Guideline to Planning and Building of District Heating Networks (1996 N3.1)

The handbook

District heating networks fulfill an important service role and construction of these calls for large-scale investment. Consequently, network systems must meet special criteria in terms of network operating life, reliability of supply and cost-effectiveness. A body of specialized knowledge has been assembled from the development of numerous heat and distribution services in northern and central Europe, some of them large, and this will be passed on here. Heating distribution systems of considerable size have also been built in Eastern Europe, albeit under different economic circumstances.
This handbook is intended for the trained engineer and contains information on particular aspects of building heat distribution lines. It is not a textbook for teaching the basics to engineers. It discusses only the fundamental aspects involved in design and construction but does not touch on specialized products or on specific construction alternatives.
This publication has been put together with the collaboration of experts from nearly ten countries. It is written in everyday engineering terms as well as those of routine planning for district heating systems. The text details many important situations and difficulties. This is not intended to intimidate the reader with the numerous interrelationships and problems but rather to make those less experienced aware of the hidden pitfalls.
Most of the manuscript was written in Germany. Correspondingly, the majority of the illustrated material has also been drawn from German sources. It should be said in this regard that cost considerations alone restricted the use of illustrated material from outside Germany. Scandinavian engineers have had no less success in developing the heat distribution systems in their own countries. This work looks at the problems primarily from the standpoint of the engineer. The business background is discussed to the extent necessary for proper understanding.
Even technically discussion is confined to the planning and construction of pipelines for hot water and not for steam. The issues involved in thermal generation or customer's service installations are touched on only as they affect network planning.
The present handbook is intended to provide engineers with stimulus for their everyday planning work. It will have achieved its purpose if it saves them from having to acquire some costly knowledge or other on their own.

As far as the organization of the contents is concerned, the handbook discusses the basic aspects required for network planning in the initial sections (up to and including Section 5). In Section 6 the reader is given a look at the technical and economic parameters which most affect network engineering. This is intended to provide a sufficient overview from which to recognize the most troublesome factors in the welter of interrelated aspects.
Section 7 deals with the process of network planning itself. The first general part discusses the various stages in the engineering aspects of planning while also describing the business situation and its implications on construction costs. Other technical discussions involve a detailed look at system hydraulics as well as issues relating to structural engineering, thermal insulation and even operating costs.
Lastly, Section 8 discusses pipeline engineering focussing on the laying of plastic- sheathed pipe. Other pipelaying techniques are discussed only as an adjunct. There is also discussion of special components involved in district heating lines such as compensators, inspection chambers, thermal insulation etc.

The case study in Section 9 is designed to illustrate the preceding theoretical sections. The handbook concludes with the requisite bibliographical data and editorial information.