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5.4 Process Capability Study and Improvement

Purpose:

- Unless otherwise specific requirement from Nissan especially included in RFQ (Request for Quotation) the supplier shall meet the following basic guideline.
- Evaluate, monitor and manage process capability in order to maintain a capable and stable process condition that continuously achieves compliant parts.
- The supplier shall demonstrate process capability using suitable methods of statistical process control (SPC) for the product characteristics defined in drawings.
- The supplier shall define sampling size, frequency, sampling type (cluster, random etc.) to get the sufficient level of confidence in the decision of acceptance in order to assure the part conformity through control plan. Because it is the supplier responsibility to build the capability study plan, and the capability study plan has to be built in order to give a confidence level in the capability result.
- If the process capability level is insufficient for a confident demonstration of ability of compliant manufacturing :

  - the supplier shall establish root cause(s) and implement effective and efficient countermeasure(s) to reach the convenient level.
  - all products shall be subjected to additional confirmation activities to ensure compliant delivery, until effective countermeasure(s) are implemented and verified.
  - The supplier shall continuously monitor and reduce variation in both product and manufacturing process characteristics.

Note(s)

The Special Characteristics and the Key Features which specified on QA Table A(These are referred to as important control characteristics).

- Above characteristic must have a process capability index (Cpk) > 1.33 all along mass production; RFQ might specify more stringent process capability value. The sample size for capability evaluation should be over 30 pieces.
- To assure the target value in serial life, demonstration shall be available before part approval. The demonstration should include adequate margin (e.g. Cpk >1.67 with trial parts etc…), verification of process control, etc.

Each normal characteristic except the key features which specified on QA Table A.

- Each normal characteristic must have a process capability index (Cpk) > 1.00 all along mass production; RFQ might specify more stringent process capability value. The sample size for capability evaluation should be over 30 pieces.

- To assure the target value in serial life, demonstration shall be available before part approval. The demonstration should include adequate margin (e.g. Cpk >1.33 with trial parts etc…), verification of process control, etc.

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General treatment for a process capability index control.

- In order to maintain a capable and stable process condition, the supplier shall identify an "unusual" or "abnormal" process conditions. (Examples of an "unusual" or "abnormal" process conditions include (but are not limited to) difficulties experienced during set-up and start-up or excessive noise or vibration from equipment during operation.)
- Then, In the event of an "unusual" or "abnormal" process condition being identified, the supplier shall implement a reaction plan,
- The supplier shall implement an effective counter measure based on clarified root cause before submitting PSW when insufficient process capability with Nissan requirement being identified.

Phase	1	2	3	4	5
Activity Content		● Planning for a Process Capability Study Plan after define characteristics in the component drawings and specification.	● Carry out the process capability evaluation of off tool parts along with the Process Capability Study Plan and make the Process Capability Study Result. ● Update the final Process Capability Study Plan based on the evaluation results.	● Carry out the process capability of off process and its parts and update the Process Capability Study Result. ● To complete countermeasure before PSW approval	● Update the Process Capability Study Plan if any change and submit the Process Capability Study Results if the Nissan requests.
Output Document			● Process Capability Study Plan		

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