

A History of the
FOUNDRY EQUIPMENT
MANUFACTURERS
ASSOCIATION

1919 – 1979

by
SUSAN L. GIBSON



Casting Industry Suppliers Association
223 West Jackson Blvd.
Suite 800
Chicago, IL 60606
312-957-1701
email: info@cisa.org
www.cisa.org

This history of FEMA has been prepared by the staff of *Foundry Management & Technology*, whose association with FEMA began with the organization of the group in 1919. The first offices were established in the then Penton Building in Cleveland and the first secretary was A.O. Backert, the editor of *The Foundry* (now *Foundry Management & Technology*) at that time.

Cooperation of FEMA staff personnel and representatives of FEMA member companies is acknowledged with gratitude.

Particular thanks are due Frank G. Steinback, former editor and publisher of *Foundry* and the first honorary member of FEMA, without whose extensive help this history would be incomplete.

This history of the Foundry Equipment Manufacturers Association is dedicated to the men who lived through its first 60 years, serving the foundry industry and their country, meeting the challenges of peace as well as those of war.

A HISTORY OF THE FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION

1919-1979

STUDY of the 60-year history of the Foundry Equipment Manufacturers Association makes the importance of relationships clear. The essence of history involves relationships between people and events, causes and effects, and the interaction of people.

The history of FEMA is one piece in a gigantic panorama; although small, it is integral to the whole picture. Changes in American life are reflected in the decisions and activities of FEMA.

FEMA was organized because men representing the 25 original company members felt that a formalized group would give strength to each individual member and to the entire industry. It was logical and natural that manufacturers with common customers and common problems should work together. The development of the U.S. foundry industry is closely linked with the development of foundry equipment manufacturers.

THE FIRST YEARS – 1919-1929

World War I was a great shock for the American people. Before the war, life had been simple. Foreign policy was more or less isolationist, the federal government was too small to qualify as a “bureaucracy,” and the quality of life improved consistently. Industry took giant leaps in technology, and business moved ahead at an even pace. Life was not based on the future or the past, but on the present.

Perhaps the greatest shock of World War I was that it swept America into the 20th century. American industry first took on the characteristics of the modern industry that we know today. Americans were forced to widen their vision and play a role in international affairs. As the United States became a partner in the fighting, it became part of the war effort. Grim reality set in as American casualty lists grew. American industry, however, was perhaps the key factor to winning the war.

This “modern” war shook up a foundry industry unaccustomed to making war materiel for a demanding government. It took some time after the U.S. had entered the war for the government to recognize the importance of castings. As that recognition came, alloy steel castings experienced great demand and malleable castings were used briefly for hand and rifle grenades until gray iron was substituted. Established foundry groups such as the American Foundrymen’s Association (AFA, now AFS), the Steel Founders’ Society of America (SFSA) and the forerunners of the former Malleable Founders Society (MFS) and the National Foundry Association (NFA)

educated the government on the need for castings. Eventually, the industry received higher priority ratings and did better business.

Need for Organization—Foundry equipment manufacturers, however, had encountered some problems. Until the foundry industry was given proper recognition, equipment production was hampered by a lack of priority ratings and shortages of materials. This matter was discussed at the AFA meeting in Milwaukee in October 1918.

As a result, a temporary organization of foundry equipment manufacturers was formed to appoint a War Service Board that would be representative of the industry in government offices. The board was to plead the industry’s case to the government, stressing the importance of foundry equipment to the production of essential castings.

The executive committee of the War Services Board consisted of V.E. Minich, Sand Mixing Machine Co., president; Franklin G. Smith, Cleveland Osborn, Mfg. Co., vice president; and A.O. Brackert, *The Foundry*, secretary-treasurer. Other members included R.H. Bourne, Whiting Foundry Equipment Co.; E.D. Johnston, P.H. & F.M. Roots Co.; S.T. Johnston, S. Obermayer Co.; L.L. Munn Arcade Mfg. Co.; and E.A. Rich, Rich Foundry Equipment Co.

The War Service Board met at the U.S. Chamber of Commerce Reconstruction Convention of the War Service Committees, held Dec. 4-7, 1918 at Atlantic City. Then and at subsequent meetings, the group discussed forming a permanent organization, and they set Feb 4, 1919 for that purpose.

Although the war had ended, the idea of a permanent organization for foundry equipment makers definitely had appeal. The efforts of older foundry groups had shown the value of group exchange and action.

The war started a trend in the foundry industry. Large foundries turned to scientific methods and more mechanization to provide high production of quality goods. The majority of American foundries, however, were small and under equipped.

An editorial in *The Foundry* in early 1919 chided, “Few industries, taken as a whole, are so poorly equipped with labor-saving devices as that of casting production. There are still several thousand shops in this country in which the benefits of the molding machine are not appreciated. The sand blast is still an enigma to many.”

In early 1919, prices of materials and labor continued at wartime levels, malleable castings for railroads and gray iron castings for automobiles were picking up, and steel and gray iron jobbers suffered from a quick drop in federal contracts. Activity in the foundry industry was a factor in the postwar economic recovery. The high cost of labor drove many foundrymen into the equipment market. Inquiries were higher than they had been at any time since Spring 1917. Business looked good.

A Permanent Commitment—Attendance at the first meeting of FEMA came from 25 companies that became the original members (see box). A constitution and by-laws were drawn up, and the members elected officers and directors. The officers were those who had served on the previous War Services Board. An initiation fee of \$25 was paid, and members agreed to prorate railroad fares and Pullman charges so that all companies could be represented at meetings.

The original purposes of FEMA were listed as follow:

- To foster better trade practices.
- To reform abuses existing or arising in the trade.
- To diffuse reliable and accurate trade information.
- To eliminate excessive costs due to unnecessary multiplicity of styles and types of equipment.
- To lend full strength toward cooperating with other business associations with an idea of improving, strengthening, and stabilizing the business interests of the country.

Those intentions give a clear guide to activities that have benefited the group, as well as individual companies, through the years since.

Once FEMA had been organized, it got down to business quickly. In the first year of its founding, members held ten meetings and set up several enlightened and progressive programs. At each meeting, members reported on business conditions and special problems. Soon, a picture of the equipment industry's business patterns evolved. Shared information on regional buying trends, pay scales, manufacturing problems, and new markets was helpful to the membership and led to group action in problem areas.

As the U.S. switched back to a peacetime economy, foundry equipment makers discovered new opportunities for business. Reports from 14 member companies showed that their total volume of business in 1918 had been \$3,086,274. One year later, business had jumped 21%. The figures illustrate vigor in both domestic and export markets.

Sales to railroad foundries started out slowly because of continued government control, but later resumed a healthy pace. Demand for automotive, tractor, and household goods grew sharply with the return of peace, and some equipment makers enjoyed sales increases of 100% or more in one year. A meeting report from October 1919 states, "The expansion in these industries is unparalleled in the history of the country, and foundry equipment manufacturers are

CHARTER MEMBERS STARTED IT ALL

On Feb. 4, 1919, 25 original member companies formed the Foundry Equipment Manufacturers Association at its first meeting. Over the years, some companies merged, some changed their names, some resigned from FEMA, and some went out of business. This is the list of charter members:

American Clay Machinery Co., Bucyrus, Ohio
 American Molding Machine Co., Dayton, Ohio
 Arcade Mfg. Co., Freeport, Illinois
 Berkshire Mfg. Co., Cleveland
 Blystone Mfg. Co., Cambridge Springs, Pa.
 Buch Foundry Equipment Co., York, Pa.
 Champion Foundry & Machine Co., Chicago
 Cleveland Osborn Mfg. Co., Cleveland
 Dayton Molding Machine Co., Dayton, Ohio
 Grimes Molding Machine Co., Detroit
 International Molding Machine Co., Terre Haute, Ind.
 McLeod Co., Cincinnati
 Simpson Technologies (f/k/a National Engineering Co.), Chicago
 New Haven Sand Blast Co., New Haven, Conn.
 S. Obermayer Co., Chicago
 Pangborn Corp., Hagerstown, Ohio
 J. W. Paxson Co., Philadelphia
 Rich Foundry Equipment Co., Chicago
 P.H. & F.M. Roots Co., Connersville, Ind.
 Sand Mixing Machine Co., New York
 U.S. Molding Machine Co., Cleveland
 Vulcan Engineering Sales Co., Chicago
 Whiting Foundry Equipment Co., Harvey, Ill.
 E. J. Woodison, Detroit
 Young Bros., Detroit

being taxed to their capacity to meet the needs of these plants."

Major Activities—The export trade was particularly attractive to FEMA members. Combined export trade of 21 FEMA members totalled \$76,127 in 1916 and \$120,799 in 1917, but dropped to \$87,841 in 1918. There was a definite need for American foundry equipment in Europe, but also stiff competition to meet. One of the first discussions of FEMA members centered on developing an export company under the auspices of the Webb Act.

After several meetings, a plan was accepted whereby each member paid 1% of domestic and foreign sales to the export company they formed in return for stock in the company. A sum of \$14,649.99 was subscribed to the Foundry Equipment Export Corp., which proceeded to act as an agent for stockholders. The corporation studied foreign markets bought equipment from members, and sold it as the company's agent abroad. Alba B. Johnson, Jr. was chosen as the European representative at a fee of \$500 per month plus expenses. Apparently business was good.

A revealing view of the industry emerges from discussion among members. The labor situation was changing for foundrymen and manufacturers alike. Re-

duction of hours brought the average work week down to around 50 hours and in some places to as low as 44 hours. One foundry bonus plan was discussed because of its success in improving attendance. A bonus of 10% plus a paid, two-week vacation was given to those earning \$25 or less per week and 5% to those earning more.

Payment and responsibilities of equipment salesmen varied widely, as manufacturers found out in discussion. One manufacturer computed salesmen's salaries on the basis of a percentage of sales for one year, which became the quota for the territory. Another manufacturer fixed a minimum quota and paid a bonus for sales over that amount. In one firm, salary and expenses totalled 12½% of a fixed quota, with a bonus of 5% on excess business. FEMA members found that salesmen were an invaluable link to the individual foundryman, and they soon found ways to capitalize on that contact.

Mechanization—The foundry industry needed mechanization to cut growing labor costs, but mechanization often turned out to be a waste for small foundries. Some foundrymen bought the wrong equipment; others did not fully understand the capabilities of and uses for machinery; and many sorely neglected repair and maintenance of equipment.

As a result, many foundrymen felt frustrated and angry when equipment ended up idle in a corner. G. L. Grimes, Grimes Molding Machine Co., a FEMA member, told foundrymen in 1919, "The change in foundry methods caused by the introduction of machinery is calling for mechanical training that was not necessary with the old floor methods. Too many foundrymen depend on their hunches that the equipment is all right or not. Often when foundry superintendents and foremen are changed, the entire equipment is changed. This is an economic waste, which reacts seriously on the industry. Equipment is often condemned when it only needs a little intelligent care."

Communication—FEMA members recognized from the start that they and their customers needed better communication. At the third meeting, in April 1919, a service and education bureau was established. Soon renamed Research and Information Bureau, it concentrated on gathering information on the foundry industry. It set out to achieve these goals: 1. Study the number of foundries, their size, types of equipment used, and equipment needed. 2. Study the kinds of foundry courses in colleges, the kinds of equipment studied there, and instructors' attitudes. 3. Give information to foundrymen on the benefits and care of foundry equipment. 4. Open the door to sharing information with the foundry industry.

PAST PRESIDENTS OF FEMA

Years	Company Affiliation	Years	Company Affiliation
1919-21	Verne E. Minich*	1950	John Hellstrom*
1922-23	Franklin G. Smith*	1951-52	Chester V. Nass*
1924-25	Thomas S. Hammond*	1953	Claude B. Schneible*
1926	Samuel T. Johnson*	1954-55	W.B. Wallis
1927	Thomas W. Pangborn*	1956-57	David E. Davidson
1928	Sidney C. Vessy*	1958-59	Gordon E. Seavoy*
1929-30	H.W. Standart	1960-61	Einar A. Borch
1931-32	Herbert S. Simpson*	1962-63	Richard A. Brackett
1933-34	Sidney C. Vessy*	1964	Ralph M. Trent
1935	F.R. Wallace	1965-66	John M. Kane
1936-37	Robert S. Hammond*	1967-68	C.H. Barnett
1938-39	Herbert S. Hersey*	1969-70	Hugh A. Stier
1940-42	P.J. Potter	1971-73	James B. Green
1943-44	Ralph W. Hisey*	1973-74	Kenneth E. Blessing
1945-46	Thomas Kaveny Jr.	1974-76	David E. Bonn
1947-48	Otto A. Pfaff*	1976-78	Jay E. Blanke
1949	W.L. Dean*		

*Deceased

FEMA conducted a similar and more detailed survey of the state of foundry education after World War II, and that information aided in the later development of the foundry Educational Foundation.

The bureau also recommended that all traveling salesmen and field men tell their home offices of trouble any foundryman was having with equipment made by any FEMA member so that repairs or training could be started. The Foundry, in an editorial in October 1919, praised the new idea, saying, "The policies of this association, if carried out, cannot fail to benefit the entire castings industry. . . . This kind of business policy has been termed 'enlightened selfishness'—at all events it is effective in its beneficial results to all concerned."

To enlist the aid of salesmen, members invited them to a meeting to "absorb the spirit manifested there." Salesmen, members, and nonmembers were welcomed to the banquet meeting held in conjunction with the AFA convention in Philadelphia.

A publicity committee was established to begin an information program for foundry executives. The goal was to explain how to get longer life and maximum efficiency from foundry equipment. A list of names gathered from salesmen and from mailing lists was expanded to include foundry management, superintendents, and foremen.

The committee felt that a personal approach would be to send an introductory letter to 5,000 foundrymen, explaining the purposes of FEMA and asking for home



A.O. Backert, editor of *The Foundry* from 1907 to 1924, became the first secretary of FEMA when it was formed in 1919.

addresses. Letterheads listed all FEMA members. The committee also set dates to speak at the AFA convention and at the NFA meeting to introduce and publicize FEMA. The FEMA speakers were warmly received. Members began printing "Affiliated with FEMA" on company letterheads.

The introductory letter was extremely successful. FEMA received 2,189 replies and got 9,736 names for its list. Follow-up mailings hoped to bring the total to about 16,000 men. The committee then sent pocket binders to the men on the list, with monthly bulletins for insertion covering various aspects of equipment. Each month, the issues discussed a particular type of equipment such as cranes, converters, cupolas, grinding wheels, sand mixers, and so on. Eventually, most FEMA members contributed their expertise.

It became necessary to develop a standard report system to simplify business trend interpretation. A new reporting sheet was adopted that listed company name, total number of orders, total volume of business, shipments, and unfilled orders for the month. A credit exchange was started to counteract problem credits. Each member listed all accounts 90 days or more past due and gave them to the secretary so that poor credit risks were exposed.

In the first year, FEMA members set an initial membership fee of \$50. Members later were assessed .1% of gross volume of business in 1918. A membership committee was formed, and all members pledged to try to bring in one new member. Equipment makers not in FEMA repeatedly were invited to attend meetings and banquets. Resignations were accepted reluctantly and new members welcomed readily. A committee was formed to write an industry code of ethics. Study was given to the idea of forming groups based on types of equipment.

Members celebrated the good business outlook at the end of FEMA's first year. A growing American economy, export opportunities, and an upward buying trend kept them busy. FEMA projects started in the first year were to open new doors to sales and communication with the foundry industry.

The Twenties Boom—As the U.S. entered the 1920's, it felt a delayed effect from the halt of a wartime economy. Businesses that suffered most during the war recovered best in peace, and vice versa. A recession started that lasted until 1922. Equipment makers had moderate sales at first, but complained bitterly of the difficulty in obtaining gray and malleable iron castings. Gray iron castings jumped in price, and the skilled labor shortage was acute. Equipment makers eventually suffered through a slack period of promising inquiries and disappointing sales.

The "Roaring Twenties" wouldn't have been nearly as much fun if it hadn't been for the automobile. It was the key to a business revival that started in 1922 and continued for seven years to prosperity. Everyone wanted a car, and as auto production boomed, so did production in related industries. Output per manhour

FEMA CODE OF ETHICS (Adopted in 1924)

The foundation of business is confidence, which springs from integrity, fair dealing, efficient service, and mutual benefit.

The reward of business for service rendered is a fair profit plus a safe reserve, commensurate with risks involved and foresight exercised.

Contracts and undertakings, written or oral, are to be performed in letter and in spirit. Changed conditions do not justify their cancellation without mutual consent.

Unfair competition, embracing all acts characterized by bad faith, deception, fraud or oppression, including commercial bribery, is wasteful, despicable, and a public wrong. Business will rely for its success on the excellence of its own service.

Controversies will, where possible, be adjusted by voluntary agreement or impartial arbitration.

To avoid overstatements or misrepresentations concerning our product, with respect to quality or materials, workmanship, accuracy, efficiency, or size of any machine or any parts thereof.

To take no advantage of a customer's ignorance to sell him any machine that we are not convinced is best suited to his purpose.

To quote time of delivery only after careful production schedules have been made, and not to promise deliveries that cannot be reasonably made.

To promote elimination of unnecessary sizes, to conform to standards after they are adopted, thereby giving our customers a lower price through reductions in cost of equipment.

To build all equipment to conformity with standard safety codes whenever these codes come into effect.

To refuse to accept orders including unreasonable demands for service terms, data, attachments, or any other thing not required by the usual competent buyer.

To keep on improving the design and quality of foundry equipment in reasonable step with progress in the art, but not to multiply sizes and styles at the whim of the user.

To take no buyer's word as to a competitor's price, terms, time of delivery, guarantee of production, or any other material condition of a sale, for an ethical buyer will not disclose such matters to a seller's competitor.

Not to solicit the cancellation of an order placed with a competitor nor to accept such an order if offered, but to consider such orders as closed incidents.

To be very particular, when sketches or drawings are presented by a customer, that their use and reproduction will not infringe property rights of others, and will not deprive others of the legitimate fruits of their own toil or inventive ability.

To prove to competitors by our acts that we are as sincere and honorable in all matters as we fairly expect them to be.

To hold our industry, ourselves, and our fellow participants in it, in the high esteem that rightfully belongs to the makers of foundry equipment.

To maintain such a friendly attitude towards competitors as to enable us to meet them and discuss frankly any question of mutual interest that we are permitted by law to discuss.

rose 63% during the decade, compared to 14% between 1910 and 1919. The real GNP increased by 42% by 1929.

The foundry industry recovered from the recession to surpass all records. Foundrymen showed new interest in money-saving equipment, new processes, cost systems, and merchandising. New technology developed, including magnesium alloy sand casting and a flask pin to insure close tolerances of cope and drag mold halves.

During the recession of the early 20's, an editorial in *The Foundry* pointed out the trend toward more refined and economical equipment, especially for sand handling, cleaning, and material handling. The editorial guessed that more equipment developments were in the making, and stated, "Progress always has attended more faithfully upon eras of industrial and business stress, as is evident from a chronological study of inventions, and the period now closing (1922) should prove to be no exception."

In the mid-1920s, refinements in dust control, annealing, sand control, permanent molding, heat treating continuous melting, and cleaning came on the foundry scene. Reduced costs and higher production led to hand-controlled hoists, mechanical chargers, improved hand-controlled hoists, mechanical chargers, improved core and mold blowers, pouring devices,

tilting sandblasters, and a wide variety of molding machines.

In 1924, the Committee on Standard Tests of the AFA Foundry San Research Committee published a set of tentative standards for determining sand characteristics and analysis. Representatives of FEMA worked closely with AFA on subsequent committees for pattern and vibrator standardization.

Getting Experience—As business picked up, FEMA activity branched out in many areas. FEMA officially endorsed the modification of the Johnson Act on immigration. Member suffered from the skilled labor shortages and needed the manpower that a relaxed immigration policy would permit.

FEMA members became active in foundry industry groups, and some served as officers in both areas. The pocket binder system, suspended briefly, was revived—this time with 15,000 names on the mailing list. FEMA supported the AFA exhibit.

The Code of Ethics Committee submitted its final draft in 1924, and it was adopted by the group for the sales and manufacture of foundry equipment (see box item).

Equipment makers experienced a boom in 1926. Business was 17% higher than it had been in 1925. Some plants operated at 80-85% of capacity.

Before the Bust—FEMA's 1926 annual report described how that boom should encourage members to consider long-range plans. The report incorrectly guessed that the good business streak meant a stabilization of business, but it did forecast the importance of distribution and marketing in the next decade. Members seemed to agree, for FEMA activities show an increase in the study of sales forecasting and analysis, advertising and promotion, standardization, merchandising, and group action.

FEMA established a statistical system based on an index figure of 100% that represented orders averaged from 1922-24. Members were encouraged to meet as much as possible with foundrymen and to offer helpful ideas for improving foundry production. A committee was formed to study simplification and standardization in the foundry equipment industry.

FEMA came to the defense of the foundry industry in an angry resolution to the American Society of Mechanical Engineers, dated Sept. 20, 1927. The complaint followed an ASME pamphlet covering rules for the Lincoln Arc Welding Prizes, which implied that in many cases, castings were either unsuitable or inferior as components for use in machine parts.

The resolution evoked an apology from ASME, which promised changes. At the same time, the Publicity Committee displayed newspaper and magazine clippings quoting manufacturers' reasons for not using castings as parts. The committee urged a program of advertising to cover the advantages of casting and to promote both foundrymen and equipment makers.

The committee report explained, "In the final analysis, the merchandising problems of the foundry are our problem. Whenever forgings, stampings, or fabricated unites supersede castings, the foundries' decreased volume is reflected in our business. There appears to be a very definite need for a well directed campaign to create and maintain a 'casting consciousness'... Possible cooperation by the foundries, foundry supply industry, and the AFA is a matter for discussion."

By the end of the decade, the foundry industry was doing well. In an industry made up primarily of thousands of small shops, the trend was toward mergers and growth into larger plants to handle increased demand. Equipment manufacturers concentrated on improving export business through establishment of a strong tariff, developing installment selling plans, and selling the concept of machinery obsolescence to foundrymen.

The stock market crash of October 1929 came and went, and business for the foundry industry continued to be encouraging into early 1930. An editorial in *The Foundry* in December 1929 said, "The stock market fails to rock foundry boat." Apparently the foundry industry and its suppliers lagged behind the general economic trends for some time, for it was a little later



The original Penton Building, home of Penton Publishing Co. and The Foundry, in Cleveland, also was the site of the first FEMA offices from 1919 to 1923. The building no longer exists.

that both felt the sting of depression. The strength that had developed in FEMA as a result of its activities in the first ten years was the essence of survival in the next ten.

THE DEPRESSION—1930-1938

Economics was the big story in the 1930s. The depression brought our industrial system to a standstill, and other events seemed to pale in comparison. The crash of 1929 exploded into an immediate loss of billions of dollars, then settled into a deadly spiral of decline that lasted for years. Equipment makers and foundrymen felt the pinch in mid-1930 when new orders dropped. Casting totals across the board quickly diminished, and equipment orders dwindled away to around 10 on the index (1922-24=100). The total number of foundries in 1932 was only a few more than the number in 1900. Foundrymen and suppliers found that survival often meant merging into larger firms.

Hard Times—Early in the depression, the Hoover administration formed the Reconstruction Finance Corp. to help get business moving again. The corporation concentrated on key industries, such as railroads, and loaned them money to pay off debts and repair equipment. Industry in general, however, became exceedingly glum, and the prevailing attitude was one of retrenchment rather than reconstruction. In the summer of 1932, banking and industrial committees were formed in Federal Reserve districts to help organize American businessmen.

An editorial in *The Foundry* in March 1930 encouraged foundries to repair or replace equipment so that they would be ready when new orders started coming in. Another editorial described the situation this way: "When business is good, many foundries feel that they cannot afford to shut down even an obsolete machine to make a change. When business is poor, some plants regard even badly needed plant improvements with disfavor."



FEMA headquarters moved to the second Penton Building, at West Third Street and Lakeside Avenue in Cleveland, when it was built in 1923. FEMA maintained offices there until the mid-1930s. This building was demolished in 1972.

Equipment makers passed the slack times by experimenting with new designs, modifications, and improvements. New machines and supplies were developed and made ready for production whenever business picked up.

Another editorial in the Foundry, in 1931, explained, "Recurrent cycles of depression always are periods of gestation for new ideas. Inventive genius is stimulated by adversity. The present is no exception. Those firms which maintain their faith in the future, and utilize the imposed leisure of slack business to improve their plant facilities, that study to develop new products, will come out of this era with new assets and take the climbing curve of returning to prosperity with increased acceleration."

Safety in Numbers—In 1930, FEMA members realized the need for a united industrial front through cooperation with foundry groups and allied industries. Members saw that the point of contact within FEMA was a common customer rather than a common product.

This view led to a formal plan of classification into product groups. A report on this decision explained, "Special problems relating to each of these classifications and not common to the entire association thus may be handled on a more practical basis. Standardization work, particularly as it relates to commercial practices, statistics by groups which will afford a more accurate guide to business trends, and the compilation of general figures from all of the group classifications will form one of the major activities of the association."

Crane manufacturers (who had grouped a few years earlier) and the sand preparation and material

handling group did meet. They prepared an agenda based on collecting information and educating the foundry industry. The sand group felt that an education project would make FEMA an impartial and authentic source of information on foundry equipment and would eliminate duplicate public relations efforts by members. The problems of the depression interfered, and the program was postponed until more manufacturers could cooperate.

FEMA members looked forward to participating in the Chicago Century of Progress Exposition to be held in 1933. The expo had no specific foundry area, but a general industrial section. FEMA cooperated with the AFA exhibit. Prices for booths averaged about \$10 per square foot for three months, plus maintenance.

Membership dwindled with the lack of business, and a major FEMA activity was the meticulous handling of credit reports, which were absolutely necessary at the time. About 17 members submitted reports, and of 50 nonmembers invited to participate, 13 accepted. Reports were made on accounts 60 days or more past due, and by January 1932, the 30 companies had reported 123 delinquent accounts.

The year 1932 was the low point for foundry equipment manufacturers. The Roosevelt administration brought changes, but for the industry, recovery was a long, slow climb. FEMA members learned that government interference was both good and bad and that an economic turnaround required the help of everyone.

A New Deal—The Roosevelt administration hit the U.S. like a bolt of lightning. In the first 100 days, the government set up new bureaus to solve problems in industry (NIRA), construction (PWA), finance and credit (RFC), unemployment (CCC), agriculture (AAA), energy (TVA), and relief.

The National Industrial Recovery Act (NIRA) was of prime importance to the foundry equipment industry. It required self-instituted codes of fair business practice and a commitment to minimum wages and working hours. Ideally, it was to level labor costs, localize sales, remove some competition, and allow the industry to police itself. Profits would be made by salesmanship and operating efficiencies.

FEMA instituted an NIRA code after months of work and frustration (see box). It was a classic case of bureaucratic confusion; and FEMA, like others, became frustrated and angry at a government that delayed code approval, offered token enforcement of violations, made exceptions to rules, pushed unwanted reforms, and encouraged union organization.

The foundry equipment industry gradually picked up under the New Deal. A study of buying trends done in 1935 showed that unfilled demand for foundry equipment was estimated at \$25 million. The figure accounts only for normal buying and does not take into account the state of foundry equipment at the time and the probable replacement needs of the industry.

As business improved, equipment makers shared the problems of other manufacturers. Output per

manhour dropped as workers tried to sustain their jobs, and many accidents were thought to be caused by inattentive, worried workers. The use of apprentices had stopped when business slowed in 1930, and by 1935, there was a growing need for both apprentice training and skilled labor.

Equipment exports gained ground as business improved abroad. Foundry equipment was more popular than other industrial machinery, and total foreign shipments amounted to \$1,879,709 for the first nine months of 1936, compared with \$983,807 in 1935 and \$445,535 in 1934. The major customer in 1936 was the USSR, which spent \$1,381,762. Most major industrial countries began buying American foundry equipment in 1936, led by the USSR, Canada, England, and Australia.

FEMA activities in the mid-1930s included a change in the by-laws to make two classes of members: Class A were under the NIRA code, and Class B were not. Members discussed working within the bureaucracy. Business improved with a program administered by FHA, which provided low-interest loans for foundry equipment. The FHA loan program allowed for loans to \$50,000 to be secured through local banks, with government guarantees against loss up to 20%. No down payment was required, and the first payment was delayed 60 days.

Members participated in presentations of new foundry equipment and processes at foundry associa-

tion meetings. They were well received by foundrymen eager to buy, but still limited in financial resources.

Gaining Ground—In 1936, the NIRA was ruled unconstitutional by the Supreme Court, and government controls were in flux. F.R. Wallace, Tabor Mfg. Co., FEMA president at the time, summarized the effect of NIRA on FEMA: “Under NIRA, association activities of necessity received a distinct impetus. Thanks to wise leadership, this industry suffered less and gained more during the code-making period than many others. The termination of NIRA found this association stronger and better able to serve this industry than ever before.”

Technology became an integral part of the foundry industry in the 1930s, and foundrymen anxious to beat the competition turned to experimentation. Refined and specialized equipment appeared for molding, sand reclamation, heat treating, sand control, and high-frequency melting. Foundrymen tried radiography, continuous melting, rotary furnaces, superduty fire-clays, spectrography, new gray iron alloys, and high-production casting cleaning units

New markets for foundrymen developed, including refrigeration, aluminum cylinder heads, magnesium aircraft parts, investment-cast materials, and cast iron brake drums and crankshafts. Foundries specialized to stay in business, and as new products appeared, the processes changed. By 1937, steel and malleable output had risen to 80% of 1929 totals. A survey of the

SURVIVING THE NEW DEAL

FEMA members, like most American businessmen, were eager to cooperate with Roosevelt's New Deal programs to get the economy moving again. The goals of the National Industrial Recovery Act (NIRA) were immensely important to equipment makers, and it was their first real taste of bureaucratic red tape.

FEMA called a special conference in June 1933 to discuss NIRA and the part FEMA would play. A committee had met in May of that year and recommended to conference participants that FEMA should protect its members by having an industry code and a code of fair competition. The first draft of the code was presented at the conference and was sent back to the committee for revision. A special fund for code work and expenses was charged to members, with the provision of a time-payment plan for members in bad financial condition.

During the summer of 1933, Drafts 2 through 4 were written, revised, and studied by members. Draft 4 was sent to Washington for government approval. In October, committee members went to Washington with Draft 5 for preliminary hearings, which resulted in Draft 6. This was presented at a public hearing in November, and committee members believed that the changes in Draft 7 would be the last. Just to be sure, they submitted Draft 8.

Committee members waited a week, then received a completely changed and rewritten Draft 9, sponsored by the administration. On November 20, two drafts almost passed each other in the mail as the administration and FEMA tried again. By November 21, 12 drafts had been written. At the end of November, Draft 15 was proposed.

Committee members, government representatives, and industry spokesmen made phone calls, wires, and had meetings to hash out problems in time to have a final draft at the end of December. Draft 18 was mailed to Washington on December 20, and C.E. Hoyt, industry advisor, was given power to accept certain changes in an effort to “get the boys out of the trenches by Christmas.”

The difficulties were too much, however, and revisions continued until the acceptance of Draft 21 on January 2, 1934. The FEMA code finally was signed on February 6, 1934.

Apparently, however, FEMA's experience with NIRA codemaking was relatively easy compared to those of other industries. After NIRA had been judged unconstitutional, industry leaders feared its resurrection in another form and actively fought against it. The ordeal of the NIRA and its problems forced foundry equipment makers to realize the importance of communicating with government agencies. From then on, many took a more active interest in government affairs.

foundry industry that year showed that the average rate of operation was 44 % of capacity, that the average work week was 3 ½ days, and that 67% of foundrymen were interested in new equipment.

In 1937, sales for equipment makers increased an average of 89.9% over 1936 figures. FEMA members surveyed found customers to be cautious, that they paid an average of 10-15% more in wages over 1936, that labor troubles were slight, and that most were active in government affairs. One company reported that orders were easier to get than at any other time since 1929. It almost was a seller's market.

FEMA had survived the lean years of the depression, and accordingly, membership increased near the end of the decade. Under the direction of Arthur J. Tuscany, Jr., executive secretary, a three-year plan was started to insure the development and longevity of FEMA.

The FEMA *Newsletter* first was published in 1935 and carried sales tips, recommendations on federal programs, and progress reports of committees. Product groups finally organized, and the credit interchange improved as more participated. Various committees represented manufacturers on industry standardization work. An industry directory was planned.

Just as business started to recover, it slumped again in 1938. New Deal critics blamed government actions for reforms that weakened business confidence. Roosevelt's recovery efforts took an obvious reform stance. Business, government, and the public shared equally the support of the old and poor through taxes. Industry was forced to accept guaranteed minimum wage-and-hour protection with the FLSA.

Equipment sales dropped below 1937 levels with the burdens of government regulations and taxes. FEMA became more active in government affairs, and manufacturers learned to cope with regulation. The Fair Labor Standards Act encouraged labor, and the period was characterized by violent strikes and enthusiastic union organizing. Unemployment jumped to 19% in 1938, and depression seemed ready to settle down once more.

The outlook at the end of 1938 may not have been the brightest for foundry equipment manufacturers, but it signified the end of an era. Few people realized then that the next few years would bring drastic and unexpected changes in the foundry equipment business.

WORLD WAR II—1939-1946

In isolationist America, few preparations for war were under way during the depression. By the late 1930s, the Roosevelt administration became concerned over the state of our military, and it pressured Congress to vote defense appropriations that ultimately would serve two purposes—provide for a strong defense and revive the failing economy. New

orders from Europe, demand for consumer goods, defense orders, and the Lend-Lease plan gave industry the boost it needed.

In 1940, foundry operations increased to 60% of capacity. As foundry production grew, the foundry equipment industry flourished. Never before had it had so many burdens and opportunities at the same time. Equipment makers enabled a weak and out-of-date industry to rebuild for production at the highest rates ever. Foundries of every size and specialty had been derelict in improving and even maintaining equipment and systems. Before they could produce high-quality war armaments, they had to revamp, modernize, and smooth out production kinks.

The foundry industry was just beginning to appreciate mechanized systems when the U.S. began its military buildup. In a speech at the AFA Congress in 1939, W. J. Jennings, John Deere Tractor Co., described the situation typical of the industry at the time: "There are perhaps a dozen large foundries that are completely mechanized and a hundred or more partially so. Due to changing economic conditions, it becomes almost imperative that our foundries are equipped better—improved from every point of view." This comment described an industry of about 5,000 foundries.

Tooling Up for War—The prospect of increased business and the possibility of war resulted in a change of priorities for FEMA as manufacturers concentrated less on recovery and more on war production. The credit interchange was dropped temporarily, and the membership considered collecting figures on industry consumption of raw materials. If complete, the figures could help the industry in the event of allocations. Membership increased, and representatives continued to assist in the development of technical codes.

A survey of FEMA members in September 1939 showed that business for August and September increased between 104% and 380% over business in the corresponding months of 1938. Supplies were abundant, labor problems minimal and the outlook encouraging.

At the 1939 annual meeting, V.E. Minich, Wheelabrator Corp., who had been the first FEMA president in 1919, recalled the industry's situation in 1918. He told of difficulties in getting materials and of the frustrations of working without a united industry voice. He also warned the membership to be ready to work as a group to secure priorities for materials and to get government cooperation in production problems. FEMA members, studying the situation that had existed before the U.S. entered World War I, expected casting demand to fall.

It was apparent to Americans at the end of 1940 that the European situation was serious and that a full-scale buildup of U.S. arms was necessary. FEMA members set about streamlining their operations and planned for cooperative industry efforts. Membership

was encouraged, and statistical reporting was improved to provide a better picture of industry activity. The base years for the index of orders were changed from 1922-24 to 1937-39. The FEMA staff took on additional duties, including giving information on sales opportunities, locating personnel, conducting surveys on specific types of equipment used, assisting with tax

Foundry production became the highest since 1929. Steel castings were used for railroads; for armor plate for tanks, shells, turrets and hulls; for marine work; for pipeline valves; and for miscellaneous parts. Chief malleable casting markets were automobiles, motorized military equipment, military parts, and shells used by some Allied countries. Gray iron castings

TOOLING UP FOR WAR

The remarkable contribution of equipment makers to the war effort was summed up in an article written in 1942 in the *Daily Metal Trade*. It said this:

"To appreciate how sharply this industry had to increase its operations to meet the unprecedented requirements of war, one should remember that foundry equipment was not in active demand throughout most of the decade of the thirties, in fact, in certain months of 1932 and 1933, the index of foundry equipment orders (1922-24 = 100) dropped to as low as 9, 10, and 11% of the base.

From this abnormally low point the business of the industry recovered through the late thirties and under the impact of war, rose to an unbelievable peak of an index number of 1490 (1922-24=100).

For any industry to go from a low of 9 to a high of 1490 in a ten-year period is remarkable. For the foundry equipment industry to take these extremes in stride is phenomenal because the industry is relatively small, is compact, and caters to a definite, limited field.

Nevertheless, foundry equipment manufacturers have been successful in meeting every challenge of the rapidly expanding war production effort. To illustrate how it has met unexpected assignments effectively, we can cite two typical instances.

In March 1942, ground was broken for a new steel foundry in the Chicago area. It was to be one of the

largest steel casting establishments in the country. Orders for foundry equipment were placed when the original plans were drawn. However, the capacity of the plant was revised several times, and orders for equipment were increased accordingly.

In spite of the fact that the equipment industry was confronted by 'must' orders from expanding foundry capacity throughout the casting industry, it managed to get out the equipment for the steel foundry so expeditiously that the great steel casting plant—started in March—already is in operation. It was dedicated on October 29.

A second illustration has to do with unexpected emergencies. Several times during the past year disastrous fires have swept through foundries engaged in war work. Each time government and industry representatives went to the foundry equipment to get the fire-swept plants back into production at the earliest possible moment.

In each instance the foundry equipment manufacturers managed somehow to perform miracles in re-equipping the ravaged casting shops, at the same time continuing their task of equipping the expanding foundry industry.

Regardless of what the future may hold in store, the foundry equipment manufacturers are entitled to congratulations for the job they are doing in meeting a difficult, unprecedented challenge."

problems, contacting government offices for individual members, and securing licenses for foreign trade.

Gearing up for war production on short notice created labor problems. Although semiskilled workers could be trained quickly, skilled labor still took time to develop. FEMA members were encouraged to develop apprentice training programs based on rapid and logical advancement.

Members also came to realize that prejudice against the use of castings existed in some high government offices. A joint conference of foundry trade association presidents was planned so that they could coordinate efforts.

The annual survey of 1940 showed some changes in the foundry equipment business. August and September sales showed gains averaging 76% to 275% better than the tremendous growth in 1939. Prices for raw materials rose, and scarcities developed—some of them serious.

centered mainly on consumer markets, but also had sizeable tonnages for machines and parts in the Army and Navy, including valves and engines. Regular and experimental orders for shells and ammunition parts were cast in gray iron for the U.S. and Britain. Aluminum and magnesium foundries specialized in aircraft castings, and the non-ferrous industry as a whole felt strong demand. The industry entered a period of intense building, expansion, and shifting to high production.

Equipment manufacturers were ready from the start of tooling up, and the importance of their contribution cannot be overstated (see box item). The demands of the military made metalcasting an exact and constantly changing technology, and production of weapons had to wait until equipment for foundries were designed, built and delivered. P.J. Potter, Pangborn Corp., FEMA president 1941, stated that the equipment industry had an immediate responsibility to the war effort to complete its backlog of orders as quickly as possible. He said,

“This responsibility is due to the fact that equipment for foundries is fundamental to practically all metalworking industries.”

In September 1941, equipment manufacturers were granted priority ratings to insure the quick and steady flow of materials for production. Foundry equipment and machine tools were among the first industries to receive such ratings, which could be extended as far as necessary to ensure ultimate delivery of required materials.

Similarly, priority assistance was granted for repair work in foundries. This ruling meant that the flow of foundry production was considered important enough that repairs could be made without delay. Priority-rated foundries had the means to get quick repairs and parts from equipment makers.

The priority ratings were granted on a temporary basis, and it became necessary for the foundry equipment and supplies industry to be represented in Washington (see box item).

War Production—The ratings came none too early. As the U.S. entered the war, Roosevelt called for a \$52-billion armaments budget. In 1943, he increased the figure to a \$100-billion budget. He asked for the production of 60,000 planes, 45,000 tanks, 20,000 anti-aircraft guns, and 6 million deadweight tons of merchant ships. The foundry industry responded with a 1942 output four times that of 1941.

Foundrymen resisted the urge to worry about post-war implications and plunged in by building larger plants and planning mechanized systems. Production emphasized improved cast metal properties, redesign of castings to meet specifications, and developing new uses for castings. Steel foundrymen learned to use lower grade scrap, and others began to conserve materials and substitute alloys.

The trend in buying reflected the need for mechanization, which included larger, specialized molding machines; core machines; sand conditioning units; blast cleaning equipment; conveyors; and cranes. Special problems were solved with the development of foundry equipment (see box).

World War II meant that everyone sacrificed, including equipment makers. In spite of huge production demands, equipment manufacturers had many problems of their own to cope with. The industry suffered from a severe manpower shortage, and men thought indispensable to plant operations suddenly volunteered or were drafted into the armed forces.

The remaining manpower pool consisted of men over military age, women, handicapped workers, and the wounded who had returned to civilian life. Under normal circumstances, it was thought impossible to maintain production levels with that labor force. Manufacturers also had to consider training, poaching of workers, turnover and absenteeism.

The new labor force presented an unusual problem for managers who not only had to keep production rolling at record levels, but also had to strive for the

A UNIFIED WAR PRODUCTION EFFORT

History is said to repeat itself, and it did for the foundry industry at the start of World War II. Foundry production trends followed those of World War I, with growing demand for steel and nonferrous castings and a slump in orders for gray and malleable iron. Ferrous foundries that did not switch to production of steel or other castings conducted research into new uses of iron castings and tried to develop stronger, more versatile castings. Foundrymen, through their technical societies, tried to educate the government on the value of iron castings as war materials.

As a result of the sudden demand for war materials prior to World War II, FEMA became an integral part of the war production effort. By the time government production efforts were concentrated in the War Production Board, FEMA was ready to step in as an effective representative of the foundry equipment industry.

In 1940, President Roosevelt appointed Mason Britton, vice president, McGraw-Hill Co. and three associates to form the nucleus of the Machine Tools and Heavy Ordnance Division of the Advisory Commission to the Council of National Defense. This eventually became the Tools Div. Office of Production Management—later the War Production Board. Britton was closely allied with the machine tool industry and was responsible for meeting the growing demand for war production machinery.

Britton realized that casting production must rise to accommodate the manufacture of machine tools, and, therefore, foundry equipment was both necessary and urgent for success.

At his request, Frank G. Steinbach, editor of *The Foundry*, served in Washington as chief of the Foundry Equipment and Supplies Unit for a year. FEMA then sent Wyndham R. Bean, vice president, Whiting Corp., as its representative. He, in turn, was followed by Thomas Kaveny Jr., then vice president, Herman Pneumatic Machine Co. (now Herman Corp.) in 1943. Kaveny resigned his presidency of FEMA to take the government position, then returned to FEMA in 1944.

As the initial tooling up for war slowed down, equipment makers felt a slack in orders for ferrous foundries. This was remedied as foundry industry groups and official representatives to the War Production Board convinced the government of the necessity of all types of castings. As a result, foundry workers were exempted from the draft, demand for iron castings grew, and equipment makers had more opportunities to contribute to foundry war technology and production.

cooperation of people unfamiliar with industrial life and working conditions.

When the initial tooling up for defense production slowed, equipment business calmed down. The foundry industry entered a period of large-scale production, and demand eased up on equipment manufacturers. Production of steel castings by 1944 was almost 50% higher than the 1929 levels and aluminum casting production soared. Magnesium casting production jumped from 2,500 tons in 1939 to 170,000 tons in 1943 (mostly for fire bombs).

While steel foundries worked full tilt on high-priority orders, gray iron orders slowed, due to limitation orders that stopped civilian production and left many gray iron plants facing curtailment of operations. Some gray iron plants switched to steel production. Malleable foundries lost orders on agricultural and railroad markets. Brass and bronze foundries started work on aluminum or magnesium parts.

Foundry industry groups gradually educated the government to the advantages of gray and malleable

iron castings for war, and the inoculation of gray iron opened doors for high-quality cast irons as replacements for some steel castings. Research and quality control became integral parts of many foundry operations, and marketing became more imaginative.

Postwar Outlook—FEMA members were urged to salvage any materials deemed worthy of the war effort. Maintenance and repair gained importance as manufacturers tried to prolong the life of plant machinery. “Find a use for it or scrap it” became the byword. With more time to reflect, members considered the problems of postwar planning.

They were in an unusual and vexing situation. The foundry industry was basic to U.S. industrial production, which at that time, concentrated on war goods. The outcome of the war was not certain. Equipment manufacturers had been instrumental in keeping the foundry industry responsive to changing technology and production requirements, but it also had to look to the future.

It is the business of equipment makers to anticipate changes in the foundry industry, and it was difficult to do so, for anything could happen. Equipment makers worried that they might be forced to convert to direct production of war material.

They wondered whether they should start designing equipment aimed at a future consumer market or whether they should wait. They wondered what would happen to the glut of single-purpose machines currently being overused and under-maintained. Would they have to design machines to make single-purpose units obsolete? What about future price controls and probable material shortages? FEMA members searched for ideas and plans to help them get ready for the end of the war.

State of the Association—FEMA membership had grown during the war, partly as a result of public relations efforts to the metalworking industry. Organized FEMA actions helped to keep problems with government contracts, prices, backlogs, subcontracting, and taxes under scrutiny and under control. In 1944, a new logo was designed and a concerted public relations effort enabled members to make contact with more government offices and foundry groups. A study of foundry buying trends showed a favorable outlook for the future.

Members prepared themselves for the sudden reconversion of industry to come at the war’s end. Although some experts warned of high unemployment, others predicted high demand for consumer goods, and accompanying high employment.

Foundry breakthroughs developed during the war indicated promising new markets for equipment. The success of abrasive blasting technology, increased mechanization of foundries, and new emphasis on dust control presented interesting possibilities.

EQUIPMENT SOLVES WAR PRODUCTION PROBLEMS

During the war, military requirements for equipment and materials changed constantly, and foundrymen tried to accommodate the changes as smoothly as possible. This effort required larger equipment and special types of molding machines, sand conditioning units, blast cleaning equipment, conveyors and cranes. The special machines allowed production of better war materials.

For instance, nonferrous foundries increased production of castings for rotary airplane motors. To produce large aluminum castings for the Rolls Royce airplane motor, they needed some of the largest molding machines ever used in America. Equipment makers quick redesigns and speedups of production schedules helped nonferrous foundries meet their demand.

Conservation of materials during the war led to the increased use of airless blast cleaning equipment. Developments in the field during 1942 led to design of equipment to handle production of castings for rifles, armor-piercing shells, bombs, tank bogie wheels and tractor treads, airplane engines, armor plate, and other products.

The excessive use of compressed air to blast internal cavities was a major production problem. Research by equipment makers led to the development of a combination machine that greatly reduced compressed air use and the number of operators required for the work. As a result, the new multipurpose machines brought greater flexibility, increased cleaning speeds, manpower reductions and better quality.

This story was repeated many times over as foundrymen and equipment makers cooperated in helping to increase war production and minimize limitations.

New developments included the inoculation of gray iron, synthetic and mixtures, alloy steel additions improved heat treating, and mechanical charging. Foundry practice improved with the use of directional solidification techniques, aluminum matchplate patterns, exothermic materials to aid feeding, and the discovery of phenolic resins for pattern making. New emphasis was placed on radiographic inspection and magnetic particle testing.

Surplus and Shortage—The problem of surplus equipment became real with the end of the war. The government had invested millions in foundry plant expansions and was ready to dispose of surplus at a fair price to all involved. Equipment manufacturers advised customers of the adaptability of equipment to make peacetime products. Foundry buying was healthy as plants, converted operations, tried to reduce production costs, and made up for the shortage of skilled workers. Manufacturers encountered problems with material shortages and labor difficulties that flared up at the end of the war.

FEMA set out on an ambitious public relations effort that included a speakers’ bureau and a survey of foundry education in the nation’s colleges. The survey showed a definite need for foundry equipment in many institutions. As a result, FEMA recommended to the Surplus Property Administration that it might find an outlet for extra foundry equipment.

The survey also showed that a concerted effort by the foundry industry and equipment manufacturers was needed to educate institutions on the importance of foundry training and technology. Product groups, which

had been active since the end of the depression, were reclassified into dust control, molding machines, abrasive cleaning, sand handling, and blast cleaning.

America gave a huge sigh of relief as the war ended, then proceeded to strive for normalcy once again. The depression and then the war had brought about drastic changes in the lives of Americans and in the fortunes of American industry. The foundry industry had reached new heights in production, quality, research, and technology.

The foundry equipment industry had shown its ability to adapt to changes and to get the job done. The postwar era promised new markets, new products, and booming business.

THE POSTWAR ERA—1947-1958

In the aftermath of World War II, the United States was the most powerful nation in the world. Its military-industrial machine was second to none, its human and natural resources seemed boundless, and its economic system was stronger than ever. Our nuclear capabilities brought the sobering realization that peace was a precious commodity. Three institutions fought for control of American life—business, government, and labor. The U.S. began an ambitious program of foreign aid, starting with the Marshall Plan, in an effort to rebuild nations and cultivate friendships. A thriving export business resulted.

At home, Americans were eager to regain security and consume goods denied for many years. The foundry industry quickly retooled for peacetime goods and prepared to take full advantage of the fruits of wartime research. In the 16 months after V-J Day in August 1945 until the end of 1946, the foundry industry showed a gross increase of 17% and planned another increase in production of 16.3% for 1947. Gray iron, malleable iron, and steel foundries felt heavy demand for production of peacetime goods. Increased use of light metals for military applications led to higher expectations and popularity among consumers, and production of aluminum castings grew. Industry in general tended to mechanize more. Household goods, aircraft production, and automotive demand contributed to the growth of the castings industry.

Foundrymen planned to mechanize and modernize. They particularly wanted systems for sand handling, mold handling, and dust control. The industry still needed a united voice and a more comprehensive approach to dealing with government agencies.

The New Technology—Major changes in foundry technology surfaced as America returned to a peacetime economy. Captured German documents describing the “C” or Croning process of shell molding were made public in 1947. By 1950, many foundrymen showed active interest in the process. Estimates of resin sales for shell molding in the U.S. show the phenomenal growth of the process, which increased resin use from ¼ million lb sold in 1949 to 8 million lb

sold in 1954. In 1970, over 70 million lb of resins were sold.

Another exciting discovery at the time was the development of ductile iron, announced at the AFS Casting Congress in 1948. The separate efforts of Henton Morrogh, British Cast Iron Research Association, and of Albert P. Gagnebin and Keith D. Millis, International Nickel Co., had produced the new metal by different methods. The next year, 50 U.S. foundries had Inco licenses for production of ductile iron. The new material showed increased popularity from then on, and production rose until it became the second largest cast metal in the 70's.

Still another significant development that influenced foundry technology was the introduction of the first organic no-bake cores in the early 1950s. Subsequent experiments led to the development of inorganic no-bake, hot box, and cold box cores. Some foundries continued the use of conventional oven baking of cores, but many gradually invested in the new equipment and processes that promised high-quality results.

Use of the cupola began to decline at the end of the war as foundrymen turned to electric heating and other alternatives. The steady fall in cupola use over the years closely followed the decline in the number of small gray iron foundries. Many foundrymen, however, showed an interest in basic-lined and watercooled cupolas during the 1950s.

Postwar Business—The new technology brought tremendous opportunities for growth among equipment manufacturers. The foundry industry accepted those new developments more readily than before, probably as a result of changing wartime demands and developments in technology. The number of foundries began to drop at the end of the war, but those that prospered were cognizant of the new methods and materials and more apt to invest in mechanized systems and equipment. Manufacturers expanded operations and followed demand into the new markets.

The immediate postwar era found FEMA healthy and active. Membership was at an all-time high of 60 and represented about 80% of the foundry equipment industry. Although business was good, members showed concern over future prospects. They discussed a coordinated effort to persuade the government of the need for liberalized laws on depreciation and replacement of capital assets. Such laws would encourage more foundries to replace rundown or obsolete equipment.

Manufacturers realized that the near future meant a change to a buyers' market when initial postwar buying slowed. Their main problem was keeping volume of sales at the same level it had been when the war ended and during the period immediately after. New efforts would have to be in selling, advertising, and more sophisticated marketing techniques. FEMA activities were directed to market surveys, detailed statistical breakdowns of industry trends, credit reports, and concentrated public relations drives. FEMA members parti-

cipated in the Foundry Equipment Advisory Committee to the industrial College of the Armed Forces, to maintain communication with the government defense establishment in case of emergency.

In 1948, a Foundry Advisory Group was appointed by the Munitions Board. Its formation was an important step for the industry to gain a unified voice in national affairs. The Advisory Group consisted of

Problems affecting Korean War production were inherited from the aftermath of World War II. They included labor problems, raw material shortages, government controls on some segments of the industry, and inflation. Improvements in FEMA statistical methods and active participation in representative industry groups enabled the foundry equipment industry to present to the government cogent and definite

FEMA AND THE FOUNDRY EDUCATIONAL FOUNDATION

FEMA made foundry education a high-priority activity in its first year, and it has supported educational programs throughout its history. FEMA's early surveys on the state of foundry education were instrumental in the formation of the Foundry Educational Foundation in 1947. FEMA was a founding member of the FEF and contributed toward the first \$280,000 grant to establish training programs. Since then, FEMA has provided continuing financial help to FEF programs.

In 1964, FEMA members realized the benefits of sending FEF students to visit AFS exhibits during conventions. FEMA contributed \$1,000 to the program, which was combined with FEF funds to send about 12 students to the 1964 show. The program was successful, and for the four exhibitions from 1966 to 1972,

inclusive, FEMA contributed a total of \$10,000. More students were accommodated in 1974 when FEMA raised its biannual donation to \$3,800.

The Foundry Educational Foundation had started its College-Industry Conferences on an annual basis in 1964. This program grew in success and attendance over the years. FEF approached FEMA on the possibility of supporting the College-Industry Conferences in 1974, and FEMA responded by dividing the \$3,800 earmarked for biannual AFS shows and giving half of it, \$1,900, to the 1975 College-Industry Conference.

Since 1976, FEMA has contributed \$2,500 annually to the FEF College-Industry conferences, which now draw over 150 eager engineering students. FEMA's annual gift to the FEF has increased five times since 1964.

representatives from all major foundry industry groups, including FEMA.

FEF Established—FEMA's concern over education in the foundry industry had been constant since its first year, and it was only logical that FEMA should become a founding member of the Foundry Educational Foundation in 1947. FEMA contributed toward the initial grant used to establish foundry engineer training programs in the original six FEF schools (see box item).

In addition, FEMA was a founding member of the now defunct National Castings Council, which was formed to provide a voice for the combined foundry industry groups. Much of its work has been taken over by the Cast Metals Federation.

FEMA members also contributed time and effort to the National Security Resources Board, which prepared the "Industrial Mobilization Plan for Foundry Equipment and Supplies," written by Lee C. Wilson, consultant. Members of the Foundry Facing Manufacturers Association cooperated on this project.

War, Again—Those efforts proved to be timely, for the industry soon entered another period of war production and controls, during the Korean War. With the experience of war production problems still fresh in their minds, and with a spirit of cooperation with key government officials, foundry equipment makers managed to meet production demands and keep operations moving at a reasonable pace.

reports on the state of the industry at the start of the war. The three key government agencies dealing with equipment makers were the Munitions Board, the National Security Resources Board, and the National Production Authority.

The Korean War ended the slump equipment makers had felt in late 1948 and 1949 and pointed them toward greater production for the war. New orders increased about 245% during 1950, and the growth of business resembled that of World War II.

In spite of close cooperation with government agencies, however, manufacturers still had some difficulty securing materials for war production and price controls also complicated business. In 1952, government control began to slide as defense production leveled out and equipment manufacturers prepared once again to make the conversion to peacetime operations.

Manufacturers spent much time discussing future marketing problems at FEMA meetings. The trend of business activity showed that manufacturers would have to concentrate on design improvements and intelligent marketing more than ever before. Sales forces needed to be organized and to become more comprehensive, and equipment makers needed to specialize and develop new products to remain profitable.

Trend Toward Automation—The years 1952-1955 indicated a slowdown of foundry expansions, but

not of the trend toward mechanization. Spending by foundries dropped from \$118 million in 1952 to \$114 million in 1953. Casting production for 1952, however, was the second highest ever recorded at that time, and production for the first nine months of 1953 measured 13,504,173 tons. Between 1952 and 1955, production of aluminum castings jumped 58% while ferrous casting production increased 11%. Both increases included a general slump in foundry orders during late 1953 and 1954. Casting sales might have been even better if foundrymen had been more aggressive in marketing and sales. Casting consumption lagged behind the gains registered by other industrial products on indexes of production between 1946 and 1955—a lag that could be attributed at least partially to lack of salesmanship.

Equipment manufacturers concentrated on selling foundrymen on the need to replace obsolete equipment with newly developed machinery. Foundry expansions gave way to modernization, in the form of automated foundry systems. Demand for foundry goods was high enough for foundrymen to invest in labor-saving equipment. Foundrymen interested in reducing overall manufacturing costs and meeting tight quality requirements looked to automated systems for closer working tolerances, more complex design possibilities, and cost savings.

The foundry industry was aware of the need to automate, but in some instances, the integration of research, quality control, and engineering into production methods was too much too soon. Foundrymen who failed in their initial attempts at automation misunderstood the importance of a systematic approach and had trouble with the concept that a variation in casting quality meant that an entire line or possibly an entire plant was operating incorrectly. To help correct these problems, equipment manufacturers and foundrymen cooperated with better training and more planning of systems.

An editorial in *Foundry* in 1955 summarized the importance of cooperative efforts between foundrymen and equipment makers since 1940. It said, "In our book, the foundry industry owes much to the companies engaged in the manufacture of foundry equipment, and to their many sales and engineering representatives. Without them, progress in the field of mechanical production would be ever much slower, and it is doubtful if the foundry industry could meet the frequent peak demands for quality castings...If these organizations were not willing to make investments (in designing, building, and supplying the mechanical requirements of casting producers), if they were not anxious to serve the industry in every possible way, if they did not have vision and enterprise, it is doubtful if the foundry industry could look back over the past 15 years with great pride in accomplishment and the knowledge that, to a great extent, its facilities are modern."

FEMA headquarters were moved to Washington in 1954 to provide closer contact with government agen-

cies of defense, price controls, and commerce. Throughout the postwar years, equipment manufacturers were represented at government forums on contracts, tax codes, defense programs, zoning and air pollution codes, and export rules. The group began to hold spring meetings in addition to fall meetings in 1955.

New emphasis and enthusiasm for improvements in foundry processes led to the introduction of automatic matchplate molding, the use of precision piece molds, and the ceramic shell process in investment casting, growth of high-pressure molding, interest in quality control and testing equipment, growth and pearlitic malleable iron, the study of titanium properties, advancements in heat treating, and developments in the use of copper alloys.

Future Plans—Foundrymen were interested in buying equipment, and an article in *Foundry* in 1956 summarized their requirements: 1. Versatile machines for small shops 2. Better designed and engineered units emphasizing easy maintenance and noise and dust controls. 3. Improved sales and service policies. 4. Equipment easy to run and maintain. 5. Complete machines, ready to operate on delivery. 6. Automation for large and small plants. Other demands were for specialized handling equipment, more flexibility in equipment design, segmented automation and in-line operations, electrical controls, and clear definitions of equipment limitations.

Equipment manufacturers tried to meet the requirements of foundrymen and listed some predictions of their own about trends in the foundry industry. They forecast cleaner, safer and brighter foundries; specialized equipment; more use of electric melting; automatic inspections of castings; improved raw materials; more control of metals; and more sophisticated management of foundries. Eventually, the expectations of both foundrymen and equipment makers have been met through refinements in design and emphasis on safety and maintenance.

In 1957, equipment manufacturers studied ways to improve delivery problems, field service work, quality control, and sales contracts. Product groups were extremely active, and FEMA had established itself as a responsible voice of the industry in governmental and economic matters. Life had settled down and no longer was complicated by national emergencies.

Equipment manufacturers found that the times, in spite of cyclical changes in buying, were the best ever for equipment orders and business. Although the 1957 index of orders showed high demand, the industry was entering a period of changing foundry needs. Mechanization was slowing, and the need for replacement of worn equipment had not yet manifested itself. Equipment makers looked forward to a peacetime economy in full flower to increase business, and they fostered great hopes for the 1960s.

America seemed to grow more prosperous every day and the economy rolled ahead relatively smoothly.

For equipment manufacturers, their biggest challenge was keeping up with technology, entering new markets, and meeting demand.

YEARS OF GROWTH—1959-1968

Economic Growth—Americans had great hopes for the decade of the 1960s, and they enjoyed a period of “normalcy” in the late 1950s. For the first time in 30 years, Americans looked forward to a period of peace and prosperity. The fortunes of business no longer depended on recoveries from recessions or buildups for war.

Business already was paying for its prosperity. In 1959, inflation was estimated to cost industry \$6 billion annually, and manufacturers pressed government to enact tax reforms through depreciation laws. Business for equipment manufacturers stagnated in 1958 and again in 1960-61 as the foundry industry hesitated between further expansion and replacement of machinery bought in the late 1940s and early 1950s. Wages jumped and manufacturers felt hard pressed for business.

In spite of the setbacks, this period represented phenomenal growth in the American economy. Between 1945 and 1965, the GNP (1958 dollars) rose from \$355 billion to \$609 billion. Manufacturing employment rose from 15.5 million to 18 million. The number of scientists and engineers in private industry more than doubled, from an estimated 400,000 in 1940 to almost 900,000 in 1964. Industry gambled high stakes on developing new products, and the research and development efforts paid off in equipment orders and capital investments required for production of new goods. Demand for consumer goods outstripped that for defense work and it was estimated in 1964 that 14% of all products available then were new since 1961.

This period was particularly fruitful for the foundry industry, for it finally, really, had learned to sell. Although the period between 1957 and 1960 reflected a low-activity cycle, foundries bounced back to high production in the early 1960s. Between 1962 and 1965, ferrous castings jumped 35% and aluminum casting 21%.

The trend toward automation and developments in foundry technology of the 1950s apparently paid off in the early 1960s, for high-quality, versatile castings led the way into new markets and heightened demand. As traditional foundry markets expanded, demand naturally grew, and foundrymen ventured into new areas. The use of cast aluminum engines for some cars led to improvements in the casting of gray iron engines, including lighter engine blocks. Use of malleable iron in automobiles grew 50% during the 1960s.

Foundrymen began to appreciate the intricacies of production systems and the benefits of technology. The pattern of expansion gave way to replacement of equipment, and as more complicated and capable machinery entered the foundry, the need for better trained people grew. Foundrymen bought equipment in the early

1960s mainly to replace the old and to counter rising costs of labor.

There is a saying that “Automation begets automation,” and as foundrymen bought automated molding systems, they also needed parallel systems for sand handling and preparation. In addition, more foundrymen became conscious of the whole foundry plant and showed interest in improving dust control, safety, lighting, and emission and noise control.

FEMA Projects—The equipment manufacturing industry, too, enjoyed a period of prosperity in the early 1960s. FEMA participated actively in industry standards-setting committees, expanded the product group programs, and represented the industry at AFS conventions. In October 1963, the Foundry Facings Manufacturers Association affiliated with FEMA and became a product group (see box item).

Manufacturers analyzed the costs of salesmen's calls and agreed that a well-developed and efficient sales organization would offset rising costs in that area. Free engineering had become a major cost for manufacturers, with the growing demand for special rather than standard machines and the trend toward the purchase of a method of production, instead of machines only.

FEMA members questioned the practice of offering free engineering to get orders, for it cost the manufacturer money that eventually had to be reflected in future equipment prices. Members realized the need for a more systematic, organized method of management, and many discussions centered on new management theories and practices for greater productivity.

The slowdown of 1960-61 encouraged manufacturers to seek more export business. In 1960, 75% of FEMA members estimated that their export business was less than 10% of total orders. Although the U.S. trade deficit was not large, the possibility of intense foreign competition existed. Some foreign producers already were underselling U.S. competitors, and the balance of payments situation had begun to change. Equipment manufacturers felt some competition from foreign producers, and they were aware of developing technologies and trends abroad.

Equipment makers discussed at length the characteristics and problems of the small foundry customer. In the mid-1960s, foundries with fewer than 100 employees constituted 85% of all casting producers and provided about a third of the industry's expenditures for plant and equipment. From 1960-1965, most of the 1,500 shops that closed and the 1,000 shops that opened were smaller operations. Although the closings were expected to decline, the small foundry would remain a welcome but problem customer for equipment makers.

A panel discussion brought out the main problems of the small foundry, and those points are still valid: 1. Small foundries need a sustained period of good business before they make equipment purchases. 2. Even then, they often have inadequate capital. 3. Small

foundries need more automated equipment to offset high costs of labor. 4. They need specialized equipment that costs more. 5. The industry must have more technology to survive. 6. Equipment makers have neglected the problems and potentials of the small foundry market. 7. Not all foundries need full mechanization, but

with the average of 122 for 1963. Early gains reflected replacement buying, but later trends showed that foundrymen aimed for more capacity. Major buying trends focused on automotive, agriculture, and manufacturing machinery in large, ferrous foundries.

Recent technical developments in the foundry

FOUNDRY SUPPLY MANUFACTURERS GROUP OF FEMA

Since October 1963, the Foundry Supply Manufacturers Group has been an important and productive segment of FEMA. The FSMG is a nonprofit, unincorporated association that provides statistical surveys, market research, credit reports, and information updates for the foundry supplier. Through its committees and its association with FEMA, the FSMG offers representation in Washington, public relations for the industry, and full support of Foundry Education Foundation programs.

The origins of the Foundry Supply Manufacturers Group are unclear, but it may have been in existence as an informal group before 1900. A 1929 article in *The Foundry* traced the history of American Foundrymen's Association (now AFS) exhibits, and stated that a group called the Foundry Supply Association began to assist AFS with convention exhibits starting in 1907. S.T. Johnston (later FEMA president) was named group president and H.M. Lane, editor, *The Foundry*, was secretary.

The group organized exhibitions each year and changed its name to the Foundry & Manufacturers Supplies Association in 1909. After the Detroit convention in 1910, the association was discontinued and the Foundry & Machine Exhibition Co. was formed in its wake. It handled the exhibits until AFA took over in 1915.

The report from FEMA's third meeting, held in April 1919, states that FEMA planned to hold its next meeting in conjunction with the Foundry Supply Manufacturers Association. This group was organized in 1916, and probably was the forerunner of the Foundry Facings Manufacturers Association, which was formally organized in the early 1920s. In any event, some foundry suppliers undoubtedly participated in earlier industry projects.

The Foundry Facings Manufacturers Association consisted primarily of suppliers of carbon facings. The group had headquarters in Cleveland and New York before it moved to Pittsburgh in 1947; it has remained there, with one brief exception. G. Dixon Shrum served as secretary-treasurer and legal counsel from 1947 to 1959. That office currently is held by Bruce Harrison Jr., who has served since 1962.

The paths of foundry suppliers and equipment manufacturers crossed often over the years, and the Foundry Facings Manufacturers Association joined FEMA as a product group in 1963. Its name was changed in 1968 to the Foundry Supply Manufacturers Group to reflect growth and diversification in the foundry supply field.

Currently, the FSMG is active in most phases of FEMA programs. Its 21 members are a sizeable portion of FEMA.

most need planned objectives through a step-by-step program to improve production.

Business for equipment manufacturers improved dramatically after the slowdown of 1960-61. Einar Borch, then with National Metal Abrasive Co., and FEMA president at the time, explained the problem: "For better or worse, we follow the trends established by those major segments of the economy of which we are but a relatively small part. It is apparent that any 'sickness' in the foundry industry does not stem from a major divergence with trends of other industries in the primary metals category. The unquestioned cause of trouble has to be the relative ability, or inability, of individual firms to withstand the financial shock of those low periods of activity that hit the metalworking segment of the economy generally."

In 1963, FEMA changed its index base years to 1957-59, and the level of business inducted a nine-month increase in backlogs of 85%. Business was better than that of the best of the 1950s. In 1964, the order index for the first half averaged 245, compared

industry led to new trends in equipment. Foundrymen and equipment makers had to work more closely when they were planning new foundry molding systems, for instance, so that they were not compromised by overloads in other foundry departments. Varied sand temperature requirements led to a wider selection of equipment to meet foundrymen's sand distribution and preparation needs. New trends in molding and coremaking, such as production of high-density molds, improvements in resin coating, and use of hot box cores resulted in the manufacture of new equipment and the need for more training and maintenance. Political pressure for air pollution codes in local areas caused equipment manufacturers to analyze future problems and design more carefully.

Equipment developments in the 1960s also helped to change foundry operations. The development of steel shot and wear-resistant materials and the airless blast wheel improved casting cleaning operations. Foundrymen saved money with the combination of core knock-out and cleaning in one step. Continuous processing,

large-capacity units, and automatic features on batch-type barrels improved efficiency and savings.

New Priorities—By 1966, the chaos of the decade was in full tilt. The U.S. was piling up an enormous debt in Vietnam, and the people of America were confused, restless, and vocal. Special-interest groups organized and began to plead for women's rights, veteran's rights, safety in the workplace, and preservation of the environment. More and more local ordinances and laws supported them. The individual taxpayer and the businessman got the bill.

The Vietnam War caused little stir in the equipment industry, for orders for defense purposes were relatively small. FEMA officers and directors did meet the government officials to set up methods of determining material requirements of equipment makers in case of a national emergency. The group also discussed forming a trade mission to foreign countries to build export business.

The largest areas of equipment sales in 1966 were in melting and dust control, and as a result, the index of orders for foundry equipment held above the national level of plant and equipment expenditures. The value of shipments of equipment and supplies in 1966 amounted to \$166.5 million, for an increase of 25% over the figure for 1965. The FEMA sales index rose 275% between the low in 1961 and the 1968 level.

A 1969 survey of the equipment industry by the Business and Defense Services Administration, Department of Commerce, showed that in 1966, the foundry equipment industry consisted of 139 manufacturers employing 12,500 people. The majority of manufacturers concentrated on only one of the survey's major product groups. The industry in 1966 operated at about 67-80% of capacity. The survey predicted major foundry industry problems with air pollution control and a subsequent growth in equipment sales. The foreign trade market in 1967 represented 15% of domestic production and totaled \$45.3 million, with Canada the largest customer. Members of FEMA's Government and Public Relations Committee participated in the work on the survey.

In 1967, FEMA elected Frank G. Steinebach, publisher of *Foundry*, to be its first honorary member "in recognition of his distinguished career of services in and to the foundry equipment and supplies industry." Subsequently, Gordon E. Seavoy, vice president, Whiting Corp., and Thomas Kaveny Jr., president, Herman Corp. (formerly Herman Pneumatic Machine Co.), also were named honorary members.

As the Johnson era ended, the foundry equipment industry still rode a wave of good business. Social outcries of the 1960s were to force government action on legislation of great impact to the foundry industry and equipment manufacturers. FEMA members, cognizant of the problems, prepared as well as they could for the coming decade. Their organization proved to be effective in the next ten years, but twists of fate also brought some unexpected surprises.

SETTING A NEW STYLE—1969-1978

As the Foundry Equipment Manufacturers Association began its 50th year, the forces and problems that had been building in the 1960s seemed to culminate in a time of polarization, scientific advances, and terror. The rising voices of divergent groups made themselves heard in government, and new laws affecting equal opportunity employment, health and safety, air and water pollution, and business practices were enacted. The escalation of government social programs and investments in the Vietnam War created a massive new federal bureaucracy and an unstable American economy.

Dr. Seymour L. Wolfbein, Temple University, summarized the recent trends for FEMA members at the annual meeting in 1969. His main points were these: 1. Industrial productivity was double that of 25 years earlier. 2. Service industries employed two of every three workers. 3. Professional people outnumbered skilled workers. 4. Around 20% of all personal income was centered in "Sun Belt" states, and 35% of all engineers lived in California. 5. Vocational training was needed desperately. 6. One of three persons alive in 1969 had been born since 1954. 7. Management would show a trend to younger or older people to compensate for the birth lag of the 1930s. 8. Women would account for the large future increase in employment.

Foundry industry production increased at a moderate rate at the end of the 1960s. Between 1967 and 1970, ferrous castings had a net increase of 5%, and aluminum castings showed a gain of only 3%. Foundrymen continued to delve into new processes and to invest in expansion and modernization programs. Between 1964 and 1969, two-thirds of all foundries made major or substantial capital investments—particularly the larger plants.

Some new technical developments included rapid control tests for carbon equivalent in iron, using a cooling curve; automatic slagging of coreless induction furnaces; flaskless molding; computer control of melting systems; sand reclamation; shortened annealing times; and the availability of scrap in forms suitable for foundry melting furnaces.

Government Influences—Although foundrymen aimed for increased capacity and more modernized operations, they were aware that recent pollution control and health and safety legislation would cost them money in both investments and possible penalties for violations. Each foundry was a unique operation and had to face regulations from an individual standpoint. Pollution control equipment was costly, for it usually had to be engineered to meet specific needs. Often, the combined figure for engineering production, installation, and maintenance exceeded the original cost of the foundryman's cupola—and sometimes his total capital investment.

Foundrymen who had decided to stick with cupola melting during the buying spree of the 1960s were especially hard hit, but those who had switched to electric melting also had to invest in "nonproductive equipment." The nature of foundry work and the work environment made it a natural target for health and safety inspections. Foundrymen's problems turned out to be a mixed blessing for equipment makers: while the foundry industry invested heavily in pollution control equipment, it was forced to cut back on capital expenditures in other foundry areas.

When foundrymen did buy equipment, they tended to secure turnkey contracts for all phases of engineering, production, and installation. FEMA members discussed other business trends such as the effect of government regulations on employment and safety, the increasing number of mergers, and the need to motivate employees. Membership reached 62, product groups were increasingly active, and the outlook for sales at the start of the new decade was optimistic.

As the passions of the 1960s spent themselves, the U.S. entered an era of relative quiet at home, new economic problems, and shifts in power on the international scene. Foundry industry production began to dip in 1969, and shipments of ferrous castings plummeted 18% in 1970, compared with a GNP gain of 4% for the year.

Equipment manufacturers felt a delayed reaction with a drop in sales in late 1970. Shipments of foundry equipment in 1971 fell 48% from 1970 levels, and 1972 shipments were down another 45% from that. Foundry supplies shipments varied at a more moderate rate and followed more closely the pattern of foundry industry production. Tight money and the uncertain economic situation were major factors inhibiting equipment buying.

Uneven Economy—In 1972, the Nixon administration set wage and price controls to limit inflation and slow down the economy. The economy rebounded under the artificial situation, which was reflected in the rise in equipment orders in late 1972 and 1973. FEMA members, concerned over the foundry industry trend of failure to increase its productive capacity, studied the characteristics of the industry and its potential for the future. Ten-year projections showed production increases of 30% and a spending increase of 60%. Member discussion established that future foundry industry growth depended on development of new products, and foundry profits were needed to invest in necessary research and development.

A statistical analysis of foundry buying trends done in 1973 showed that over 80% of orders originated from ferrous foundries, that about 50% of FEMA members' orders came from large foundries, and that OSHA requirements had a minimal effect on 1972 buying patterns.

The Nixon administration's emphasis on détente was responsible for huge American sales of wheat and industrial goods to the USSR in the early 1970s. The

Russians' Kama River truck plant brought new export opportunities for American foundry equipment makers, and orders were estimated to be worth as much as \$200 million or more. While U.S. equipment makers continued to court foreign buyers, they met increasingly stiff competition from foreign manufacturers such as the Germans, Japanese and British.

Withdrawal from the Vietnam War, the end of wage and price controls, and the Arab oil embargo of 1973 precipitated a recession in 1974-75.

The foundry equipment industry experienced a time of explicit government regulations and anticipation of more. Equipment makers actively took a leadership role in dealing with current and potential foundry industry problems.

Foundry industry fortunes followed those of the general economy, with a slide to a low in 1975, then a gain to the present. Equipment orders lagged by one year, with a low of 150.8 (1967 = 100), then a 20% increase in 1977 that continued in 1978. FEMA continued its traditional activities and studied the problems of the present. The Foundry Supply Manufacturers Group instituted a new statistical system for better interpretation and forecasting of business. Population growth, political trends, equal opportunity regulations, export business, industry self-promotion, compensation programs, better management, and increasing productivity highlighted meeting agendas.

A FEMA survey showed that in 1975, 73% of the respondents (58% of the membership) had active research and development programs. Government pressures on foundries for improved pollution, health, and safety controls forced equipment makers to redesign and make changes. The energy crunch slowed or totally incapacitated many foundry operations, and new emphasis was placed on energy-saving equipment and systems. A growing demand for lightweight, thin-wall castings contributed to the slow growth of casting tonnages, for production continued high. Most foundrymen bought equipment mainly for replacement, rather than for new processes or methods.

Recent years have produced several FEMA efforts of great potential benefit to the industry. They include work on safety standards, education, product liability, and government relations.

Safety Standards—FEMA representatives began work in 1972 with AFS to promulgate standards for the American National Standards Institute regarding foundry equipment use. The committee aimed to develop specific foundry industry standards that would be accepted by the newly formed Occupational Safety and Health Administration (OSHA). The standard for the foundry industry, Z-241, would center on four areas: 1. Molding, coremaking, sand preparation and related equipment. 2. Melting and pouring. 3. Cleaning and finishing. 4. Storage of materials and material handling.

FEMA'S EXECUTIVE SECRETARIES – THEIR CONTRIBUTIONS

The men who guided and administered FEMA are, in part, responsible for its current strength and good health. They could see the industry as a whole, and as such, worked to unify the group, clarify needs and goals, and organize activities to the greatest benefit for members.

The first secretary of FEMA was A.O. Backert, who was editor of *The Foundry* from 1907 to 1924. He was active in the 1918 committee that discussed the formation of FEMA and was elected secretary-treasurer at FEMA's first meeting in 1919. It was under his direction that FEMA established many important programs and policies that exist today. Backert organized record-keeping and set up FEMA offices at the Penton Publishing Co., which provided clerical services. FEMA offices remained at Penton until the mid-1930s.

When Backert died in 1924, he was succeeded by H. Cole Estep, vice president of Penton Publishing Co. He served until 1929, and it was during his term that FEMA established its index of orders and became vocal in its defense of the foundry industry.

In 1930, FEMA elected R. P. Dryer as executive secretary. Dryer had represented several equipment manufacturers and had formed the American Trade Association Executives before joining FEMA. In his brief tenure, he worked for closer cooperation between FEMA and other trade groups.

Dan M. Avery, editor, *The Foundry*, was the next executive secretary, and he served from 1931 to 1933.

His chief concerns were keeping FEMA membership active during the Depression and expanding the credit reports.

The pressures of meeting an NIRA code for foundry equipment manufacturing led FEMA members to elect John D. Wise to the post in 1934. He was associated with Osborn Mfg. before his election. His prime concern was NIRA code implementation. In 1935, he resigned and joined Pangborn Corp.

With the election of Arthur J. Tuscany in 1935, FEMA management settled down under a steady leadership. Tuscany served FEMA for 17 difficult years that included a depression and two wars. During his term, membership grew, detailed member surveys were started, marketing information became more sophisticated, product groups were established, and FEMA became an outspoken and effective voice for the industry. After his death, Arthur J. Tuscany Jr. served as executive secretary in 1953.

After the Korean War, members realized the value of a Washington liaison. As a result, they elected CR. Heller to the post and moved FEMA to Washington. Heller was experienced in association management and worked to establish industry/government communication in the productive postwar years.

Charles E. Perry became executive secretary when C.R. Heller retired in 1962. Under his direction, FEMA activities have expanded, membership is at its highest level, and the organization constantly strives to represent current interests of the members.

The aim of the standards was to provide reasonable and detailed guidelines specifically for the foundry industry. Equipment makers aimed at holding down costs while genuinely increasing safety and weeding out insignificant rules. Emphasis was on the practical and realistic. At first, a deadline of April 1973 was set, but after 22 months of work, only a tentative proposed standard had been produced. It was sent to 37 groups, including FEMA, for comment and acceptance. In 1975, ANSI Standard Z-241.1 for molding, coremaking and sand preparation was accepted for the foundry industry. It is included, by implication, in OSHA regulations, and influences judgments.

The next standard, Z-241.2 on melting and pouring, is in the process of review and approval. FEMA members continue to be enthusiastic in the development of standards for industry safety, and work has been started on the third and fourth sections of Z-241. Additional pressure for the development of precise foundry standards has been felt since the establishment in 1976 of OSHA's National Emphasis Program, which concentrated on training inspectors in the foundry field, but currently has been set aside.

Education—in 1973, the FEMA meeting program emphasized the importance of training foundry personnel how to use new equipment and processes

effectively. The discussion gave birth to a committee to study training programs and recommend a program of action. The committee decided to concentrate initially on a "Buyer's Guide" that would help foundrymen plan, select, and use equipment to best advantage. Plans were made for a subcommittee to deal with specific product areas, and work was started in 1974.

FEMA published the guide in 1975. It is a 16-page booklet, prepared with the cooperation of *FOUNDRY Management & Technology*, which contributed its efforts. The guide was made available through member companies and provided a general information source.

Product Liability—Perhaps as the issue of OSHA regulations and safety in foundries grew, the status of product liability and the issue of medical malpractice claims gained prominence. Emphasis also is due to the growing consumer movement of the 1970s.

Representatives of FEMA attended a White House conference on product liability in March 1976 and were briefed by officials from the Departments of Commerce and Labor, the Small Business Administration and OSHA. The officials were told that claims by injured industrial workers against manufacturers and sellers of capital equipment had skyrocketed to the point that insurance carriers were greatly raising premiums or denying coverage altogether. Product liability cases reportedly rose from 50,000 in 1960 to 1 million in 1975,

with judgments rising astronomically. Companies with less than \$50-million sales were more likely to be involved.

The trend toward “strict liability” replaced negligence as a basis for litigation in most states, and court rulings moved the manufacturers’ situation from very limited liability to full responsibility for their products. Soon after the White House meeting, FEMA voted to establish a clearinghouse to provide information on product liability litigation and to provide guidelines for those who became involved in such litigation.

FEMA’s Product Liability Committee realized that product liability problems could be changed in two ways: by a change in government policy and through legislative reforms. The committee reviewed progress on both fronts and recommended that FEMA join the Special Committee for Workplace Product Liability Reform (SCWPLR), and prepare a position statement.

FEMA published its position statement authored by Frank B. Hall, Beardsley & Piper Div., Pettibone Corp., in 1978. This statement takes the position that industrial accidents are far different from consumer accidents. It recommends that a manufacturer’s responsibility for an industrial accident should be covered under Workmen’s compensation procedures, not as a personal injury suit brought into the courts. FEMA’s alternative plan has been used by SCWPLR, a group of about 15 industrial organizations, to influence legislative thinking on solving the product liability problem.

FEMA’s Government and Public Relations Committee became active again in the mid-1970s and has worked as a liaison with the Department of Commerce. The committee follows developments that affect foundries,

such as export regulations, foreign trade trends, OSHA activity, and Environmental Protection Agency rulings. The committee is planning to cooperate with the Department of Commerce in the work on an industry survey similar to the one conducted in the late 1960s.

The work of these committees and other FEMA activities clearly show the benefits of group organization for mutual benefit and protection. Political and economic changes of the 1970s have left us with an uncertain picture of the future, but FEMA group activities certainly will become even more important.

The foundry industry today is as strong as ever, but faces serious challenges from sophisticated foreign competitors, government regulations, and constant demand for lighter, more versatile castings. It will need to continue growth in technology, marketing, productivity, and sales. It must remain profitable and reliable. To accomplish those goals, the foundry industry must maintain and replace old equipment, invest in the newest equipment and processes, and constantly strive for better production and quality.

For the last 60 years, equipment manufacturers have shown a remarkable ability both to lead and to support the foundry industry. Equipment makers created or sensed the new trends in foundry technology, then supplied the equipment once the trends came into vogue.

Throughout its history, FEMA has encouraged the foundry industry, defended it, prodded it toward improvement, and been its backbone. FEMA continues to fulfill its original purposes, and its growth and influence over the years reflect a long and honorable tradition for the foundry equipment manufacturing industry.

For an update on FEMA – now the Casting Industry Suppliers Association or CISA – please refer to our web site at www.cisa.org.