Sidebooms continue to evolve

Midwestern sidebooms have evolved from the "Little Boomers" of the 1970s to the largest booms now available the industry.

Whenever pipeliners talk about construction equipment, the discussion usually includes sidebooms produced by Tulsa-based Midwestern Manufacturing Co. Since the mid-1950s, the company has engineered, designed, tested and made more than 7,500 hydraulic controlled sideboom attachments for new and used, tract and rubber-tired tractors manufactured by Caterpillar, John Deere, Komatsu and other OEMs. Today, the company offers over 140 models of hydraulic sidebooms specially engineered and designed to lift between 10,000 and 200,000 lbs (90,720Kg).

PipeLine and Gas Technology *recently sat down with Thomas F. Golden, President of Midwestern Manufacturing Company, to get his views on the state of the pipeline construction industry, and learn how Midwestern is helping the industry move forward and meet its needs for today's construction environments. Golden has served as President of Midwestern Manufacturing Co. since 2002. Prior to his employment with the company, he was partner with the law firm of Hall, Estill, Hardwick, Gable, Golden & Nelson, P.C., in Tulsa, Oklahoma, and provided legal counsel to Midwestern. Golden is a 1965 graduate of Oklahoma State University, B.S., Economics; and a 1968 graduate of the University of Tulsa, J.D.*

Midwestern introduced the world's first hydraulically operated sideboom pipelayer attachment in 1953. For over 50 years, these sidebooms have continuously set the highest standards for safety, reliability, ease of operation, and cost-efficiency in the pipeline industry. Today, Midwestern sidebooms are engineered and manufactured to satisfy the requirements of each job and the needs of its customers worldwide, and the Midwestern sidebooms are designed to fit on Caterpillar, John Deere, Case, and Komatsu tractors.

Thomas F. Golden, President, Midwestern Manufacturing Company, Tulsa, Oklahoma.

PGT: Midwestern has a long history in the pipeline construction equipment industry. What were the circumstances under which the company was founded?

Golden: In 1956, Midwestern Manufacturing was founded by Armon Bost and a handful of other oil patch innovators and entrepreneurs. Butch Graham of Ritchie Brothers, knew and respected Armon Bost, who he called the father of the modern hydraulic sideboom. At that time, existing pipe laying machines were awkward mechanical machines. Photos of this type of pipe laying machines from that period show complicated configurations that were difficult to operate and potentially dangerous to the welders and other construction workers on the ground in the pipe and tie-in gangs. Midwestern had a better idea: simplify the operations with the use of hydraulics. The idea had legs but the development started slow. Various designs were tried and rejected. New and innovative thoughts were developed, and slowly the modern sideboom began to evolve into a reality.

PGT: What types of equipment offered the industry's first niche into the marketplace?

Golden: At first, the company focused on small sidebooms for the smaller tractors used primarily in utility and plant work and for gathering lines. Many were used to create combo units that could perform three separate functions to decrease the number and types of machines needed by the Contractor on these pipeline construction jobs. The main advantages of the new design were ease of operation and safety. Both advantages are due to the hydraulic operations of the sideboom. On the smaller tractors, the addition of a sideboom converts the machines to combo units. This adds the function of a side lift capacity to the machine. Applied to a loader backhoe, for example, it adds to the loader/backhoe the side lifting capacity for use in plant or fieldwork by making the machine a multi-purpose piece of equipment. On the larger dozers, it converts the machine to a pipelayer to hold the line pipe sections over the ditch as it is welded, coated and lowered in. No one can lay pipe without the pipelayer since it is essential to the pipeline construction process on any size project. The smaller pipelayers and combo units were well accepted in the utility and oil field work, and the machines become known as Midwestern "Little Boomers." The affectionate term "Little Boomers" was a play on the small size of the booms (lift capacity of 10,000 to 30,000 lbs) and because the company is located in the "Boomer Sooner" State of Oklahoma, which is the nickname of Oklahoma University football team. After the production of the small size sideboom attachments was well developed, the company then proceeded

to move up to the next larger size. Taking the knowledge and experience it gained on its first sidebooms, it next applied its expertise to ever larger machines.

PGT: Partnerships have been a key part of Midwestern's business strategy. Can you describe how those relationships evolved?

Golden: Having established a base with the Little Boomers, the company established partnerships and alliances with Caterpillar, Inc. and John Deere Tractor Co. for the supply of sideboom attachments to those companies and other branded machines. The sidebooms were marketed by the tractor manufacturers to their respective customer bases, attached to new small tractors, and sold as completed new pipelayers and combo units. These relationships were mutually beneficial, since Midwestern had access to multiple distribution channels and the manufacturer had access to the sideboom attachments to increase sales of its new machines.

The company continued to refine and improve its specifications on the sideboom while also moving up to larger machines (lift capacity of 30,000 to 100,000 lbs). Designs were also made to convert used purpose built mechanical pipelayers to hydraulic operational pipelayers. Again, the advantages were primarily ease of operation and safety. The benefits of hydraulic controls for the pipelayer were easily recognized by the pipeline construction industry due to the operating ease and safety. High degrees of operating skills and experience were necessary with the mechanically operated pipelayer. With hydraulic controls, operator training time was reduced and the pool of potential operators expanded. Today, most hydraulic pipelayers are controlled by single joystick and pilot control lever.

In recognition of the safety benefits, several pipeline companies mandated hydraulic controls in job specifications. Governmental entities also have required hydraulic feature for use in various jurisdictions. Even where not mandated, the company's hydraulic conversion kits for existing mechanical machines throughout the world are used to convert the machines to gain the benefits of hydraulics and to extend the working life of the conventional mechanical pipelayers. Older model pipelayers with lifting capacity of 40,000 to 200,000 lbs were thus enabled by the conversion to continue to operate for additional years, which in effect is an exercise of advanced recycling.

PGT: Pipeline construction has often been cyclical. How has Midwestern dealt with the high and lows of this part of the industry?

Golden: We have always adapted our equipment to meet the needs of the industry. In the early 1990s, pipeline construction activity was virtually nonexistent. New equipment needs in the industry were minimal until the late 1990s when yet another boom in the new big inch pipeline construction began worldwide. The company had, at that point in time, developed a sideboom attachment model with a lifting capacity of 140,000 lbs The model was primarily designed to attach to older D8K Caterpillar tractors. Midwestern initially offered the sideboom attachment kit to pipeline contractors with an inventory of D8K tractors so that the fleet could be converted from dozers to pipelayers. When it was recognized that growing demand for pipeline construction equipment was creating a shortage of pipelayers, the company purchased 10 of the D8K machines for its own account, and proceeded to convert them to pipelayers with Midwestern sidebooms. The pipelayers were placed in a Ritchie Brothers auction in Houston, Texas. All were purchased and together with eight others auctioned in Ft. Worth, Texas, were exported to Brazil where they worked on a cross-country line through the jungle for over three years. The owner of the pipelayers later reported that during the entire job, the sidebooms operated in the harsh remote conditions without any significant down time or failure. This auction further established Midwestern as a high-quality attachment manufacturer for all sized sideboom attachments, not just the Little Boomers. It represented the reward of 40 years of hard work and lots of listening to the customer base.

As usual, after the pipeline construction boom subsided in 2001, demand for pipeline construction equipment again subsided. During this time, the company began preparing for the next inevitable uptick in pipeline construction while also maintaining its reduced volume of production for the continuing market. Two goals were established, first to design a sideboom attachment for a Caterpillar high-tract D8 size dozer (D8N and D8R) and a second design for the larger D9 size oval tract Caterpillar dozer (D9H).

The first goal was to design a sideboom to attach to a high drive tractor to convert the machine from a dozer to a pipelayer capable of lifting 140,000 lbs at a four-foot boom extension. This is equivalent to the lift capacity of a 583K and 583R Caterpillar pipelayer. Caterpillar ceased building the D8K tractor model in 1984. Since the mid-1980s, most larger Caterpillar track-type tractors have all been built with an elevated sprocket under carriage, which presents some design challenges when converting it to a side lifting pipelayer.

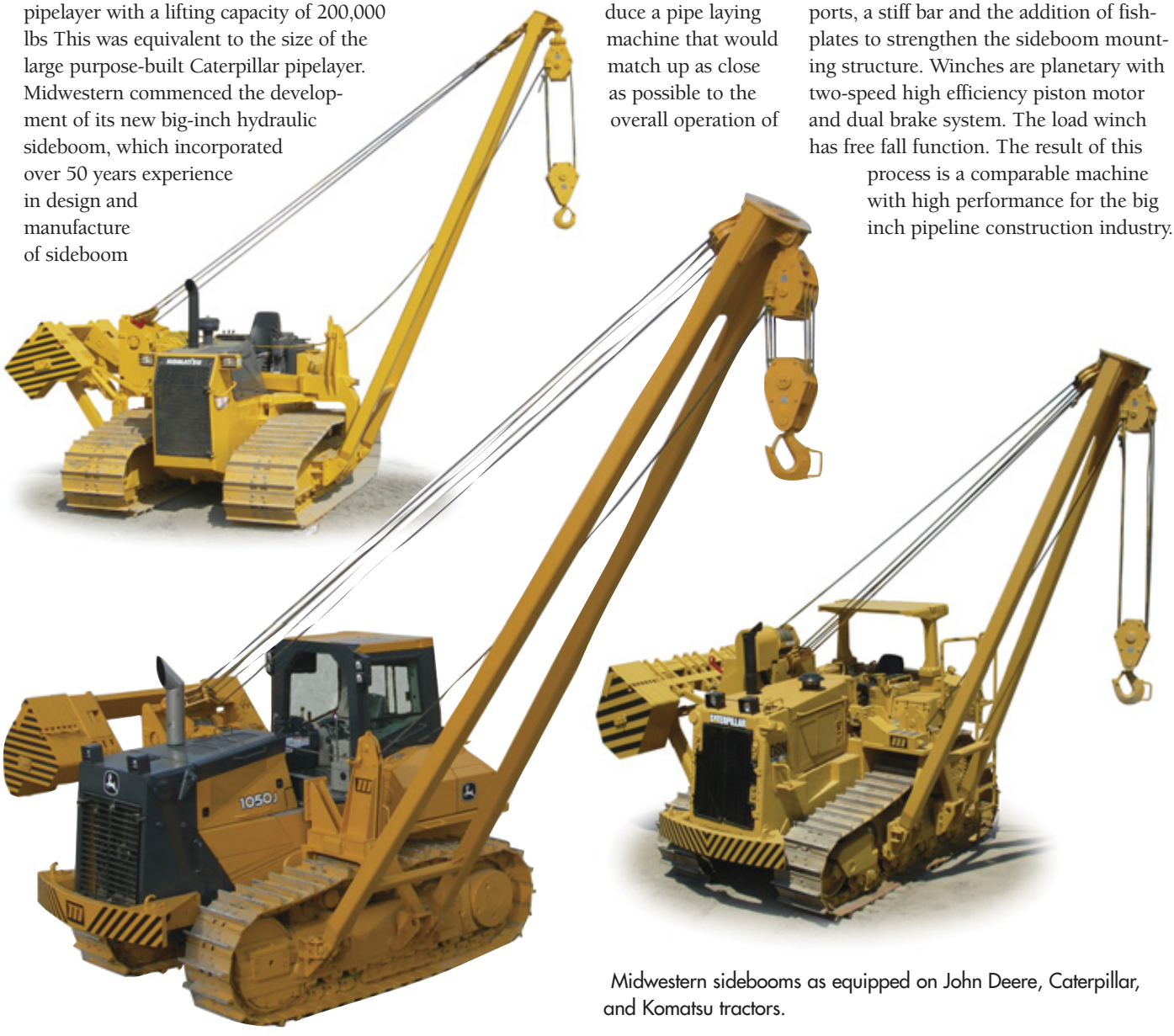
PGT: The design of the pipelayer attachments is a key aspect of the sideboom's functionality and durability. What are some of the most important design goals?

Golden: The importance of the design for the pipelayer attachment came from its ability to enable the newer fleet of high drive tractors to be converted by the company's attachments into an efficient and safe hydraulic pipelayers. The new features of the sideboom attachment developed for high drive D8N track type tractor include excellent visibility to the front of tracks and load hook; pilot

controls for simultaneous control of hydraulic operations; free fall; vertical boom stop and kick out; and multi-axis hydraulic joystick combined with a rebalanced weight distribution for optimum control and performance. The new unit utilizes planetary winches with high efficiency motors and brake valves for smooth load control. The higher center of gravity of the high track machines is countered by a rebalancing of the weight distribution.

The second goal was to design a sideboom attachment kit to convert a Caterpillar D9G and D9H dozer to a pipelayer with a lifting capacity of 200,000 lbs This was equivalent to the size of the large purpose-built Caterpillar pipelayer. Midwestern commenced the development of its new big-inch hydraulic sideboom, which incorporated over 50 years experience in design and manufacture of sideboom attachments. Upon completion of the design, the attachments were installed on three D9H tractors; and, with the assistance of two major U.S. pipeline contractors, field-tested these big pipe-laying machines. The result of this long engineering process resulted in the availability of big-inch pipe laying machines that have been field tested and have performed at or above industry standards with a maximum lift of 200,000 lbs (90,720 Kg) and a maximum working load of 117,600 lbs (63,343 Kg).

The design process included consideration of all factors to produce a pipe laying machine that would match up as close as possible to the overall operation of a purpose-built pipelayer of equivalent size. Close scrutiny was given to modifications to the D9H tractor platform body itself, not just to the sideboom, counter weights and draw works. The new Midwestern M594C includes hydraulic pilot controls; an upgraded hydraulic system with load-sense pressure compensated piston pump; off-set 35-in. track shoes (9,240 square inches of ground contact area); a gross machine weight of 128,300 lbs; good weight-to-HP ratio; and a 132-in. track length. Modifications were also made to the D9H case and frame by the addition of rear "track to frame" supports, a stiff bar and the addition of fish-plates to strengthen the sideboom mounting structure. Winches are planetary with two-speed high efficiency piston motor and dual brake system. The load winch has free fall function. The result of this process is a comparable machine with high performance for the big inch pipeline construction industry.



Midwestern sidebooms as equipped on John Deere, Caterpillar, and Komatsu tractors.

PGT: What has the industry been telling you about it needs in recent years, and how is Midwestern helping the industry meet these needs?

Golden: The large sideboom attachment kits and tractor modifications for used Caterpillar tractor models attracted the attention of the industry. In 2004, John Deere approached Midwestern to develop and expand its production lines to include sideboom attachments models for new 750J LGP (60,000 lbs) and 850J LGP (100,000 lbs) size tractors.

Midwestern had for many years manufactured sideboom attachments for smaller John Deere tractors such as 450J, 550J, 650J and 700J. The move to the next two larger tractors was a relatively easy design process due to the uniformity of design and the quality of construction of all John Deere tractor models, small to large, and further, due to Midwestern's 50 years of specialized experience and knowledge with sidebooms of all sizes. John Deere introduced the new pipe layer models to its dealers and customers with the announcement that the John Deere pipelayers had been developed in partnership with Midwestern. The combination of the two branded names of John Deere and Midwestern helped the new models become quickly accepted in the market. Midwestern has recently introduced its sideboom attachment for the 1050J (140,000 lbs) size tractor and is now available through the John Deere dealers.

PGT: Midwestern has more than half a century of experience in the pipeline construction industry. How does this experience position your company for the future?

Golden: Midwestern's knowledge and experience gained by its long history of growth has solidified its position as a significant member of the worldwide pipeline construction community. It has grown from being known as the maker of the "Little Boomer" in the 1970s to a quality manufacturer of the largest booms available now to the industry. Midwestern has its eyes on the future, and is well positioned to continue to grow and expand its reach so as to continue to be an important contributor to the pipeline construction industry's future. It is monitoring the efforts of IPLOCA and BP to reduce the costs of landline construction equipment and techniques. It is pursuing its own independent research and development of new designs and applications to ensure an active future as the industry continues to evolve. Based on its past and current performance, the future appears to be bright. ■