

File Power Capacitors
KENNEDY CAPACITOR (A)

Pricing in the Electrical Equipment Market

In the summer of 1964, Bill Moyers, marketing manager for power capacitors for the Kennedy Capacitor company, was considering a proposal to withdraw from the market. Kennedy's high-voltage power capacitor division had operated at a net loss since 1960. In 1963, the division lost \$630,000 on sales of \$4.2 million.

The principal problem was severe price competition which beset the industry. There were six firms: Kennedy, Lawford, Hamilton, AG, Stewart, and Austin, all bidding for public and private electric power utility business. Since 1960, Kennedy had adopted several pricing policies, under the titles of "book price policy," "controlled opportunistic pricing," and "selective price policy," all of which were judged unsatisfactory. Early in 1964, Kennedy had attempted to relinquish what it viewed as its role as industry price leader, but in the opinion of most Kennedy managers, this move had been a resounding failure.

Moyers had been named marketing manager for power capacitors in 1963. At that time, the general manager of the company had laid down three objectives for Moyers to fulfill:

1. To obtain more profitable price levels for Kennedy.
2. To restore Kennedy's historical market share.
3. To obtain more stable prices.

Moyers did not believe he had been successful in achieving these objectives.

In the spring of 1964, a series of bids at the Southern Valley Authority (SVA), a large electrical power utility, culminated in one of Kennedy's largest competitors, Lawford Electric, quoting the lowest industry price on record (the equivalent of 98 cents per kilovar - the standard engineering measure of capacitor size). With this bid, Lawford won the second of SVA's 1964 orders for power capacitors. Together with the first SVA order, which it also won, Lawford had now booked \$355,000 worth of business with SVA for 1964.

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An immediate decision facing Bill Moyers was what price to bid for a third capacitor order which SVA had just announced, with a bid date of August 5, 1964. If this competition resulted in still lower prices, Moyers was convinced there was little future for Kennedy Capacitor in this market.

The Kennedy Capacitor Company

The Kennedy Capacitor company, with annual sales in the \$100 million range, and profits after tax equal to 5.3% of sales and 14.4% of net worth, manufactured and marketed a broad line of electrical equipment for power generation and transmission. Within the company, there were separate divisions for transformers, power capacitors, and switchgear. In recent years, profits had been squeezed in all three operating divisions. To counteract this, Kennedy managers were actively seeking new product opportunities through internal research and development. Increasingly, Kennedy participated in government contracts for NASA and the Department of Defense.

Description of Power Capacitors

Power capacitors were one of the simplest of electrical devices. Made from metal foil and paper insulation, assembled in a metal box and impregnated with insulating oil, a power capacitor had no moving parts and consumed almost no power. The capacity of the device was measured in kilovars (KVAR).

Utilities employed power capacitors to increase the efficiency of electrical power transmission through raising the "power factor" of distribution systems. Some modern distribution systems were designed at the outset for "100% power factor" operation; that is, for the maximum efficiency available through the use of capacitors.¹

Electrical utilities purchased power capacitors for pole-top installation (as shown in Exhibit 1) or for substation installation (as shown in Exhibit 2).

¹In a-c power systems, there is a tendency for voltage and current to be out-of-step, or out-of-phase. When this condition occurs, more current than is necessary passes through the circuit, leading to power losses and unduly heavy loading of the circuit. When voltage and current are exactly in phase, on the other hand, power losses and loading of the circuit are minimized, and the power factor of the system is said to be 100% or unity. Systems which operate at less than 100% power factor can be restored to unity power factor through adding capacitors to the circuit.

The Economic Benefits of Capacitor Installation

Electrical utilities derived three principal benefits from installing capacitors:

1. The voltage drop on distribution feeders was reduced permitting more load to be served without adding new feeder lines.
2. Overload conditions were relieved, postponed, or eliminated on substation transformers and other KVA-rated equipment.
3. Improved power factors could reduce the cost of power for distribution utilities which were charged for power on the basis of peak KVA demand.

Exhibit 3 contains information on the cost and value of typical capacitor installations in electrical utilities. As a rule-of-thumb, Kennedy marketing managers estimated that 50% of a utility's installed total cost of capacitors was due to the equipment itself; the remaining 50% was due to installation work.

The Customers for High-Voltage Power Capacitors

All 5,000 electrical utilities in the United States were potential power capacitor customers. About 1,000 of them purchased capacitors in a typical year. Of these, approximately 500 placed orders with Kennedy. The average order size was slightly under \$10,000.

Typically, an electrical utility placed its orders for power capacitors once a year, frequently splitting the business among two or three suppliers. Capacitors were commonly regarded as a "hardware" item, handled through regular purchasing channels. Capacitor purchases were frequently given low priority until more urgent capital investments had been made.

For large-scale projects, consulting engineers, such as Stone & Webster, or EBASCO, occasionally made decisions concerning sources of supply. Communications among key engineers and purchasing agents in the industry were particularly well developed. Pricing and product information was quickly shared.

Kennedy sales engineers called upon the large public utilities and attempted to persuade them to write technical specifications which favored Kennedy capacitors. However, many customers were convinced that all capacitors were alike.

There were three types of customers in the utility market: public agencies, private utilities, and the municipals and REA's (Rural Electrification Agencies). They were described by Kennedy's marketing manager as follows:

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"Public Agencies (such as the TVA) represent 10% to 15% of industry sales. In each agency, annually, the systems planning group puts together its total capacitor requirement for the year, which is then broken down into specific sizes by the distribution engineers and the transmission engineers. Then the purchasing agent or buyer writes to us, sending a copy of his technical specification and asking for a sealed bid. At 12:00 noon on the designated day all of the sales representatives assemble to learn the results. The bids are opened and read out (later they are published) and the low bidder wins. The theory is that it is just a matter of looking at the price, because the technical specs are very tightly written.

"In the past the public agencies had the reputation of being price buyers, but there has been an increasing tendency to disallow bids on engineering grounds.

"Private Utilities (such as Consolidated Edison in New York) represent 70% to 80% of industry sales. There are two types. One type puts out a well-written spec for their annual requirements, announces bids are due on a set date, and doesn't allow you to revise your price once it's in. Delivery is spaced out over the year.

"The other type of private utility (in the minority, but including some very big ones) is very leaky about competitor's prices. They may sign an open commitment with you for one year's supply at a certain price, but that is conditional upon your matching competitive prices during the year. It is really just a promise to give you "last look" at a competitor's price.

"In actual practice, the wheelers and dealers tend to get a lower price. They watch the public tenders very closely, and are very offended if they do not get the lowest price.

"Municipals and REA's are the little guys, representing 10% to 15% of industry sales. Typically they don't plan ahead; they wait until the last minute before mailing out bid requests, they don't mail them to everybody - they stick with the old-line suppliers - and they want delivery immediately. Frequently, they end up paying a higher price."

"Kennedy Capacitor's market share was highest on orders placed by the private utilities, and the municipals and REA's. Kennedy prices were usually higher than competitor's in sealed bidding for public agency orders.

Growth of Installed Power Capacitors

As Exhibit 4 shows, the number of installed power capacitors in the United States experienced a remarkable growth between 1930 and 1953. As a result of lower capacitor prices and product improvements, utilities added large numbers of capacitors to their systems, bringing system power factors from below 90 in the 1940s toward the middle 90s by 1964. Several large utilities (notably, Pacific Gas & Electric Company) were leading the way to unity (100%) power factor operation in the summer of 1964.

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Supply and Demand Conditions: 1951 to 1963

Total industry shipments of power capacitors peaked in 1955-1956, and then slumped, as indicated by the following data:

	<u>Total Industry Shipments</u>	
	<u>Kilovars</u>	<u>Value*</u>
1951	3.1 million	\$15.5 million
1952	3.9	19.9
1953	3.8	18.8
1954	3.5	15.8
1955	4.9	21.3
1956	6.0	18.2
1957	5.8	15.9
1958	4.5	11.7
1959	4.5	12.9
1960	5.2	15.2
1961	5.7	14.4
1962	5.9	13.0
1963	6.2	12.1

*Approximately one-quarter of this dollar figure is the value of associated rack equipment, switches and controls. The balance is the value of capacitors alone.

Source: NEMA data.

Manufacturing capacity was plentiful in the industry. The supply capability of each competitor, as estimated by Kennedy engineers, is plotted on Exhibit 5, together with industry shipments.

Market Shares, by Company

Prior to World War II only two companies, Kennedy Capacitor and Lawford Electric, were in the high-voltage power capacitor business.

By 1957, the total capacitor business was split among six active suppliers: Kennedy Capacitor, Lawford Electric, Hamilton Corporation, AG, Stewart, and Austin. Three other suppliers, Lone Star, Roberts, and Dean, were not actively seeking business with a competitive pricing policy, although they did submit bids from time to time.

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Between 1957 and 1964, market shares varied as follows:

Estimated Market Shares: 1957 to 1964
(based on Kilovars shipped)

	<u>Kennedy Capacitor</u>	<u>Lawford Electric</u>	<u>Hamilton Corp.</u>	<u>AG</u>	<u>Stewart</u>	<u>Austin</u>	<u>Total</u>
1957	48%	13%	25%	1%	12%	1%	100%
1958	45	10	19	9	12	5	100
1959	39	18	16	10	7	10	100
1960	34	25	18	11	3	9	100
1961	30	27	18	10	10	5	100
1962	36	30	12	3	9	9	100
1963	36	28	16	7	7	6	100
1964 (4 mos.)	27	32	19	16	3	3	100

Characteristics of Individual Firms

Kennedy Capacitor, which started its power capacitor division in 1932, was the recognized technological leader in the industry, having pioneered most of the product advances, such as improved dielectric (insulating) materials and more stable insulating fluids. Several competitors paid royalties to Kennedy for the use of patents. Kennedy tended to be conservative in its designs, building a wide safety margin into its capacitors.

Lawford Electric was a large, diversified manufacturer of consumer, defense, and industrial products with sales in excess of \$100 million per year. Lawford had supplied capacitors to utilities for 25 years, and was regarded as a high-quality manufacturer. Recently, however, it had introduced a lower priced, lower quality line of capacitors.

The following competitors each had sales in the \$50 to \$100 million range:

Hamilton Corporation was a supplier of electrical transmission and distribution equipment. New management had taken over Hamilton's capacitor department in 1960, instituting a change in policy. Hamilton brought out a cheaper, lower priced product, and aggressively sought an increase in market share, apparently without regard to cost.

Stewart, a growing company in the electronics business, entered the power capacitor business in 1959 when it acquired Furness Electric. Furness had been founded in 1946 by a brilliant engineer, but had twice previously gone out of business. Reputedly, Stewart obtained the assets of Furness Electric for 10¢ on the dollar. Stewart operated its capacitor business on a seasonal basis, soliciting orders only during the peak-buying season of November to January, often at very low prices.

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Austin was a manufacturing company owned 50-50 by two parent corporations which performed all engineering and marketing: Valenti Electric and the Bird Corporation. Valenti used Austin's manufacturing capability to foster its own image of being a full-line utility equipment supplier, but did not aggressively seek capacitor orders with competitive prices. The Bird Corporation, on the other hand, was aggressively marketing Austin-manufactured capacitors of a radically different (and controversial) design.

AG was principally a supplier of electric motors and radar components. In recent years, AG had shown operating losses as a result of weaknesses in its capacitor department, according to annual reports of the company.

Trends in Prices, Manufacturing Costs, and Profits

As shown in Exhibit 6, the average industry selling price, above \$16 per kilovar in 1930, had dropped to less than \$2 per kilovar by the end of 1960.

Kennedy's average selling price followed the industry trend downward. Through an energetic cost-reduction program, Kennedy's direct manufacturing costs (labor, materials, and other variable expenses - mostly scrap losses) were also reduced, but not as rapidly as selling prices:

	<u>Direct Manufac- turing Costs</u>	<u>Contribution to Other Expenses and Profits</u>
	55% of sales	45% of sales
1957	52	48
1958	46	54
1959	30	50
1960	53	47
1961	56	44
1962	67	33
1963		

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Kennedy's high-voltage capacitor business operated at a net loss after 1960. The earnings statement for 1963 was:

1963 Profit and Loss Statement
High-Voltage Power Capacitors Division

	<u>\$ Thousands</u>	<u>%</u>
Sales: Capacitors	\$3,010	72%
Racks and other equipment	1,190	28
Total	<u>\$4,200</u>	<u>100%</u>
Materials	\$2,100	50
Direct labor	210	5
Scrap, etc.	504	12
Total direct costs	<u>\$2,814</u>	<u>67%</u>
Manufacturing overhead	\$ 504	12
Engineering	210	5
Marketing	630	15
General & administrative	672	16
Total indirect costs	<u>\$2,016</u>	<u>48%</u>
Net profit before taxes	(630)	(15)

For 1964, Kennedy had budgeted total sales of \$4.7 million (including \$3.4 million of capacitors and \$1.3 million of other equipment) and a reduction of net losses before taxes to \$430,000.

Kennedy did not keep a separate balance sheet for its power capacitor business, but the company over all had an investment of \$214 in net working capital and \$141 in plant and equipment, for every \$1,000 in annual sales. Kennedy's plant manager reported that if Kennedy withdrew from the high-voltage power capacitor business, there would be no reduction in total manufacturing overhead. He believed some of the senior labor force could be reassigned to other tasks, but there would be inevitable layoffs.

Using salesmen's reports and published bid data, Kennedy's business research department carefully tallied all orders over \$5,000 which were placed with Kennedy, or with individual competitors, and summarized this information monthly for Kennedy's marketing manager. A summary for 1958 to 1963 is shown as Exhibit 7.

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The Kennedy Sales Organization

Kennedy employed a sales force of 50 experienced electrical and mechanical engineers, at a cost of approximately \$35,000 per man (\$12,000 for salary and bonus, \$12,000 for office support, and \$11,000 for overhead). These men worked from 10 district offices, selling the full product line.

Concerning pricing authority, the Kennedy marketing manager stated: "Our sales engineers don't have any! Otherwise, our salesmen will spend an awful lot of time trying to find out competitor's prices, and trying to get the factory to lower its price. When our salesmen are convinced our prices are firm, they will try to sell regardless of price."

Price Policy in the 1950s: The "White Sale"

In the 1950s, the utility market for power capacitors experienced periods of severe price instability, starting with the renowned "White Sale" in late 1955 and early 1956. The White Sale was several months of unprecedented price competition in the heavy electrical equipment market (power transformers and generators), which gradually spread to smaller equipment, such as power capacitors.

"This product (capacitors) wasn't really mixed up in the White Sale," one Kennedy engineer recalled, ". . . it got dragged in by accident. Everything got to be sold as a package. Single deals were made for all the equipment for new stations still on the drawing boards, and for some not even dreamed of yet, at prices up to 40% off book (list) prices. Somewhere, somebody wrapped in power capacitors along with everything else.

"We booked two years of business all at once," this engineer recalled. "The major suppliers clubbed each other over the head. The big utilities . . . and construction companies . . . bought ahead (with no cancellation penalties) for projects they didn't even have! The aftermath was a bunch of commitments, some of which materialized as actual orders and some of which did not."

In 1956, the major utilities placed orders based upon their White Sale commitments. Thus, only about one-half of the "available" (available business) came up for bid in 1956. (The effects of the White Sale lingered for some time; one Kennedy salesman reported 10 years later that a small utility could not buy any capacitors because it still had some left over from the White Sale.)

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Price Lists Become Meaningless: 1956-1959

During the 1950s it was Kennedy's policy to publish a "book price," as shown on price sheets distributed to salesmen and customers, and to quote specific jobs at some current multiple of book price: e.g., "ten per cent off book." By the latter part of 1959, "chaos and market deterioration prevailed," according to one Kennedy manager, and list prices became meaningless.

Early in 1959, Kennedy's marketing managers decided to undertake a broad effort to slow down the price erosion, bring market stability, and, if these two objectives were accomplished, to try to lead market prices to a level which would again permit profitable operations.

The "Book-Price Policy": March 1960 to April 1962

After considering several alternatives, the Kennedy managers adopted on March 7, 1960, a "Book-Price Policy," which was described to Kennedy sales engineers in a letter as follows:

We have had to make several adjustments recently in our published prices. Our pricing policy is as follows:

1. To quote all electric utilities our published prices. There are no exceptions.
2. To make adjustments in our published prices to keep them competitive with the market level.
3. To reduce the prices of unbilled shipments to our new published prices if reductions in book-price levels are made.

We believe this policy to be very realistic and fair. All customers can have confidence that they will receive the same quoted price from us and they will all receive the benefits in their billing of any reduction in the market price.

We want each of you to communicate all changes in capacitor market conditions to us promptly and accurately. Our ability to adjust our published prices to the market level quickly and to keep you competitive depends upon you.

Kennedy managers planned to initiate price increases, or follow the price increases of others, once market stability had been demonstrated on several significant jobs. Orders already on the books would be "protected" from any price increase for 90 days (later, 180 days). Price changes would be telegraphed to the salesmen and announced in the press, 48 hours before they took effect.

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Kennedy merchandised the Book-Price Policy to its customers, with a booklet and presentation telling them this was "A Pricing Policy Which Offers You Fairness, Consistency, and Simplicity, in addition to better R&D and better products."

Between March 1960 and April 1962, Kennedy announced 28 changes in book price: 22 reductions and 6 increases. The market price of capacitors fluctuated widely, but average prices continued their downward trend. For only short periods did competitors quote prices in line with Kennedy's published book prices.

Kennedy's share of the available orders fluctuated widely. When competitors were quoting below Kennedy, even by as little as 1%, Kennedy received very little business. When competitors were quoting at Kennedy's published level, Kennedy received most of the business and some competitors received none.

When Kennedy reduced its book price to the market level, price cutting by competition would cease for a brief period. If prices were kept too long at the new level, price cutting would recommence. During the second year of the Book-Price Policy, Kennedy managers adopted the strategy of raising book prices slightly after Kennedy's share had climbed, in order to discourage price cutting.

Kennedy managers discovered that announcing an increase in book prices by even a small amount - 3% or 4% - would drive in large amounts of business. Customers apparently believed the announcement presaged a general long-term advance of the market price. Kennedy's own sales engineers used the impending price increase as a means to pull in orders.

To cut down this advance buying, Kennedy managers experimented with "sudden death" price increases; i.e., price increases which went into effect without a 24-hour notice. This approach fostered customer and sales engineer ill will. Many orders were predated before they were mailed in.

With the influx of orders immediately preceding each price increase, Kennedy apparently secured a high percentage of the available business. However, Kennedy later found out that many of these "orders" were not in fact firm orders. There were no penalties for cancellation of orders in the industry.

On very large jobs, Kennedy's market share suffered as a result of the policy of adhering to book prices. Kennedy was frequently underbid by only 1% or 2%. To avoid being "sitting ducks," Kennedy managers on three occasions timed their reductions in book prices to coincide with the opening of large sealed bids to public power authorities. For only one bid did this strategy result in Kennedy getting the order.

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Review of Book-Price Policy

In the autumn of 1962, Kennedy managers reached the following conclusions on their Book-Price Policy:

On the favorable side, this policy concentrates on product, quality and service selling, rather than price selling; it assures all customers of equal price treatment; and it has brought a relative degree of price stability to the market, since ups and downs have been within a $\pm 10\%$ range. On the negative side, large customers dislike receiving treatment identical with that given to small customers; Kennedy has not been able to negotiate or capitalize on "second look" opportunities; Kennedy's market share has declined; the policy is expensive to administer; and the competition has selectively picked off the most profitable jobs.

Kennedy managers looked for ways to improve upon the Book-Price Policy. There appeared to be a clue in the fact that prices stayed within 10% of Kennedy's published book price. This suggested that Kennedy might be able to price flexibly within 6% of its own book price.

"Controlled Opportunistic Pricing": May 1962

In May 1962, a "Controlled Opportunistic Policy" was adopted. This policy was defined as follows:

1. Publish book prices.
2. Maximum price cut to be 6% below book price.
3. In any given month, the total business quoted will not exceed 3% below book price, on the average.
4. Book price will not be adjusted during the month.
5. Orders already booked will not be adjusted in price.
6. If Kennedy's share of the available business increases 5% or more, raise book price 3% to 5%.
7. If share of available business declines 5% or more, lower book price consistent with market information.

Kennedy managers believed this new policy "would allow greater flexibility in the use of price to control Kennedy's market share; that it would permit greater selectivity in securing the more desirable jobs; and that it would permit Kennedy to meet competitive prices, as long as they were within 6% of book prices." They foresaw certain negative aspects to the new policy: "It might speed the downward trend in market prices; it would make Kennedy's actions predictable to competitors; and it would reduce the stature of Kennedy's book price."

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The new policy was inaugurated on May 1, 1962. At the same time, Kennedy increased its published prices 5% across the board, "to give us room to start operating within the 6% range without reducing the market level." A list of criteria was developed to determine where, within the 6% range, Kennedy would quote each job.

A Kennedy manager later observed, "We came out of the controlled portion (i.e., the 6% range) of our opportunistic pricing policy very fast!"

"Selective Pricing Policy": June 1962 to October 1963

By the end of May 1962, Kennedy managers observed that the 6% range was not sufficiently wide to allow Kennedy to secure a reasonable share of the larger jobs, particularly those over \$100,000. They therefore adopted a new pricing policy, which they designated "Selective Pricing," the key modifications in policy reading as follows:

1. Kennedy would meet competitive prices in the event a conclusive reading was obtained on the prices offered by competition.
2. Sales engineers would be given authority to negotiate within the 6% range.
3. Sealed bids in excess of \$100,000 would be quoted outside the 6% limit if necessary.

The objective of the Selective Pricing Policy, as explained in a letter to all sales engineers, was to enable Kennedy to select orders which provided: the most attractive margins, balanced factory loads, and a minimum of extra engineering and drafting, while maintaining market position and meeting sales budgets.

One Kennedy manager observed, "We told the salesmen, find out competitive prices and if you can get the job at that price we'll meet it. The result was that prices went all to hell. Kennedy got the less profitable big jobs, and competitors took all the small jobs."

For the 13-week period ending October 7, 1962, the business research department reported that price cutting actions (average % cut off book price) were as follows in the under \$100,000 category:

Manufacturer	Size of Job Category (\$ thousands)						Total Jobs	
	\$5 to \$15	\$15 to \$30	\$30 to \$100	Under \$100,000				
	Sales %Cut	Sales %Cut	Sales %Cut	Sales %Cut				
Kennedy	\$ 66 3.5%	\$21 7.6%	\$121 13.0%	\$208 10.5%				
Lawford	14 6.0	13 12.0	83 6.0	110 6.0				
Stewart	10 22.0	36 20.5	134 16.5	180 17.0				
Hamilton	22 9.0	-	52 6.0	74 8.0				
AG	15 3.8	-	-	15 3.8				
Austin	-	-	42 4.8	42 4.8				
TOTAL	\$127	\$70	\$432	\$629 10.2%				

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Late in October 1962, Kennedy managers decided to widen the pricing range for smaller jobs, using the following unpublicized formula:

1. On jobs \$5,000 and smaller, quote book.
2. On jobs \$5,001 to \$19,999 quote book less 10%.
3. On jobs \$20,000 to \$49,999, quote book less 15%.
4. On jobs over \$50,000, quote to match the market level.

During the latter part of December 1962, Lawford Electric sharply increased its share of the market, predominantly by quoting lower prices in the over \$100,000 category.

The Year-End Review: December 1962

For the year 1962, Kennedy's market share for all jobs was 36%, lower than the budgeted 40%, but higher than the 30% achieved in 1961. Most of this gain had come in the large jobs at less attractive prices.

Kennedy managers observed that under the Selective Pricing Policy the average market price level had declined to approximately \$1.40 per KVAR. Kennedy's earnings had suffered badly.

Kennedy managers met once again to consider appropriate action to retard the decline of market prices. At a round-table meeting these possibilities were suggested:

1. Raise book prices 5% and then discount them to the price levels which prevail in current market. It was thought that this would focus attention on prices, and provide a higher level to discount from.
2. Raise book prices 5% and announce the use of volume discounts. This would formalize the quantity discounts which big utilities now gained through sharp competitive bargaining. However, Kennedy managers did not know whether they could obtain legal approval for such a move.
3. Temporarily quote existing book prices only on all jobs, regardless of size. It was believed that this would likely raise market price levels several months hence.
4. Return to the former Book-Price Policy.
5. Abandon book prices and price on the basis of direct costs.
6. Adopt a commodity futures approach, i.e., Kennedy would hold a monthly auction of its future plant capacity, accepting the most attractive bid from the utilities.

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Kennedy managers finally decided to announce a 4.9% increase in book prices. This new level would be quoted at first on only a few jobs, preferably the smaller sealed-bid jobs. If Kennedy observed higher prices being quoted by other manufacturers, then it would quote higher prices too.

Pricing During 1963

Prices continued to decline sharply throughout 1963. At certain times, one or more manufacturers (e.g., Hamilton and AG) withdrew from the market, according to Kennedy managers, by consistently quoting prices which were substantially above the market level. Hamilton subsequently re-entered the market with competitive prices.

With the price decline came a narrowing of the price differential between large and small jobs, as a result of pricing initiatives by Stewart and Austin on smaller orders.

In April 1963, AG re-entered the market with a redesigned line of units. AG's apparent determination to obtain a substantial volume of business in a relatively short period of time contributed to a sharp industry price drop.

In mid-1963, Kennedy managers decided to merchandise the need for higher prices among key utility customers with a flip-chart presentation, the keynote of which was, "You can buy value, you can buy price, but you can't buy both." One Kennedy manager recalled, "It was a heart-rending story, but it didn't impress anybody."

Concern Over Product Quality

Kennedy managers were concerned that the cost-price squeeze had forced several manufacturers to introduce new, lower cost capacitor designs which, in Kennedy's judgment, represented marginal or unacceptable life expectancy compared to the expectation of utility customers.

Kennedy held a series of meetings with key utility customers in all districts "to present Kennedy's design philosophy in detail, and to determine if this approach was reasonable and acceptable."

Kennedy's design philosophy, as presented, took into account the effects of increased dielectric stress¹ and temperature on the life expectancy of high-voltage capacitors. This relationship had been measured through tests

¹Dielectric stress is measured in volts per mil of insulation thickness. The greater the stress, the greater the risk of insulation failure.

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upon hundreds of samples over a period of seven years, at widely different stresses and temperatures. When applied to the competitors' products, these life data suggested the following discounted cost of capacitors, plus replacements over a 25-year period, as a percentage of original costs:¹

Index of Total Cost Over 25 Years (Initial Cost=100)

Kennedy	105
AG	107
Hamilton	109
Austin	131
Lawford	158
Stewart	158

This information was given to Kennedy's sales engineers with instructions that it was "for use only in such ways as to demonstrate the superiority of Kennedy equipment." It was "not to be used to discredit competitive equipment." Customers were to be informed that Kennedy would not lower its product quality.

The results of Kennedy's quality information program were encouraging. Many major utilities tightened up their specifications to include maximum permissible dielectric stress and temperature values, thus favoring Kennedy.

Competitors responded by extending the warranty period on their equipment. In June 1963 the Shreveport Public Service managed to obtain offers of extended warranties from four suppliers, with Kennedy and Hamilton abstaining. Later, Lawford offered extended warranties to customers in the New York area. Kennedy managers wondered whether they should announce extended warranties on all jobs, since the extended warranty was likely to sweep the industry.

Kennedy Decision to Withdraw Price Lists

In the autumn of 1963, Kennedy marketing managers decided they should relinquish what they viewed as their role of industry price leader. They judged that if another supplier in the power capacitor market took over price leadership, the chances for price stability would be improved.

First, a last attempt was made to exert strong price leadership. A new published price list was announced by Kennedy, effective November 11, 1963. These prices (\$1.56 per KVAR) were approximately 10% above the market price level, but represented a 20% decrease from Kennedy's previous book prices. At the same time, Kennedy announced that it would quote only published prices.

¹Using a 6% present worth discount factor.

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Seeing no market response by competitors, Kennedy issued the following trade press release:

FOR IMMEDIATE RELEASE

December 4 - The Kennedy Capacitor Company announced that effective immediately the published prices covering Kennedy's high-voltage power capacitors are to be used for estimating purposes only. This, in effect, withdraws the price increase announcement of July 9, and Kennedy's published prices which became effective on November 11, 1963.

The general manager of Kennedy Capacitor Company stated that it has become evident since the price increase announcement of July 9 that competitive activity has caused Kennedy's published power capacitor prices to become out of line with the market.

He went on to say that he believes the recently published prices are realistic and fair for high-quality products, and that he hopes that the market will strengthen within a reasonable period. In the meantime, Kennedy plans to remain fully competitive with other quality suppliers.

Kennedy managers believed (subsequently) that Lawford tried to take over the role of price leader. They pointed out that Lawford, on January 2, 1964, published prices essentially the same (\$1.56 per KVAR) as those which Kennedy had withdrawn on December 4.

However, Kennedy managers did not become aware of Lawford's move until February 17, when a Kennedy sales engineer picked up a copy of the new Lawford price list from a customer. Meanwhile, market prices remained low, sliding below \$1.30 per KVAR.

Encouraged by the Lawford price announcement, Kennedy managers moved quickly to announce new published prices, effective March 2, 1964. The new prices, \$1.40 per KVAR, were lower than the Lawford published prices (to meet interim price cutting by AG), but above the market level.

One day prior to Kennedy's announcement, but unknown to Kennedy, Stewart Company announced new published prices which were even lower (\$1.34 per KVAR) than those about to be announced by Kennedy. This, in turn, was followed by a Lawford price announcement of \$1.25 per KVAR (the lowest published price on record) effective March 12, 1964. Kennedy managers re-issued their price lists, lining them up with the \$1.25 price announced by Lawford, and making them effective March 26, 1964.

The Southern Valley Authority Bids

March 19, 1964, was the closing date for bids for two large capacitor banks for the Southern Valley Authority (SVA), a public agency with large annual capacitor requirements. SVA announced it would receive tenders for its 1964 requirements in two parts, "Stage I" and "Stage II":

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	<u>Closing Date for Bids</u>	<u>Award Announced</u>	<u>Requirement</u>
Stage I	March 19	April 9	Two 12,000-KVAR banks Ten 100-KVAR spare units
Stage II	May 12	May 20	Twenty-four 12,000 KVAR banks One-hundred 100-KVAR spare units

SVA had tightened their specifications, requiring a prebid qualification test which only Kennedy and Lawford Electric had passed. Therefore, only these two companies were competing for Stage I.

In formulating a bidding strategy for both parts of the SVA order, Kennedy managers took into account the fact that (without SVA) their market share for the first four months of 1964 would probably be 27%, considerably less than the budgeted 36% for the full year. The "orders booked" situation was estimated to be as follows, disregarding the SVA order:

Orders Booked (without SVA)*
((\$000))

	<u>First 3 mos. 1964</u>	<u>Probable April 1964</u>	<u>Total 4 mos. 1964</u>	<u>Kennedy Budget & Industry Forecast for 1964*</u>
Kennedy	\$ 960	\$ 150	\$1,110	\$3,400
Others	<u>2,640</u>	<u>350</u>	<u>2,990</u>	<u>6,100</u>
Total				
Industry	\$3,600	\$ 500	\$4,100	\$9,500
% Share				
Kennedy	26.5%	30%	27%	36%

*Budget and industry forecast for capacitors alone, excluding rack equipment, switches, and controls.

Kennedy's market analyst estimated that if Kennedy obtained both parts of the SVA order it could probably have \$1,735,000 on the books for the first five months of 1964, and could probably meet its sales budget for the year. Without SVA, it appeared likely Kennedy would need an unrealistically large share in the remaining seven months to reach its 1964 sales budget.

	<u>Orders Booked: May 1964 (\$000)</u>	
	<u>Kennedy Wins SVA</u>	<u>Kennedy Loses SVA</u>
Kennedy	\$ 625	\$ 250
Others	<u>500</u>	<u>875</u>
Total Industry	\$1,125	\$1,125

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There was also speculation concerning probable price levels which might prevail, and the impact on operating profits. Bill Moyers judged that average prices would be driven down to \$1.05 to \$1.10 per KVAR for the remainder of the year if Kennedy aggressively bid for the SVA order. If Kennedy adopted a "firm price" approach, if it did not bid aggressively for SVA, he expected that prices would possibly stay at \$1.20 per KVAR for the remainder of the year.

Kennedy's Stage I Bid

It was finally agreed to price "on the gold standard" (i.e., the current book price of \$1.25 per KVAR) for the first round bidding on March 19, 1964. Kennedy managers would then watch market behavior closely before deciding on a final bid price for the second round (Stage II).

The results of the first round (Stage I) bidding were:

	Kennedy	Lawford
Two 24,000 KVAR banks	\$31,015.92	\$30,888.60
	each	each
Ten 100-KVAR spare units	\$125 each	\$125 each

Lawford had shaved the price of certain auxiliary items to arrive at its winning bid (miniature price cuts had always been a favorite Lawford tactic).

Kennedy's Stage II Bid

For the second round (Stage II) bidding, four suppliers were qualified. The specified units were identical to those in the first round of bids.

During April 1964, price cutting was the general rule in the market. Fearing the impact of aggressive pricing action upon an already unstable market, certain Kennedy managers argued in favor of passing up the Stage II bidding. Others, however, were nervous about Kennedy's loss of market share. One manager expressed concern over the possibility that market prices might become too stable - leading to identical Stage II bids from all manufacturers, which Kennedy's lawyers thought would be unfortunate. On April 23, Kennedy announced to its sales engineers that "henceforth we are going to be flexible in our approach to bidding."

For SVA (Stage II) Kennedy managers quoted the equivalent of \$1.04 per KVAR, to be absolutely sure of winning the job. Lawford quoted the equivalent of \$0.98 per KVAR and won the order:

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	<u>Stage II Bid</u>	<u>Equivalent \$/KVAR</u>
Hamilton	\$382,000	\$1.28
Kennedy	309,920	1.04
AG	304,485	1.02
Lawford	292,040	0.98

Subsequent Activities

Since there was a substantial amount of private utility business pending, Kennedy reacted promptly to the Lawford 98-cent bid, offering to accept business at 98 cents per KVAR for any requirements on which customers would accept delivery prior to May 1965. Between May 19 and 22, 1964, 19 Kennedy sales engineers were telephoned and asked to take this offer first to those customers where the chance of immediate acceptance would be good, and the chance of an early leak to competition negligible.

By May 26, however, Lawford managers had apparently learned of the offer, since they telegraphed all major utilities, stating their capacitor prices had been withdrawn for review, and urging customers not to make long-term commitments.

By the end of June, 44 utilities had been approached with this offer, of which 15 made commitments with Kennedy, 4 with Lawford, and 2 with AG. Total business placed on this basis was estimated to be as follows:

Kennedy	\$ 760,000
Lawford	500,000
AG	220,000
Others	40,000
Total	\$1,520,000

Including these special utility orders, a total of \$6.89 million of capacitor orders had been booked by the industry for the first six months of 1964.

Southern Valley Authority: Stage III Bid Request

The Southern Valley Authority purchasing agent was so impressed with the 98-cent price that he announced a "Stage III" or third-round competition for 200,000 kilovars, with a bid date of August 5, 1964. Kennedy marketing managers wondered what their pricing strategy should be this time.

In July, Lawford announced new published prices of \$1.15 per KVAR, a reduction of 10 cents from their previous book price.

In the background, as Bill Moyers pondered Lawford's latest book price, was the question of whether Kennedy should simply withdraw from this business.

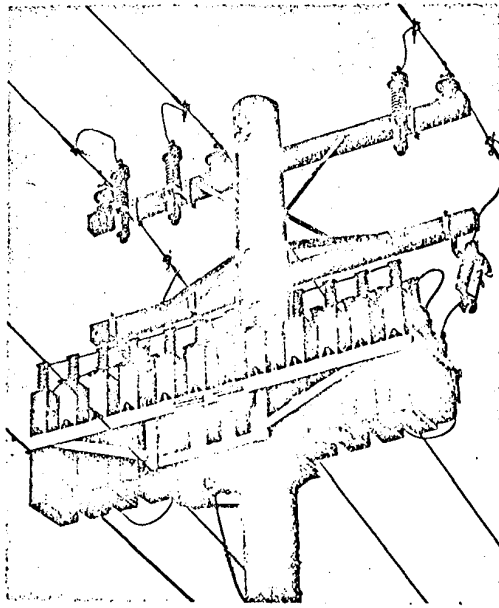
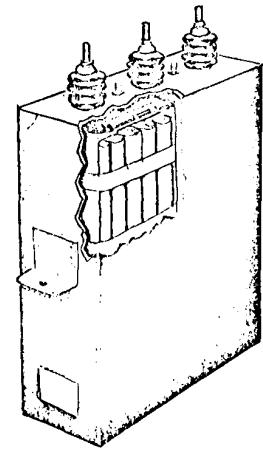
0436683

CAPACITORS

pole-type equipments

Capacitors can serve you as a cost-reduction tool. Installed on your distribution feeders, they will help you lower operating expenses and hold down system investment.

By furnishing kilovars (magnetizing current) close to the point of utilization, capacitors can reduce and even eliminate the flow of kilovars on your primary feeders, through distribution substations and over your power supplier's system.



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CAPACITORS

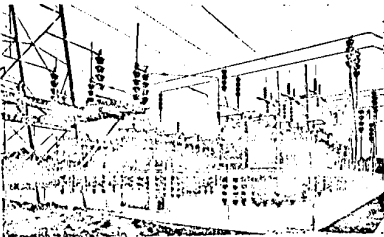
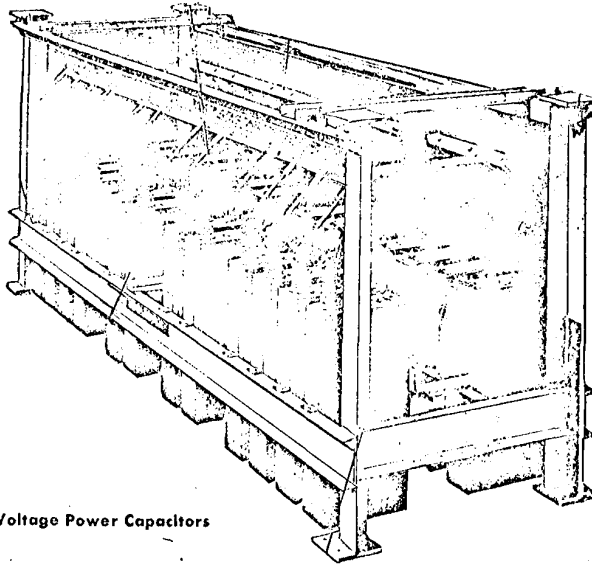
open-rack equipments

stack-rack

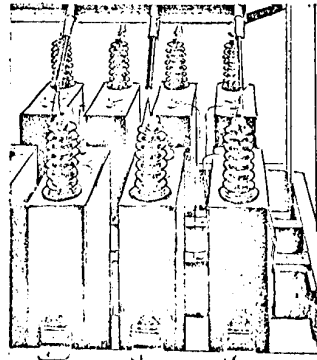
Rack consists of three basic parts — the structural members, the capacitor units and the capacitor fuses and buswork. Aluminum angles and channels are used to form a strong framework.

stack racks are shipped pre-assembled with capacitors, fuse holders and buswork in place. Field assembly is limited to inserting fuse links, stacking racks on top of each other or on spacing insulators, and making inter-rack and incoming line connections. Racks can be stacked up to three high. Kilovar rating of the complete equipment is unlimited.

High Voltage Power Capacitors



Power lost in your primary feeders and in the distribution substation may represent as much as 4, 6 or even 8% of the power input. The addition of capacitors can often reduce these primary losses to $\frac{3}{4}$ or even $\frac{2}{3}$ of their original value. In this way, the addition of capacitors helps you reduce the difference between the KWHS you purchase and/or generate and the power you sell.



0436685

Plan 5 Years Ahead for System Var Supply

Union Electric forecasts requirements 5 years ahead,
determines firm and other economic sources of supply

V. J. FARMER, Electrical Engineer,
G. S. WHITLOW, Planning Engineer,
Union Electric Co., St. Louis, Mo.

System var supply is growing in importance because of higher summer loads and greater transmission distances. Var supply is enhanced by the lower relative cost of capacitors and improved control equipment. Supply of system vars should be planned as carefully as system watt supply, giving proper consideration to the various sources—generators, synchronous condensers, and primary and secondary capacitors. It is the authors' experience that a clear picture of system var requirements and how they will be met is needed about 5 years ahead.

Cost About \$6 Per Kvar

Fixed primary capacitors on poles, at about \$6 per kvar, are second only to generator vars in cost

and provide near-maximum benefits. Only secondary capacitors, nearer the load, provide greater benefits. Fixed capacitor vars are limited to the minimum var load. With leading power factor there may be high-voltage difficulties and generator stability margins will be reduced. Pole-mounted, secondary capacitors, costing \$16 to \$20 per kvar, may be justified by the released capacity, loss reduction and voltage improvement on primary, mains, transformers, and secondaries.

Offers Some Benefits

Switched primary feed capacitors, costing \$8 to \$9 per kvar or more, offer the same benefits as fixed capacitors, plus voltage regulating ability. Capacitors on distribution substation buses cost \$9 to \$10 per kvar but provide less benefits than those on primary feeders. Substation capacitors should be considered only when feeder capacitors cannot be applied.

Capacitors on bulk substation

buses cost \$9 to \$10 per kvar for large banks and may be justified by the combination of residual var loads from distribution substations, bulk customer loads, and var losses in transmission and subtransmission lines and transformers. Voltage benefits under contingency conditions may be important.

Capacitors at bulk customer loads may cost about the same as substation capacitors, but, installation and maintenance are often difficult.

Additional var supply from generators costs about \$4 per kvar including additional transformation costs, but unlimited var supply by generation affects slightly the optimum economic system power factor.

Incremental cost of system capacity, as affected by reduction of power factor, is difficult to determine. If \$40 per kva is selected, with capacitors at \$8.50 per kvar, an economic power factor of 97.7% is indicated. If the power plant component of cost is omitted (\$5 per kva for lower power-factor generators), economic power factor will drop to only 97.0%. Efforts to obtain maximum var supply from generators may not be justified, but a liberal var reserve in generators will be beneficial under contingency conditions.

Costs Up, Benefits Down

As var supply location progresses from fixed primary to bulk substation, costs increase and benefits decrease. Thus full use should be made of each type, consistent with its inherent limitations, before proceeding to the next least costly type.

One factor that limits capacitor additions is generator instability due to low excitation during periods of leading power factor. Another type of instability from high levels of capacitor application is that of the system disturbance which would cause a severe slump in voltage. The seriousness of this stability hazard is problematical, although there appears to be no record of system breakdown due to this cause.

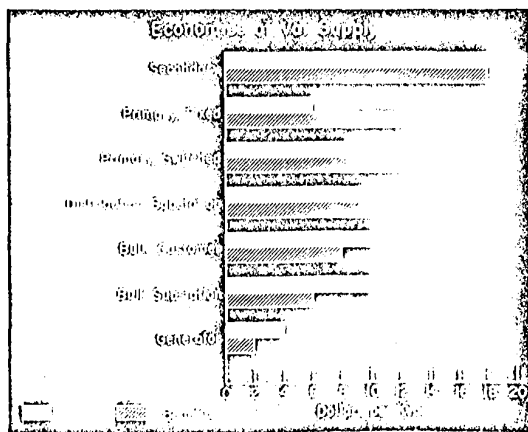


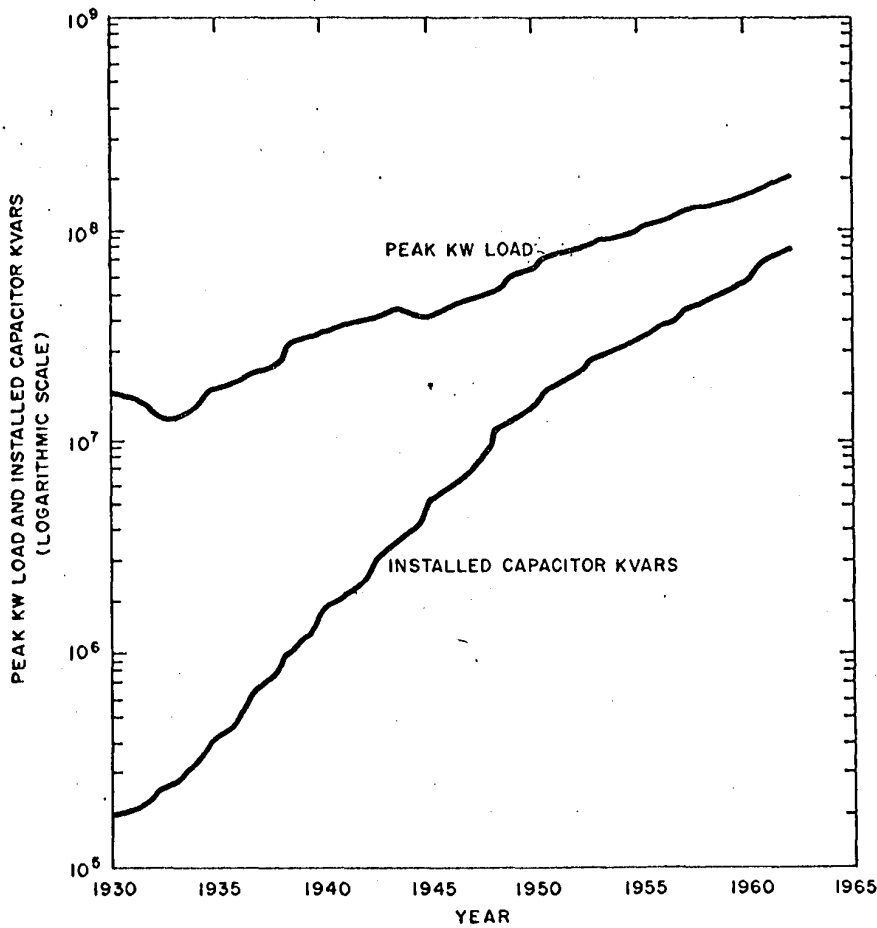
FIG 2—KVAR COSTS and benefits indicate full use should be made of each var source before the next least costly source is applied to the utility system

(EXCERPTS ONLY FROM ARTICLE IN ELECTRICAL WORLD, NOVEMBER 11, 1957)

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EXHIBIT 4
KENNEDY CAPACITOR (A)

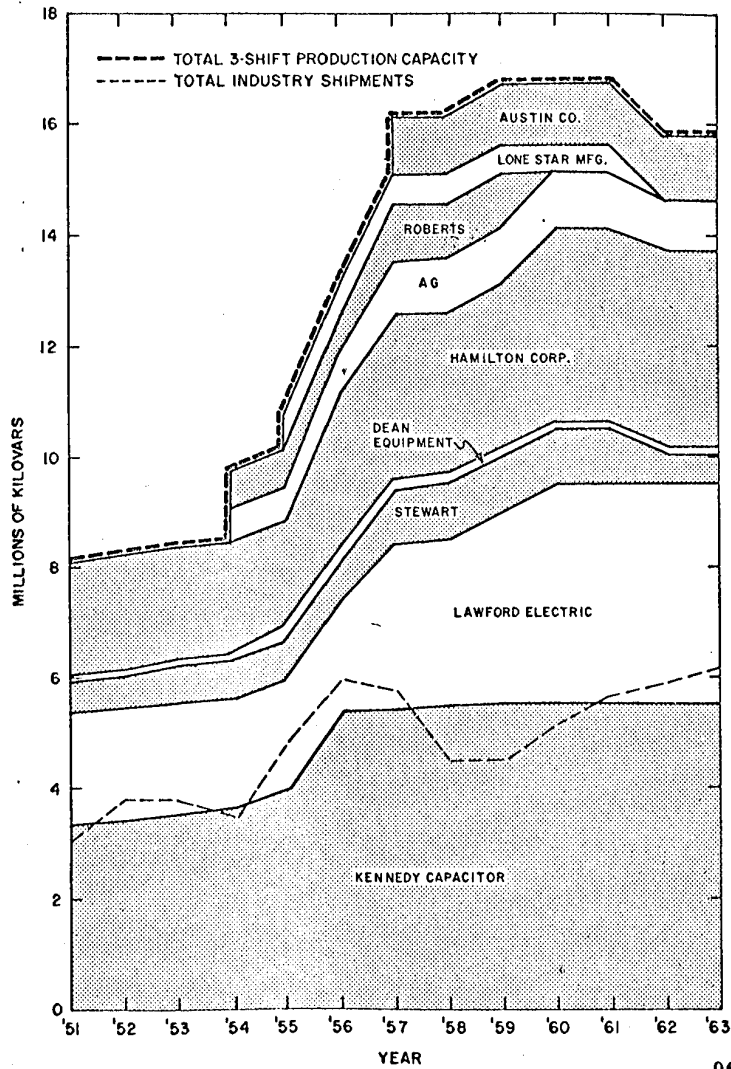
GROWTH OF PEAK LOAD KW AND INSTALLED CAPACITOR KILOVARS
FOR TOTAL ELECTRICAL UTILITY INDUSTRY



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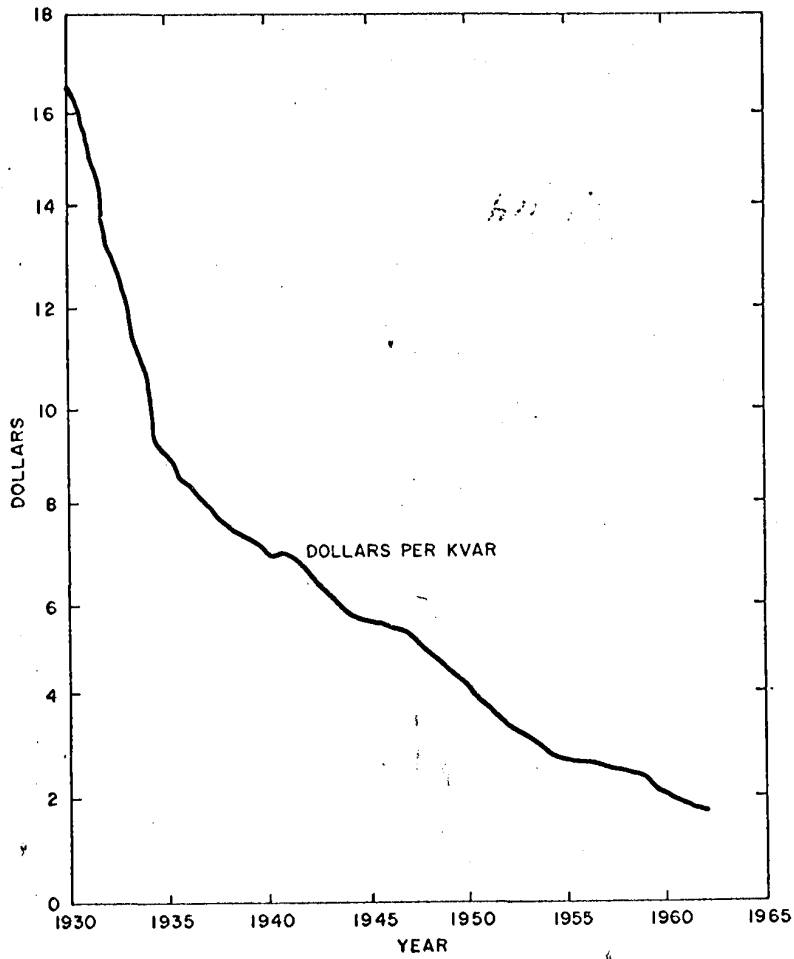
EXHIBIT 5
KENNEDY CAPACITOR (A)

TOTAL INDUSTRY SHIPMENTS AND TOTAL 3-SHIFT MANUFACTURING
CAPACITY OF HIGH VOLTAGE POWER CAPACITORS



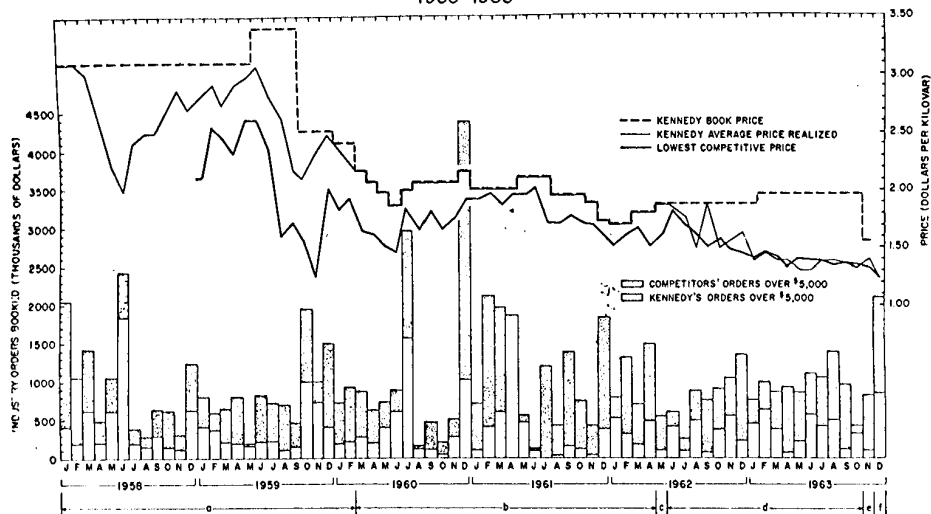
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EXHIBIT 6
KENNEDY CAPACITOR (A)
AVERAGE SELLING PRICE PER KILOVAR
1930 TO 1963
HIGH VOLTAGE POWER CAPACITORS



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EXHIBIT 7
KENNEDY CAPACITOR (AS)
CAPACITOR PRICES AND TOTAL INDUSTRY ORDERS BOOKED
1958-1963



LEGEND: KENNEDY PRICE POLICY

- | | | |
|--------------------------------------|---------------------------------------|--------------------------------------|
| a) "PRICING INDIVIDUAL TRANSACTIONS" | c) "CONTROLLED OPPORTUNISTIC PRICING" | e) KENNEDY QUOTES BOOK PRICES |
| b) "BOOK PRICE POLICY" | d) "SELECTIVE PRICING POLICY" | f) KENNEDY WITHDRAWS ALL BOOK PRICES |

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