

# DISTRICT HEATING



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# Development of District Heating in Aitkin Minnesota

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In the U.S. the prevailing wisdom on building a district heating system is that the process of developing a feasibility and economic study is the mandatory first step. In Aitkin, MN though, a district heating system was seen as a good idea that fit existing needs, without going through a lengthy study. Located in north central Minnesota, Aitkin has a population of 1,800, and is in one of the poorer counties of Minnesota. Preservation of current jobs and development of new ones has a high priority.

District heating started in Aitkin with the decision by two brothers who owned a small industrial complex to try and reduce their fuel costs. Lyle and Glen Anderson owned the Aitkin Iron Works, Glarco and L.A. Tool. The Iron Works was burning 35,000 gallons of oil a year, so to reduce that consumption they bought a 150 hp boiler and started burning railroad ties. Lyle Anderson decided to build a central plant that would also heat their other buildings, and in early 1982, Ashcon Inc. (Anderson Steam Heating Concepts) was created by Lyle Anderson and a partner Jeff Schettelle.

In order for the system to be practical other customers were needed other than the Anderson's industrial complex. Lyle Anderson let it be known in the community that he was interested in having other customers on the system but there was little response initially. Aitkin businessman, Dave Hasskamp discussed this situation with Lyle and showed him that the businesses would not come to him on their own and the system needed to be marketed. Mr. Hasskamp was then given the task of marketing the system, working with the city to obtain a franchise and to develop a financial package to help build the system and assist in customer hook-up. Through his efforts, interest in the district heating system grew and Ashcon built a facility large enough to handle not only the Anderson business, but also to serve several of the downtown businesses located in a 3½ block radius.

Since the participants in this project were sure this idea would work, there were no feasibility studies conducted. The first step in the project was the purchase of two reconditioned low pressure boilers with a capacity of 400 hp each. They are fueled by wood chips utilizing, the wood waste from the local lumber industries. An eighteen inch chipper is used at the lumber mill to reduce the size of the material to that needed for firing. The boilers have also been success-

fully test-burned for peat. Aitkin Iron Works was responsible for designing and building the boiler facility, designing and installing the wood feeding equipment and developing a control system. They also served as contractor for the building conversions.

Several approaches were taken to the development of a distribution system. Insulated steel pipe was needed for the main and fiberglass was planned to return the condensate. Initially Ashcon purchased preinsulated pipe but found it too expensive. The next step was to manufacture the pipe and weld it into 160' lengths at the Iron works, form insulate and seal it. This length was selected as the longest amount of pipe that could be handled so welds, foaming and sealing could all be done in the factory. This helped insure the high quality of the welds, but again the costs were higher than desired. The final solution was to lay the pipe in trenches with a sand bed for drainage, graded, raised 4" on blocks, foamed in the trenches and wrapped in plastic.

The initial customers connected to the system were Aitkin Iron Works, Glarco, L.A. Tool, the public utility building, a church and a rectory. The system began serving these customers in January 1983 and later in that year the high school, city hall, county courthouse, First National Bank and a small office building were connected. There are now fifteen buildings on line.

The steam is measured for billing by condensate meters and the smaller customers are charged \$7 per M cubic feet. The larger customers have either five or ten year contracts. Their prior fuel use is determined and the contracts are indexed to #2 fuel oil giving the customers a 20% discount.

The initial stages of the project were financed with short term market rate bank loans from the First National Bank in Aitkin. Although this financing worked well in getting the system started, in order to make the project feasible, additional customers and longer term financing were needed. To accomplish these two objectives, Ashcon solicited the assistance of the Governor, the State Energy and Economic Development Department (DEED) and the Iron Range Resources and Rehabilitation Board (IRRRB), which was created in 1943 and operates a variety of programs to assist economic expansion in northeastern Minnesota.

After several months, a new loan package was put together by IRRRB, and a business financing specialist working with DEED. This loan package included a

\$280,000 15 year loan at 8% interest from IRRRB matched by a \$280,000 15 year floating rate loan from the First National Bank of Aitkin. The loans are to be used to refinance the outstanding debt of Ashcon and also include \$85,000 for expansion to 6 new customers. Prior to this financing package the IRRRB provided interest free loans to finance the internal conversions of city hall, the school and courthouse.

The town of Aitkin exemplifies American initiative. District heating was identified as a viable way to contain energy costs. To minimize construction expenses, the developers made their own pipe, designed and installed the peripheral equipment and served as contractor for building conversions. Ashcon has also recently decided to do a major expansion of the system. They will add boilers to be able to cogenerate, then they plan to expand the steam loop through the downtown, then expand the line through a 1/2 mile of a residential area, a low-rent housing project, the community hospital and the elementary school. This expansion will increase the load of the system four times. District heating development cannot always be this easy, but in this small Minnesota town action was needed fast and community involvement proved its worth.



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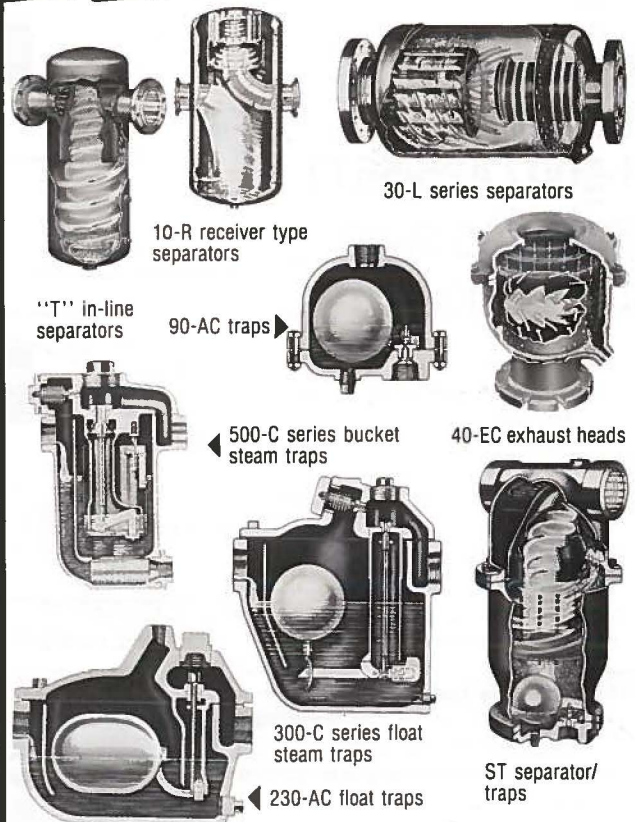
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