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CONTROL OF PROCESS & SAFETY (COPS) PRODUCER INSTRUCTIONS

A tutorial on entering data into the Control Of Process & Safety (COPS) database in compliance with HSC16199

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For COPS issues or questions contact:
gputascops@hs.utc.com

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CHAPTER 1: INTRODUCTION

- What is “Control Of Process & Safety”?
- Process Overview
- Course Overview
- Collins Aerospace Responsibilities
- Producer Responsibilities

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WHAT IS “CONTROL OF PROCESS & SAFETY”?

The Control Of Process & Safety (COPS) database is the result of merging the Process Certification and Flight Safety databases.

COPS is one of the many tools that Collins Aerospace employs to assure that our products meet or exceed our customer's expectations.

COPS involves the selection of critical to quality features on the Engineering drawing. There are three types of critical to quality features; those controlled by variation management techniques, those managed by frozen process techniques and those that require the producer to define their own sub-level features. These techniques have been proven to have a positive effect on form, fit, function, performance and service life.

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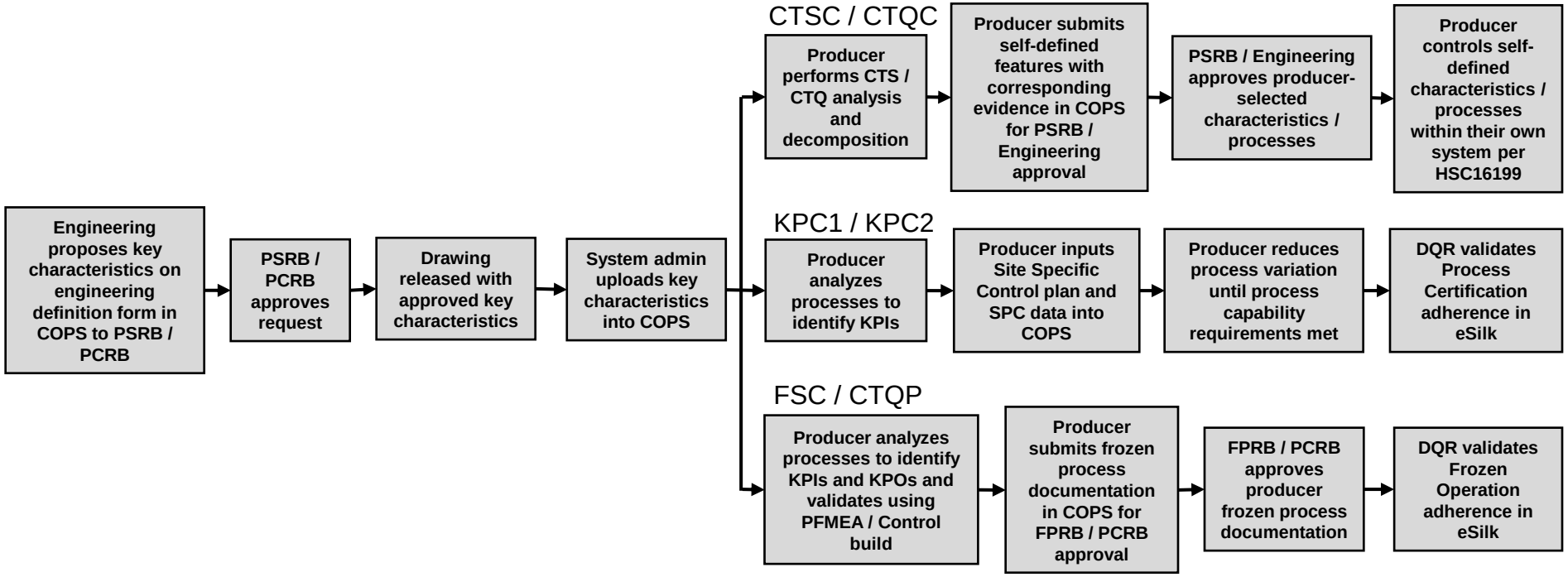
PROCESS OVERVIEW



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COURSE OVERVIEW

Upon completion of this course, learners will be able to navigate and enter data into the Control of Process & Safety database. Producers will use the data from their own manufacturing documentation, process control plans and Statistical Process Control (SPC) data programs. This will entail:

For characteristics controlled by variation management

1. Successfully completing a site specific control plan for each key process characteristic (KPC) which includes:
   - •Defining key processes inputs which affect variation
   - •Selecting a control chart and subgroup size
   - •Completion of gage R&R and applying to a feature
2. Inputting summary statistical process control data for each lot produced:
   - •Uploading on-line (real time)
   - •Uploading off-line (using MS Excel)
3. Managing progression through the milestones which includes:
   - •Continuously improving processes until process capability goals are met
   - •Initiating KPC Management Forms when required.

For characteristics controlled by frozen process

1. Submitting a manufacturing process for Collins approval that will consistently produce results that meet the engineering requirements
2. Freezing the approved process (no changes without prior approval)
3. Assuring that all product is produced to the approved, frozen process

For producer-defined characteristics

1. Submitting a list of characteristics on the producer's drawings that will affect each CTSC or CTQC to Collins for approval.
2. Identifying those selected features on the producer own drawings.
3. Using either frozen process or variation management techniques within the producer's own system to assure compliance.

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COLLINS AEROSPACE SYSTEMS RESPONSIBILITIES

- Select Critical to Quality (CTQ) and Critical to Safety (CTS) features and document on the Collins drawing/specification.
- Flow down Process Certification requirements via HSM17 on PO.
- Create a Primary Control Plan in the COPS database for each CTQ and CTS feature.
- Perform basic training on program requirements and COPS database utilization
- Perform an initial compliance audit
- Approve supplier frozen process documentation for FSC and CTQP characteristics
- Approve characteristics defined by the supplier for CTQC and CTSC characteristics
- Close out any action items identified during the compliance audits.
- Periodically re-audit producers to ensure continued compliance.
- Disposition KPC Management forms when required
- Provide additional assistance when requested- gputascops@collins.com

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PRODUCER RESPONSIBILITIES

Method of Control	Safety	Non-Safety
Variation Management	KPC1	KPC2
Frozen Process	FSC (★)	CTQP
Supplier Defined	CTSC	CTQC

For characteristics controlled by variation management

- •Create a site-specific control plan as applicable.
  - •Process Capability
  - •Gage Capability
- •Initiate Statistical Process Control (SPC) data collection.
- •Perform process improvement activities as required to achieve process capability requirements.
- •Input SPC data for each manufactured lot into COPS
  - •KPC1- 100% inspected
  - •KPC2- Sampling may be done per ASQR 20.1 once requirements in sections 4.1 and 4.2 or **HSC16199** are met
- •Submit **KPC Management** forms when needed

For characteristics controlled by frozen process

- •Submit manufacturing documentation to Collins for approval per requirements in HSC16199
- •Freeze approved manufacturing documentation (no changes without prior approval)
- •Ensure that all parts are manufactured in strict accordance with frozen processes

For supplier-defined characteristics

- •Submit supplier-defined characteristics to Collins for approval **(HSF5138- Supplier Self-Selected KPC Summary Sheet)**
- •Incorporate approved supplier-defined characteristics into supplier engineering documents
- •Control supplier-defined characteristics in accordance with supplier's internal procedures and systems

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** Items in red can be found on the supplier portal

CHAPTER 2: NAVIGATION FEATURES

- COPS Database Access
- COPS Summary Screen Fields
- COPS Summary Screen Navigation Buttons
- Sort & Filter

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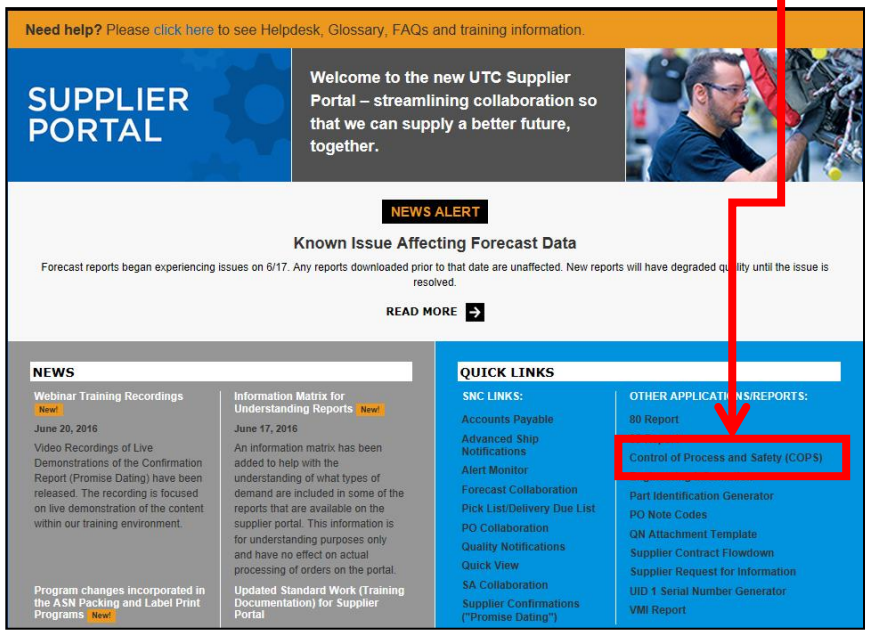
COPS DATABASE ACCESS

For suppliers: To access COPS, logon to the Collins Aerospace Supplier Portal:
https://suppliers.utc.com/Pages/Home
Click on the "**Control of Process and Safety (COPS)**" link



For the link to be visible the user must first request access from their designated Supplier Portal Admin.

Once the supplier admin verifies the users citizenship they can request access for COPS under-
manage users > restricted access

The access request will go to the COPS administrator to disposition, for issues or questions contact
gputascops@hs.utc.com

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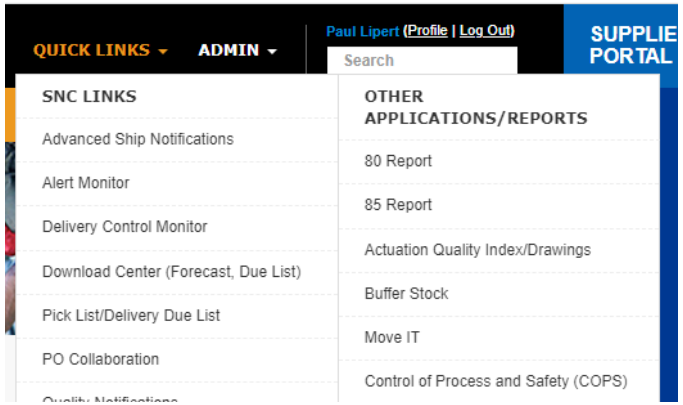
COPS DATABASE ACCESS

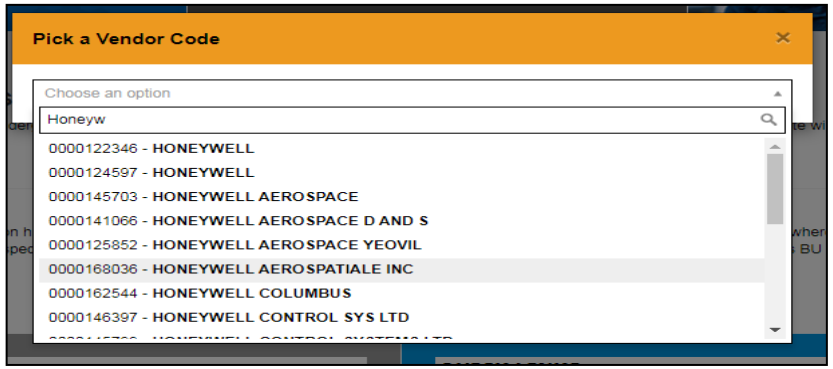
Step 1: Select COPS from Quick Links



If the COPS link is not visible the user can request access from their designated Supplier Portal Admin.

Once the supplier admin verifies the users citizenship they can request access for COPS under- manage users > restricted access

Step 2: Enter Vendor Code

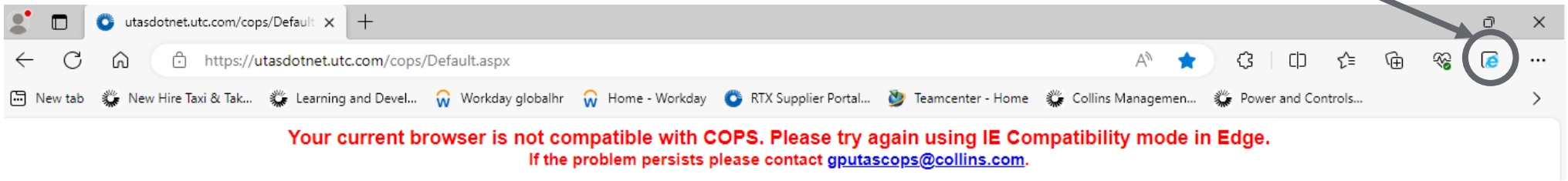


This will only be applicable if the user has portal access to multiple company vendor codes

COPS DATABASE ACCESS

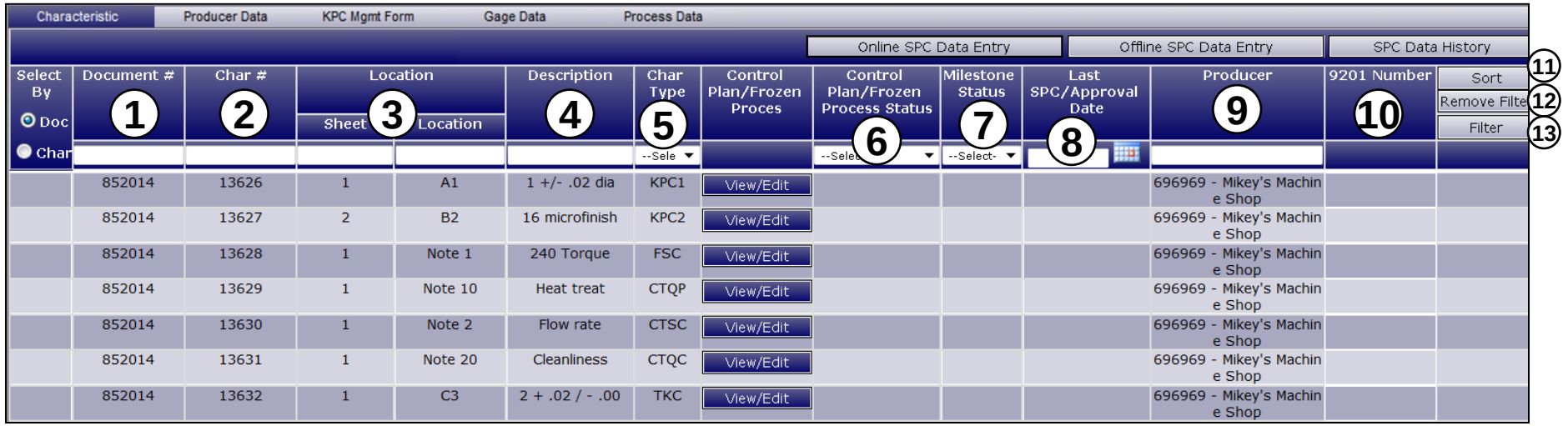
Step 3: Select “Launch COPS in a new window”

The COPS Database must be launched in IE compatibility mode using Microsoft Edge. If the below message is received select the IE icon in the top right corner of the Edge browser window in order to launch the database. The database will launch in a separate window.



COPS SUMMARY SCREEN FIELDS

This is the COPS home screen or characteristic grid. It provides a listing of all of the CTQ/CTS features (FSC, KPC1, KPC2, CTQC, CTSC, CTQP & TKC) assigned to the producer. All of the features of this COPS screen will be explained in the following chapters.



1. **Document #** – the document (drawing or specification) where the CTQ/CTS symbol is displayed.
2. **Char #** – a computer generated number which uniquely identifies the CTQ/CTS feature.
3. **Location**
   - **Sheet** – the sheet of the drawing or the page in the specification where the CTQ/CTS symbol is located.
   - **Location** – the zone/paragraph within the sheet where the CTQ/CTS symbol is located.
4. **Description** – a brief description of the CTQ feature.
5. **Char Type** – a code which specifies the type of CTQ/CTS feature (FSC, KPC1, KPC2, CTQC, CTSC, CTQP or TKC).
6. **Control Plan/Frozen Process Status** - indicates status of Control Plan/Frozen Process for a CTQ/CTS feature.
7. **Milestone Status** – the highest milestone requirements the CTQ/CTS feature has satisfied.
8. **Last SPC/Frozen Process Approval Date** – indicates the last SPC data submittal/Frozen Process Approval date.
9. **Producer** – identifies the producer or internal manufacturing site that is producing the relevant CTQ/CTS feature.
10. **9201 Number** – allows foreign nationals to view the characteristic
11. **Sort** – allows the user to sort data by using one or more columns.
12. **Remove Filter** – allows all previously set filters to be removed in order to display all data.
13. **Filter** – filters data with all previously set filters.

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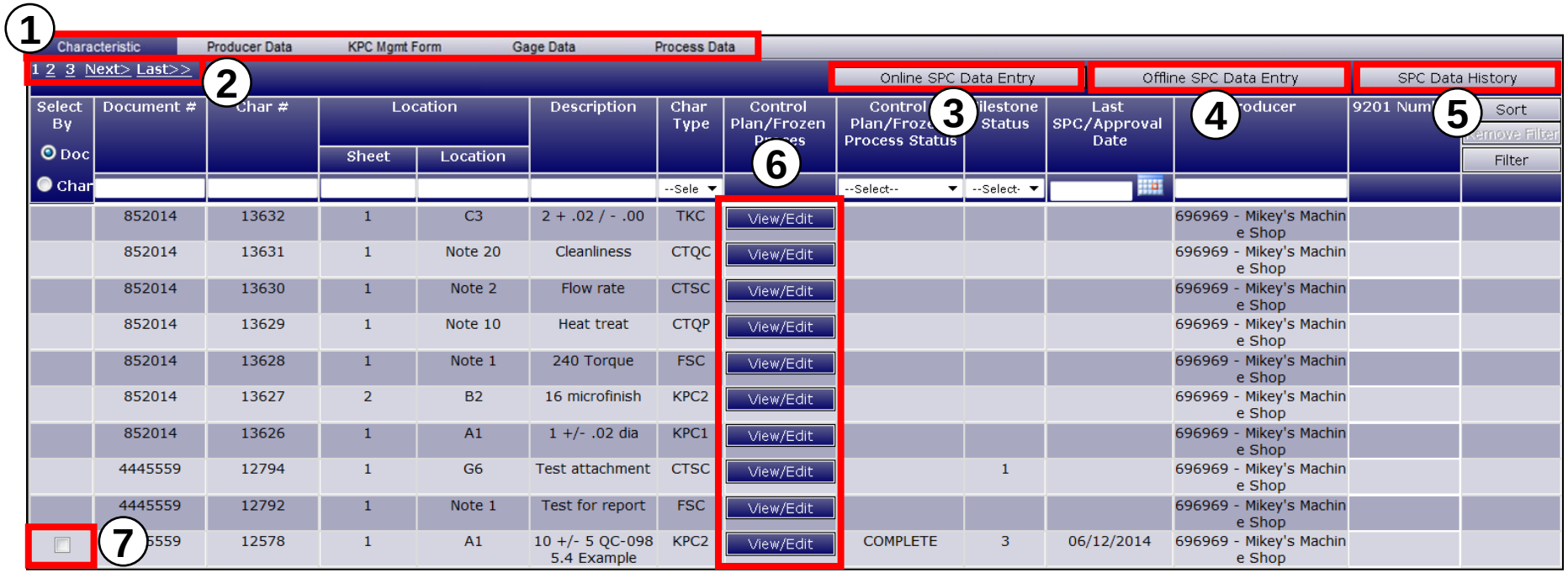
COPS SUMMARY SCREEN NAVIGATION BUTTONS



1. **Screen Navigation Tabs** – click on any of these TABS from any screen and you will be returned to the selected screen.
2. **Page Navigator** – numbers indicate more characteristics for a producer reside on other pages.
3. **Online SPC Data Entry** – this link opens a screen for real time SPC data input.
4. **Offline SPC Data Entry** – this link opens a screen that creates an MS Excel spreadsheet template for off-line data entry.
5. **SPC Data History** – view and edit SPC data previously entered.
6. **View/Edit** – allows updates to the Site Specific Control Plan/Frozen Process/supplier-designed characteristics and viewing of the Primary Control plan and Milestone Status screen.
7. **Check Box –** indicates the Site Specific plan is complete and SPC data may be input for that CTQ characteristic.

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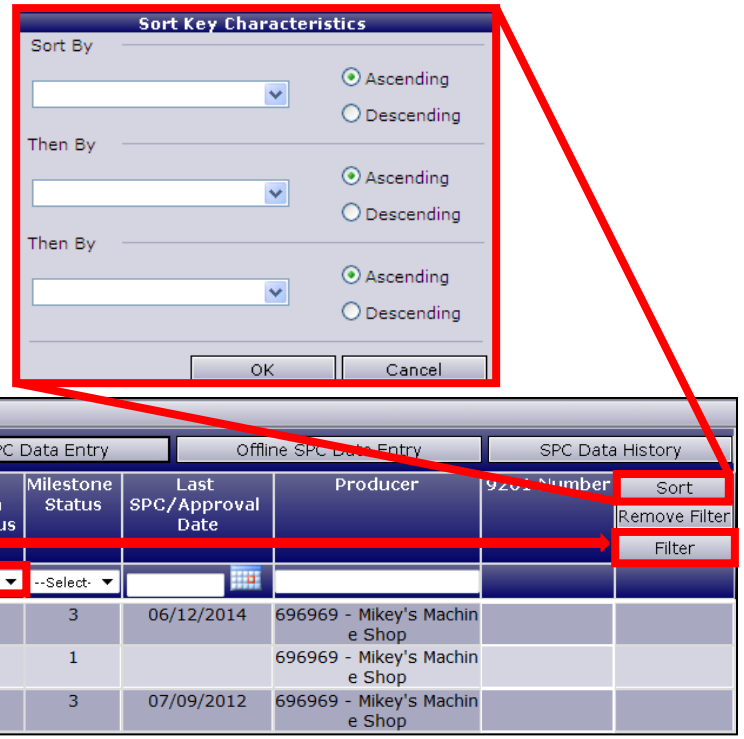
SORT & FILTER

The “**Sort**” button sorts the visible cases by user-defined parameters.

This efficiently organizes the visible cases.



The “**Filter**” button execute the filters the user-defined parameters.

This narrows down the amount of files visible based on the parameters.

Use “**Remove Filter**” to disable.

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CHAPTER 3: REQUIREMENTS FOR VARIATION MANAGEMENT CHARACTERISTICS

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CHAPTER 3A: PROCESS MANAGEMENT

- Process Management Defined
- Navigating to the Process Data Grid
- Creating a New Process
- Editing an Existing Process
- Deleting an Existing Process

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PROCESS MANAGEMENT DEFINED

- A process is a list of key parameters that must be controlled in order to minimize variation.

- For each KPC1/KPC2 in the database, a process must be defined as part of completing the Site Specific Control Plan when progressing toward Milestone 2 (refer to Chapter 6: Milestone Management).

- Processes already defined may be applied to any KPC that uses the same key process inputs to control the variation on that KPC (refer to Chapter 3c: Site Specific Control Plan for instructions on applying a process to a KPC).

- When it's necessary to create a new process, follow the instructions provided in this chapter.

- Existing processes may be modified (edited) as required and processes that are not in use may be deleted.

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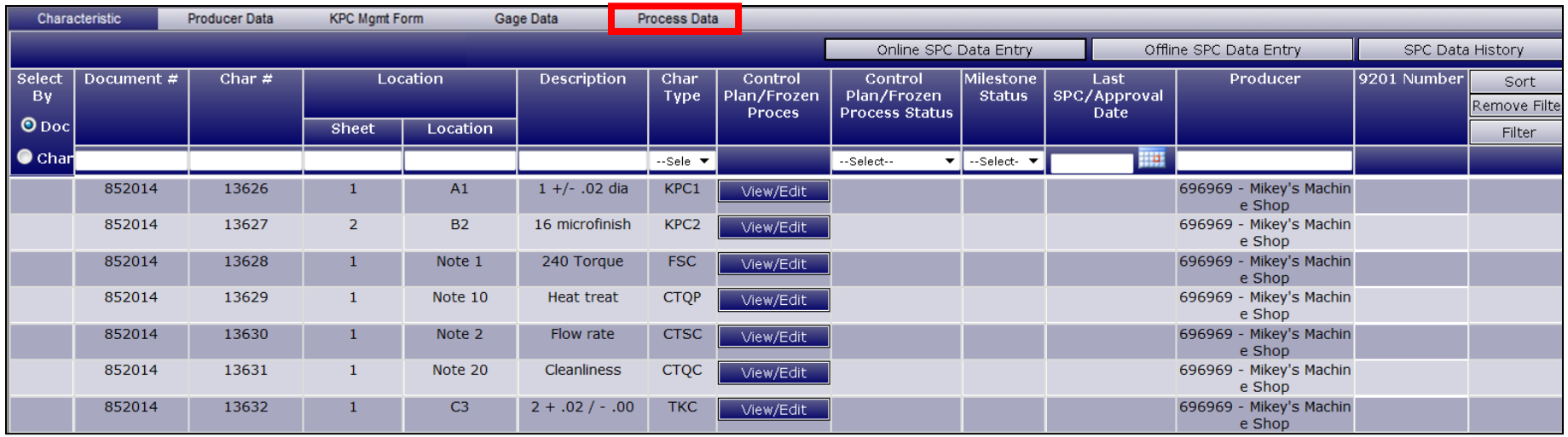
NAVIGATING TO THE PROCESS DATA GRID

Select the “**Process Data**” tab to view the data grid that contains all defined processes.



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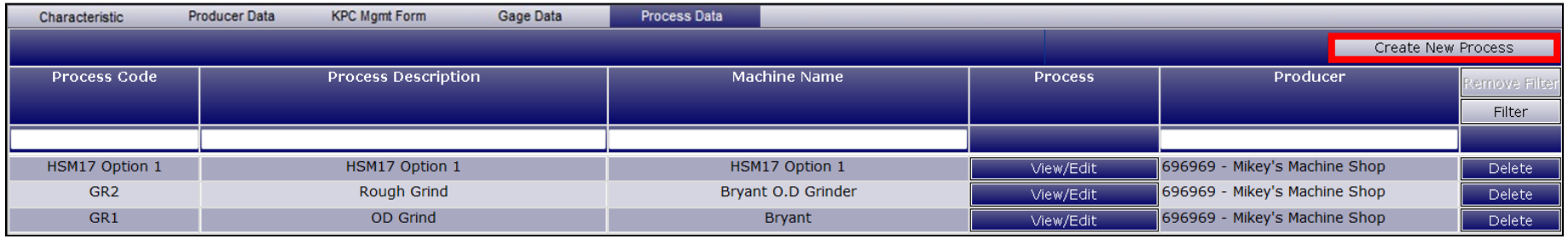
CREATING A NEW PROCESS

To create a process, select “**Create New Process**”.



Note: A new process can also be created from the Site-Specific Control Plan.

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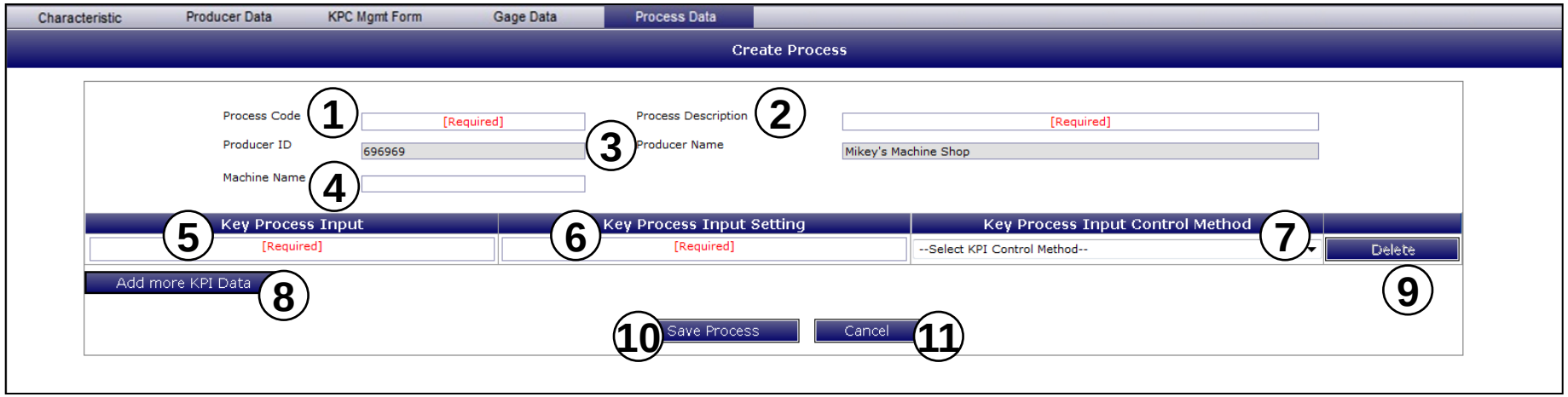
CREATING A NEW PROCESS



1. **Process Code** – Producers assign this code in the format of their choice. The format of the code should be such that it will assist the producer when selecting processes for other KPCs.
2. **Process Description** – Producer assigns a meaningful description of this process such that it will assist the producer when selecting processes for other KPCs.
3. **Producer ID & Producer Name** – Computer assigned information. These fields are read only.
4. **Machine Name (optional)** – Enter name of machine performing the process.
5. **Key Process Input** – List all key process parameters that, when effectively controlled, will minimize process variation.
6. **Key Process Input Setting** – List the settings of the Key Process Inputs that were defined in item 5.
7. **Key Process Input Control** – Select applicable control method from the drop-down list that relates to the Key Process Input and Key Process Input Settings defined in items 5 & 6.
8. **Add more KPI Data** – Click this button to add more lines of Key Process Input data as required.
9. **Delete** – Click this button to delete any single line of KPI data.
10. **Save Process** – Important!!! Click this button before leaving this screen to prevent loss of entered data. Once saved, this process will now be available on the Process Code and Process Description pull-down lists on the Site Specific Control Plan screen.
11. **Cancel** – Click this button to return to the Process Data Grid without saving data entries.

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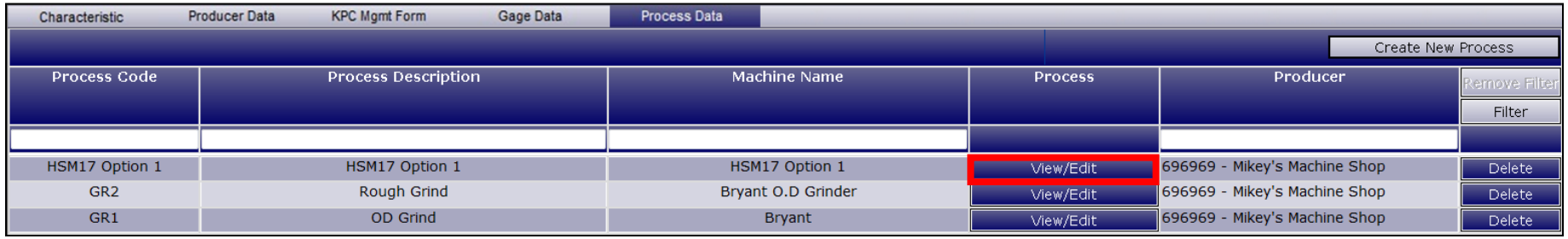
EDITING AN EXISTING PROCESS

To edit an existing process, select “**View/Edit**” adjacent to the process in question.



A screen will appear with all of the process data displayed. Any of the fields may be changed, new KPI data may be added or existing KPI data deleted. The field names and explanations are the same as the Create New Process screen. Be sure to save your changes.

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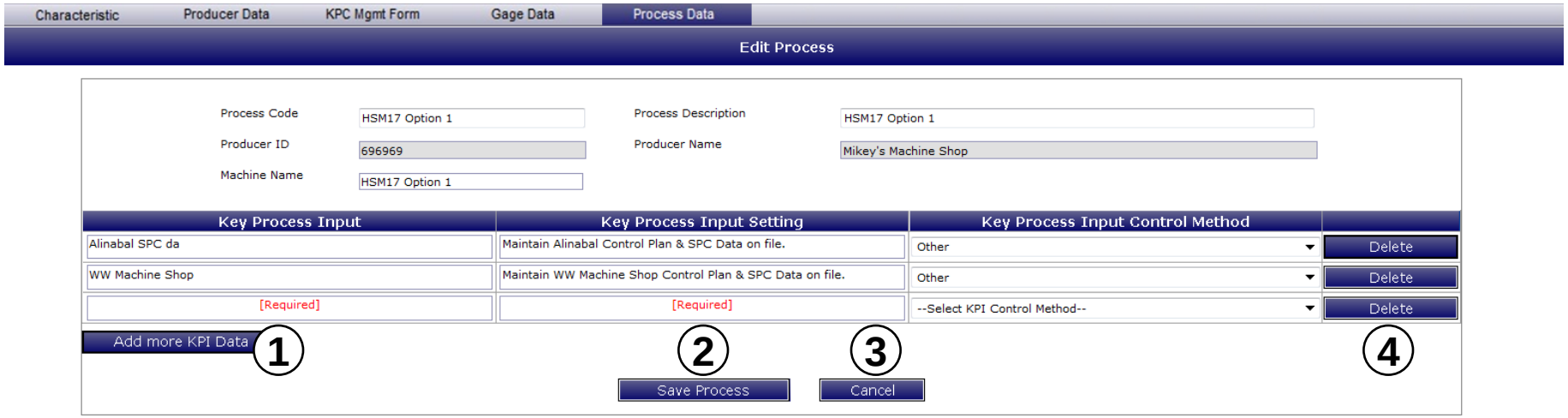
EDITING AN EXISTING PROCESS



1. Click on the “Add more KPI Data” button to add additional lines for Key Process Inputs, Key Process Input Settings, and key Process Input Control Methods.
2. Click on the “Save Process” button before leaving this screen to save all data.
3. Click on the “Cancel” button to return to the Process Data grid. Note: Any edits performed will not be saved.
4. Click on the “Delete” button to remove a key process input and its related data

Note: Only unshaded fields can be edited

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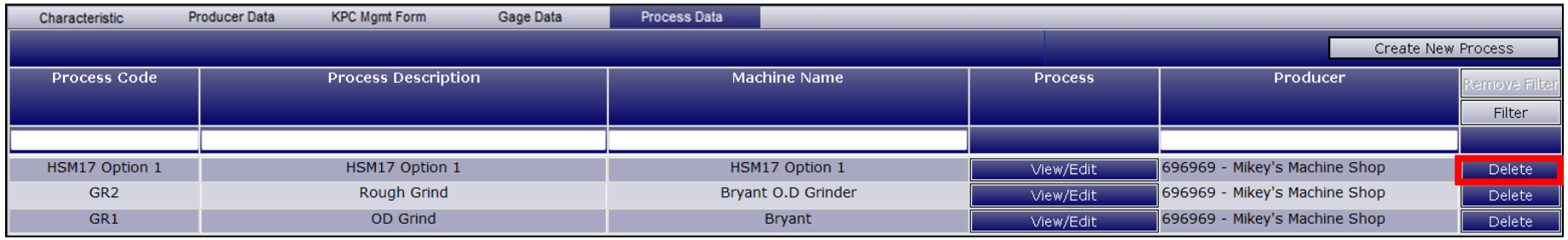
DELETING AN EXISTING PROCESS

Select “**Delete**” to delete any process that is no longer needed.



Note: A process can only be deleted if it is not assigned to any KPC’s.

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CHAPTER 3B: GAGE MANAGEMENT

- Gage Management Defined
- Navigating to the Gage Data Grid
- Creating a New Gage
- Editing/Deleting an Existing Gage

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GAGE MANAGEMENT DEFINED

- As part of completing the Site Specific Control Plan when progressing toward Milestone 2 (refer to Chapter 6: Milestone Management), a gage must be defined for each KPC in the database.

- Each gage used to measure a specific key characteristic must undergo a gage capability study to determine if it is capable of measuring the KPC with the required accuracy.
  - The gage resolution must not exceed 10% of the total tolerance
  - The gage RR% to tolerance must be 20% or less

- Gages already defined may be applied to any KPC for which that gage is suitable to measure (refer to Chapter 3c: Site Specific Control Plan for instructions on applying a gage to a KPC).

- When it is necessary to define a new gage, follow the instructions in this chapter.

- Existing gages may be modified (edited) as required and gages that are no longer used may be deleted.

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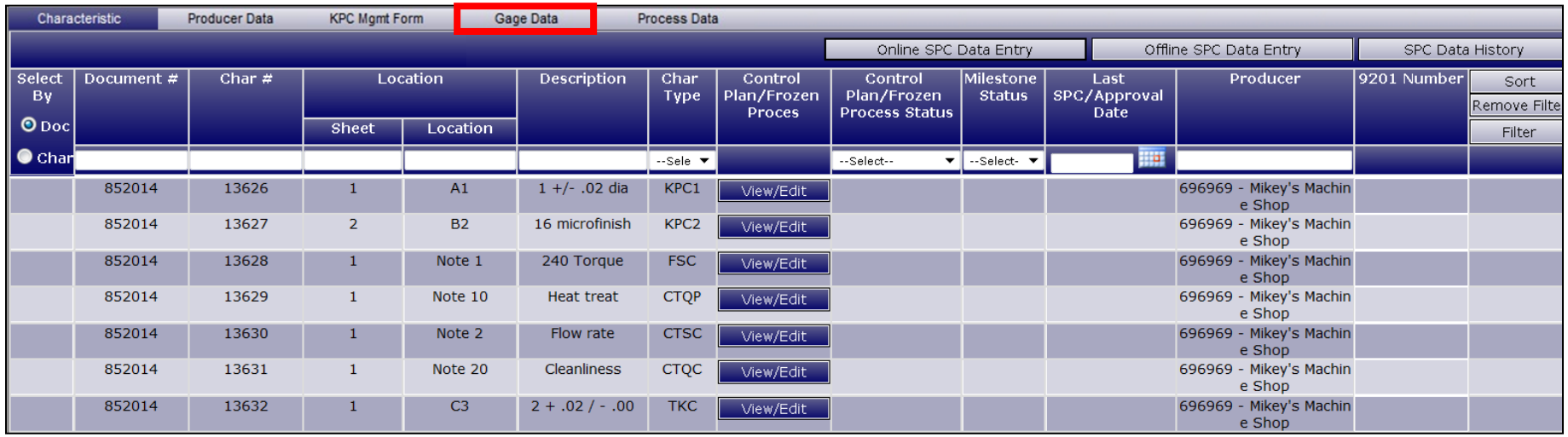
NAVIGATING TO THE GAGE DATA GRID

From any page, select the “**Gage Data**” tab to view a data grid of all defined gages.



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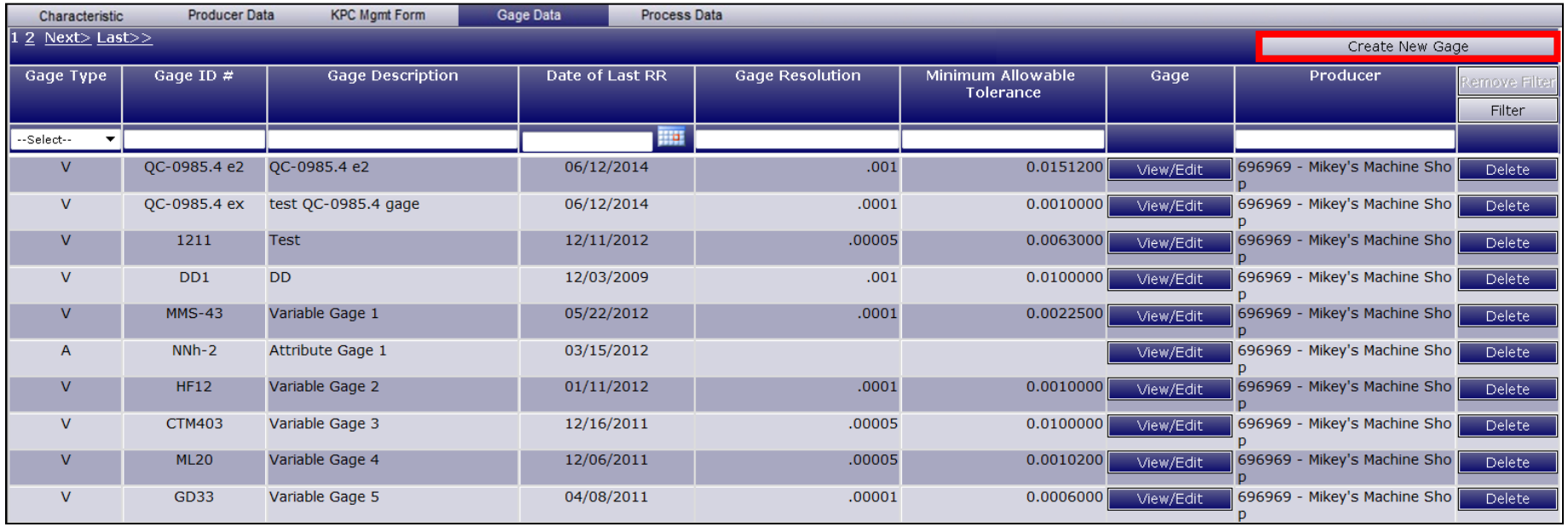
CREATING A NEW GAGE

Select “**Create New Gage**” to add a new gage.



Characteristic | Producer Data | KPC Mgmt Form | Gage Data | Process Data

1 2 Next> Last>>

Create New Gage

Gage Type	Gage ID #	Gage Description	Date of Last RR	Gage Resolution	Minimum Allowable Tolerance	Gage	Producer	Remove Filter / Filter
--Select--								
V	QC-0985.4 e2	QC-0985.4 e2	06/12/2014	.001	0.0151200	View/Edit	696969 - Mikey's Machine Shop	Delete
V	QC-0985.4 ex	test QC-0985.4 gage	06/12/2014	.0001	0.0010000	View/Edit	696969 - Mikey's Machine Shop	Delete
V	1211	Test	12/11/2012	.00005	0.0063000	View/Edit	696969 - Mikey's Machine Shop	Delete
V	DD1	DD	12/03/2009	.001	0.0100000	View/Edit	696969 - Mikey's Machine Shop	Delete
V	MMS-43	Variable Gage 1	05/22/2012	.0001	0.0022500	View/Edit	696969 - Mikey's Machine Shop	Delete
A	NNh-2	Attribute Gage 1	03/15/2012			View/Edit	696969 - Mikey's Machine Shop	Delete
V	HF12	Variable Gage 2	01/11/2012	.0001	0.0010000	View/Edit	696969 - Mikey's Machine Shop	Delete
V	CTM403	Variable Gage 3	12/16/2011	.00005	0.0100000	View/Edit	696969 - Mikey's Machine Shop	Delete
V	ML20	Variable Gage 4	12/06/2011	.00005	0.0010200	View/Edit	696969 - Mikey's Machine Shop	Delete
V	GD33	Variable Gage 5	04/08/2011	.00001	0.0006000	View/Edit	696969 - Mikey's Machine Shop	Delete

Note: A new gage may also be created from the Site Specific Control Plan.

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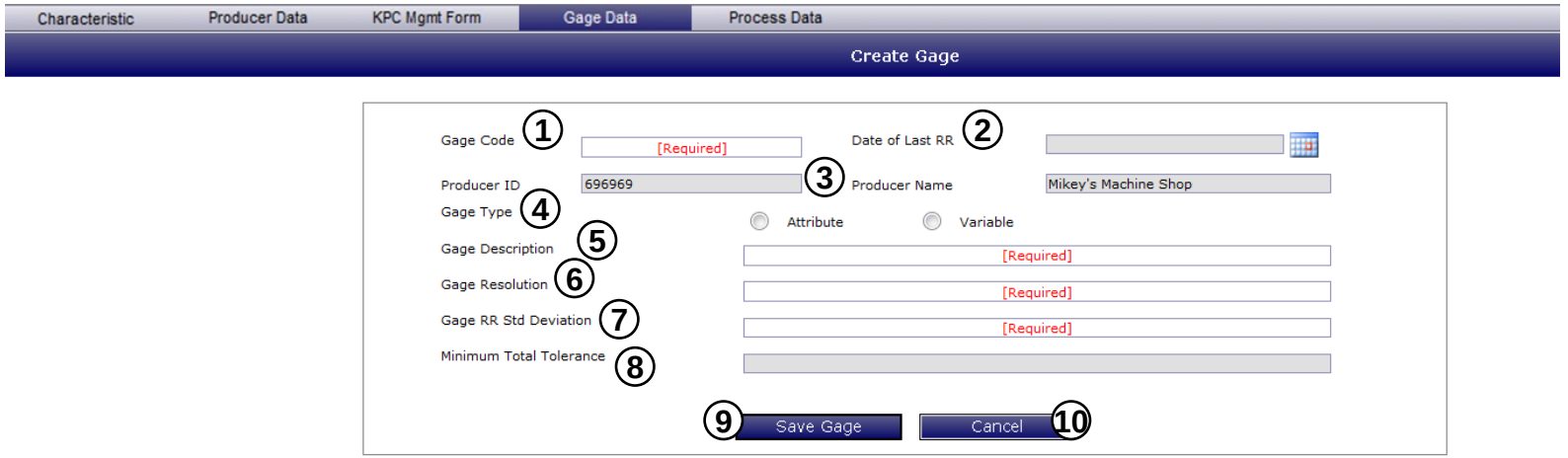
CREATING A NEW GAGE



1. **Gage Code** – Producers assign this code in the format of their choice. Tip: Make the gage code the same as the gage identification in the producer's calibration control system.
2. **Date of Last RR** – Select the date of the last gage capability study for this gage using the calendar tool.
3. **Producer ID & Producer Name** – Computer assigned information (read only).
4. **Gage Type** – Select the corresponding radio button that matches the type gage to be used. Note: If an attribute gage is more suitable for the measurement of the KPC, a KPC Management Form must be submitted and approved by Collins before the gage can be applied (refer to Chapter 3e: KPC Management Forms for instructions on submitting a KPC Management Form).
6. **Gage Description** – Assign a meaningful description of the gage that will assist when selecting gage for other KPC's. Tip: Make the gage description the same as the gage description in the producer's calibration control system.
7. **Gage Resolution** – The smallest measurement increment on the gage measuring the KPC. The gage resolution should be 10% or less of the total tolerance of the KPC. If gage resolution exceeds 10%, and a resolution below 10% cannot be achieved, a KPC Management Form needs to be submitted in order to waive the requirement (refer to Chapter 3e: KPC Management Forms for instructions on completing KPC Management Forms).
8. **Gage RR Std Deviation** – Enter the standard deviation from the gage capability study.
9. **Minimum Total Tolerance** – The minimum total tolerance (MTT) a gage is suitable for measurement purposes. MTT is a computer calculated value based on the gage resolution and the gage RR standard deviation. Note: If the total tolerance of the KPC is less than the MTT, then a new gage must be selected which meets the requirements or a KPC Management Form must be submitted and approved by Collins before the gage can be applied.
10. **Save Gage** - **Important!!!** Click this button before leaving this screen to prevent loss of entered data. Once saved, this gage will now be available on the Gage Code and Gage Description pull-down lists on the Site Specific Control Plan screen.
11. **Cancel** - Click this button to return to the Gage Data Grid without saving data entries.

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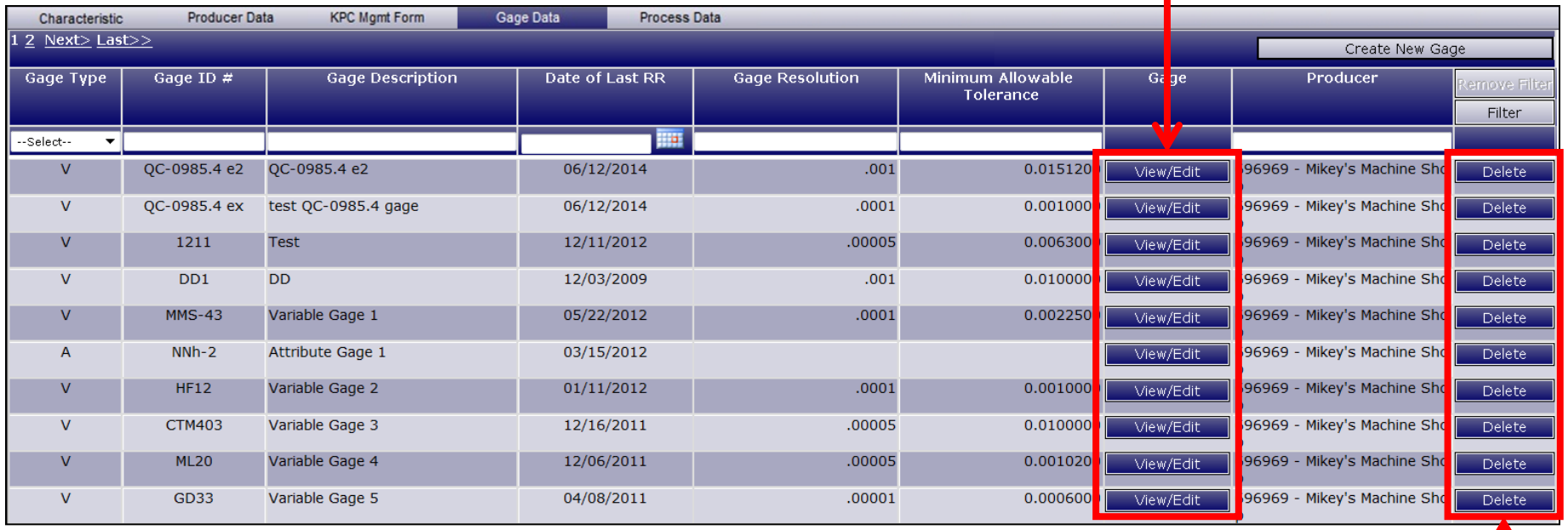
EDITING/DELETING AN EXISTING GAGE

Select “**View/Edit**” to view or edit a previously defined gage.



Select “**Delete**” to delete a previously defined gage that is not being used.
Note: A gage can only be deleted if it is not assigned to any KPC’s.

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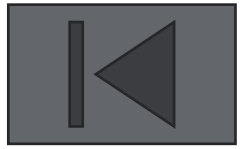
CHAPTER 3C: SITE SPECIFIC CONTROL PLAN



- Definition of the Site Specific Control Plan
- Completing the Site Specific Control Plan

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DEFINITION OF THE SITE SPECIFIC CONTROL PLAN

The Site Specific Control Plan defines the methods and controls used to manufacture, chart and measure a KPC. It consists of:

- Process Data – includes key process inputs, settings and control methods.
- Chart Data – includes control chart type and related sub-group size.
- Gage Study Data – includes data from the gage capability study.

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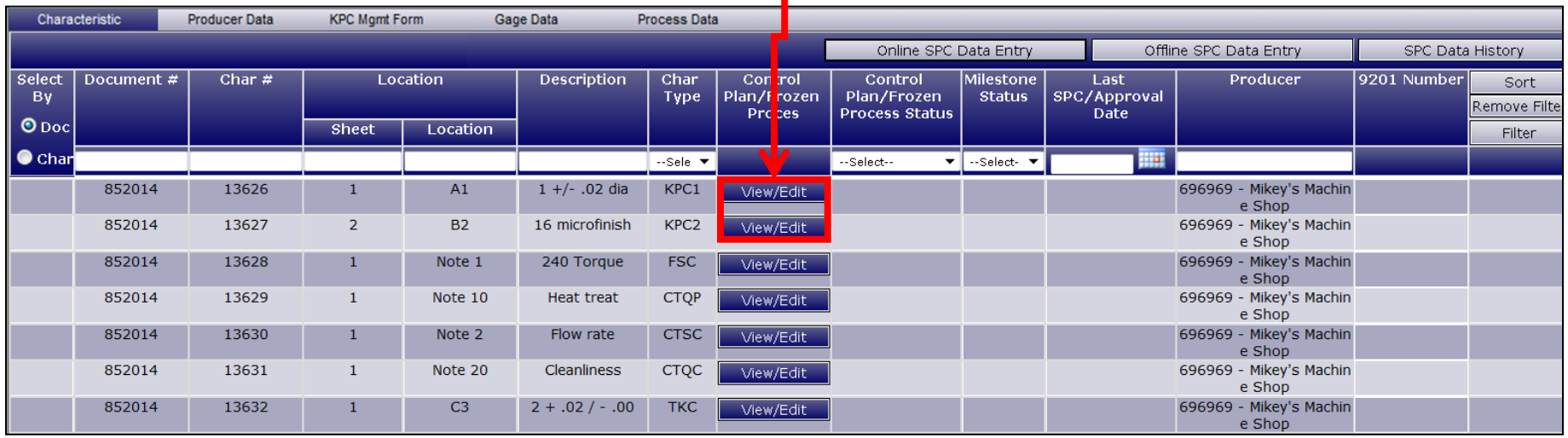
COMPLETING THE SITE SPECIFIC CONTROL PLAN

Step 1: Select the KPC. From the COPS Summary Screen, select "**View/Edit**" button to go to that KPC's Site Specific Control Plan.



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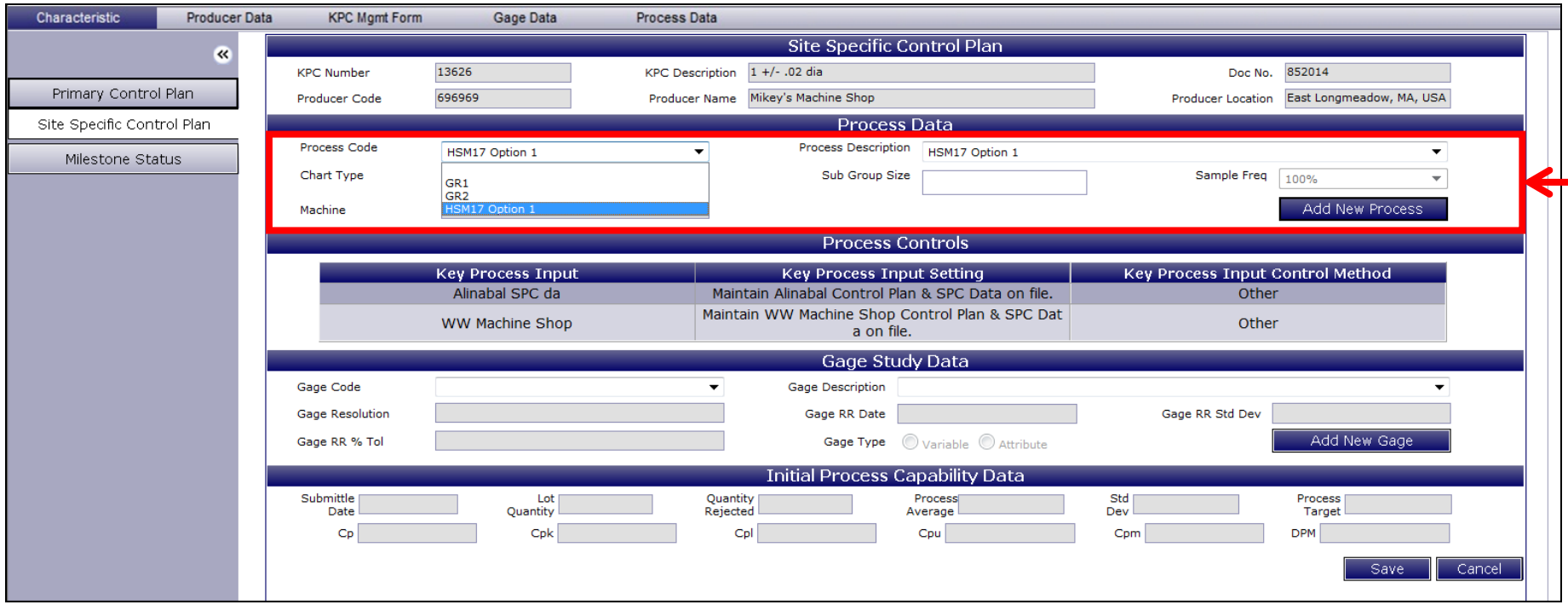
COMPLETING THE SITE SPECIFIC CONTROL PLAN

Step 2: Select the Process. Once the KPC has been selected, chose the process you want to apply from either the "**Process Code**" or "**Process Description**" pull-down menus. Note: If the desired process has not been defined, select "**Add New Process**" (refer to Chapter 3a: Process Management for guidance on creating a new process). If the new process definition is launched from the Site Specific Control Plan screen, you will be returned to this screen and the new process data will be displayed.



Note: Once the process has been selected/created, the "Process Code", "Process Description" and "Process Controls" fields will auto-populate.

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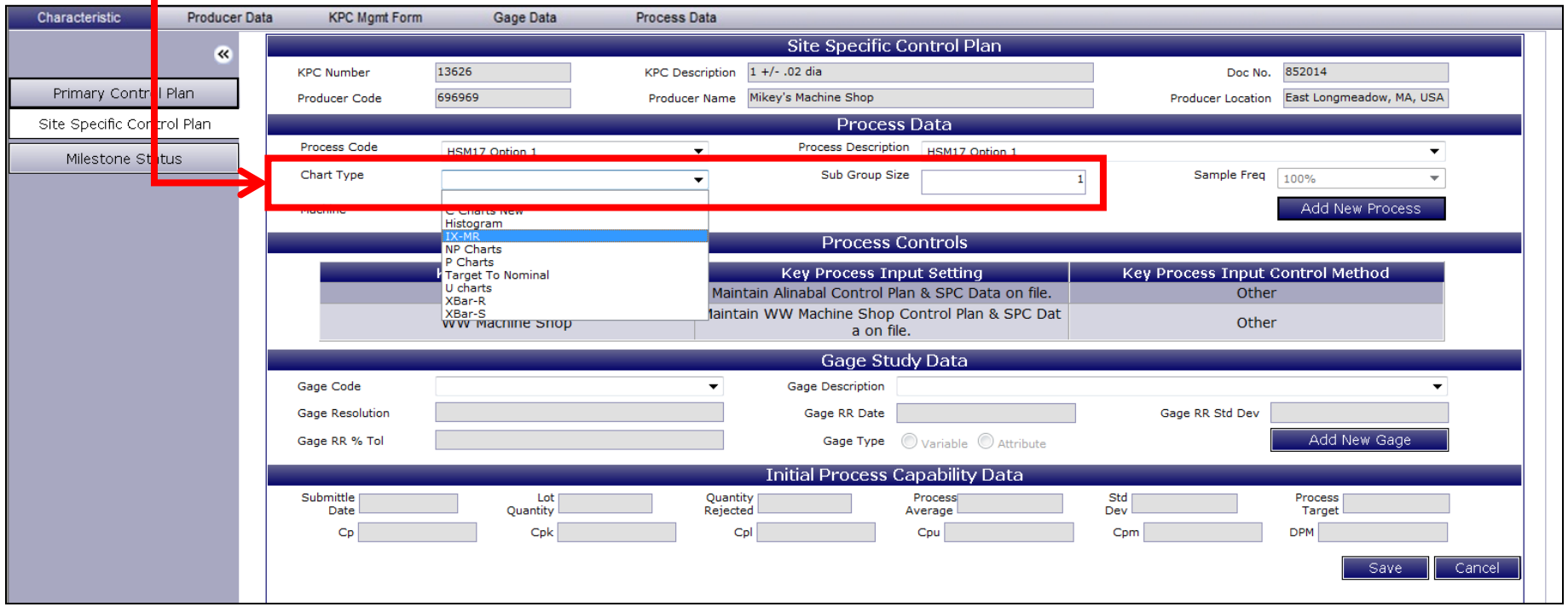
COMPLETING THE SITE SPECIFIC CONTROL PLAN

Step 3: Select the "Chart Type" (from the pull-down menu) to be used for SPC data collection and monitoring. Enter the appropriate "**Sub Group Size**" for the Chart Type selected.



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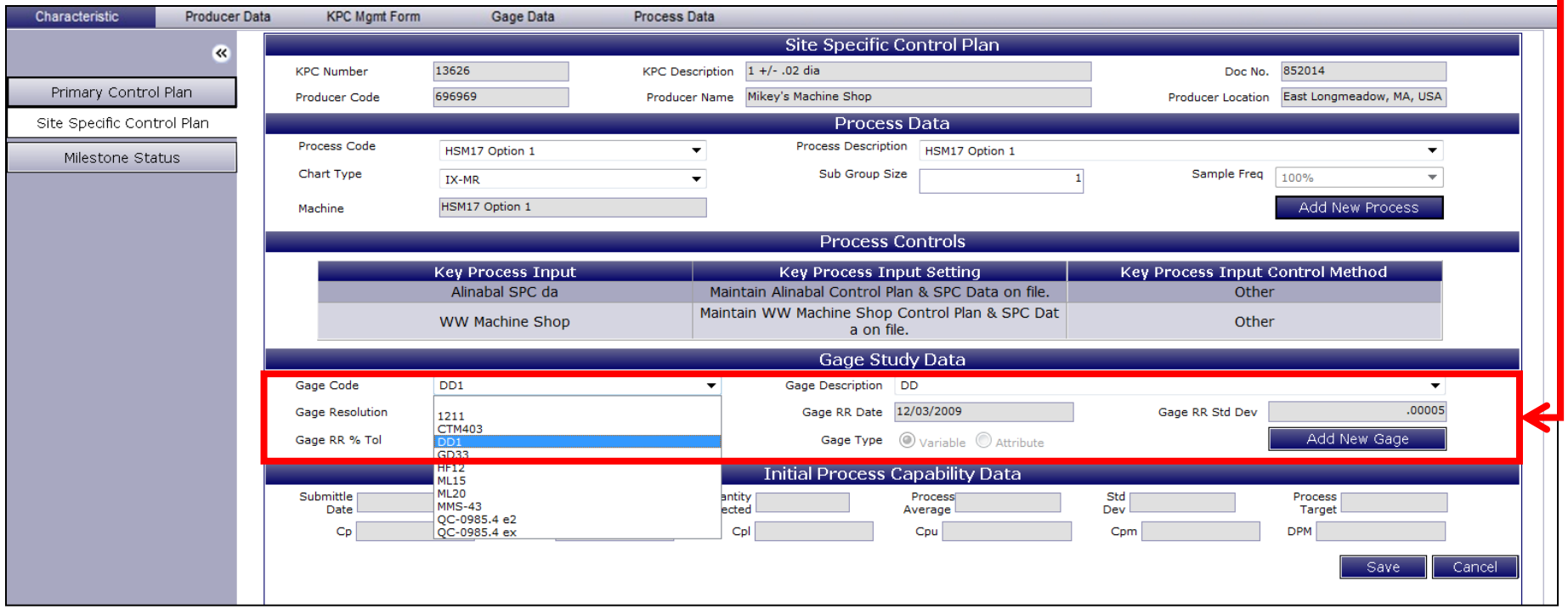
COMPLETING THE SITE SPECIFIC CONTROL PLAN

Step 4: Select the Gage. Chose the gage you want to apply from either the "**Gage Code**" or "**Gage Description**" pull-down menus. If the desired gage has not been defined, select "**Add New Gage**" (refer to Chapter 3b: Gage Management for guidance on creating a new gage).



Note: Once the gage has been selected/created, the "Gage Code", "Gage Description" and "Gage Study Data" fields will auto-populate.

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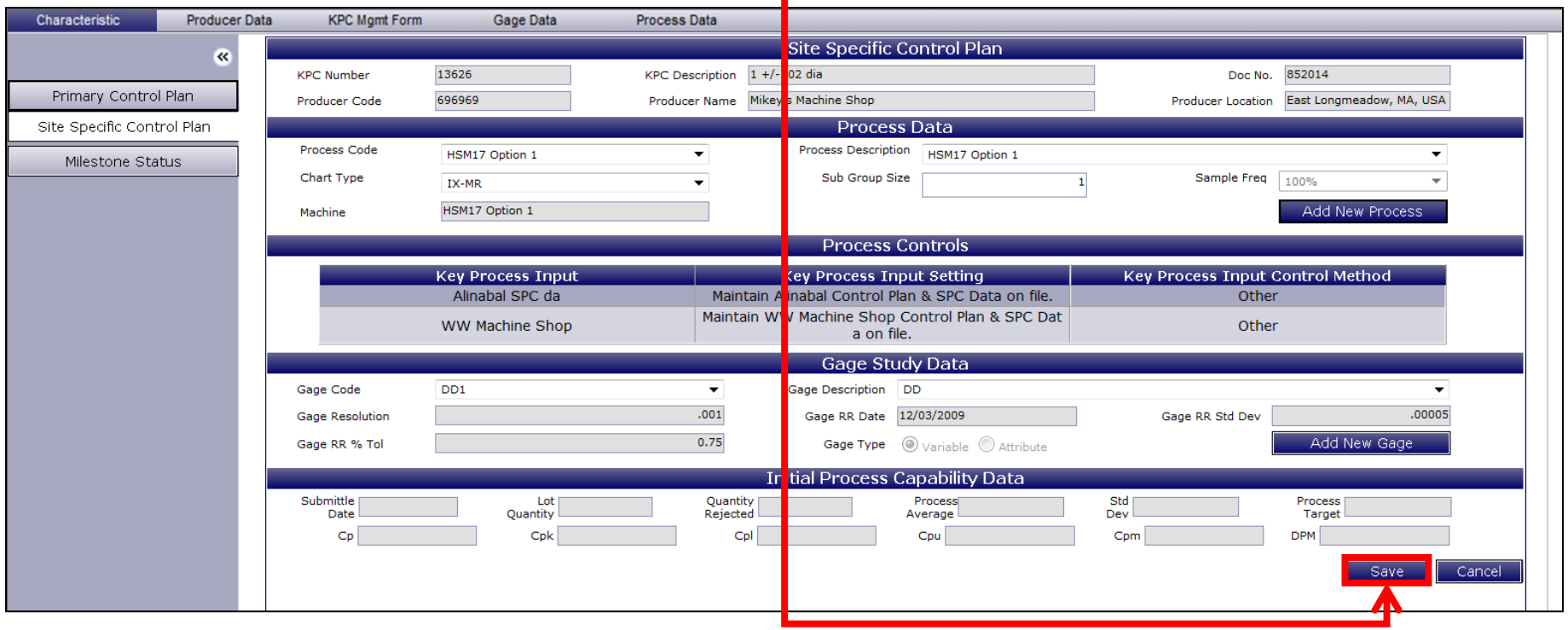
COMPLETING THE SITE SPECIFIC CONTROL PLAN

Step 5: Save the Site Specific Control Plan. Select "**Save**" to save the Site Specific Control Plan. An incomplete plan may be saved and completed at a later time.



Note: Choosing "Cancel" will return you to the COPS Summary screen without saving entries.

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CHAPTER 3D: SPC DATA REPORTING

- SPC Data Entry
- View/Edit Previously Submitted SPC Data

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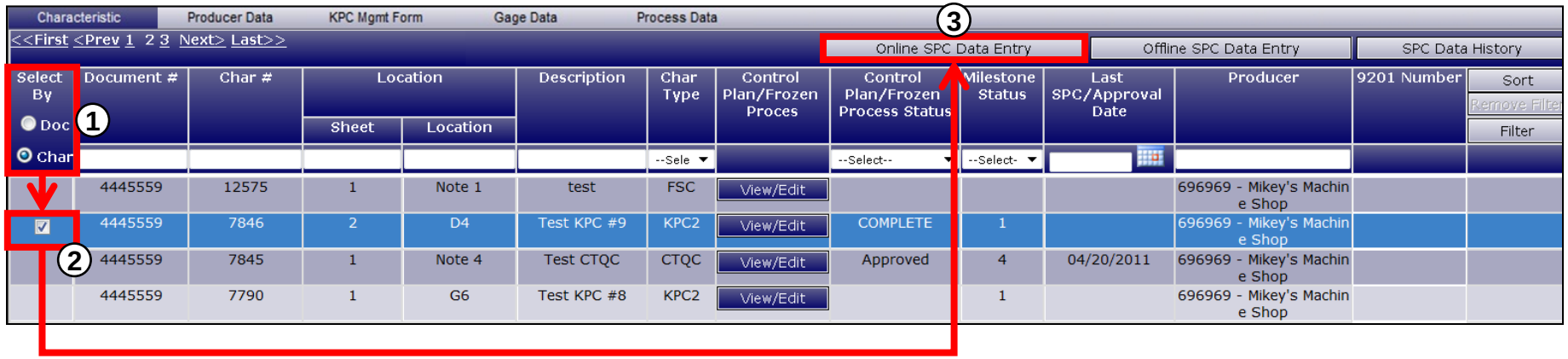
SPC DATA ENTRY

SPC data must be entered on the COPS Summary Screen each time a lot is manufactured and an iLot is going to be created in the Supplier Portal or as required per HSC16199. The data must be entered before any parts from that lot are shipped to Collins Aerospace. Previously submitted SPC data may also be viewed/edited. The data can be entered either online or offline.

From the COPS Summary Screen, the online data submittal screen can be opened by performing the following steps:
Step 1: Select By Doc or Char. If "**Doc**" is selected, all KPCs for that document with completed Site Specific Control Plans will be available for data submittal. If "**Char**" is selected, only that specific KPC will be available for data submittal.
Step 2: Select the KPC. Check the box and data lines that contain KPCs become highlighted when a KPC is chosen for SPC data entry. Note: Only KPCs with completed Site Specific Control Plans can be chosen for SPC data entry.
Step 3: Select "Online SPC Data Entry". Click on this button to open the screen for online SPC data entry.



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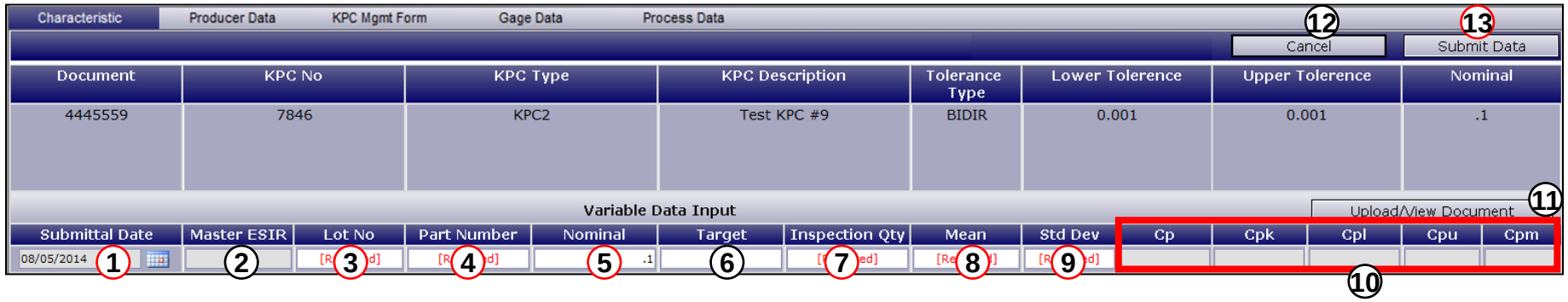
SPC DATA ENTRY

Online SPC data entry screen for **variable** data:



Red fields indicate required fields that need to be filled in order to be able to submit data:

1. **Submittal Date** – The date the manufactured lot passed final inspection (defaults to today's date). Click on the calendar tool to revise this date.
2. **Master ESIR**– Master ESIR created in eSilk for this lot of material. Will be auto-filled when ESIR is generated in eSilk.
3. **Lot No** – Enter the manufacturing lot traceability number.
4. **Part Number** – Enter the Collins part number that appears on the purchase order.
5. **Nominal** – If the KPC is a tabulated feature, enter the nominal value for the part number; otherwise, the nominal value will be pre-populated.
6. **Target** – If the process is targeting off the nominal value to allow for tool wear, enter the targeted value; if not, leave blank.
7. **Inspection Qty** – Enter the number of pieces in the manufactured lot.
8. **Mean** – the average of all measurements in the manufactured lot for an individual KPC.
9. **Std Dev** – Enter the calculated standard deviation for all measurements in the manufactured lot.
10. **Cp, Cpk, Cpl, Cpu, Cpm** – Computer calculated values based on mean, standard deviation and upper/lower limits.
11. **Upload/View Document –** Button that allows raw data to be attached that was used to create summary SPC data (mean & std dev).
12. **Cancel** – Click the "Cancel" button to exit this screen. Note: Data entries will not be saved.
13. **Submit Data** – Click the "Submit Data" button when all entries have been completed.

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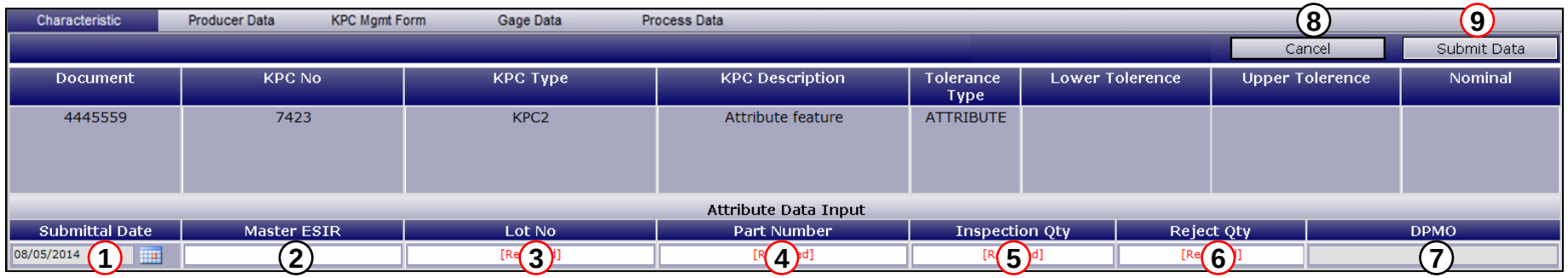
SPC DATA ENTRY

Online SPC data entry screen for **attribute** data:



Red fields indicate required fields that need to be filled in order to be able to submit data:

1. **Submittal Date** – The date the manufactured lot passed final inspection (defaults to today's date). Click on the calendar tool to revise this date.
2. **Master ESIR**– auto-filled when Master ESIR is created in eSilk.
3. **Lot No** – Enter the manufacturing lot traceability number.
4. **Part Number** – Enter the Collins part number that appears on the purchase order.
5. **Inspection Qty** – Enter the number of pieces in the manufactured lot.
6. **Reject Qty** – Enter the number of pieces rejected from the manufactured lot.
7. **DPMO** – Computer calculated value.
8. **Cancel** – Click the "Cancel" button to exit this screen. Note: Data entries will not be saved.
9. **Submit Data** – Click the "Submit Data" button when all entries have been completed.

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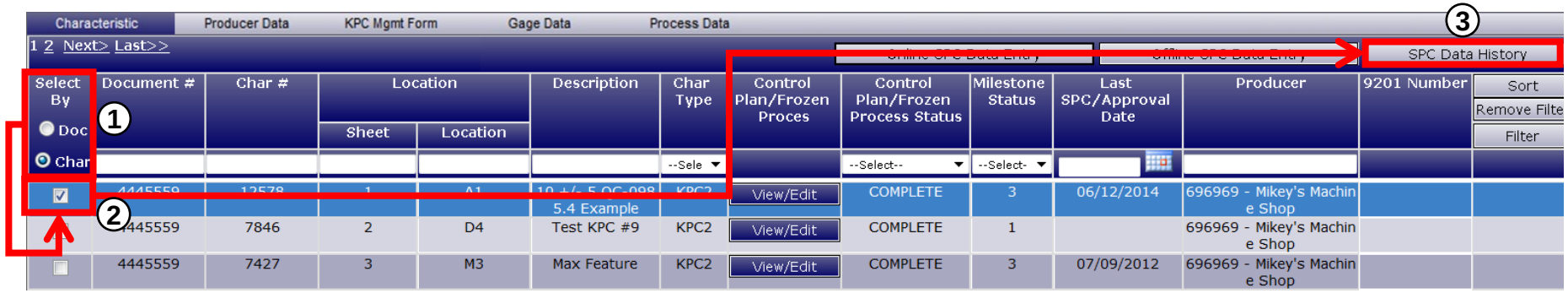
VIEW/EDIT PREVIOUSLY SUBMITTED SPC DATA

From the COPS Summary Screen, the SPC data history screen can be opened by performing the following steps:

Step 1: Select By Doc or Char. If "**Doc**" is selected, all KPCs for that document with completed Site Specific Control Plans will be available for data submittal. If "**Char**" is selected, only that specific KPC will be available for data submittal.
Step 2: Select the KPC. Check the box and data lines that contain KPCs become highlighted when a KPC is chosen for SPC data entry. Note: Only KPCs with completed Site Specific Control Plans can be chosen for SPC data entry.
Step 3: Select "SPC Data History". Clicking on this button will allow you to view/edit previously submitted SPC data.



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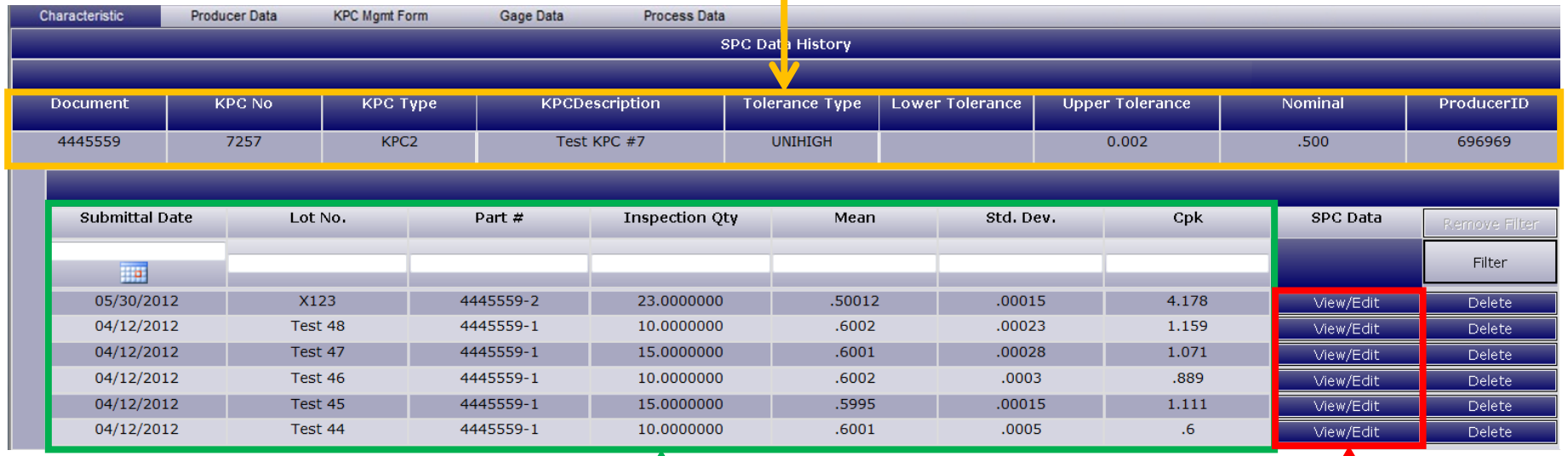
VIEW/EDIT PREVIOUSLY SUBMITTED SPC DATA

This row contains view only data describing the selected KPC.



This section displays all lot-to-lot SPC data that has been submitted to date. In this example, 6 lots have been submitted.

To edit previously submitted data, Click on the "**View/Edit**" button for the manufactured lot number to be updated. The screen on the next slide will appear.

Note: Clicking the "Delete" button will remove the manufactured lot and its SPC data from the database.

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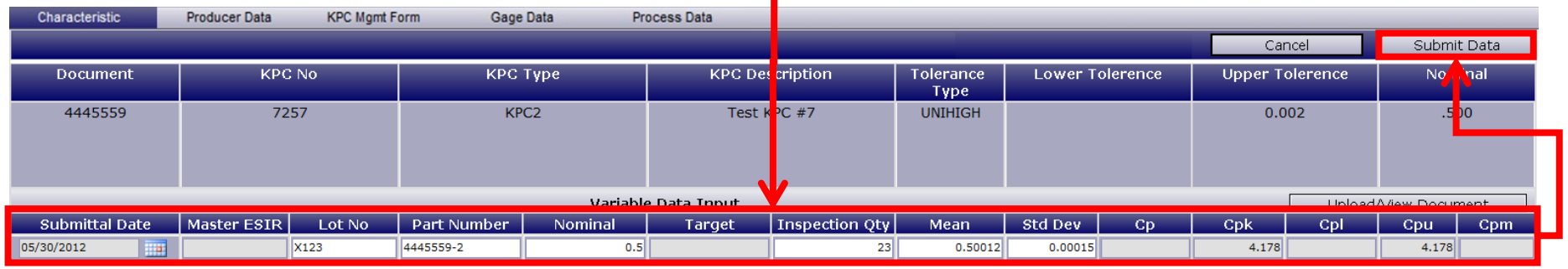
VIEW/EDIT PREVIOUSLY SUBMITTED SPC DATA

Enter the applicable data in the updatable fields then click on the "**Submit Data**" button to save the revised data.



Note: Choosing "Cancel" will return you to the SPC Data History Screen without saving entries.

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CHAPTER 3E: KPC MANAGEMENT FORMS

- What is a KPC Management Form?
- When is a KPC Management Form required?
- How to launch an KPC Management Form
- Create and submit a KPC Management Form
- Determine the status of a KPC Management Form

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WHAT IS A KPC MANAGEMENT FORM?

- A KPC Management Form is an electronic document that is initiated by a producer to request an exemption of their KPC requirements:
  1. When gage capability requirements cannot be economically met
  2. When process capability requirements cannot be economically met
  3. When the use of variable gaging is impractical for the type of characteristic being measured
  4. To request waiver of all HSC16199 requirements for a specific KPC due to an alternate method of control

- KPC Management Forms apply only to characteristics controlled by variation management (KPC1s & KPC2s)

- The KPC Management Form is documented and stored in the COPS database

- If a KPC Management Form is approved, the Milestone Status Screen will be updated accordingly

Note: KPC Management Forms are launched from the Milestone Status screen

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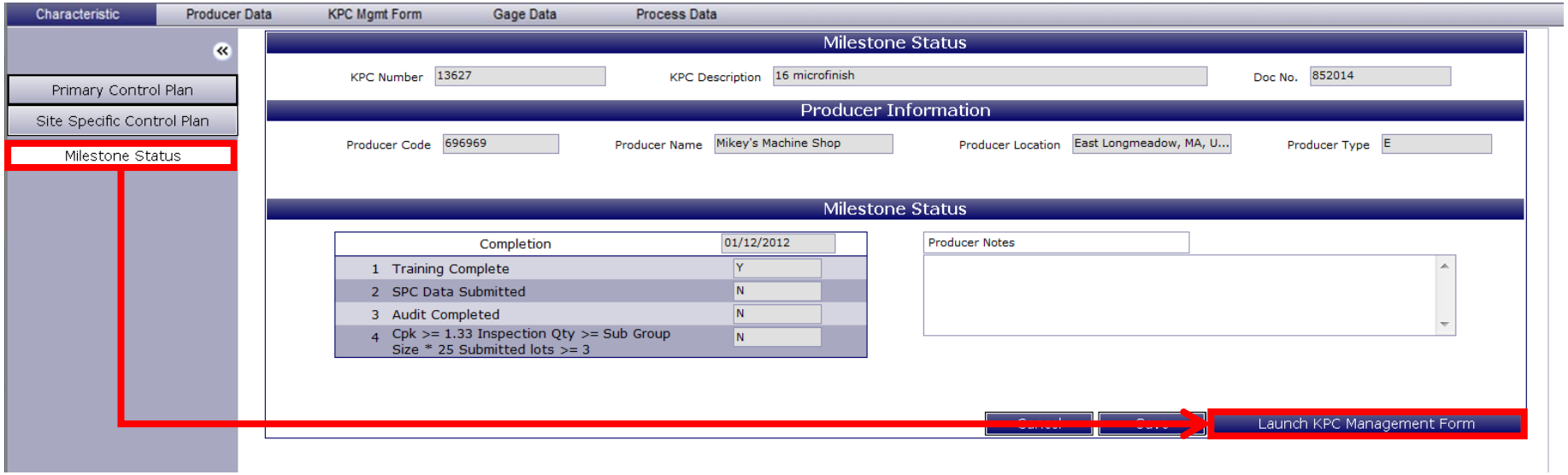
HOW TO LAUNCH AN KPC MANAGEMENT FORM

After pressing "**View/Edit**" for a KPC, click on the "**Milestone Status**" tab and press the "**Launch a KPC Management Form**" button:



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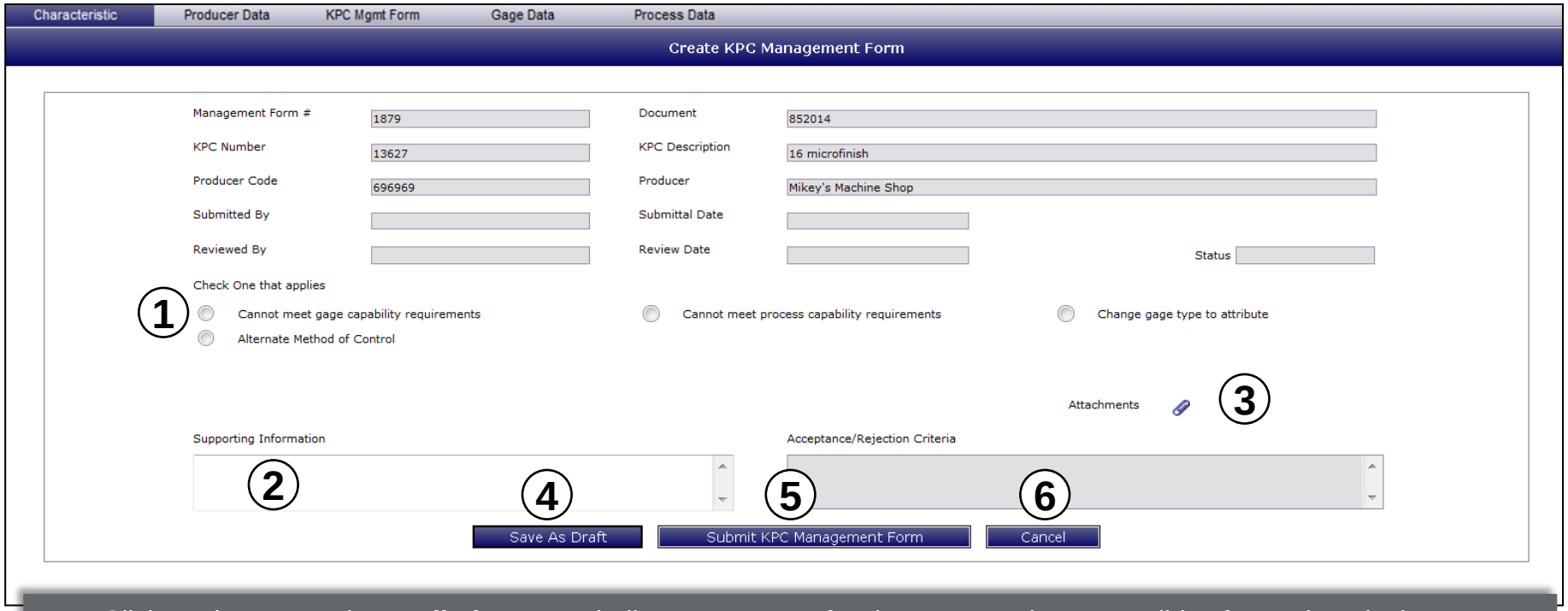
CREATE AND SUBMIT A KPC MANAGEMENT FORM



1. Click on the appropriate **radio button** to indicate category of waiver request (see next slides for explanation).
2. Enter the **supporting information** for requesting the waiver in this field.
3. Click on the **paperclip** to attach the completed KPC Management template and any supporting documents. The KPC Management template can be found on the supplier portal, ensure you are following the instructions tab when completing the template.
4. Click on "**Save as Draft**" to save the KPC Management Form as a draft for later completion and submittal.
5. Click on "**Submit KPC Management Form**" to submit the completed KPC management Form to Collins for review.
6. Click on "**Cancel**" to cancel the KPC management Form.

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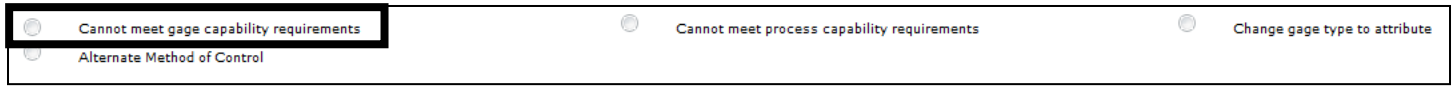
CANNOT MEET GAGE CAPABILITY REQUIREMENTS



Reason: Producer's gage does not meet reproducibility / repeatability requirements and cannot be practically brought into compliance.
Based on worst case of either:

- Gage needs to be able to measure at least 1/10 of total tolerance
- Gage R&R % to tolerance cannot be greater than 20%

Acceptance Result: Acceptable gage requirement is waived, and control plan can be completed without an acceptable gage to enable the producer to enter SPC data.

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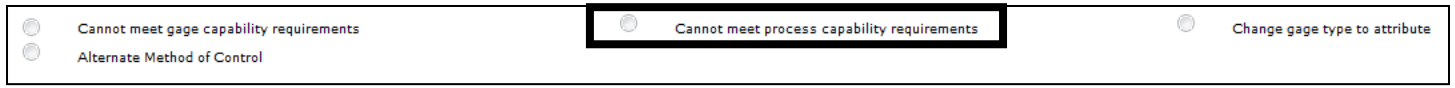
CANNOT MEET PROCESS CAPABILITY REQUIREMENTS



Reason: After reasonable effort, producer cannot achieve process capability requirements due to cost or design requirements resulting in Cpk < 1.33.

Acceptance Result: Cpk >= 1.33 Milestone 4 requirement is waived.

Completion		04/12/2013
1	Training Complete	Y
2	SPC Data Submitted	Y
3	Audit Completed	Y
4	CpK >= 1.33	W

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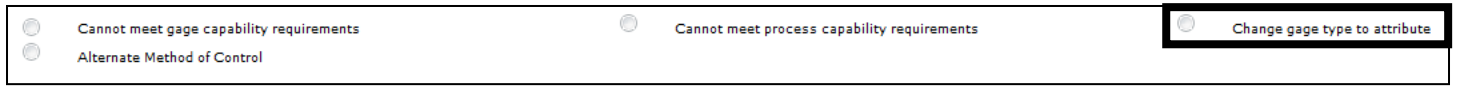
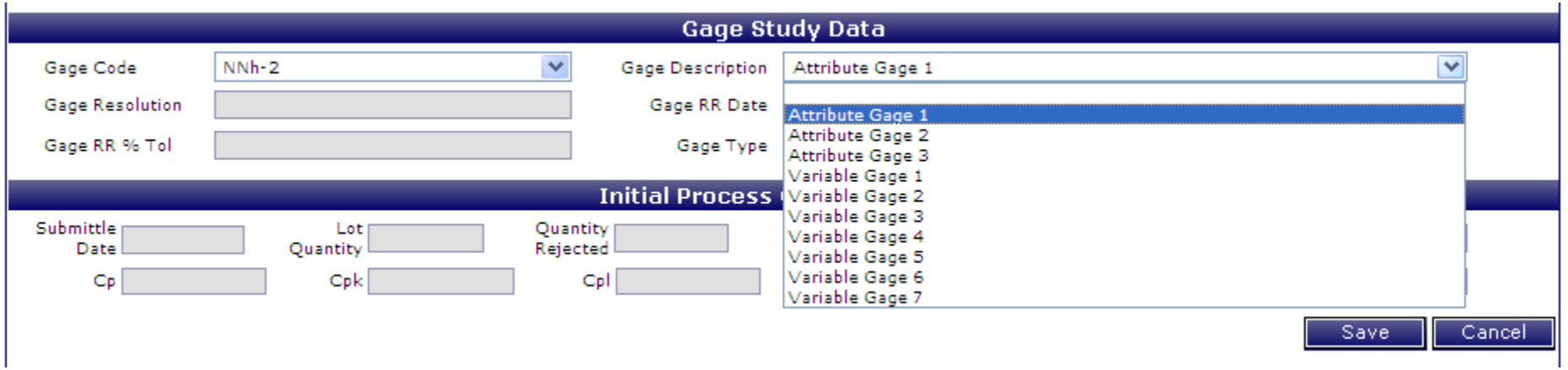
CHANGE GAGE TYPE TO ATTRIBUTE



Reason: Geometry not practical for Producer to measure using variable gaging.
Example: Small hole with go/no go pins

Acceptance Result: Gage type will be changed to “Attribute” and Producer will be allowed to select attribute gages for this characteristic.



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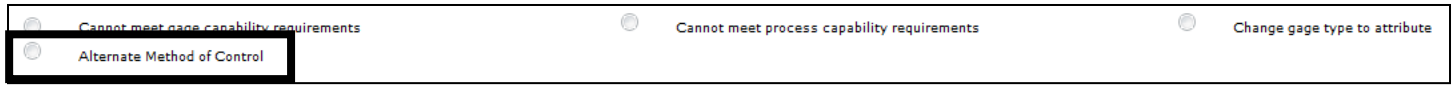
ALTERNATE METHOD OF CONTROL



Reason: Inappropriate application of statistical process control techniques for this characteristic.

Examples of characteristic types that are not good applications are:

- True position
- Surface finish
- Minimum tolerance characteristics
- Hardness
- Edge breaks
- Thread dimensions
- Characteristics that are visually inspected
- Material attributes
- Non-measurable characteristics

Acceptance Result: Characteristic is inactivated for that producer, and they can no longer see it in their characteristic summary screen.

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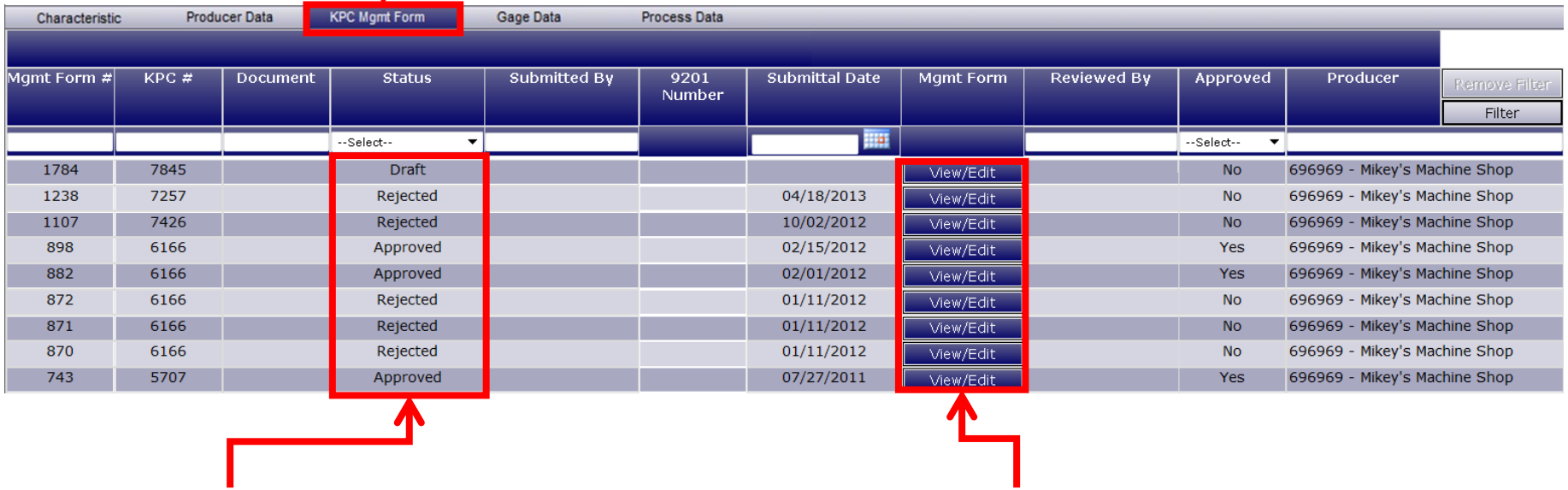
DETERMINE THE STATUS OF A KPC MANAGEMENT FORM

Click on the "**KPC Mgmt Form**" button from any screen to view summary information for all initiated KPC Management Forms



Status of each KPC Management Forms is displayed

Click on the "**View/Edit**" button to view detail information for any KPC Management Form or to complete a KPC Management Form in draft status

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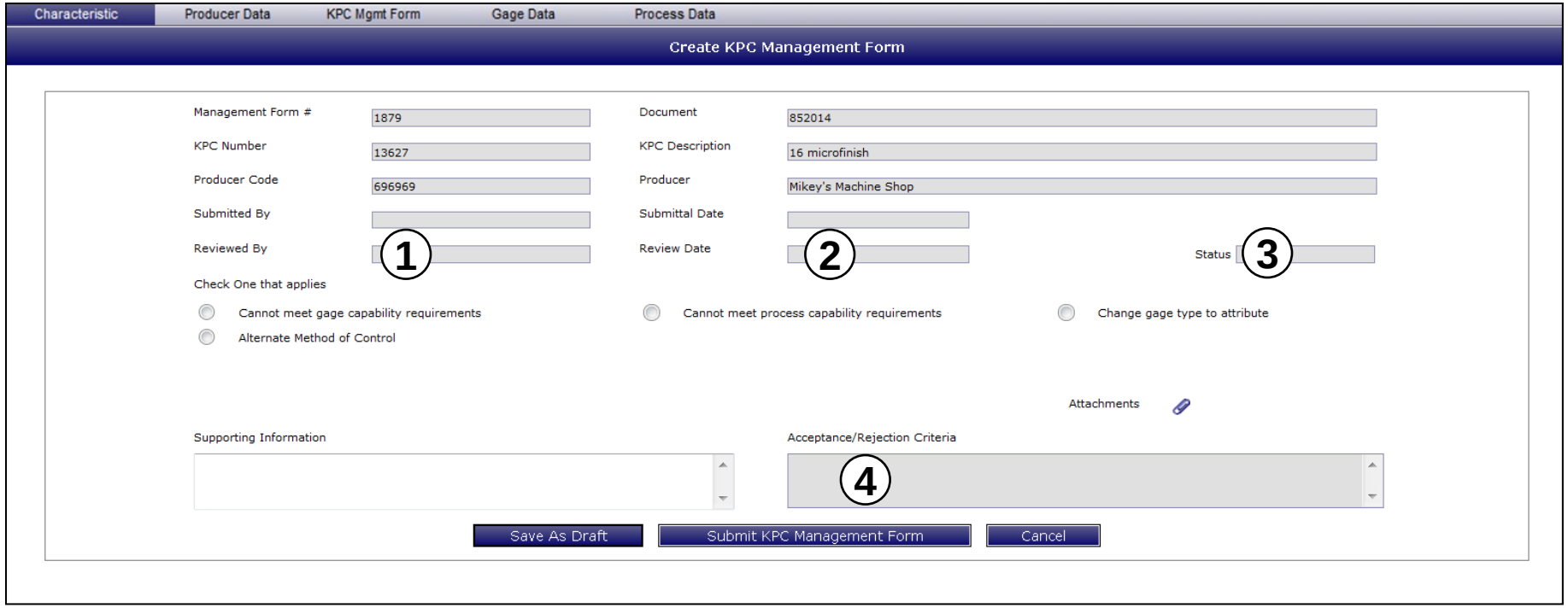
DETERMINE THE STATUS OF A KPC MANAGEMENT FORM



1. Displays the name of the Collins reviewer
2. Displays the review date
3. Displays the status of the KPC Management Form (Draft, Submitted, In-process, Approved or Rejected)
4. Displays the acceptance/rejection criteria

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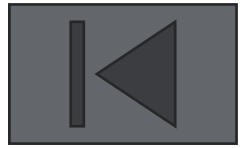
CHAPTER 3F: TEMPORARY KEY CHARACTERISTICS



- What is a Temporary Key Characteristic (TKC)?
- How is a producer notified when a TKC is assigned?
- Viewing the TKC
- TKC Requirements

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WHAT IS A TEMPORARY KEY CHARACTERISTIC (TKC)?

- TKC's may be assigned to producers at the discretion of Collins Quality Engineering for any of the following reasons:
  - to validate the effectiveness of the corrective action plan submitted by a Collins Supplier in the event of a dimensional escape.
  - to validate the effectiveness of the corrective action plan submitted by a Collins Supplier in the event of a dimensionally related Conditional Advanced Disposition (CAD).
  - when Collins Engineering/Quality/Procurement may want to understand the capability for a given process/feature for design and/or root cause analysis purposes.

- Any TKC resulting from a dimensional escape will be tied directly to a specific Quality Notification emanating from the System for Tracking Action Requests (STAR).

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HOW IS A PRODUCER NOTIFIED WHEN A TKC IS ASSIGNED?

- Once Quality Engineering assigns a TKC, the producer will be notified via Email.
- The Email will contain an attached letter with the following information:
  - Applicable part number
  - TKC description
  - Location of the TKC on the applicable document
  - Instructions for TKC data collection and reporting
  - Applicable forms (Getting Started Spreadsheet, form QC-0985.4)
- Concurrent with the Email notification, the TKC will be created in the COPS database.
- The TKC may be viewed via the COPS grid, similar to all other KPC’s

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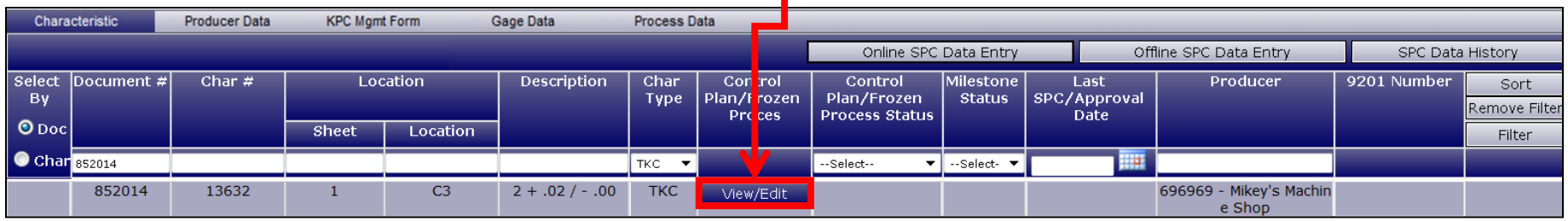
VIEWING THE TKC

Click on the “**View/Edit**” button to go to that TKC’s Site Specific Control Plan.



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TKC REQUIREMENTS

- All the requirements for KPC1's and KPC2's previously defined apply to TKC's:
  - Completion of Site Specific Control Plan (refer to Chapter 3c: Site Specific Control Plan).
  - Data collection and reporting (refer to Chapter 3d: SPC Data Reporting).
- Milestone progression does not apply to TKCs
- TKCs become "Inactive" once the following conditions have been satisfied:
  1. A minimum of 25 consecutive measurements from a minimum of 3 consecutive lots.
  2. Calculated Cpk from each lot must be equal to or greater than 1.33.

Note: Refer to HSM17 for detail requirements regarding TKCs.

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CHAPTER 4: REQUIREMENTS FOR FROZEN PROCESS CHARACTERISTICS

- Definition of a Frozen Process
- Completing a Frozen Process
- Reworking a Frozen Process
- Modifying an Approved Frozen Process

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DEFINITION OF A FROZEN PROCESS

A frozen process is defined by the manufacturing documentation (traveler, OP sheet, oven schedule, weld schedule, etc.) that is used to produce the applicable Frozen Safety Characteristics (FSC) or Critical to Quality Process characteristics. FSCs are designated by a star symbol (★) on the drawing and Critical to Quality Process characteristics by the CTQP symbol.

Once defined, a process must be submitted for Collins approval and no parts may be shipped before approval.

After approval, a process is considered frozen and may not be changed without prior Collins approval.

All parts must be manufactured in strict accordance with the approved, frozen process.

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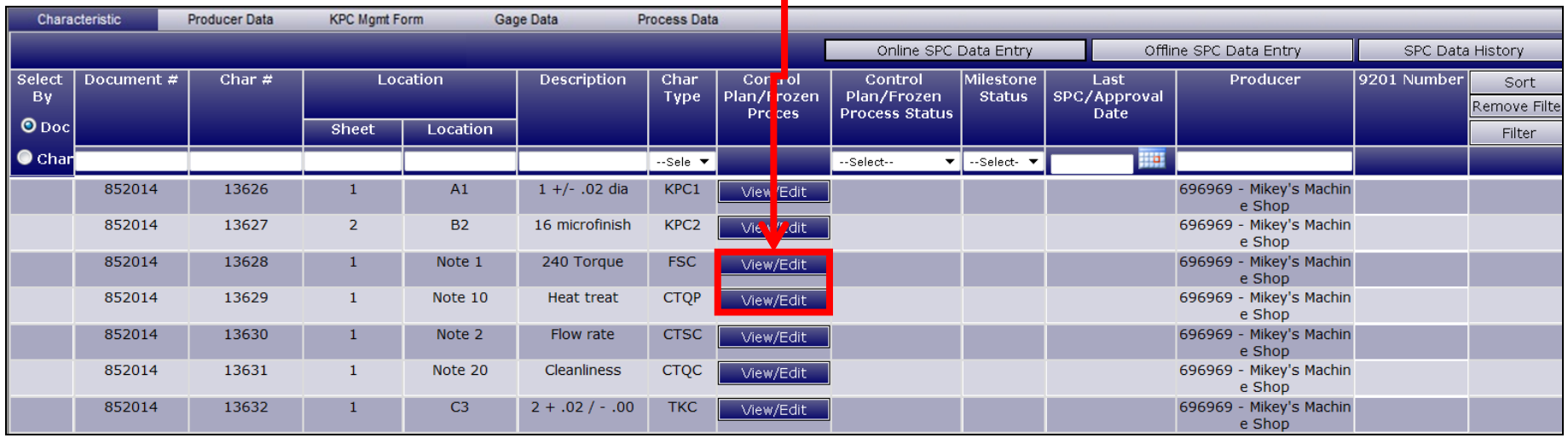
COMPLETING A FROZEN PROCESS

Step 1: Selecting the FSC/CTQP. From the COPS Summary Screen, select "**View/Edit**" to go to that FSC/CTQP's Frozen Process Screen.



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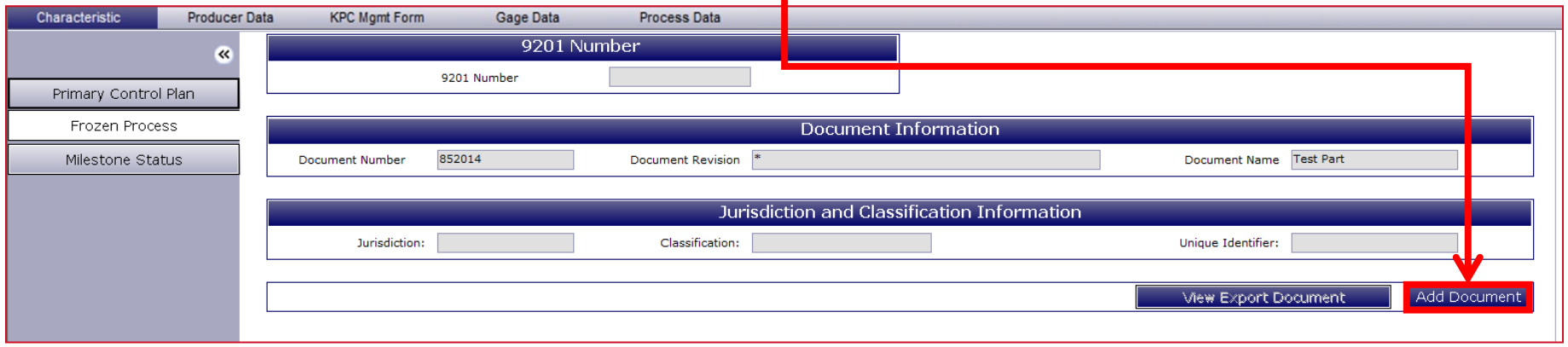
COMPLETING A FROZEN PROCESS

Step 2: Selecting the Document. Once the FSC/CTQP has been opened, select "**Add Document**".



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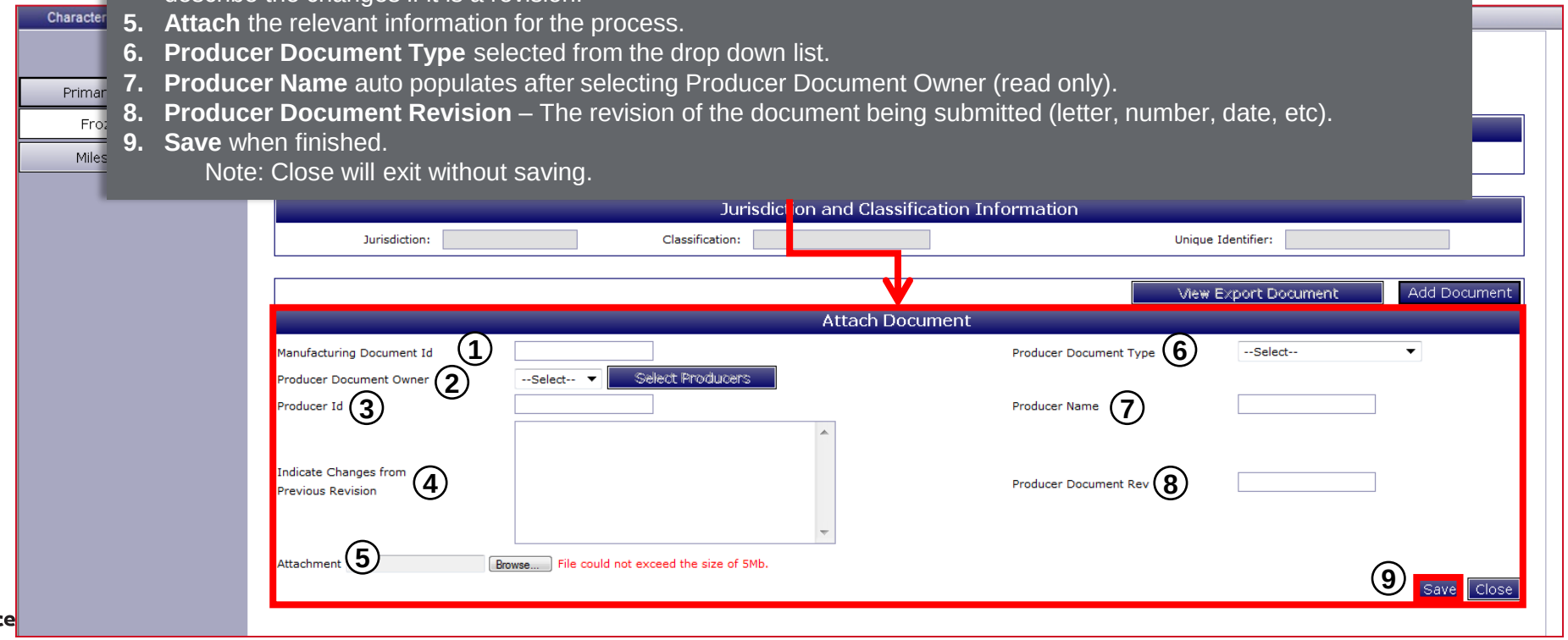
COMPLETING A FROZEN PROCESS

Step 3: Attach Document. Fill out these required fields to define the process:

1. **Manufacturing Document ID** – Producer's OP sheet number, weld schedule ID, traveler title, etc.
   Note: This field needs to be a unique identifier and cannot be used again on another characteristic even if the same documentation is used.
2. **Producer Document Owner** from the drop down list – Either Self (yours) or Subtier (your subtier).
   Note: For Self, the "Select Producers" button is not needed.
   Note: For Subtier, click on "Select Producers" to pick subtier producer(s) from a list. (See next slide for details)
3. **Producer ID** auto populates after selecting Producer Document Owner (read only).
4. **Indicate Changes from Previous Revision** – Enter "New" if the document is being submitted for the first time or describe the changes if it is a revision.
5. **Attach** the relevant information for the process.
6. **Producer Document Type** selected from the drop down list.
7. **Producer Name** auto populates after selecting Producer Document Owner (read only).
8. **Producer Document Revision** – The revision of the document being submitted (letter, number, date, etc).
9. **Save** when finished.
   Note: Close will exit without saving.



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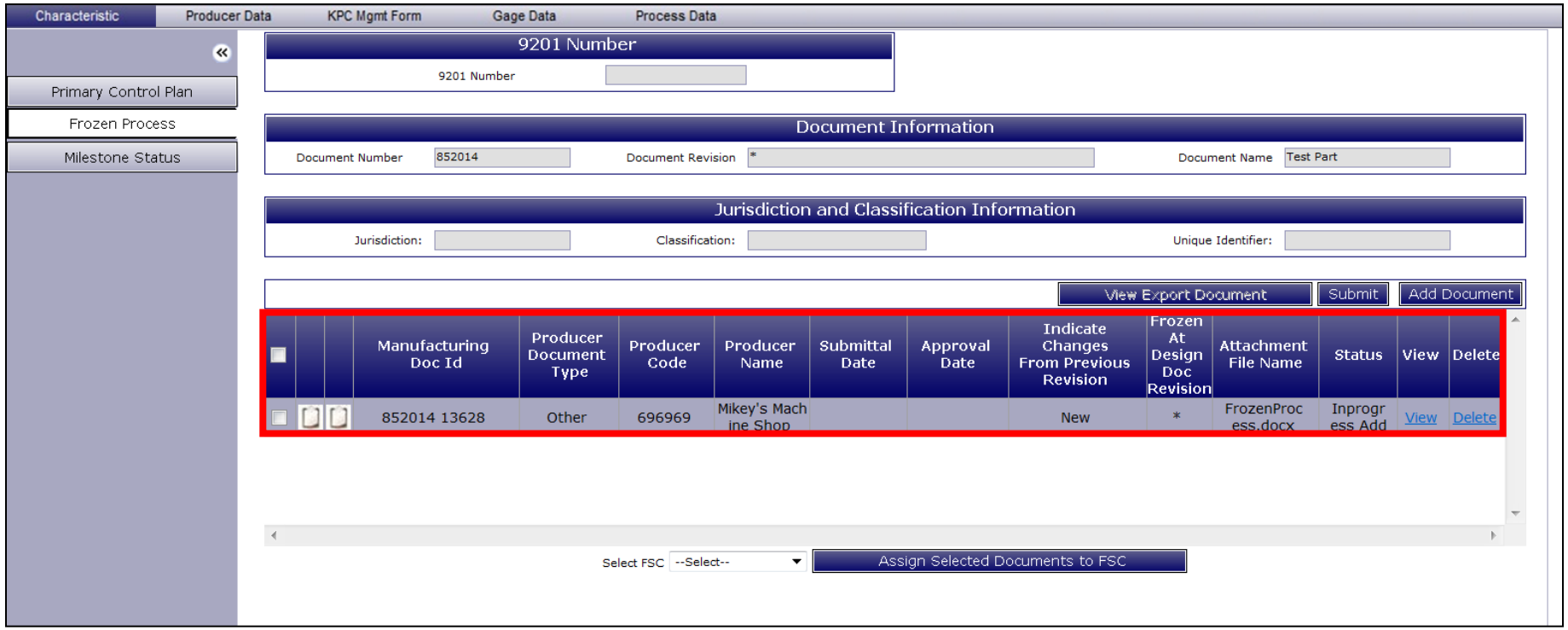
COMPLETING A FROZEN PROCESS

A document that defines part of the process has now been created in the Frozen Process tab. More documents can be created as needed to completely define the whole process to be frozen by repeating the instructions on the previous slides.



After adding all the required documentation, the definition of the frozen process is completed by associating the documents to a FSC/CTQP characteristic by following the instructions on the next slides.

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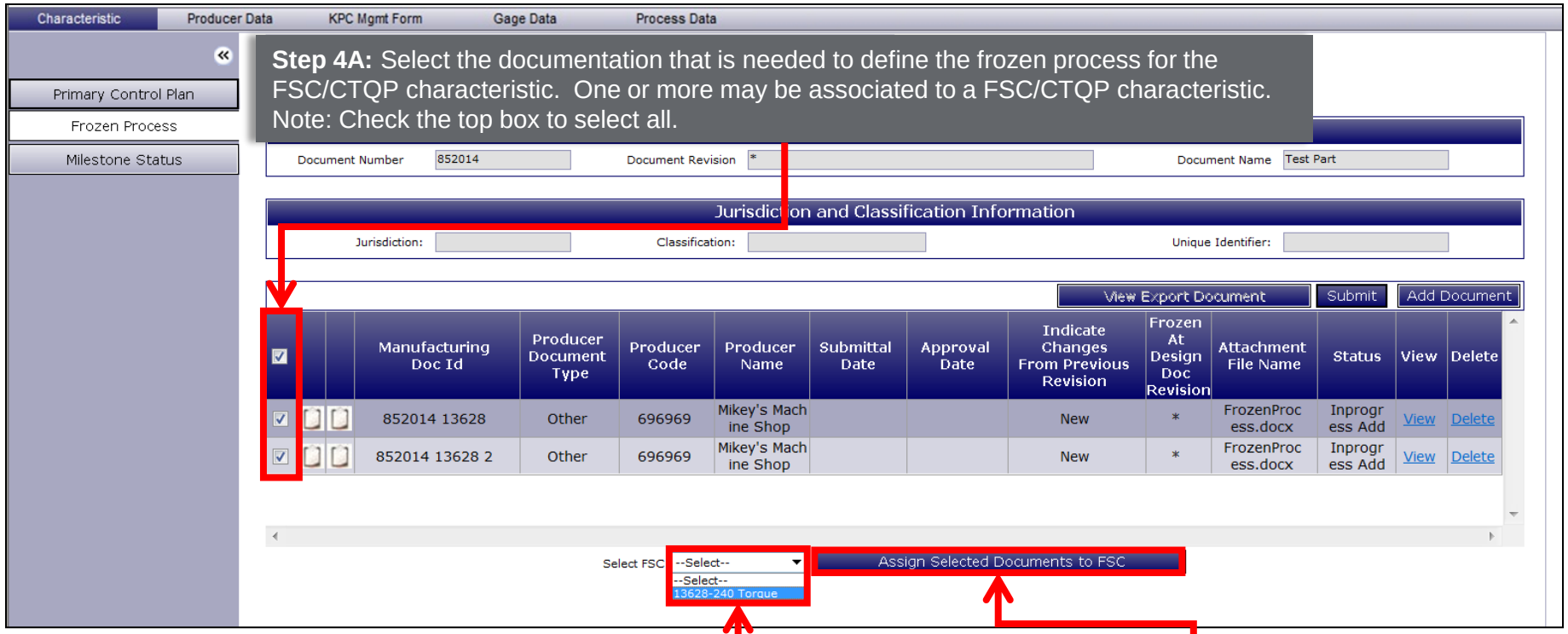
COMPLETING A FROZEN PROCESS



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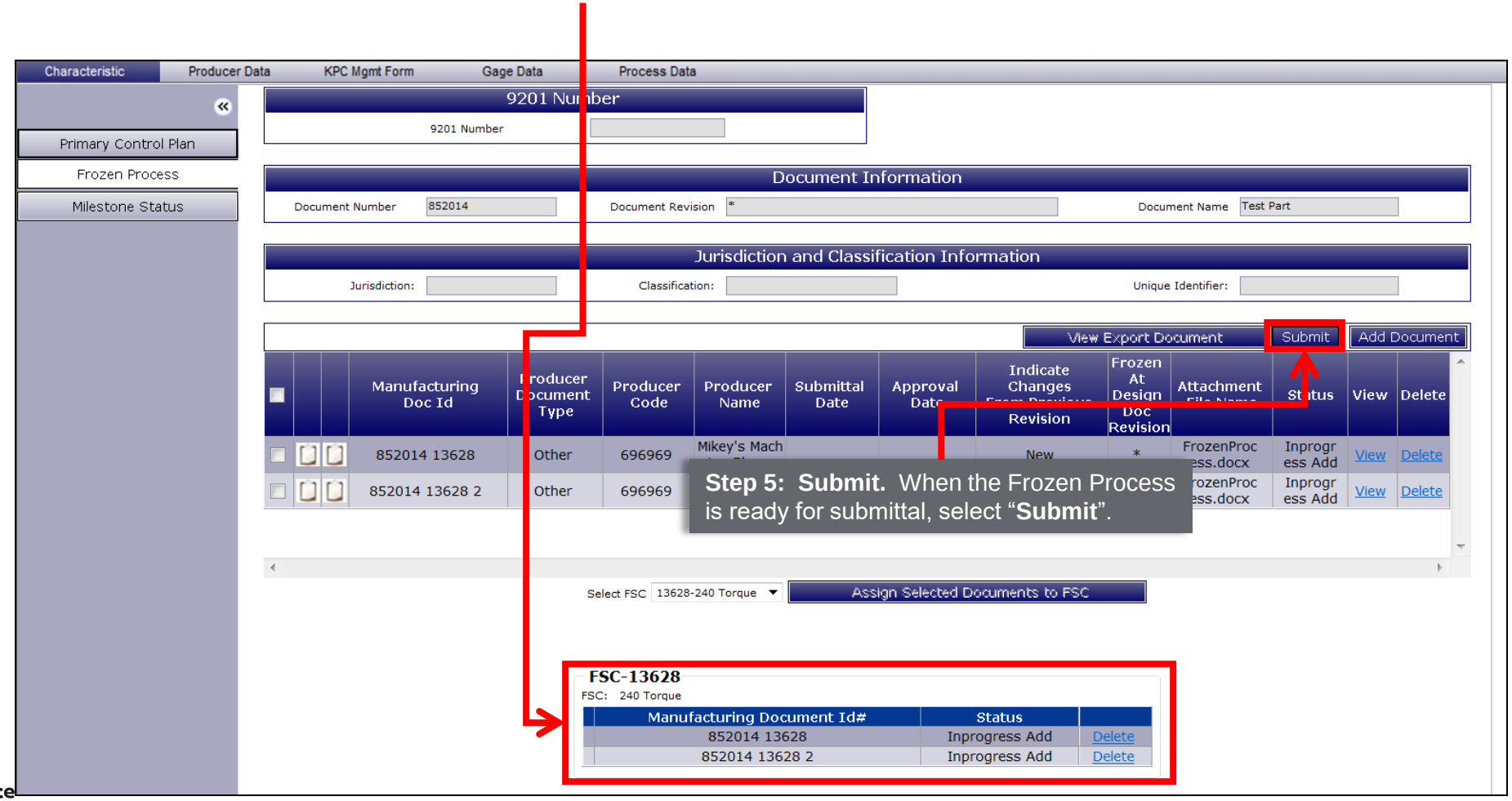
COMPLETING A FROZEN PROCESS

The FSC/CTQP is now associated with its process document(s).



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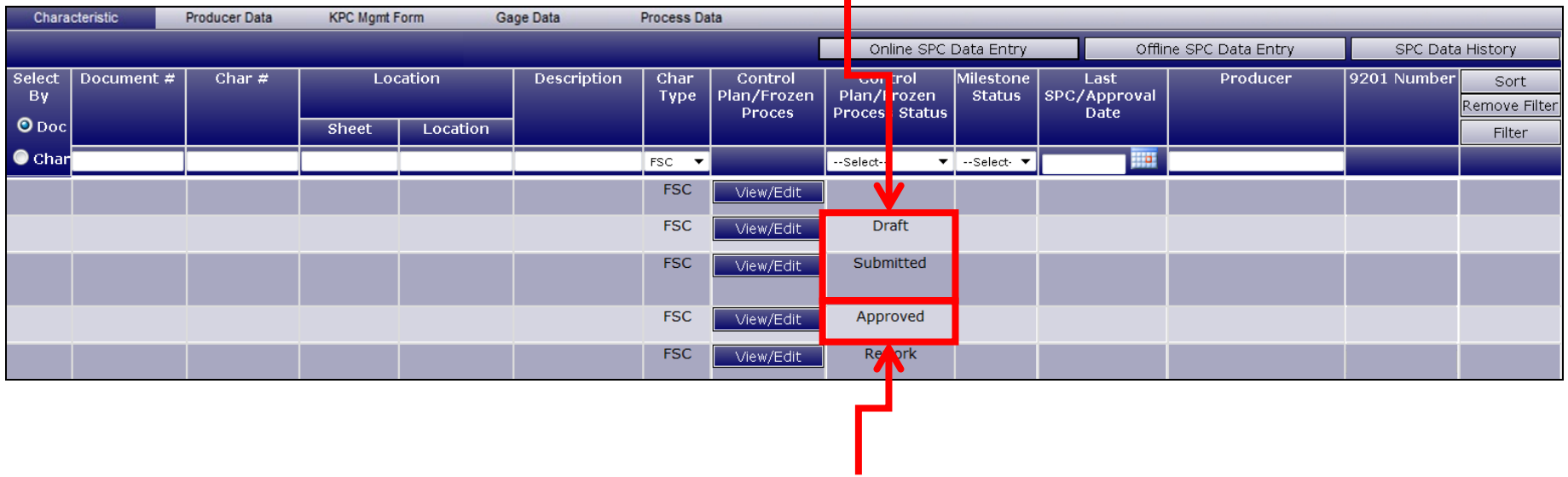
COMPLETING A FROZEN PROCESS

After being submitted, the status of the Frozen Process will change from “Draft” to “Submitted” in the COPS Summary Screen.



Review Board Response. After being reviewed, if the process is acceptable, the status will display “Approved” and the process will be considered frozen.

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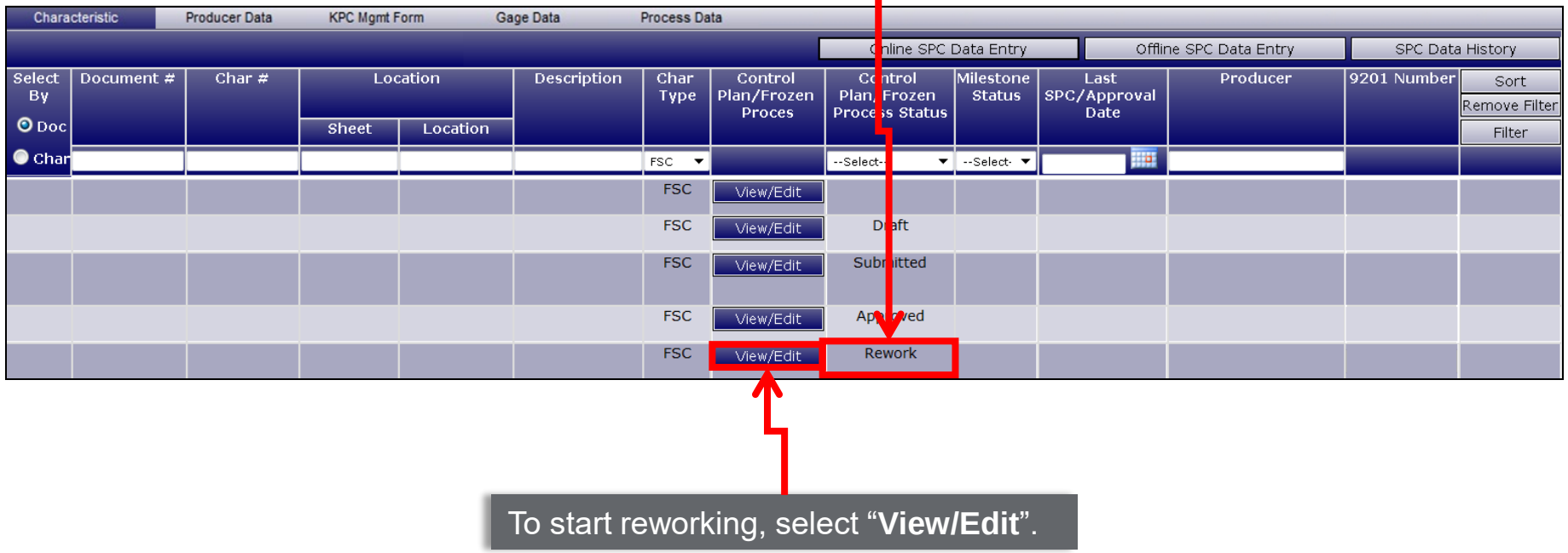
REWORKING A FROZEN PROCESS

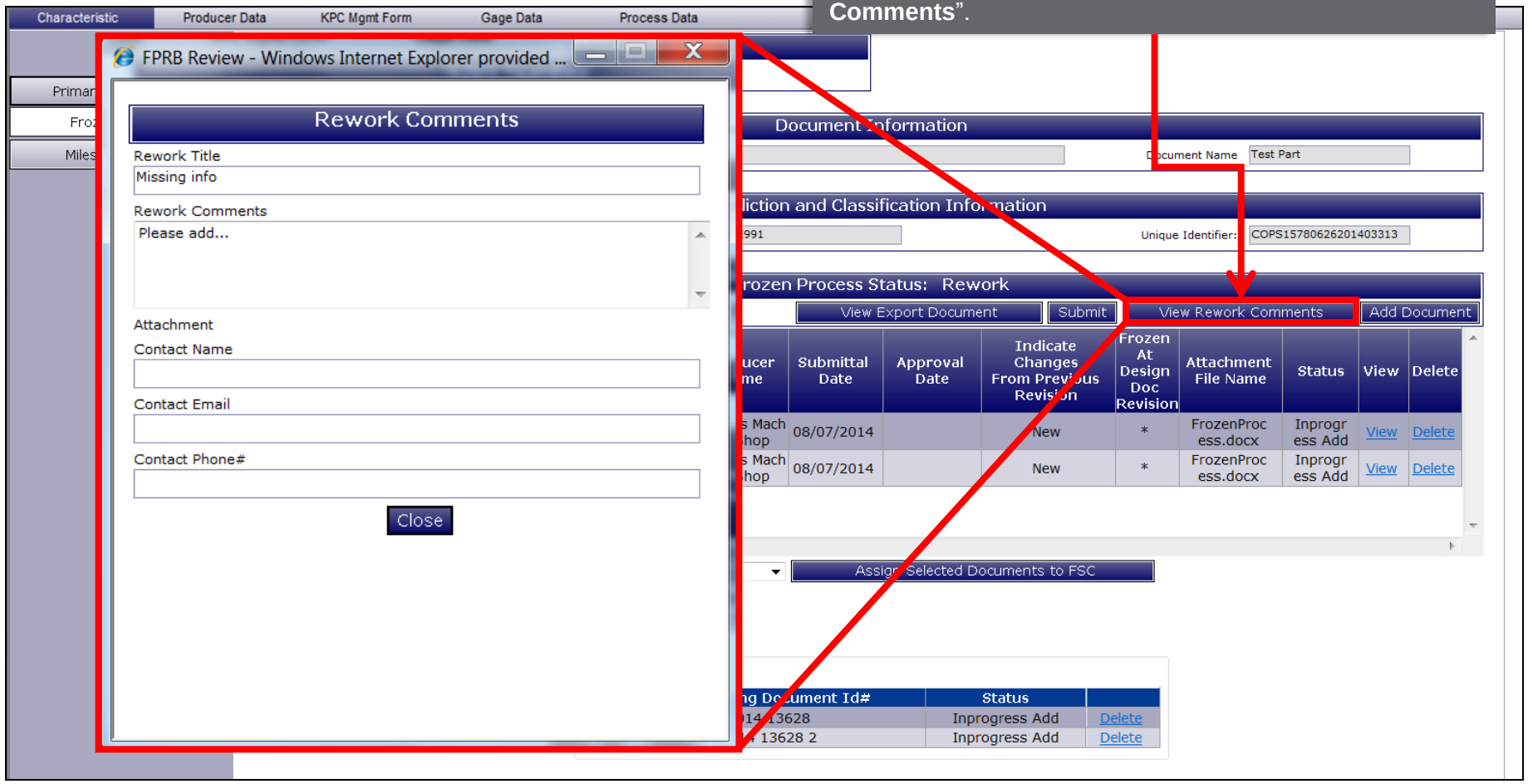
If the process needs improvement or changes, the status will display “Rework”.



To start reworking, select “**View/Edit**”.

REWORKING A FROZEN PROCESS

In order to view rework comments, select "**View Rework Comments**".



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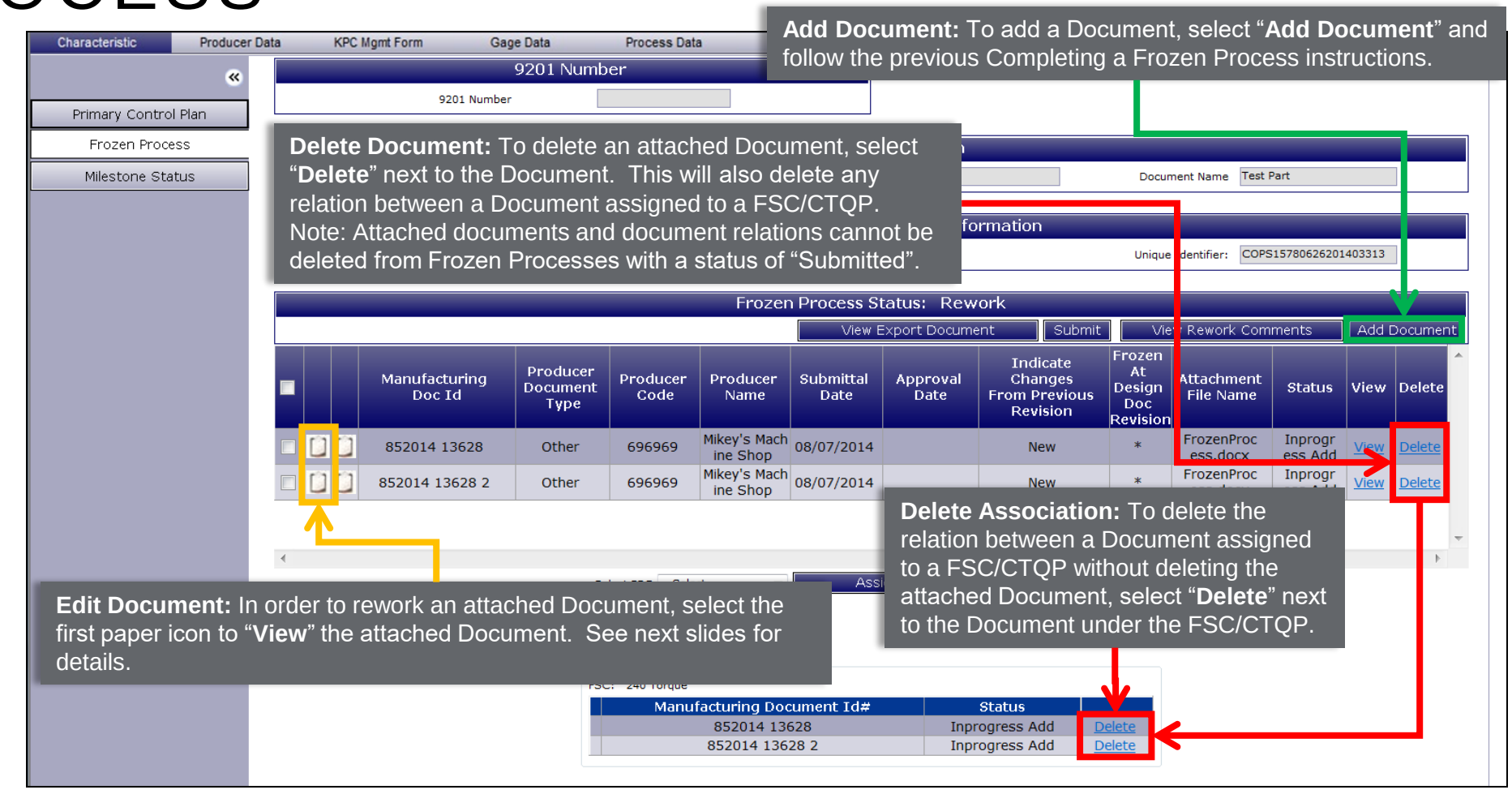
REWORKING A FROZEN PROCESS



Add Document: To add a Document, select "**Add Document**" and follow the previous Completing a Frozen Process instructions.

Delete Document: To delete an attached Document, select "**Delete**" next to the Document. This will also delete any relation between a Document assigned to a FSC/CTQP. Note: Attached documents and document relations cannot be deleted from Frozen Processes with a status of "Submitted".

Delete Association: To delete the relation between a Document assigned to a FSC/CTQP without deleting the attached Document, select "**Delete**" next to the Document under the FSC/CTQP.

Edit Document: In order to rework an attached Document, select the first paper icon to "**View**" the attached Document. See next slides for details.

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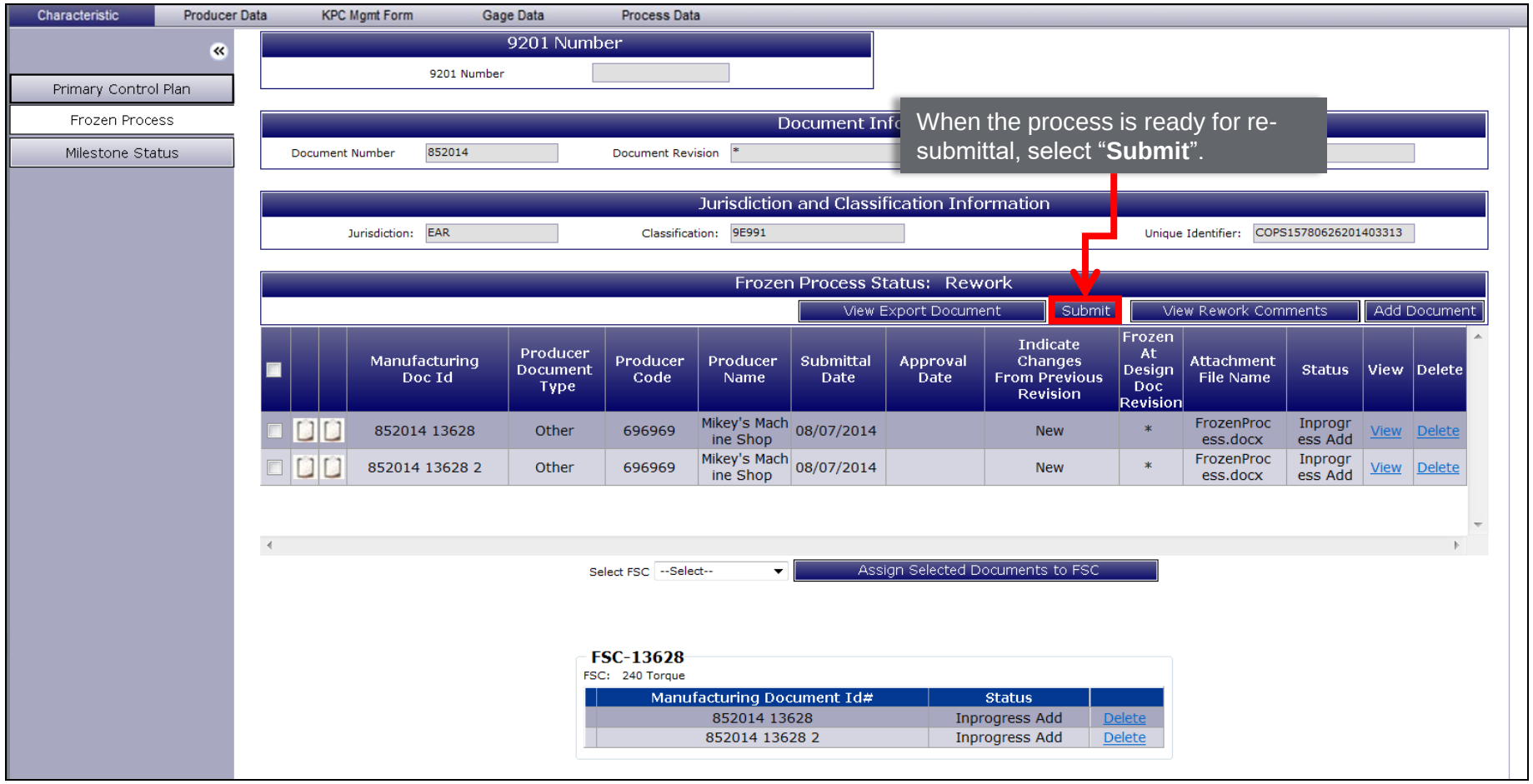
REWORKING A FROZEN PROCESS



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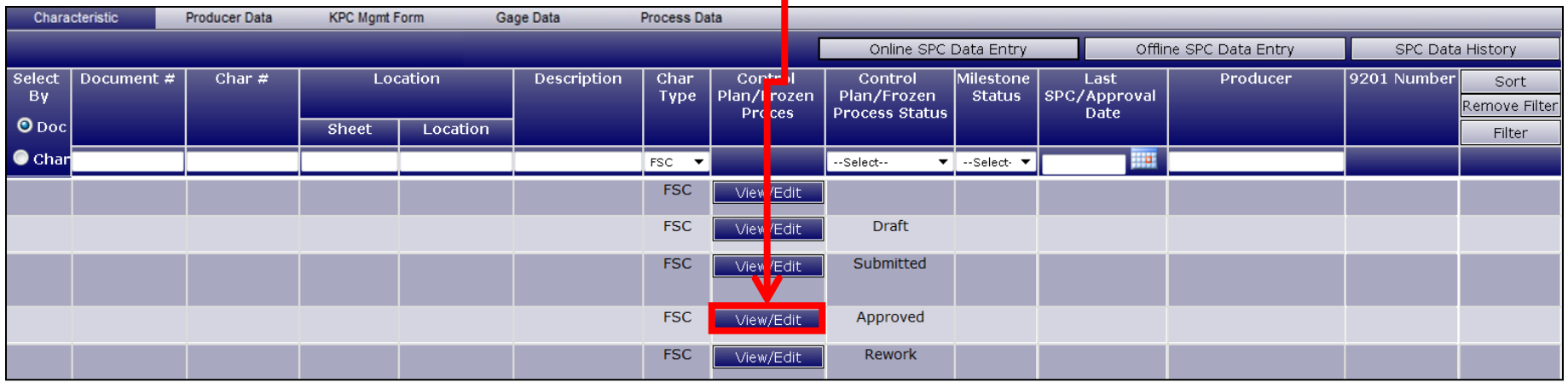
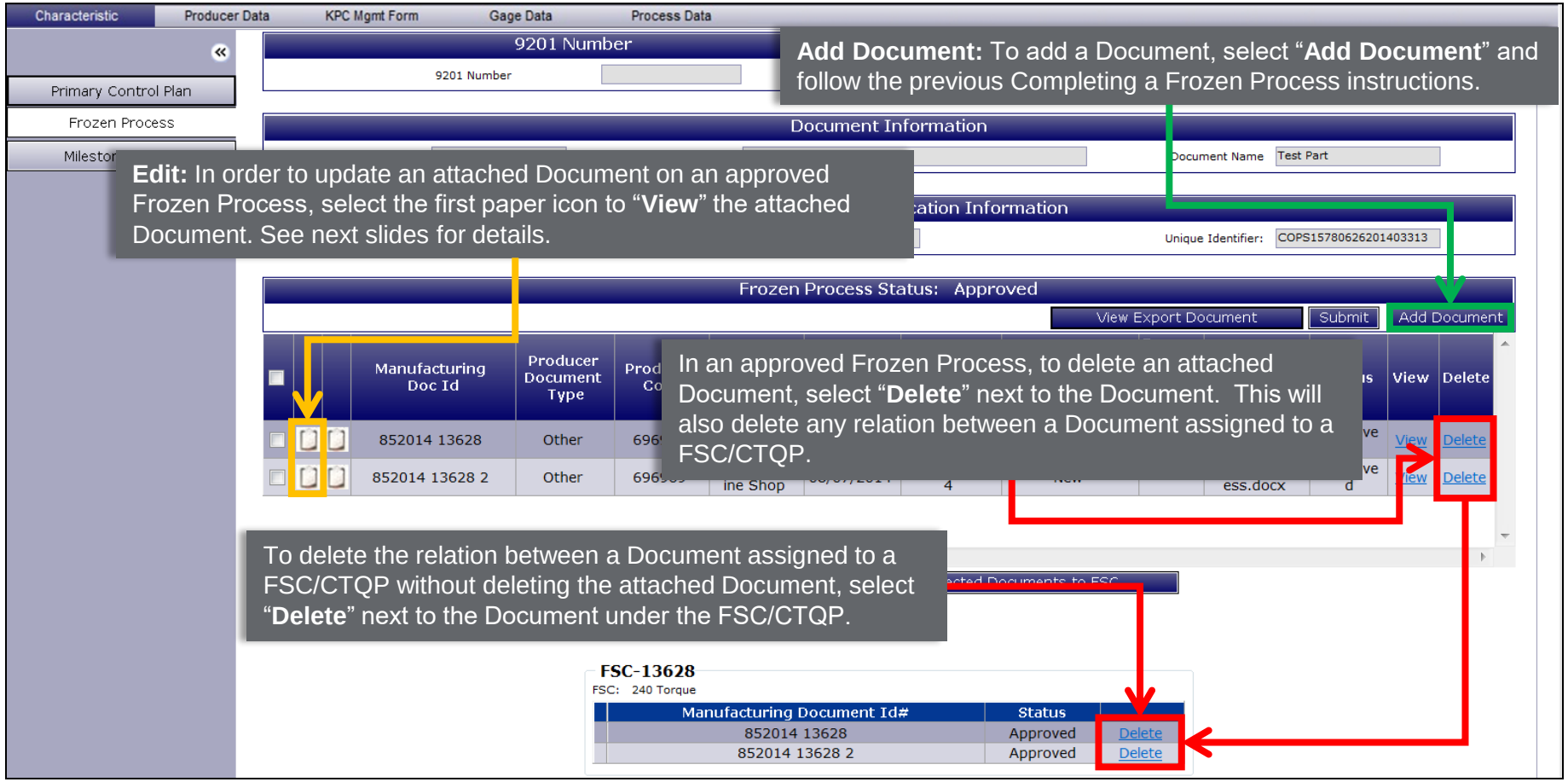
MODIFY AN APPROVED FROZEN PROCESS

To start updating an approved frozen process, select “**View/Edit**”.



MODIFY AN APPROVED FROZEN PROCESS



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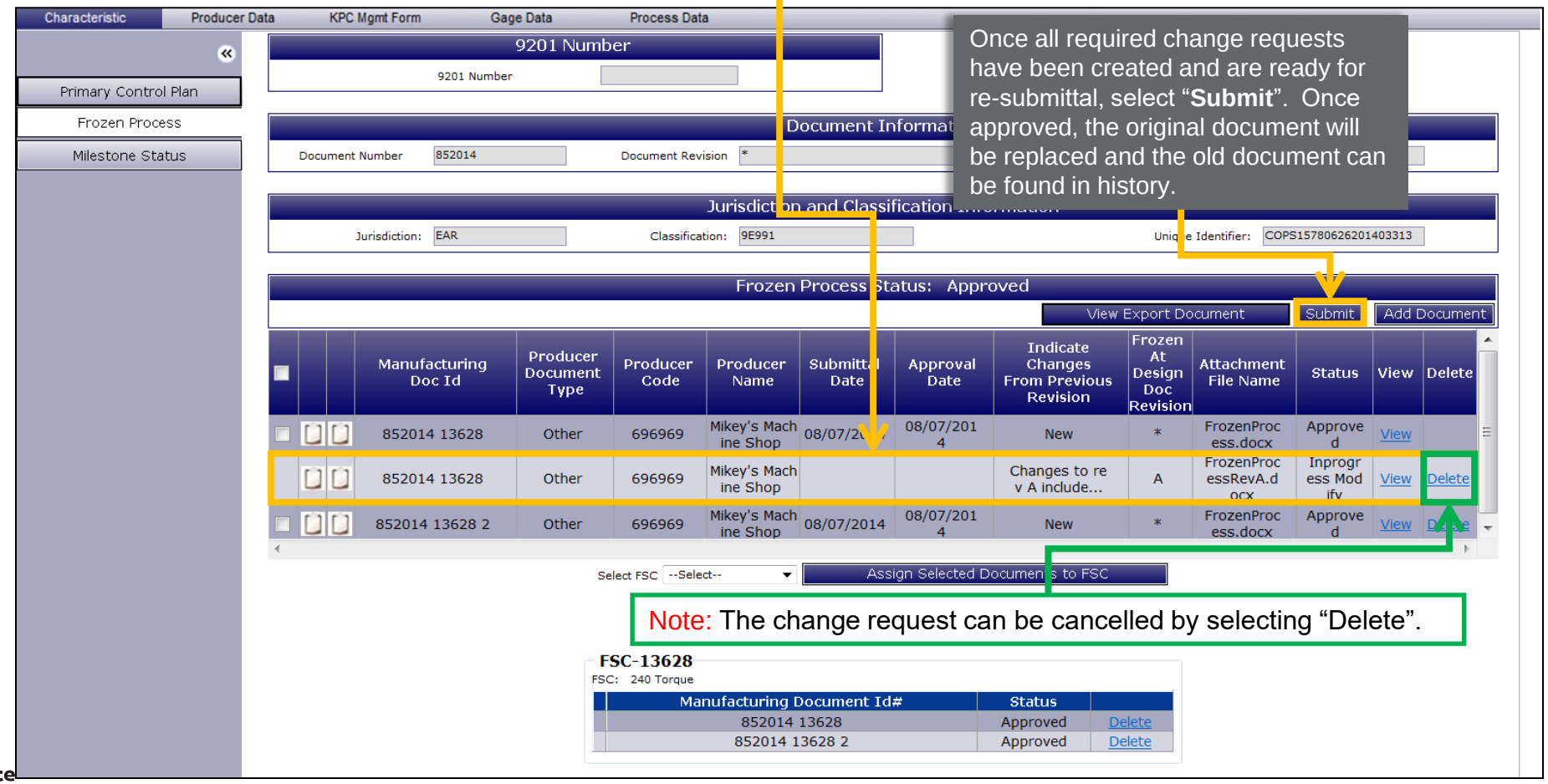
MODIFY AN APPROVED FROZEN PROCESS

The changes will be saved as a duplicate document with the status “In Process Modify” underneath the original document pending approval.



Once all required change requests have been created and are ready for re-submittal, select “**Submit**”. Once approved, the original document will be replaced and the old document can be found in history.

Note: The change request can be cancelled by selecting “Delete”.

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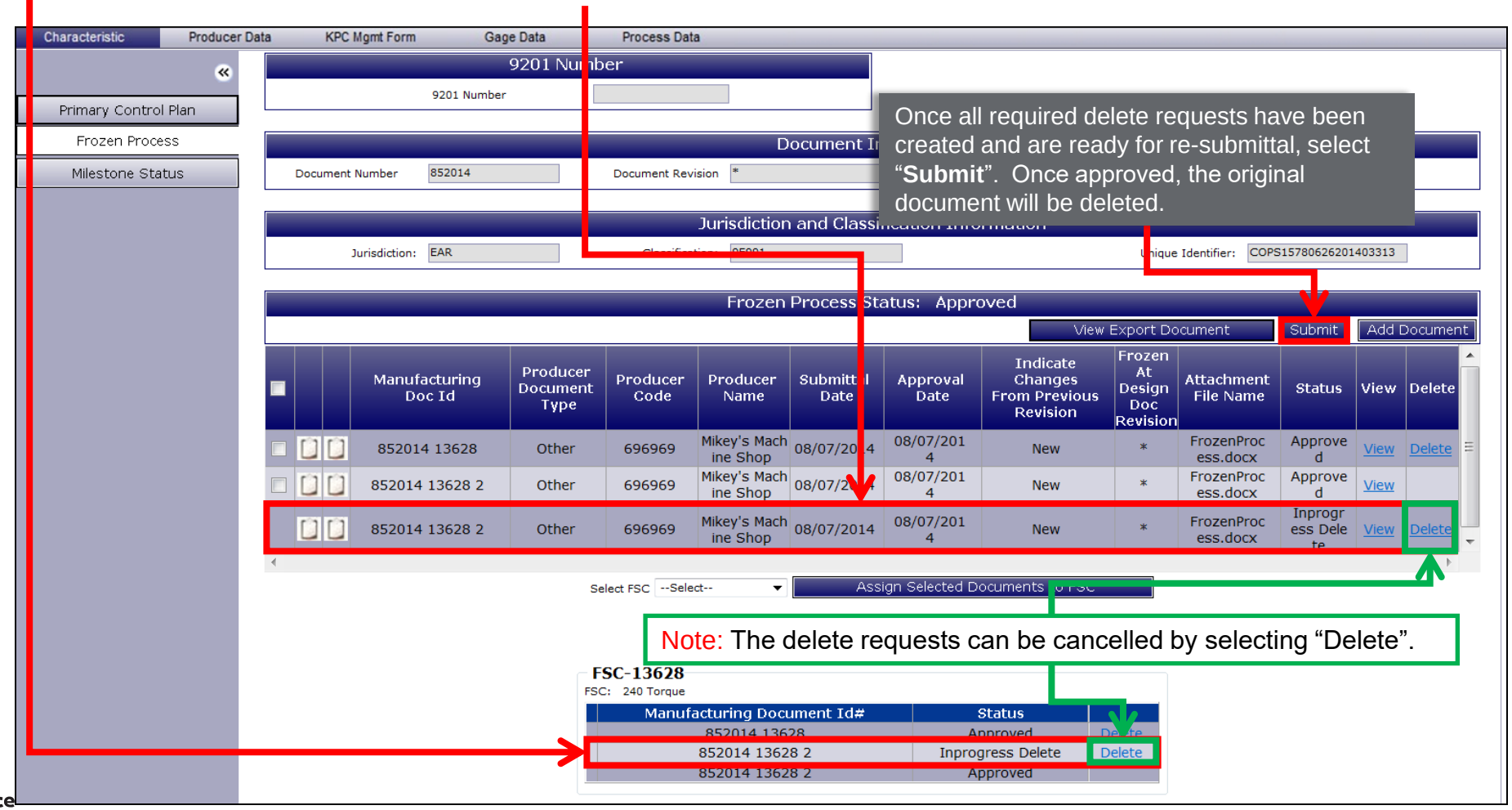
MODIFY AN APPROVED FROZEN PROCESS

The delete request will appear as a duplicate document/association with the status “In Process Delete” next to the original document/association.



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CHAPTER 5: REQUIREMENTS FOR SUPPLIER DEFINED CHARACTERISTICS

- What are Supplier Defined Characteristics?
- CTSC/CTQC Requirements
- Submittal of Producer Defined Characteristics

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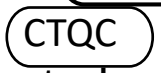
WHAT ARE SUPPLIER DEFINED CHARACTERISTICS?

- Critical To Safety Characteristics and Critical to Quality Characteristics are upper level elements or functions of a part or assembly that have the greatest impact to the safety or quality of the product.

- Critical to Safety Characteristics (identified by the symbol 

) and Critical to Quality characteristics (identified by the symbol 

) are only applied to supplier designed items procured via Source Control or Vendor Item (Spec Control) drawings.

•CTSC/CTQC's drive the selection of lower-level frozen process characteristics and variation management characteristics by the producer that will have the most influence on the CTSC/CTQC. The supplier defined features must be approved by Collins Engineering and then be included on the supplier's engineering documents.

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CTSC/CTQC REQUIREMENTS

- Supplier shall self-select lower level frozen process characteristics and variation management characteristics that impact the Collins defined CTSC/CTQC per Appendix B of HSC16199.
- Supplier defined characteristics must be documented by the producer in COPS and submitted electronically to Collins for approval.
- Once approved, the supplier shall document the self defined characteristics on supplier’s product definition documents (drawings and specifications) in accordance with supplier’s internal systems and procedures.
- The supplier shall manufacture parts in accordance with the supplier’s internal systems and procedures using frozen process and variation management techniques as applicable on the self defined features.
- Suppliers engineering and manufacturing documentation are subject to audit by Collins to assure compliance to these requirements.

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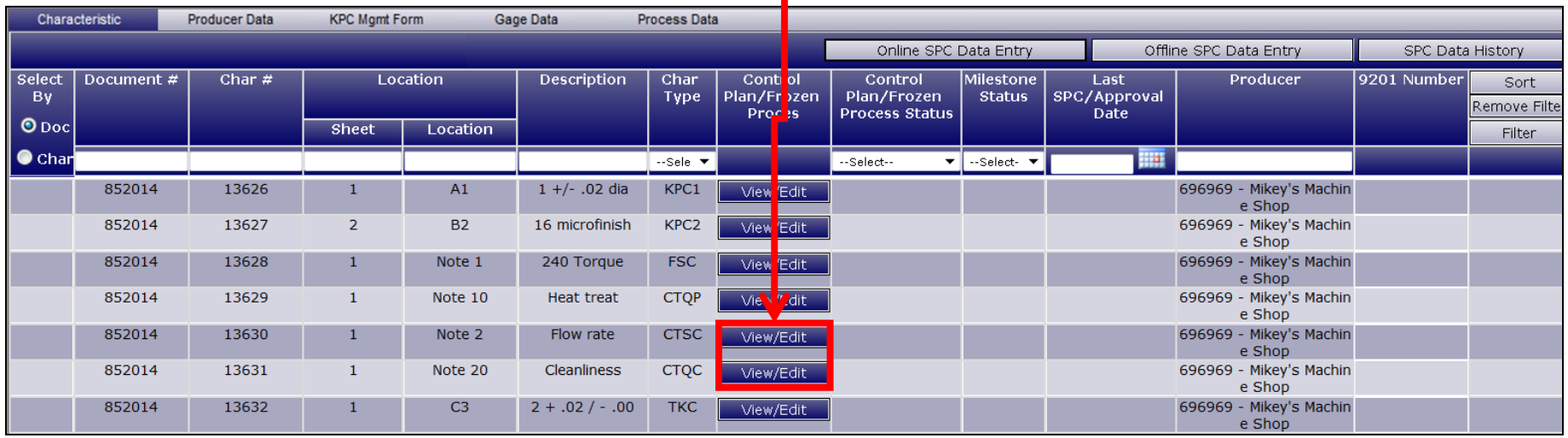
SUBMISSION OF PRODUCER DEFINED CHARACTERISTICS

Step 1: Selecting the CTQC/CTSC. From the COPS Summary Screen, select "**View/Edit**" to go to that CTQC/CTSC's Supplier Defined Characteristics screen.



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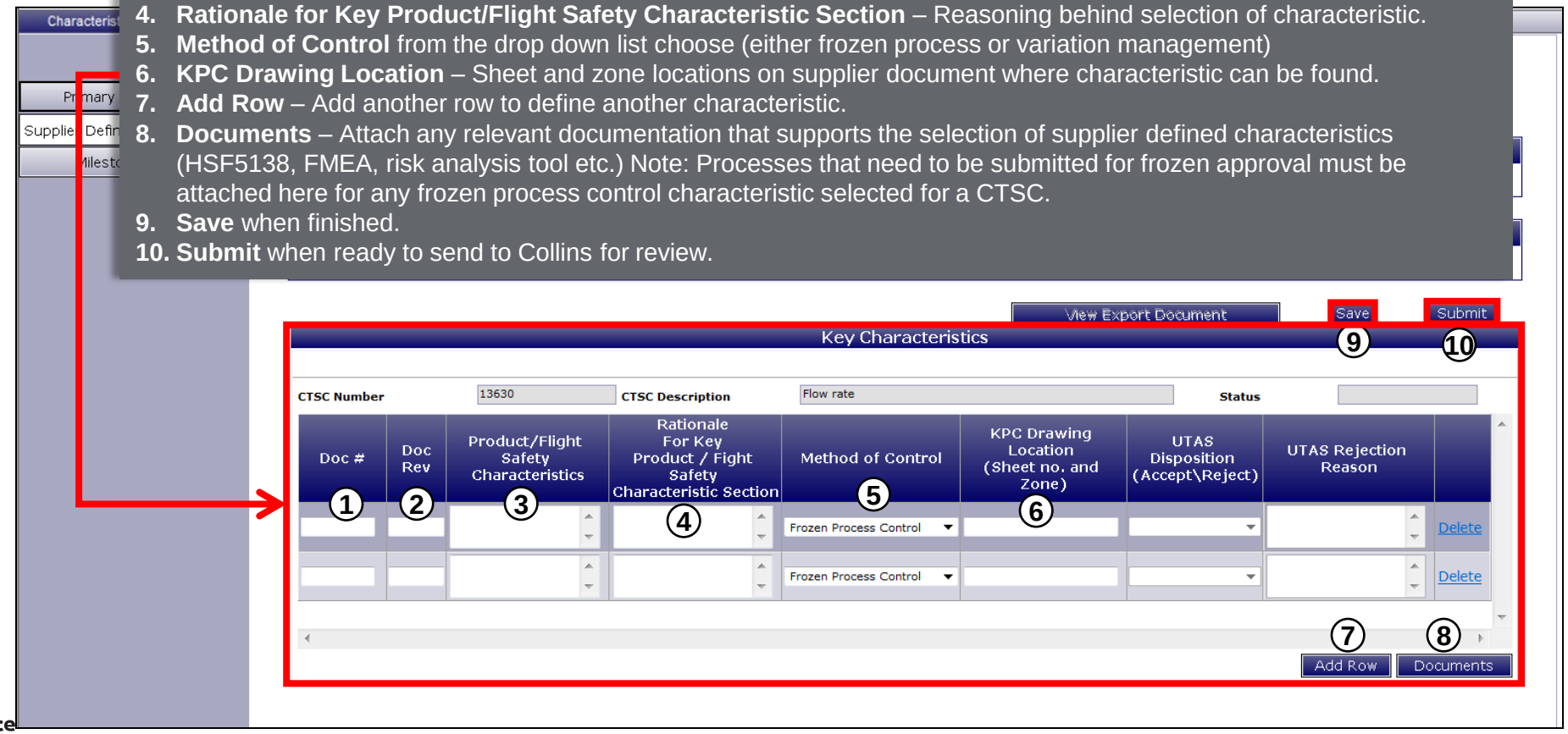
SUBMISSION OF PRODUCER DEFINED CHARACTERISTICS

Step 2: Define Key Characteristics - Fill out these required fields for the Supplier Defined Characteristics:

1. **Doc #** – Producer's document where characteristic will be defined.
2. **Doc Rev** – Producer's document revision (letter, number, date, etc).
3. **Product/Flight Safety Characteristics** – Description of characteristic.
4. **Rationale for Key Product/Flight Safety Characteristic Section** – Reasoning behind selection of characteristic.
5. **Method of Control** from the drop down list choose (either frozen process or variation management)
6. **KPC Drawing Location** – Sheet and zone locations on supplier document where characteristic can be found.
7. **Add Row** – Add another row to define another characteristic.
8. **Documents** – Attach any relevant documentation that supports the selection of supplier defined characteristics (HSF5138, FMEA, risk analysis tool etc.) Note: Processes that need to be submitted for frozen approval must be attached here for any frozen process control characteristic selected for a CTSC.
9. **Save** when finished.
10. **Submit** when ready to send to Collins for review.



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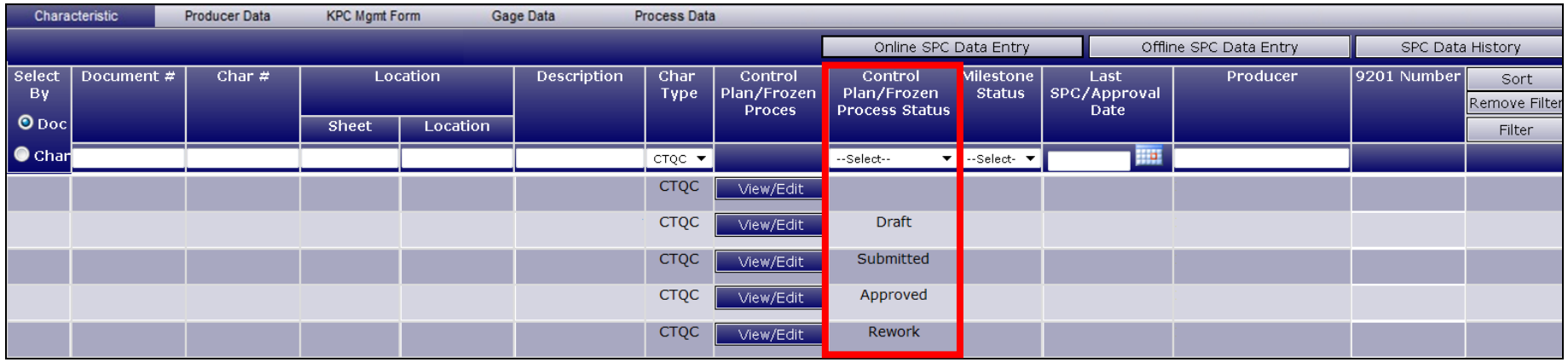
SUBMITTAL OF PRODUCER DEFINED CHARACTERISTICS

If the CTQ is saved without being submitted, the status will display “Draft”. This can be completed and submitted at a later date by clicking on “**View/Edit**”.

When the CTQ is submitted, the status will change to “Submitted” pending Collins review.

After the Collins has performed the review, the CTQ status will change to either “Rework” or “Approved”. If the CTQ needs to be reworked, click “**View/Edit**”, make the appropriate changes and resubmit.



CHAPTER 6: MILESTONE MANAGEMENT

- Milestones Defined
- Milestone Status Screen Location
- Milestone Status Screen

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MILESTONES DEFINED

Milestones are used as a methodology to measure the progression of a KPC1, KPC2, FSC, CTQP, CTSC or CTQC toward certified status. There are four key milestones each containing sub-elements that must be satisfied in order to achieve certification (refer to Chapter 1: Introduction for milestone responsibilities). The four milestones are:

- Milestone 1: *Training*
  - Supplier trained on HSC16199 requirements
  - Supplier trained on using COPS database
- Milestone 2: *Data Submittal*
  - For variation management characteristics - Site Specific Plan complete and SPC data submitted
  - For frozen process characteristics – frozen process documentation submitted
  - For supplier defined characteristics – supplier selected characteristics submitted
- Milestone 3: *Process Compliance Verification*
  - Compliance audit conducted
  - All findings resolved
- Milestone 4: *Achievement*
  - For variation management characteristics – process capability goals met
  - For frozen process characteristics – frozen processes approved
  - For supplier defined characteristics – supplier selected characteristics approved

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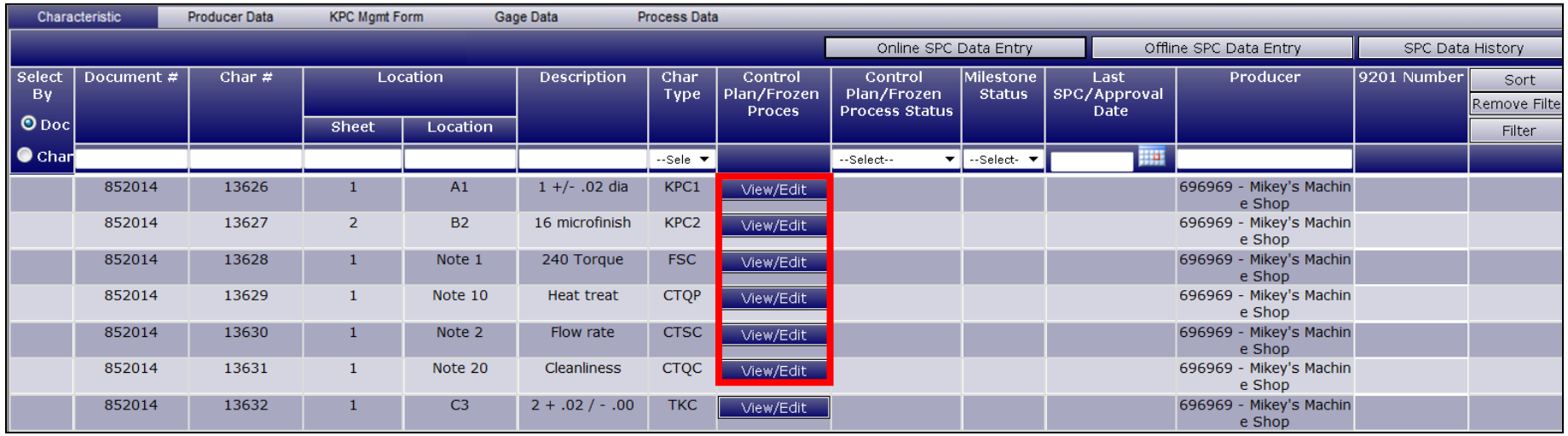
MILESTONE STATUS SCREEN LOCATION

From the COPS Summary Screen, select "**View/Edit**" of the applicable characteristic.



Characteristic | Producer Data | KPC Mgmt Form | Gage Data | Process Data

Online SPC Data Entry | Offline SPC Data Entry | SPC Data History

Select By	Document #	Char #	Location		Description	Char Type	Control Plan/Frozen Proces	Control Plan/Frozen Process Status	Milestone Status	Last SPC/Approval Date	Producer	9201 Number	Sort / Remove Filte / Filter
			Sheet	Location									
Doc / Char						--Sele		--Select--	--Select-				
	852014	13626	1	A1	1 +/- .02 dia	KPC1	View/Edit				696969 - Mikey's Machine Shop		
	852014	13627	2	B2	16 microfinish	KPC2	View/Edit				696969 - Mikey's Machine Shop		
	852014	13628	1	Note 1	240 Torque	FSC	View/Edit				696969 - Mikey's Machine Shop		
	852014	13629	1	Note 10	Heat treat	CTQP	View/Edit				696969 - Mikey's Machine Shop		
	852014	13630	1	Note 2	Flow rate	CTSC	View/Edit				696969 - Mikey's Machine Shop		
	852014	13631	1	Note 20	Cleanliness	CTQC	View/Edit				696969 - Mikey's Machine Shop		
	852014	13632	1	C3	2 + .02 / - .00	TKC	View/Edit				696969 - Mikey's Machine Shop		

Note: Milestone progression does not apply to TKCs.

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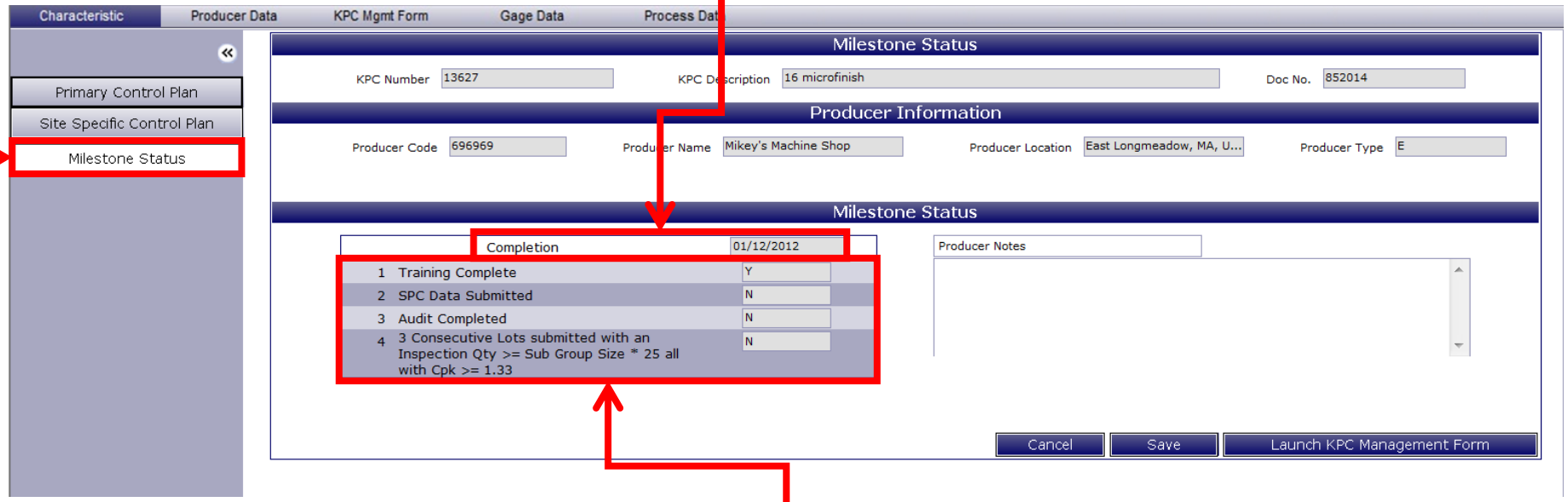
MILESTONE STATUS SCREEN

VARIATION MANAGEMENT CHARACTERISTICS WITH VARIABLE DATA

Select the "**Milestone Status**" tab.

Indicates date of highest milestone achievement. In this case, Milestone 1 was achieved on 02/08/2013.



1. Indicates if Milestone 1 has been achieved (KCR has been performed).
2. Indicates if Milestone 2 has been achieved (Initial lot of variable SPC data submitted).
3. Indicates if Milestone 3 has been achieved (Compliance audit has been conducted and all items closed).
4. Indicates if Milestone 4 has been achieved (Process capability goals have been met).

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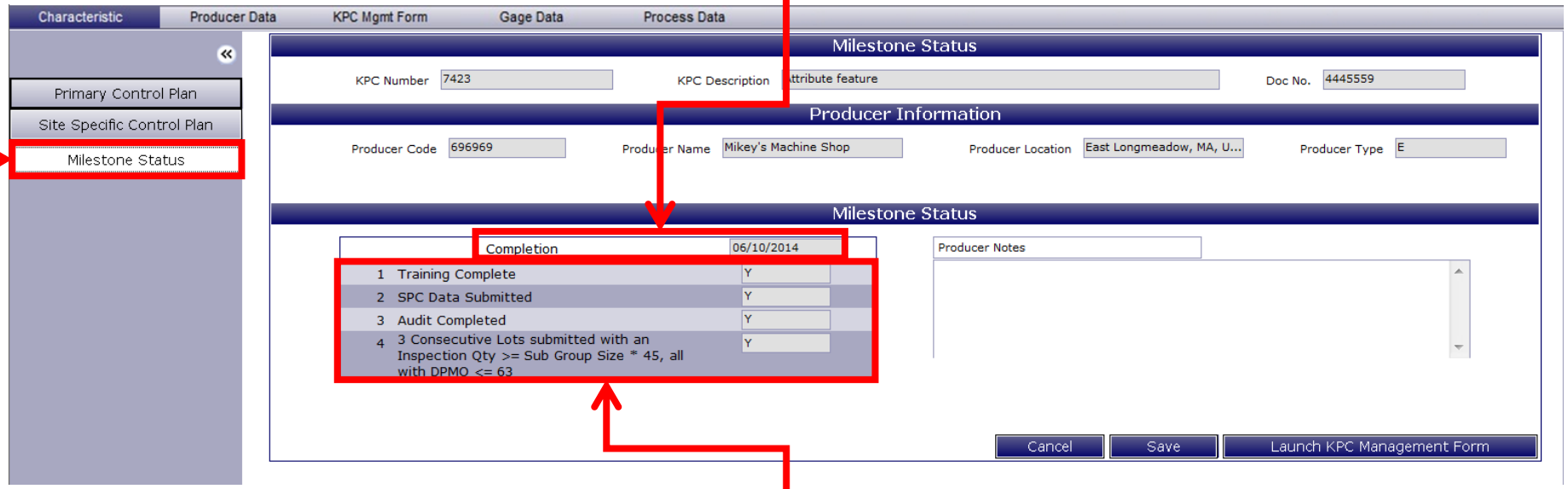
MILESTONE STATUS SCREEN

VARIATION MANAGEMENT CHARACTERISTICS WITH ATTRIBUTE DATA

Select the "**Milestone Status**" tab.

Indicates date of highest milestone achievement. In this case, Milestone 4 was achieved on 2/24/2013.



1. Indicates if Milestone 1 has been achieved (KCR has been performed).
2. Indicates if Milestone 2 has been achieved (Initial lot of attribute SPC data submitted).
3. Indicates if Milestone 3 has been achieved (Compliance audit has been conducted and all items closed).
4. Indicates if Milestone 4 has been achieved (Process capability goals have been met).

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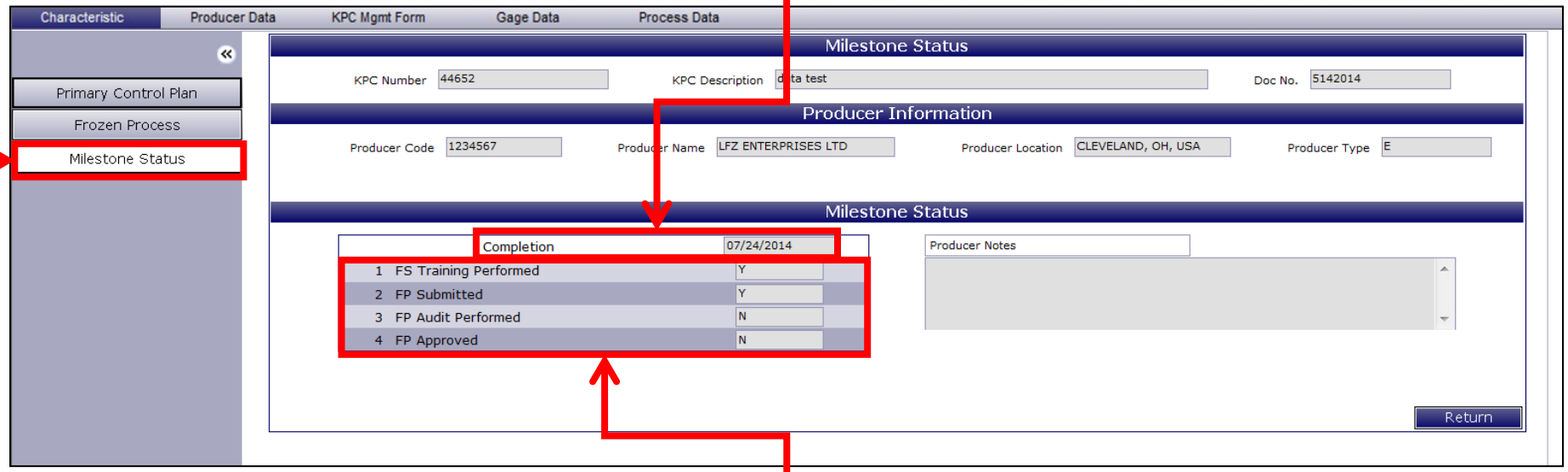
MILESTONE STATUS SCREEN

FROZEN PROCESS CHARACTERISTICS

Select the "**Milestone Status**" tab.

Indicates date of highest milestone achievement. In this case Milestone 2 was achieved on 07/24/2014.



1. Indicates if Milestone 1 has been achieved (KCR has been performed).
2. Indicates if Milestone 2 has been achieved (Frozen process documents submitted).
3. Indicates if Milestone 3 has been achieved (Compliance audit has been conducted and all items closed).
4. Indicates if Milestone 4 has been achieved (Frozen process documents have been approved).

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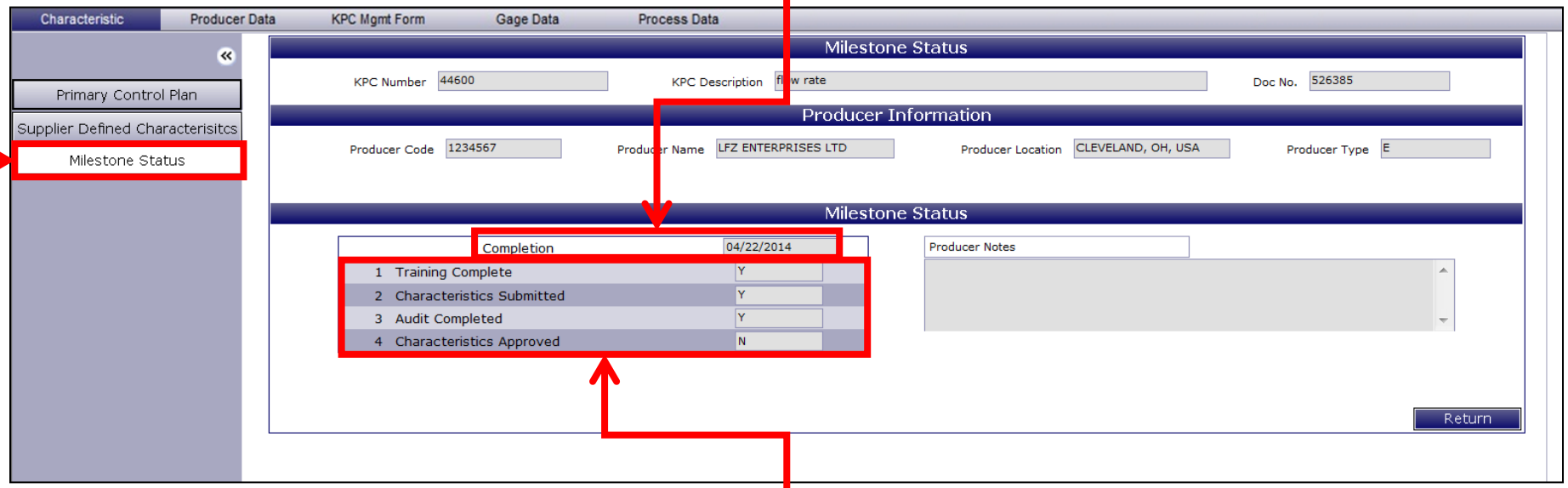
MILESTONE STATUS SCREEN

SUPPLIER DEFINED CHARACTERISTICS

Select the “**Milestone Status**” tab.

Indicates date of highest milestone achievement. In this case Milestone 3 was achieved on 04/22/2014.



1. Indicates if Milestone 1 has been achieved (KCR has been performed).
2. Indicates if Milestone 2 has been achieved (Supplier defined characteristics submitted).
3. Indicates if Milestone 3 has been achieved (Compliance audit has been conducted and all items closed).
4. Indicates if Milestone 4 has been achieved (Supplier defined characteristics approved).

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CHAPTER 7: PRODUCER INFORMATION

- The Producer Information screen documents the following data:
  - producer name
  - producer address
  - producer contact information (primary and alternate)
  - producer training/audit status
- The producer updates the Producer Information screen when any of the following information has changed:
  - contact name
  - contact title
  - contact telephone number
  - contact Email address

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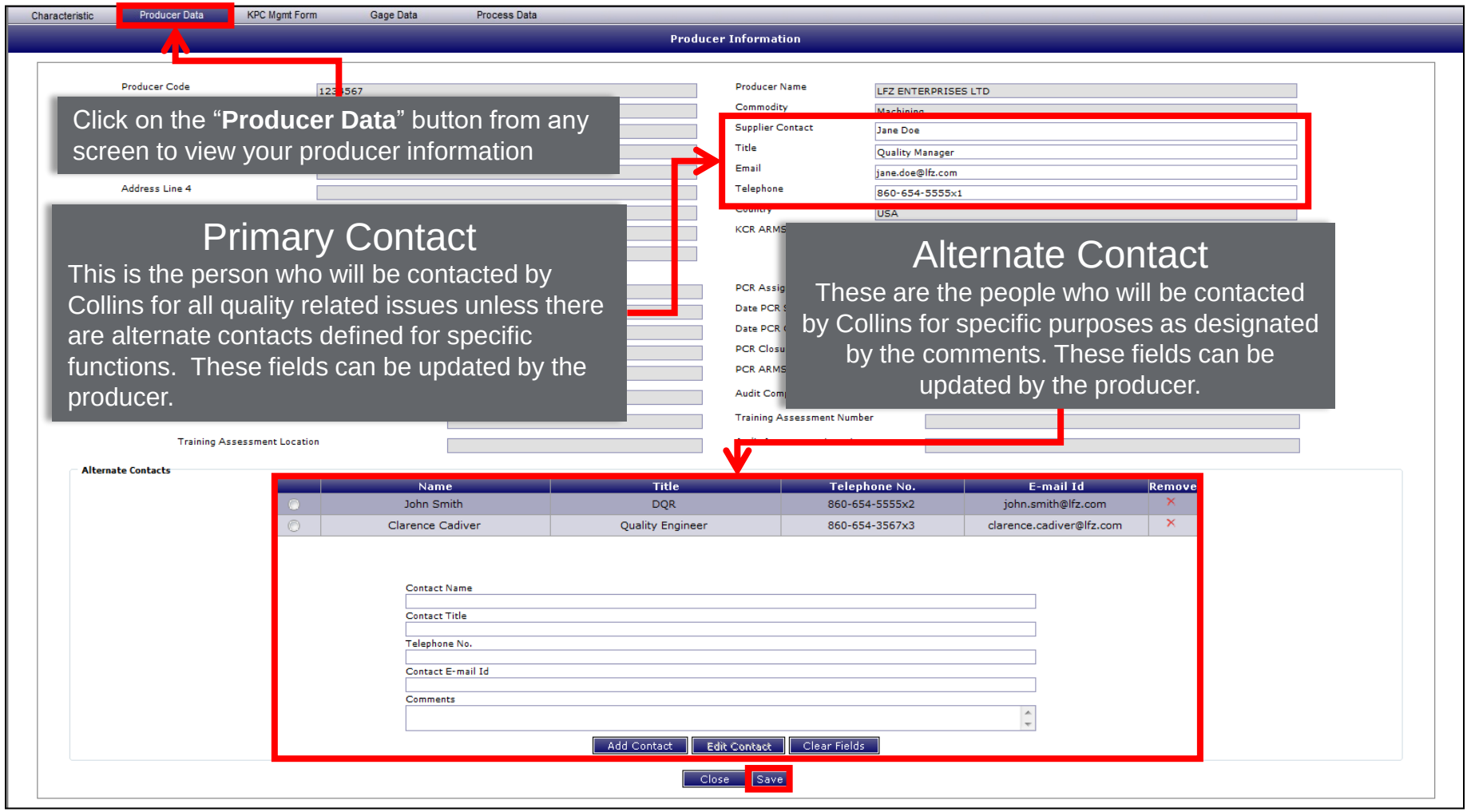
PRODUCER INFORMATION



Click on the "**Producer Data**" button from any screen to view your producer information

Primary Contact

This is the person who will be contacted by Collins for all quality related issues unless there are alternate contacts defined for specific functions. These fields can be updated by the producer.

Alternate Contact

These are the people who will be contacted by Collins for specific purposes as designated by the comments. These fields can be updated by the producer.

Note: Save button needs to be pressed in order to save changes here.

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CHAPTER 8: EXPORT CONTROL

Anyone who meets one of the following conditions is considered a foreign national:

- Non-US person
- Working at a non-US company
- Working at a non-US location

Whoever meets one of these conditions and tries viewing classified materials without an associated 9201 number will encounter the pop up window on the next slide.

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HOW TO NAVIGATE

If a record that contains a Collins review (has or had status of “Approved”, “Rework” or “Reject” in the past) is trying to be accessed by a foreign national where the 9201 field is blank, the following message will appear after “**View/Edit**” is clicked:

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