

Chapter 5 – Power Pooling

Gary Zimmerman

Replacing Dick Gorman was going to be one of the more difficult tasks in MPPA's history. Gorman, the former city manager in Petoskey, had guided the joint action agency's activities since its founding in 1978. When Gorman announced his intention to retire in 1990, MPPA commissioners immediately began a nationwide search, seeking a successor to the only general manager in the Agency's history.

MPPA found Gorman's replacement in a Chicago suburb. Gary Zimmerman was already a respected veteran of joint action agency administration in 1990. When Illinois municipal utilities formed the Illinois Municipal Electric Agency in 1978, Zimmerman had been one of the organizers. Since 1974, Zimmerman had served as general manager of the municipal utility in Winnetka, Illinois, a suburb of Chicago. In 1984, when IMEA realized it needed a full-time manager to oversee the Agency, Zimmerman was IMEA's logical choice.¹

"I stayed with the village of Winnetka for the 10-year period until 1984," Zimmerman recalled. "When the Agency was formed, I became its first chairman of the board. I was elected by my colleagues. And then when they started receiving funding and having the opportunity for employment at the agency, I was selected as the first general manager. That was a competitive selection. I was not

Less than a year after the dedication of Belle River, 14 of the MPPA's members began seriously discussing the feasibility of setting up a power pool to serve public power communities in Michigan's Lower Peninsula. Dan Cooper, a consultant with R.W. Beck and Associates' Midwest engineering office in Indianapolis, had worked with MPPA since 1983 to help the Agency develop plans for additional power sources.

"I had some support work on the Campbell bond refunding for MPPA," Cooper said. "What happened was that once Belle River was completed, MPPA began looking for the next resource since they still needed quite a bit more power. I was brought on at that time to work with MPPA on doing a power supply study. We did that in late 1983, through 1984, and the upshot of it was a study to survey all the member-owned capacity and what was available."¹

The power supply study, which R.W. Beck completed in late 1984, examined the electrical loads of MPPA's 14 members and projected future capacity and energy requirements for each of the members and for the group as a whole. Beck's projections indicated that MPPA and its members could expect an annual load growth of about 2.35 percent through the remainder of the 20th century.²

The projected load growth was in line with what other utility economists were predicting for the industry during the mid-1980s. The average annual 7 percent load growth of the 1950s and 1960s had shrunk by one-half or more during the inflationary 1970s. Most utility executives and regulators forecast annual load growth of below 3 percent for the rest of the 1980s and 1990s.

Cooper and the Beck consulting team compared the known or expected capacity resources of MPPA members and made operating cost projections through 2003. The projections contrasted the current operating costs with the costs of an integrated system. When the completed power supply study was submitted to MPPA's board of commissioners in December 1984, it drew two basic conclusions.

"Except for a few years," the report stated, "MPPA members have sufficient resources to meet their needs until the year 2000. MPPA members can achieve substantial savings in power costs if they supply each others' needs through a pooling arrangement rather than continuing to purchase power from outside sources."³

Commissioners unanimously approved the study and directed Beck to proceed with the "Power Resources Study – Phase II," essentially a plan for providing an integrated pooling system among MPPA members. Commissioners also instructed Beck and the Agency's staff to participate in a power supply needs analysis for the entire state of Michigan, with an eye to the possibility of pooling with Wolverine Power Supply Cooperative.⁴



Into the Pool

Pooling is a utility engineering concept that has been practiced for more than 75 years. Electric utilities realized as far back as the 1920s that interconnection was necessary to ensure reliability.

From the World War I era on, utilities maintained a reserve margin in case a baseload generator suddenly disconnected from the system. A portion of that reserve margin was what engineers called “spinning reserve,” which meant that auxiliary generating units were kept running to be ready to feed power into the grid at a moment’s notice. Power engineers quickly discovered that spinning reserve could be reduced if utilities were interconnected with adjacent utilities.⁵ The principle remained unchanged at the time Cooper and his team were studying MPPA’s spinning reserve in the mid- to late 1980s.

As early as 1922, utilities in Connecticut and Massachusetts created the Connecticut Valley Power Exchange (CONVEX) as a method for strengthening reliability and reducing spinning reserve in the Northeast.⁶ The three utilities, serving customers in Hartford, Connecticut and Springfield and Turners Falls, Massachusetts, agreed to share the cost of building a 66,000-volt transmission line connecting their systems. The partners agreed to buy electricity from the generating unit with the lowest cost and to split the savings among themselves at the end of each month.⁷ CONVEX was the first example of voluntary cooperation and revenue sharing among electric utilities for transmission planning purposes.

Five years later, in 1927, Pennsylvania Power & Light Company, Public Service Electric & Gas Company and Philadelphia Electric Company signed an agreement to create the Pennsylvania-New Jersey interconnection (PNJ). The three utilities agreed to build a ring of 220,000-volt transmission lines circling Philadelphia and to share in the costs of operating the coordinated system. PNJ was the nation’s first true power pool.

Throughout the 1920s, engineers from the three utilities and at Princeton University had studied the concept. They had concluded that the utilities could save more than \$3 million a year in spinning reserve costs by building the ring interconnection.⁸

PNJ was the first large-scale interconnection in industry history. Its significance lay in the fact that integration of transmission systems under separate ownership was proved both theoretically and practically feasible.⁹ PNJ was a model that would become widespread in the U.S. electric utility industry in the years following World War II, and a format that federal regulators would urge other utilities to emulate after 1965.

the only person running, and it was a challenge to seek and get the position.”²

Zimmerman brought a wealth of experience to the Michigan job. Raised in Jefferson City, Missouri, he earned his bachelor’s of science degree in electrical engineering from the Missouri School of Mines and Metallurgy at Rolla. Following graduation, Zimmerman worked for a year in the University’s coal-fired power plant before enlisting in the U.S. Army in 1966. For the next two years, he put his degree to good use as a military test and results engineer at the Aberdeen and White Sands Proving Grounds.³

Following his discharge from the service, Zimmerman accepted a position with the Denver office of Stearns-Rogers, a major industrial engineering construction firm. For the next year, Zimmerman worked with the firm’s mining clients before joining the staff of AMAX Molybdenum, an important mining complex located high in the Colorado Rockies at Leadville. From 1971 to 1974, Zimmerman worked in the physical plant department at the University of Colorado at Boulder.

“While there, I sought a master’s in business administration degree with the University of Denver,” Zimmerman said. “I ended up picking up my MBA in 1974 and following that, I wanted to find something in management and get out of just pure engineering and technical work.”⁴ In August

1974, Zimmerman returned to the Midwest when he accepted the position of Superintendent at the Winnetka municipal utility.

Zimmerman's experience "has allowed him to acquire a diverse electrical background, including university facilities and systems, heavy industrial design engineering, and plant engineering," MPPA said in announcing his May 1990 selection as the Agency's second general manager.⁵

Zimmerman's experience enabled him to quickly pick up the reins in his new job. MPPA had found the right man to replace Dick Gorman.

Endnotes

1. "Michigan Municipal Electric Association Appoints Zimmerman as Executive Vice President," *MMEA Currents*, v.23, no.5, May 1990, p.1
2. Zimmerman Interview, p.7
3. *Ibid.*, p.3
4. *Ibid.*, p.4
5. "Michigan Municipal Electric Association Appoints Zimmerman as Executive Vice President," *MMEA Currents*, v.23, no.5, May 1990, p.1

The First Blackout



Most of the power pools serving electric utility customers in the early to mid-1960s were loosely organized and controlled by investor-owned utilities, a result of the private utilities' ownership of most of the nation's high-voltage transmission system. That all changed in the late afternoon hours of Tuesday, November 9, 1965.

Just after 5:16 p.m. EST that day, a backup protective relay on one of five 230,000-volt transmission lines carrying power from the Sir Adam Beck station to the Toronto metropolitan area opened and caused the circuit breaker to disconnect the line.¹⁰

Within three seconds, the other four 230,000-volt lines in the area were loaded beyond their capacity and tripped out in turn. Generation from Sir Adam Beck station was separated from the Ontario Hydro system almost immediately, followed seconds later by the disconnection of Robert Moses hydroelectric station across the St. Lawrence River operated by the Power Authority of the State of New York (PASNY). Less than one second after the first fault at Sir Adam Beck station, 3,300 megawatts of power from Sir Adam Beck station and Robert Moses station were cascading out of control across the transmission grid of upstate New York.¹¹

By 5:30 p.m., 80,000 square miles of the Northeast United States and adjacent Ontario were without power. More than 30 million people were in the dark.¹² Most of Michigan experienced only a flicker of lights as the power reversed flow eastward, but it would be late evening or early the next morning before electricity was restored to much of the East Coast.

Within days of the blackout, President Lyndon Johnson ordered the Federal Power Commission (FPC) to make an immediate and thorough investigation of the power outage and its causes.

When the FPC issued its three-volume report on the blackout in 1967, it was unequivocal in its conclusions. "Transmission must be recognized as the principal medium for achieving reliability, both within a system and through coordination among systems," the report said. "The major defense against power interruptions ... lies in the high-quality planning of interconnected power systems and in strict adherence to carefully developed and coordinated operating and maintenance programs."¹³

The year following the FPC report, FPC and most of the major utilities in the country announced the creation of the North American Reliability Council (NERC), a voluntary group that would be responsible for developing and maintaining national standards for interconnected transmission systems in the United States. The most visible manifestation of NERC was the establishment of regional power pools, modeled on PJM, which dealt with transmission issues on a regional and local basis and served as the functional control system for the U.S. high-voltage transmission grid for the next 34 years.

The Lower Peninsula of Michigan, home to all of MPPA's members, was basically served by a single NERC pool. ECAR, the East Central Area Reliability Council, served almost all MPPA members. Consumers Power and Detroit Edison, the state's two biggest utilities, maintained ECAR membership, as did utilities in nearby Ohio. MAPP, the Mid-Continent Area Power Pool, served municipal utilities in Michigan's Upper Peninsula.

Creating the MPPA Pool



Designing and creating MPPA's pool took uncounted hours of work. With the completion and approval of Phase II of MPPA's Power Resources Study in 1986, MPPA and Dan Cooper and his team from R.W. Beck forged ahead with the myriad of details necessary to get a power pool established and operating. The first step tested the concept, finding out how many of MPPA's members wanted to proceed with more detailed studies of how a pool would actually work for them.

"Once the conceptual design was done," Cooper explained, "then we moved into trying to estimate the cost of benefits to all the cities of being in the pool. That was difficult because there was such a wide range of needs and characteristics of the various cities."¹⁴

Lansing, for instance, generated surplus power it could sell on the pool. Other MPPA members had no generation and purchased all of their electric power wholesale. "Holland was a particularly difficult case," Cooper explained, "because Holland was almost in balance on its resources and loads at that time. They gained minimal benefits from a pool."¹⁵

The cost benefit studies continued for a period of three years. At that point, Cooper said, there was an opt in or opt out choice for Agency members. "Eight of MPPA's cities committed to the power pool, and five others for various reasons decided to not go into the power pool," Cooper said. "At that point, we began working on the actual contracts for the pool internally, and also on transmission arrangements for the pool with Consumers Power."

Consumers Power did not want to potentially lose customers to the new MPPA pool, and the Jackson, Michigan IOU was willing to match anything the MPPA pool could offer. "What happened was that word of what the pool was doing and the pricing that was negotiated in the pool agreement was leaked to Consumers Power," Cooper said. "Consumers came back with an identical cost proposal to those cities. Those five cities essentially decided that since the pricing was the same, they would stay with Consumers rather than join the pool."¹⁶

The eight cities that did want to participate in the MPPA pool – Charlevoix, Grand Haven, Harbor Springs, Lansing, Lowell, Petoskey, Traverse City and Zeeland – needed the use of Consumers Power's high-voltage transmission network in the Lower Peninsula to make the proposed power pool work. Cooper had designed a network transmission arrangement with a real-time dispatch function for the MPPA pool, similar to the way a NERC pool operated.

The Threat of Antitrust



At first, Consumers Power balked at providing access to its transmission grid. But the 1978 antitrust settlement that had enabled MPPA to purchase an ownership share in Campbell No. 3 was explicit about transmission access.

"The 1978 antitrust settlement that Consumers had entered into was our bargaining chip," Cooper explained. "Spiegel and McDiarmid, our legal counsel, told Consumers that if you block

Chapter 5 Endnotes

1. Tape-Recorded Oral History Interview with Dan Cooper, Lansing, Michigan, December 19, 2002, p.1
2. "Power Supply Study," 1984 Annual Report, Michigan Public Power Agency, n.p.
3. R.W. Beck and Associates, "MPPA: Power Resources Study – Phase I," December 1984, p.3
4. "Power Supply Study," 1984 Annual Report, Michigan Public Power Agency, n.p.
5. Beck, *Interconnections*, (Minneapolis: Mid-Continent Area Power Pool, 1988) p.37
6. Electricity Milestones (U.S.), <http://www.inventors.about.com/library/inventors/blelectric2.htm>
7. Beck, *Interconnections*, p.43
8. Beck, *PP&L-75 Years of Powering the Future*, (Allentown: Pennsylvania Power & Light Company, 1995), pp.195-196
9. Bayla Scholssberg Singer, "Power to the People: The Pennsylvania-New Jersey-Maryland Interconnection, 1925-1970," Dissertation Presented to the Graduate Faculties of the University of Pennsylvania in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy, 1983, p.136
10. Beck, *Interconnections*, p.95
11. Northeast Power Failure, November 9 and 10, 1965, A Report to the President by the Federal Power Commission, December 9, 1965, p.4
12. [events/1965, http://blackout.gmu.edu/events/t1965.html](http://blackout.gmu.edu/events/t1965.html)
13. Quoted in William C. Hayes, "Editorial," *Electrical World*, November 1990, p.9
14. Cooper Interview, p.2
15. *Ibid.*, p.3
16. *Ibid.*, p.4
17. *Ibid.*, p.7
18. *Ibid.*, p.6
19. *Ibid.*, p.6

20. "MPPA Power Pool Incepts," *MMEA Currents*, v.25, no.8, August 1992, p.1

21. Dan Cooper Interview, p.7

us from doing this, we are going to take you up on antitrust again. Consumers didn't necessarily facilitate the process, but on the other hand they did work with us."¹⁷

With transmission access guaranteed, the biggest operational hurdle to getting the pool up and running was the selection of a dispatch center. Cooper and his team had two choices. They could dispatch the MPPA pool from the dispatch center at the Lansing Board of Water & Light, or through the Wolverine Power Supply Cooperative at Cadillac. Eventually, MPPA chose Lansing.

"Lansing's strengths were also its weaknesses," Cooper said. "It was part of MPPA and so it was one of us, but on the other hand, because of its size there was also some concern about whether the arrangement would operate to benefit Lansing or all of the members of the pool."¹⁸

Cooper worked on several fronts, mainly to get an agreement with Lansing giving MPPA enough oversight ability to blunt concern from other members about self-dealing on Lansing's part. The second part of the project, Cooper added, "involved the simple mechanics of how do we do this."¹⁹

As signed contracts from the eight pool members arrived in MPPA's offices early in 1992, Cooper and his team were hard at work installing remote telemetry units (RTUs) at each of the eight utilities. Finally, all was in readiness. On August 1, 1992, the eight MPPA members began purchasing and selling electric power among themselves and outside parties. By making the MPPA pool part of a larger Michigan pool operated jointly with the Wolverine Power Supply Cooperative, MPPA's pool members were able to avail themselves of access to 900 MW of dispatched power on the combined pools.²⁰

For Cooper, it had been an exhausting, but satisfying, nine years. In May 1992, just months before the MPPA pool went operational, Cooper left R.W. Beck and joined MPPA to help run the pool.

"The principal point which has made the pool such a success is the members have generally recognized that the entire pool concept is one of compromise," Cooper said. "The eight cities understood that there are times when you win and times when you lose, but everybody comes out ahead over time. I think that has been the key factor in making the pool a success."²¹