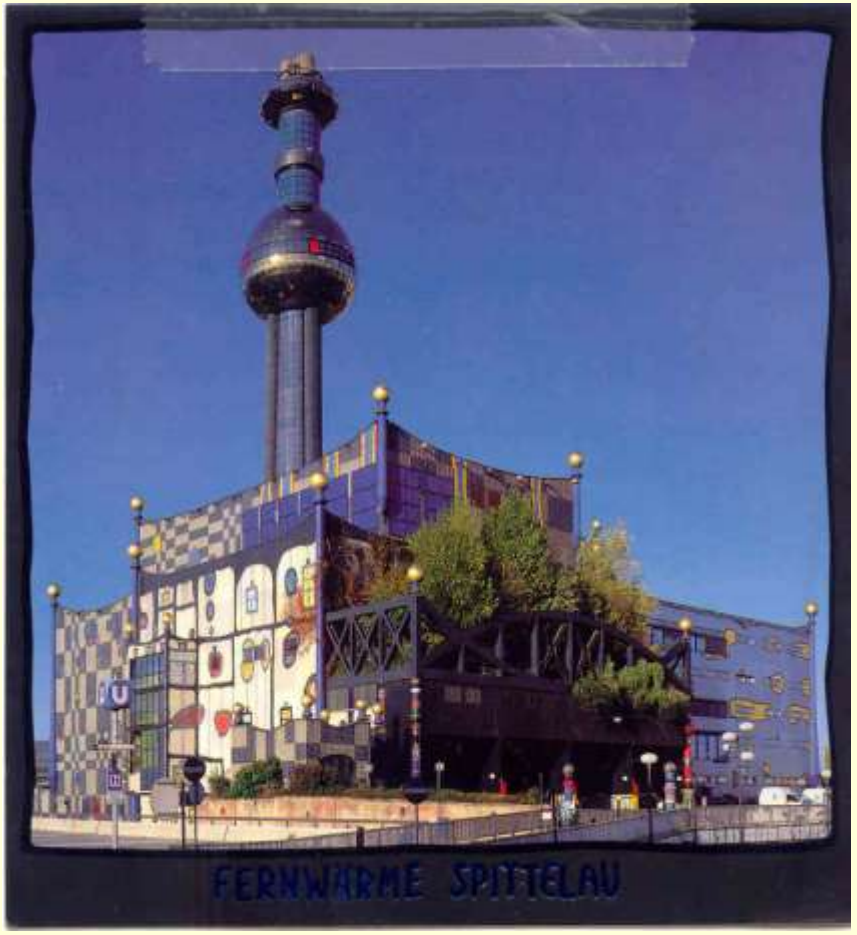
EUROHEAT
Customer Installation

- Benchmarking
- Guidelines
- Best reasons for connecting to DH !

Guidelines

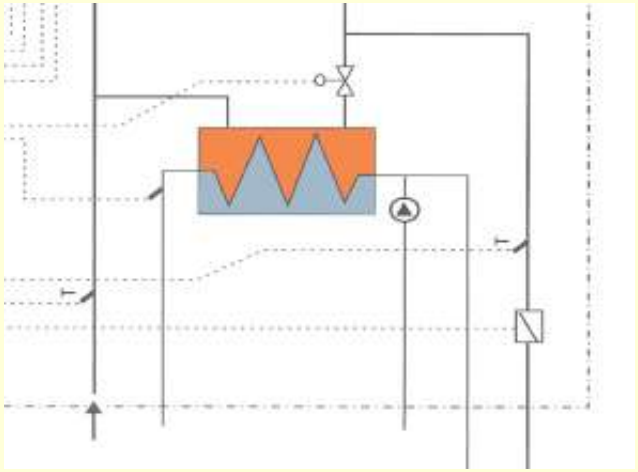
- Indirect / direct connection
- Heat exchangers / storage tanks
- Domestic warm water demands
- Interaction between the substation and the production

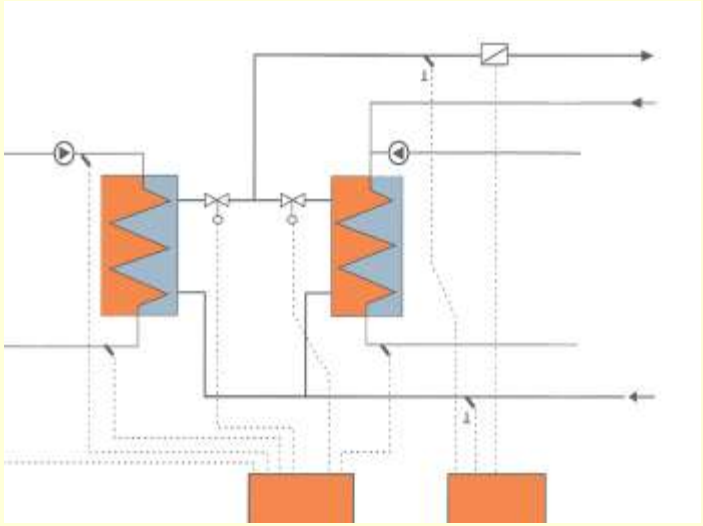


Guidelines District Heating Substations

Presentation on:

GUIDELINES FOR DISTRICT HEATING SUBSTATIONS

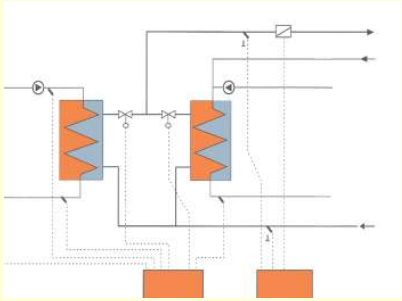




GENERAL

The Guidelines address…

- Those who are running and maintain a DH system
- Those who design, purchase, test, install and manufacture substations
- Those who own or maintain a building connected to the district heating network
- Those who are responsible for contacts between the district heating utility and the customers



District Heating systems

- **DH companies recommended to build all new systems, including new parts in older systems, in accordance with levels provided below**

District Heating system	*Operating data*	*Design data*
High-temperature system (HTS system)	**100 C; 1,6 MPa** **differential pressure 0,8 – 0,10 Mpa**	**110 C; 1,6 MPa**
Low-temperature system (LTS system)	**Max 85 C; 0,6 Mpa** **differential pressure 0,35 – 0,3 MPa**	**90 C; 0,6 MPa**

District heating substations

- HTS systems normally operate with a differential pressure in the range of: 0,1 to 0,8 MPa [common range is 0,1 to 0,6 MPa]

- For overall substations efficiency in a big DH network 0,10 MPa is recommended as the lowest DP level

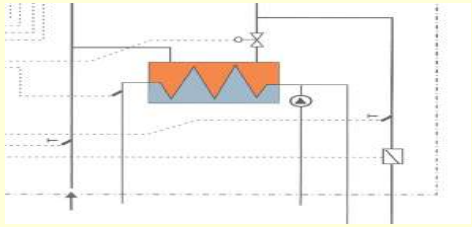
- Good cooling of the DH water (i.e. the more heat abstracted) and good performance of the district heating substation are in the interests of both the customer and the heat supplier.

THE DOMESTIC WARM WATER SYSTEM

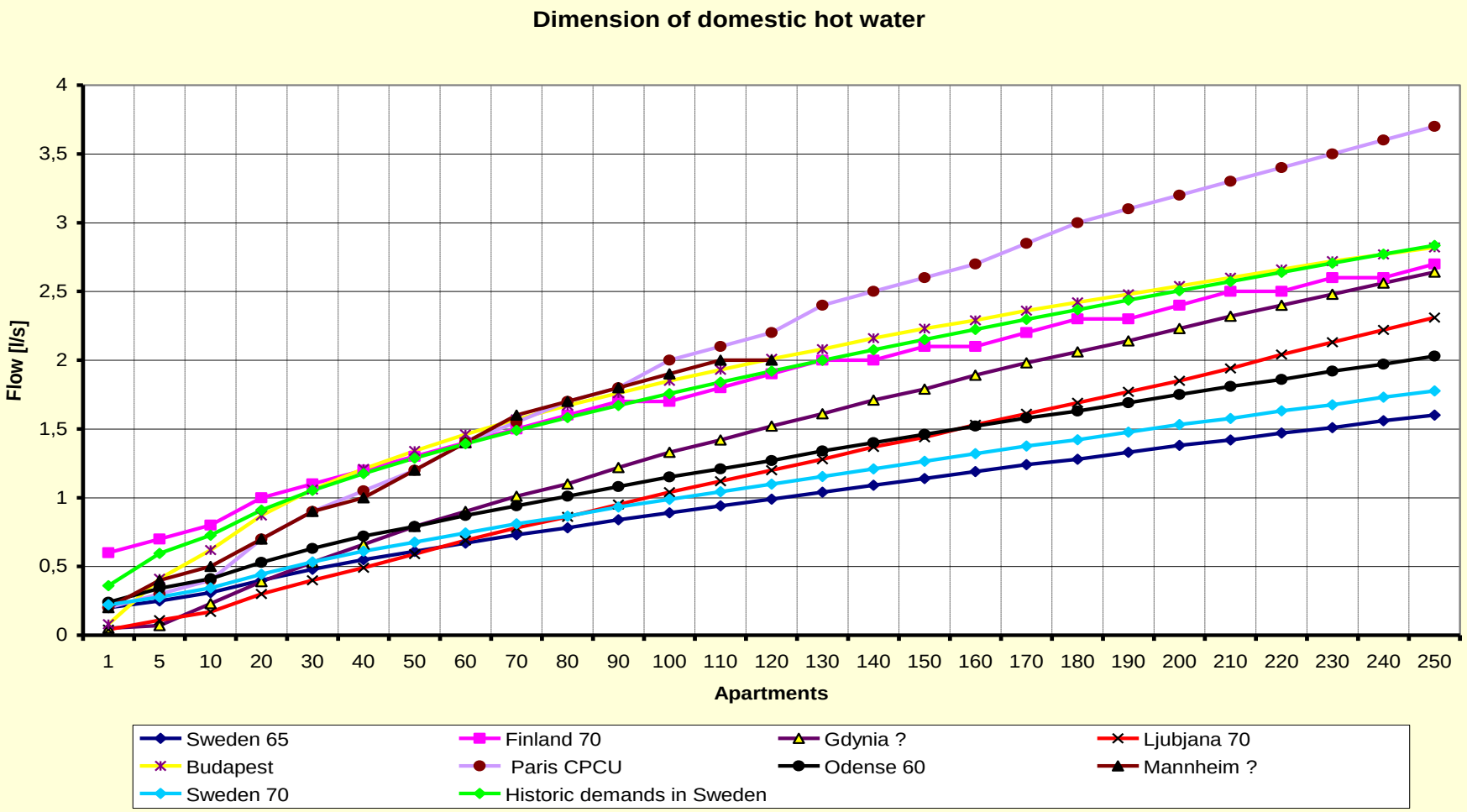
- **Directive 98/83/EC: European standard for the safety of water for human consumption.**

- **In all warm water systems special actions should be taken to prevent the development of bacteria and Legionella (not a problem specific to district heating).**

- **Production of DWW either by a heat exchanger or storage tank (with internal or external heat exchanger).**

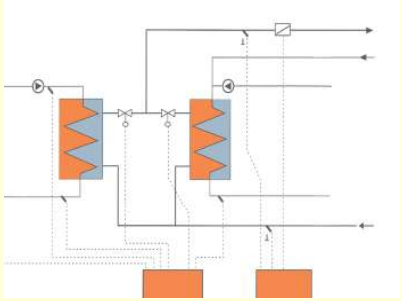


Benchmarking
Customer Installation



Domestic Warm Water dimensioning

- **Choice of flow recommended for dimensioning (*best results is obtained closest to the lower line*)**



Domestic Warm Water circulation system

- To keep the DWW-system active and the temperature on such a level, that both comfort and health requirements are satisfied
- Especially recommended for multi family houses
- To ensure, that the DWW-return temperature never goes below 50 C.
- This can be ensured through a variable pump, thermostatic valves and balancing valves

RADIATOR AND VENTILATION SYSTEM

- **Radiator and ventilation systems should be built so that the return temperature of the DH water is as low as possible.**

- **When dimensioning heat substations the operating mode with the highest heating power requirements should be considered**

PUMPS, SAFETY EQUIPMENT AND OTHER COMPONENTS

- Energy saving pumps (electrical controlled) should be considered in all positions to save energy and to reduce life time operation cost of the system. These kind of pumps also help to maintain a right flow for all situations, providing better space heating conditions

- The flow for a DWWC-pump should be at least 20% of the total flow for DWW heat exchanger

- All pumps in the system should have so low noise level that no noise is transferred into the living quarters of the building

SERVICE AND MAINTENANCE

- Customer satisfaction is essential for DH
- Substations are extremely reliable and have a long lifetime, but for smooth and economically efficient operation, regular inspection and maintenance are recommended
- Specified periods of time are not prescribed
- Qualified personnel is indispensable

- DH supply companies can develop individual inspection and maintenance plans and calculations

HEAT METERING

IF a meter is used in the right way it is a **tool for...**

- **Energy saving by**
  Invoicing the real consumption of energy
  Supervision the function of the substation

- **Customer service by**
  Reporting back suspicious levels of consumption

- **Meter contributes to optimizing operation**
  By knowing what happens in the network

Functional requirements

- Use standardised types and dimensions to ensure compatibility and replacing ability

- Measuring range
  - Temperature: One range fit most needs
  - Flow: Select carefully to avoid over sizing

- If you have short peak loads
  - Use fast response flow sensors
  - Use short response time on sensors
  - Use high resolution on flow signal
  - Check the requirements for mains or battery

CONCLUSIONS

- Guidelines have direct impact on improving technical performance of DH systems and on significantly decreasing both life-time costs as well as installation costs

- Correctly carried out installation assures high levels of services and simultaneously reduced maintenance cost

- Guidelines allow to significantly decrease return temperatures in the DH network

- Such rationalization will lead to a reduced use of primary energy sources and less greenhouse gases emission

Production plants are highly dependent on the sizes of the valves in the substations

Advantages with small dimensions

- Dumb network (responds better to changes)
- Less cyclic variation in domestic warm water
- Higher accuracy on heat meters
- Cost reduction in production plants
- Less pumping costs in the network
- Better cooling of the network in the summertime
- Reduced morning peaks
- Creating more capacity in the existing network
- Faster recovery from blow out of the network

Reducing capacity in district heating networks

- Network capacity demand: Ca 350 MW
- Number of substations: 300
- Kvs-value 2003 : 32000
- Kvs-value 2005: 24000
- Decrease in capacity: 20 MW

Reducing of capacity