100.0 INTRODUCTION

The main objective in creating this document is to provide pump users with a concise, easy to read, illustrated field-testing procedure. The goal was to take into account the "imperfect" realities of actual field conditions, with all the obvious restrictions and emphasis on plant uptime.

Pump testing has previously been addressed in a number of documents, including [1] The Hydraulic Institute (The Hydraulic Institute [1] testing), API 610 [2] (centrifugal pumps), and API 676 [3] (rotary gear pumps). But, the test procedures covered in these documents focus primarily on testing at the pump manufacturer's own facilities. Such tests are accurate, repeatable, and reliable, but are difficult to duplicate in the field, where access to specialized test instrumentation is often difficult if impractical. For example, torque meters are routinely used by manufacturers for testing. These devices, which can measure torque and speed, and can perform internal conversion to calculate power, are only used temporarily as auxiliary devices, and are not installed in the field between the pump and a driver. Therefore, a user cannot readily measure pump input torque to calculate the horsepower, even if the rotational shaft speed is known. Reading the motor current, however, is relatively straightforward, and so, for field operators, a method that converts current to power, even if some accuracy is sacrificed, would be useful. Another example is a requirement of a certain length of piping at the pump inlet, as well as before measuring devices (gauges, flow meters). Rarely, if ever, do such "perfect" accommodations exist in the field. Obviously, the accuracy of measurements cannot be expected to be as good as at the manufacturers' test facilities.

The need to differentiate between the more accurate pump manufacturer's test facilities and field-testing methods has been recognized in the past, in AICHE Equipment Testing: Procedures for Centrifugal and Rotary Positive Displacement Pumps, [4,5]. Reading them now, these documents are not outdated, but do have two major shortcomings. First, they are focused on rotary pumps, and on Newtonian liquids only. Second, their style is too "academic" for use by those who operate the pumps. A complete revision and rewrite of the field testing procedure to include the positive displacement pumps types now commonly used at chemical plants and related facilities is long overdue.

Since the introduction of the first field-testing procedure in 1968, a large number of new chemicals have been introduced by the rapidly expanding industry. Non-Newtonian fluids can no longer be considered an exception, and pump testing procedures must incorporate such cases. There are numerous examples of pumpage that is not liquid, but is a fluid in a more general sense. Paper pulp, slurries, waste sludge, and adhesives are all examples of fluids that, at least by appearance, do not resemble a liquid at all.
The style of this Procedure is simple and practical. It is hoped that it would be easy and interesting to read, and could be useful for the internal training of plant personnel, as well as for expanding the general existing literature on pump fundamentals and reliability, such as [6], [7], [8].