

DATA ITEM DESCRIPTION

Title: STATISTICAL PROCESS CONTROL (SPC) PLAN

Number: DI-MGMT-81987

AMSC Number: N9564

DTIC Applicable: No

Preparing Activity: SH

Applicable Forms:

Approval Date: 20150714

Limitation:

GIDEP Applicable: No

Project Number: MGMT-2015-009

Use/relationship: The Statistical Process Control (SPC) plan defines management's SPC responsibilities, involvement, and commitment to continuous process improvement. The plan describes the contractor's policy for applying SPC and information regarding the implementation of SPC. This plan also provides detail for specific manufacturing processes and operations parameters under control.

This Data Item Description (DID) contains format and content preparation instructions for the data product generated by the specific and discrete task requirements as delineated in the contract.

Requirements:

1. Format. The plan shall be in the Contractor's format.
2. Content. The plan shall include a cover sheet identifying:
 - a. Contractor preparing office.
 - b. Contractor's title.
 - c. Contract Number.
 - d. Procurement Request Number, if applicable.
 - e. Revision and date.
 - f. Nomenclature of the system/component/program/project.
 - h. Government activity issuing the controlling contract.
- 2.1. The plan shall include all descriptive material, sketches, drawings, photographs, tables, forms, graphs, worksheets, charts, etc. needed to show clarity in the text.
- 2.2 The plan shall contain a table of contents.
- 2.3 The plan shall include an index.

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2.4 The plan shall contain the following sections:

2.4.1 Policy. This section of the plan shall describe the contractor's policy for applying SPC, including goals and management commitment to SPC.

2.4.2 Applicable documents. This section shall include a list of documents that are the basis for the contractor's SPC program (e.g. ANSI standard, textbooks, Government documents).

2.4.3 SPC management structure. This section shall define the SPC management structure within the organization. The identity and interrelationships of all departments involved in SPC (e.g. Production, Quality, Engineering, Purchasing, etc.) shall also be specified.

2.4.4 SPC application personnel. All job titles and key personnel within departments involved in the application of SPC shall be identified. Also, a description of which functions are being performed by key personnel and when they are performed shall be included.

2.4.5 SPC inspection personnel. Personnel responsible for performing inspections/audits, charting and interpreting data, personnel responsible for determining, initiating and implementing corrective action upon detecting assignable causes, etc., shall be included.

2.4.6 SPC training. The section shall identify by job title and position.

- a. The primary individual responsible for overseeing that SPC training is accomplished.
- b. The qualification program required and in use for all personnel utilizing SPC techniques, including the qualification of trainers shall also be included.
- c. The identification of who is to be trained and the type, extent and length of such training (e.g., on-the-job, classroom, etc.) and how personnel using SPC techniques are monitored when refresher training is required.

2.4.7 Manufacturing controls. The section shall identify the criteria for performing SPC capability studies and how and when these studies were applied. When gages are used, the gage repeatability and reproducibility analysis shall be completed, and accuracy shall be addressed.

2.4.8 Determination of SPC use. The section shall describe how the process/operation parameters are determined appropriate for SPC application and identify what actions are to be taken if SPC is not deemed appropriate for key or critical characteristics, special and major process/operation parameters (e.g., Pareto analysis; analysis of characteristics with tight tolerances, etc.).

2.4.9 Locating Strategy. The section shall identify how product locating is consistently used throughout production and product validation.

2.4.10 Process stability and capability criteria. The section shall identify the criteria for

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performing process capability studies and how and when these studies are applied. The section shall also describe how the process capability index is calculated and the frequency of these calculations.

2.4.11 Process stability and capability action and analysis. The section shall identify:

- a. The actions taken as a result of each process capability study.
- b. The contractor's methodologies when process capability is for variable and attribute data.
- c. The actions taken if process/operation is sub-marginal or marginal (Cpk less than 1.33 or 2.0 for criticals or grand average fraction defective is greater than 0.003 percent).
- d. Analysis results of statistical distributions and all formulas and symbols utilized.

2.4.12 Control Chart policy. This section shall include the following:

- a. Type of charts to be used (e.g., \bar{x} bar/R \bar{x} bar/S, etc.) and rationale for use.
- b. Criteria for selection of sample size, frequency of sampling and rational subgroups.
- c. Procedures for establishing and updating control limits, including frequency of adjustments.
- d. Criteria for determining out-of-control conditions (e.g., trends, points beyond control limits, etc.) and the corrective action taken to include failure analysis when the process is unstable or when nonconforming product has resulted from unstable processes.
- e. Illustration of out-of-control tests.
- f. Description of method of recording pertinent facts on control charts such as changes in raw material, machines, manufacturing methods and environment, and corrective actions taken.
- g. Description of how control charts are traceable to the product.

2.4.13 Vendor/subcontractor purchase controls. The section shall identify whether suppliers are required to utilize SPC and shall show the extent the vendor's policies and procedures are consistent with in-house procedures of the prime contractor.

2.4.14 The Plan shall identify the following methods utilized to determine that suppliers have adequate controls to assure:

- a. Defective products are not produced and delivered.

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b. For the system utilized to audit suppliers, what will be audited, how often, and what action will be taken when out-of-control conditions exist at subcontractor/vendor facilities.

2.3.15 SPC Audit System. This section shall contain a description of the contractor's SPC Audit System and how the contractor plans to comply with auditing, plans for review and analysis of the outcomes, including implementation of necessary corrective action.

2.4.16 SPC records. The report shall identify various records to be used in support of SPC and describe their use. The retention periods shall also be included.

2.4.17 SPC detailed plans. The detailed plans shall describe control of specific manufacturing process/operation parameters or characteristics and shall include the following for each:

a. Identification of the process/operation by name or characteristic under control.

b. Rationale for selection or justification for non-selection if the parameter or characteristic is deemed impractical for the application of SPC techniques for parameters or characteristics identified as key, critical, special or major.

c. Description of how the characteristic is produced; the chain of events, type and number of machines involved, location of manufacturing facility, tolerances maintained, etc.

d. Production and inspection machinery used, including the production rate, number of shifts, length of shifts, whether inspection is fully or semi-automatic or manual; if the inspection is manual, identify the type of gages in use.

e. Identification of the type of charts to be maintained and whether the process/operation is performed in-house or subcontracted out.

f. Identification of the facility/vendor where process/operation parameters are targeted for SPC.

3. Media requirements. The plan shall be in Adobe® electronic Portable Document Format (pdf), version 2007-2010.

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