The 7 Most Frequent Errors in SPC

With the help of SPC (Statistical Process Control), processes are controlled in respect of deviations from target values and significant changes on the operator level. Due to capable measurement processes, specified characteristics are measured. Individual value charts, parts protocols or quality control charts display the results. The target values depend on the selected task. Either the process lies within the selected control limits or, in the simplest case, it lies inside n % of the tolerance. In case of deviations, the operator is informed and can take corrective actions.

For an easy recording of measurement results and of additional data, the operator needs an entry mask specific to the selected task containing all required data fields. These fields should be filled in automatically (e.g. using bar codes and the real-time data transfer of the measurement values). The standard for data contents can be found in catalogs.

Error 	The default quality control chart is not appropriate to the process of the monitored procedure or does not meet the requirements of the task. Otherwise the control limits are too narrow or you have chosen the wrong stability conditions.
Consequence 	Either the process control becomes too “sensitive“ (unnecessary notification of operators). The operator always receives needless error messages and cannot take appropriate corrective actions. This deters him from his work. He becomes frustrated and refuses this tool. Or the control is too “vague”. Significant deviations may be overlooked.
Solution 	Select the SPC quality control chart only after a comprehensive process analysis (pre-run / similar process) according to DIN ISO 21747. qs-STAT® determines the appropriate, time-dependent distribution model automatically. On the basis of this model, the corresponding quality control chart including the right control limits and stability conditions is proposed.

Error 	An appropriate Plausibility Test is not available when taking over measurement values.
Consequence 	Frequently, measurement values are recorded that do not describe the process. Typical example: the tool tries to record measurement values although there is not part in the measuring device. This leads to unnecessary reactions and wrong data in the database.
Solution 	There are configuration possibilities for the Q-DAS® products procella® or O-QIS that do not take over illogical measurement values. The operator is informed about these values and has to release them manually to take them over.

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Error 	A measuring procedure cannot be repeated.
Consequence 	The same part is measured repeatedly. All data is transferred to the data pool. The sample contains the wrong measurement values. Thus, the calculated results are wrong.
Solution 	The possibility to repeat the last measurement or sample leads to more “honesty“ during the Statistical Process Control and raises the data quality in the database.

Error 	The operator has to work with an inappropriate entry mask. The measurement procedures are not displayed or displayed incorrectly. The entry mask and evaluation mask are fraught with information. There are no mandatory fields that must be filled in.
Consequence 	The measurement process and the recording process are too complex and take too long. Irrelevant statistical values are displayed deterring the operator from his work. The operator refuses this tool.
Solution 	The Q-DAS® products procella® or O-QIS can display the optimal measurement procedure and, according to the respective configuration, only show the information relevant to the operator. Thus, the recorded measurement values are monitored in the background in compliance with the target values. Alarms are only displayed in case of significant deviations. The operator can concentrate on his main task without being afraid of missing important changes in the process.

Error 	No catalogs for additional data, events, actions and causes are used.
Consequence 	If you want to evaluate special process situations correctly later on, you need to enter all relevant and descriptive information immediately when recording measurement values. Otherwise you cannot select data for the evaluation of the actual situation later.
Solution 	procella® and O-QIS provide many additional data, catalogs and subcatalogs to describe events, causes and actions. The operator can select the respective contents quickly and easily.

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Error 	Recorded data is not merged centrally because there is no interface to the data pool.
Consequence 	As long as the data is only stored locally, the actual situation cannot be examined and evaluated holistically. Long-Term Analyses and organized data storage in order to comply with the retention period requirements are hardly possible.
Solution 	Many measurement processes and SPC systems (e.g. procella® or O-QIS) support the Q-DAS® ASCII Transfer Format (q.v. AQDEF standard). The Q-DAS® CAMERA Concept collects the data of local recording stations in a central data pool (Q-DAS® database) automatically. Thus, any desired evaluation of the actual situation is possible from different angles and perceptions.

Error 	The acceptance of the used measurement system was not verified.
Consequence 	Possibly, the results may be regarded as incorrect. The consequences are permanent discussions whether the deviations or the fact that the limit values have not been reached results from the product itself or from the measurement process.
Solution 	Verify the acceptance of the measurement system according to MSA or GUM/VDA5 with the help of the Q-DAS® product solara®. Find more information in the book called “Measurement Process Acceptance“ or in the company guidelines.

Many of the errors listed above can be avoided by using the Q-DAS® software procella® or O-QIS.

Here you can find more information about SPC:

- Book: Performance Quality System for the Quality Evaluation in the Industrial Production
- AQDEF – Automotive Quality Data Exchange Format
- Flow Chart: easy2use | procella
- Seminars
- Hotline

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