

Conference Paper



CONSUMERS POWER--DETROIT EDISON POWER POOL

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CONSUMERS POWER--DETROIT EDISON POWER POOL

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Consumers Power Company and The Detroit Edison Company supply electricity to most of the State of Michigan's 7,800,000 people and to heavy demands of industry, commerce and agriculture. Installed capacity of the two companies totals 7,000,000 kw. Only 150,000 kw of this total is in hydro and the remainder is thermal power. In addition, two nuclear plants, whose capacities at this time are not included in the total, are involved. The Big Rock Point Nuclear Plant, rated 75,000 kw, is presently producing electric energy in a research and development phase. The Enrico Fermi Atomic Power Plant, with an ultimate capacity of 150,000 kw, has attained criticality. It also is in a research and development phase but has not started electric energy production.

The electric transmission facilities of the Consumers Power Company and of The Detroit Edison Company have been interconnected since 1928. During most of the first two decades of its existence, the interconnection was used only as a last-ditch support measure. In fact, it was a matter of considerable individual company pride to operate in such a manner as to be completely independent under all probable circumstances. Exigencies of the post-war circumstances caused many changes so that but little of this early independence remains today.

It is understandable that some difficulties must be faced in effecting optimum utilization of interconnections. Full accord in planning between two systems inevitably restricts management's individual freedom of operation. Furthermore, many engineering and operating decisions must run the gamut of task force, subcommittee, main committee and administrative committee scrutiny and study before decisions can be reached. The advantages of full utilization of interconnections, however, far outweigh the disadvantages.

After the war, the very rapid load growths which were experienced and the resulting low reserve margins necessitated mutual assistance. Interconnection facilities were strengthened and were frequently the means of preserving service continuity. Our first effective power pooling agreement became operable in 1949. It was simple in form and, in effect, made general provision for most of the features which are common in interconnection agreements today.

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Briefly, our 1949 agreement provided for split-savings on economy power interchange and for emergency assistance based on out-of-pocket costs for fuel. No capacity charge was involved unless one party's reserve margin dropped below a predetermined level. In such a case, a purchase was required. The 1949 agreement also recognized the possibilities of staggered construction and made provisions for it.

However, during the first few years after the war, the load growth was so rapid that both companies were pushed to keep up with capacity requirements and there was no opportunity for staggering construction. Later on, three cases of staggered construction were studied in detail, and two were actually signed, only to be later canceled by changed conditions. A large part of the difficulty in effecting staggered construction, based on separate engineering studies, is that it tends to be an after-the-fact chore. Each company was prone to make independent decisions as to unit size, its location, and its service date, and it was very difficult for the interconnection committees to juggle these nearly-crystallized facts to obtain an overall improvement. Either the location was wrong or the timing was wrong, and it is difficult to defer a unit once it is well under way. It was recognized by both the interconnection committees and by managements that fully coordinated planning on a one-system basis might afford worthwhile savings. Accordingly, task forces were appointed and extensive studies were made to determine the advantages of a one-system planning approach.

Study Procedure

The approach to evaluating the economic advantages of a one-system planning program was simple in concept. Each company developed its own optimum long-range bulk power expansion plan. This plan was then priced out, and annual costs were calculated including fixed charges, fuel and operating expenses. A one-system optimum plan was then developed. It, too, was priced out. Its costs were found to be significantly lower than the sum of the independent approaches. Although this conceptual approach was indeed simple, the studies to be meaningful had to be on a consistent basis. This required the development of detailed planning rules and agreement on many items. For example, it was necessary to reach agreement on the proper return from a planning standpoint, on life and depreciation rates, on property taxes and their probable future escalation, on basic unit costs for generation and transmission equipment, on the fundamental differences in fuel costs at the different sites, and on fuel, construction and operating cost escalation rates.

Satisfactory agreement was reached on all necessary items and many expansion plans were evaluated. Annual savings on a 20-year levelized basis for the one-system planning approach were found to be several million dollars per year. It only remained then to prepare an agreement which would provide for a one-system operating and planning

approach and which would provide for an equitable sharing of the savings which resulted from this approach.

Basic Features of New Interconnection Agreement

In preparing this new electric power pooling agreement, it was recognized that it would be difficult, if not impossible, to foresee at the time of writing the many situations which would arise over the years. Accordingly, the agreement proper was divided into two major sections. The first section would cover only the general principles involved, while the second section would include supplements covering the numerous details. These supplements would be revised as changing conditions warranted. The material covered by each section is as follows:

Section I

- General Obligations
- Sharing of Pool Reserve Responsibility
- Sharing of Pool Unit Energy and Economy Energy
- Third Party Energy and/or Capacity Exchange
- Non-Utility Party Capacity and/or Energy Exchanges
- Ownership and Operation of Interconnections
 - Between Parties
- Ownership and Operation of Pool Associated
 - Transmission
- Committees
- Billing
- Michigan Public Service Commission
- Due Diligence, Continuity of Service, Liability
- Waivers
- Successors of Parties
- Defaults
- Effective Date and Term
- Review and Amendment

Section II

- Pool Operating Principles and Procedures
- Pool Planning Principles and Procedures
- Principles Relating to Commitment for
 - Specific Pool Units
- Non-Utility Party Capacity Authorization
- Firm Power Contracts
- Interconnections
- Operation Prior to First Pool Unit

Section I was written with the following objectives in mind:

1. To fully coordinate the electric operation and expansion of the two systems in order to achieve lowest overall cost and optimum security of power supply.
2. To share the prospective pooling benefits equally, insofar as practicable, between the two companies for at least 20 years in the future.

The first of these objectives was obtained easily relative to the second. To establish coordination, it was agreed that the Planning Committee would recommend size, type and location of a pool unit on a one-system approach. It was further agreed that the Operating Committee would dispatch the two systems as one, exchanging economy energy whenever there is a difference in incremental costs, delivering pool unit energy in proportion to capacity commitment at an energy rate including only fuel cost and transmission losses to the delivery point, and upholding service reliability on a one-system basis.

Achievement of the second objective -- development of procedures for sharing benefits -- required many studies to test the various contractual concepts.

The second section, as previously stated, would cover the numerous and changing operating and planning details, and also include the supplements covering the sharing of pool unit capacity, firm contracts, interconnections, and similar matters.

Capacity Sharing

The Consumers-Detroit Edison pooling concept is based largely on the principle of each company planning for the same reserve percentage, and, in order to remove any inequities that may occur, an after-the-fact adjustment (which is in reality a payment for capacity) is made on the basis of actual loads at the end of each peak load season. The implementation of this concept and principle is achieved as follows.

At the time it is necessary to make a commitment for additional pool capacity (usually three to four years in advance), each company prepares its load forecasts and capabilities for the particular year under consideration. The new pool unit capacity (whose size, location, type, etc. have previously been decided) is added to the total capacity of the pool. Calculations are then made to determine the megawatts each company will require of the pool unit in order to equalize percentage reserves in that period.

The installing party is responsible for the cost of financing, manning, constructing and operating the pool unit. The purchasing party pays, after the unit is synchronized, its share of fixed charges, plus additional manning costs, plus estimated average maintenance costs.

The purchasing party receives its share of all energy output of the pool unit and pays fuel costs and transmission losses for this energy.

The purchasing party, from the date of synchronization of this project, pays its share of these costs monthly and continues these payments until the advent of the next pool unit. The process is repeated similarly for the succeeding pool unit, with it normally being the case that the preceding pool unit's capacity reverts totally to the owning party, and all capacity sharing is accomplished in sharing the latest pool unit. This we call "short-term" participation. The agreement is, however, sufficiently flexible to permit long-term participation should specific conditions warrant.

It is quite evident that this procedure alone could very well result in inequities, due primarily to load forecast error so far in the future. Therefore, at the end of each peak load season an after-the-fact adjustment is made. This adjustment may result in a Principal Capacity Equalization Charge, or, if the adjustment involves matters such as mid-year capacity requirements, capacity deratings, differing maintenance practices, etc., a Secondary Capacity Equalization Charge may result. In either event, kilowatts of capacity deficiency are computed (if such actually occurred) to which a rate in dollars per kilowatt per year and a multiplier are applied in determination of the charge one party bills the other. The multiplier is stepped so that a maximum charge rate results when one party's accredited capacity is low enough to jeopardize pool security, and a lesser charge rate results if respective deficiencies exert less effect to actual adequacy of pool reserve.

If for some reason one company wishes to install capacity having unusual characteristics of design for experimental or other purposes, this capacity may also be shared by mutual agreement. However, if the non-building party does not wish to participate and deems that such generation would not be economic or firm, it may decline to participate. The building company may proceed unilaterally, but such capacity will not be considered as firm pool capacity for reserve requirement determinations until it has proven itself as reliable or until equivalent capacity is adequately guaranteed by the building party.

If at any time it becomes apparent that one party's load forecasts are in error to the extent that the pool reserve may fall below the minimum planned, then the party responsible for the deficiency must make every effort to procure short lead time capacity.

Transmission

The transmission facilities as regards all pooling arrangements are considered in three categories as follows:

1. Transmission directly associated with a pool unit.

This is the transmission required in order to deliver the pool unit's capacity and energy from the site into the system and is, therefore, considered for sharing purposes the same as the pool unit capacity. In other words, the fixed charges, operating and maintenance costs will be shared for this transmission in the same ratio as the pool unit capacity is shared, and payments continue for the same length of time as a pool unit.

2. Transmission Grid Lines.

Transmission lines built to serve a pool function, but not directly associated with a specific pool unit, will be treated separately and will be shared in cost and for a period as mutually agreed upon, dependant upon the particular specific situation.

3. Interconnection Transmission Lines.

The annual cost of transmission lines interconnecting the two companies is shared on a 50-50 basis. Each party owns the facilities in its service area and payments are made to equalize annual cost. These lines are considered as long-term lines and the 50-50 basis remains throughout the life of the interconnection agreement.

Other Parties

All pooling arrangements with other parties outside the State of Michigan must be handled as a joint venture with the two Michigan companies acting as a unit.

All arrangements with utilities, municipals, industrials having generation, etc., within the State of Michigan, will be negotiated individually by the company in whose area such other party is located. However, any such capacity to be considered firm in the Consumers-Detroit Edison pool must be approved by the other pool member.

Any non-utility capacity that is included in pool capacity must be guaranteed by the sponsoring pool member. Such guarantee commits the sponsoring party to immediately take steps, even to the extent of extraordinary costs, to replace that capacity if the loss results in a tendency to impair pool security.

Energy

All energy interchanges between the parties (except that associated with a specific pool unit) is considered as economy energy regardless of unintentional, emergency or other circumstances, and all payments for such energy are based on split-the-savings. All generation in the pool will be dispatched strictly for pool-wide economy (after area security requirements are satisfied), and energy crossing the interconnection is considered as free flowing with no attempt to restrict such flows at any amount less than dependable capability of the interconnecting lines.

Operation Under New Agreement

Since the new agreement went into effect in December 1962, the installation of two pool units has been agreed upon. The first unit, James H. Campbell No. 2, rated 385 mw, is located on Lake Michigan near Grand Rapids and is planned for service May 1, 1967. The second, Trenton Channel No. 9, is located just south of Detroit at the mouth of the Detroit River, is rated 500 mw, and is planned for service in January 1968. Decisions are expected shortly which will locate the third and fourth units in the Saginaw Bay and Lake Erie areas.

Planning Procedures

The study procedure followed to develop the most economic expansion pattern is essentially as follows.

A number of alternate expansion plans covering the next 20 years are selected for evaluation. There will be one series of plans wherein the only variable will be unit size, another series with differing site developments as the variable, still other series with nuclear and peaking capacity as the variables.

The capital costs for each plan in today's dollars are estimated and fixed charges are computed and levelized with the aid of a computer program. Construction costs are escalated as are property taxes. Capital recovery rates are varied to reflect the expected life of the several types of equipment.

A companion computer program calculates the annual and levelized fuel cost of each program. Manning and maintenance are estimated and added to the results of the computer program to obtain year-by-year

and levelized annual costs for each expansion plan. It is interesting to note that the task force is already sufficiently experienced to initially select the two or three plans which will be in final contention as the optimum choice. Usually annual costs for those two or three plans will be sufficiently close that judgment or intangible factors may be deciding.

When the studies have been completed, recommendations are presented in a joint top management meeting. These recommendations include the need for new generating capacity, when and where it should be installed, and the economic unit size and type. A decision involving two units, one on each system, has merit where it is practical. In such a case, Company A agrees to install the first such unit, and Company B agrees to install the other. Supplements to the main agreement are drawn which make provision for the sharing of output and annual cost of each unit for an appropriate period.

The principal components of such a supplement are as follows:

The estimated cost and net capability of the unit.

Its estimated heat rate and fuel cost.

The expected peak load and capability of each party.

An allocation of the pool unit capacity to each party for the peak load seasons in which it will be a pool unit.

The capacity billing charge to the purchaser which includes an estimate of (a) the fixed costs for the specific investment for the unit and the annual cost of its transmission-- sunk costs are excluded; (b) the cost of additional operating labor; and (c) estimated long-term average maintenance costs.

These estimated costs are revised just prior to service to reflect the actual costs incurred.

Other items covered include expected average transmission costs for pool unit energy to the interconnection metering point, the rate to be applied to principal and secondary capacity equalization charges, the planned pool reserve percentage, and the minimum reserve percentage, and a detailed breakdown of the expected plant and transmission construction costs.

The detailed engineering and design of a unit is the responsibility of the installing party.

Operating Procedure

Once a pool unit is installed, it is dispatched, just as any other unit, to provide the lowest overall cost of energy delivered to the distribution system. Its capacity is allocated between the two parties in accordance with the terms of the supplemental agreement, as is its hour-by-hour output. The actual fuel costs and the manning and estimated average maintenance costs are shared in the same proportion. When a pool unit is shut down for repairs, each party loses its share of its capability; however, maintenance and day-to-day operating schedules are fully coordinated.

One-system dispatch to provide the lowest overall cost of delivered power is presently being handled by frequent contact between dispatchers. Edison's on-line dispatch computer periodically calculates incremental cost data. Similar data for the Consumers' system has been prepared in chart and tabular form. As the differential in cost changes, the dispatchers adjust the interchange schedule setters. The Operating Committee is studying the economic feasibility of a pool dispatch center. In this connection it should be borne in mind that fuel costs and thermal efficiencies of the two systems are quite comparable; hence, incremental cost differentials are small. The benefits to be realized by automatic intercompany dispatch may not be large.

Interconnection Capacity

Michigan interconnection capacity enlargement and extension can be achieved in several ways, either with Ontario, or with Ohio-Indiana, or both. At the present time a new and expanded interconnection agreement between The Hydro-Electric Power Commission of Ontario and the Michigan companies is nearing completion, and this agreement will provide for a third circuit between Ontario and Michigan. Technical and economic evaluations of interconnections with others are being continuously pursued. Also, interconnection capacity between the Consumers and Edison systems is presently being increased by installation of a fourth circuit and by a major strengthening of one of the three existing ties. The successful conduct of these undertakings has been expedited by the Consumers-Detroit Edison Pooling Agreement, and would have been much more difficult under the former agreement.

Conclusion

In its two years of existence, the new pooling agreement has resulted in joint effort on an enlarged scale in many areas, particularly those of system engineering, planning and operation. Although more investigations are required to achieve joint decisions, each decision is more secure and attendant delays have not handicapped the outcome. Throughout the first two years, additional studies have brought factual assurance that the new agreement is beneficial to both companies and there is reassurance that anticipated substantial future benefits will be achieved.

Jan. 20, 1955

CONSUMERS POWER COMPANYCONTRACT FOR ELECTRIC SERVICE

AGREEMENT, made and entered into as of the 27th day of June, 1966, between CONSUMERS POWER COMPANY, a public utility corporation authorized to transact business in Michigan, and having its principal office therein at Jackson, Michigan, herein termed the Company, and the ALPENA POWER COMPANY, a public utility corporation authorized to transact business in Michigan, and having its principal office therein at Alpena, Michigan, herein termed the Customer.

WITNESSETH:

That, in consideration of the mutual agreements herein to be kept and performed by the parties hereto, it is agreed as follows:

1. ENERGY TO BE FURNISHED:

Subject to the terms and conditions hereof, the Customer agrees to purchase and accept from the Company, and the Company agrees to supply and sell to the Customer, electric energy as auxiliary or standby to the Customer's electric generating plants, which are used by the Customer to supply electric energy to its distribution system within its service area, but not in excess of 50,000 kilovolt-amperes, being the capacity reserved by the Company for the Customer's use. The Company will, at the written request of the Customer, made at least thirty (30) days in advance, permit an increase in such reserved capacity provided the Company has power available.

2. CHARACTER OF SERVICE:

The supply of electric energy to be furnished by the Company to the Customer shall be alternating current, three phase, 60 cycles per second, at approximately 138,000 volts.

3. POINT OF DELIVERY:

The point of delivery for all electric energy to be supplied hereunder shall be at the Customer's side of the Company's 138 kv metering installation located in the Company's and Customer's joint substation located adjacent to Four Mile Dam in Section 7, T31N, R8E, Alpena Township, Alpena County, Michigan.

4. METERING:

The Company shall furnish, install and maintain suitable and adequate meters and metering equipment for the measurement of maximum demands and kilowatt-hours delivered. Metering shall be at 138,000 volts at the point of delivery described in Section 3 hereof and two per cent (2%) shall be deducted from the meter readings thus obtained for billing purposes. The Customer shall provide a suitable location for the Company's metering equipment and afford

adequate protection to avoid damage thereto or any tampering or interference with such metering equipment. The Company shall have access to its said metering equipment by its proper representatives for the purpose of installing, replacing, removing, inspecting and maintaining such equipment. The Company shall periodically inspect and test its meters and keep them within accepted standards of accuracy. The Customer shall have access to and the right to participate in the inspection and testing of such meters by its proper representatives. The Customer shall also have the right to read any of said meters at all reasonable times. Said meters shall be tested annually by the Company, and if the Customer desires more frequent tests, it shall bear one-half of the expense thereof.

5. EQUIPMENT TO BE FURNISHED:

(a) By the Company:

In addition to its said meters and metering equipment, the Company shall furnish and maintain all transmission lines and other equipment for the delivery of energy to the point of delivery described in Section 3 hereof. The Company, its agents and employees, shall have full right and authority of ingress and egress at all times on and across the premises of the Customer for the purpose of constructing, operating, maintaining, replacing, relocating, repairing, moving and removing its said transmission lines and equipment. Said right of ingress and egress, however, shall not unreasonably interfere with the use of the premises of the Customer.

(b) By the Customer:

The Customer shall furnish and maintain, at its expense, all facilities and equipment required to control, regulate, transmit, distribute and utilize such energy beyond said point of delivery. The design, plans, specifications and installation of the Customer's 138 kv facilities and all equipment connected directly to said 138 kv facilities shall be subject to the inspection and approval of the Company. However, the Company shall have no legal obligation or responsibility with respect to the installation, repair, maintenance, replacement, relocation, removal, operation or adequacy of any facilities and equipment located beyond said point of delivery.

6. RATE:

The Customer agrees to pay for such electric energy delivered to it hereunder in accordance with the following rate, to-wit:

Capacity Charge:

\$1.80 per month per kva for the first 2200 kva of billing demand,

\$1.60 per month per kva for all over 2200 kva of billing demand.

Energy Charge:

.7¢ per kwh for the first 6,000,000 kwh used per month,
.6¢ per kwh for all over 6,000,000 kwh used per month.

Fuel Cost Adjustment Charge:

When the weighted average cost of all fuel in storage at the Company's interconnected electric generating stations, at the end of each of the three months immediately preceding the month covered by the Customer's bill, is more or less than 33.0 cents per million Btu, there shall be a corresponding increase or decrease of .0012 cent per kilowatt-hour in the charge for all kilowatt-hours included in such bill, for each full 0.1 cent per million Btu increase above or decrease below 33.0 cents per million Btu.

Minimum Charge:

The capacity charge included in the rate, but in no case less than \$50,000 per month.

Delayed Payment Charge:

Two per cent (2%) of the total monthly bill if not paid within twenty (20) days from date rendered.

Tax Clause:

Bills shall be increased within the limits of political subdivisions which levy special taxes, license fees or rentals against the Company's property, or its operation, or the production and/or sale of electric energy, to offset such special charges and thereby prevent other customers from being compelled to share such local increases. Bills shall also be increased to offset any new or increased specific tax or excise imposed by any governmental authority upon the Company's generation or sale of electric energy.

Determination of Maximum Demand:

The maximum demand or rate of use of electric energy for each month shall be the greatest average load in kilovolt-amperes during any fifteen-minute period of such month as registered by suitable instruments installed by the Company to make such determination.

Determination of Billing Demand:

The billing demand for each month shall be the maximum demand for such month but not less than 60% of the highest billing demand for the preceding eleven months, nor less than 18,000 kilovolt-amperes.

7. LOAD BALANCE AND USE OF SERVICE:

The Customer shall so arrange its circuits and operations as to avoid a current unbalance between the three phases of more than fifteen per cent (15%) between the high and low phases. The Customer and its customers shall so use

the service as not to disturb or interfere with the Company's service to its other customers. No type of electrically operated device which could cause objectionable operating conditions on the Company's system shall be attached by the Customer without the consent of the Company.

8. PARALLEL OPERATION:

It is intended that the Customer will operate its electric generating plants in parallel with the Company's system. The Customer agrees to install and properly maintain suitable approved appliances and devices and to provide sufficient trained personnel to protect its equipment and service and the equipment and service of the Company from injury or interruptions which might be caused by a flow of current from the Company's lines to the Customer's connections or from a flow of current from the Customer's plants to the Company's lines, and to assume any loss, liability or damage caused by a lack of such protection.

The electric measuring instruments from which information is taken for billing purposes will be equipped with ratchets or attachments to prevent a credit to the Customer for any current which its plants may generate and send back into the Company's lines.

9. CONNECTIONS WITH OTHERS:

It is agreed that the electric energy to be supplied by the Company to the Customer hereunder shall be used solely to meet a part of the requirements of the Customer in the operation of its electrical system located in the State of Michigan. It is further agreed that without the written consent of the Company, the Customer shall make no interconnection with any person, firm, corporation, government agency or other entity which might result in either party hereto becoming engaged, directly or indirectly, in the transmission or sale at wholesale of electric energy in interstate or foreign commerce. If the Customer makes such an interconnection without such written consent, the Company may, at its option, terminate this agreement forthwith by giving written notice of its intention so to do.

10. LIABILITY:

Except as to the capacity and minimum charges payable by the Customer, prescribed in said rate, neither party shall be liable to the other for damages for any act, omission or circumstance occasioned by or in consequence of any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, or by any other cause or causes beyond such party's control, including any curtailment, order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or by the making of necessary repairs upon the property or equipment of either party hereto.

Notwithstanding the provisions of the foregoing paragraph or any other provision of this agreement to the contrary, the Customer shall at all times assume all liability for, and shall indemnify and save the Company harmless from any and all damages, losses, claims, demands, suits, recoveries, costs and expenses for injury to or death of any person or persons whomsoever,

or for any loss, destruction of or damage to any property of third persons, firms, corporations, or other entities, arising out of or resulting from, either directly or indirectly, the Customer's facilities, or arising out of or resulting from, either directly or indirectly, the electric energy sold hereunder after it has been delivered by the Company to the Customer.

11. BILLING:

The Company shall render to the Customer, within a reasonable time after the first of each month, proper billing for electric energy furnished during the preceding month. Such accounts shall be paid by the Customer within twenty (20) days after date rendered.

12. RENEGOTIATION OF RATE:

Either party shall have the right to renegotiation of the rate to be charged by the Company, as described in Section 6 hereof, at the following times and under the following conditions:

(a) Either party shall have the right to renegotiation of said rate for any purpose on June 27, 1971, and at five-year intervals thereafter, hereinafter called the "regular renegotiation dates". The party desiring such renegotiation shall initiate the same by giving notice in writing to the other party at least ninety (90) days prior to a regular renegotiation date.

(b) Either party shall also have the right to renegotiation of said rate from time to time in the event the Company's Commercial and Industrial Primary Service Rate D, a copy of which is attached hereto for reference purposes, is hereafter modified by any future revision or amendment thereof, supplement thereto or substitution therefor which may be filed with and approved by the Michigan Public Service Commission, or in the event a customer of the Customer, guaranteeing minimum monthly billing demands of 7500 kw or more, elects to be served by the Customer at a rate equivalent to some other Company rate applicable to such service. The party desiring such renegotiation shall initiate the same by giving notice in writing to the other party within thirty (30) days following the date that such modification of said Rate D becomes effective, or within thirty (30) days following the date such customer of the Customer makes election as aforesaid. The purpose of such renegotiation shall be to adjust said rate as may be necessary to assure substantially the same rate of return to the Customer if it resells a substantial portion of the energy furnished hereunder at a rate equivalent to said Rate D after such modification, or such alternate rate as aforesaid, as it would have obtained if such energy were resold by the Customer at a rate equivalent to said Rate D prior to such modification of said Rate D or election of such alternate rate.

In the event that the parties cannot agree upon a rate as a result of such renegotiations within ninety (90) days following the written notice specified above in subparagraphs (a) and (b) of this Section 12, then the matter of the rate to be charged shall be referred to the Michigan Public Service Commission, or its successor, for determination by arbitration and the decision of the Commission shall be binding upon the parties hereto. In the

event that the Michigan Public Service Commission, or its successor, determines that it is without power or jurisdiction to act as arbitrator hereunder or if for any other reason it refuses to act as such arbitrator, then the matter of the rate to be charged shall be referred to a board of arbitrators to be selected by the parties as follows: each party shall, within ten (10) days following the refusal of the Michigan Public Service Commission, or its successor, to act, select an arbitrator and the two arbitrators so selected shall, within ten (10) days following their selection, select a third arbitrator to act with them. In the event either party fails to select an arbitrator within said ten (10) days, or in the event that the two arbitrators so selected are unable to agree upon a third arbitrator within said ten (10) days, then in any such event such arbitrator or arbitrators shall be appointed by the senior judge of the Circuit Court of Ingham County, Michigan. The decision of a majority of said arbitrators shall be binding upon the parties hereto. A judgment of the Circuit Court of Ingham County, Michigan, or of any other court of competent jurisdiction, may be rendered upon an award of the arbitrators made in accordance herewith. The rate so determined by renegotiation or arbitration shall be applicable to electric energy furnished hereunder from the beginning of the five-year period under negotiation (or from the date that a modification of said Rate D, or election of such alternate rate as aforesaid, became effective if the renegotiation resulted from such modification or election) until such time as either party shall obtain renegotiation of the rate as hereinbefore provided. In the event that neither party hereto notifies the other in the time specified above in subparagraphs (a) and (b) of this Section 12 of its desire to have renegotiation of the rate, the rate at that time in force shall continue in force until such time as either party shall obtain renegotiation of the rate as hereinbefore provided.

13. TERM:

This agreement shall be in effect for an initial term commencing on June 27, 1966 and ending at the close of the day on June 30, 1980, and from year to year thereafter until terminated by mutual consent or by either party giving the other at least thirty-six (36) months' written notice of its desire to terminate the same at the expiration of said initial term or at the expiration of any yearly period thereafter.

14. GOVERNMENTAL AUTHORITY:

This agreement is subject to valid laws, orders, rules and regulations of duly constituted authorities having jurisdiction.

15. SUCCESSORS AND ASSIGNS:

This agreement shall inure to the benefit of and be binding upon the successors and assigns of the respective parties hereto. This agreement shall not be transferred by the Customer or otherwise alienated without the Company's written consent.

16. CANCELLATION OF PREVIOUS CONTRACT:

This agreement supersedes and cancels, as of the effective date hereof, the agreement between the Company and the Customer with relation to the supply of electric energy dated July 10, 1959.

IN WITNESS WHEREOF, this agreement has been executed on behalf of each of said parties by their duly authorized officers on this 18th day of November, 1966, but to be effective as of June 27, 1966.

APPROVED AS TO FORM

256
CONSUMERS POWER COMPANY
LEGAL DEPARTMENT

CONSUMERS POWER COMPANY

By

[Signature]
Vice President

Attest

[Signature]
Secretary

ALPENA POWER COMPANY

By

[Signature]
President

Attest

[Signature]
Secretary

**COMMERCIAL AND INDUSTRIAL
PRIMARY SERVICE
(CONTRACT RATE "D")**

Availability:

Open to any customer desiring primary voltage service for Commercial or Industrial use where the billing demand is 50 kw or more.

Nature of Service:

Unregulated alternating current, 60 cycles, single phase or three phase, 2,400 nominal volts or more, except that where the line voltage exceeds 14,400 volts the Company may make one transformation to any standard supply voltage including those below 2,400 volts. The particular nature of the supply voltage in each case shall be determined by the Company.

Monthly Rate:

Capacity Charge:

\$2.55 per kw for the first 100 kw of billing demand,
\$1.70 per kw for the next 300 kw of billing demand,
\$1.45 per kw for the next 1,600 kw of billing demand,
\$1.30 per kw for the next 15,000 kw of billing demand,
\$1.20 per kw for all over 20,000 kw of billing demand.

Energy Charge:

1.05¢ per kwh for the first 50,000 kwh,
.90¢ per kwh for the next 180 kwh per kw of billing demand,
.75¢ per kwh for the next 1,000,000 kwh,
.68¢ per kwh for the next 15,000,000 kwh,
.60¢ per kwh for the excess.

Fuel Cost Adjustment:

When the weighted average cost of all fuel in storage at the Company's interconnected electric generating stations, at the end of each of the three months immediately preceding the month covered by the customer's bill, is more or less than 33.0 cents per million Btu, there shall be a corresponding increase or decrease of .0012 cent per kilowatt-hour in the charge for all kilowatt-hours included in such bill, for each full 0.1 cent per million Btu increase above or decrease below 33.0 cents per million Btu.

Tax Adjustments:

- (a) Bill, shall be increased within the limits of political subdivisions which levy special taxes, license fees or rentals against the Company's property, or its operation, or the production and/or sale of electric energy, to offset such special charges and thereby prevent other customers from being compelled to share such local increases.
- (b) Bills shall be increased to offset any new or increased specific tax or excise imposed by any governmental authority upon the Company's generation or sale of electrical energy.

Minimum Charge:

The capacity charge included in the rate.

Delayed Payment Charge:

A delayed payment charge of 2% of the total net bill shall be added to any bill which is not paid on or before the due date shown thereon.

(Continued on Sheet No. 14.01)

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RATE "D"

(Continued from Sheet No. 14.00)

Billing Demand:

1. The billing demand shall be the kilowatts (kw) supplied during the 15-minute period of maximum use in the billing month adjusted as specified below, but not less than 60% of the highest billing demand of the preceding 11 months, nor less than 50 kw.
2. When a customer guarantees in writing a billing demand of 2,500 kw or more for a minimum term of twelve consecutive months, the billing demand each month during the period of such guarantee shall be the average of the four maximum weekly demands for such month (the period after the first 21 days of each month being considered to be the fourth week); provided that no billing demand shall be less than 60% of the highest billing demand of the preceding 11 months, and in no case less than 2,500 kw.
3. When a customer agrees in writing to restrict his demands established during the months of November and February to 50%, and during the months of December and January to 30% of the highest billing demand of the preceding 11 months, the billing demands shall be determined as follows:
 - (a) For the months of November to February, inclusive, the billing demand shall be determined as provided under paragraph 1 or 2 above, whichever is applicable; except that there shall be no minimum billing demand.
 - (b) For the months of March to October, inclusive, the billing demand shall in all respects be the same as provided under paragraphs 1 and 2 above for regular nonseasonal customers.
 - (c) If, during any of the months of November to February, inclusive, a customer fails to restrict his demands as provided herein, one-half the excess over and above the restricted demand shall be added to the billing demand, as normally computed, to determine the billing demand for that particular month.

Adjustment for Off-Peak Hour Operation:

Demands created during off-peak hours designated by the Company shall be adjusted as provided in the Company's current "Schedule of Off-Peak Hours" (Sheets No. 7.00 and 7.01) filed with the Michigan Public Service Commission.

Adjustment for Power Factor:

This rate requires a determination of the average power factor maintained by the customer during the billing period. Such average power factor will be determined through metering of lagging kilovar-hours and kilowatt-hours during the billing period. The calculated ratio of lagging kilovar-hours to kilowatt-hours will then be converted to the average power factor for the billing period by using the appropriate conversion factor.

- (a) If the average power factor during the billing period is .850 or higher, the capacity charge will be reduced in accordance with the following table:

<u>Average Power Factor During the Billing Period</u>	<u>Capacity Charge Credit Allowed</u>
.849 and lower	None
.850 - .899	1%
.900 - .949	2%
.950 - 1.000	3%

(This power factor credit shall not in any case be used to reduce the prescribed minimum charge or the capacity charge when based upon 60% of the highest billing demand of the preceding 11 months.)

- (b) In those cases where the average power factor during the billing period falls below .800, the peak demand for billing will be increased by the ratio that .800 bears to the customer's average power factor during the billing period.

Term and Form of Contract:

Minimum term of one year on written contract.

(Continued on Sheet No. 14.02)

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RATE "D"

(Continued from Sheet No. 14.01)

Rules and Regulations:

Service governed by Company's Standard Rules and Regulations.

Where service is supplied at a nominal voltage of 14,400 or less, the customer shall furnish, install and maintain all necessary transforming, controlling and protective equipment.

Where the Company elects to measure the service at a nominal voltage above 14,400, 2% will be deducted, for billing purposes, from the demand and energy measurements thus made.

Where the Company elects to measure the service at a nominal voltage of less than 2,400, 3% will be added, for billing purposes, to the demand and energy measurements thus made.

Where service is supplied at a nominal voltage of more than 14,400 volts and the customer provides all of the necessary transforming, controlling and protective equipment for all the service, there shall be deducted from the capacity charge herein provided for, the sum of 10¢ per kw if the nominal supply voltage is 46,000 volts or less and 20¢ per kw if the nominal supply voltage is above 46,000 volts (after the 2% deduction or the 3% addition referred to above) for the highest demand created during the month or for the billing demand, whichever is greater.

Where service is supplied at a nominal voltage of more than 14,400 volts and the customer provides all of the necessary transforming, controlling and protective equipment for a part of the service, there shall be deducted from the capacity charge herein provided for, the sum of 10¢ per kw if the nominal supply voltage is 46,000 volts or less and 20¢ per kw if the nominal supply voltage is above 46,000 volts (after the 2% deduction or the 3% addition referred to above) for that part of the highest demand created during the month through such customer-owned equipment.

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