

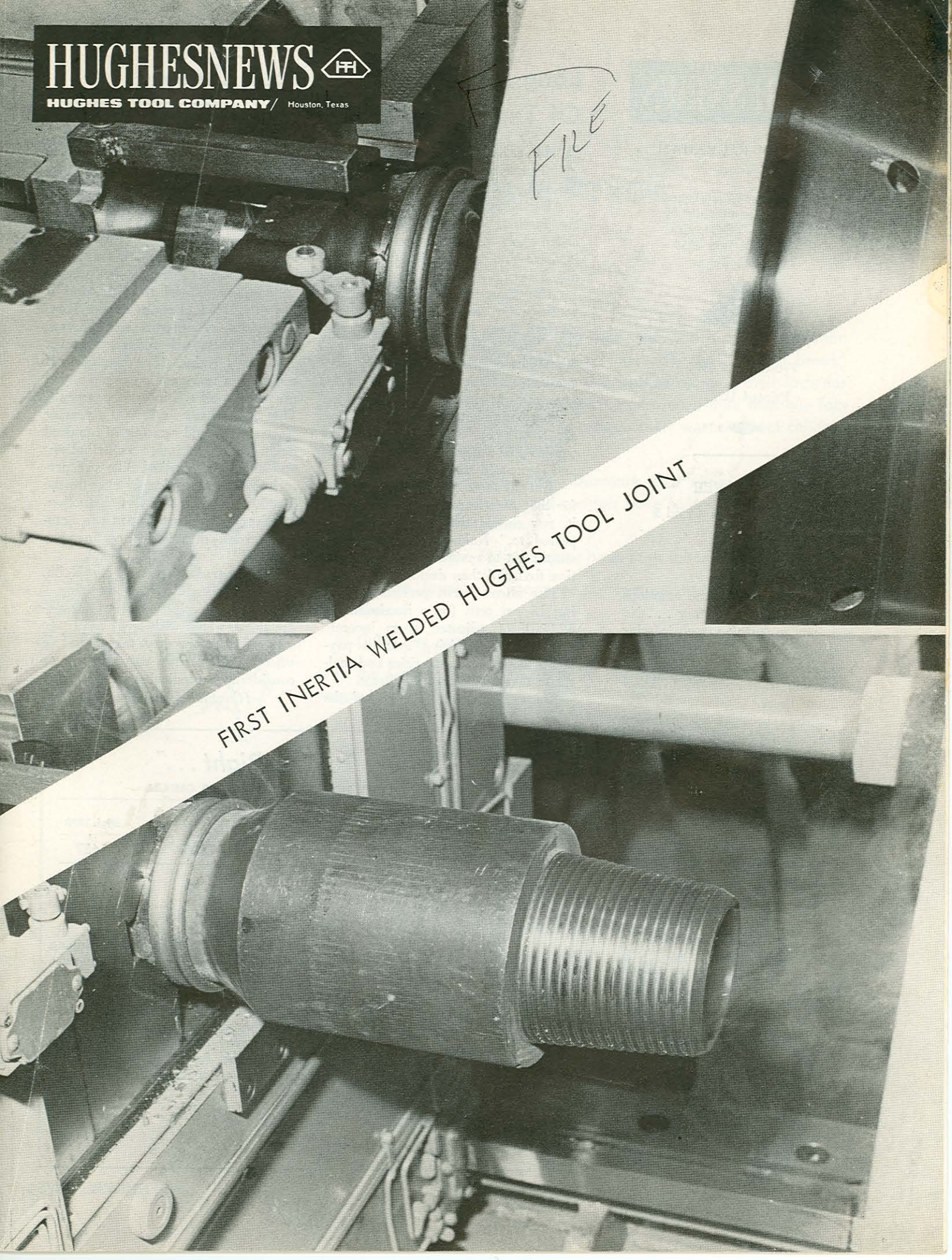
HUGHESNEWS



HUGHES TOOL COMPANY / Houston, Texas

FILE

FIRST INERTIA WELDED HUGHES TOOL JOINT



Inertia Weld is Part of Major Expansion In Tool Joint-Drill Stem Production Area

EARLY IN 1973 Hughes Tool Company President James R. Lesch announced plans for a major expansion and modernization program in the tool joint manufacturing and drill string production departments in the Houston plant.

Recognizing the drilling industry's immediate, and anticipating its long-range, drill string needs, the company promptly began work on the expansion program to help meet the growing world wide demand for energy. Estimates place the cost of

the expansion program at approximately \$7.5 million which will be financed out of internally generated funds and not result in a significant increase over the 1972 level of capital expenditures in either 1973 or 1974.

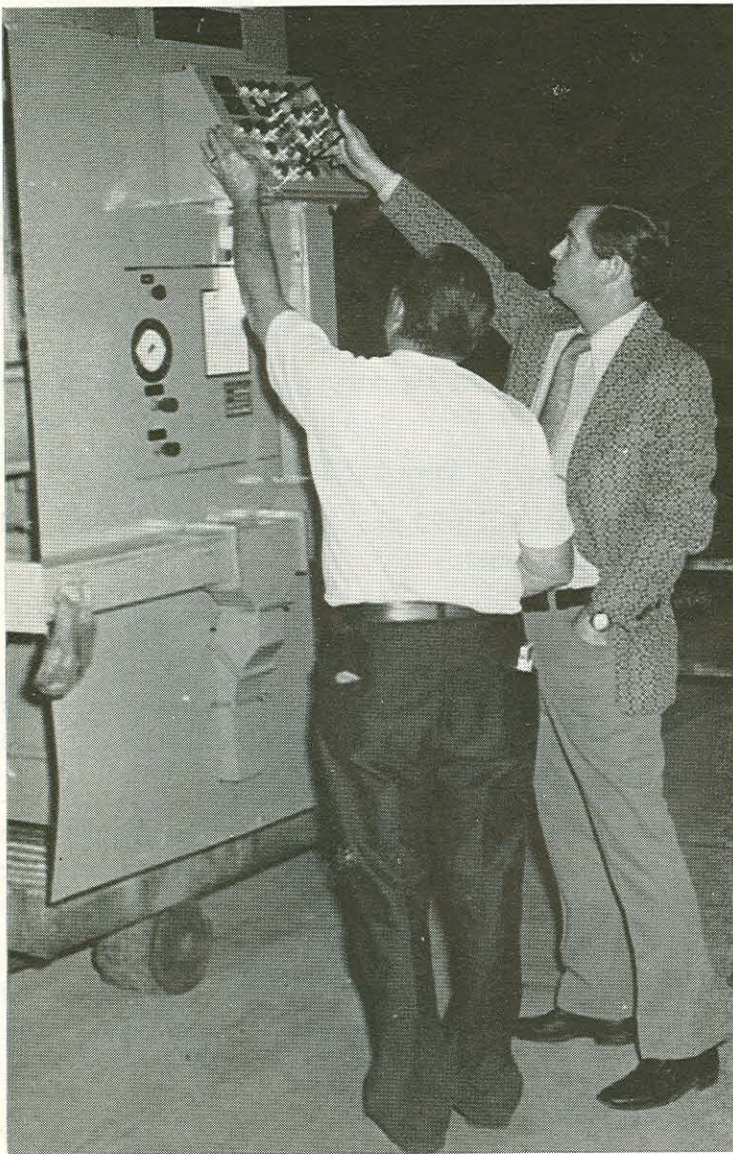
Operations began in the new facilities in December 1973 and are expected to reach full production later this year without interruption of our regular production program.

One of the two keys to the modernization program is the introduction of the Inertia Weld process for attaching tool joints to drill pipe through the use of specially designed equipment. Hughes Tool Company, which introduced the Flashweld process, is also unique now in applying the Inertia Weld process to tubular metal of the size of drill stems. Augmenting both Flashweld and Inertia Weld is the second key—"Tuffweld."

"Tuffweld" restores the physical properties altered by the heat generated in welding tool joints to drill pipe. The heart of the "Tuffweld" treatment is a controlled quench of the heat affected weld zone of the joint-to-pipe connection. Induction heated to above the critical temperature, the weld zone is then quenched to below 600° F, both inside and out, by the use of special equipment designed by Hughes metallurgists and engineers. As the result, a "Tuffweld" treated assembly's fatigue life, tension-impact strength and yield strength are increased significantly. "Tuffweld", in fact, insures that pipe-end strength is essentially the same after welding as when the pipe was shipped from the mill.

Hughes Flashwelded tool joints have been familiar to our customers in the field since their introduction in 1938. Inertia Weld, however, is a relatively new and unique process based upon the conversion of stored kinetic energy in a rotating mass into heat for welding, another pioneering achievement of Hughes research. The energy conversion takes place when a stationary pipe end is forced

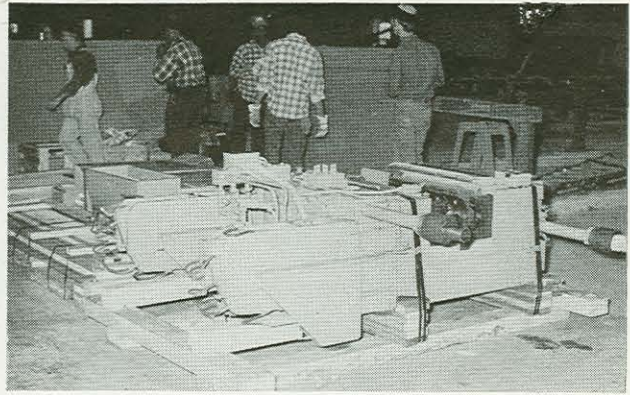
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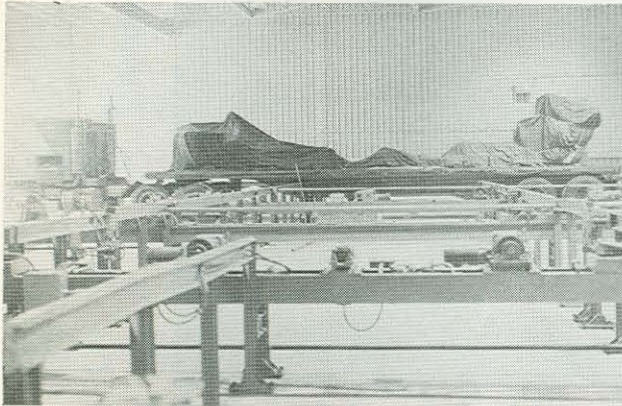
INERTIA WELD PROJECT MANAGER Tom Peacock checks out a control panel with **Craft Manager-Electrical Louis Goodman** (back to camera). Tom is an engineering graduate of Texas Tech and has been with Hughes since 1957. He has served in various assignments in field engineering and has been Inertia Weld Project Manager since 1972. Mr. Goodman has been associated with Hughes Maintenance since 1941.



Truck carrying Inertia Weld Equipment arrived at Hughes plant on December 17, 1973.



Part of unit unloaded and ready to be positioned.



Truck in unloading position in new Inertia Weld Building.



Complex machine is carefully assembled.

Inertia Weld—

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against a rapidly spinning tool joint attached to a properly sized flywheel. Before the rotating joint comes to rest a solid bond between pipe and joint is formed. "Tuffweld" treatment of the narrow heat affected zone assures the assembly of the physical properties necessary to long life and trouble-free performance.

Both Flashwelded tool joints and Inertia Welded tool joints receive the "Tuffweld" treatment—making them the only assemblies in the world today having *quenched* and *tempered* weld zones. This condition is very desirable

on today's higher strength, quenched and tempered drill pipe.

All of the new facilities planned and now in use were designed to provide maximum employee safety and comfort and will assure drilling contractors and operators the quality and strength necessary to fully utilize modern high-strength drill pipe and meet the increasingly severe drilling conditions expected in the future.



Like expectant fathers, company officials anxiously await trial run on December 28, 1973 (above) and happily view the birth of the first Hughes Inertia Welded tool joint, a photo of which appears on our Front Cover.

