

CHAPTER 5

Holding the Line

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1940 – 1949

Demand for power surged in Edmonton during the 1940s, and Rosedale was obliged to keep up. Edmonton, with its busy aviation fields, was a key part of Canada’s war effort, and much of Alberta’s industry was adapted to wartime production. Coal and labour shortages, both resulting from the war, hampered electricity production. Edmonton itself also grew in size. Through all of these challenges, however, Edmonton’s power plant proved itself to be a dependable and innovative source of electricity.

A NEW DEAL

Once again, an offer to exchange surplus energy with Calgary Power was on the table in 1939. And, as in previous decades, debate over this offer was heated. The issue was urgent during the war years; it was vital that electricity continue to flow uninterrupted to the city and its wartime industries.

Many thought that Edmonton had found its own solution to the electric supply problem when it increased total

BELOW: *Jasper Avenue in 1942.*



MILESTONES

1940

Edmonton’s Commercial Grads basketball club plays its last game.

The Canadian Standards Association assumes responsibility for testing electrical equipment for safety.

1942

The Alaska Highway is constructed.

A record-breaking snowfall ties up city traffic.

1943

Eight hundred and sixty planes pass through Edmonton on September 23, setting a North American record.

1945

World War II ends. The Loyal Edmonton Regiment returns home.

1947

Oil is discovered near Leduc.

Edmonton’s electrical utility commissions the Network Distribution System in downtown Edmonton.

1948

The Edmonton Flyers hockey club wins the Allan Cup, the Canadian senior amateur title.

The Northern Canada Power Commission is created.

installed capacity to 38,000 kW. It accomplished this with the installation of turbo-generator number 1. City Council had also approved the installation of a \$750,000 generator in 1941. With such a capacity for production, many felt that a pact with Calgary Power was not only unnecessary but also undesirable, given the negative press that the collaboration had been given in the 1930s.

Proponents of the agreement were concerned about coal shortages, war demands, increased population growth, and the very real threat of power outages. Arguing that an interchange agreement with Calgary Power would assist Edmonton in times of shortage or outage, those in favour of an agreement pressed for a decision.

That argument was given additional weight on Saturday, August 10, 1940, at 1:00 PM, when a major power breakdown struck Edmonton. All over the city, streetcars stalled and water was shut off. The cause: a blown cable and

motor that drove a fan on a main steam boiler at Rossdale. Deputy Mayor Guy Paterson accepted an offer from Calgary Power to provide electricity to Edmonton free of charge for the duration of the crisis; in doing so, he overruled R.G. Watson, Rossdale superintendent. In the end, Rossdale was brought back into operation before Calgary sent any power northward.

This outage prompted City Council to act. After a series of late-night meetings and discussions, the council finally voted six-four in favour of the Calgary Power agreement on August 28, 1940.

EXPANSION AT ROSSDALE

Despite a renewed agreement with Calgary Power, expansion at the Rossdale Power Plant remained an issue. In March 1940, City Council approved an additional \$750,000 improvement to the power plant in the form of renovations and new equipment. Calls for tenders were released and Superintendent Watson made inquiries about the pur-

UNEXPECTED ENDS

When it agreed to exchange electricity with Calgary Power, the City of Edmonton expected that the net flow of electricity would be northward. As it happened, however, Edmonton sent more surplus energy to Calgary Power than it received. By October 1946, Calgary Power owed Edmonton about 100,000,000 kWh; this figure was reduced to 91,000,000 kWh by the end of the decade.

chase of a 15,000 kW turbine (number 2) from C.A. Parsons and Company Limited in England.

By the fall of 1940, however, City Council had decided to delay action on the proposed power extension program for three months. There seemed to be serious objection to the issue; the Edmonton Taxpayers Association argued against expansion, citing the need to support the British war effort through reducing municipal taxes so that citizens could bear a growing federal war tax. Others countered that a turbine purchase from Britain would increase British exports and help to maintain British foreign trade.

In October 1940, just one month into the three-month delay, another surprising turn of events obliged City Council to revisit its decision to delay. City commissioners announced that a

representative of the Canadian and British governments had asked Edmonton to proceed immediately with a \$730,000 extension to the City-owned power plant so as to help supply power for the \$8,000,000 ammonium nitrate plant planned in southern Alberta as part

THE INTERCHANGE AGREEMENT CLAUSE

Subject to the requirements of the City to supply itself and its present and future customers, and to the present capacity of its steam plant, the City shall supply any kilowatt hours to the company [Calgary Power] which the company may require during the low water seasons; and subject only to the company's ability to supply from its present hydro-electric plants, the company agrees to accept such kilowatt hours as and when required by the City during subsequent high-water seasons; and during such high-water seasons the City for such periods as

may be necessary to permit the company to return the kilowatt hours due to the City and/or to permit the company to establish a kilowatt hour credit balance as provided for, agrees to operate its steam plant at loads not exceeding 4,000 kW, or at such greater loads as may be necessary from time to time to supply itself and present and future customers and which the company is unable to supply or may be mutually agreed upon to meet the circumstances then existing

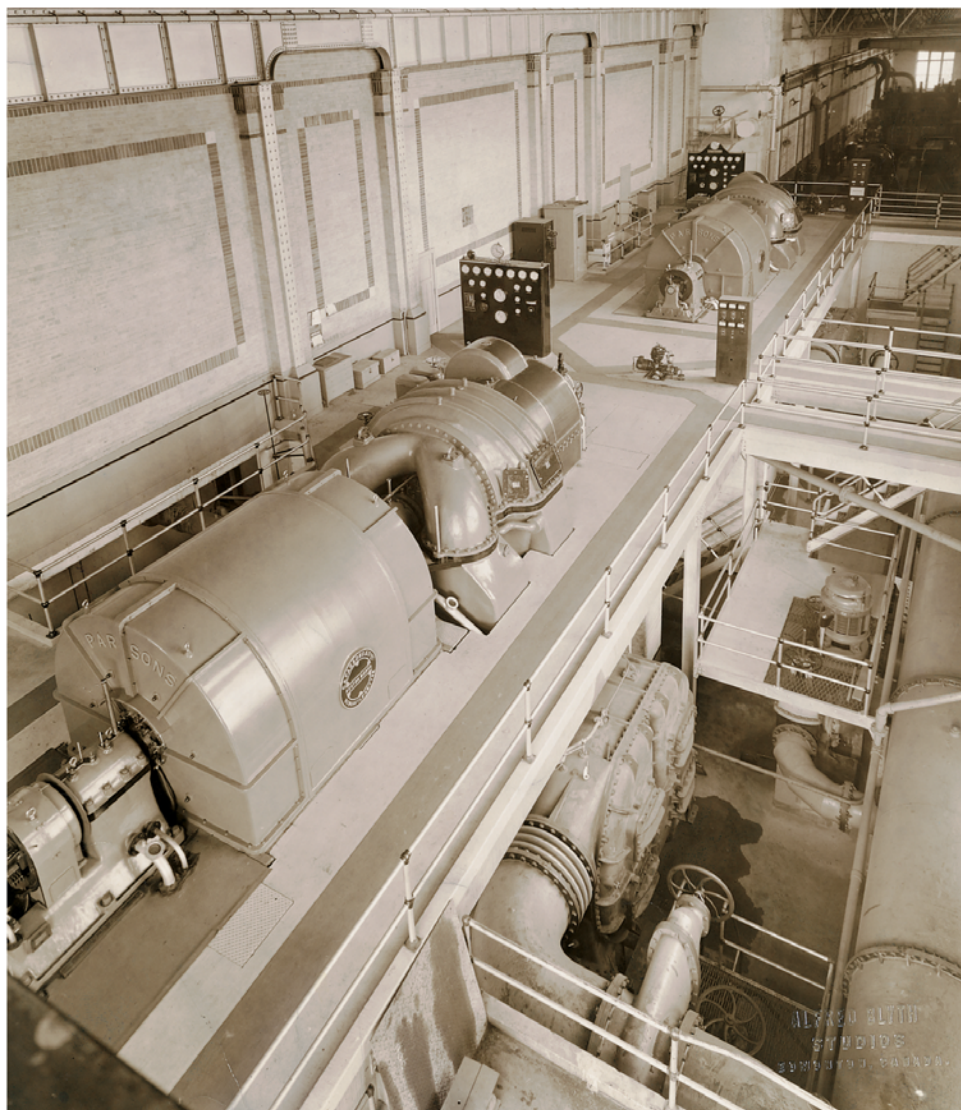
from The Edmonton Journal

of the Canadian government's wartime explosives program.

Ammonium nitrate is used in making smokeless and flameless explosives.

Though the ammonium nitrate plant was also negotiating with Calgary Power, it was clear that an expansion of Rossdale was necessary; war industries all over the province would need more

BELOW: *A view of the interior of the Rossdale Power Plant. Parsons turbine-generators numbers 1 and 2 are the two similar machines on the upper level. Generators commissioned before World War I are visible in the background.*



electrical power. The decision to move forward with the expansion was made. Superintendent Watson arranged for the purchase of a new boiler and turbine. The boiler, made in Galt, Ontario by Babcock & Wilcox, arrived in the fall of 1941 at a cost of \$244,000. The British turbine cost \$258,000. The balance of the expansion budget was spent on equipment needed to make the new turbine and boiler operational, and on an expansion of the building at Rossdale.

Portions of the British turbine were delivered in August, 1942; however, the rest went down in the Atlantic along with the transport ship, both victims of

FUN FOR BOYS COSTLY TO CITY

Take one small boy with a [sling-shot], a newly graveled road and a lighted street lamp, and the result often is – a shattered bulb and costs of \$5 to the City, taking into consideration the lamp cost and labor.

Of the 30 street lamps broken on the average week, more than 80 percent are shattered by boys, an official of the electric light department said Friday. Expense to the City runs into many hundreds of dollars yearly. Favorite weapons of the youngsters are stones, and in the winter, snowballs

When the boys are caught the department makes them pay, if possible, for the damage.

“Our chief trouble is to catch the boys,” the official said.

*from The Edmonton Journal,
1944*

ALBERTA'S CHEMICAL INDUSTRY

The basic chemical industry was founded in the province in 1941, when a plant was built at Calgary to produce ammonia and ammonium nitrate, using natural gas as the principal raw material. Before the end of the Second World War this plant was converted to the manufacture of ammonia and fertilizer-grade ammonium nitrate. In 1952, an industrial high explosives plant commenced operation at Calgary, using ammonia and ammonium nitrate from the fertilizer plant.

From Alberta: Province of Opportunity

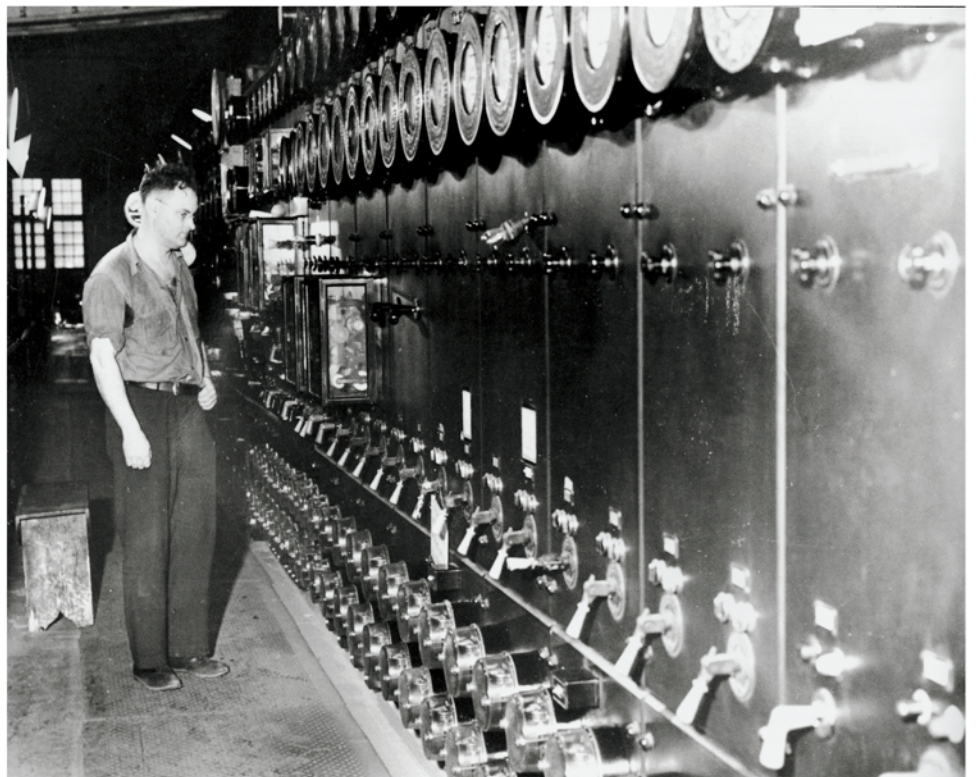


ABOVE: *Edmonton's streets were well-lit in the 1940s.*

RIGHT: *Edmonton power plant employee Frank Prior inspecting a switchboard at Rossdale in 1944.*

Nazi submarines, in December 1942. C.A. Parsons replaced the parts, which arrived at last in May of 1943. R.G. Watson was able to put the full system into operation by March, 1944.

The expansion was timely. Rossdale's output in September of 1942 was 36.3 percent greater than output in the same period in 1941. Much of this electricity was sent south to Calgary Power under the terms of the interchange agreement. Edmonton's own war efforts were increasing consumption locally as well. Airport construction, aircraft repair,



TRANSCRIPT OF A CJCA BROADCAST

March 3, 1943 at 9:30 PM

Announcer: Tonight's "Town Topics" originate at the city power plant, the heart of Edmonton's intricate system of electricity and water supply. We are standing now at the site of the City's efficient and up-to-date plant that supplies your homes, offices and industrial centres with lighting, electrical power, and water. This plant originally operated from the river's edge at the foot of 101st street. It was moved in 1907 to its present location. At that time it was already the property of the City of Edmonton for three years. Since 1907, the plant grew as the city grew, increasing its capacity for generating electricity from 4,000 kWh to 34,000 kWh. This maximum capacity will be increased as soon as another 15,000 kWh generator can be installed. First impression we get as we enter this huge building is the immensity of the machinery coupled with the physical insignificance of man in their midst. The deafening drone of the turbines helps make the man's position in the midst of this huge machinery even more insignificant. We'll start in the boiler room, where the resulting power in your home or factory passes through its first stages of creation.

Pause to reach boiler room.

Towering above us for 60 feet are three boilers, two of them now being in operation, and the third, nearing completion. These are tremendous objects with goose-walks and stairways draping the sides and ends. Running full-length along the lower front side are the stokers which are fed by a coal hopper or "way line" which is suspended from a rail and stretches out its crane-full of coal towards the stokers as it supplies the required amount of coal. The coal is

automatically weighed as it passes out of an overhead bunker into the traveling way line. It passes through a crusher before it reaches the overhead bunker. Situated right behind us at a point from which all three boilers can readily be seen is the control panel, which automatically charts water level, air flow, coal consumption, steam pressure, and so on. This of course is the guide for the automatic control of the huge stokers. Now, coming out of this immense and complicated set-up and bringing the results to your home, here's what the results are: every pound of coal and every 9 1/4 pounds of water used in this room supply you with enough electricity to burn 10-100 W bulbs for one hour. Now to see how that tremendous amount of electricity is made [we go] into the next room.

Pause.

Here we see the source of that droning noise you likely hear, and the source of your electricity. We're standing alongside the newest acquisition to your city's plant. The immense 15,000 kWh generator was installed several years ago. It's a huge cylinder laying horizontally with a portion of the lower regions below the floor surface. At the far end of this long room is the 10,000 kW turbine and alongside are the 4- and 5,000 ones. The two small turbines are idle now, as with the lengthening day, the city demand for power has receded from the mid-winter peak. Standing in this same line of monster machines is the Direct Current Reciprocating Steam Engine, which augments power for the city street railway. All these are immense machines. Standing at this elevated point, they give one a scene that could well be compared with a number of dinosaurs or whales wal-

lowing in shallow water. We'll step over to our right a short distance to see what's below us.

Pause.

Looking over a strong rail we see huge pipes, one about six feet in diameter and one about four – serving as a lead-in and an outlet for the water supply at the plant. The smaller pipe leads to the condenser. That's a bulky machine whose job it is to change the steam coming out of the turbines back into water. It's the pivot link in the chain which forms the water cycle at the plant. Here's how the water travels. It's heated in the boilers and is passed to the turbines, at very near the boiling point. In the process of generating electricity it changes into steam and is passed to the condenser in that form. The condenser changes it back to water, whence it returns to the boilers to complete the cycle. Simple, isn't it?

Pause.

Lining a high wall above us is a long series of panels bedecked with dials, switches, buttons and numerous other gadgets. These are the switchboards which control the lighting and power supply in various parts of the city. Here's Mr. R.G. Watson, plant superintendent ... Thanks very kindly, Mr. Watson, and the best of success with your regular operations and your new installations.

Back to studio for signoff.

Note that many of the figures and some of the processes given in the transcript are incorrect. The generating station was relocated to the Rosedale site in 1902. The generating capacity figures were 1907, 1908, and 1943 were, respectively, 675 kW, 1375 kW, and 38,000 kW.

TWO WOMEN METER READERS LIKE THEIR WARTIME WORK

Edmonton's two women meter readers, Mrs. Verna Barnett and Mrs. Ruth Limb, like their jobs despite fierce-looking dogs, strange basements and dusty meters.

They've been on the job for three weeks, and they don't look at the winter months ahead with misgiving.

"I guess some days won't be so nice what with cold winds and deep snow ... but then, it's all part of the job," says Mrs. Barnett. Mrs. Barnett wears blue coveralls on her job now but the City is making plans to equip all the meter readers, including the two women, with fleece-lined parkas for the winter months.

"I find the people very nice to deal with as I go from house to house," Mrs. Barnett declared. "I haven't had any trouble with dogs yet and don't expect any. I find that no matter how tough they look, if you speak to them in a friendly fashion they don't bother

you."

"I suppose you see some pretty fantastic basements as you go around?" asked the reporter.

"Well, I wouldn't like to say," she replied. "What people have in their basements and how they keep them is their own business, I guess."

A goodly number of the meters are dusty and Mrs. Barnett said sometimes she has to get a rag and wipe the glass clear so she can read them.

"The funny part of it is," she added, "after getting this job I checked up on the condition of my own meter and have to admit I found it pretty dirty. You don't realize these things until you become personally interested."

The City employs eight meter readers under foreman S. Clark. Mr. Clark thinks his two women readers are "just fine."

from The Edmonton Journal, 1943

RCAF schools and 24-hour packing-houses all called for huge amounts of electricity.

TWO WOMEN HIRED AS METER READERS

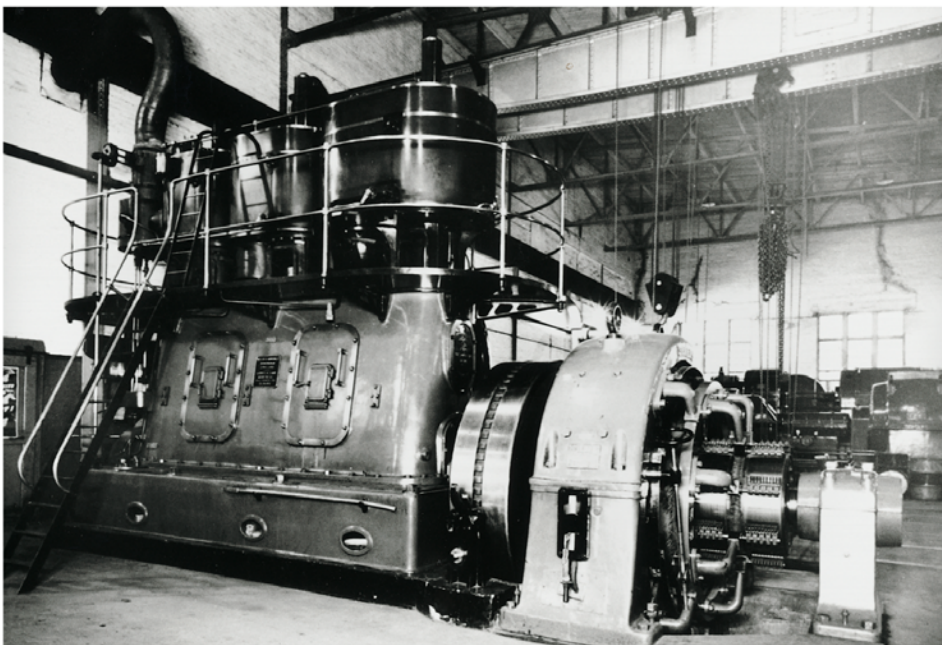
Another challenge that the utility faced during the war years was a critical shortage of workers. In August 1943, plans were announced to hire two women as meter readers. In an August 31 *Edmonton Journal* report, it was made clear that this move was intended to supplement male meter readers, not replace them. Much attention was paid to the problem of outfitting the female workers; the City hoped to provide the women with coveralls and a cap.

COAL SHORTAGES

During the early 1940s, the cost and availability of coal provided another challenge to the City's ability to produce adequate power. North America's war machine consumed vast amounts of coal. It is therefore no surprise that the price of coal had almost doubled by the end of the war, going from \$1.58/ton in 1939 to \$3.11/ton in 1945. The implications of this shortage for Rosedale were serious. In December of 1942 the power plant's coal reserve was reduced to 7,000 tons, down from 14,000 tons. The possibility of power rationing became very real because the plant used 300 tonnes of coal per day in peak season.

In November 1943, a miner's strike reduced coal reserves to such low levels that the City had to declare a "dimout" to conserve the fuel. Streetlights were off longer, and citizens, businesses and

LEFT: *Pre-World War I machines continued to operate in the Rosedale Power Plant through the 1940s.*





ABOVE: Roy Fitzsimmons (left) and Stan Hampton (right) at 350 Substation.

industries were asked to reduce the amount of electricity they used as much as possible. Watson was able to obtain between 5,000 and 10,000 tons of coal from an abandoned mine near Camrose, which was expected to see the plant through a few weeks. By December 1, 1943, Watson had built the reserve up sufficiently to ease up on the city-wide dimout.

The coal shortage gave rise to the first of many discussions about converting some or all of Rossdale's boilers into gas-fired burners. In letters to and from City commissioners, the mayor, aldermen, coal company representatives, and R.G. Watson argued back and forth throughout July and August of 1943, sometimes quite heatedly. The need to protect the multi-million dollar coal industry, the inability of the gas company to provide enough gas, and Watson's uncertainty about possible damage to the boilers all

worked together to argue against using gas. On August 20, 1943, R.J. Gibb, commissioner of utilities, wrote to Ernest Manning, minister of trade and industry, in response to Manning's inquiry about conversion to gas. "[T]he Civic Administration was never very favorable to the proposed change. The matter seems to be in abeyance and if it is revised we will be pleased to advise you." For now, the question was at rest.

By March of 1944, coal reserves had increased to 18,000 tons and power plant officials were no longer concerned about shortages.

EXPANSION

Rossdale's expansion in 1944 didn't quench Alberta's thirst for electricity. By May 1945, Watson was before City Council with another request for expansion to the power plant. The need was much greater this time. In the five years since his previous request, Edmonton's population had increased from 91,723 to

BOMB SCARE WRECKS METER FOR CITY LIGHT DEPARTMENT

Because an Edmonton hotel owner was bomb-shy early Thursday, the City Electric Light Department is shy one voltage checking meter.

Shortly after 4:00 AM a guest at the Banff Hotel, 9930 Jasper Avenue, awoke proprietor Morris Gottfried excitedly, telling him he had found "a bomb" ticking away in the hall. It precipitated a bomb scare, as Gottfried on checking found a 12-inch by 16-inch box plugged into the electrical system in the hotel hallway.

When he heard the box ticking ominously, Gottfried took no chances. Instead he took the box in his hands, ripped it away from the wall and tossed it out of a window onto an adjoining roof.

Then he ran as fast as he could to the police station two blocks away and burst in to report the "bomb." Constables Benny Wheatfield and W. A. Maloney rushed to the hotel as a two-man demolition squad, and finally found the "bomb" on the next door roof.

It was ticking no longer. In fact, chances were it would never tick again, which is why the Electric Light Department is out some equipment. The "bomb" turned out to be a clock-work meter the department uses to check electrical systems in Edmonton buildings. Tossing it out of a window onto a roof did it little good.

from The Edmonton Journal,
1949

111,745. Power demand was continually on the rise. Watson also argued that a cheap and reliable power source would attract more industry to Edmonton. He outlined a \$1,777,000 expansion that included a new 30,000 kW turbine generator and associated boiler and auxiliaries, all of which could be paid for by the end of 1949 with reserves from revenues.

In September 1945, City Council approved Watson's expansion program,

BELOW: Transformers for the new Network Distribution System arrived by train.

BOTTOM: Ducts such as these were essential in the Network Distribution System.

BELOW RIGHT: Transformers were lowered into vaults below city sidewalks.

and by 1949 generator number 3 and boiler number 5 were installed and operational. According to employee Terry Stone, the installation of this equipment had some interesting challenges.

On a Saturday in 1948 there was a cloud burst over the river valley, and you couldn't see 20 feet in front of you. We were bringing in some equipment through an opening in the wall. The rain was leaking in through the roof drains and we had all of these open cables and circuits. We had to use tarps to scoop the water out.

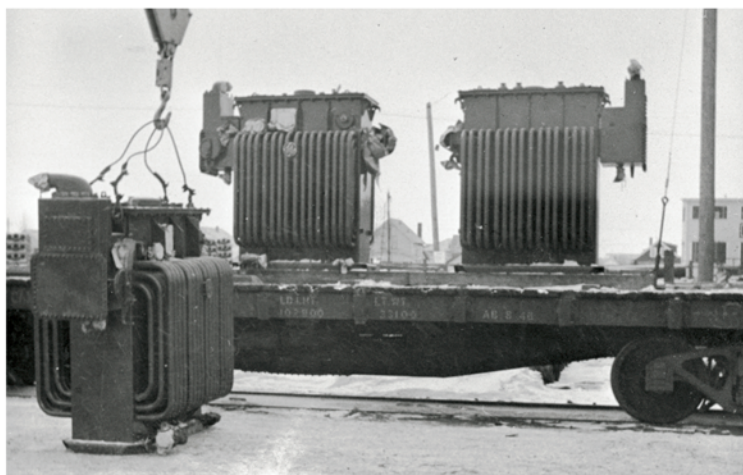
Despite the dangers, no one was hurt and the equipment was safely situated in

the plant. Once things were up and running, says Stone, "there was the constant hum of machines all day long. If there was a little surge in the machines you would pick it up right away." Like so many others who have worked at the plant, Stone's ears were totally tuned in to the noise of the turbines.

POWER DISTRIBUTION TAKES A NEW TURN

In 1947 the Electric Light and Power Department determined that it was time to remove the lines that had long been strung over streets and sidewalks in the downtown core of Edmonton. The lines

would be installed in an underground complex called the Network Distribu-

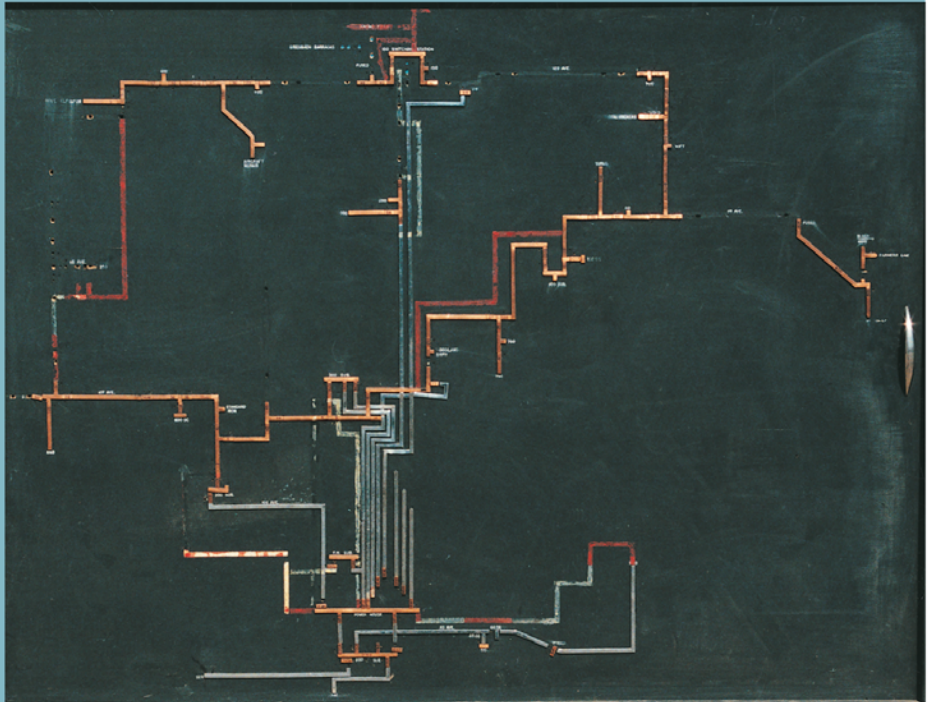


SYSTEM DIAGRAM

The system diagram, or dummy bus board, in the picture at right is an illustration of the city's electrical distribution system as it was between 1947 and 1957. During this period, the board was mounted in a control room at Rossdale. Each chrome or copper bar on the board represented a feeder coming out of Rossdale; these feeders led to substations around the city, as well as large industrial customers. There were 85 switches on the board; these switches indicated which lines were active.

Circuits could not be controlled from the bus board. In order to activate (or deactivate) a line, the operator would select the appropriate key from a cabinet at Rossdale, drive out into the field, use the key to close or open the circuit, then return to the powerhouse. The switches on the board were then manually moved to the "on" or "off" position.

Adapted from text by Paul Collis



ABOVE: *Rossdale in the 1940s.*

tion System. This system was designed to ensure that electricity could be supplied at the usual voltage even if one or more of the transformers or supply cables shut down or failed. Theoretically, just five of the eight primary cables could supply the network load, if necessary.

A system of vaults and duct lines was built beneath the streets in Edmonton's downtown core. This system housed transformers and cables, and was connected to the surface by manholes. Removable grates and concrete lids from this system remain visible today.

This was a reliable method of power

distribution. The underground system put into place in 1947 would be expanded and improved as the City grew over the next few decades. Subsequent power outages were much less serious than they would have been with an aerial system. According to Art Baird, an engineer and

retired director of distribution engineering, only three major outages (July 1965, August 1973, and March 1979) resulted from failures within the Network Distribution System. Other outages to

‘I’M JUST SICK’

April 2, 1949

Dear City Commissioners:

This is not a joke – I’m just sick.

Enclosed package is only a sample of what I have on my door steps and window sills every day from the city power plant.

Can not anything be done to prevent some of this menace I sure would be very grateful. I have been a resident of this city, since 1901, and love Edmonton and its people;

Sincerely yours
(Mrs.) Christopher Spillios

April 6, 1949

Mrs. Christopher Spillios,
9742 - 103 St.
Edmonton.

Dear Madam,
Received your letter and package as of April 2, and I am quite in agreement with you that the situation is not good.

It is only during the present winter than complaints have been made con-

cerning the power plant and the commissioners and the superintendent, as well as council, have been considering methods which would alleviate the situation. The boiler giving the most difficulty is one which has to be dismantled and cleaned. During the past winter pending the use of new equipment, some of our boilers have been forced in order to produce the necessary power and we think that this may have something to do with the condition.

Commissioner Menzies, who is an engineer, is following up the matter with the superintendent with a view to finding some remedy and I trust that they will be successful.

We are aware of one method but it is pretty costly and in view of the discussion with council concerning the installation of gas in our power plant, there has been some delay in deciding on a definite policy.

Yours very truly,

MAYOR

the network service area have occurred when all generating units shut down as a result of system faults.

POLLUTION THE ISSUE AS DECADE CLOSES

At the close of the decade, air pollution in the form of fly ash would become a major issue for the power plant. Letters began to arrive in Commissioner Menzie’s office from Rossdale citizens concerned about fly ash, which drifted down the river valley and onto skating rinks, fresh laundry, and furniture. Residents wanted a solution to the problem.

Superintendent William McFarland, who succeeded Watson in 1945, submitted a report on the issue to City Council. According to McFarland, the problem resulted from forcing old boilers to burn more coal than usual, and was therefore temporary. More coal was burned in the winter of 1948 than ever before, and new boilers were yet to be operational. Therefore, the old boilers operated at lower efficiency and discharged more than the usual amounts of fly ash. It was hoped that installing new boilers would solve the fly ash problem.

In fact, the new boilers aggravated the situation. Because of the new design, less

PROTEST AGAINST THE POWER PLANT

Residents of Rossdale Community League are more than just irked, they’re fighting mad, and Edmonton’s City commissioners are pondering ways to make them mellow again. Blackened housewives’ washes, nearly \$2,000 worth of unusable rinks, and doctor’s bills for removal of cinders from eyes have the Rossdale residents up in arms. Their anger is caused by

the belching grit which settles over the district daily from the four smoke stacks of the City’s power plant.

Protests against the black dust have been lodged with the commissioners for the past two years. The ire of the residents reached the boiling point this winter when the black cloud became denser. Full blast was given City commissioners Thursday.

Charles Simmonds, president of the Federation of Community Leagues, and Duncan Innes, chairman of the federation’s civic committee, took the communities’ protests before Commissioner Menzies and demanded that something be done.

from The Edmonton Journal,
1948

ash was trapped in the boiler and more went up the stack! Alterations were made with some positive results, but the problem prevailed.

Technology that would allow the utility to burn coal without producing fly ash was unavailable in the 1940s. Thus, when large quantities of gas were discovered near Leduc in 1947, the City converted some of its boilers to use this cleaner fuel. Number 1 boiler was the first to be converted, and in late November 1949 began to burn gas. By the end of December, City Council was discussing a full conversion to gas. The City would save money on ash control equipment as well as on fuel costs. However, the topic remained an open issue as the decade closed.

LABOUR SHORTAGES

A labour shortage marked 1949 for the Electric Light and Power Department. Though the war had been over for years, there was a severe shortage of linemen; workers were required to install sorely needed streetlights. According to an *Edmonton Journal*

report, an appeal made to the cities of Vancouver and Winnipeg failed to produce reinforcements for Edmonton's linemen. The department consequently had to turn to all of the employment offices in Canada to request help in remedying the situation. As a result of the labour shortage, streetlighting improvements planned for 99 Street and 109 Street were placed on hold until more men could be found.

Rosssdale's capacity was 38,000 kW at the beginning of the 1940s; this was increased to 60,000 kW over the course of the decade. Edmonton's utility was fast becoming a leader in power production technology. In 1949, Rosssdale was described as being the largest plant of its kind in Canada; it was well-prepared for post-war industrial expansion. To its credit, the utility also responded to concerns about its impact on the environment, and took steps towards reducing air pollution.

BELOW: *Oil was discovered near Leduc in 1947.*

UNDERGROUND TREASURES CHANGE ALBERTA FOREVER

Beginning February 1947, Alberta's economy was no longer dependent on agriculture. The discovery of oil near Leduc forever changed the province.

The number of producing oil wells in Alberta increased from 418 to 7,390 in the decade following the Leduc oilfield discovery, and the petroleum industry pumped \$2.5 billion into the Alberta economy. New manufacturing plants went up. Within a few years, pipelines carried oil west to the Pacific and east to the Great Lakes. Thousands of jobs were created, and the population of Edmonton grew rapidly. Edmonton had become the sixth-largest Canadian city by 1956, and along with Calgary, was the fastest growing metropolitan area in Canada.

