District Heating & Cooling

Volume 73 Number 2 Fourth Quarter 1987

DHC in Pennsylvania

With Reports On . . .

Harrisburg
Pittsburgh
Philadelphia

Also in this Issue

Plus a
SPECIAL REPORT—
The Future of DHC in Kansas City

A Report from UNICHAL

The International Union of Heat Distributors (UNICHAL)

By Dr. E. Keppler, General Secretary

On 19th May 1954, on the initiative of the President of the Board of Directors of the Paris district heat distributor CPCU, Mr. A. Charbonnier, representatives from 9 West European district heat distributors founded the International Union of Heat Distributors UNICHAL in Paris. According to the statutes of foundation, the main purpose of association was to examine the problems of the development of heat distribution systems which use public land. The objectives were reformulated when the statutes were revised in 1983 and now include all questions relating to production, distribution and sale of heat. In particular, UNICHAL's tasks include the study of combined heat and power generation.

In the initial phase, the UNICHAL membership was restricted to companies which produced heat and distributed this to third parties via a network, and to associations and regional associations which had the same objectives as UNICHAL. Today, universities, research centers, engineering offices and especially industrial companies interested in district heating generally are also accepted by UNICHAL as associate members.

UNICHAL members now include about 110 district heat distributors and 40 associations and companies from a total of 15 countries. Altogether, the heat distributed in the public network by heating stations belonging to the UNICHAL membership was about 320000 TJ in 1986.

UNICHAL Activities

UNICHAL has a General Secretariat in Zürich, Switzerland, which coordinates the work of the Union. Technical matters are dealt with by Study Committees, which are formed from representatives of member stations. The work of these Study Committees will be reported in the following section.

At present, a UNICHAL district heating congress is organized every 2 years and is attended by numerous participants from many European countries. At these congresses, the Study Committees present reports and results of investigations on topical problems in heat distribution.

In addition, individual papers are submitted at the congresses. At the last congress, held in Berlin from 17th to 19th June 1987, more than 50 reports were presented on the general theme selected: "District heating: efficient and environmentally compatible use of energy."

There are also periodic specialist seminars at which heat distributors and industry discuss specific problems in the heating sector. In 1986, a seminar of this type was held on the subject of "Heat meters"; a further seminar on "Preinsulated pipelines" is being organized for 1988.

All these activities are reported in the periodical "District Heating International" (FWI).

Table I

1984 **Share of District Heating in the Heat Market**

	Heat released into the district heating networks TJ	Percent share of district heat in the total heat market	Percent share of heat market in total final energy consumption
FR of Germany	139 280	4,0%	42,0%
France	—	—	30,0%
The Netherlands	4 800	0,5%	41,0%
Sweden	62 000	14,0%	31,0%
Belgium	5 600	1,2%	35,0%
Finland	26 470	11,0%	33,2%
Austria	8 700	4,0%	33,0%
Switzerland	3 970	1,2%	46,0%
Denmark	53 430	27,0%	39,0%
Italy	13	—	27,0%

Work of the UNICHAL Study Committees

As early as the founding of the Union in 1954, a few Study Committees were set up to deal with specific district heating problems. These Study Committees report on their work at the congresses organized periodically by UNICHAL. Today, there are six Study Committees. In order to introduce these, their work for the last UNICHAL Congress in Berlin in June 1987 will be described below by way of example.

Study Committee for Nomenclature and Statistics

This Study Committee has for many years been compiling annual district heating statistics of the countries represented in UNICHAL. The data collected relate among other things to:

- number of pipeline systems and heating stations
- heat output capacity with/without electricity production
- subscribed demand
- maximum heat load
- share of fuels used

Table II

Share of Energy Sources

Country	1973 Coal	1973 Fuel oil	1973 Natural gas	1973 Refuse	1973 Others	1984 Coal	1984 Fuel oil	1984 Natural gas	1984 Refuse	1984 Others
Denmark	4	95	—	1	—	52	32	1	11	4
Switzerland	2	59	6	33	—	8	22	38	24	8
Austria	26	53	13	8	—	18	38	30	13	1
Finland	30	64	—	5	1	51	20	3	4	22
Belgium	1	32	67	—	—	29	31	40	—	—
Sweden	2	95	—	2	1	22	34	—	9	35
The Netherlands	—	2	98	—	—	64	1	33	2	—
Italy	—	—	100	—	—	—	24	76	—	—
France[2])	13	62	10	15	—	21	48	11	17	3
Great Britain	—	—	—	—	—	15	15	50	2	18[1])
FR of Germany	31	37	30	2	—	47	14	29	8	2

[1]) Estimated figures [2]) Figures stated are for 1978 instead of 1973

- heat delivered to the pipeline systems and
- heat taken by consumers
- heat loss
- route length of pipeline systems

Table 1 is an extract from the national statistics for 1984.

At the Berlin Congress, a special report on the development of district heating in the UNICHAL countries from 1973 to 1984 was also presented. (Table 2)

Study Committee for Environmental (and General) Questions

Before the next Congress (in 1989 in Graz, Austria), this Committee will be replaced by the newly formed Study Committee for Environmental Questions. At the Berlin Congress, problems relating to heat distribution and heat supply and to consumers' systems were subjected to a critical examination from economic points of view. For historical and other reasons, various systems of heat distribution have developed in the European countries. Whereas in the USA, for example, steam has been the preferred heating medium for a long time, after the World War Two there was a change in Europe from steam to hot water at various temperatures to cover the requirement for space heating. The investigations carried out under the existing general conditions have shown that, as a rule, systems with low outgoing temperatures are more economical than those with high outgoing temperatures. It is likely that the lower specific initial capital expenditure in the distribution network will result in such great savings that the additional costs arising from the increase in diameter will be offset.

Study Committee for Economic and Tariff Questions

Questions relating to cost-effectiveness and tariffs have always occupied an important place in the UNICHAL discussions. Over the past few years, it is mainly the economic aspects and considerations from the point of view of the distributors which have received priority in the investigations carried out by this Committee.

UNICHAL members now include about 110 district heat distributors & 40 associations and companies of 15 countries.

Table III

District Heating Versus its Competitors

Aspects considered	District Heating	Natural gas	Light fuel	Electricity
A Operational costs	1.6	2.3	3.3	3.9
B Associated capital costs	3.2	2.0	2.6	1.1
C1 Safety	1.2	4.3	2.7	1.9
C2 Regulation	3.0	3.0	3.0	1.0
C3 Comfort	1.1	2.0	3.4	1.1
C4 Maintenance	1.9	2.9	4.2	1.2
C5 Space requirements	1.7	2.8	4.1	2.4
C6 Supply—storage	1.0	1.0	4.0	1.0
C7 Lifespan of equipment	1.2	3.1	4.0	1.6
C8 Billing difficulties	3.2	2.8	3.3	1.6
C9 Impact on the customers' immediate environment	1.4	2.4	3.7	1.0
C Average score	1.7	2.7	3.6	1.4

Over the past two years, the consumer's attitude to district heating has been examined. Among other things, the Committee has attempted to compare the position of district heating with that of its main competitors in the energy market from the point of view of the customers, the economic situation at the end of 1985 being chosen as a basis. Nine typical features were selected and were used to evaluate four heating systems. Ratings 1 to 5 were given, in the sense that 1 denoted the best level and 5 the poorest. Table III shows the result obtained, which of course may not be taken as an absolute standard of value.

Study Committee for Generation of District Heat (include Nuclear Energy)

Up to the time of the Berlin Congress, the Study Committee for Generation of District Heat was concerned exclusively with questions relating to nuclear energy. The field of activity of the Committee has now been extended to all heat producing methods. At the Congress, it presented an investigation into the costs of heat extraction from large-scale turbo-sets, as well as an overview of the state of development of nuclear reactors for heat generation. Various European manufacturers have developed concepts for the use of such heating reactors and are also ready to make binding offers for their construction. However, discussions on the acceptance of nuclear energy have so far prevented the concept from being put to the test in practice.

Study Committee for Connecting Stations and Consumer's Installations

The Study Committee for Connecting Stations tends to deal with questions which are more of a technical nature. At the Berlin Congress, a detailed investigation into the importance of hot water generation was presented. For correct functioning of a hot-water generation system, more importance should be attached to correctly dimensioned house installations than to a perfectly operating substation. On the basis of measurements in large hot water distribution systems, it has been possible to discover

continued on page 41

graphite packed joints designed to absorb pipe expansion. The 6500 line, "Perm-Pax", incorporates corrosion-resistant aluminum/bronze alloy guides. A one-piece body with integral reduction to the nominal pipe size is a unique feature of the new design. Configurations are available for axial travel to 24 inches and service conditions to 600 psig at 750 degrees Fahrenheit. Complete with five-year warranty the new joints conform to MIL-E-17814E.

For information, write Hyspan Precision Products, Inc., 1685 Brandywine Avenue, Chula Vista, CA 92011, (619) 421-1355. Ask for catalog No. 986.

New Steam Trap on the Market

Spirax Sarco, Inc., of Allentown (PA), has introduced the UBP30 combined steam trap nd "in-line renewable" pipeline connector. The connector allows for rap rotation through 360 degrees to fit any piping configuration. The sealed stainless steel steam trap uses the latest themostatic capsule technology and an efficient two-bolt connection. The UBP30 is designed for use as a steam main drip trap and steam tracing trap, rated to operate at a maximum 435 psig, 545 degrees Fahrenheit.

For more information, call or write Spirax Sarco at 1951 26th Street, S.W., P.O. Box 119, Allentown, PA 18105, (215)797-5830. IDHCA

Harrisburg, continued from page 11

Operations, of course, did not cease during the transfer of Walnut Street steam plant from PP&L to HSW. A new operating and maintenance staff was hired by HSW and trained on-site by PP&L in preparation for the changeover. In addition, HSW went to work on the construction and early operation of a diesel cogeneration facility for Paxton Creek Cogeneration Associates. By the end of 1986, HSW's Walnut Street plant had produced (including purchases) 605 MM lbs., had sent out 525 MM lbs., and completed sales of 440 lbs.

With one year of service under its belt, HSW looks forward to putting a spit polish on its operations.

"In 1987," says Mangione, "the plant operations will concentrate on efficiency and steam generation reliability improvements. Also, we'll work on our diesel plant operations, repair distributions piping steam leaks, and work on a preventative maintenance program." IDHCA

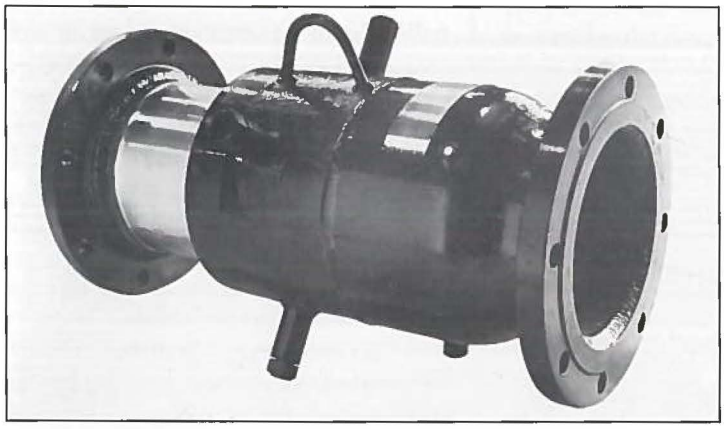
UNICHAL, continued from page 25

weak points and to suggest possible measures for improvement.

Study Committee for Heat Transport and Distribution

Today's energy policies demand either the erection of new heating plants outside the metropolitan centers of consumption or the connection to cost-efficient plants which are usually located some distance away. Both cases call for considerations of the economic limits of district heat transport. Taking examples from practice, the Study Committee has determined the heat transport costs and found the most important parameters by carrying out calculations for variants. Although such calculations cannot replace an exact calculation for a specific project, they do in fact provide valuable information for assessing an existing project.

Information about UNICHAL, its activities and its publications is available from the General Secretariat of UNICHAL, Bahnhofplatz 3, Postfach, 8023 Zürich, Switzerland; tel. 01/211 51 91; telex 814002 ucs ch; telefax 01/221 04 42. The General Secretary is Dr. E. Keppler. IDHCA



Hyspan "Permax-Pax" Expansion Joint

Spirax Sorco Steam Trap