The industrial company calibrates, but what for?
Les sociétés industrielles étalonnent, mais pourquoi faire ?

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The calibration certificate is often a poorly operational document and frequently used only for audit. We believe that the difficulty to find the actual information for the manufacturer is the main cause. Moreover, the quantities of instruments managed by the metrologist during each campaign can be a handicap in the performance of its functions. Can it be otherwise? Can a calibration certificate be used by the manufacturer to improve the quality of measurements and production?
In the first part, we will talk about the calibration certificates and the information which need to be provided. In the second part, we will explain how these documents could be used in the industry. Finally, we will develop the useful information in a calibration certificate; and so the useful complements to improve the validity of the measurement system.
The content of the calibration certificate is described in the documentation fascicle: FD X 07-012. This document provides an exhaustive list of the elements which need to be in the certificate: the measurement standard, the measuring instrument, the operator who realised the measurement, the measurement procedures and the environmental conditions. In fact, all the factors that impact the uncertainty of the measurement result have to appear. The central element in this document is the measurement result.
In all of this information, the confusion is easy, especially when the documents are managed in different ways. This includes, the emission date with the calibration date, the expression of the deviations and the correction of the measuring instrument, the designation of the instrument in the certificate and the designation in the company. First of all, for the connection to the international measurement standards (or another measurement standard agreed with the customer). The industrials have to verify on the certificate the connection chain with the standards measurement used for the calibration. What counts for the industrialist is the conformity of the measuring instrument. To do so, they need to inspect the measurement results. In many cases, the verifications certificates are established on the standards or manufacturer tolerances which are different than the real need for the measurement process. It is interesting to use the uncertainty of the measurement result as it could be used for the uncertainty calculation of the measurement process. It could also be used to verify the capability of the laboratory to establish instrument conformity.
Nevertheless, the interpretation of the last calibration certificate and the conformity of this operation are not enough. In fact, the other results have information which are a shame to miss. In fact, the importance of the measurement standards is to be stable in time. The study of the precedent certificate can permit to study eventually a drift of the measuring instrument, and to adjust the calibration intervals, or even anticipate non-conformity on the measuring instrument. Then the calibration operations are not perfect and they have a measurement uncertainty. The study of the last calibration result can be weighted in function of the other calibrations results this is in order to have the right information of the measurement standard value. We can also work on a global study on the calibration result to have some information about the evolution of the measuring instruments in the company.
Ultimately, the calibration is limited. It cannot certify the quality of the measurement process. In fact, the uncertainty of the measurement result is linked to all the factors influencing the measurement process and not only to the measuring instrument. They advise to do the periodical surveillances directly on the measurement process (in reference to the Guide for the French college of metrology: "surveillance of the measurement process"). This can be documented and exploited as the calibration results. This simple action is efficient and enables verification directly on the measurement process. It can also be an indicator to your calibration intervals.