**INSTRUCTIONS FOR THIS TEMPLATE**

1. Assign a unique document number.
2. Complete the document in accordance with the requirements in your Purchase Order.
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4. Attach required documents in the Appendices. Ensure these documents are complete.
5. DELETE THIS PAGE prior to routing for approval.
6. Ensure all green text is filled in properly (or deleted) and changed to black.
7. Review and approve the document prior to submitting it to GD-OTS. Ensure the document number, revision, and date are part of the file name.  
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8. Submit the approved document through SharePoint.

**Plan Format**

The preferred format for SPC Program Plan submissions is MS Word (Office 2007 or later, .docx version). Supporting documentation including Process Flow, Process Control Document, etc, may be embedded in the document.

**Black** = Standard text. Do not delete or change.

**Green =** Replace with applicable information.

**Red** = Guidelines for completion. Delete red text when complete.

REMOVE THIS PAGE PRIOR TO SUBMITTING TO GD-OTS

**HYDRA-70 2.75-Inch Rocket System (HYDRA-70)**

**FYXX-XX Production**

**Statistical process control (SPC) PROGRAM PLAN**

**Supplier name**

**supplier locations**

**applicable drawing numbers and titles**

|  |
| --- |
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Supplier SPC Pgm Plan Author <Role> Approval Date

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Supplier SPC Pgm Plan Approver <Role> Approval Date

Supplier SPC Pgm Plan Approver <Role> Approval Date

(as required)

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# Introduction

This Statistical Process Control (SPC) Program Plan describes the SPC program as required by Quality Clauses QXXX and QXXX using ISO 11462-1 as a guide. This document satisfies the requirements of the HYDRA-70 FYXX-XX SPC Program Plan.

# Applicable Documents

The following documents establish the requirements for the SPC Program Plan and provide the guidance for its preparation.

Table I. Applicable Documents

| **DOCUMENT NUMBER** | **TITLE** | **REV** |
| --- | --- | --- |
| QXXX | Baseline Qualification First Article Test – Quality Clause | MM/DD/YY |
| QXXX | Statistical Process Control – Quality Clause | MM/DD/YY |
| ISO 11462-1 | Guidelines for Implementation of Statistical Process Control (SPC) - Part 1: Elements of SPC | YYYY |

# SPC Objectives and Organization

The SPC program has been established to reduce variation of the processes and or characteristics that are instrumental to system function and/or performance. The goal is improving the overall performance of the process and ensuring the final product meets customer requirements.

Specific objectives include:

* *<Add objectives of your SPC program>*

# Management Support

Management will document, implement, and maintain support for SPC activities.

Provide management statement that describes how resources will be provided to implement and maintain an effective SPC program.

# Statistical Process Control System

The following sections provide the framework of the SPC control system.

## Process Documentation and Control Plan

SPC process documentation includes the following:

* SPC Process Flow Diagram: The process flow diagram includes the operations that are to be monitored by SPC. Refer to the process flow diagram(s) generated as part of the Baseline Qualification effort.
* Process Control Plan: Refer to the Process Control Plan generated as part of the Baseline Qualification effort.
* Work Instructions: See section 5.4.
* SPC Data Reports: Reports are submitted monthly on the characteristics specified herein.

## Process Targets and Limits

The characteristics selected by *<insert supplier name>* include

* *<List the characteristics selected for SPC>*

Requirements for selection of the characteristics are as follows:

* Cpk > 1.66 for (6) consecutive months and X lots, reduce or discontinue is considered.
* If SPC is discontinued on one characteristic, another will replace it.
* If Cpk < 1.33, must submit root cause and corrective action (ex. Use 8D process) for variable characteristics and for attribute characteristics and processes that exceed 65 defective parts per million (DPPM).

Provide detailed description of criteria for selecting characteristics for SPC data. And process for adding and/or removing characteristics. Examples may include yield, scrap, rework, cost, escapes, variability and risk.

## Measurement System Evaluation and Control

Provide a description of the SPC measurement system used.

The measurement system used at *<insert supplier name>* includes *<examples>* automatic monitoring and control systems, manual tracking systems, fixturing and test set equipment, automated transaction record-keeping systems, and physical and chemical property equipment.

These systems are monitored and evaluated to minimize the risks that the measurement system inadequacies may lead to false out-of-control signals in production or to nonconforming product shipped to the customer.

The measurement system is evaluated:

## Work Instructions

The following list includes the work instructions which provide SPC guidance or instruction for the operator to start, measure and save the required SPC data. Provide a detailed example of how SPC is defined and included in documented work instructions.

* *<List the work instructions and what information they cover.>*

## Employee Training

Provide a detailed description of the SPC training program.

Employees are trained in accordance with current work instructions. The work instructions will instruct the employees on how to measure, collect interpret and act on data. Objective evidence of training and competency is maintained with Human Resources. Effectiveness of the training is assessed through observation and SPC audits.

Course topics include:

* *<List the courses and/or topics. The following are examples.>*
* Statistical methods: Specific statistical techniques used in production are defined in work instructions.
* Use of statistical tools; The use of MiniTab in the recording and analysis of SPC data;
* Special SPC electronic gauging, measurement, and data collection equipment.

Employee training is conducted under the following conditions:

* *<List the conditions. The following are examples.>*
* Implementation of SPC;
* Relevant personnel changes;
* Deviation in procedure which is in conflict with the SPC Program Plan;
* Upon a change to the SPC Program Plan and/or Control Plan;
* Improper charting or recording of SPC data occurs.

## SPC Process Data Collection

Provide a detailed description of the method of data recording and collection.

Data collection for the characteristics listed in Section 5.1 is captured using *<a manual and/or automatic system>*. The following sampling decisions include:

* *<List sampling decisions, for example sample size, frequency, randomization, responsibilities, periodic review.>*

## Variability Assessment

*<Supplier name>* will assess process variability to determine ways to reduce it. Provide a detailed description of methods used for monitoring, evaluating and reducing variability. Provide methods of long-term variability assessment and control limit assessments. Also define how limits are set and checked for normality and how special causes are identified. Describe in detail the plan for managing out of control manufacturing processes. Include rules that define an out of control condition and for approving a process restart.

## Internal SPC Audits

*<Supplier name>* will periodically audit the SPC process to measure progress made in implementing SPC and to ensure compliance with this SPC program plan. The audit will include the following to verify that:

* the process control plan is being implemented;
* process data are being collected and used as intended;
* process controls are effective;
* corrective or control actions are being taken to prevent repetitive process disturbances, and checks are being done to make sure the actions are effective;
* work instructions exist for every operation, as appropriate;
* work is being done consistently according to documented instructions.

Provide frequency of audits and methods used.

## Process Improvement, Optimization and Troubleshooting

Process improvements will be performed to reduce random causes of variation. Processes will be optimized to prevent assignable causes of variation from affecting the process. Troubleshooting and investigation will be performed to reduce the effects of special process events and disturbances. All process improvements will be performed in compliance with the requirements of process change for the program.

Provide detailed description of methods used to optimize and improve processes.

# SPC Plan Maintenance

Explain the frequency of review of the plan and what drives an update.

*<Supplier name>* will periodically review the SPC program plan when changes to qualified production processes, test and inspection equipment, and modifications to the technical data package occur to determine if the SPC plan requires an update.

# SPC Implementation Schedule *<if required>*

Define the SPC Implementation Schedule to include actions and dates of completion, as required. If you already have SPC implemented, this paragraph may be deleted or marked not applicable.

The following milestone schedule provides the timeline for implementing SPC in the process.

| **Action** | **Date** |
| --- | --- |
| 1) Initiate data collection for all SPC data controlled points |  |
| 2) Develop control limits for pilot area |  |
| 3) Develop reaction plans for pilot area |  |
| 4) Develop training program |  |
| 5) Train pilot area |  |
| 6) Implement pilot area |  |
| 7) Monitor, evaluate and adjust pilot area |  |
| 8) Develop control limits for remaining areas |  |
| 9) Develop reaction plans for remaining areas |  |
| 10) Implement remaining areas |  |

Appendix A. *<TBD>*