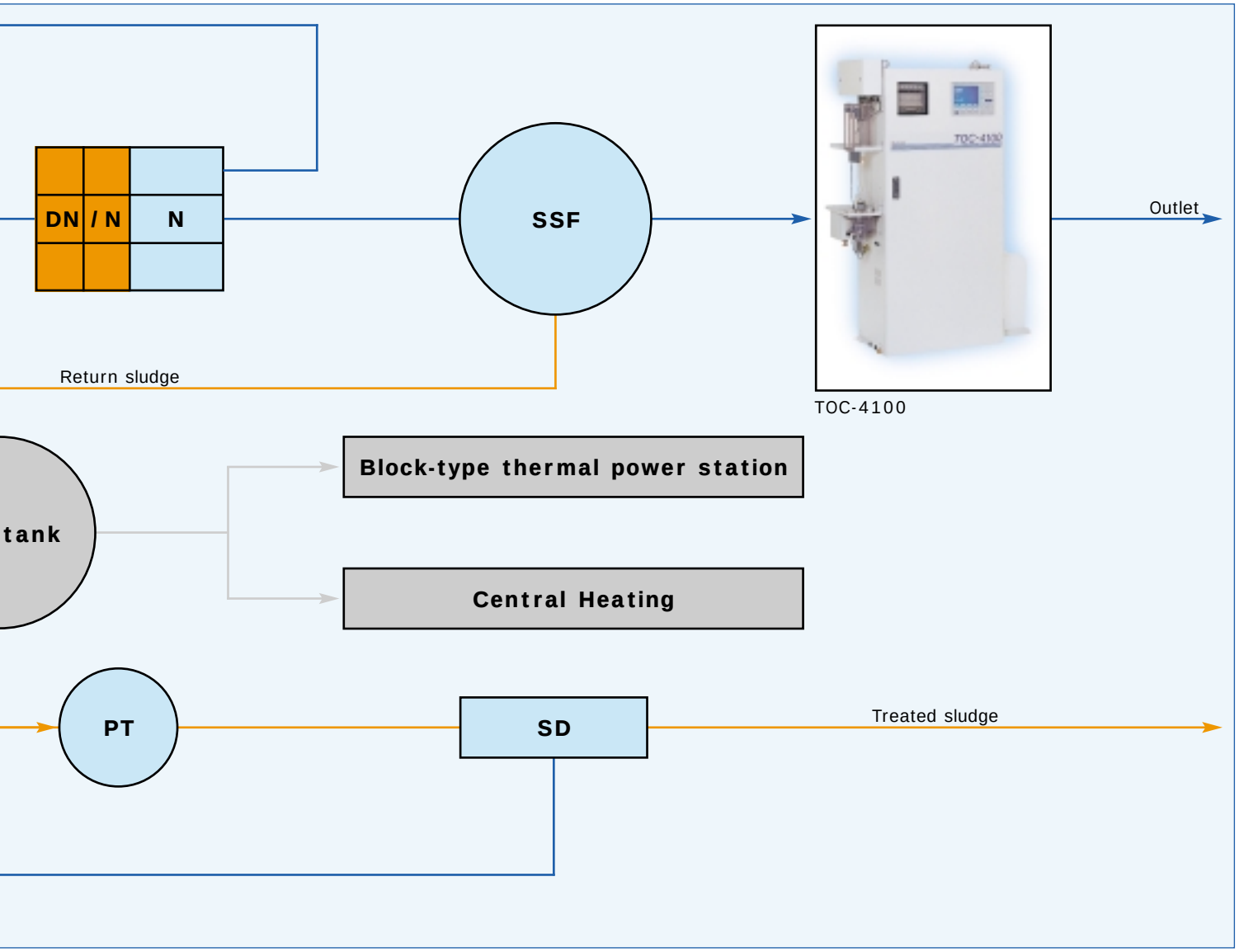
The central wastewater treatment plant in Ansbach, Germany, processes, since the start up operation in 1980, the wastewater of a city of 40.000 people and all local industrial wastewater, particularly from the meat processing companies in the area.

In addition, the wastewater plant has a sludge tower, where the raw sewage can be stored and partially composted and resulting biogas can be used as a source of energy. This way it was possible to produce 1.62 million tons of biogas in 1999, which had a clearly positive influence on the energy balance of the plant.

Although the chemical oxygen requirement parameter still needs to be determined as a reference parameter, the plant will switch to on-line total organic carbon (TOC) analysis in the near future. Therefore the TOC parameters have been determined in the effluent after treatment in parallel to COD parameters since November 1998 and give a better overview and control of the COD values. The TOC analysis is carried out automatically on-line, 24 hours a day, whereas COD is manually determined once every 24 hours on a 2-hour mixed sample. The NPOC (Non Purgeable Organic Carbon) value is determined every 10 minutes in the sample stream. For quality control of the analysis, the calibration is checked automatically once a week: the results of this check are compared with the current calibration and evalu-

Analytical parameter	Effluent values (mg/l)
Chemical oxygen requirement (COR)	40
Biological oxygen demand	15
N_{tot}	18
NH_4^+-N	5 (May – October)
P_{ges}	1

Effluent values to be observed



4100 in wastewater treatment plants

ated via user-defined acceptance values of the standard deviation. It is then decided whether an automatic recalibration is performed or whether the current calibration can further be used. The TOC-4100 system uses the well-known catalytic oxidation at 680° C, a method developed by Shimadzu, which has been successfully applied in Shimadzu's analytical systems for many years. NDIR detection as well as oxidation method is in accordance with EN 1484.

The TOC-4100 uses an extraordinary sample introduction system, which precludes the need for a costly filtering unit. In addition of saving purchasing costs, maintenance costs are also significantly reduced. At the same time, the economic viability increases due to a reduction in instrument down-time.

The TOC-4100 is maintained by Mrs. Ute Stingl and Mrs. Inge Sennfelder. Maintenance takes approximately 2 hours per week. The catalyst needs to be exchanged once every 5 to 6 months.

Presently the biology of the plant is being examined mainly via turbidity analysis, temperature and oxygen concentration. This requires considerable experience from the plant supervisor as well as time-consuming evaluation of the analytical results and corresponding revisions, in order to optimise the wastewater treatment process. The long-term goal is therefore to simplify and to automate the treatment processes via the already existing process techniques. This requires online stations, which operate reliably with minimum maintenance or down-time.