DOWNLOAD PDF DISTRICT STEAM SUPPLY

Chapter 1 : Steindorf STEAM School / Home

District heating (also known as heat networks or teleheating) is a system for distributing heat generated in a centralized location through a system of insulated pipes for residential and commercial heating requirements such as space heating and water heating.

MISSION - Provide an environment where students, staff, and the community are actively engaged in project based learning through a student-centered approach with real-world applications. Foster students who lead and contribute to the world around them. The Fall Book Fair is thriving this week in the media center! It takes place November 13 - November Please consider supporting this library fundraiser by purchasing books for your home libraries! Click here for more information: Have you made your donation yet? Cash or checks can be dropped off in the metal PTO box on the wall in the office, or you can make a credit card donation at: EDUStaff at or www. Requirements for sub teachers can be found at www. Job Responsibilities Supervise students at playtime and lunchtime and maintain a harmonious atmosphere by encouraging peaceful resolution of conflicts. Organize group games and activities. Assume responsibility for play equipment. Direct movement of groups to and from playground, lunchroom and classrooms in a safe and organized manner. Assist students in lunch room clean-up. Other duties may be assigned. Interested in applying for a paid position? Would you rather volunteer a few days a week instead? Please contact Brooke Stidham, Assistant Principal at stidham aaps. Students will help prepare the food and drinks, serve breakfast to guests, and then clean up the kitchen following the meal, all with guidance from adult supervisors from St. Due to the size of the St. The sign-up form is located here. For more information, contact annaskindness yahoo. Science Olympiad is an exciting competition where student teams participate in a variety of events involving subjects like engineering, math, biology, electronics, astronomy, programming, chemistry, and more. Science Olympiad is designed to foster critical thinking, cooperative learning and the transfer of conceptual knowledge to hands-on challenges. Science Olympiad is a volunteer led group. In order to be successful we will need parent involvement to act as coaches and volunteers on the day of the event. This year, the Science Olympiad competition will be held on Saturday, May 11, An informational meeting on Science Olympiad for parents of 2nd through 5th graders will be held from 5 pm to 6 pm on November 29th in the Media Center Library , preceding the PTSO meeting. There will be a short presentation followed by a question and answer period. The meeting is geared towards parents of new participants, but all are welcome. If you are interested in being a coach, but cannot attend the meeting, please e-mail me at a2steam. If you are not on Facebook but want the notes, just e-mail us at secretary a2steampto. Remember to dress your student in warm clothes! As the cold weather sets in, please be sure to dress your children in warm coats with hats, mittens, socks and boots. STEAM students go outside everyday and we want to ensure that each student keeps warm and dry.

Chapter 2 : Ann Arbor STEAM / Homepage

Steam is supplied to the consumer in the same manner as gas, and is paid for in proportion to the amount used, as indicated by a meter, at a cost not exceeding the usual cost ^Â°' 'as in the case of gas supply, the steam supply pipes are laid up to the curbstone, the consumer paying for all mterna pipes, fittings, and radiators, which can be.

Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checlced below. Les details de cet exemplaire qui sent peut-Atre uniques du point de vue bibliographique. La bibliothdque des Archives publiques du Canada The images appearing here ere the best quslity possible considering the condition and legibility of the original copy and In keeping with the filming contract specif icetlons. Original copies In printed paper covers ere filmed beginning with the front cover end end! All other original copies ere filmed beginning on the first psge with a printed or illustrsted Impres- sion, and ending on the last page with a printed or illustrsted impression. Meps, pistes, charts, etc. Those too lerge to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right end top to bottom, as many frames as required. The following diegrams iiiuatrate vhe method: Lea images sulvantes ont 6t4 reproduites avec le plus grend so!! Un des symboies sulvants apparattra sur la dernldre imege de cheque microfiche, selon le ces: Les csrtes, planches, tableaux, etc. Les diagrammes sulvants illustrent le mithode. The following is a brief abstract of the paper: Wood stoves, coal stoves, hot air furnaces, combi- nation hot air and hot water apparatus, hot water, and steam. Open fireplaces and grates, are often used as an aux- iliary and as an aid to ventilation, but are not adapted for use alone. Gas stoves are seldom used, except for cooking purposes. All stoves and furnaces are made of thm cast-iron plates. Considerable skill is required in moulding and fitting them up. After being in use for a time, and exposed to the action of the fire, the cast-iron warps and gets out of shape, allowing gas to escape, and becoming unhealthy ; the atr whilst being heated is burnt and vitiated by contact with the hot metal plates. A necessary, but most unsightly feature of every stove, is the flue or stovepipe, connecting the stove and house chimney. Stove pipes are usually made of sheet iron, and of considerable length, so as to economise all the heat possible, but, as they cannot be swept or cleaned out when m position, it is necessary to take them down every year for that purpose. Anthracite coal is very generally used for household purposes ; and for all small boilers, furnaces, or stoves, an expensive class of this coal is required, and in every case the fuel has first to be stored, then handled and burnt, and the ashes afterwards removed. Prior to the year many very large buildings and blocks of buildings were heated by sttam, supplied from boilers situated in some central place, and there are also many cases on record, of steam being carried very long distances in pipes. BIrdsill Holly, a mechanical engineer of Lockport, N. In 1S77 an experiment was made by laying half a mile of three Inch pipe ; this was again increased to a mile and a third, and experiments carried on. Before winter set in about three miles of underground pipe had been laid, and over twenty dwelling-houses fitted up with pipes and radiators, and this number was largely increased during the winter ; stea;i was supplied from three boilers, situated in a central position, and carrying a pressure of 25 to 30 pounds per square inch. As all the houses, to which steam had been supplied during the winter, had been most comfortably heated, and the discomforts of the old methods done away with, the new system created a considerable amount of interest, particularly when it was claimed, that heat could be supplied at a much lower cost, than by the old methods. The system consists in the generation of steam at a central point, its transmission by well protected mains to suitable distances, and its utilization for heat, or power, by means of various mechanical devices. Where buildings are already fitted up. Where houses are supplied with a furnace, it is only necessary to sub- stitute steam coils in its place, for heating the a. Seguin Boilers, flat- ended cylindrical shell. I diameter, arranged in vertical, and hon- zonmlrows. The grate was placed beneath the boilers, at the front, and the products of combustion returned from the back, through the flues, into the smoke box. From the boilers, the steam passed into the mains, which are composed of American standard wrought-. For special curves, bends, and other details, cast-iron was used. Valves were placed in various positions, in the same manner as in gas, and water works, so as to be able to turn off the supply of steam where-ever necessary. This is the vital point of the

system, and condensation was guarded against in two ways ; first, by protecting the pipes by non-conducting materials, and, secondly, by keeping them dry, when underground. The pipes were prepared as follows: The naked pipes were held in a lathe, and were wrapped with the following materials: Sheet asbestos about J of an inch thick, one thick- ness. Porous felt paper, two or three thicknesses, or hair felt J inch thick. Manilla paper, one thickness sufficiently strong to stand handling covered pipes, and not to tear. Three or four of these strips were laid slightly spirally around the pipe, forming spacing pieces. Copper wire was used to bind the strips, and string for the other coverings. The outside casing of all was made of solid square pine logs, bored out about two inches larger than the diameter of the pipe, the thickness of the wooden shell being in no place less than three or four inches ; the ends of the wooden pipes were made to fit into each other. When the iron pipes, duly protected, were put inside the wooden log, the spacing pieces left an air space all round, and allowed the iron pipe to expand and contract freely, by changes of temperature, while the logs were securely anchored and immovable. In the System at Belleville, Keeping the pipe casings dry, when underground, was effected by placing a tile drain, three or four inches in dia- i i screw last-iron e same to turn tion was [pipes by lem dry, ;ed pipes bllowing le thick- r hair felt strong to ich thick. To provide for contraction and expansion in the iron pipes, caused by differences in temperature, stuffing bo. The arriving main from the boilers, had r. A ball and socket joint attachment was always used, so as to be able to conform to variations in the levels of the streets and to prevent injury or strain from settling. A very important improvement has recently been made by using elastic copper ends to the sections of iron mains, this allows sufficient play, and does away with all packed joints, which are now entirely discarded. The service pipes were protected from con- densation, in the. The steam on entering any building through the service pipe, at high pressure, had at once to pass through a regu- lator-. This was done by means of an elastic diaphram, and a weighted lever, a small slide valve being moved, by a valve rod connected with the diaphram. Valves made on the same principal have often been used for supplying low-pressure steam engines, from high-pressure boilers. Figure 1 ,â€” Soctioiial Elevation. A method of accurately measuring, and recording, the amount of steam supplied, has been a most difficult problem to solve, the commercial success of the system being really dependent upon it. The method at present employed is pronounced reliable and satisfactory, by several independent parties, after being in practical use for the past two years. On the outside, upturned face are a series of horizontal dials, which register revolutions, actuated from gear wheels inside the top chamber, they derive their motion from a central vertical shaft, passing through the other compartments, and having a bearing on the bottom of the meter. To this shaft are fastened two miniature brass paddle wheels, or spider frames, of eight arms each, with vane-shaped ends, curved slightly forward. The second, or steam entry compartment, contains one paddle-wheel, which revolves almost touching the bottom. A circular opening in the bottom, connects the third, or steam exit compartment. The bottom compartment, which is closed, all but a small hole round the shaft, contains the other paddle-wheel, and is always full of condensed water, in which the paddle-wheel revolves, stationary vanes preventing the water from being bodily whirled in the direction of rotation. Steam is admitted through a square pipe, the centre line of the opening being on the line of the inside circumfenMice of the chamber, giving the steam a circular motion, as it enters ; within, and from the top of the square pi] e, is hung a long copper tongue, the same width as the pipe. Tiic tongue rises and falls as tiie juantity of passing steam vari! The bottom spider, revolving in water, acts as a governor, and prevents the too rapid revolution of the shaft, the revolutions of which are recorded by the counters on the top. The steam passe-s out of the third compartment, the exit being nearly at right angles to the entrance. The quantity of steam passing through the meter is not measured, or recorded in any ordinary terms of measurement, such as pounds, or cubic feet, but in " units," the value of which, have been determined by experiments, the amount of condensed water, resulting from steam passed through, haxing been accurately weighed. The value of the unit varies with the size of the meter, the pressure of the steam, and the cost of fuel and water, and the evaporative performance of the boilers. From the meter the steam intended for heating purposes, passed through the supply pipes into the radiators. Any of the ordinary forms may be used, and all the ordinary steam fixtures. The usual American pattern of radiators are made of vertical lengths, of i-inch iron pipe, secured into a base and cap, the steam exit and entrance both being in the base. In common with most descriptions of steam radiators, they have to be either full of steam or

empty, there being no means of regulating the steam supply. Holly overcame this, by making the steam entrance at the top of the tubes, in the cap, and having an air valve at the base, to permit the air to escape. Steam, being lighter than air, displaced it to any extent that might be required, entirely, or only partially filling the tubes. In practice it was found difficult to keep the joints tight, in the base and cap, owing to unequal expansion and contraction. The Steam and water of condensation, from all the radiators, passed through coils of steam pipe, in a chamber in the basement, to which fresh air from the outside, was carried through a tlue ; the air thus heated rises through flues and registers, in the ordinary way, and supplies fresh air, while assisting to heat the house. The water of condensation escaped through a steam trap, and wasted into the sewers, unless required for domestic purposes. Live steam can be used for heating water, and when this is done, by direct contact, the noise can be almost entirely stopped, by first passing the steam through a small box filled with gravel or fragments of stone. For cooking purposes, steam does well for a variety of articles, and a stove has been perfected, that with super- heated steam, all sorts of cooking can be done, the super- heating being done with a gas flame. Birdsill Holly was published at Lockport on May i8th, Boiler house and chimney stack 8. Twelve tons ofcnal, at District System wtUi 1, Consumers. The first meters did not work well, and the only way of charging for iicat was by bargain, based upon the previous coal bills of the consumer. The companies suffered severely in these bargains, but the greatest loss was caused by having long lines of miin, with only a few consumers drawing steam, â€" the loss by condensation being then very great. The result of all this being the failure of several of the companies. The idea being to utilize the p nver first and leave sufficient pressure for heating purposes. The boiler house here was situated on very low land, which was subject to inundation, during extreme high tides ; the consequence being, that near the boiler house the steam mains were sometimes under water, and as few of the streets in Lynn are sewered, the ground was constantly damp in many of them, and a very large amount of condensation took place. The steam supply was discontinued, and the works sold and utilized for other purposes, although the steam works were fully paying expenses at the time of selling out. Station H, at Nos. On the 1st of binu n-y. The condensed water is returned to the boilers by. The mains and reti. Smith ii McNeil, irecnwich St. Crook, in the New York liiiies building, is the next in size in the city, and onv. The proprietors of both thes! Steam will i esup plied by m!

Chapter 3 : Brooklyn Middle School

district steam system PROJECT DESCRIPTION The University of Alabama at Birmingham (UAB) relies on steam energy to provide high quality and affordable utility services across the UAB Campus, Hospital and research facilities.

Central solar heating Use of solar heat for district heating has been increasing in Denmark and Germany [20] in recent years. The solar-thermal panels are ground-mounted in fields. Today the installed capacity is about MW heat, utilizing treated sewage water, sea water, district cooling, data centers and grocery stores as heat sources. Among the ways that industrial heat pumps can be utilized are: As the primary base load source where water from a low grade source of heat, e. These devices, although consuming electricity, will transfer a heat output three to six times larger than the amount of electricity consumed. An example of a district system using a heat pump to source heat from raw sewage is in Oslo, Norway that has a heat output of 18 MW thermal. Heat is recovered using a heat pump and can be sold and injected into the network side of the facility at a much higher temperature e. Concerns have existed about the use of hydroflurocarbons as the working fluid refrigerant for large heat pumps. An example is a 14 MW thermal district heating network in Drammen, Norway which is supplied by seawater-source heatpumps that use R refrigerant, and has been operating since In a district system where the chilled water could be utilized for air conditioning, the effective COP would be considerably higher. Furthermore, higher efficiency can be expected through operation on the high voltage network. Storage of this energy as potential electrical energy e. However, storing it as heat in district heating systems, for use in buildings where there is demand, is significantly less costly. Whilst the quality of the electrical energy is degraded, high voltage grid MW sized heat pumps would maximise efficiency whilst not wasting excess renewable electricity. Therefore the usage of rather expensive electricity storage can be minimized, as the heat sector balances the variable production of renewable energy sources with flexible loads and heat storage. Hot water and space heating is provided by heat pumps, which use the cold district heating system as heat source. The system itself can be fed by various low-temperature heat sources including ambient heat, ambient water from rivers, lakes, sea or lagoons, and waste heat from industrial or commercial sources. This allows cogeneration units to be run at times of maximum electrical tariff, the electrical production having much higher rates of return than heat production, whilst storing the excess heat production. It also allows solar heat to be collected in summer and redistributed off season in very large but relatively low-cost in-ground insulated reservoirs or borehole systems. District heating systems consist of feed and return lines. Usually the pipes are installed underground but there are also systems with overground pipes. Within the system heat storage units may be installed to even out peak load demands. The common medium used for heat distribution is water or pressurized hot water , but steam is also used. The advantage of steam is that in addition to heating purposes it can be used in industrial processes due to its higher temperature. The disadvantage of steam is a higher heat loss due to the high temperature. Also, the thermal efficiency of cogeneration plants is significantly lower if the cooling medium is high-temperature steam, reducing electric power generation. Heat transfer oils are generally not used for district heating, although they have higher heat capacities than water, as they are expensive and have environmental issues. At customer level the heat network is usually connected to the central heating system of the dwellings via heat exchangers heat substations: However, direct connection is used in the Odense system. Due to the expense of heat metering, an alternative approach is simply to meter the water â€" water meters are much cheaper than heat meters, and have the advantage of encouraging consumers to extract as much heat as possible, leading to a very low return temperature, which increases the efficiency of power generation. Some district heating schemes might only be sized to meet the needs of a small village or area of a city in which case only the secondary and tertiary pipes will be needed. Some schemes may be designed to serve only a limited number of dwellings â€" 20â€"50 â€" in which case only tertiary sized pipes are needed. Pros and cons[edit] District heating has various advantages compared to individual heating systems. Usually district heating is more energy efficient, due to simultaneous production of heat and electricity in combined heat and power generation plants. This has the added benefit of reducing carbon emissions. In the case of surplus heat from industries, district heating systems do not use additional fuel

because they recover heat which would otherwise be dispersed to the environment. District heating requires a long-term financial commitment that fits poorly with a focus on short-term returns on investment. Benefits to the community include avoided costs of energy through the use of surplus and wasted heat energy, and reduced investment in individual household or building heating equipment. District heating networks, heat-only boiler stations, and cogeneration plants require high initial capital expenditure and financing. Only if considered as long-term investments will these translate into profitable operations for the owners of district heating systems, or combined heat and power plant operators. District heating is less attractive for areas with low population densities, as the investment per household is considerably higher. Also it is less attractive in areas of many small buildings; e. Individual heating systems can be completely shutdown intermittently according to local heating demand which is not the case with a district heating system. Ownership, monopoly issues and charging structures[edit] In many cases large combined heat and power district heating schemes are owned by a single entity. This was typically the case in the old Eastern bloc countries. However, for many schemes, the ownership of the cogeneration plant is separate from the heat using part. Sweden provides an alternative example where the heating market is deregulated. In Sweden it is most common that the ownership of the district heating network is not separated from the ownership of the cogeneration plants, the district cooling network or the centralized heat pumps. There are also examples where the competition has spawned parallel networks and interconnected networks where multiple utilities cooperate. In the United Kingdom there have been complaints that district heating companies have too much of a monopoly and are insufficiently regulated, [39] an issue the industry is aware of, and has taken steps to improve consumer experience through the use of customer charters as set out by the heat trust. In addition, nations have different access to primary energy carriers and so they have a different approach on how to address heating markets within their borders. They have compiled an analysis of district heating and cooling markets in Europe within their Ecoheatcool project supported by the European Commission. A separate study, entitled Heat Roadmap Europe, has indicated that district heating can reduce the price of energy in the European Union between now and This directive intends to support cogeneration and establish a method for calculating cogeneration abilities per country. The development of cogeneration has been very uneven over the years and has been dominated throughout the last decades by national circumstances. Denmark, the Netherlands and Finland. Germany set a target to double its electricity cogeneration from The UK is also actively supporting district heating. According to the IEA modelling of cogeneration expansion for the G8 countries, expansion of cogeneration in France, Germany, Italy and the UK alone would effectively double the existing primary fuel savings by The association is backed by the key players in the industry including gas and electricity companies, ESCOs, equipment suppliers, consultancies, national promotion organisations, financial and other service companies. A EU energy strategy suggests increased use of district heating. District heating in Vienna is run by Wien Energie. A biomass-fired power plant has produced heat since Most of the older fossil-fired district heating systems have a district heating accumulator , so that it is possible to produce the thermal district heating power only at that time where the electric power price is high. Bulgaria[edit] Bulgaria has district heating in around a dozen towns and cities. The largest system is in the capital Sofia , where there are four power plants two CHPs and two boiler stations providing heat to the majority of the city. The system dates back to There are many smaller central heating systems spread around the country [48] including waste heat usage, municipal waste incineration and heat plants. Heat recovered from waste incineration accounted for Natural gas is mostly used in the south-east gas pipeline network, imported coal is used in areas close to ports, and peat is used in northern areas where peat is a natural resource. Other renewables, such as wood chips and other paper industry combustible by-products, are also used, as is the energy recovered by the incineration of municipal solid waste. Industrial units which generate heat as an industrial by-product may sell otherwise waste heat to the network rather than release it into the environment. Excess heat and power from pulp mill recovery boilers is a significant source in mill towns. There is no law on it as most elements of district heating are regulated in governmental or regional orders. There is no governmental support for district heating networks but a law to support cogeneration plants. The largest system is the city of Ptolemaida , where there are five power plants thermal power stations or TPS in particular providing heat to the majority of the largest towns and cities of the

area and some villages. The first small installation took place in Ptolemaida in , offering heating to Proastio village of Eordaea using the TPS of Ptolemaida. Today District heating installations are also available in Kozani , Ptolemaida, Amyntaio , Philotas , Serres and Megalopolis using nearby power plants. In Serres the power plant is a Hi-Efficiency CHP Plant using natural gas, while coal is the primary fuel for all other district heating networks. Geothermal borehole outside the Reykjavik Power Station. Hungary[edit] According to the census there were , dwellings

DOWNLOAD PDF DISTRICT STEAM SUPPLY

Chapter 4 : District Energy (Steam Service) | We Energies

Read at the British Association, Montreal, Cover.

Carrie Andrews at the awards ceremony. Thank you, Deborah Stein, for your service to Cambrian School District and congratulations on your outstanding achievement! The Board determined on October 18, that they will fill the Board vacancy. Applications are being accepted through 5: Whenever a vacancy occurs as defined in Government Code Section , or whenever a resignation of a School Board Member has been filed with the County Superintendent of Schools containing a deferred effective date, The Cambrian School District Board shall, within 60 days of the vacancy or the filing of the deferred resignation with the County Superintendent of Schools, either call an election or make a provisional appointment to fill the vacancy. If a provisional appointment is made, it shall be the policy of the Cambrian School District to involve community representatives in the appointment. Board Procedure available at www. Applications may be submitted to the District office weekdays between 8: Deadline for submitting provisional appointment application to the District office is 5: A screening panel will determine which applicants move on to the interview process. Applicants will be contacted if selected to move on to formal interviews. The time of the meeting TBA. The new Board of Trustees member will be sworn in at the public meeting at 7: Any person, regardless of sex, who is 18 years of age or older, a citizen of California, a resident of the school district, a registered voter and who is not disqualified by the Constitution or laws of California from holding a civil office, is eligible to be elected or appointed a member of a governing board of a school District without further qualifications. Elections are held in even-numbered years and terms are staggered to ensure that only 2 or 3 seats are open each election. The Cambrian Board of Trustees works with the Superintendent to: Provide direction for the District Establish District policies and procedures Ensures accountability Provide community leadership on behalf of the district and public education The Governing Board makes learning a priority for all students, prioritizing goals and clarifying expectations for positive outcomes. Authority is granted to the Board as a whole, not each member individually. Therefore, Board Members fulfill these responsibilities by working together as a governance team with the Superintendent to make decisions that will best serve all the students in the community. In California, there are approximately 1, school districts and county offices of education that are governed by more than 5, school board members. This building is located behind the main office and can be reached by entering the gate to the right of the main building. Regularly scheduled meetings begin at 7: Special Board meetings dates and start times vary and are scheduled when needed. Contactâ€¦ For more information regarding the responsibilities of Board of Trustees members, please direct inquiries to Carlena Grandey, assistant to Superintendent Dr. Carrie Andrews, at grandeyc cambriansd.

Chapter 5 : Home - Valley Stream 13 School District NY

District steam supply: heating buildings by steam, from a central source: 1. District steam supply: heating buildings by steam, from a central source.

Chapter 6 : Hillcrest STEAM Academy / Hillcrest Home

District energy (steam service) Steam produced at Valley Power Plant serves about customers for heating and industrial processes. Our Milwaukee district energy area extends approximately from Mitchell Street north to West Vliet Street, and from Lake Michigan west to 19th Street.

Chapter 7 : Home - International District Energy Association

Companies - District heating, cooling, steam and compressed air supply services - United States District heating, cooling, steam and compressed air supply services United States.

DOWNLOAD PDF DISTRICT STEAM SUPPLY

Chapter 8 : District heating - Wikipedia

The New York City steam system is a district heating system which takes steam produced by steam generating stations and carries it under the streets of Manhattan to heat and cool high rise buildings and businesses. Some New York businesses and facilities also use the steam for cleaning and disinfection.

Chapter 9 : Steam Benefits | Con Edison

A district steam system consists of at least one steam boiler, a fuel system, a feedwater system, a flue-emissions-control system, a boiler-control system, a condensate-return system, and a steam-distribution system.