… IN PROCESS QUALIFICATION OR LONG-TERM ANALYSIS

The measurement process measures characteristics at different stations for process qualification or long-term analysis. The results are transferred to a recording system or a SPC system (e.g. procella). In order to get a comprehensive overview, you have to structure the data and save them to a central data pool where you can manage them. You can load a selection of these data from the data pool either at regular intervals or when a certain event occurs. Now you evaluate them and provide the results to the respective recipients with the help of specified reports.

Error 1		The data recorded in the measurement process is not representative (e.g. operators forgot to take a measurement after the change of shift or after a break).
Effect		The recorded data does not reflect the actual situation. There is the risk of deviations that will not be identified in time. The results of the statistical evaluation might thus be wrong.
Solution		First you record data at regular intervals over a longer period. You will detect deviations immediately and eliminate them by taking corrective action. Operators should be informed about measurements that are due. Find more information about sampling in the reference book "Statistical Procedures for Machine and Process Qualification" or in the Daimler guideline LF1236.

Error 2		The description of capability indices is not clear.
Effect		There are different ways of interpreting capability indices.
Solution		The meaning and definition of the capability indices C_m, C_{mk}, P_p, P_{pk}, C_p, C_{pk} or T_p, T_{pk} must be clearly defined. Find more information in the Daimler, GM or VW guidelines.

Error 3		The data, especially descriptive data, are of poor quality. The operator does not complete all the fields or enters continuous text.
Effect		A selection of contents from these fields will lead to an incomplete data set.
Solution		The Q-DAS products procella and O-QIS help you define mandatory input fields. In case a mandatory input field is not completed, the program does not proceed and prevents the input of new measured values. In order to avoid continuous text, use the comprehensive catalogues to complete the fields. These data are available in the Q-DAS ASCII transfer format (AQDEF) and can be saved to the central database.

Error 4		You calculate capability indices without knowing the time-dependent distribution model. The calculation is often based on the normal distribution model because it is easier.
Effect		Calculated capability indices are often wrong or do not describe the process situation sufficiently well.
Solution		Use qs-STAT to find the suitable time-dependent distribution model according to ISO 22514-2:2015. The software also assigns a method for the calculation of capability indices to the respective time-dependent distribution model. You can even automate this procedure for validated evaluations. Results from different plants and locations thus become comparable.

Error 5		Terms like in control, capable and stable are not specifically defined.
Effect		Misinterpretations and needless discussions.
Solution		Define the terms based on standardised corporate guidelines (e.g. ISO 3534 ff).

Error 6		You use the wrong stability criteria when dealing with huge data volumes.
Effect		A process is considered to be instable although it is not.
Solution		Depending on the number of measured values or subgroups, more or less control limit violations shall be acceptable in the quality control chart without triggering an alarm indicating a possible lack of stability. Find more information in the reference book "Statistical Procedures for Machine and Process Qualification". qs-STAT applies these limits automatically.

Error 7		Evaluation results are not traceable.
Effect		The results are not comparable.
Solution		Specify the additional information the result has to contain. It e.g. has to include the capability index, the time-dependent distribution model and the calculation method.

FURTHER ERRORS

Error 8		Statistical evaluations are often made locally without transferring the recorded measured values to a central database.
Effect		The results cannot be compared and a comprehensive overview of a process or a product is not possible.
Solution		Use the same programs in all plants to calculate capability indices. Structure and save the data to a central database to evaluate and compare the data company-wide.

Error 9		Many non-validated Excel form sheets with macros for the calculation of results include errors.
Effect		Depending on the configuration, the calculated results are wrong or inaccurate which makes them useless.
Solution		Apply a validated evaluation strategy in qs-STAT.

Use the Q-DAS software qs-STAT to avoid many of the errors listed above.