SaberES Designer: Release flow

SaberES Designer includes a release flow to support design life management. SaberES Designer release flow archives and stores all versions and releases of a design. Also, it stores all links between different designs and versions. This enables you to do more checks and reports for understanding the changes that have been made.

The newly introduced design branches enable you to work in parallel branches, at different release stages. In SaberES Designer there are three release stages, as follows:

- **Work in progress (WIP):** In this stage, all the design changes are done. All changes from the parent design are implemented and all design changes are done.
- **Pre-release**: When all changes are done and the design in consistent with its parent design, the design is put into the Pre-release status. This stage is an intermediate stage, where designs are checked thoroughly, for the errors that were not detected in the WIP.
- **Release**: When all corrections are made, the design is put into its final release status. During this stage, no changes are accepted, and the design is archived.

SaberES Designer saves all releases and links between the designs. This makes it possible to correct a branch of the design that has been released by creating an incremental release. This is useful when errors are discovered, for example, in prototype builds, that needs correction in the release design. After corrections, designs can be released again.

In the appendix there is a detailed explanation of the release flow, with several use cases.

Installing this example

After you have downloaded this example and unzipped the content into a local folder, you will need to make some changes to the start script, to make this example work correctly. In the example folder you will find a file *SaberESDesigner.bat*. This file is used to start SaberESD and set the needed environment and settings.

Open the file in a text editor, such as Notepad. In this file there are setting that you must change to match your environment. The *EXAMPLE_FOLDER* should point to the folder where this example is placed and the *SABER_INSTALL* settings should point to the folder where you have installed SaberES Designer. Also, the *.bat* file has some help text to help you with this.

Release Flow exercises

Learning goals

You will learn how to:

- Working with version control
    - Check-out
    - Check-in
- Working with the release flow
    - Pre-Release

o Release

To start, you will have a System design, a Wiring design with some Bundle design connected to it. The release flow will work for the complete flow. However, for explaining the release flow we will focus on the Wiring and Bundle designs. The System design is already released, as is the Wiring Design.
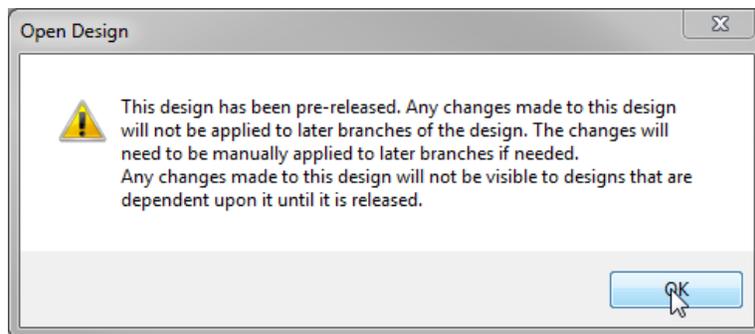
Name	Status
⊟ System	
⊟ Design_VehicleA - B2	WIP
⊟ B1	Pre-Release
R1	Released
⊟ Wiring	
⊟ Design_VehicleA - B2	WIP
⊟ B1	Pre-Release
R1	Released
⊟ Bundle	
⊟ Design_VehicleA	
⊟ engine	
engine_Sedan - B1	WIP
⊟ engine_SUV - B2	WIP
⊟ B1	Pre-Release
R1	Released

The scenario and the starting point to our design: The Bundle engineer responsible for the SUV has released the bundle design for a proto built. During the proto built it is noticed that C001 inline is incorrectly specified. The socket connector is specified for the engine harness, but the installation requires a plug connector. He notified the Wiring team.

First step will be correcting the inline connector in the Wiring Design. After that the Wiring design can be released. After the Wiring design is released, the connected bundles can be released too. It is not possible to release a design based on an unreleased design. SaberES Designer doesn't allow a user to release against a moving target. Follow the steps below:

1. Use the start script to start SaberESD.
2. Open the Wiring design; *Design_VehicleA -B1 (Pre-Release)*, **File > Open > Design.**

Note: As the design is in status Pre-Release, you will get a message that all changes made to this design will only be seen in the bundle design after the design has been release. The Pre-Release status is an intermediate stage, that is typical used to thoroughly check the design for correctness. Press **OK** to continue.

Open Design

This design has been pre-released. Any changes made to this design will not be applied to later branches of the design. The changes will need to be manually applied to later branches if needed.
Any changes made to this design will not be visible to designs that are dependent upon it until it is released.

OK

3. Select all sheets in the design browser, right-click and select **check out**.
4. Then ensure to open the *Alarm. Mirror_lights and Power_gnd_supply* sheets. To open, select them in the design browser, right-click and select **open**.

5. On the *Alarm* sheet, search for *C001*. Then on the inline symbol do **RMB > Connectors > C001_plug**.
   This will open the *Update Inline Connector Dialog* for *C001.* In this dialog you will see that the plug connector is specified for the *Instrument* harness. To correct the connector, you will need to interchange plug and socket side. This can be done by pressing [icon]. After changing this you can close the dialog by pressing **OK**.

6. Click[icon] in the Quick access toolbar and then check in the design by using the **Check In** button in the *Concurrency* section of the *Wiring -Create* ribbon. This action will check in all sheet that the user had checked out. It is not possible to check-in a single sheet.
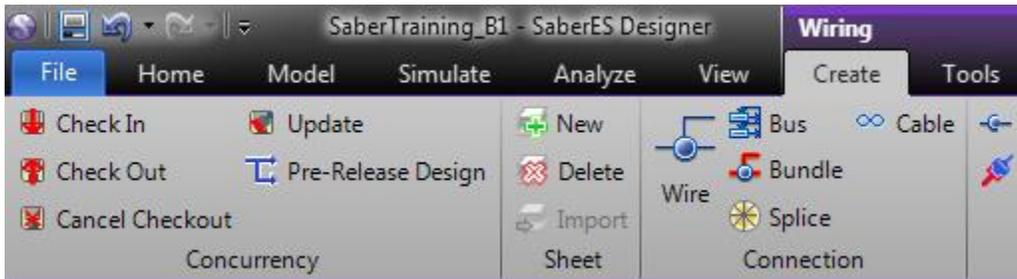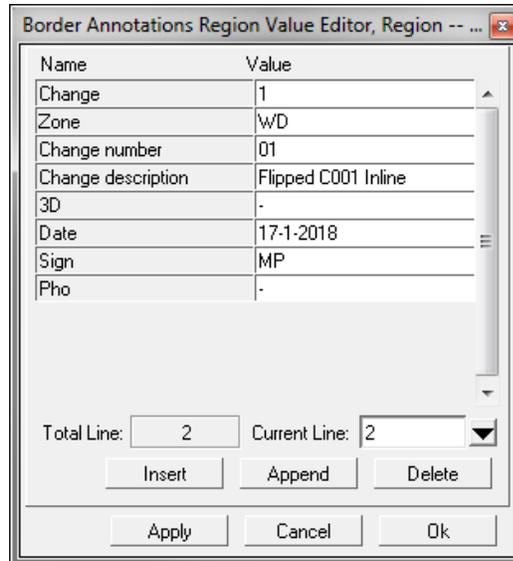

7. Open the sheet *ReleaseData* by doing a **RMB** > **Open** in the design browser.
8. Check out the sheet by using the **Check Out** button in the *Concurrency* section of the *Wiring - Create* ribbon.

This sheet is used to track changes to the design. In this case, we will need to add **C001 inline** as changed.

9. **Double click** on the top line of *change field* on the title corner.

10. Use the example below for a reference, use the current date and your initials.

11. Check-in the sheet by using the **Check In** button in the *Concurrency* section of the *Wiring -Create* ribbon.

12. Now that all corrections are done, you can release the design by pressing the **Release** button in the ribbon.
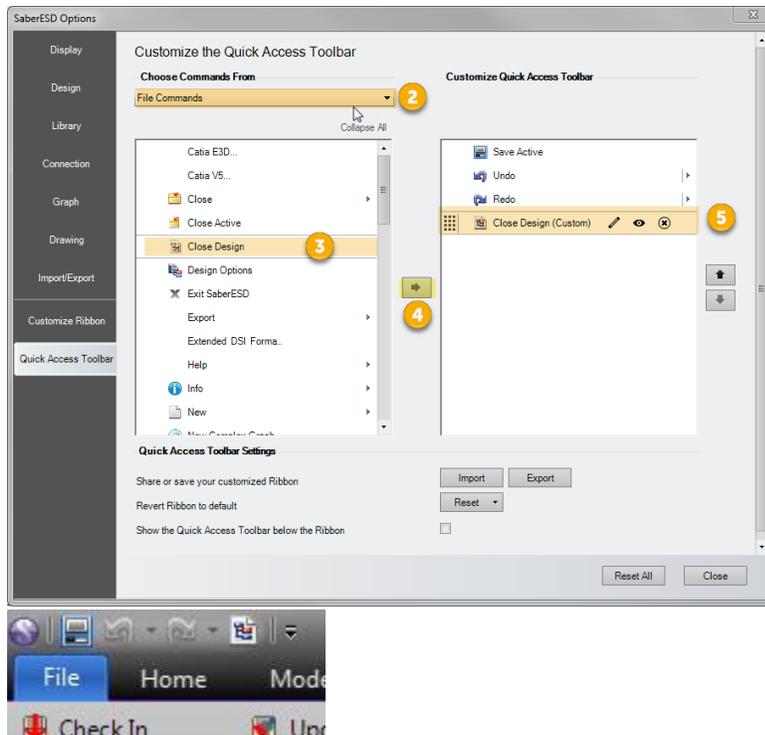

13. Click **Release** to release the design.
    Note: After the design is released, the release will be opened in the tool. This design is Read-only for the users, unless you have a special user role assigned that allows you to edit a released design.

    Now, we need to close this design by using the close design from the file menu, as closing all the sheet will not close the design. Create *close design* button in the Quick Access toolbar to make it more efficient, for closing the design.

    13.1. On the top of the screen, select the down arrow to activate the customize menu
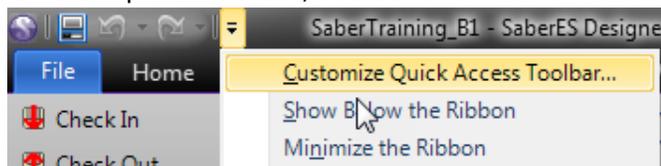
    13.2. Use the **Choose Commands from** filter to narrow down the selection, by setting it *File Commands*

    13.3. Select **Close Design** in the left selection list

    13.4. Click the arrow located in the middle to add this to the *Quick Access Toolbar*

   13.5. Press the **Close** button will close the dialog and save the changes.

14. Close the design to finish the first part of this example.

   Next task, will be working to release the bundle drawings.

15. Open the *engine_SUV* – B1 (Pre-Release) bundle design.
16. Check out the sheet by using the **Check Out** button on the *Create* ribbon.
17. Use the *Design Update* tool to get the latest data from the Wiring design. Do this by pressing the Synchronize with Depending design button.
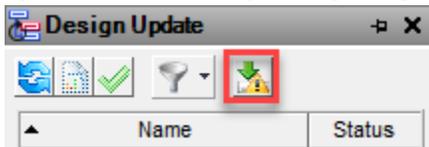

You will get a difference report, close it by pressing **OK**, and *C001* will be listed in the *Update* list.
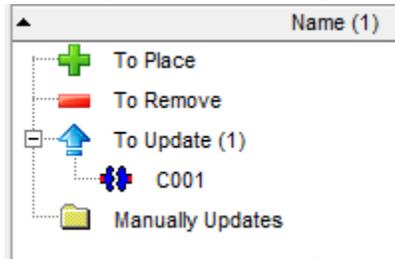
18. Update C001 by double-clicking the icon in the update list. Or by selecting it in the list and

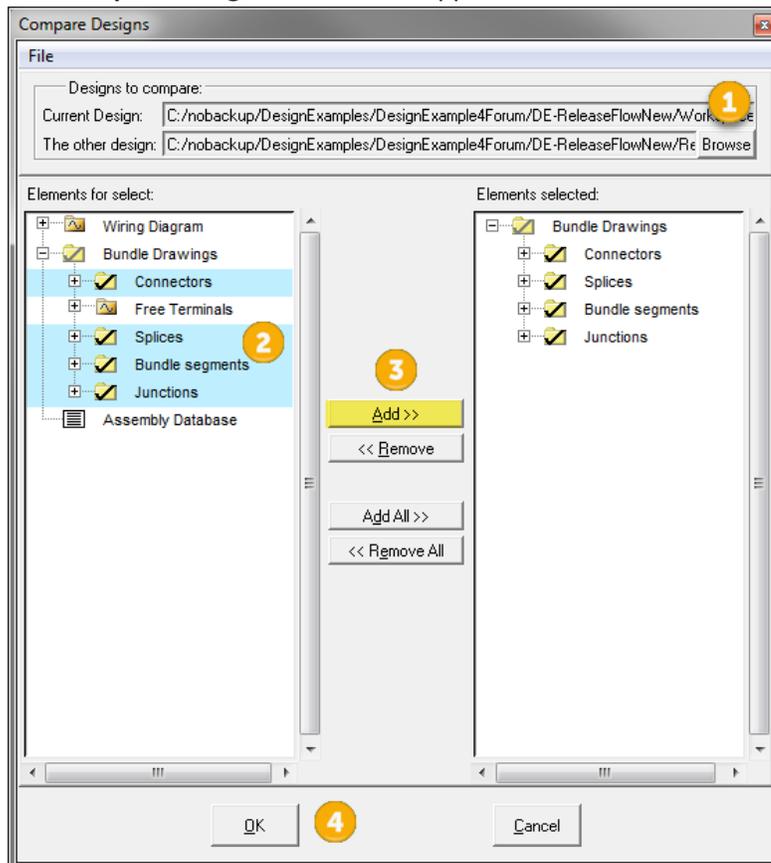   pressing the *Apply* button of the *Design Update* tool.

19. After the update, save and check-in the design.

To check if you made the correct changes without affecting other parts of the design, we will compare this design to the previous release.
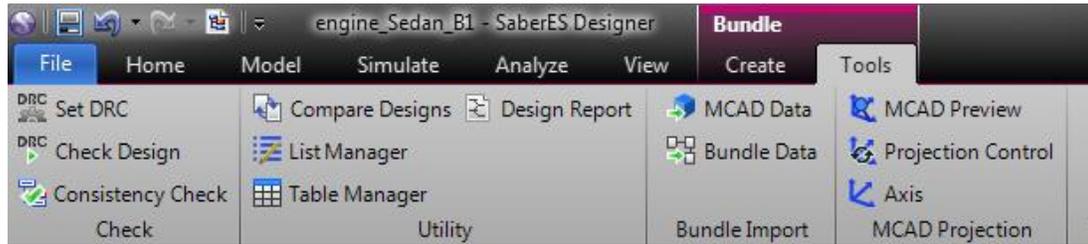
20. In the **Bundle** >**Tools** settings, click **Compare Design**.
21. The **Compare Design** interface will appear.

21.1. First select the design you want to compare the current design with. Click **Browse** and navigate to the root folder of this experiment. Then navigate to
\Release\Bundle\Design_VehicleA\engine_SUV_B1_R1
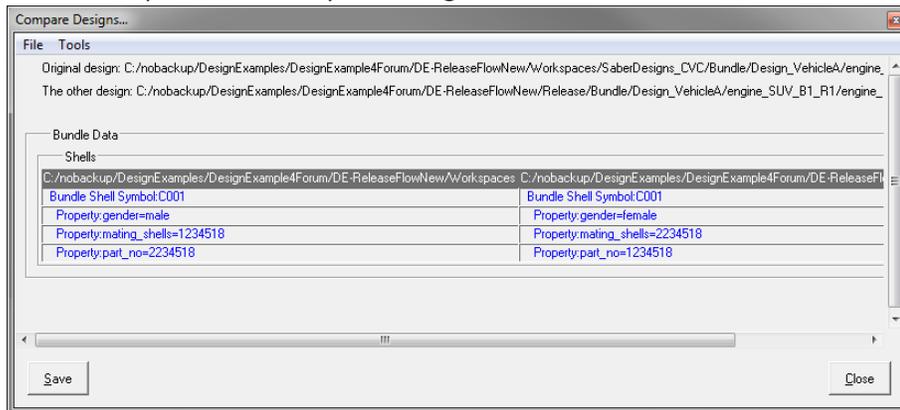Select the *engine_SUV_B1_R1.ai_hrnbdl* file and click **Open**

21.2. On the left side of the interface select the items you want to compare. In this case, select the following:
- Connectors
- Splices
- Bundle segments
- Junctions

21.3. Click **Add >>** to move the elements to the right side.

21.4. Click **OK** to compare.

The report should only list changes to the *C001.*

22. Close the report.
23. Now use the Consistency Check to see if the design is in line with the Wiring Design. The **Consistency Check** is located in the *Check* section of the *Bundle > Tools* ribbon.
24. When the consistency check passes, release the design.
25. Close the design to finish this bundle.

Next task will be working on the Sedan drawing. This drawing has not been released yet.

26. Open the *engine_Sedan-* B1 drawing.
27. Pre-Release the design. Connect the B2 of this bundle to B1 of the Wiring design.

Note: After a Pre-Release of your bundle design, you must select the branch of the parent design that you want the next branch of your bundle to connected to. In a production setting, you would be able to select from various branches. Each branch will have different data in the wiring design. Typically, the differences between these branches are discussed between the bundle and the wiring teams. Also, the changes to various branches of wiring design is discussed.
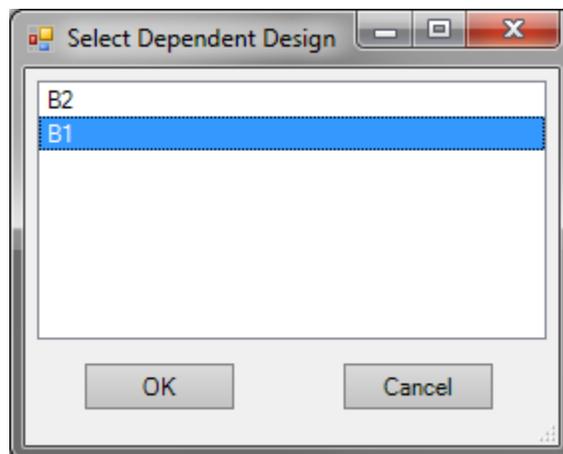

28. For now, select B1 and click **Okay**.

SaberES Designer will now create the new branch B2 of the Bundle design and will change the status of the B1 design to Pre-Release. Also, it will automatically open the B2 branch.

29. Now close the B2 design and open the B1 (Pre-Releases) design again. Notice that the Pre-release button is now change into a Release button.
30. Now release the design.

Note: When doing the release, a consistency check will be done. Depending on your site setting, it might pass or stop the release process with a warning, as shown below.
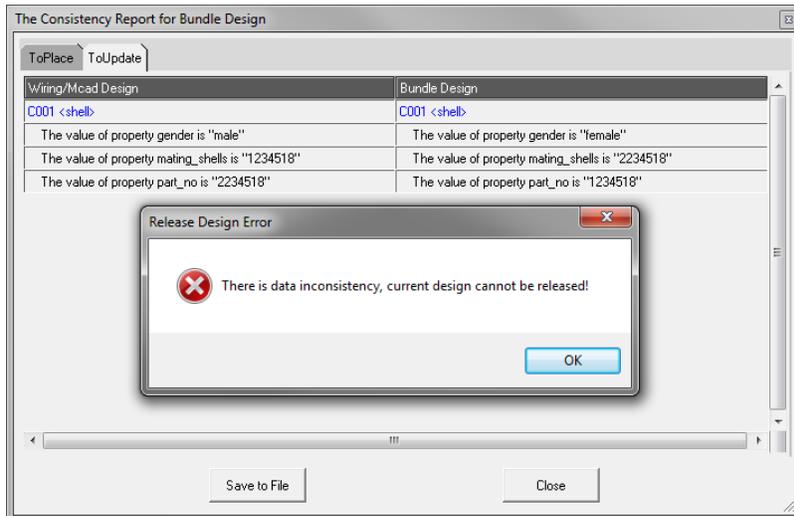
31. Check out the drawing and update C001, as you did for the SUV drawing.
32. Then place the *G9* above *G101* and connect it to the existing junction.
33. Make the segment length as 300 and place a tape on it.
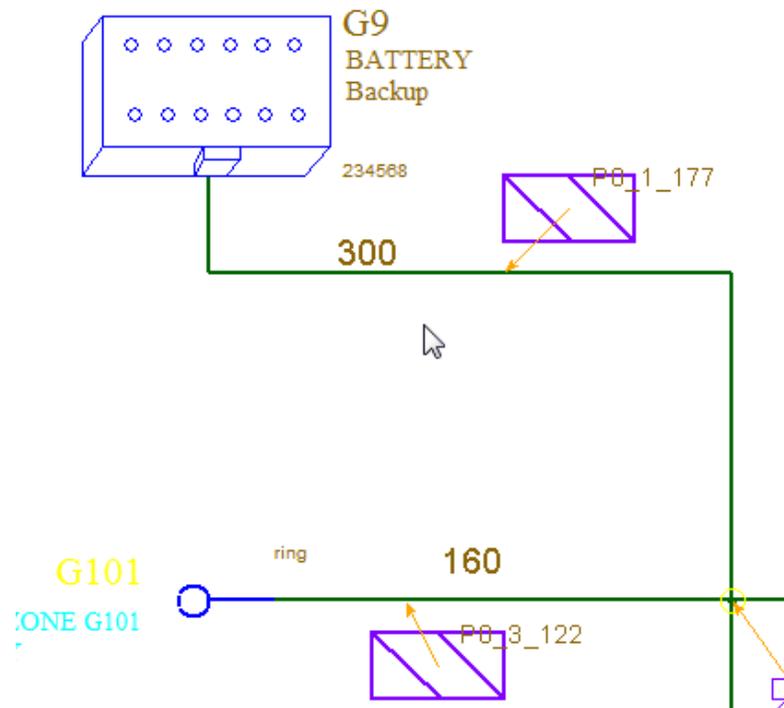
34. Now check the Consistency, like you did with the other drawing.

Note: You may notice that there is a message in the Bundle Update Report at the bottom of your screen.
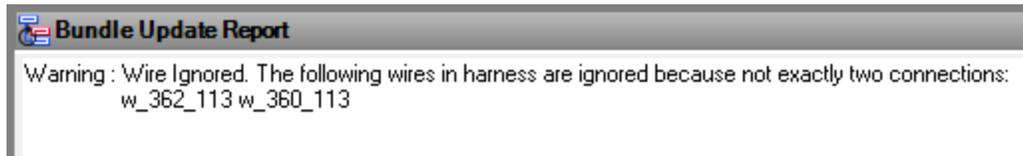
Note: With this issue you should not release your drawing. You must correct the Wiring design.

35. First check use **File > Info** menu to which Wiring design your current bundle is connected to.
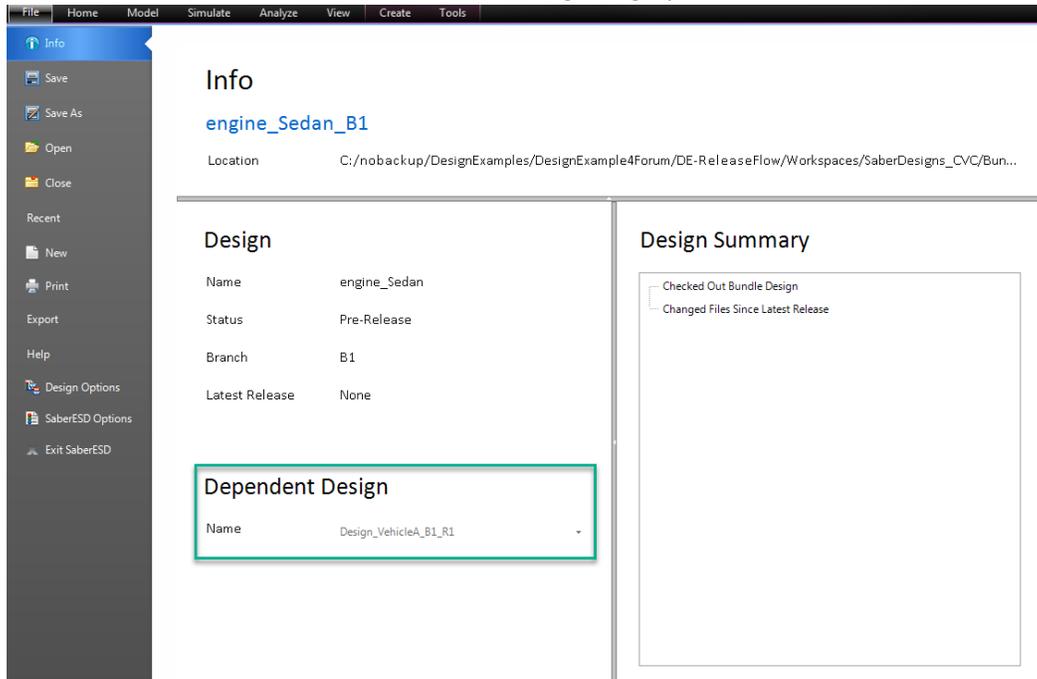
You will see the bundle is connected to the latest release of the wiring design. As you can't change an already released design, you will need to change the WIP design and do a new release.

36. Open the Wiring design *SaberTrainiing_B1* (Pre-Release).
You can leave the Bundle design open. SaberESD will open the wiring design in a new instance, but stull use 1 SaberESD license.

37. Use the DRC for Wires to locate this issue.
Deselect all the checks in the other DRC sets
And set the wires so that it doesn't check for wires length and color.

Design Rule Checks:

File   Edit   Scope

DRC Set: Wires

Filter Settings: [Entire Design]

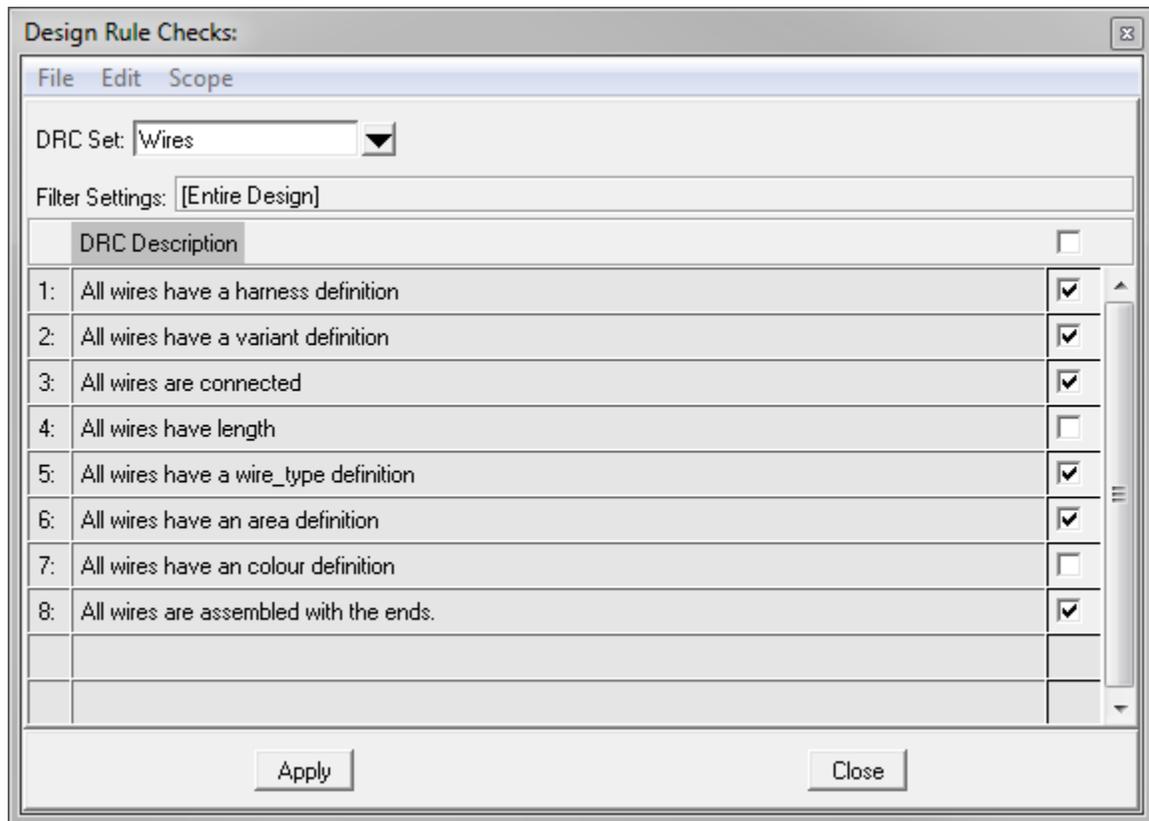|	DRC Description	
1:	All wires have a harness definition	☑
2:	All wires have a variant definition	☑
3:	All wires are connected	☑
4:	All wires have length	☐
5:	All wires have a wire_type definition	☑
6:	All wires have an area definition	☑
7:	All wires have an colour definition	☐
8:	All wires are assembled with the ends.	☑

Apply   Close

38. You will see a message saying that there are 4 errors. All are involving inline C001.
39. Open and check out the *Alarm* sheet.
40. Zoom-in on the wires and inline below *G9*.
41. C001:5 and C001:6 inline connector terminals are incorrectly drawn. The socket is pointing upwards. The wires belong to engine harness, but socket shell is instrument harness. Flip them upside-down to get the correct connection.
42. Run the DRC to check the design.
43. If the design does not have any errors, update the *ReleaseData* sheet to register the changes made.
44. Now you can **Check-in** and **Release** the design.
45. Wait until the release is done, then switch to the Sedan bundle drawing

46. A warning, the dependent design is out of date, will be shown as below:

⚠ The dependent design is out of date. Use Design Update tool to synchronize.
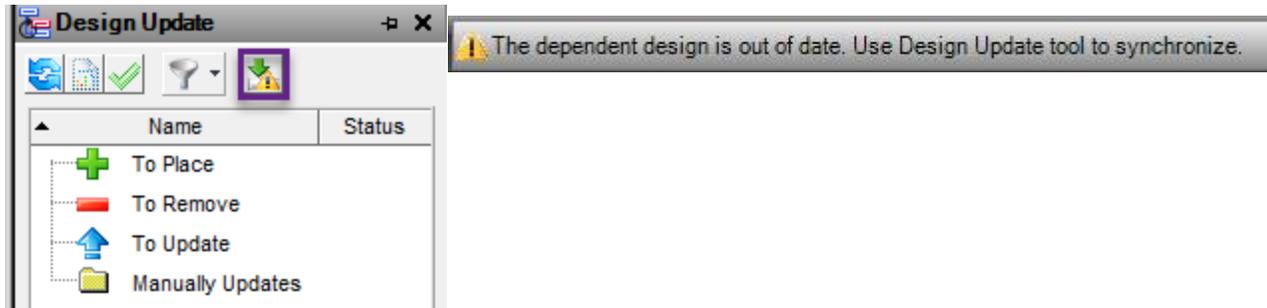
47. Click the **synchronize** button in the Design update tool, to update the design.
    You will get a message that the design is updated.
48. Check the **File > Info** menu to see that your design is connected to the wiring design B1_R2.
49. If the tool does not show the *Bundle Update* windows, this mean the windows is empty and no issues are found.
50. As the design is correct, you can Release the design.
51. Close the design to finish this part and continue with the final part of the example.

While Pre-Releasing the Bundle design for the SUV, we had selected the B2 of the bundle design to be connected to the B1 of the Wiring design. After some reflections, it is decided that it is better to connect the bundle to the B2 of the wiring design.

52. Open the bundle design *engine_SUV – B2*.

53. Click **File > Info**
54. Click drop down list located against Name field in **Dependent Design** section.
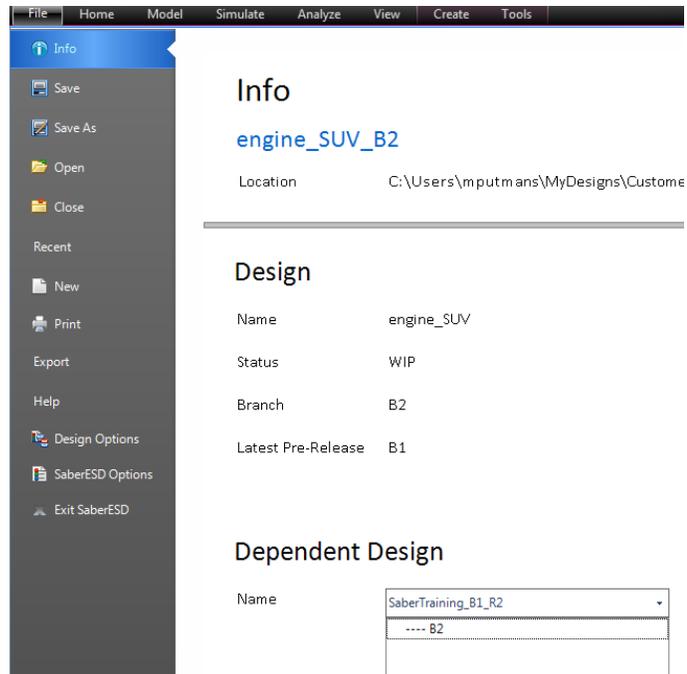
55. Select B2 to connect the design to *Design_VehicleA _B2* wiring design.
56. Close the design and SaberESD to finish this example.

Appendix: Release Flow Explained

In SaberES Designer, there are three release statuses as follows:

- **Work in progress (WIP)**: In this stage, all changes from the parent design are implemented and all design changes are done.
- **Pre-release**: When all changes are done and the design is consistent with its parent design, it is put into the Pre-release status. This is an intermediate status, that is typical used to thoroughly check the design for correctness. This status is then used to correct some errors that where not detected in the WIP.
- **Release:** When design is corrected, it is put into Release status. In this status no changes are allowed and the design is archived.

Initial Work in progress status of the Electrical Design.

For illustration, we will consider an electrical design consisting of a System design, a Wiring design and 3 Bundle designs to start with.
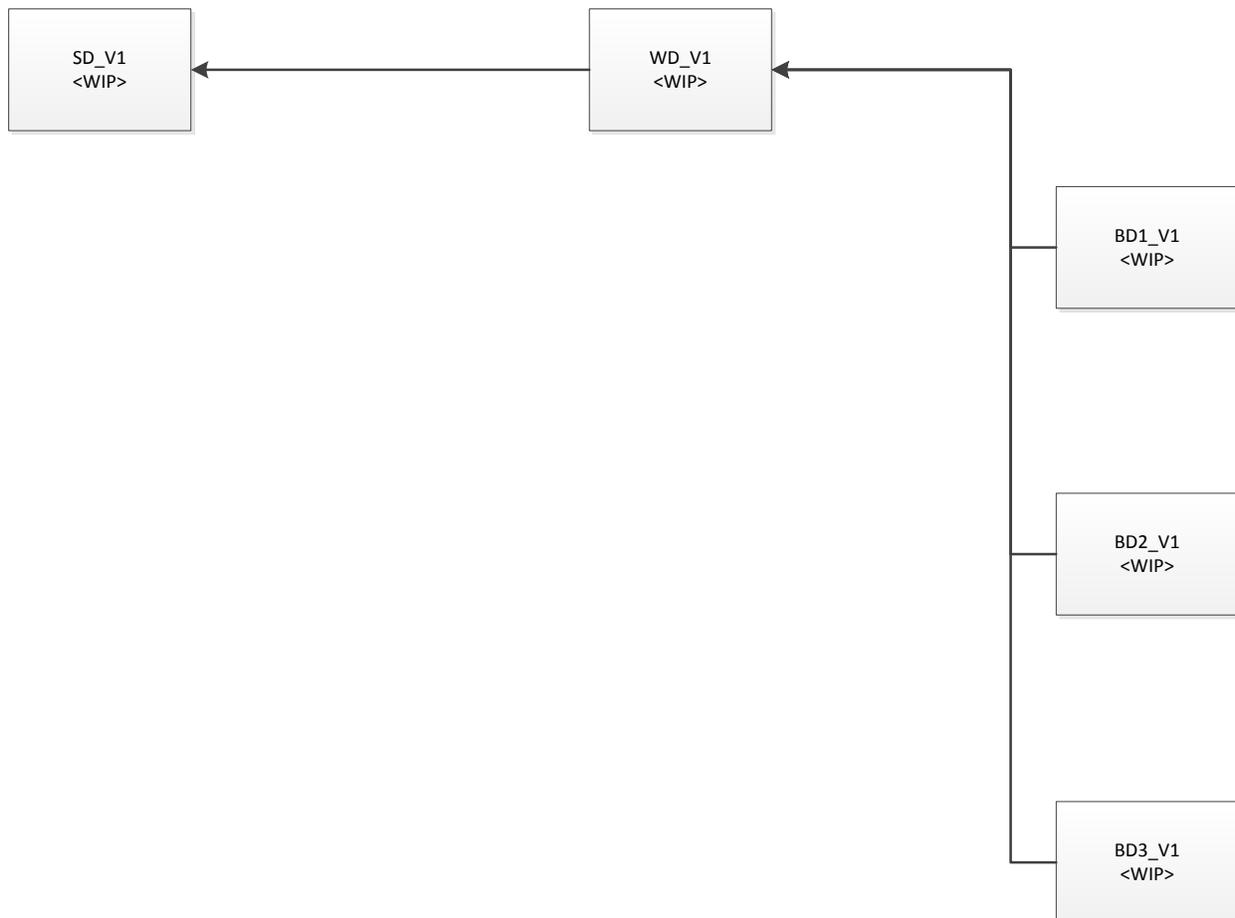

Figure 1.Start situation.

We will assume that all designs are just created and are in Work in Progress, WIP status. In Figure 1, you can see how the designs are connected to each other.

Pre-Release and Release stages

For the designs that are in WIP status, the next stage in the release flow is Pre-release. First we will do pre-release of the System design. When doing a pre-release, the current branch (V1 in this case) of the design is moved from WIP to Pre-Release status. And a new branch is created (V2 in this case), from the existing branch, which will be in WIP. All the wiring designs that were dependent on System design V1, would continue to be dependent on the System design V1. The only difference is V1 has moved into Pre-release status from WIP status allowing Pre-releases for its depending wiring designs to take place when needed. See Figure 2 for the new situation; marked with purple are the changes.
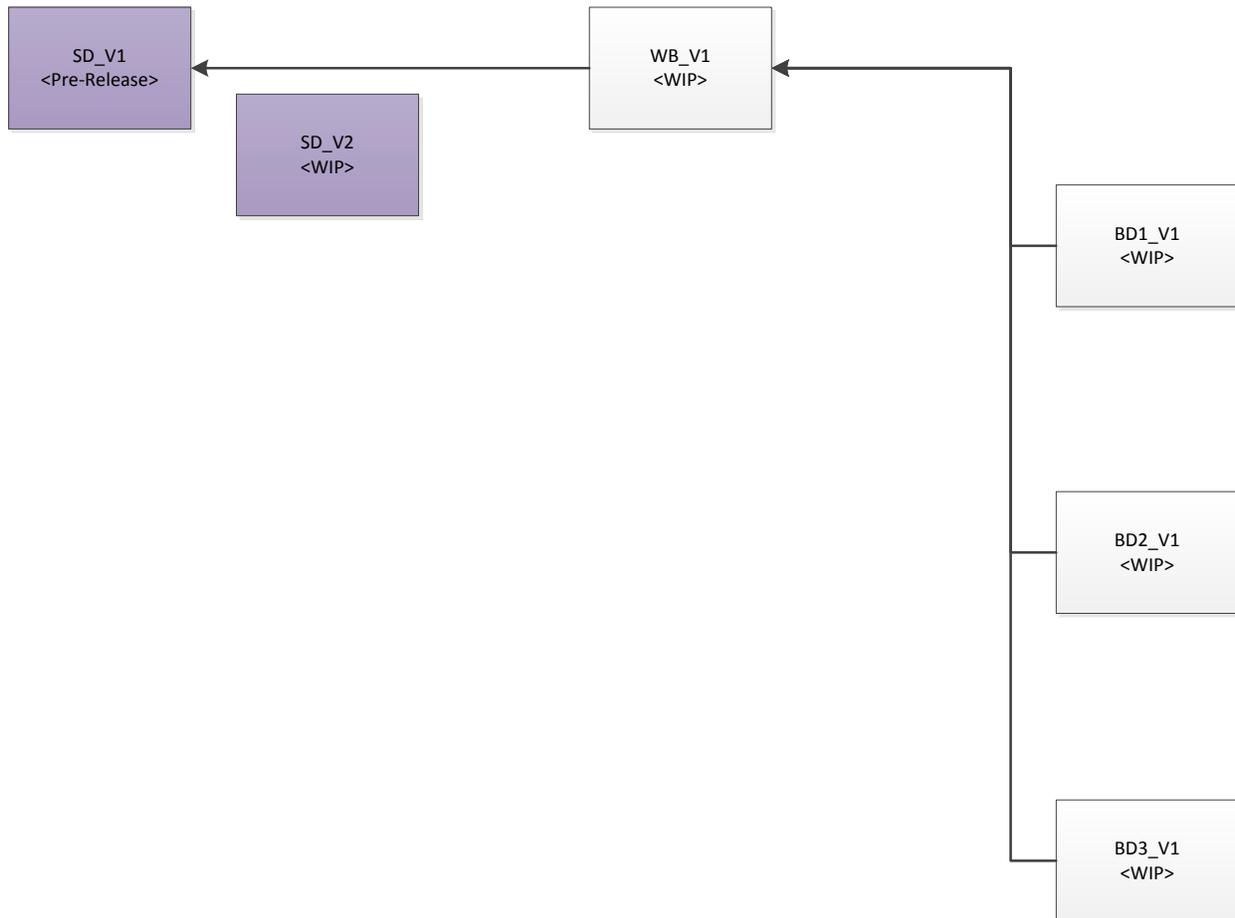
Figure 2. Situation after Pre-release of the System design

Pre-release status means that the design is almost ready for release with some minor corrections that can be fixed before a final release. After making the required minor changes on a pre-release design and when doing a release, a copy of that design is stored with the status Released. The current design keeps its Pre-release status, so further additional releases can be done from this Pre-release design, if needed. When a first release is made from pre-release design V1, the first released design will get the release tag V1_R1. Now, all the unreleased designs that were dependent on the pre-release design V1 would now

depend on V1_R1. When multiple releases are done from a pre-release design, the dependent downstream unreleased designs would depend on the latest (highest) release under that pre-release version. In Figure 3 you will see the situation after two releases of the V1 branch.
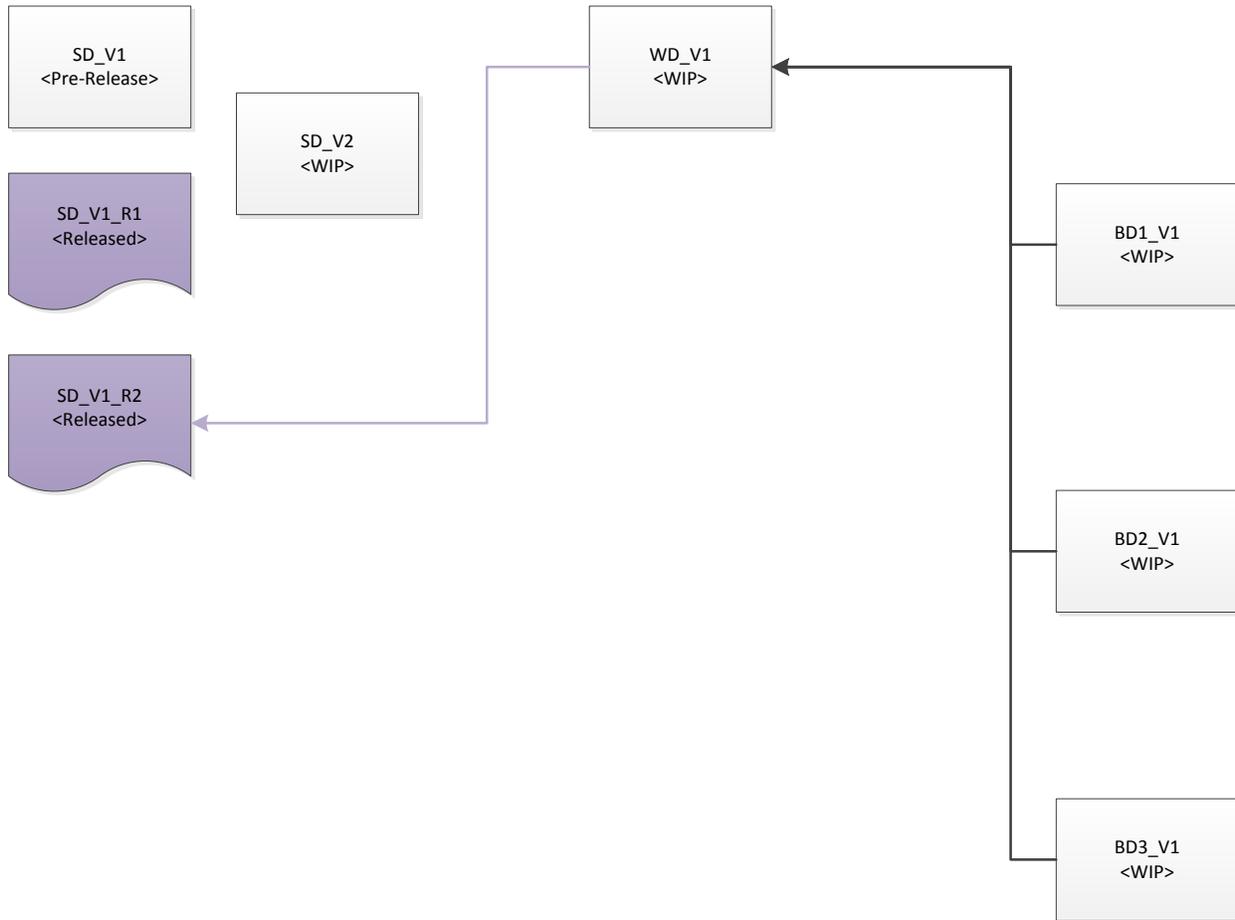

Figure 3. Situation after two releases of the System design

Use cases, user roles

We are going to use the situation in Figure 3 for the use cases to explain more about the release flow in SaberESD. To make this easier to understand we will add some users to the designs.

Figure 4. Users

Clark is the owner of the System designs. He will create the System Design base on the project specifications and will select the needed Sub-Systems for that from the Sub-System Library.

Wayne is the owner of the Wiring design. He will receive the System Design from Clark and will add physical properties to all items. For example, he will add area and color to the wires and will add connector shells to the ECU's. Also, he will add inline connectors to map the wiring design to geometric zones within the project. Together with the Bundle Design owners, he will add design option to all the items and will work with them to get all wiring harness part numbers into the Assembly Library.

Manny, Hillary and Dan own Bundle Design one (BD1), two (BD2) and three (BD3) respectively. They work with Wayne to get their sub harness into the Assembly library. They layout their Bundle design according to the routing using 3D information. They will also add mechanical components including, electrical component covers and clips to the harness design. And finally create the output needed to manufactory the wiring harness.

Use case1: Manny's Bundle release

For the first use case, Wayne has finished his Wiring design and worked with the Bundle design owners to make sure all data is correct and the Assembly Library is complete. He does a pre-release of his wiring design. This will create the V2 version of the Wiring design and give the V1, the Pre-release status.

To perform a pre-release for a design, the dependent parent design should already be in pre-release status with or without released versions underneath.

Wayne could do the pre-release of his wiring design, because the status of its dependent parent System design, (SD_V1_R2), has a status Release. Pre-Release button would be greyed-out and Pre-release would not be possible.
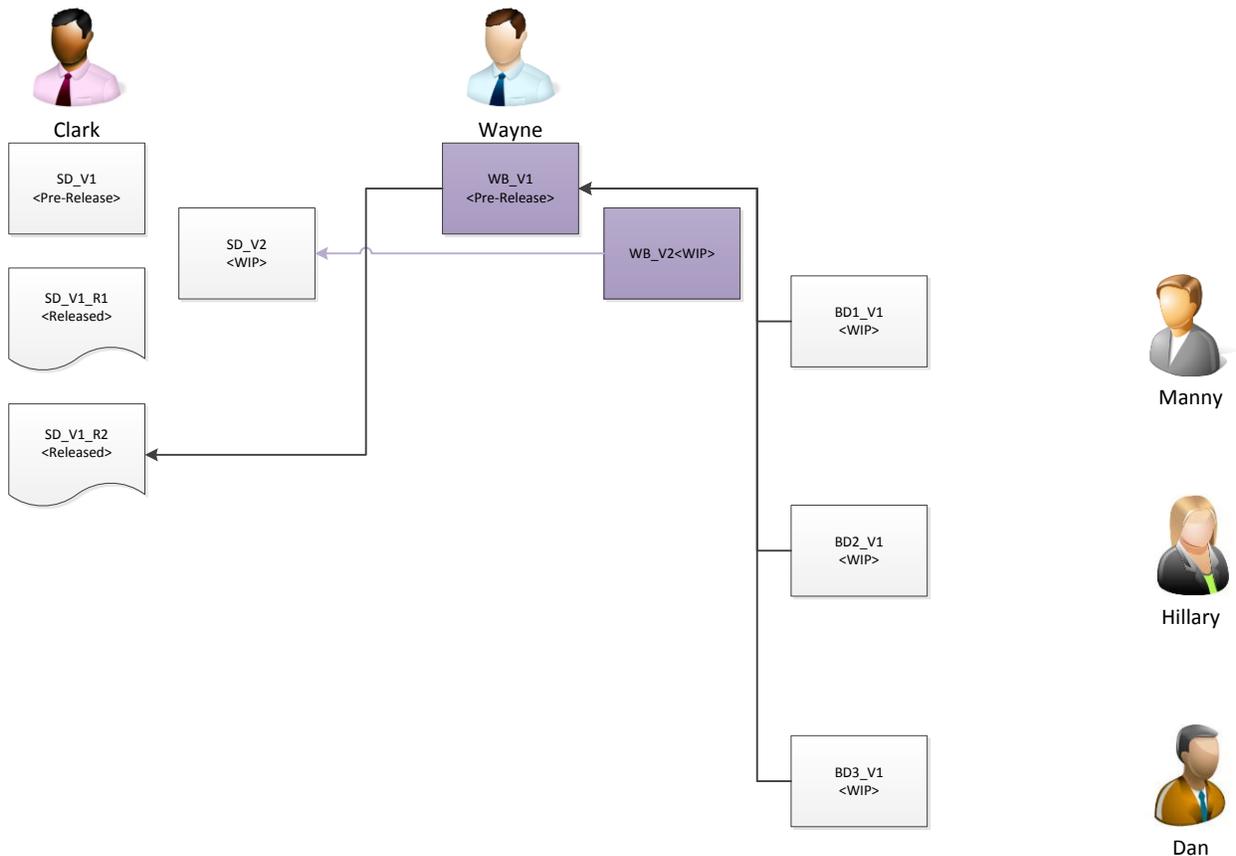

Figure 5. Pre-Release of the wiring design

All the Bundle designs are depending on the pre-released version of the wiring design V1. Now Manny is starting his release process for his Bundle design BD1_V1. He checks his design and sees that he is missing a wire. He goes to Wayne, they check the design and see that Wayne has forgotten to put a variant on that wire. Wayne corrects his error both in the V1 and the V2 branch of the Wiring design. As soon as Wayne made the correction and checked the design back into the repository, Manny will get a notification that he will need to update his design. Manny implements the update, checks his design and sees that it is correct. Then, he does a pre-release of his bundle design and gives Wayne his approval for releasing the dependent parent wiring design. Wayne goes ahead and releases his wiring design.

Manny's pre-release will create the V2 of his bundle design, connected to the V2 of the Wiring design. Wayne's wiring release will create R1 release and all the connected bundle designs will now be connected to his R1 wiring release. With this situation Manny is free to release his Bundle design, which creates the V1_R1 release of the Bundle 1 design. This situation is shown in figure 6.
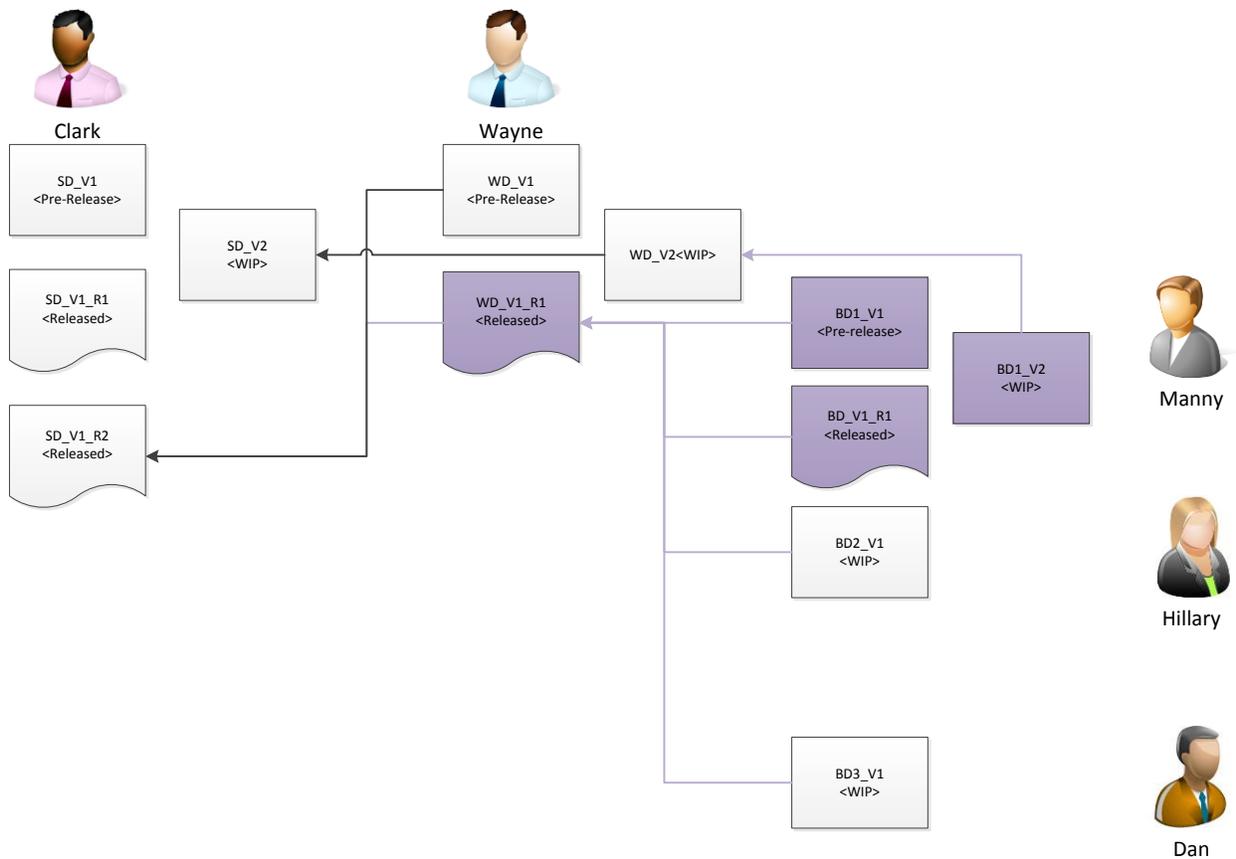
Figure 6. Situation after the release from Wayne and Manny

User Case 2: Hillary's Bundle release.

For this use case, we will continue with the situation we ended up with in the first case. Hillary has to release her Bundle design. But she has to add an extra set of rear lights to her drawing before release. She goes to Wiring design owner, Wayne and they find out that this option is not included into the Wiring design. So they go to System design owner, Clark, and they tell him that they will need to add an extra set of rear lights to the design. Clark looks up the needed Sub-System design. He adds this to the System design and does a new release (R3) of his system design. After the release is done for the system design, Wayne's wiring design (WB_V1) will now be connected to the new release R3 of system design and he will did get a notification to update his wiring design. The released version of the wiring design V1_R1 will not change its dependency as it is already released and it will be permanently dependent on the system design V1_R2.

Hillary already placed her bundle design in the Pre-release. And is waiting for Wayne's wiring design release.

Wayne does an update of his design and adds the extra rear lights to his wiring design. He gives the wires the needed physical attributes and assigns the correct variants to the wires and connectors. He then runs APS to assign the contacts to the newly added wires and connectors and releases his wiring design as R2. This release connects all Bundle designs in the downstream, that are not released yet and those which were previously attached to the Release 1 now to Release 2.

Now Hillary get a notification, in SaberES Designer, that the dependent design has been updated. She can update her bundle design to include the extra set of rear lights. After she has added them to the design with the correct layout, she releases her Bundle Design. Figure 7 shows the relations at the end of this use case.
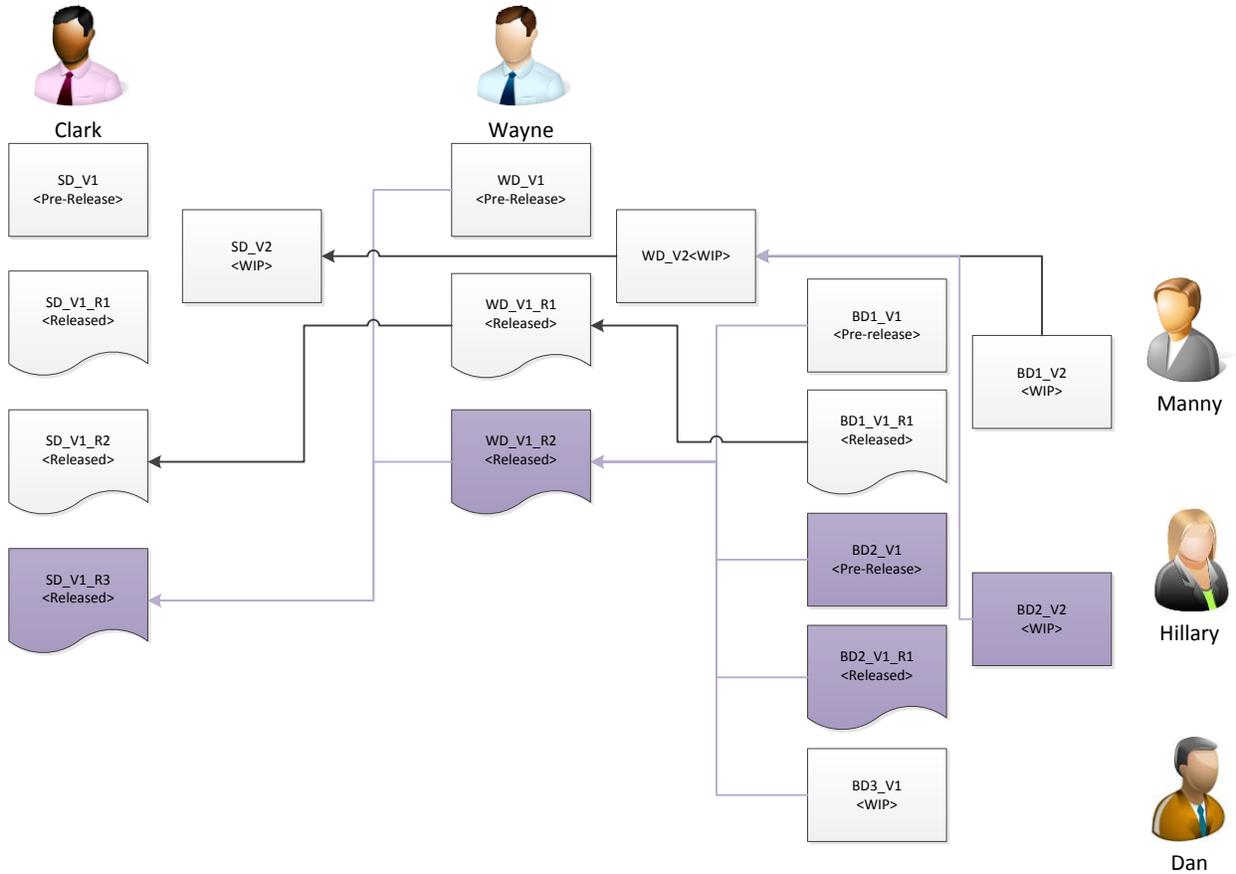

Figure 7. Situation after Hilary's release

Use case 3: Dan's Bundle design

As we did in the previous use case, we continue with the situation after the last case. Dan has checked his schedule and sees that his Bundle design will not have to be released based on the first version (V1) of the Wiring design, but with the latest version. So he wants to connect his Bundle design to the version V2 of Wayne's Wiring design.
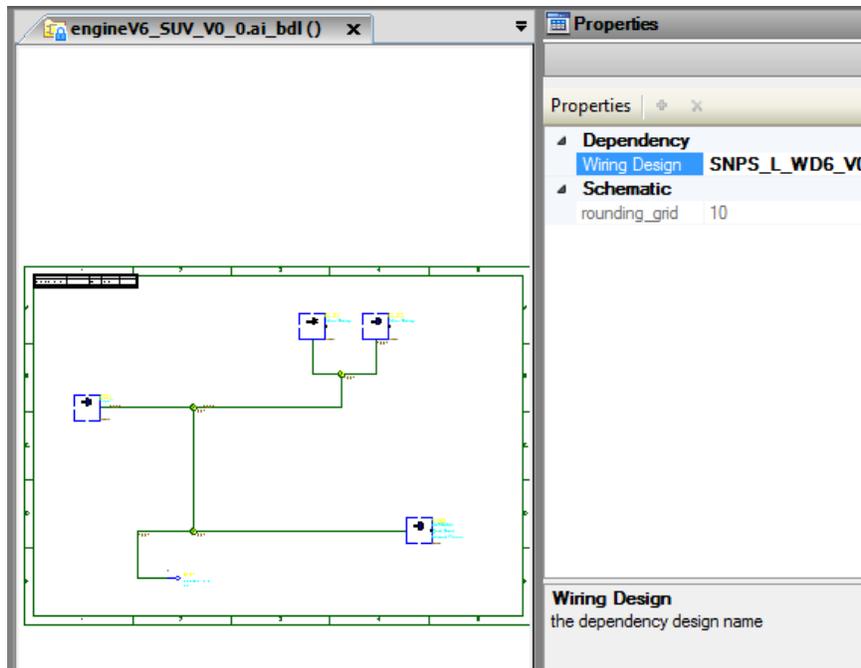
Figure 8. Change dependency

To do this, he opens his bundle design, and sets the dependency to the latest WIP of the parent wiring design. In this case this will be V2, but if Wayne already did a new Pre-Release, the dependency would be moved to V3. In picture 8 you see the result of the move to latest WIP.
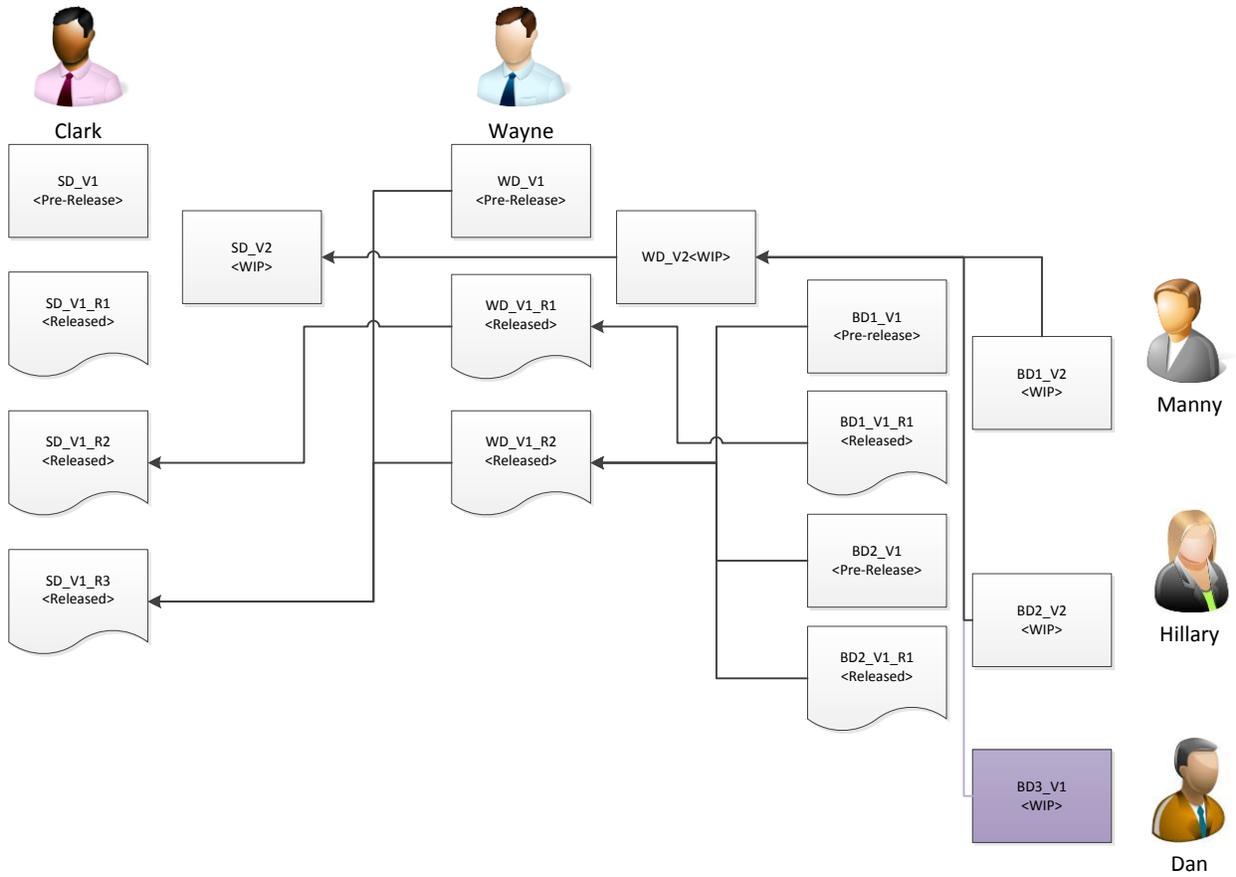
Figure 9. Situation after Move to Latest WIP