

Laser Tracker Measurements for Hydro Units: Benefits Evaluation and Sharing of Techniques

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This paper is a general discussion regarding the use of a laser tracker to build and assemble hydro units on-site. It presents the benefits and sometimes limitations of using a laser tracker, and it gives details about the hydro applications where they can be used. Examples are given from a few projects where Voith Hydro was building new turbine and generator units as well as a project with runner replacement and machining of the embedded turbine parts.

The approach being used for these projects was to own and keep a laser tracker on-site for the duration of the project so that it could be used anytime it was needed. The benefits have been assessed by comparing the laser tracker measurements with alternative conventional methods as far as ROI, time savings and quality of data and information derived from the system.

This paper also shares some techniques and methods that have been used on-site to ensure that the measurements are accurate. In some cases we needed to be able to prove on-site the accuracy of large dimension readings, and simple tests have been performed. Another interesting issue was the use of the integrated level which has a specified accuracy of 2 arcseconds. In some applications, we needed a *level accuracy* lower than 2 arcsec and we were able to verify and show on-site that the *level accuracy* was better than 2 arcsec and therefore adequate for our application.

Many examples for using a laser tracker are shown. One of these examples is lifting a large component with a crane and monitoring its position with a laser tracker for lifting the component (a headcover) and passing around another piece (a shaft) with a small clearance. The method used is discussed in this paper.

There remains some measurements not taken with the laser tracker, but for many measurements the laser tracker is the best tool. The ROI and the overall benefits on a project are significant for both the customer and the contractor.