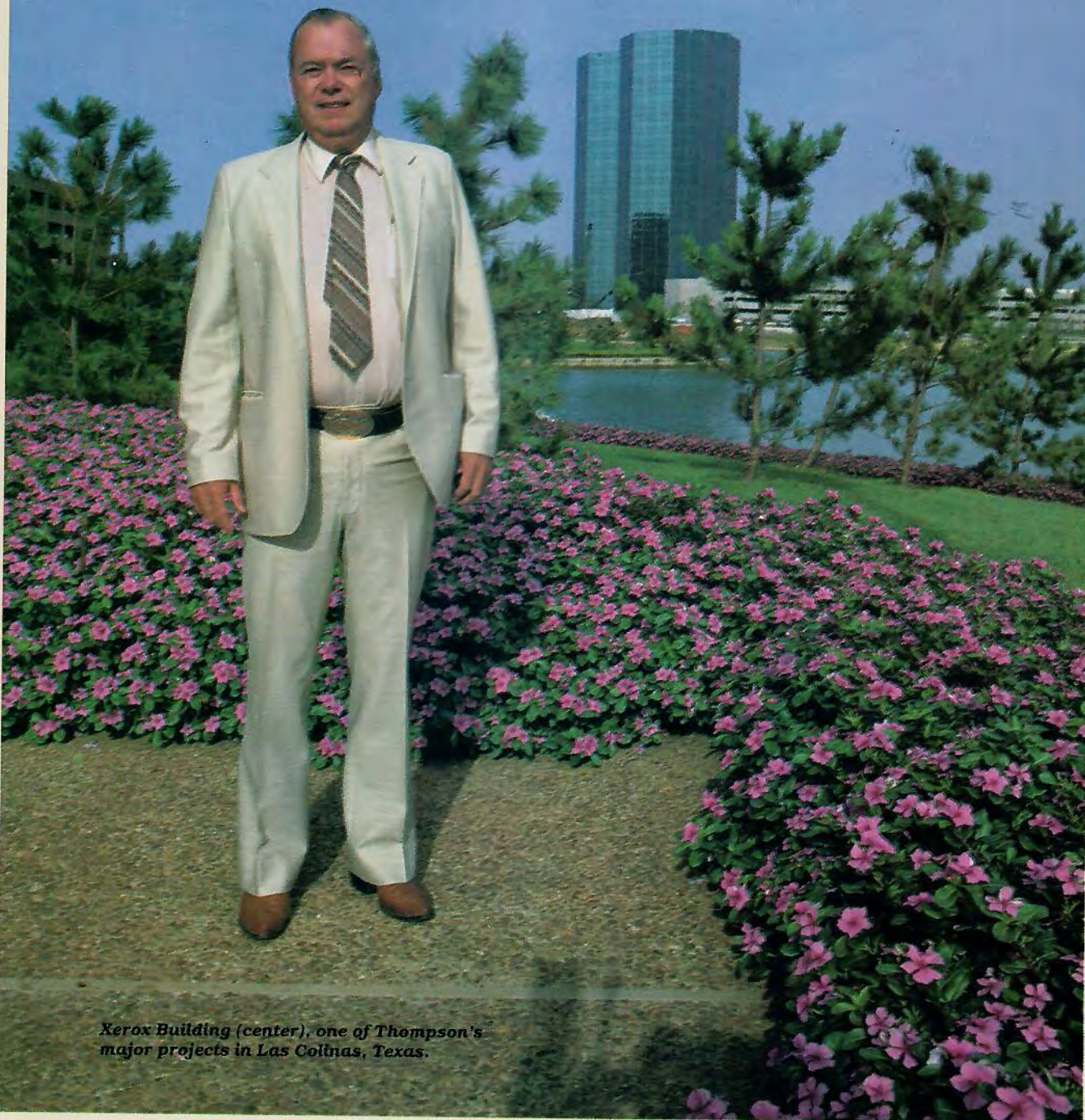


Jack Thompson:



Xerox Building (center), one of Thompson's major projects in Las Colinas, Texas.

37 Years In Mechanical Contracting

When a group of people is fortunate enough to be addressed by the President of the United States, the M.C. makes no attempt to summarize his career and credentials, as is customary when introducing most speakers. All that is required is the line: "Ladies and gentlemen. . .the President of the United States!" That says it all.

That's sort of the way we feel about Jack Thompson. Many of you know who he is—one of the true giants ever to grace the mechanical contracting industry. If you haven't heard of him, take a peek at his resumé, summarized two pages following, and be dazzled as we were by the incomparable breadth of experience, awards, honors and accomplishments. For us to try to summarize such an illustrious career in this introduction would be as futile as trying to write an abridged history of the world. His resume speaks for itself.

Jack has earned a spot for all time in the annals of mechanical contracting — but his career is not finished yet. His newest venture is a consulting business, Enercon, which is explained in the box on page 46.

Most exciting from our standpoint, however, is that Jack has agreed to use us as a vehicle to share his vast knowledge with the industry at-large. He will be writing a monthly column, titled "Mechanical Contracting," and for that we are happy and proud beyond words.

His column will begin next month. In this issue, Jack begins his affiliation with us by writing an overview of his 37 years in the mechanical contracting industry, both his personal involvement and his analysis of the industry's evolution during that period. We think you'll enjoy and benefit from his insight.

—THE EDITORS

IN THE BEGINNING . . .

There has been a lot of water under the bridge since that day in February 1947 when I reported to work as a gopher at the C. Wallace Plumbing Co. in Dallas, Texas.

In December 1946, I returned from Japan and was discharged from the U.S. Army. I didn't know anything



Jack Thompson inside refrigeration piping/machinery room of Arkansas Power & Light Company in Little Rock, Ark. The 1958 project utilized a unique two-stage heat pump system.

about the construction business.

My pre-war major at Texas A&M was aeronautical engineering, but I switched to mechanical engineering at SMU and worked for Wallace concurrently.

At Wallace I did all kinds of unglamorous things, many of which made me appreciate the skills of the workmen in the field. I shagged the materials, saw that the men had information when they needed it, did drafting, and so on. In addition, I made the cash payroll for all the Wallace jobs in the City of Dallas — and here we're talking of 200 or 300 men working every day.

I'd date the real growth of the mechanical construction industry from this post-World War II period. It was right after the war that most of the people who are active in the business today got their start. The economy started blossoming, and the building industry started growing.

I won't try and list the major mechanical contractors at post-war 1945, or even list the prominent mechanical engineering firms back in those days either, because there

were few, if any, by today's standards.

THE INDUSTRY COMES OF AGE

Prior to World War II, most companies were family firms. Very few piping contractors did the kinds of work we expect a mechanical contractor to do today. A plumbing contractor would do the plumbing work, and the piping contractor the air conditioning work only.

The natural tendency of a contractor is to increase his volume. Either he grows or goes backwards; he can't stand still. It just became natural when doing a large office building or large industrial plant, to do *all* the piping rather than part of it. The more volume one had, the more opportunity he had to make money. So the mechanical contractor evolved in a natural sequence.

Before going further, though, let's define "mechanical contractor": It is a corporation, partnership, or proprietorship that performs installations of all kinds of piping systems and related equipment, with the possible exception of fire protection, refrigeration cycles and highly technical systems such as cryogenics.

I've excluded refrigeration cycles because it is a very

Thompson

specialized activity, highly technical. Fire protection is also specialized, although there are mechanical contractors who do fire protection. Cryogenics, a very low temperature refrigeration, is even more involved from a detailed and technical standpoint than the comfort refrigeration cycle. In the past 25 years, there's been a growth in the cryogenics field, primarily in space work.

Manufacturer Vs. Contractor: The air conditioning equipment manufacturers were the system design experts in the old days. They either designed and installed themselves, or helped the consultants design, or designed for the installing contractors.

They helped educate the contractor, but also competed for his customers. During the late '50s and early '60s, the contractors started putting the heat on them to get out of the contracting business. So you find very few manufacturers today who do more than assist in design work, or do any contracting work. They are still competing for service work, however.

I became infatuated with the idea that if I joined the United Association's five-year apprentice program, it would give me a tremendous background in the contracting industry. Unfortunately, according to the rules of nepotism, since I wasn't the son of a Dallas Local 100 journeyman, I wasn't accepted.

I could have *bought* a union card if I had gone to West Texas or Arkansas or somewhere else, but my theory was

to learn by *working*. As it turned out, I progressed faster than I might have in the apprentice program, by the things I ultimately did, although they were done mostly by trial and error.

If At First You Don't Succeed . . . I was so enthused about the air conditioning industry that I wanted to work for an a/c company.

Texas Distributors, Inc., was a *nonunion* refrigeration cycle subcontractor for Wallace. I think I caught its president, **Jack Lowe**, by surprise when I told him I wanted to work for him. But he hired me, and in January 1949, I became a refrigeration mechanic trainee. I worked in the field, and progressed into drafting and then sales engineering.

THE GOOD OLD DAYS

When an engineering firm turned out a set of plans and specifications in the Wallace days, they had a complete design and put it on the blueprint. Thus, when the contractor prepared his bid, the information was there, and he could prepare an intelligent bid. The plans were so good in fact that many times he could use them to make his installation. That's not the case today in many instances.

Back then, not only were mechanical specs and plans pretty good, but so were the field supervisors. Wallace's general superintendents had their own team of superin-

Call Enercon For Project Planning & Troubleshooting

Jack Thompson left the Sam P. Wallace Co. this past May 31, shortly after new ownership took over and reorganized the executive ranks. (See story on page 31.)

Jack says that he departed without rancor, explaining that there was a position available for him in the new organization, but that he preferred instead to pursue an idea that had been rumbling in his mind for quite some time.

That idea is Enercon, an independent consulting firm headed by Jack, which he describes as completely different from most consulting firms now operating in the industry. He explains:

"There are a lot of consulting engineers out there, but not a heck of a lot doing what I'm offering. Most of the consultants do design. I'm doing everything *except* design.

"A lot of owners, developers and contractors have design problems, scheduling problems, start-up problems, claims problems and so on—all of which can wind up hurting the final systems that they build. Very few realize it, but if

they had somebody independent reviewing their plans and specifications *before* they are put out for bids, *before* construction begins, they could save themselves a lot of potential trouble.



"I've been on so many projects over the years," he continues, "I can recognize problem areas faster than most people, and that's a service I feel is really needed in this industry."

Enercon also offers technical assistance in a variety of other systems, such as cost estimates, air balance, water balance, etc. Additionally, the firm will conduct seminars on various topics for companies and groups. Among those developed thus far are programs on the MCAA Labor Estimating Manual, change orders, claims, pre-construction planning, project management, and improving estimating systems.

As of this writing Enercon consisted of Jack Thompson, his wife **Pollie Ann**, left (a former contractor herself) and a part-time secretary. In addition, Jack is drawing from a team of eight veterans "more or less retired from the mechanical construction industry" who are available for assignment as needed. "We'll have permanent employees as our volume increases to the point to justify it," he says.

For more information about Enercon, contact Thompson at: Enercon, Inc., 215 Steeplechase Drive, P.O. Box 160039, Irving, Texas 75016. Telephone: 214/258-6198.

Resume Of Jack W. Thompson

Born: Dallas, Texas, August 12, 1925

Married, 4 children, 8 grandchildren

Military: First Lt., 457 Parachute Field Artillery Bn., 11th Airborne Div., Aust., World War II

Education: Texas A & M University, 1943-44; graduated Southern Methodist University, BSME, 1949.

EXPERIENCE

Sam P. Wallace Co., Inc.

2/84-3/84 President

4/83-2/84 Executive Vice President & Regional Manager

11/78-4/83 Senior Vice President, Regional Manager, Manager/Energy Division

11/75-11/78 Executive Vice President/Operations Manager (Wallace International Ltd.)
Also, Executive Vice President (Wallace-O'Connor International Ltd.) Complete charge of operations for Middle East activities.

1/71-11/75 Vice President & Chief Division Engineer

George Linskie Co., Inc.

1964-1971 Executive Vice President

Natkin & Co.

1959-1964 Vice President, Chief Engineer, General Manager

Fagan Air Conditioning Co.

1951-1959 General Manager & Chief Engineer

Texas Distributors, Inc.

1949-1951 Staff Engineer

C. Wallace Plumbing Co.

1947-1949

NOTABLE PROJECTS

Hallam Nuclear Power Facility, Hallam, Neb.—liquid sodium-cooled reactor

Beef Abbatior/Armour Co.—proto-type plant (design & construct)

Arkansas Power & Light—2-stage-heat pump system (design & construct)

V.A. Computer Center, Austin—one of largest computer centers in the South (design & construct)

Jimmy Dean Meat Plant, Plainview, Tex.—glycol bath for sausage chill (design & construct)

World Trade Center, Dallas—1.2 million sq. ft. (design & construct)

SATSOP Nuclear Power Facility, Elma, Wash., Plant 3 & 5

Jedda International Airport, Jedda, Saudi Arabia

Marriott Hotel, Cairo, Egypt

Kuwait Museum, Kuwait City, Kuwait

Peace Hawk V Project, Dhahran, Taif, Khamis Mushayt, Saudi Arabia

Abqaiq Community Expansion (Aramco), Ras Tanura, Saudi Arabia

Bell Helicopter Facility, Isfahan, Iran

AWARDS & HONORS

1980 MCAA Distinguished Service Award

1975 ASHRAE Engineer of the Year

1971 ASHRAE Distinguished Service Award

ASHRAE Fellow

Principal Author, MCAA Labor Estimating Manual

PROFESSIONAL TITLES

Professional Engineer

Constructioneer

Licensed Air Conditioning Contractor

Licensed Master Plumber

Certified Test, Adjust & Balance Supervisor

ASHRAE Fellow

ASME Member

NSPE, TSPE Member

NCEE Registered

NEBB Certified

ASSOCIATION ACTIVITIES

ASHRAE, 1949-Present. Member: Energy Council, Research & Technical Committee, Nominating, Finance, Journal, Standards, Government Affairs, Long-Range Planning, International Activities.

Director, 7 years

Regional Chairman, 6 years

MCAA, 1967-Present. Member: Resolutions Committee, Budget, Nominating, Management Methods, Foreign Activities.

Chairman, Labor Estimating Manual Committee.

Co-chairman, National Environmental Balancing Bureau

MCAA of Texas, 1964-Present, Director, President, Vice President, Secretary, Member of various committees.

Engineering Societies

National Society of Professional Engineers

Texas Society of Professional Engineers

ASME, ASHRAE

INDUSTRY ACTIVITIES

Plumbers & Fitters Pension Trust Fund, 6 years

Apprenticeship Committee, 5 years

Chairman, City of Dallas, Mechanical Code Revision Committee, 2 years

Mechanical Code Committee, North Central Texas Council of Governments, 3 years

Plumbing/Mechanical Code Advisory & Appeals Board, City of Dallas, 4 years

Director & Founder, North Texas Contractors Association.



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MODEL 815

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tendents and foremen. They made their own buy takeoffs, and did their own detailing. There was no such thing then as a project manager. The superintendents and foremen provided the details, material and the tools for the workmen who did the work.

Or they worked a job this way: they would give a superintendent a pickup truck, a set of plans and specs, some purchase orders and checks — and instruct him not to come back to the office until the job was finished and paid for.

Also in the '50s, important things like markups were higher, and qualified people were around to do the available work, both in the office and field. Contracting was less complicated and more fun. On the other side of the coin, however, systems were not as complicated either.

TECHNOLOGY SPUTTERS AHEAD

With the expansion of technology, there are now more techniques in designing systems that are energy conserving or offer maintenance free operation. Yet the controls and instrumentation involved in those systems have expanded to the point where the average operator and average contractor has to push himself to understand and implement them.

I joined Fagan Air Conditioning Company, a subsidiary of Fagan Electric Company, in 1951. The company had been in existence just nine months. (In those days, I knew just enough to be dangerous but I was also brash enough to think I could make a success on my own initiative.)

I spent eight rewarding years developing Fagan Air Conditioning Company into the largest mechanical contractor in Arkansas.

Floyd Sharp, executive vice president of Fagan Electric Company, was probably the most unforgettable character I ever knew. He was an American Indian, had been active for years in the '30s and '40s in government service, equally at home at the White House or working with such people as Arkansas Senator John McClellan, Harry Hopkins and other people in the Roosevelt Administration or Orval E. Faubus, Governor of Arkansas.

He gave me advice and counsel whenever I needed it, but he also gave me a free hand. Between us, we made a pretty good team.

DESIGN SECTOR SHIFTS

The decade of the '50s found a lot of design being done by manufacturers representatives as well as air conditioning contractors. Systems were becoming more sophisticated. Project managers and/or project engineers were now found on the larger projects. Field supervisors made their own take-offs and did their own detailing; workmen still took pride in their work; and markups were still up.

I guess air conditioning's been around since the early 1900s, but it was in the '40s and particularly in the '50s when it became a necessity, especially in the Southwest. In Dallas and Houston, for instance, any new building was naturally going to be air conditioned.

There weren't many design engineering firms around who had established an in-depth knowledge of air systems at that time. So they depended on the manufacturers, the Carriers, Yorks, etc., to help develop the air conditioning mechanical systems. They helped contractors and eng-

neers develop designs around their equipment.

The distributor a/c organizations sold packaged a/c units, and the condensing units. They also designed and installed refrigeration systems and refrigeration cycles.

Many manufacturers had employees who switched over to the consulting side, and used their experience to become consulting engineers.

Design implementation has to be based on somebody's equipment, whether from one manufacturer or a composite of several. The designs are incorporated onto the drawings, and then bids are taken for the erection of mechanical systems.

In the last 20 years, most of the people in the design field who did not come from the manufacturers' or manufacturers reps' groups, learned from their own experience, because they either worked for contractors,

In the old days, a/c equipment manufacturers were the system design experts. When they began competing for customers, contractors applied the heat, so now few do design or any contracting work.

or worked for a consultant.

Designers have an opportunity to learn more by working with contractors than they do with consultants, because they're exposed to more kinds of jobs as part of a contracting team.

Today there are innumerable mechanical consulting engineering firms. The principals are usually knowledgeable in mechanical design and layout, but normally



Thompson and consulting engineer Herman Blum (now deceased) meet on site of Taylor Publishing project, in Dallas, Texas (1967).

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relegate design implementation to less qualified employees. That's why I say that today designs are less comprehensive than they were 30 years ago. Not enough attention to detail results in interferences and potential problems.

IMPORTANCE OF ASHRAE

Meetings and related activities of the American Society of Heating, Refrigerating & Air Conditioning Engineers (ASHRAE) form a common meeting ground for all facets of the mechanical industry. The benefits from personal and active participation are fantastic.

Most of the things I learned about design I learned at ASHRAE meetings and by participating in committees, going to seminars, getting their data book, etc.

As an engineer, I have enough professional interest to want to participate in ASHRAE programs. I think over the years a lot of mechanical contractors were not brought up through the engineering ranks, and so are not motivated to take part. It has to do with a lack of *professionalism*.

I can't name a specific instance where participation got me any business, but I am confident that business came as a result of these activities. My philosophy was and is today, "Contribute something back to the industry that has been so good to me and my family over the years."

A NEW ERA BEGINS

I joined Natkin & Company as chief engineer in 1959. I relocated to Lincoln, Neb., soon after as vice president/chief engineer and branch manager. We had a very successful and profitable operation during my five-year tenure.

Most contractors were less sophisticated by today's standards in their estimating, project management, cost control, etc. We had labor units for estimating the installation of material, a fairly sophisticated cost accounting system, and relative standard procedures for project administration, and projects being run by project managers and project engineers.

Contracting was less complicated and more fun in the '50s. On the other side of the coin, however, systems weren't so complicated either.

Designs were still relatively simple, but the workmen as well as the supervisors were of a younger group (not as well versed in the old work ethic, quite a few of them products of the apprentice training program and they were beginning to lose company loyalties). They were not willing or able to do their own detailing, make their own buy take-offs or handle reporting. So it became necessary for management to develop ways to back them up and, in some cases, do the administrative job for them.

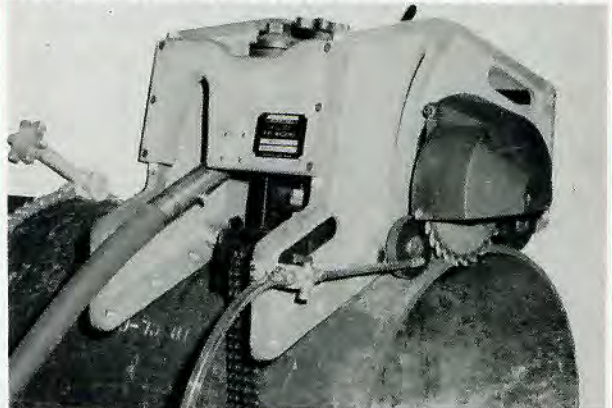
I believe this was the beginning of a new era. Let me give you an example.

Fagan Air Conditioning was strictly a small a/c

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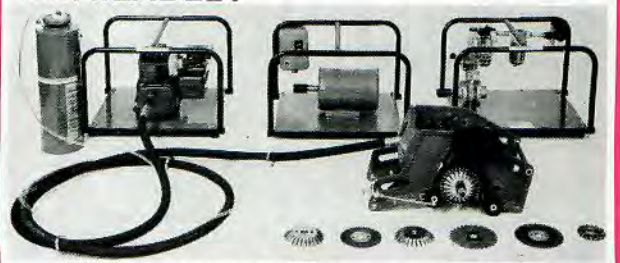
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contractor. But from 1951 to 1959 we became the largest mechanical in Arkansas by developing techniques to do the whole job rather than part of it. I think it's a similar case history with most people who call themselves mechanical contractors.

However, there are mechanical contractors today who will take the whole job, but then subcontract the sanitary plumbing part of it and do the piping themselves or vice versa.

In 1964, I returned to Dallas as executive vice president and part owner of the George Linskie Company.

At this time, contracting was becoming more frantic, designs were less complete, owners were becoming more sophisticated, customers were demanding more, and workmen were becoming more radical, and were less productive.

There was very little nonunion competition then in mechanical work, except in the Southeast.

UNION VS. NONUNION

Today, most mechanical contractors have in some fashion or another established a nonunion company to get business where the nonunion market is strong.

Designers learn more by working with contractors than they do with consultants because they're exposed to more kinds of jobs.

Let's look at Dallas, for instance. In 1975, very little work of any size was done nonunion. But wage rates got up to a point that the union people were pricing themselves out of the market.

In other words, the cost per square foot ballooned. When you're talking of contractor cost at 50¢ a minute for a union workman, let's say, compared to a nonunion workman at 25¢ a minute, you've got a real difference in



Jack and Pollie Thompson enjoy the sights atop local transportation in Cairo, Egypt (1978).



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what the total contract is going to cost.

Five years ago there were not many nonunion workmen as well qualified from an experience and techniques standpoint as the union people. Since then the nonunion people started their own training programs and are making slow progress in this direction.

A nonunion contractor can put together a skilled workman and a crew of three or four or five people who are not as skilled, but ultimately get the job done. Normally they would not do it quite as fast, or do as good looking a job, but the name of the game is: the owner wants a job that works at lowest cost and besides, most of the workmanship is covered up.

The problem is not so much the union wage scale, but the working rules. There are innumerable rules that say what a guy can do on a job and what he can't do. The things he can't do are so prevalent that it makes the cost of construction inordinately high compared to the nonunion guys who can do anything they are able to do.

The unions are making some concessions in wages, but very few in working rules. I wrote an article a year or more ago on the high cost of union construction. With union labor costing from 40¢ a minute in the South and Southwest, all the way to 90¢ a minute in San Francisco, it doesn't take many lost minutes and hours to add up in a hurry.

Unions in most places are giving lip service to doing something about it. In Phoenix, however, they took a \$4 an hour wage cut; in Dallas, they recently took a wage cut, and in Houston too. It's a step in the right direction — but they haven't done anything about the work rules. I don't mind paying a guy \$15 an hour, if he can *produce*. But when I've got five guys I'm paying \$15 an hour, and I don't need but one with four helpers, that's where the problem comes in.

By 1985 I think we will see a complete change in the mechanical industry. In 1983, in Dallas, for example, three major building projects out of four, totalling a billion dollars of total construction, went to nonunion mechanical contractors.

Prior to 1975, no major mechanical project in downtown Dallas had gone nonunion — the split in North



Thompson in front of Wallace headquarters in Alkhobar, Saudi Arabia (1977).

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Texas may have been 80% union, 20% nonunion. By 1983, the pendulum had swung the other way. Now the work is 80% nonunion, 20% union. This has happened in varying degrees across the country except for the West Coast. The San Francisco Bay area, Los Angeles, Seattle, are still union areas, but they are beginning to break.

MCAA LABOR ESTIMATING MANUAL

The Mechanical Contractors Association of America (MCAA) Labor Estimating Manual is acknowledged worldwide as the most comprehensive labor estimating manual in the industry. It covers the mechanical field.

Since its introduction to MCAA membership in 1971, the manual has represented the materials and joining methods prevalent in the industry today. It has no equal.

In 1968, I volunteered to be chairman of the committee to produce that manual. My fellow committee members were **John Quackenbush, Ray Jung, Jim Righter, Joe Sacra, and Ralph Phillipy**, with special help from many others along the way.

The manual was quite an arduous task. For two years, we met at least once a month, for three days at a time, working I would say, conservatively, 16-18 hours a day, plus another week of "homework" once we were back in our offices. Thus, when we met at the next committee meeting, we were up to the next step in progression.

We had three goals: **1)** Define the concept; **2)** Devise how we were going to develop it; and **3)** Come up with something that would work.

I don't mind paying a guy \$15 an hour, if he can produce. But when I've got five guys I'm paying \$15 an hour, and I don't need but one with four helpers, that's where the problem comes in.

We investigated *every* labor manual in existence at the time to see if we could expand upon the information available. But we decided there was none comprehensive enough to suit our needs. I guess it took us about two months just to get to the point where we said, "Okay, we're going to develop our own handbook."

The end result, the **MCAA Labor Estimating Manual**, has had a tremendous effect on the industry. Most government agencies recognize it; the U.S. Corps of Engineers and General Services Administration, for example. And most consulting engineering firms recognize it too, as well as owners sophisticated enough to utilize it.

The committee members continue to research the field. If there is a new section or new phase involved, they issue an addendum. If something needs to be changed in the original work based on new data, they produce a modification. A new chairman heads the committee in most cases every year.

In recognition, the MCAA awarded me the 1980 Distinguished Service Award for which I am very, very proud.

COMPLEXITY AT WALLACE

In January 1971 **George Linskie** sold me along with the company to the Sam P. Wallace Company, where I became vice president and profit center manager of Wallace's Dallas division.

At that time we had more detailed construction controls at the Linskie Company, but over the last 13 years, Wallace developed some pretty sophisticated systems for control and implementation of mechanical construction work. True, they required quite a bit of preparation time as they evolved around computer programs, forms and techniques. But they're not so complicated that a person who understands the construction industry can't assimilate it.

It's not so much the complexity as it is the time and relationship of one system to another. And the understanding and motivation of the person using it.

A case in point would be job costs. Computerized systems break costs down into a multitude of categories. Take the original estimate plus any change orders that impact it: carry that on Spent to Date, and Estimate to Complete. This will tell him the status of a job on any day basis, and what the total cost of that job will be to complete.

Now the Estimate to Complete is a very complicated process because you have to take the job on whatever day, estimate labor, materials, equipment, payroll taxes and insurance, union fringe benefits — all the things that are going into cost to the end of the job. If a guy isn't qualified or interested or dedicated, then the figures mean nothing.

BIG, BIGGER...BEST?

The 1970s were a transitional period. I remember reading letters from Carl Wallace to the editor of one of our trade publications as far back as 1962, asking the question, "Who is the largest mechanical contractor?" Subsequently, the Book of Giants appeared annually, and we often wondered how Wallace or Natkin would have been listed if the criteria had been based on net profits. I guarantee you they wouldn't have been #1 or #2.

All we can do is speculate because almost all mechanical contractors in the country are privately owned. Therefore, their operating data in any one year is not public information, and unless a contractor wants to provide



Egyptian plumber working with lead on Omar Khayyam Marriott Hotel project, Cairo (1978).

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that information, there's really no way to know.

During this period, consultants, contractors and projects all proliferated. In fact, the volume of work far exceeded the experienced persons available.

At the same time, plans and specs were less than complete; construction supervision was less than accomplished; quality management sacrificed for speed. Paper flow increased horribly — the "CYA" syndrome. Too, markups progressively decreased, and project management became less than qualified. All in all, the industry had accepted mediocrity.

TRAINING PROGRAMS A MUST

The MCAA has made tremendous progress in the past 10 years or so with its annual "College For Contractors" and seminar programs. Unfortunately, at least in my mind, the people who need it the most don't go to the meetings. The principals of contracting firms get all that good information, but it's questionable how much they actually disseminate to the people who actually do the work.

Employee training is the only way to upgrade quality. At Wallace, for instance, we had a Key Employee Training Program. Once a month or variation thereof, each of us in our divisions had a session with all of the key employees on some aspect of our business. How many contractors do that I don't know, but not very many, I would think.

(Continued on page 124.)



Early construction phase of the south tower, Omar Khayyam Marriott Hotel project, located in Cairo (1978).

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(Continued from page 58.)

THE MIDDLE EAST CONNECTION

I first went to Saudi Arabia in 1975 as Wallace's project management representative when we ran into problems on the Jeddah International Airport project. In July 1976 we were bought out by our Joint Venture partners, and moved on to the Peace Hawk airbase project.

I returned to Dallas and became executive vice president of Wallace International, responsible for the

At one Saudi job site, our people lived in tents, with no hot water, and makeshift showers. Add the heat, sand, and humidity — there were days of 120° and 95% humidity — and working became almost unbearable.

company's Middle East activities. We were working in Egypt (Omar Khayyam Marriott Hotel in Cairo), Saudi Arabia (air bases and Aramco projects), Kuwait (Kuwait Museum), and Iran (Bell Helicopter Facility).

We worked under extraordinary conditions, especially in Saudi Arabia. At one early job site, our people lived in

tents, with no hot water, and makeshift bathing facilities. Add the heat, sand, and humidity — there were days of 120° and 95% humidity — and working became almost unbearable.

The food wasn't bad, but there were not many recreational facilities. Since women lead a very confined existence in Saudi, we had personnel problems because the wives couldn't adjust.

We had all types of employees. Usually the men had a pretty good reason for leaving the States, whether to escape a bad marriage, alcohol, a bill collector, or the IRS. I guess the shortest tenure we had was one guy who showed up one day, and left the next morning! If the employee adhered to his contract, though, he could return to the States or leave Saudi on some regular basis, say every six months.

The Saudis used American contractors extensively up to 1977. Today there are few American contractors working there. The Koreans and Japanese have done a tremendous job of beating our prices on construction.

It cost the company a lot of money, about \$100,000 a year, just to keep one American worker in Saudi Arabia. We had to pay high salaries just to recruit U.S. workers, and high living costs all contributed to that amount. In Dhahran, for instance, we rented a four-apartment villa for \$300,000 cash — in advance.

Probably the most we had on the payroll in Saudi Arabia was 900 in 1977. Our workmen, not the supervisors, were usually from Egypt, Pakistan or the Philippines. We paid them a lot less money, but we got a lot less work. Very few Saudis worked in the field; they were too busy supplying services or running their own businesses; in short, anything besides manual labor.

I'd like to go back someday, although it's not exactly a garden spot!

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THE INDUSTRY TODAY

I headed the Energy Management Group which projected Wallace into the retrofit and energy management side of the mechanical business. All told, I spent the better part of 1976-78 in and out of the Middle East.

Energy conservation has become a buzz word, but there is very little net effect in the designs I have seen to really attempt to save energy. The budget and/or low dollar is still the criteria for the speculative building design and contract award. On the other hand, if the owner is going to occupy or use the facility, however, he will in most cases be very energy conscious. From an economic standpoint, the higher the cost of a kilowatt, the more interested people who operate these buildings will be in energy conservation. Right now in Dallas, for instance, the cost of a kw is about 5 1/2¢; in New York it's 10¢ or more.

The number and size of nonunion contracts have increased tremendously. But the nonunion people are faced with additional problems over the union contractors: **1)** They lack organized training programs for key employees in the office and field; **2)** They lack a training program at the entry and apprentice level; and **3)** They lack a manpower pool of trained workers for the plumbing, pipefitting and sheet metal trades.

In spite of the available training and information, many contractors are still flying by the seat of their pants. "We do it this way because we have always done it this way." But at some point in the volume of a business, it gets too involved for one or two people to do the whole thing. A

small company can operate that way, a big one cannot.

A company has to become departmentalized to take care of all the records and paper flow; you have to add people, systems and procedures. But you have to have everything going the same way. You have to maintain management control or you will not have any way of knowing if everything has been done right. It's also likely that you will be losing money and won't know it.

We've outgrown our manpower infrastructure. It's reached the point that we cannot supply the qualified people necessary to maintain quality construction.

To my knowledge, there is not one kind of college program that turns out a graduate who can say "I'm a contractor." University programs lean toward highbrow, or I call "egghead" teaching, forsaking the trade school type of teaching. None of the construction management programs that have evolved in the past 10 years is really oriented to mechanical contracting.

Some architectural schools talk about expanding the construction technology, but no one talks of expanding the *engineering* aspect. Until something's done about that, the situation is going to get worse.

NEW GAME IN TOWN

Markups have almost evaporated. I have seen fees for G-Max projects erode from 8% or 9% down to 4% and 5%, and still lose the job. Owners and general contractors are getting pretty cagey — they will pick several candidates for a potential team project and play them one against the other for the lowest fee. They don't consider who can do the least expensive job in the most

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timely and best manner. They don't seem to realize that 1% in fee is insignificant when weighed against potential cost savings.

As late as 10 years ago, a team concept worked this way: the owner would pick a team of general, mechanical and electrical contractors, architects and consulting engineers; collectively they would come up with a budget concept and plans to build the project. That goes back to the guaranteed-maximum concept: each contractor guarantees that his part of the work will not exceed so many dollars.

Today, the owner calls in four or five mechanical contractors on a team project, gives them the scope of the work, and sees what kind of fee they will charge to do the work. That gets back to playing one against the other. And then, if he picks the one with the lowest fee, he might not pick the best contractor.

During the past three and a half years, markups on hard bids have approached zero. Contractors who should know better are bidding at 5% or less markup on hard cost before overhead just to help cover overhead or to keep a crew busy or to help his cash flow.

BE A LEADER

Convince yourself as well as your employees and associates that you are all helpers to the plumbers, pipefitters, and sheet metal workers on the job. See that everyone is dedicated to seeing that nothing interferes with these guys getting the piping, ducts and the equipment installed. Work from can to can't, the way you did when most of you got started in the business.

As a contractor grows, he brings in more people to his organization, and becomes an administrator.

In most companies, people work and do as the leader does. If he works long hours, they work long hours; if he demands performance, they will perform; if he doesn't demand performance, they may or not perform. The niceties of construction that you may not need, like an

During the '70s, consultants, contractors and projects proliferated. In fact, the growth of work exceeded the experienced persons available

office and secretary on the job site, or equipment that may not be utilized full time, help to make costs overrun.

I'm convinced that average workmen want to do a good job — they don't like to stand around or "make work." So get them the tools, materials, and instructions in a proper and timely manner, and get out of the way. If it is possible, they will make you some money.

As many of you know, I left Wallace on May 31, 1984 to become a consultant. You can read about this elsewhere in this magazine. Jim and Jerry have convinced me that maybe I could offer some of my 37 years' experience back to the industry in the form of articles on subjects such as estimating, preconstruction, planning, marketing, claims, finishing the job, management, to name a few. We'll give it a try. Give me the benefit of your input.

—PM