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PlantScape Controller Implementation

Lesson 2

Configuring Safety Override Interlocks

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Notes

Introduction

The purpose of this Lesson is to give you the knowledge to be able to configure Safety Overrides and Interlocks. After you complete this Lesson you will have Interlocked the Valves and Agitator in this project to close when certain alarms are activated.

Objectives

❶ Modify existing CMs for Interlock

❷ Set the Safe States in DEVCTL blocks

❸ Inactivate, Re-Load and Reactivate all CMs modified in Unit 6

❹ Use the Safe output to interlock in a PID loop

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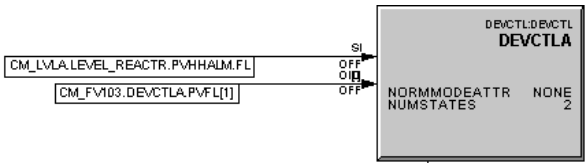
Modify Existing CMs

- Open **CM#_FV101**
- Add a Parameter Connector to the **SI** Pin on **DEVCTLA**
- Enter Parameter Connector Information
  - **CM#_LVLA.LEVEL_REACTR.PVHHALM.FL**
- Double click the **DEVCTL** block
  - Click on the **Output** tab
  - Verify that the Safe State is S0 (Closed)



- **Close** and **Save** changes
- Repeat for **CM#_FV102**

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Notes

Safety Interlocks -- Device Control

Here we are interlocking CM#_FV101 and CM#_FV102, the two tank bottom valves. We are using the safety interlock to force them closed (0) when the Reactor is very full as designated by the Level Indicator being in PVHH alarm.

Recall that we have process overrides on these same valves to force them shut when the Reactor is in PVHI alarm. Those can be bypassed. The safety interlocks have higher priority and cannot be bypassed.

We will add parameter connections to the SI input pins of the valve DEVCTL blocks to configure the interlocks.

Changes may be made to a CM in the project view without deactivating the CM. Eventually the CM will have to be deactivated for the changes to be loaded. Then the CM may be reactivated .

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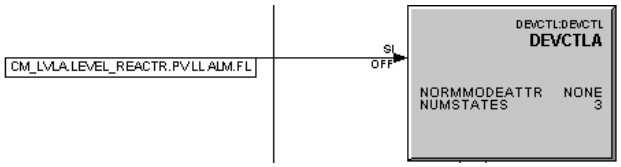
Modify Existing CMs to Interlock (CM#_AGIT101)

- Open **CM#_AGIT101**
- Add a Parameter Connector to the **SI** Pin
- Enter Parameter Connector Information
  - **CM#_LVLA.LEVEL_REACTR.PVLLALM.FL**
- Double click the **DEVCTL** block
  - Set the Safe State to S2 (Stopped)
- **Close** and **Save** changes



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Notes

Safety Interlocks -- Device Control

Here we are interlocking CM#_AGIT101, the reactor agitator. We are using the safety interlock to force it to the Stopped state (2) when the Reactor is empty as designated by the Level Indicator being in PVLL alarm.

We will add a parameter connection to the SI input pin of the agitator DEVCTL block to configure the interlock.

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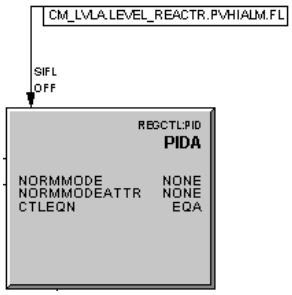
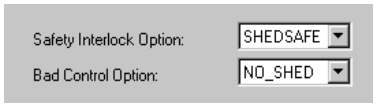
Modify Existing CMs to Interlock (CM#_FV101RC)

- Open **CM#_FV101RC**
- Add the following pin to **PIDA**

Pin	Location
SIFL	**Input/Top**



- Add a Parameter Connector to the **SIFL** Pin
- Enter Parameter Connector Information
  - **CM#_LVLA.LEVEL_REACTR.PVHHALM.FL**
- Double click in the **PIDA** block
  - Change SI option to SHEDSAFE



- Click on **Output** tab
  - Set safe OP to **0**

- **Close** and **Save** changes

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Notes

Safety Interlocks -- Regulatory Control

Regulatory Control CMs also have Safety Interlock capability.

The parameters used to affect the interlock are SIFL (Safety Interlock Flag) and SIOPT (Safety Interlock Option). When SIFL goes true, the CM behaves according to the configured SIOPT. (See the reference below for more information.)

In our process, we are using the SIOPT of SHEDSAFE when the Reactor Level is in PVHH alarm. SHEDSAFE causes a regulatory control CM (FV101RC) to :

• Change Mode to MAN

• Change Modattr to OPER

• Disable External Mode Switching

• Change OP to the configured Safe OP (0.0 for FV101RC)

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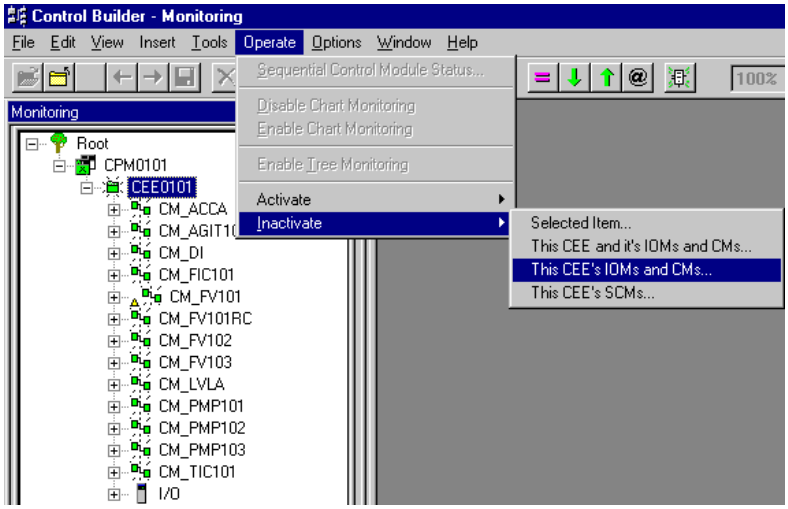
Deactivating and Reloading CMs

- Select **CEE0101** in the Monitoring Tab
- Deactivate your CMs by clicking
  - **Operate**
    - **Inactivate**
      - **This CEEs IOMs and CMs**



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Notes

Deactivating and Reloading CMs

CMs must be inactivated to reload changes.

The technique we are using here inactivates all CMs and IOMs in the Controller. We have modified so many CMs in this last two exercises that this is an effective way to inactivate. We will use the same technique to reactivate the CMs and IOMs after loading.

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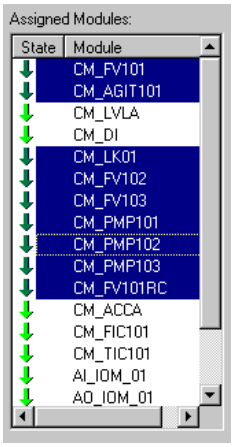
Deactivating and Reloading CMs *…continued*

- **Load** the **CMs** you created and modified in Unit 6
  - **CM#_FV101**
  - **CM#_ FV101RC**
  - **CM#_ FV102**
  - **CM#_ FV103**
  - **CM#_ LK01**
  - **CM#_ PMP101**
  - **CM#_ PMP102**
  - **CM#_ PMP103**
  - **CM-AGIT101**



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Notes

Reloading CMs

Reloading from the Controller Assignments screen is useful here since we can use <ctrl> mouse to select all CMs that need to be reloaded

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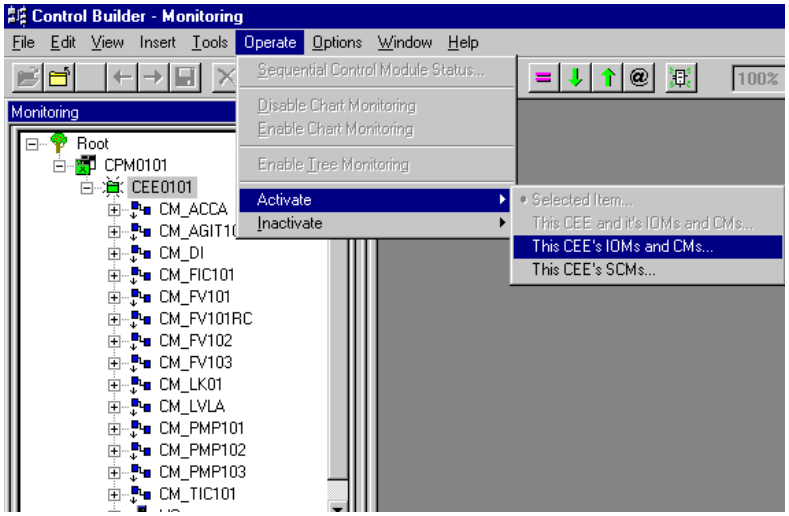
Reactivating CMs

- Activate your CMs by clicking
  - **Operate**
    - **Activate**
      - **This CEEs IOMs and CMs**



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Notes

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This completes….

PlantScape Controller Implementation

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Notes