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A GLIMPSE INTO ADSCO ACTIVITIES FOR 1929

EXPANSION JOINTS IN AMERICA'S NEW SKYSCRAPERS
THE NEXT STEP IN PUBLIC UTILITY SERVICE

During the last few years, America has watched with amazement the gigantic development of public utilities. The generation and transmission of electricity has been multiplied to the great benefit of industry and with an ever-increasing contribution to the efficiency, comfort, convenience and happiness of modern life.

The centralization of electric generation, with its resulting economies and advantages to the public, is comparable to all utility services. We have seen central pumping stations and underground water mains supply hundreds of thousands of individual pumps and wells; central electric stations have rendered obsolete the kerosene lamp and other individual systems for producing power and illuminating; modern sewerage systems contribute to health and sanitation; and transportation utilities gridle the continent with speed and convenience.

In practically every city and town, smoky chimneys provide convincing evidence to the inefficiency of our common heating practices. Thousands of tons of heat are distributed over our communities, killing our beautiful buildings, ruining our merchandise and seriously affecting our health. Manoeuvres and ash trucks add to our traffic congestion and thousands of individual fires set up a terrifying fire hazard. A great need exists for public heating.

In scores of American cities, the magic hand of Public Utility Service is demonstrating that these conditions can be vastly improved by District Heating. Generating steam in efficient central boiler Plants and distributing it through well insulated underground mains to all of the buildings within a given district is the solution public utilities are offering to the age-old heating problem. Public heating plants are growing rapidly in response to public demand for service. Not only for heating purposes, but for process work in industrial plants, enormous quantities of steam are required. Public utility executives, constantly on the lookout for opportunities to render profitable public service, are realizing that District Heating for business, residential and industrial sections is a field of utility service where the surface has only been scratched. Here may be discovered manifold opportunities for economies, increased incomes and magnified public benefits.

With the widespread financial support the American public is giving to public utility enterprises, we may reasonably look for the same rapid expansion in public steam service as we have observed in other fields of service requirements.

For more than fifty years the activities of the American District Steam Company have been closely allied with the development of District Heating. The experience gained through this close association is available to utility executives and others interested.

AMERICAN DISTRICT STEAM COMPANY
North Tonawanda, N.Y.

Who Says There's No Romance In Business?

Saturday Noon. Somewhere a whistle blows noisily. A score of others join the medley—blending with the shouting and bantering of two hundred men.

The doors of the factory open. A small army rushes out and moves on to the garages and street cars. A clatter of starters—a tumult of horns—and save for a few stragglers, the grounds are cleared.

Two fine old men watch the exodus through an open window.

* * * *

John D. Walsh

"Well, John," said W. D. Rees, "I suppose we may as well track along. But, somehow, now that I haven't got so many years left ahead of me, I just sort of hang on to every sight like the one we just saw. I hate to leave it behind."

Rees had been in the employ of the American District Steam Company for nearly fifty years. John D. Walsh—another veteran employee, had been with the company ever since its inception.

Walsh smiled, and sent a smoke...
ring curling up toward the ceiling. “You know, Bill, I wonder what Holly would say if he could see this plant today. Doesn’t seem so many years ago when he and you and I were sweating this thing out—and working those dreams of his into realities.

“They didn’t appreciate him in those days. Thought he was visionary, but that’s what they said about Newton and Edison, too. I can’t understand that attitude, especially where Holly was concerned. After he had pioneered the steam fire engine and the rotary pump, you’d think they’d have had some respect for his ability—but that crowd was certainly the original ‘Doubting Thomas’ bunch.”

“Yes, and a lot of them lived to regret their doubts,” agreed Rees. “But, of course, when Holly first came to Lockport from Seneca Falls and started in building sewing machines, skinks, boxes, flatirons and sinks, everybody kind of overlooked that fire engine business and figured out he was just a little two by four manufacturer who had reached his limit.

“And when he designed the system for pumping water through underground pipes, will you ever forget the mob that went down Main Street to see whether or not the hydrants would work! And when Holly turned on the pumps down at the pumping works, how the water shot out of the hydrant and knocked over a row of the audience?”

The old chap chuckled reminiscently, and puffed on his pipe. Holly had been hard of hearing, and the pump was noisy. He never knew what had happened until afterwards. Rees could still see the crowd scattering as the gush of water spatred from the hydrant.

“You know, John, Holly told me many a time that it was the underground water line that gave him the idea for underground steam mains. He figured if water could be conveyed from a central point, why not steam?

“Say, when he expressed that idea, didn’t they laugh? I felt sorry for him. He took it so seriously—and the worst part of it was that no one would back him financially. Lucky he had a little money of his own. Do you remember, when he finally decided he was going to prove that steam could be carried underground, that big boiler he built? Looked like a locomotive boiler. Only had four or five tubes—but they were tubes! I’ll never forget it... a sheet of iron drilled with holes for a grate. What a time he had getting it into his cellar...

“Yet,” interposed John Walsh, “I don’t believe there was ever a minute when Holly didn’t feel sure that the system would work. I can see him now, digging that funny winding line of trenches in his own and his neighbors’ back yards. Never could figure how he got 700 feet of pipe in that trench line.”

“And, say,” interrupted Walsh, “Wasn’t that some radiator he fixed up in his house? They wouldn’t use those coils of pipe in a garage today!”

“Yes, I know,” continued Rees, “But then it served its purpose. By golly, how the ‘smart alecks’ shut down when Holly showed ‘em that old boiler running under ten pounds of pressure, and then took ‘em upstairs and let them feel the steam pipes. Say, they fellows were so skeptical they had to burn their fingers before they believed the pipes were hot.”

And so these two old-timers recounted from brilliant memory the great events in the growth of the industry to which they had devoted their lives—the project of District Steam Heating and the building of equipment to insure the ultimate in efficiency from steam lines whether above or below ground.

“Let’s see,” said Rees, taking out a pencil and drawing on a scrap of paper. “In his first installation, Holly first carried the steam up into his attic to a distributing, and then down through separate pipes to the heater coils. Then he carried the returns in to the basement to that contraption he used as a trap. Man alive! Wasn’t that some system!”

“Yes, they should have preserved it as an antique,” Walsh replied. “But anyway, once he got it working, didn’t take Holly long to get going on a complete plan for central heating, and didn’t he have tough sledding! Many’s the time I’ve seen him start out in the morning sure he was going to get some capital interested, and come back looking black as thunder. Seemed as if he’d never get enough money together.

Mr. Wm. D. Rees, over 50 years with ADSCO
Holly rushing around everywhere telling 'em how to do it!" Walsh grinned. "Gosh, Bill! It sure stood Lockport on its ear! Wasn't it funny, how all the town turned out? Election Day parades had nothing on that trench system for drawing the crowd. The usual committee of forty-seven was on hand every day, telling Holly and the men how to do the job."

Both old fellows had been there — on the job with Holly, supervising the work. If their impressions could have been interpreted visually, the patterns would have been almost identical.

Rees suddenly started to say something, but Walsh took the words out of his mouth. "That cool day in October when all the work was finished — Bill, doesn't it seem just like yesterday? It's hard to believe it was nearly fifty years ago. Gosh, Bill, I felt like a rubber band stretched to the limit. The old boiler was roaring away — and Holly and his boy stood there watching the old boiler house clock. Then Holly gave the okay, and young Holly turned the steam into the lines. And in less than a half hour, every coil in every house on the line was piping hot."

"And say, John," continued Rees, revealing an episode which had been lost in the dim records of the past. "Bet a cookie you've forgotten the stove Holly got up for the teachers of the Washburn Street School, so they could warm their soup, coffee and food by steam. And do you remember the steam stove that Mr. Bancroft brought to Lockport? Why they used to handle the cooking for from 50 to 75 men on that stove!"

"I sure do remember" was Walsh's answer. "That was just before Holly designed his steam meter, trap and regulator. He completed them just about the right time, too. That old coil trap didn't work so well on those out-of-town jobs."

Walsh was right. The Company was making progress. Small plants were installed at Garden City, Long Island; Auburn, New York; and at the Soldier's Home at Dayton, Ohio. It became apparent that better equipment was necessary, and it was to meet this need that Holly produced the steam trap, meter and regulator.

The second winter was now upon the company and it passed with little trouble. The old upright boiler in the station was fitted with new tubes but was used only while cleaning the horizontal boiler. During the winter, however, the company discovered that its equipment would not provide for any increase in demand, and with the coming of spring considerable extensions were made.

The company was much handicapped to obtain pipe and fittings, and some form of heater to take the place of the crude and unsightly box coil. No radiators were being made at that time and there were no steam fitters. Holly's idea in equipment was generally exemplified by the system used in his own residence. He used the attic down feed from the distributor into the attic of the radiator, but he met the need for better radiation by designing the tin atmospheric radiator which was a great improvement. Many were made and sold for the next three years to parties using District Heat.

Soon committees from other cities came to Lockport to look into this question of District Heating. Later in the second spring, a group of New York financiers sent the noted engineer, Charles G. Emery, to Lockport to investigate the practical and future prospects for underground heating. After several weeks of intensive work, he left Lockport, and his report to the men in New York resulted in an immense plant being installed in that city. This plant subsequently grew to be the largest power and heating plant in the world, with over $40,000,000 invested.

Up to this time, very little thought was given to the possibilities of heating by exhaust steam, but in the winter of 1880 the company contracted with capitalists in an Eastern city for a sizable high and low pressure installation of this kind.
Rees distinctly recalled the handling of that initial experiment in the utilization of exhaust steam. "They laid two eight inch lines in the trench," he continued, "one supplied power at eighty pounds pressure to a group of factories. The engines in these plants exhausted into the second line, and this exhaust steam was then carried into the heating district. A check of costs proved this method was a great economical advance—and they've been using that same system ever since."

"It was just about that time that things really began to show a little profit; Holly brought out his Variator to replace the old junction box, and a lot of other changes and improvements came along in fast order."

"Yes, but not in everything," retorted Walsh. "The casing, for instance. Think of using a telegraph pole for insulation—My Gosh, it nearly took a pine forest to put down a line. They drilled that casing endwise, and it was some job."

"Well John," laughed Rees, "It sure made a good job and there was mighty little heat lost from those old pipes. Of course it was a great improvement when we perfected the built-up stave casing. It got so they charged plenty for those pine logs."

"We used to get charged plenty for everything," broke in Walsh. "Holly got sick of it though. When he finally got wise to the profit outside shops were making on traps, regulators and meters, he decided to call a halt. That was when the company rented those two rooms over the store and installed the machine shop. Five men, a lathe, drill press, and planer . . . what a machine shop."

"Holly called it his attic-factory," said Rees. "But anyway, it enabled the company to build most of its own equipment, and save a lot of money. You know, John, when you come to think of it, Holly was a sort of financial wizard. He used to say 'Stick to it, boys, we'll get there! . . . ."

Although this conversation took place several years ago and John Walsh has since passed on to the reward of faithful servants, the growth and development of the company continues and Bill Rees watches with increasing pride, and takes his place in, the march of progress.

What year was it that the company took over the old freight terminal, and fixed it up into a real plant? 1882, wasn't it? Well, I always figured that right about that time—when we started to manufacture all our own equipment—was the real beginning of the company's march forward. Then as steam heating got to be more and more popular, things began to happen fast. The Sales Department got ahead of production, and then they had to put up that other new shop—and later on they had to make further additions—until finally, in 1910, the company put up the first buildings in this North Tonawanda plant . . . By Gosh, John, when I first saw those buildings, I wondered what they were going to do with all the space . . . . Now look at 'em! Funny, isn't it, how things change?"

William D. Rees and John D. Walsh sat in quiet retrospect for many minutes. Then Walsh slowly filled his pipe.

"Wouldn't it have been wonderful if Holly could only have lived to see today's development of his project? Why, do you know, Bill, it's almost like a fairy story—and we've seen it all—the bright days and the dark ones. We've been a part of the birth of an industry—and a part of its growth . . . We've seen something!"

Bill Rees nodded his head. Somehow there didn't seem to be anything left to say, but as the two slowly descended the stairs and made their way outside, he murmured thoughtfully . . . . "And who says there's no romance in business?"

* * * * *

Building A District Heating System In Record Time

By PAUL F. HELM and RAYMOND F. FORBES*

(Reprinted through courtesy of Heating & Ventilating Magazine)

ACTING upon an order of the Indiana Public Service Commission to provide steam heating service for this winter's use, instead of abandoning its hot water system, the Indianapolis Power and Light Company constructed during the past summer what is believed to be the largest steam heating system ever installed in any one year by any utility. So great was the project that many engineers and contractors expressed grave doubts as to the possibility of bringing the work to completion in the time available, between two heating seasons.

For many years, this company has operated an extensive steam heating system serving the business district in the area known as the Mile Square in Indianapolis. The installation of steam mains described in this article replaces the company's hot water mains and adds to the existing steam mains.
These pictures show some of the major pipe line installations handled by ADSCO'S two construction subsidiaries during 1929.

Every year these engineering and construction organizations handle completely the installation of miles of underground and aerial high and low pressure steam lines and other piping for public utility companies, municipalities, industrial plants, institutions and Government departments. Their engineering and construction activities extend to practically every State of the Union and every Province of the Dominion.

Wherever extensive piping is to be installed, the expert knowledge which these companies have gained through years of experience, and their prompt, efficient workmanship can contribute economy, efficiency and durability to the installation. The engineering and construction facilities of the ADSCO subsidiaries are constantly at your service.
Fig. 1. Starting Work on 20-in. Main Installation, April 15

system, resulting in a steam heating system interconnected with three plants as shown on the accompanying map.

When the old hot water system was installed in 1901 and 1902, it served a residential section known as Morton Place, situated north of the business district. Age and inherent operating conditions made it inadequate for service to this community, which has changed, to a great extent, from a residence territory to one of many business buildings and apartment houses.

Since it was necessary to install the new heating mains in approximately the location of the old hot water mains, which were being abandoned, and also because certain changes were necessary on all customers' premises to adapt their heating equipment to the new steam service, the complete change-over had to be made during the summer months just past.

Plans were started last spring to proceed with the construction program and a layout for a complete steam distribution system was made. In making this layout, consideration was given to the hot water connected load and to the future possibilities and advantages of district steam service for this locality.

In analyzing the situation, it was seen that approximately 47,000 ft., or nine miles, of underground steam mains had to be installed after the hot water system closed down May 20, and had to be ready to supply steam service at the beginning of the heating season, September 20. To carry out this project seemed quite a problem and was considered an unusual undertaking by many who studied the conditions.

Confronting all concerned was the fact that if heating service was not available at the beginning of the heating season, no excuse or financial bond would take care of the resulting situation. The many residence customers served require heating service at an earlier date than other customers.

In facing this situation, the engineering work of the Indianapolis Power & Light Company was carried on under the supervision of E. G. Ralston, vice-president and chief engineer, in conjunction with F. E. Laramore, of the Management & Engineering Corporation, the operating and engineering division of the Utilities Power & Light Corporation, of Chicago.

Due to certain operating conditions and with the present steam system operated at low steam pressure, the decision on the new mains was for a low-pressure system, with the initial steam test to be at 75 lbs. per sq. in. pressure. Later, after a survey of this territory and vicinity by the engineers of the American District Steam Company, some changes were suggested which were embodied in the layout to provide for better future expansion possibilities.

The contract for the total installation, as contemplated, was given to the Northeastern Piping and Construction Corporation, which is the construction and engineering subsidiary of the American District Steam Company. The contractor assumed full responsibility for all work except repaving and service lines. Satisfactory contract provisions were agreed upon fully to protect the company against the possibility of any of the work not being completed before the start of the heating season.

Due to the deteriorated condition and out-of-date equipment of the old hot water plant and the fact that this plant was far distant from the railroad siding for coal delivery, the proposed plan provided for steam to be supplied from the Mill Street plant through a 20-in. main, 3370 ft. long, to the distribution system. Since it was possible to install this 20-in. main without disturbing the hot water mains in use, the installation was started April 15, one week after the signing of the contract covering the work.

Fig. 2. Plan of Heating Mains, Indianapolis Power and Light Company
Fig. 1 shows the first crew starting work on the 20-in. main installation April 15. Fig. 2 shows the same location 2½ days later and is illustrative of the progress made. In the work schedule set up, 40 days were allowed for completion of the 3370 ft. of this 20-in. main. It was finished in 27 days elapsed time, which included 11 days of rain during the period.

With this line completed, little work could be done until May 20, but following the closing down of the hot water system, the installation of the complete steam distribution system was started. Considerable enthusiasm was evidenced by all foremen, and as the work progressed, five crews were formed and the working force was increased to approximately 400.

Construction work was carried on day and night. Numerous 1000-watt flood lights were provided for night operations. At no time during the progress of this work was there a delay for lack of materials and every move was coordinated with the other steps in the construction. The only cause for any line of trench to be vacant at any time was rain, which occurred during 19 days, while this work was in progress.

Pavement breaking and trenching to grade-line was done mostly during the daytime. All other work of placing drain tile, gravel for base, cement base, placing and welding pipe, conduit work and back fill followed close behind. Cement base was completed each night to the end of the trench graded that day. Quick setting cement was used, allowing pipe to be placed on the base the following day. Pipe welders and masons did not seem to know when regular working hours were ended; the object was to follow the preceding completed part of the work as closely as possible and have their part finished before the next morning.

Consisting of 47,247 ft. of mains, the distribution system was completed in 81 days, ready for steam to be turned into these mains August 1. During this period, an average of 583 ft. of pipe was installed per day. The best week was July 14-19, with no rain, and 6587 ft. of pipe were laid and tested in place, an average of 941 ft. per day.

In connection with the installation, three extensions totaling approximately 8000 ft. of 12-in. and 8-in. mains were started and completed by September 22. The completion of these and other shorter extensions brought the total length of the mains in this new system ranging in size from 20-in. to 4-in. to 59,451 ft. or 11 ½ miles and all installed between April 15 and October 1, last year.

An indication of the magnitude of this installation is given by the quantities of materials used, as follows:

- Approximately 450 tons of steel pipe.
- 105,000 pieces of 4-in. drain tile.
- 3300 cu. yds. of concrete in place.
- 209,000 pieces of multicell tile.
- 365,000 brick for manhole construction.
- 306 manholes built complete with curbs and covers.
- 98,000 lin. ft. of welding on pipe lines (over 1½ miles).
- 91 trap installations complete.
- This material, exclusive of sand and gravel, aggregated approximately 160 carloads.

All of the conduit construction was of Adsco multicell tile. The concrete base, 4-in. thick and of a width varying with size of mains, was laid over coarse gravel, with farm drain tile underneath to take care of under drainage. Guide rollers spaced 12 ft. apart on the base supported the pipe.

Acetylene and electric arc welding were used and the main was tested at 90 lbs. air pressure in sections between expansion joints. All pipe and fittings were then painted with nitrose paint before the pipe was covered.

Dabonite insulation, with waterproof jacket, a pipe covering made especially for the American District Steam Company by Philip Carey Company, was used, 2-in. thickness on 10-in. and larger pipe, and 1½-in. thickness on 8-in. and smaller pipe.

Conduit side walls were built of special salt-glazed multicell tile, which are similar to building tile, sizes 4 in. x 8 in. x 16 in., and 6 in. x 8 in. x 16 in., with two and four longitudinal air cells, respectively, with mortar locking grooves on each edge. The conduit wall thickness was 6-in. for 12-in. and larger pipe, and 4-in. for 10-in. and smaller pipe.

After the side walls were built up, a reinforced concrete roof 4 to 5 in. thick was laid over the corrugated iron top, with 3-8 in. reinforcing bars...
All concrete was 1-2-4 mix. This construction is shown in fig. 5.

No flange connections were used except for expansion joints and valves located in manholes and these fittings in manholes were tested under steam pressure before being covered.

While in most cases, the right of way was established by the abandonment of the hot water mains, yet difficulty was experienced in allowing clearance for other utility properties.

Manholes were of brick laid in cement mortar construction. In most cases the mains are below the sewers, so the traps are located in individual manholes, constructed off at the side of the line of pipe. The trap discharge is carried into a sump, approximately 5 ft. deep and 3 ft. in diameter, filled with old brick, below the bottom of the manhole. The soil conditions in this territory are so sandy that it is necessary to sheet for most of the trench work.

In addition to the installation of these steam mains by the Northeastern Piping and Construction Corporation, service lines, repaving and the installation of meters were handled by the Indianapolis Power and Light Company's organization. Approximately 300 service lines and meters were installed. Due to the fact that the greater number of connections are to residences, the service lines are of unusual length. The minimum size service pipe is 2 1/2 in. to insure proper drainage of condensate, which is returned to the main, where possible.

Steam was turned into this heating system several days earlier than needed in order to permit customers to test out their equipment. The system has been in operation since that time, operating satisfactorily.

The number of customers connected for this new service is quite gratifying and in view of the fact that the business district of the city is extending rapidly into this territory, with the prospects of many additional apartment houses it is expected a considerable additional load will be connected in the future.

It is an interesting fact that the heating system of the Indianapolis Power and Light Company is the largest low-pressure system in the world. It has a total connected load of approximately 2,500,000 sq. ft. of radiation, necessitating an output from the three steam-electric plants now supplying it of more than 2 billion lbs. of steam annually. As all this steam is discharged into a non-return system, the problem of treating all this water is of considerable importance.

Previous experience in the operation of similar water softeners in the other two steam-electric stations led to the adoption of a lime and soda ash hot-process softener with sand filters for treating all water fed to the boilers used for steam heating at Mill Street station. Experience, too, had indicated the feasibility of using, in conjunction with the softener, a certain special arrangement for blowing down boilers, which gives promise of great success.

It is believed that at the close of the season highly satisfactory steam heating service will have been rendered to the patrons of the Indianapolis Power and Light Company by reason of the newest, most modern type of steam mains installed, backed by adequate boiler capacity and scientific boiler-water treatment.
ADSCO EXPANSION JOINTS

Provide for the Expansion in the Risers and other Steam Piping of these Skyscrapers.

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IN selecting equipment for your steam lines, apply the measuring stick of past performance. ADSCO equipment is being used on 90% of the world's great District Heating lines, and is first choice of leading engineers the country over.

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ADSCO Slip-Type Expansion Joints command your interest, not only because of their demonstrated ability to give years of service without attention, but also because the wide range of sizes and types in which they are made means measurable economies in time and installation costs.

In Packless Joints

ADSCO Variators (Packless Expansion Joints) were developed nearly a half century ago for District Heating service. Since then, they have been used on hundreds of installations, a large percentage underground, where sustained, trouble-free service is not alone desirable, but imperative. ADSCO Variators are made in two types: for low-pressure, low-temperature service and high pressures, and high temperatures. Select ADSCO Variators whenever dependable packless expansion joints are required.

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One particularly significant fact about Northeastern service is that once it is used, it will likely be used again...

Just one typical example: Since 1904, when the Northern States Power Company made its debut in the field of District Heating, Northeastern has done practically all of the pipe line construction work.

In January of this year, the St. Paul utility again extended its service; Northeastern was commissioned to install the lines.

If continued use of a service is any measuring stick of its character, then you are amply justified in investigating Northeastern's ability to serve you in your piping construction work.

The experienced counsel and advice of our corps of construction engineers is available on any major steam piping installation. Estimates of cost gladly prepared.

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