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Energy Crisis

The Producers' Council sponsored a seminar on September 13, 1972, in Milwaukee, one of the first of 52 such seminars scheduled throughout the nation.

Statistics of the First Wisconsin Center

Facts and figures about the presently going up tallest office building in the State.

The Processes

Construction Management as it relates to The First Wisconsin Center.

News Notes

Daily Reporter Scholarship for School of Architecture, UWM; Wisconsin Examining Board of Architects, Professional Engineers, Designers and Land Surveyors appoint new members; Two-day seminar at University of Wisconsin Extension in Madison.

Cover Photo: Thomas E. Hall

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"The Energy Crisis — Build to Avert It" was the topic of a seminar held in Milwaukee on September 13 at the Tyrolean Towne House, sponsored by members of the Producers' Council.

This seminar was one of the first scheduled in fifty-two cities across the nation, developed by ten major building products and equipment manufacturers in cooperation with major Federal agencies and prominent authorities in the energy conservation field.

The purpose of these seminars is to make the public in general and the building industry in particular aware of the growing energy crisis as well as long range implications and ways in which this crisis can be minimized or averted.

Mr. S. C. McNeer, Sr. Vice-President, Wisconsin Electric Power Company, set the stage as keynote speaker. His address focused on the long-term problems and solutions.

Energy (which can be defined as the inherent ability to perform work) is absolutely essential to the welfare of our country or to the welfare of any country for that matter, because all human life depends upon energy in some form. Our nation could not possibly do without it. Any developed country that is denied a sufficient supply of energy will progressively revert to a primitive state. Any underdeveloped country which is denied a sufficient supply of energy will never progress to a more developed position in the community of nations.

Let us briefly review the overall energy balance and the progressive trends regarding energy supply and demand in the years ahead.

In 1971 this nation consumed close to 70 quadrillion British Thermal Units of energy. Included in the total were some 5.5 billion barrels of oil, 51 million tons of coal and 22 trillion cubic feet of natural gas. These totals were supplemented by relatively small quantities of hydro power and nuclear power.

In the last ten years the world has consumed as much petroleum as was produced during the entire century prior to 1959. And the United States is the leading energy consumer. With only 6% of the world's population, we consume 30% of the world's energy, and our energy consumption is expected to increase in the years ahead as our population increases. We have been leaders in the use of energy. We must be leaders in the wise use of energy.

There are five primary sources of energy in our country today, and in order of use, these are: oil, natural gas, coal, water power and nuclear energy. Prior to 1950, coal was in first place. In turn, there are five major market categories which use this energy. These five markets and their percent of the total energy consumption are as follows: Industrial — 32%; Electric Utilities — 25%; Transportation — 24%; Residential — 14%; Commercial — 5%.

The electric utility industry is a supplier of a secondary form of energy. Electric utilities convert energy from coal, oil, gas, uranium and falling water into electricity.

The 1960's began with plentiful fuel supplies and stable costs. Before the decade was over, however, several factors combined to create serious fuel shortages and substantially increased prices. Among those factors were: 1. Accelerated inflation. 2. Strict air pollution standards. 3. Rapid changes in the demand for different forms of energy. 4. Declining gas exploration. 5.
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New and strict environmental and safety restrictions in the mining industry. This dramatic change in the fuel picture has raised major new uncertainties for the future. Will there ever be a return to the easy supply and the stable prices of the early 1960's? Or, will the present fuel shortages and price pressures continue indefinitely?

There is a very definite problem with primary fuels at the present time. And in large part it stems from policies which we have, as a people, developed for ourselves. For example, the natural gas supply in the United States is being used up faster than we are adding to reserves—twice as fast, in recent years. At the same time the gas industry drilled only half the number of wells in 1970 as it did in 1956. That doesn't seem to make sense. We are told that a major cause was the strict policy of FPC in regulating the well-head price of new gas over the past two decades. It is more productive for the well investment dollars to go into overseas development, and that's where they have gone. FPC recently has made some drastic departures in price regulation in a belated effort to stimulate oil and gas exploration.

In any event, we have a definite shortage of gas supply in this country. A recent report issued by the FPC indicates that the national supply deficit will continue at least until 1990.

What about our enormous coal reserves? Carl Bagge, president of the National Coal Association, has referred to the coal industry as “battered from all sides—literally an industry under siege. Coal presently has several problems, but certainly not the problem of adequate supply. We have 1½ trillion tons already mapped, and the U. S. Geological Survey states that there is probably that much more waiting to be found. That is a supply sufficient for centuries, even at the greatly accelerated consumption rates forecast for the future. Coal makes up 88% of the nation's proved reserves of energy fuels, and that is the great overpowering fact that must be considered in any long-term energy plans."

“The coal industry's problems with air pollution standards, and also its difficulties with strip mine regulations, safety and other concerns of relatively short range. Solutions for these problems can and will be found fairly soon . . . last year the generation of electric power increased by 5.4%—but the use of coal increased only 2.2%. In contrast, the use of oil, chiefly imported residual fuel oil, increased 8.1%. From all we can detect, this shift from coal is accelerating."

So says Mr. Bagge. We have a fuel shortage, and yet we use less of our most prolific fuel resource. Of course, the reason is that our recently enacted air quality standards do not permit the use of much of this coal—the technology does not presently exist to meet the standards that have been set.

Due to the recent enactment of severe air quality restriction, the use of low sulfur oil has replaced coal in many areas. Here is some of what Otto Miller, president of Standard Oil of California, had to say about oil industry problems:

"Oil reserves in the lower 48 states are now below the level they were in 1956—oil demand, in the meantime, has grown by 71%. The number of wells drilled in this country has decline
d from 58,000 in 1956 to about 30,000 last year. Drilling costs, in the same interval, have risen about 55% in the U. S., while the average price of crude oil has advanced only 22%. In short, we have been consuming our oil and gas reserves far faster than we have been replacing them—while, at the same time, the business of drilling for oil and gas has been getting less and less attractive."

Mr. Miller’s words have been echoed in recent months by many other oil industry executives. There is general agreement that unless action is taken very soon to reverse these trends, the deficit can only become worse, and dependence on foreign oil can only increase. And yet, oil’s importance as a primary fuel is expected to expand—some estimates as high as double by 1985.

What will it take to improve the domestic oil supply situation? To restore and increase incentives to explore for oil and gas—so that sufficient venture capital will again flow into the industry—is apparently the first step. However, even after that step is taken—it could be years before new supplies are found and made available to the public.

There are two basic national policy questions involved. First, a significant redirection is necessary to encourage risk-taking in the exploration end of the oil business.

The second area involves environmental restrictions that now inhibit exploration and other oil industry operations in a number of important areas both on- and offshore. As cases in point, consider these facts—the Federal government has been blocked by conservationists from leasing key offshore oil and gas lands in the Gulf of Mexico; local public bodies in some areas have passed ordinances prohibiting drilling activity; the Federal government and the State of California have brought California’s offshore development to a standstill; and East Coast offshore exploration is being subjected to similar delays.

It seems to me that at least a part of the oil industry crisis is a matter of ordering our priorities.

Natural gas—coal—oil—the fossil fuels. In short—we have abundant reserves of coal—but must wait for technological breakthroughs that will permit its use in the face of the new air quality criteria. Oil and natural gas both suffer from national policies that inhibit rather than encourage developing new reserves.

What about hydro power—probably
the cleanest form of power generation. Unfortunately, this is not an effective way out—particularly in the middle west, where the land is relatively flat, and the most economical sites have long-since been developed.

This brings us to a consideration of nuclear power, a subject about which you may have read a great deal lately in connection with our efforts to license the second unit of our Point Beach Nuclear Plant. It is truly ironic that relative to this power source, too—it has been our nation's public policy to permit extensive delays in licensing completed facilities, which were built to every specification of government, from being used at all, while we examine and re-examine hypothetical situations. I do not want my remarks to be misconstrued. The nuclear generation field is a highly technical one. Back in 1965, when we made the decision to build a nuclear facility, a key part of the decision was that such a plant would be the most ecologically compatible method of producing power available to us. We were also completely satisfied that the plant would pose no threat to the public health or safety. We continue to feel that way.

I might note that there are now 22 operational nuclear power plants in this country, and, in addition, over 100 other nuclear power plants under construction or on order. From only 1.4% of the total generation in 1970, nuclear is expected to produce about 50% by 1990. On a longer-term basis, with an increasing dependence on electrical energy, the development of new nuclear technology will be crucial. Present daylight water type nuclear reactors—while they have many advantageous characteristics—only extract about 1% of the energy available from their nuclear fuel. Fortunately, nature has arranged things so we can take advantage of the breeder reactor which has the ability to produce more fissionable nuclear fuel material than it consumes in the fuel elements. The development of an efficient breeder reactor will minimize the disipation of our resources and reduce adverse impacts on the environment.

Our company is a part of the new fast breeder reactor program announced earlier this year, which expects to have a demonstration plant on the line by 1980. We have supported the Enrico Fermi Plant breeder reactor research since 1952 and feel that development of the breeder reactor is an essential part of the total nuclear power program.

Because of the breeder's more efficient use of nuclear fuels, our limited supply of uranium would last far centuries. The potential energy obtainable from uranium is many times as large as that which could be extracted from all of our other available resources—coal, oil and gas combined.

In the more distant future (probably 30 to 40 years) fusion power may be another important alternative within the nuclear field. The prospect of unlocking the virtually unlimited energy available from heavy hydrogen in the oceans is indeed an exciting vision. This process involves the fusing of light atoms at high temperatures and pressures and is similar to the process constantly going on in the sun. Just recently we announced our continued financial support of fusion reactor design studies at the University of Wisconsin in Madison.

In summary, we have looked at each of the primary fuel's that are now our sources of energy and seen that the growth of reserves of natural gas and oil has been limited by policy—not technology, the use of our vast coal reserves has been inhibited, substantial expansion of hydro power is not practical and road blocks have been thrown in the way of the orderly development of nuclear power. These are matters of national importance requiring national attention. In the meantime, what can the building industry presently do to conserve energy? How can we most efficiently utilize the energy which is available and will be available in the future?

Many practical suggestions will be offered today by subsequent speakers. The members of the Producers' Council are to be commended for taking the initiative and researching the energy problem as it relates to them and making the findings available to the construction industry not only here, but in 52 other cities across the United States. All of us must help.

The designer must design better, considering more carefully, for example, the siting of a building to enhance natural lighting and at the same time reduce the air conditioning load and heat loss.

The builder must build better, double checking to make sure the products and equipment installed to conserve energy are installed properly.

The manufacturer must devote more funds to research and development. Better methods of insulation, better environmental control systems and better heat transfer equipment will be required. The producer who is doing something about this problem today is the producer who will have the competitive edge tomorrow.

And most important, building owners can advance significantly the energy conservation cause by adopting an open-minded attitude toward advanced systems and building materials. Owners must be willing to purchase these innovative systems and materials, which may cost more initially, but less over the life span of the building, considering savings in maintenance and operating costs.

The energy shortage is a critical problem. It is not someone else's problem—it is your problem—it is my problem. It requires team action.

This seminar today is a start in that direction.
The First Wisconsin Center, located near Lake Michigan's shore in downtown Milwaukee, has received much attention recently for a variety of reasons. The 601-foot high building is the tallest office tower in Wisconsin. Some of the statistics indicate just how ambitious a project it is. A forty-story office tower rises above a two-level enclosed plaza, covering the entire length of the main block south of Wisconsin Avenue between Van Buren and Cass streets. The Plaza's first level will include a main banking floor and safe deposit area. The second level is called the Galleria, a 200-foot wide level designed for forty thousand square feet of space for shops, restaurants and a wide variety of other commercial uses. The second level of the Plaza will tie into the second block parking structure with a bridge over Michigan thirty-five feet above street level. The parking structure will contain stalls for one thousand cars. The First Wisconsin Center contains 1,300,000 square feet of gross area. It is of steel frame construction and will be enclosed with a skin consisting of 66% glass and 34% of white silicone polyester coated aluminum.

The windows will be of fixed double-glazed insulating units with bronze, heat-absorbing, glare reducing glass. The floors are of cellular steel deck with telephone, electrical, and signal raceways on 5'-0" centers. Office space can be planned with great flexibility because of 40' clear column space. In the mid-tenant floors, there will be approximately 23,000 square feet of space per floor with only two exposed interior columns; on high rise tenant floors there will be about 23,500 square feet of space with only four exposed interior columns. There will be eight 500 feet per minute elevators through the 19th floor and six elevators with 700 feet per minute from 20th through 30th floor. There will be six 1,000 feet per minute elevators from 31st through 40th floor. The First Wisconsin Center sits on a site of nearly six acres of which only 30% will be developed initially, leaving abundant space for future major expansion. Keeping this in mind, the Gallery is so designed that it can become a skywalk capable of being tied into future buildings and separating pedestrian from vehicular traffic.

Twenty floors of the tower will be available for rental and the Bank will use the remaining 16 floors. Mechanical equipment is located on the 15th and 16th floors and the 41st and 42nd floors. All three city blocks will be integrated into one site by over-and-under street facilities. Ten loading docks will be provided underground at a central receiving and shipping area.

The siting of the First Wisconsin Center was determined by the availability of land for acquisition and the strategic location of the site to Milwaukee's freeways which provide entrances and exits to expressways north, south and west only one block away from the Center itself.

The First Wisconsin Center is expected to be completed in August of next year and its owners are confident that this new project will greatly contribute to the development of the business and commercial community of Milwaukee. A recent brochure offers "an environment of elegance, combining the prominence of Wisconsin's tallest office building with 21st century facilities."
THE PROCESS... 

The First Wisconsin Center ushers in a new era of architecture for Wisconsin. With the Center we now join a modest way the cities which have experienced what Wolf von Eckhardt calls the "architecture of enormity." Because of its large scale and the inherent complexities, The First Wisconsin Center also brings to Wisconsin the sophisticated processes and latest techniques which have evolved in the building industry over the past decade. These processes and techniques make it possible to bring into existence a building of the Center's size and larger projects in the least time, at the lowest cost and hopefully with the highest quality.

To be certain these processes and techniques have been used in Wisconsin but never has there been the opportunity to bring them all into play as the Center permits it. Essentially dissatisfaction with traditional building methods, the length of time to design and then build, coupled with expensive cost overruns and contract disputes have brought about these processes which come under the general label of construction management.

More and more owners are calling on construction managers to control and administer their building projects and the First Wisconsin National Bank went the same route.

After an extensive in-house study of the projected need for the growth of First Wisconsin National Bank of Milwaukee during the next fifteen years was completed. Richard H. Holscher, President of First Wisconsin Development Corporation, consulted with officials of major banks in the United States on whose experience in building projects like the Center he drew in search for the best possible way to build the First Wisconsin Center. In his efforts he very quickly became aware of construction management procedures and the leading companies in this field. Further research convinced Mr. Holsch-
er that the expertise and past experience needed to build the Center was not available in Wisconsin. Based on past performance and expertise, a team consisting of the owner, Skidmore Owings and Merrill, Architects of Chicago, and Carl A. Morse, Inc., Construction Managers, Chicago, was formed to design and construct the First Wisconsin Center.

Comparing the traditional responsibilities with the newly rearranged methods, the architect is one member of the team, the construction manager another and the owner is the third member. Both construction manager and architect are responsible to the owner. And the owner makes all the decisions. In this arrangement the adversary position that existed under the traditional system for the general contractor has been eliminated.

In the case of the First Wisconsin Center the architect and construction manager have cooperated on at least a dozen large projects, the latest of which is the Sears Tower, a 110-story office building in Chicago.

Carl A. Morse, Inc., although maybe little known as yet in Wisconsin, has been in the business of construction management for a quarter of a century, originating from New York City. The company has to its credit the management of bank buildings such as the 62-story United California Bank; 45-story First National Bank of Oregon; 37-story National Bank of Boston; 50-story First National Bank of Seattle just to name a very few among the several billion dollars worth of construction the company is presently involved with. Here is then the way the team functions under construction management for First Wisconsin Center.

The construction manager, or as he is called in the case of the Wisconsin Center, the contract manager, in his capacity as the owner's agent, is an integral part of the entire process. During the design phase he cooperates with the architect in providing accurate, detailed cost estimates in the very early design stages and in formulating the
project budget. He assesses and relates market conditions, availability of materials and construction technology. His consultations with the architect include recommendations for alternate methods and materials to bring about project cost reductions. He prepares the list of bidders reviewed in-house for past performance, negotiates contracts with suppliers, materialmen, subcontractors and others on behalf of the owner. The construction manager reviews and evaluates the bids for contract awards. Decisions when to buy the subcontracts and the establishment of a purchasing timetable to produce favorable cost factors also enter into the bid and contract award process.

The construction manager is a professional and works for a fixed fee. In some cases he guarantees a project to come in on budget target. This is not the case with the First Wisconsin Center, according to Mr. Joseph D. Pirotta, Vice-President of Carl A. Morse, Inc., and in charge of the Center. All profits revert to the owner and all expenses are the owner's liability. Carl A. Morse, Inc., has opened permanent offices in Milwaukee located in the Wisconsin Gas Company building on Wisconsin Avenue in Milwaukee.

All the elements involved in engineering, budgeting, cost estimating, scheduling, purchasing, inspection, management and labor relations are coordinated through Mr. Pirotta. Ideally the team of architect and construction manager and owner functions are based on trust in each other. It is this word that I heard most interviewing both owner and construction manager.

The First Wisconsin Center's construction method is accomplished on "fast track," a method of construction, that was pioneered by Carl A. Morse, Inc., as I understand it. Under this method construction of the project is started as soon as the structure of the building is determined with all other design phases yet to be developed. Com-
pared to conventional procedures in which the working drawings have to be completed in order to start bidding procedures before any construction can start, this may look like a risky operation. But, again, it is the expertise and past performances of the people involved, that minimize these possible risks. It may be hard to believe but at the time of this writing, the Center has recently capped its 42nd floor and it is expected to be enclosed by December of this year, exactly one year after the first piece of steel was driven. The Center is expected to open in August of 1973 and yet detailed plans for the banking lobby, first and second level plaza have to be finalized and only exist in principle outline.

Architecture and construction under these developments have become dynamic processes which are subject to modern management techniques and controls all geared toward the one primary goal, to achieve the project in the least time at the lowest cost and the highest possible quality under the circumstances.

The role of the architect in this process at best frees him from the many frustrating responsibilities he had under the traditional method. At worst he may have to compromise the quality of his design to the concerns of economics which are the reasons those changes were brought about in the first place. In any case the architect needs to respond creatively to the challenge of processes and techniques.

One fact is for certain and that is that all members of the building industry will be affected by construction management and that the First Wisconsin Center because of its large scale and all the skills it brings together will make its mark on the building industry in this State. So far 70% of the subcontracts were awarded to local contractors and it is their general consensus that they are well satisfied with the methods as well as the management.
NEWS NOTES

WISCONSIN EXAMINING BOARD
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Announces: Four new members are
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Surveyors, by the State Department of
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Appointed for 3-year terms are:
Architect Member: Robert L. Yarbro,
Oshkosh; Engineer Member: John E.
Callan, Milwaukee; Designer Member:
Charles E. Rohde, Plymouth; and Land
Surveyor Member: Richard Batterman,
Beloit.

Mr. Yarbro is a principal in the firm
of Sandstedt-Knoop-Yarbro; Mr. Callan
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Speakers will be:
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Because Teledyne's other reprographic companies are in places like Atlanta, Philadelphia, Chicago, Indianapolis and Kansas City, we need to include the name of our home town. Thus: Teledyne Reprographics Milwaukee!

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Firm: Poethig-Steuerwald & Assoc.
Milwaukee, Wisconsin
Degree: Received his B.A. degree in
1961 from the University of
Illinois, Urbana, Illinois

ROBERT J. SHERBURNE, A.I.A.
Born: January 2, 1917
Resides: Milwaukee, Wisconsin
Firm: Plunkett-Keymar-Reginato, Inc.
Milwaukee, Wisconsin
Degree: Received B.S. in Architecture
in 1949 from University of
Illinois, Urbana, Illinois

ROBERT N. STRASS, A.I.A.
Born: April 24, 1931
Resides: Port Washington, Wisconsin
Firm: Burroughs & Van Lanen Architects, Inc.
Milwaukee, Wisconsin
Degree: Bachelor of Architecture
received in 1957 from Yale
University, New Haven,
Connecticut

Professional Associates

WALTER E. HESTEKIN
Born: August 7, 1924
Resides: Eau Claire, Wisconsin
Firm: Larson, Playter, Smith, Ltd.
Eau Claire, Wisconsin
Degree: Received BSME degree in
1947 from University of
Wisconsin, Madison
Mr. Hestekin is a Professional Engineer
and is our first Professional Affiliate
member.

JANE S. MURPHY
Born: July 9, 1917
Resides: Kewaunee, Wisconsin
Firm: Svoboda Interiors, Inc.
Kewaunee, Wisconsin
Degree: B.A. and M.A. received from
Marquette University,
Milwaukee, Wisconsin, 1939
and 1940, respectively
Professional Affiliate—Interior Designer

DALE M. WIARS
Born: September 27, 1933
Resides: Wauwatosa, Wisconsin
Firm: St. Norbert's College
West DePere, Wisconsin
Degree: Attended University of Michigan

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