THIRTY-THREE YEARS OF STANDARDIZATION
of Oilfield Equipment

By C. A. YOUNG, Director, Division of Production, American Petroleum Institute, Dallas, Texas

Early Days

The STANDARDIZATION of oil field equipment has been an integral part of the American Petroleum Institute since its organization in 1919. R. L. Welch (then general secretary of the Institute) requested the writer (then representing a manufacturer) and two other manufacturers to have an informal conference on this subject in Washington at the 51st meeting in 1919, for the purpose of developing some concrete recommendations on what might be done.

There was a crying need at that time for such a program and instances were cited on which standardization would be highly beneficial, such as pipe threads, taper joints for both rotary and cable tools, rig irons, etc. No specific recommendations were made at the 1919 meeting except that the subject be kept alive by further discussions.

In the meantime, the Purchasing Agents Association of Tulsa had appointed a committee to study the possibility of standardizing rig irons; also at about the same time the Mid-Continent Oil & Gas Association appointed a committee to prepare specifications on oil country tubular goods, under the chairmanship of J. Edgar Pew, who later on became the recognized leader, in standardization in the oil industry as affecting oil production. Captain J. F. Lucey, a director of the Institute at that time, was also active in promoting interest and discussion.

At succeeding meetings of the Institute, representatives of other organizations appeared before the Institute explaining what had been done by their organizations on standardization such as the American Society for Testing Materials, the Division of Simplified Practice in Washington, and the Department of Commerce, and others.

There was a strong under-current of objection among some of the manufacturers and suppliers who felt any such program would stultify progress and improvements, and on the other hand there were manufacturers who were equally in favor of the idea; likewise the users of equipment became increasingly interested and urged that some action be taken.

These pro and con discussions were very helpful in developing a consensus on the need for standardization, and finally, in 1923, the Board of Directors authorized the appointment of several committees to develop recommendations on such subjects as rig irons, cable tool joints, rotary tool joints, wire rope, belting, rigs and derricks, etc. In 1924 it authorized the creation of the Division of Standardization to administer the work of these committees with the writer employed as Director.

Skeptics Convinced

In the light of developments it is interesting to recall some of the early days in the work, particularly the dire forebodings of some who felt that the days of private initiative were over and complete regimentation had begun!

For example, one manufacturer who specialized in certain types of cable tools had his own taper joint which he felt was better than others on the market; also, he felt it would give him control of more business because a buyer would have to go to him for replacements on account of this special joint, apparently overlooking the fact that special subs were necessary to connect his special tools to the rest of the drilling string. It was explained to him that a standard API joint would greatly expand the use of his or any other special tool. After the API joint had been standardized he admitted the error of his previous judgment because his business had greatly expanded rather than decreased.

This incident illustrates an underlying principle that has prevailed in the API standardization programs since its inception. In the governing resolution of the Board of Directors, it states that "the fundamental purpose of this work is to bring about the adoption of such specifications and methods as meet with the practically unanimous approval of the producers of crude oil and the manufacturers of equipment. It is not proposed to impose specifications upon persons not desiring to use them, or to carry the standardization to a point where there is danger of interference with individual initiative and with the progress of invention."

Standardization is essentially dynamic—not static! Any standardization that interferes with progress simply wouldn't be used. The development of the program over the years has proven time and again the need for keeping API specifications abreast of current development.

Take rotary tool joints, for example, which is of primary interest to contractors. The first "API Regular" tool joint was adopted in 1926. It was followed by the "Full-hole" tool joint which was adopted in 1934, and then again by the "API Internal Flush" tool joint which was adopted in 1946. All of these standards are in general use today, each to fill a need in its particular field. Instead of having many different designs of each type, there is now a single interchangeable API joint in each size.

Today an additional design of a taper joint is under consideration for drill collars. This is being analyzed by a special
committee, composed principally of oil well drilling contractors, under the chairmanship of C. W. Alcorn, himself a drilling contractor.

Similar changes have occurred in size and thread design on casing, tubing and drill pipe; likewise on derricks. The first API standard derrick was specified of wood construction. Complete working drawings were available which detailed each piece of lumber required accompanied by standard material lists such as nails, bolts, etc. These standards are now, of course, obsolete. The present standards on steel derricks are now being challenged by the new portable mast type. Standards on manila cordage were adopted in the early days of the work when it was extensively used for cable tool drilling—a use which is now likewise largely obsolete.

**Present Status of Program**

The accompanying schematic sketches (Figures 1, 2, 3, and 4) illustrate the present scope of the present program. It is a far cry from the original standards adopted in 1927, as shown on additional sketch (Figure 5). Looking ahead, there will undoubtedly be similar changes in 1975.

API specifications have become the international standards throughout the oil producing world. There are at present 440 manufacturers in the United States and 90 manufacturers in 14 foreign countries now authorized to use the API monogram which, when applied to the product, is a guarantee to the buyer that the material so stamped complies with an API specification. This means that the integral parts of a drilling rig can be purchased from 15 different countries and assembled, for example, in Timbuktu, Africa, and satisfactorily drill an oil well!

This is an accomplishment that is unmatched by any other industry according to our present knowledge. Space does not permit a complete description of the methods established to maintain the accuracy of master gauges in these various foreign countries. Suffice it to say that under the tutelage of the National Bureau of Standards, Washington, D. C. (who lead the world in accuracy of measurements), API master gauges owned by foreign licensees are maintained to the same high degree of accuracy as are required in the United States.

Due to the present shortage of steel, large quantities of casing and tubing are now being imported into the United States from England, Belgium, West Germany, and France, which is being used interchangeably in current operations in this country. Further recognition of API standards was the adoption by the armed forces of API specifications on bolted steel tanks. In World War II the armed forces used API specifications on tanks and subsequent thereto initiated discussions for the purpose of extending these API standards to cover all the component parts of a tank. Formerly API standards applied to the tanks only. Complete reconciliation has been effected with the armed forces on all of these various segments so that today API standards on this item will be available equally for commercial service as well as for the armed services.

**Economy of Standardization**

The savings attributable to standardization are incalculable. Some years ago the American Standards Association attempted a survey to determine what these savings were as applied to the general field of standardization and the results were so fantastic as to beggar belief. In using 10% savings as a conservative figure on oil country equipment based on an estimated value of materials produced annually of approximately five hundred million dollars, a saving of fifty million dollars annually is indicated.

Actually the benefits are far greater than this. For example, some competent authorities give credit to the API standardization program for the deeper drilling that immediately followed the adoption of stand-
ards on tubular goods, with the resulting stronger and interchangeable threads, as well as the higher grades of casing that were subsequently developed. When one considers that several billion barrels of crude have been added to our reserves by this deeper drilling, the value of this work can hardly be determined.

Manufacturers have also reported much greater efficiency in their shop operations due to having fixed standards and limits to work to. The savings to the operator and contractor are equally great. Actually, present day drilling at current speeds would be impossible without standardization. In fact, if standardization did not produce economy, there would be no need for it.

**Contractors Participation**

According to A. W. Thompson, president of the American Association of Oilwell Drilling Contractors, practically 90 per cent of all drilling work today is performed by contractors. In keeping with the governing principle that the users mainly concerned with the equipment in question should have a major voice in the specifications, the API committee on rotary drilling equipment which includes rotary taper joints, slush pumps and other items, is dominated by representatives of drilling contractors under the chairmanship of George B. Kitchel (Kerr-McGee Oil Industries, Inc., Oklahoma City), and A. W. Thompson (Thompson-Carr, Inc., Houston) is the national vice-chairman. Also all of the various district chairmen are contractors, as follows:


Mid-Continent District: Jack H. Abernathy, Big Chief Drilling Company, Oklahoma City.


This API committee on rotary drilling equipment is also responsible for all recommendations pertaining to drill pipe which is a part of the tubular goods specifications.

The work of the rotary committee has been under the chairmanship of a drilling contractor representative since 1926, commencing with E. J. Nickols of Houston.

The contractors are also well represented on other committees affecting materials that they use such as wire rope, internal-combustion engines for drilling service, and cable drilling tools. The Institute has always appreciated highly the interest and cooperation extended by the drilling contractors fraternity and we hope that this cooperation in the years to come will continue on the same high plane that has characterized the work to date.

---

**Work on Standardizing Equipment Reviewed at Denver API Meeting**

The mid-year standardization conference of the API Division of Production was held in Denver late in May with a nation-wide attendance of approximately 350 at the important five-day sessions.

Work of the 12 main committees, composed of leading engineers and scientists of the producing branch of the industry, took on added significance this year because of the threat to world peace and the oil crisis in the Near East. The committees reviewed current specifications of oilfield equipment which can be made interchangeable throughout the world.

C. A. Young of Dallas, Texas, Director of the API Division of Production, explained that the program which started in 1924 to standardize oilfield equipment for more efficient oil production, has now developed into international proportions. He pointed out during the past year large quantities of equipment made to API specifications have been imported into the United States from England, Belgium, West Germany, France and Italy to ease domestic shortages.