TEAMCENTER

Change Management — Deployment and Rich Client Usage

Teamcenter 2412

SIEMENS

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1. What is Change Manager?

Change Manager helps you track changes to a product throughout its life cycle. You propose a change to a product and then manage the entire cycle of review, approval, and implementation of the change.

It enables your organization to ensure the quality of every change made to a product by providing mechanisms for problem identification, change authorization, coordination and planning, cost and benefit analysis, and record keeping. You can articulate the work required to:

- Implement a change.
- Assess its impact on any managed business items, such as parts or documents.
- Notify lifecycle participants about proposed and authorized changes.
- Track progress and completion of work.
- Compare before and after product configurations.

Change Manager can be easily configured to use your change process.

- Use Change Manager with Workflow Designer to **track the evolution of changes through your organization** according to a controlled, repeatable process. Workflow Viewer is accessible directly from within Change Manager.
- Use Change Manager with Schedule Manager to **create work breakdown structures** that you can use to plan and schedule the changes you are making to your product.

  You also need the **Workflow to Scheduling Integration** option installed and configured.

2. Before you begin

Prerequisites

You need a license level that enables authoring for all Change Manager functionality. If you do not have a higher level license, you are limited to the following functionality:

- Creating a problem report (PR).
- Checking in a PR and submitting it to a workflow process.
- Adding business objects to the PR **Problem Items** and **Reference Items** folders.
- Searching for and viewing change objects: PRs, engineering change requests (ECRs), engineering change notices (ECNs) and deviation requests (DRs).
- Receiving and acting on workflow assignments and tasks.

Schedule Manager must be available and licensed to use the work breakdown structure functionality. You also need the **Workflow to Scheduling Integration** option installed and configured to initiate workflows from a schedule.

Workflow Designer must be available to process a change. You update the status (such as moving the **Disposition** attribute from **Investigate** to **Approve**) in a workflow process.

> Note:
>
> The Teamcenter change management process does not support displaying substitutes on separate BOM lines in Structure Manager. Turn off the substitutes display (set **PSEShowSubstitutesPref** to **0**) when working with change-management related features.

Enable Change Manager

Before you can configure change management, you must add the application to your existing Teamcenter environment.

1. Log on to Deployment Center and select the environment to which you want to add Change Management.
2. Go to the **Applications** tab. Click **Add or Remove Selected Applications**.

3. In the **Available Applications** panel, use the web browser search to find the **Change Management** application. Select the application, and then click **Update Selected Applications**.

   Deployment Center automatically selects any additional dependent applications.

4. Go to the **Deploy** tab. Click **Generate Install Scripts** to generate deployment scripts you will use to update affected machines.

   When script generation is complete, note any special instructions in the **Deploy Instructions** panel.

5. Locate deployment scripts, copy each script to its target machine, and then run each script on its target machine.

   For more information about running deployment scripts, see *Deployment Center — Usage*.

Or, if you see Teamcenter Environment Manager (TEM), add the following features in the **Features** panel:

- **Change Management** (server)

  Installs the server-side definitions for changes.

  Select **Active Workspace→Server Extensions→Change Management**

- **Change Management** (client)

  Installs the user interface elements for viewing changes in Active Workspace.

  Select **Active Workspace→Client→Change Management**

If Change Manager does not appear in the rich client, edit the **HiddenPerspectives** preference and remove the **ChangeManager** value.

If you have trouble accessing Change Manager, see your system administrator; it may be a licensing issue.

> Note:
>
> You can log on to Teamcenter only once. If you try to log on to more than one workstation at a time, you see an error message.

Configure Change Manager	The following basic configurations are required to use Change Manager: • To customize Change Manager business rules and objects, install the Change Management Business Modeler IDE templates (during installation, select **Change Management** in the **Business Modeler IDE Templates** panel in Teamcenter Environment Manager). • Set Change Manager preferences. • Define your users, including groups, roles, and access rules. • Create your own workflow processes.
Start Change Manager	In the navigation pane, click **Change Manager**  .

3. Change management in Teamcenter

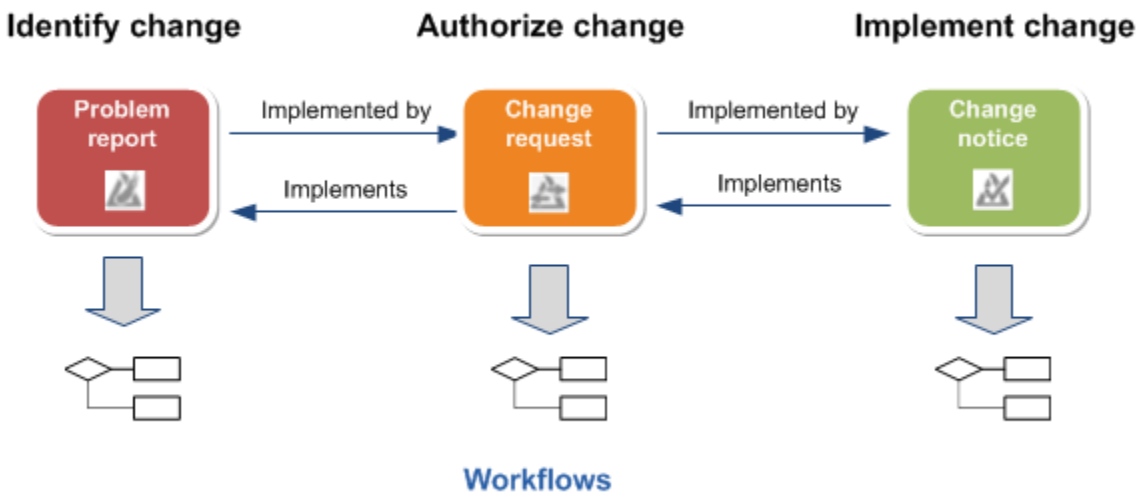
Teamcenter provides functionality that enables you to initiate, administer, review, approve, and execute product changes, using your company's business process similar to the one shown here.

By automating your change process, you can minimize change-related rework and coordinate tasks to be performed by individuals across your organization. Because Teamcenter change management leverages product structure definitions, you can evaluate the impact of changes, track the status and completion of tasks, and maintain a comprehensive history of product changes throughout the lifecycle. Change management in Teamcenter is also tightly integrated with Schedule Manager and Workflow so you can schedule implementation activities and guide a change through its phases.

In addition, if you have changes or issues that do not need to be addressed through an extensive, standardized change management process, such as the one that Change Manager supports, or you have highly visual information, you can use Issue Manager. Issue Manager automatically provides access to Siemens Digital Industries Software design review and issue resolution tools, including NX, Lifecycle Visualization, and the Lifecycle Viewer.

4. What is a change?

Three main types of change objects shown in the figure implement the key elements of Change Manager:



Each of these objects are Item types in the business model, and, therefore, are revisionable objects. Each object type encapsulates the data for a phase of the change process. For example, a problem report (PR) contains the data that defines the problem, the engineering change request (ECR) contains the analysis of the impact of the problem, and the ECN contains the data for the implementation of the solution.

Implemented By and **Implements** relationships associate the change objects with each other. Each object type can be optionally associated with a workflow that defines the sequence of tasks and moves each object through a set of states to bring the problem to a resolution.

Anyone who uses Teamcenter can create a PR to identify and formally track an issue with your product information. Others who are involved in the change process can review and confirm the problem and provide input into what business objects must be updated to resolve the issue. Members of a change review or change implementation board can review and approve or disapprove the changes.

Types of changes

The change management solution is supported using the following change objects:

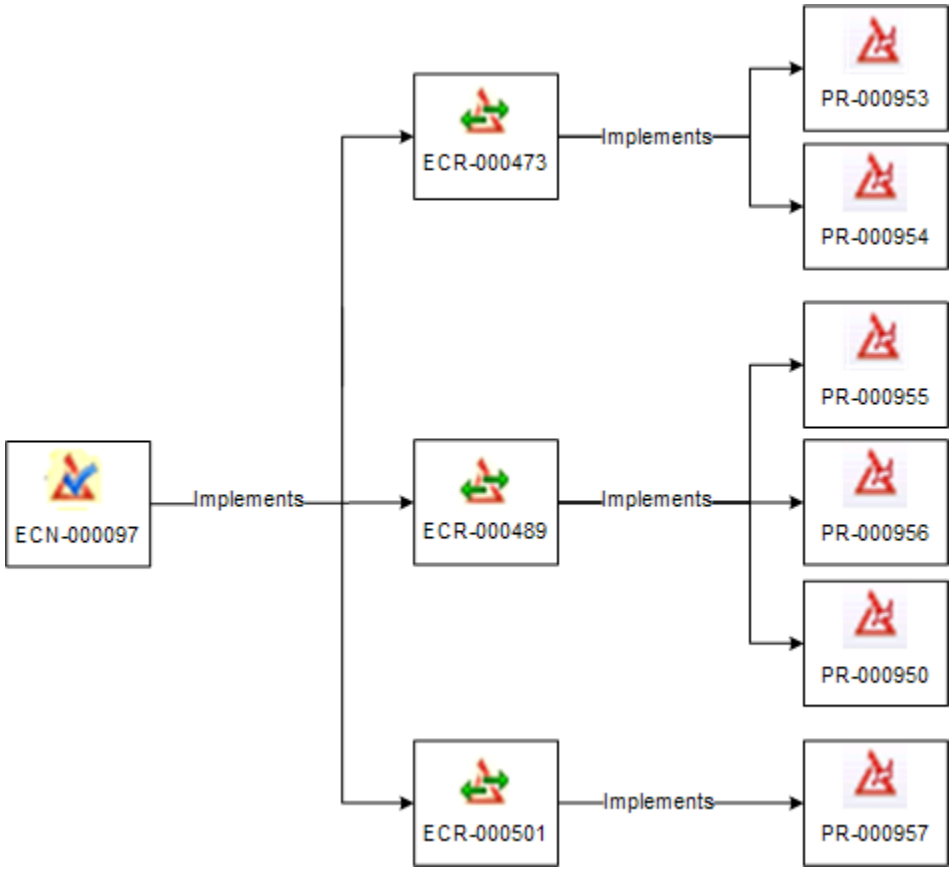
Change object	Description
Problem report (PR)	Initiates a change. A PR captures information about a problem or an enhancement. It includes the information necessary to

Change object	Description
	confirm and reproduce any problems observed or to document the specifics of a request for an enhancement. Additional attributes document the perceived severity of the problem and set the priority for addressing the issue relative to other PRs. The processing of a PR sometimes leads to the creation of an engineering change request (ECR). Creating a PR is an optional step in the change process. Depending on the conventions at your site, you may first identify a problem or enhancement with an ECR, not a PR. A PR may be addressed by one or more ECRs.
Engineering change request (ECR)	Initiates a proposal that recommends a change and captures business decisions associated with the change. An ECR proposes a solution to the problem with cost estimates and benefits of making the change. The actual solution (for example, a new item revision) is implemented in the change notice (ECN). An ECR is typically a response to a PR unless the PR stage is skipped. A single ECR may logically group and address issues identified in multiple PRs. An ECR may be addressed by one or more ECNs.
Engineering change notice (ECN)	Implements a change. It provides a detailed work plan to resolve one or more ECRs or a portion of one ECR. An ECN identifies all items and documents affected by a change and authorizes the actions that address a change.
Deviation request	Seeks consent to deviate from a solution in production to resolve a set of problems to initiate improvements. Typically, there are two types of deviation requests: • Request for deviation Seeks consent to deviate from a part solution. • Request for waiver Seeks consent to accept a non-conforming part.

Relationship between the change objects.

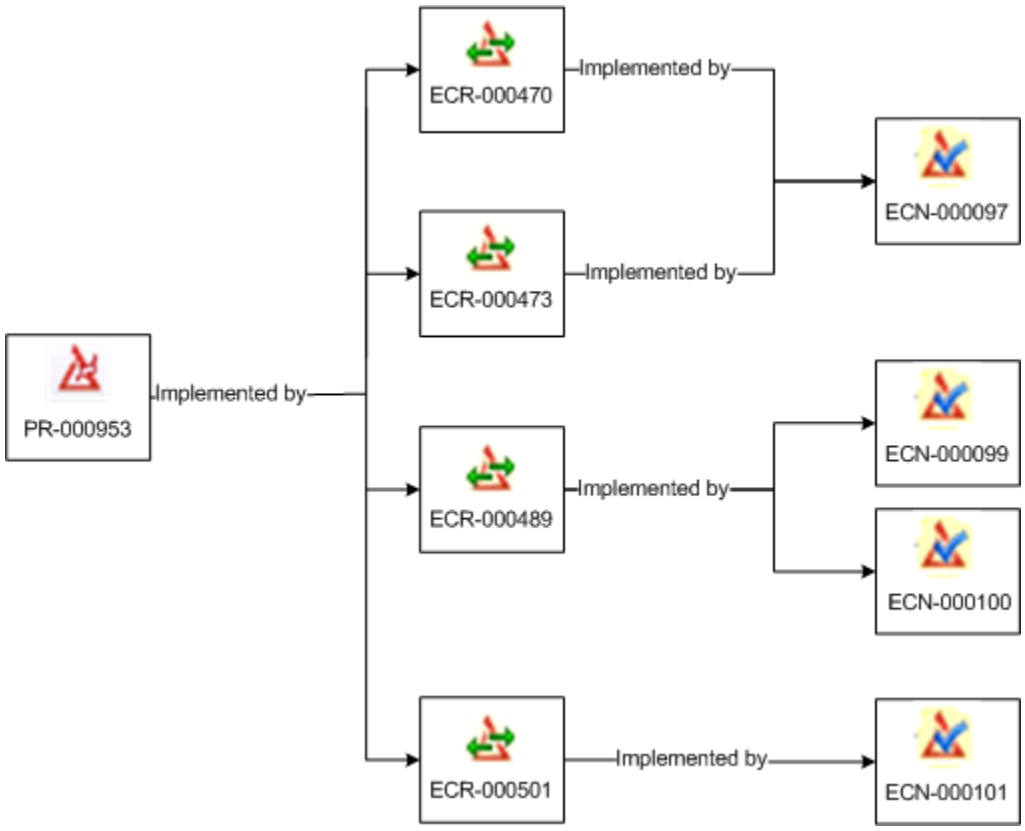
How one change relates to another

One change object in Teamcenter relates to other change object to manage the phases of the change process. In the preconfigured Change Manager model, an engineering change notice (ECN) implements an engineering change request, which implements the problem reports The following figure illustrates the relationship between these objects.



Each change object shows these relationships in the **Implements and Implemented By folders** of the change. You can also **derive one change from another** to create these relationships.

A single ECR can implement problems identified in one or more PRs. Similarly, a single ECN can implement issues identified in one or more ECRs. Likewise, two or more ECNs can implement a single ECR, as shown. Using Change Manager, you can create very complex structures of changes to satisfy specific change requirements, providing you with the flexibility you need.



5. What can you do in Change Manager?

Identify a problem

If you are requesting a change or reviewing a recommended solution or plan as a member of change review board:

- **Create a change**. For example, create a problem report to identify a problem or enhancement, provide a preliminary assessment, and show the steps necessary to reproduce the problem or create an engineering change request (ECR) to propose a solution to the problem.
- **Create a change in the context of a reference object**.
- **Derive a change from another**.

Review a solution

- **Review ECRs and ECNs** and make a business decision to approve or reject.

Manage the change process

If you are the change specialist managing the implementation of the change:

- **Initiate a workflow** to guide a change through the phases of a change process.
- **Assign participants** as the analyst and reviewers.
- **Assign effectivity** to specify when an ECN takes effect.
- Close ECRs and ECNs.

Develop or implement a solution

If you are the analyst determining how to implement a solution or if you are implementing the solution:

- **Define change properties**.
- **Relate problem and reference items**.
- **Create a work breakdown** using Schedule Manager.
- Implement the change by **creating** and **revising affected items**.

Administer the change management process

If you are administering Change Manager, you can:

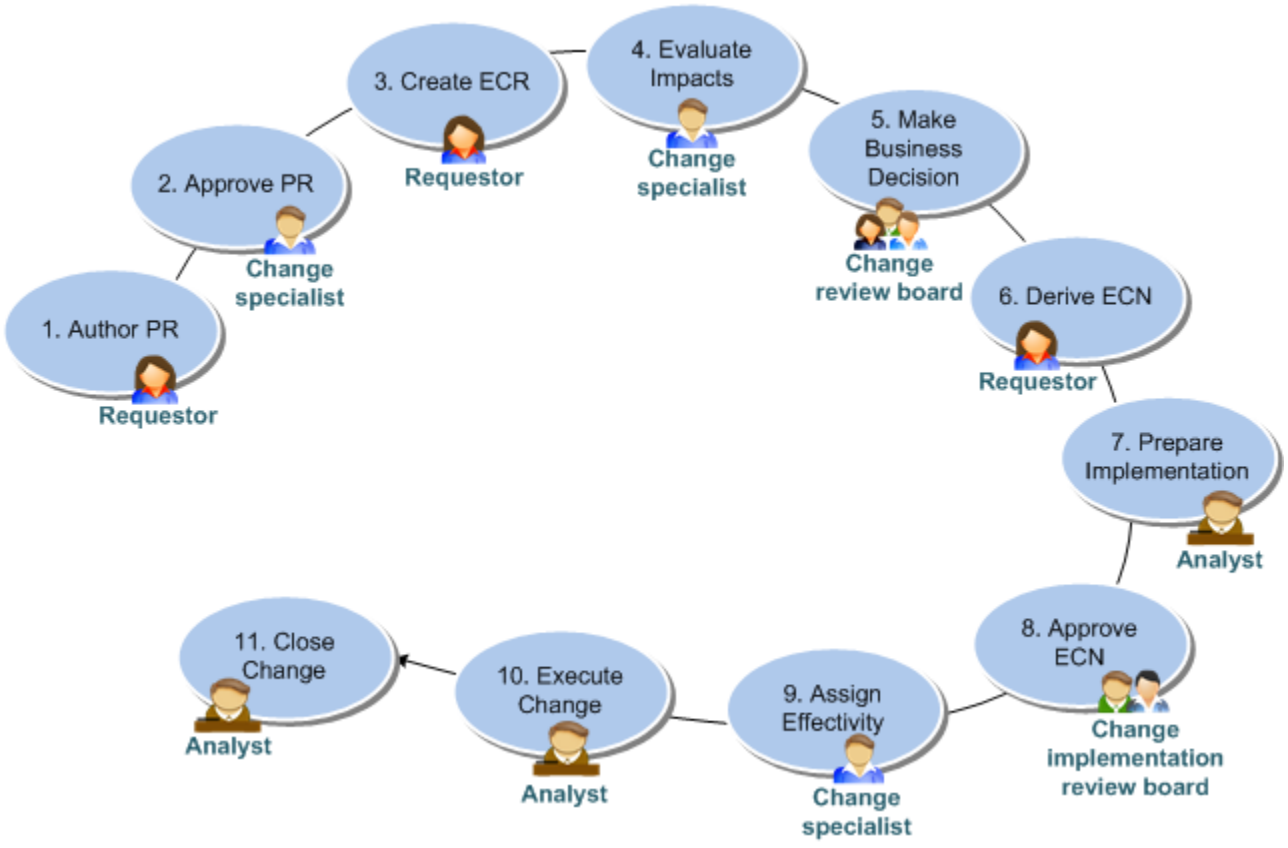
- **Install and set up** Change Manager.
- **Set Change Manager options**.
- **Set up users and the organization and roles**.
- **Define custom change management objects**.
- **Control the actions of participants through conditions**.
- **Create workflows**.

6. Understanding the change management process

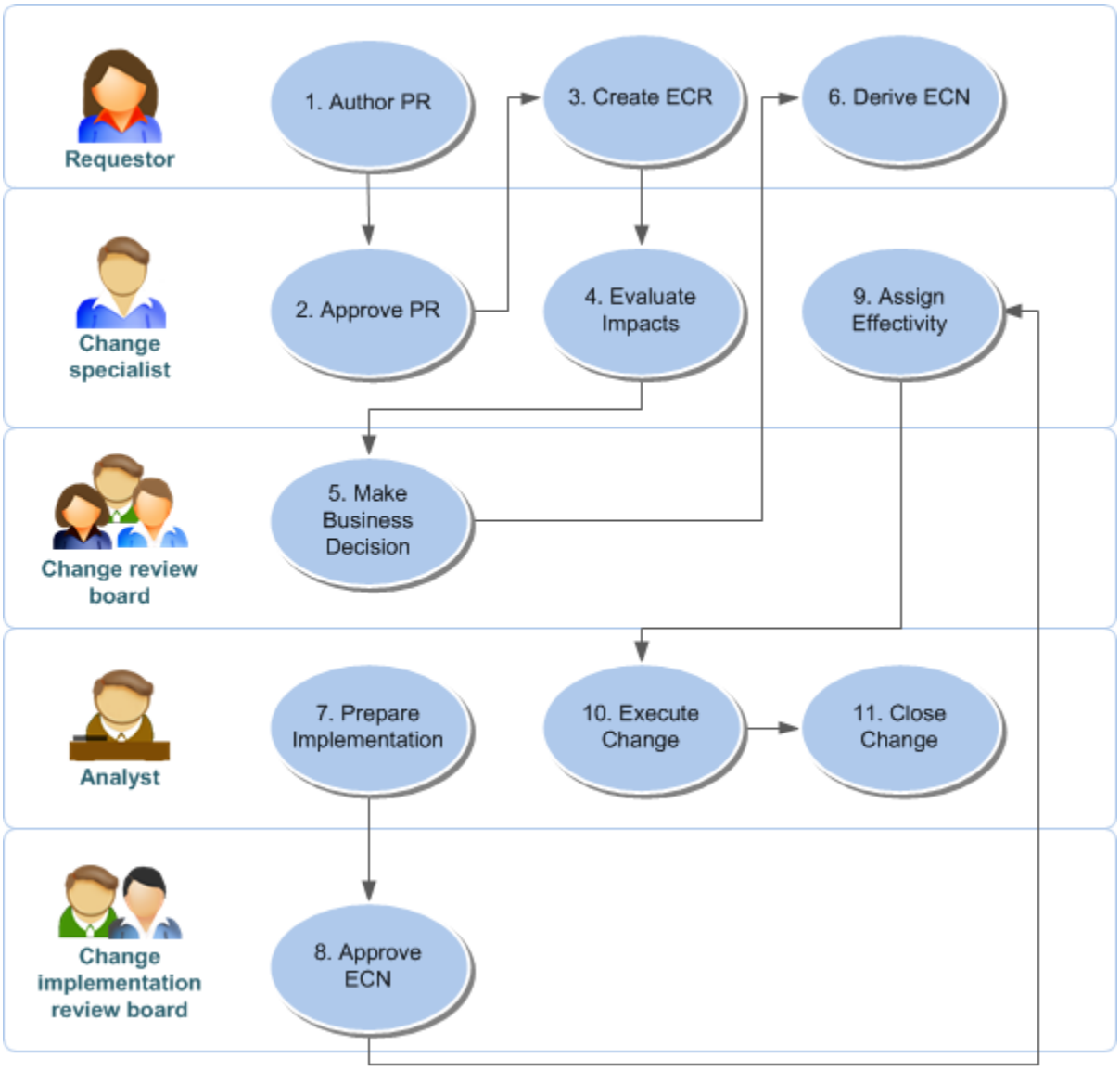
You can manage your changes in the way that works best for your company's processes. You should define a change process that is flexible enough to impose the appropriate level of rigor and control based on the level of risk, cost, and the business items impacted by the change. You can classify a change as **fast or standard track**. In a fast track process, the change does not go through a formal review process, while a standard track follows a more rigorous process, and may include a schedule to manage the required tasks. The following example shows a typical standard track process. It is followed by a graphic that shows the process by role.

See a more complete explanation of the change management business process using generic terminology.

The process is shown below by task with the associated role.



The following shows the roles and their tasks.



1. Author a problem report (PR).

   A requestor creates a problem report to identify a problem or enhancement, provide a preliminary assessment, and show the steps necessary to reproduce the problem.

2. Approve a problem report.

   A change specialist assigns a priority to the problem report and assigns it to an analyst for technical review. The specialist or analyst recommends a disposition, such as **Approved**.

3. Create an engineering change request (ECR).

   A requestor (who may be the analyst associated with the problem report) creates an ECR to address the problem report.

At this stage, the analyst develops a solution or several alternative solutions. The analyst does this by creating markups on documents, Word documents, presentations, and so on. No decision has been made at this stage about whether to proceed or what new items or item revisions may be required.

Sometimes the PR may propose a solution if the problem is simple to fix. However, the solution would still be formally documented in the ECR. Typically, though, the requestor is unlikely to be in a position to know what the solution should be and may likely have no idea at all.

> Note:
>
> The change request can address more than one PR.

4. Evaluate the impacts.

   The change specialist assigns the ECR to an analyst. The analyst identifies the items impacted by the change, prepares supporting documentation, and prepares a high-level proposal for the actions required to implement the change.

5. Make a business decision.

   A change specialist submits the ECR to a change review board who decides if the change will be made. The change review board can approve the change request, reject it, or require additional investigation. If this is a fast track change, the review board is the owner of the change and the process moves to the execute change step.

   At this stage, a decision is made about whether to revise or create new items, according to the form, fit and function and interoperability.

6. Derive an engineering change notice (ECN).

   The requestor (who may be the analyst of the ECR) either derives a new change notice to address the approved change request or associates the ECR with an existing ECN. The ECN addresses the implementation details of the change. It may address multiple change requests. The requestor can delegate responsibility for elaborating the details of the implementation plan.

   > Note:
   >
   > An ECN is always derived to implement a solution, even for an ECN that went through a fast track process. However, the workflow for the fast track ECN is very short, with a minimal number of steps. It is necessary to create an ECN so the analyst can add solution items, which is not possible in the ECR, whose purpose is only to define a proposed solution.

7. Prepare an implementation plan.

   The analyst develops a detailed plan to address the set of approved ECRs addressed by the ECN.

At this stage the agreed solution is implemented in the new/revised items.

8. Approve the ECN.

   For a standard track process, the change implementation board reviews and approves the plan to address the change. For a fast track process, the approval is informal and may just require the change specialist managing the change.

9. Assign an effectivity.

   A change specialist can assign effectivities to the ECN. The effectivities specify the timing of when the change takes effect.

10. Execute the change.

    The analyst implements and tracks the detailed plan for addressing the change. A change specialist tracks the implementation progress at a high level.

11. Close the change.

    The analyst closes the associated levels of the implementation plan. When all the actions associated with each level of the implementation plan are complete, a change specialist closes the change.

Problem report (PR) process example

The following example shows a simple process for managing a PR. **Example of a Teamcenter workflow that supports a PR process**.

After you create a PR, assign a specialist, and submit it to a workflow, you:

- **Validate the Problem Report**

  The assigned specialist reviews the PR properties.

- **Assign Analyst**

  The assigned specialist assigns an analyst.

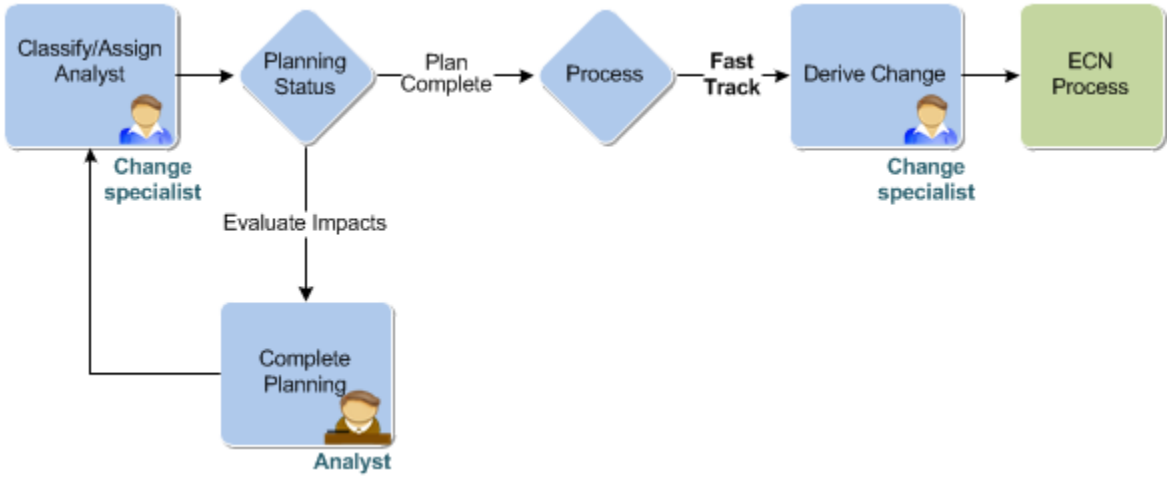
- **Analyze PR / Approve/Reject**

  The assigned analyst reviews the PR and approves or rejects the problem.

Engineering change request (ECR) fast track process example

The following fast track example shows a process for managing an ECR through fast track.

Example of a Teamcenter workflow that supports an ECR process for both fast and standard tracks.



After you create an ECR, assign a specialist and submit it to a workflow, you:

- **Classify/Assign Analyst**

  The assigned change specialist classifies the ECR as fast track, determines if more planning is required, and assigns an analyst.

  > Note:
  >
  > Change Manager conditions control who can assign the analyst. The default condition allows the current change analyst to assign a new analyst or allows the change specialist to assign an analyst.

- **Complete Planning**

  At this stage, the analyst develops a solution or several alternative solutions. The analyst does this by creating markups on documents, Word documents, presentations, and so on. No decision has been made at this stage about whether to proceed or what new items or item revisions may be required.

  If more planning is required, the assigned analyst completes it. The ECR returns to the specialist to determine if planning is complete.

- **Derive Change**

  The assigned change specialist derives an ECN to implement the solution.

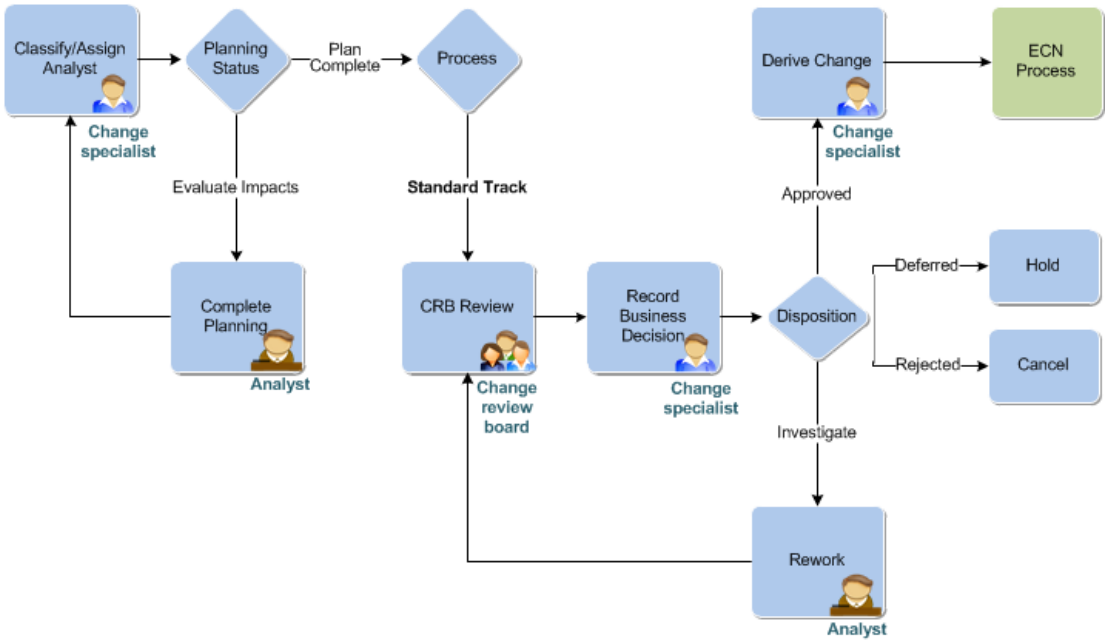
- **ECN Process**

  The assigned specialist begins a fast track ECN process so the change can be executed, and the solution items added.

Engineering change request (ECR) standard track process example

The following standard track example shows a process for managing an ECR through standard track.

Example of a Teamcenter workflow that supports an ECR process for both fast and standard tracks.



After you create an ECR, assign a specialist, and submit it to a workflow, you:

- **Classify/Assign Analyst**

  The assigned change specialist classifies the ECR as standard track, determines if more planning is required, and assigns an analyst.

- **Complete Planning**

  At this stage, the analyst develops a solution or several alternative solutions.

The analyst does this by creating markups on documents, Word documents, presentations, and so on. No decision has been made at this stage about whether to proceed or what new Items or item revisions are required.

If more planning is required, the assigned analyst completes it. The ECR returns to the specialist to determine if planning is complete.

- **CRB Review**

  If the planning is complete, the assigned change review board reviews the change and signs off as approved or rejected with comments.

- **Record Business Decision**

  The assigned specialist reviews CRB signoffs and comments and records the business decision.

- **Disposition**

  If approval criteria are met, the ECR is approved. The ECN process is executed.

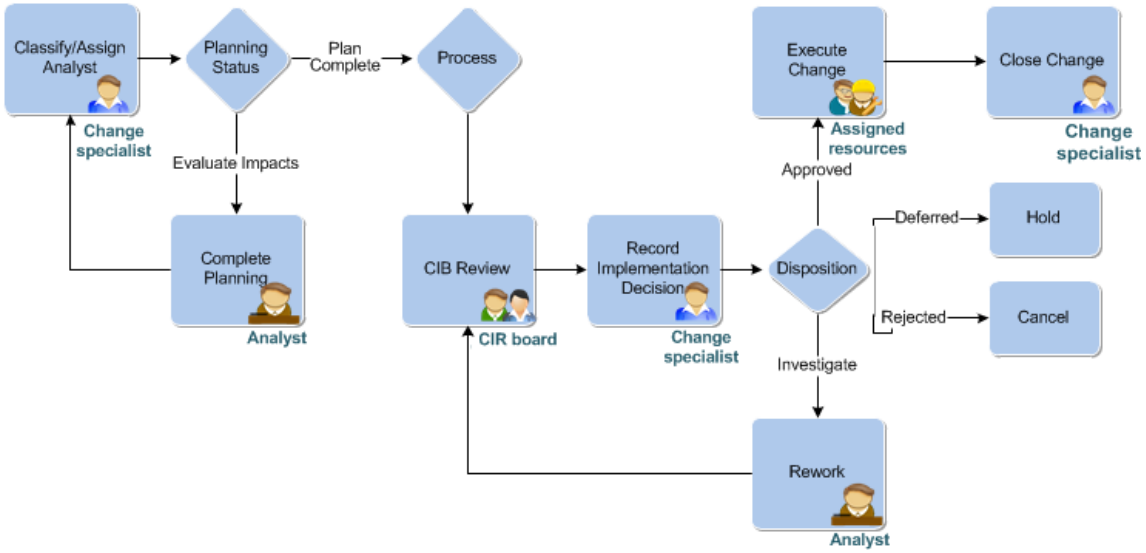
  - If the ECR is deferred, it is placed on hold.
  - If the ECR is rejected, it is closed.
  - If the ECR is not ready, it is sent for rework and returns to the CRB review step.

Engineering change notice (ECN) process example

The following example shows a process for managing an ECN for implementing an ECR that goes through the standard track process.

You can also develop an ECN process for an ECR that goes through a *fast track* process. That ECN would not include a formal review by the change implementation board. It would also be implemented by the same analyst assigned to the ECR.

Example of a Teamcenter workflow that supports an ECN process for a fast track ECR.



After you create an ECN, assign a specialist, and submit it to a workflow, you:

- **Classify/Assign Analyst**

  The assigned change specialist determines if more planning is required and assigns an analyst.

  The analyst develops a solution or several alternative solutions. The analyst does this by creating markups on documents, Word documents, presentations, and so on.

  No decision has been made at this stage about whether to proceed or what new items or item revisions may be required.

- **Complete Planning**

  If more planning is required, the assigned analyst completes the planning. The ECN returns to the specialist to determine if planning is complete.

- **Change Implementation Board Review**

  If the planning is complete, the assigned change implementation board reviews the change and signs off as approved or rejected with comments.

- **Record Implementation Decision**

  The assigned specialist reviews change implementation board signoffs and comments and records the implementation decision.

- **Disposition**

- If approval criteria are met, the ECN is approved.
- If the ECN is deferred, it is placed on hold.
- If the ECN is rejected, it is closed.
- If the ECN is not ready, it is sent for rework and returns to the CIB review step.

> Note:
>
> The **Disposition** state applies to all change objects.

- **Execute Change**

  If the ECN is approved, the assigned resources (for example, designers) implement the change according to the plan. They edit the models according to the engineer's directions as documented in the ECR. The design changes are approved as part of the process.

- **Close Change**

  The assigned specialist reviews the changes. If all tasks are complete, the ECN is closed.

7. What are change states?

Change states encapsulate the following:

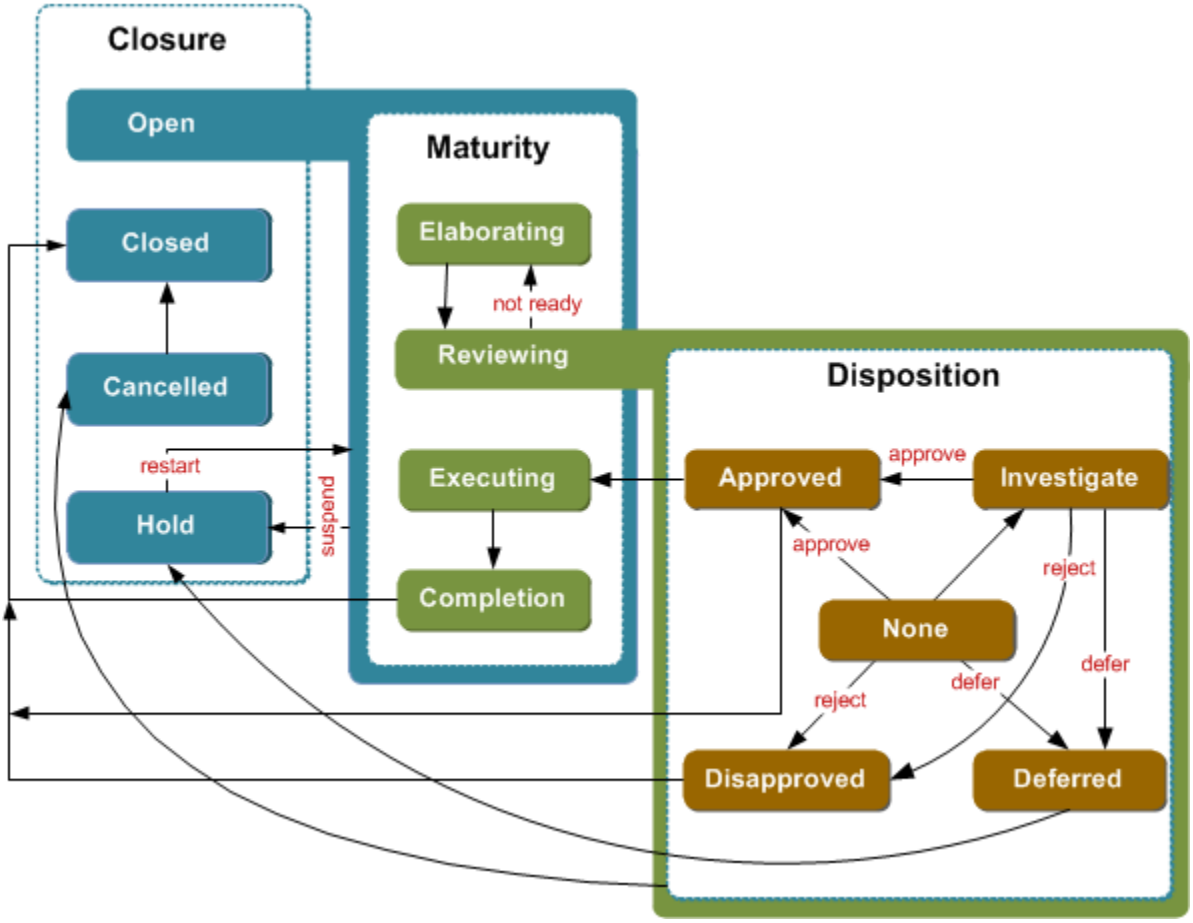
- The degree of completion or its maturity (for example, **Elaborating** or **Reviewing**)
- The business decision during change processing or its disposition

Three change object properties define these states: **Maturity**, **Disposition**, and **Closure**.

Using the default Change Manager configuration and an appropriate set of workflows, the change state model behaves according to the model shown in the following figure. In this model, any new change object (PR, ECR, or ECN) is assigned the following:

- A **Closure** state of **Open**
- A **Maturity** state of **Elaborating**
- A **Disposition** state of **None**

Maturity is a substate of the **Closure** state **Open**, and **Disposition** is as a substate of the **Maturity** state **Reviewing**.



A change object with a **Closure** state of **Open** moves through various maturity and disposition states during which decisions about the change are made. The **Closure** state remains **Open** until the change object has progressed through all phases of the change process, at which point the closure state is set to its final state of **Closed**. During this process, the change object can also be temporarily placed in one of the intermediate closure states of **Hold** or **Cancelled**. Each object has its own change states, so each change object associated with a change must be closed individually by the change process.

At each stage of the change process, the workflow changes the values of these three properties according to business rules to advance the change object to its next state.

Your administrator can configure Teamcenter using the Business Modeler IDE so your company has its own set of states, additional ones, or different values for the states. For example, your company could have 10 values for the **Closure** state and could change the name of the **Disposition** state to **Decision**. Your company can choose to follow the initial Teamcenter model or design your own. If you choose to follow the initial Teamcenter model, Change Manager provides the necessary elements for you to build upon.

Change states values

There are three key change states for change objects in the Change Manager initial configuration. Each type of change object (PR, ECR, ECN) has its own change states and must be closed individually through the process.

> Note:
>
> Although these states are defined on each object (PR, ECR, and ECN), the values apply to the overall change process. Therefore, the **Closure** state would not be set to **Closed** until the change has been completed, at which stage the closure and other states needs to be set on the PR and ECR, as appropriate.

- **Closure** defines the status of the change object. Change objects start with an open state and remain there until the change is complete unless a decision is made to defer or cancel the change. The **Closure** change state can be one of the following:
  - **Open** (default value on newly created change objects)
  - **Closed**
  - **On hold**
  - **Canceled**
- **Maturity** defines the degree of completion of the overall change process.

  The elaborating state is the investigation phase. The reviewing state can be informal where one user approves the change or formal where a review board must approve. Reviewers can decide the change is not ready and send it back to the planning phase or approve the change. Once approved, the change moves to the executing state and the actual changes begin with the creation of new items and item revisions. Finally, when all the necessary data has been created and approved, the change is considered complete.

  The **Maturity** change state can be one of the following:
  - **Elaborating** (default value on newly created change objects)
  - **Reviewing**
  - **Executing**
  - **Complete**
- **Disposition** represents a technical, business, or implementation decision by a person or review board about a change object's approval.

When a change object is created, the **Disposition** value is set to **None** (no disposition), which is the default. During review, the value should be set to **Investigate** and once a decision has been made, the value set to **Approved**, **Disapproved**, or possibly **Deferred**.

The **Disposition** change state can be one of the following:

- **None** (default value on newly created change objects)
- **Investigate**
- **Approved**
- **Disapproved**
- **Deferred**

Note:

- You cannot directly change the state. The workflow changes the state property values.
- Change state settings affect your ability to add data or relate objects to change objects (for example, to the **Impacted** and **Solution Items** folders).
- Additional control over the ability to edit a change object while the **CMClosure** state is **Closed** is available by using the **CM_Block_Edits_To_Closed_Change_Objects** preference.

Example of the state changes of a problem report

The following example shows how the default state properties change as the problem report progresses through the steps in the workflow. The change states in your organization may vary.

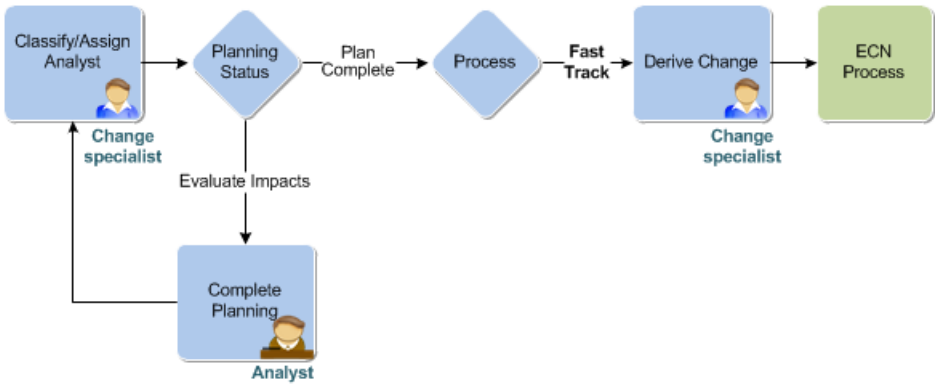
Step	Closure	Maturity	Disposition
Start	Open	Elaborating	None
Validate the Problem Report	Open	Elaborating	None
Assign Analyst	Open	Elaborating	None

Step	Closure	Maturity	Disposition
Analyze PR	Open	Elaborating	None
Approve/Reject	Open	Reviewing	None
End	Open	Reviewing	One of these: • Approved • Disapproved • Deferred • Investigate

The state property settings restrict permissions to add items to the problem report's folders. For example, the closure, maturity, and disposition property settings must be **Open**, **Elaborating**, and **None** for a **Requestor** to add an item revision to the problem report's **Problem Items** folder.

> Note:
>
> You cannot directly change the state. The workflow changes the state property values.

Example of the state changes in a fast track engineering change request (ECR)



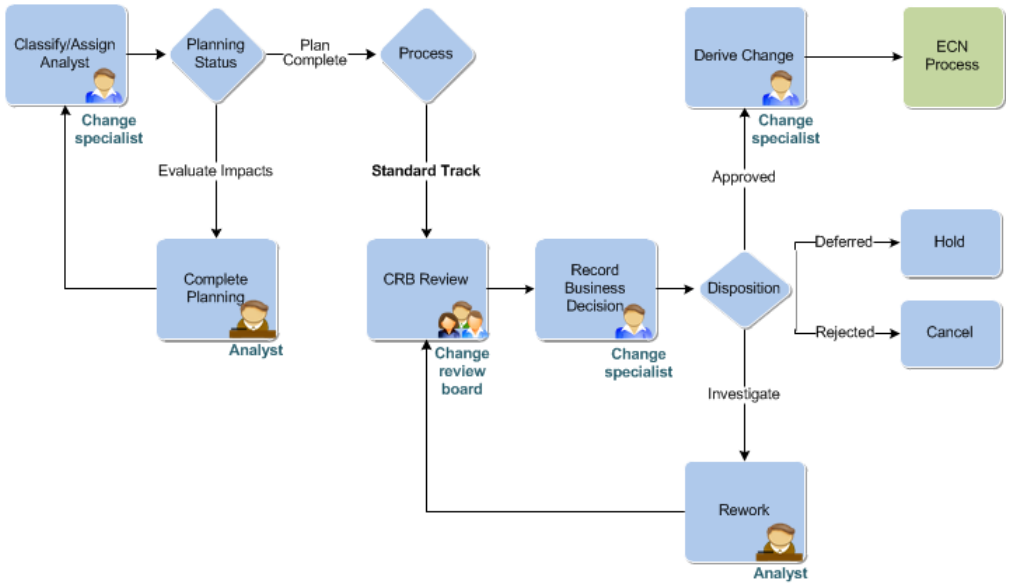
The following example shows how the state properties change as the ECR progresses through the steps in the workflow. The change states in your organization may vary.

Step	Closure	Maturity	Disposition	Release state
Start	Open	Elaborating	None	Pending
Classify/Assign Analyst	Open	Elaborating	None	Pending
Complete Planning	Open	Elaborating	None	Pending
Execute Change	Open	Executing	Approved	Pending
Close Change	Open	Executing	Approved	Pending
End	One of these: • Closed • Canceled • On hold	One of these: • Complete • Elaborating • Executing	One of these: • Approved • Disapproved • Deferred	Released

The state property settings restrict permissions to add items to the engineering change request's folders. For example, the closure, maturity, and disposition property settings must be **Open**, **Executing**, and **Approved** for an **Analyst** to add an item revision to the change request's **Solution Items** folder.

> Note:
>
> You cannot directly change the state. The workflow changes the state property values.

Example of the state changes in a standard track engineering change request (ECR)



The following example shows how the state properties change as the ECR progresses through the workflow steps. The change states in your organization may vary.

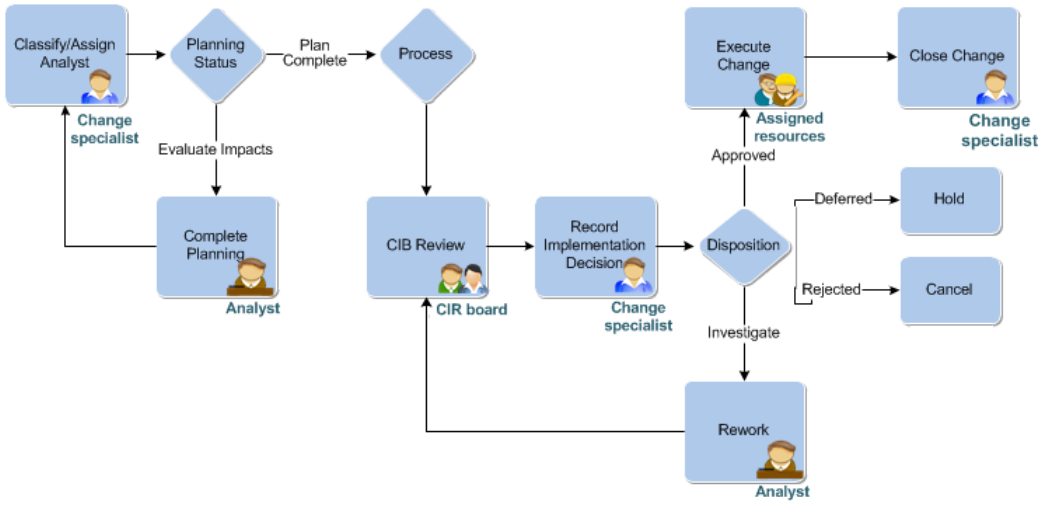
Step	Closure	Maturity	Disposition	Release state
Start	Open	Elaborating	None	Pending
Classify/Assign Analyst	Open	Elaborating	None	Pending
Complete Planning	Open	Elaborating	None	Pending
CRB review	Open	Reviewing	None	Pending
Record Business Decision	Open	Reviewing	One of these: • Approved	Pending

Step	Closure	Maturity	Disposition	Release state
			• Disapproved • Deferred • Investigate	
Rework	Open	Elaborating	Investigate	Pending
End	One of these: • Open • Canceled • On hold	One of these: • Reviewing • Elaborating • Executing	One of these: • Approved • Disapproved • Deferred	Pending

The state property settings restrict permissions to add items to the engineering change request's folders. For example, the closure, maturity, and disposition property settings must be **Open**, **Elaborating**, and **None** for a **Requestor** to add a problem report to a change request. The PR state settings have restrictions as well (**Open**, **Reviewing**, **Approved**).

> Note:
>
> You cannot directly change the state. The workflow changes the state property values.

Example of the state changes in an engineering change notice



The following is an example of how state properties change as the engineering change notice progresses through the steps in the workflow. The change states in your organization may vary.

Step	Closure	Maturity	Disposition	Release state
Start	Open	Elaborating	None	Pending
Classify/Assign Analyst	Open	Elaborating	None	Pending
Complete Planning	Open	Elaborating	None	Pending
CIB Review	Open	Reviewing	None	Pending
Record Implementation Decision	Open	Reviewing	One of these: • Approved • Disapproved • Deferred • Investigate	Pending
Set Effectivity	Open	Reviewing	Approved	Pending
Rework	Open	Elaborating	Investigate	Pending
Execute Change	Open	Executing	Approved	Pending
Close Change	Open	Executing	Approved	Pending
End	One of these: • Closed • Canceled • On hold	One of these: • Complete • Elaborating • Reviewing • Executing	One of these: • Approved • Disapproved • Deferred	Released

The state property settings restrict permissions to add items to the engineering change notice's folders.

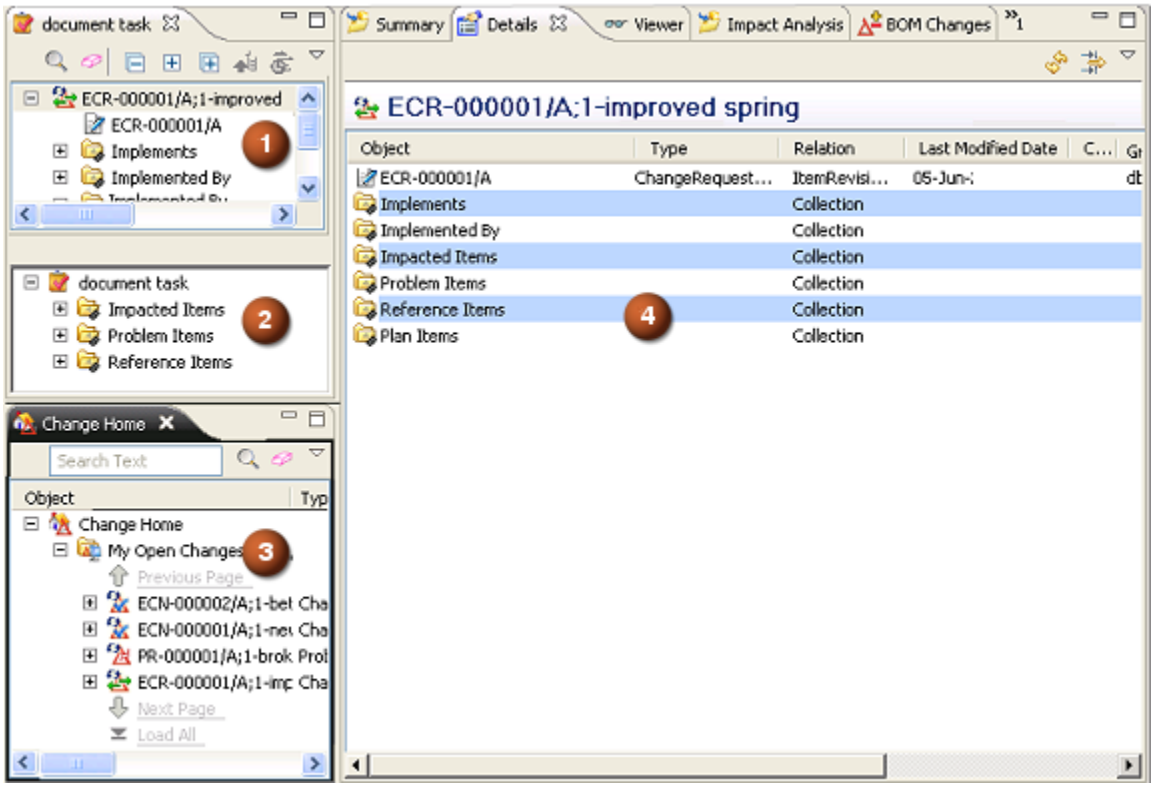
For example, the closure, maturity, and disposition property settings must be **Open**, **Elaborating**, and **None** for a **Requestor** to add a change request (ECR) to a change notice (ECN). The ECR state settings have restrictions as well (**Open**, **Reviewing**, **Approved**).

To relate a revision to an ECN, the closure, maturity, and disposition property settings must be **Open**, **Reviewing**, and **Approved** as well as the release state must be something other than null or **Released** (for example, **Pending**).

Note:

You cannot directly change the state. The workflow changes the state property values.

8. Change Manager interface



1	**Open Change** view	Displays change folders and any attached forms or other objects.
2	**Open Task** view	Displays change folders associated with a Schedule Manager task used for **work breakdown planning**.
3	**Change Home** view	Contains saved searches for change objects defined by system administrators and users. The default search is **My Open Changes**.
4	**Change Manager** perspective	Contains **views** to display change properties, related items, BOM changes, change effectivity, and work breakdown tasks.

Change Manager tabs

Tab	Description
Summary	Displays the property information of the selected object.

Tab	Description
	It also lets you **add or remove items** belonging to a change object and **display workflow tasks** associated with the change object.
Details	Displays the children of the selected component in the **Change** tree.
Viewer	Displays the registered viewer for the selected component in the **Change** tree. When a change revision is selected, the **Viewer** tab displays a user-defined list of change properties and also displays change forms in a tabular format.
Impact Analysis	Provides graphical where-used and where-referenced search capabilities.
BOM Changes	Displays changes to the structure of the selected object, based on the displayed change.
Change Effectivity	Displays the end item **effectivity information** for the selected impacted/solution items in an engineering change notice. End item effectivity information is created, modified, and displayed in this view. Clicking the **Create** button opens the **Create Effectivity** dialog box. Use this dialog box to search for end items and to set unit and date effectivities.
Work Breakdown, Schedule Manager	Displays the structure of the **schedule and task breakdown** in Schedule Manager and allows you to modify it or create a new one. Schedule Manager must be installed to see this view.
Change Details	Lets you **add or remove items associated with a schedule task** and **display workflow tasks and assignments associated with the schedule**.
Workflow Viewer	Lets you **view the tasks in a workflow** associated with a change object or schedule using the Workflow Viewer. It provides a task view representation of the workflow to which the selected change object or schedule task is submitted.

Change Manager menus

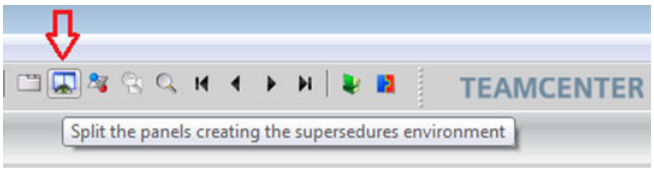
All Change Manager menus are standard Teamcenter rich client menus with the following additions.

Menu command	Description
File→New→Change	Displays the **New Change** dialog box and allows the **creation of a change object**.
Tools→Assign Participants	Assigns **users, group members, or role members called participants** to perform certain tasks during the change process.

Change Manager buttons

Button	Description
Manage saved searches	Displays the **Manage Saved Searches** dialog box and allows the creation, modification, or deletion of searches to find change objects. This button is found in the **Change Home** view.
Add Form	Displays the **BOM line item form** dialog box and allows you to associate a form with a structure change. You can use the boxes in the form to document the purpose of the change or other change information. This button is found in the Change Manager **BOM Change** view.
Delete Form	Removes the selected BOM change form for the solution item. This button is found in the Change Manager **BOM Change** view.
Rollup	Displays the **Roll Up** view with a static display of all business and change items contained in the change folders of the selected change object and any of the associated tasks in the work breakdowns. The set of relation folders displayed is the same as in the **Open Change** view. This is a virtual rollup of objects to provide consolidated visibility of the related items anywhere in the work breakdown of the change. Once the change is complete, you can make the rolled-up objects permanent by sending them to the top-level change object. This button is found in the **Open Change** view.
Open in Structure Manager with Supersedure Window	Displays the **Supersedure** view in Structure Manager with the selected item revision from the **Solution Items** folder. This button is found in the **Open Change** view.

> Caution:
>
> When you open a change object in the supersedure window for the first time, click the split panels icon:

Button	Description
	 You must select **Yes** from the confirmation dialog. If you select **No**, clicking the split panels icon when opening subsequent changes results in no action; the confirmation window does not appear nor does the supersedure window open. To reset this behavior after clicking **No**, you must close all Structure Manager windows. To disable the confirmation dialog and open supersedure windows automatically in the future, set the **CM_disp_bom_edits_dialog** preference to **Yes.**
Open Schedule	Displays the **Schedule Manager** view. This button is found in the **Open Change** view.
View Task folders	Displays the **Open Task** view. This button is found in the **Schedule Manager** view.

9. Change management business process descriptions and roles

Overview of the change management business process

Teamcenter provides you with the ability to identify, approve, sequence, and validate product enhancements throughout a product's entire lifecycle. The following shows the basic business process divided into four phases for managing changes. You can configure the business process for your company's needs. A more complete figure is shown after the table, which includes the many participants involved in identifying, managing, and resolving a change incident, including requestors, analysts, and the different review boards. The industry-independent best practices of CMII are the foundation of the change management business process.

Click a phase in the table to learn more about it.

> Note:
>
> We use general terms and not Teamcenter terms to help you understand the process without first having to understand Teamcenter.

Change driver

Documented event or idea that can result in a product change or a new product. It can be resolved with both short- and long-term solutions.

An incident report documents the change driver. It includes the information necessary to confirm and reproduce any problems observed or to document the specifics of a request for an enhancement. Additional attributes document the perceived severity of the problem and set the priority for addressing the problem relative to other incident reports.

You can use the Teamcenter products Corrective Action Preventive Action (CAPA), Change Manager, or Issue Manager to initiate an incident report.

> Note:
>
> In Change Manager, an incident report is called a problem report.

Change solution

Documented and authorized solution addressing the change driver.

A change solution collector stores the change solution, including the change analyses and captures business decisions associated with the change solution.

> Note:
>
> In Change Manager, a change solution collector is called an engineering change request (ECR).

Change implementation

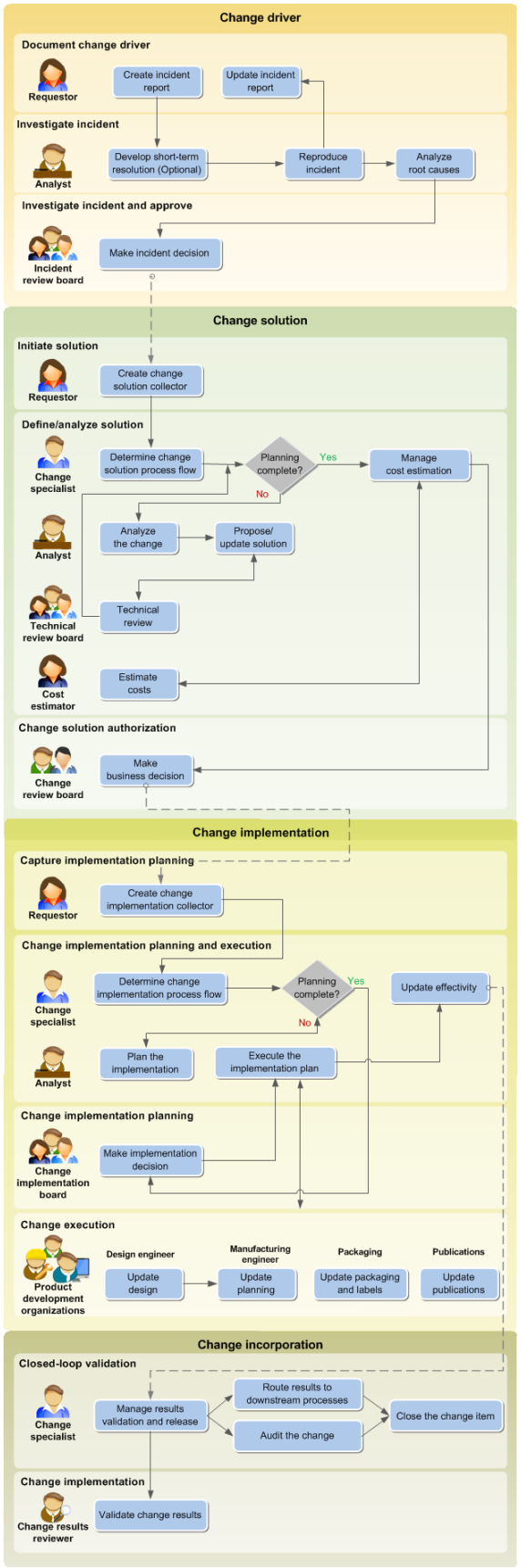
Documented and executed plan realizing the authorized change solution.

A change implementation collector stores the results of the change. It provides a detailed work plan to resolve one or more change solutions.

> Note:
>
> In Change Manager, a change implementation collector is called an engineering change notice (ECN).

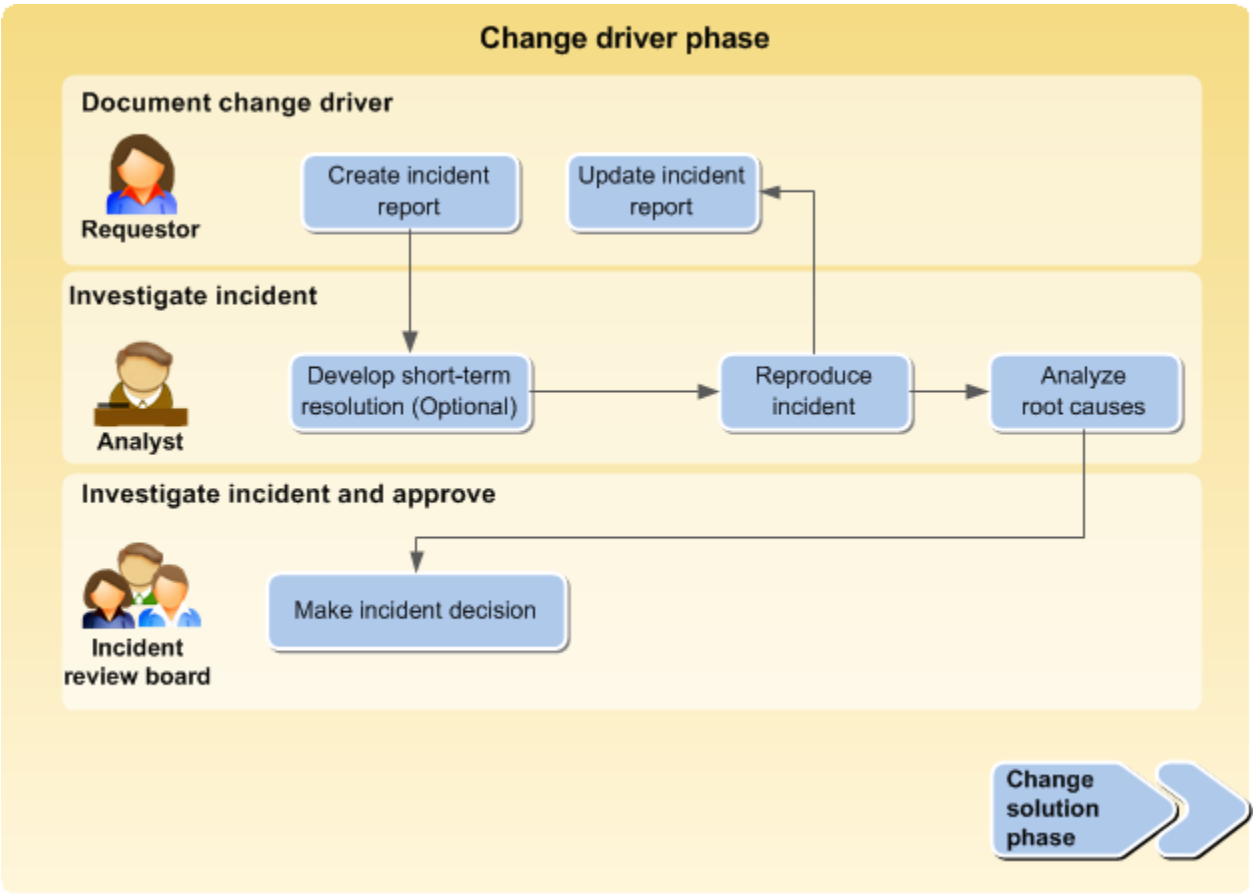
Change incorporation

Application of the updated product definition during product build, manufacturing, and construction to produce the updated product.



Change driver business phase

The change driver business process is a documented event or idea that can result in a product change or a new product. It can be resolved with both short- and long-term solutions.

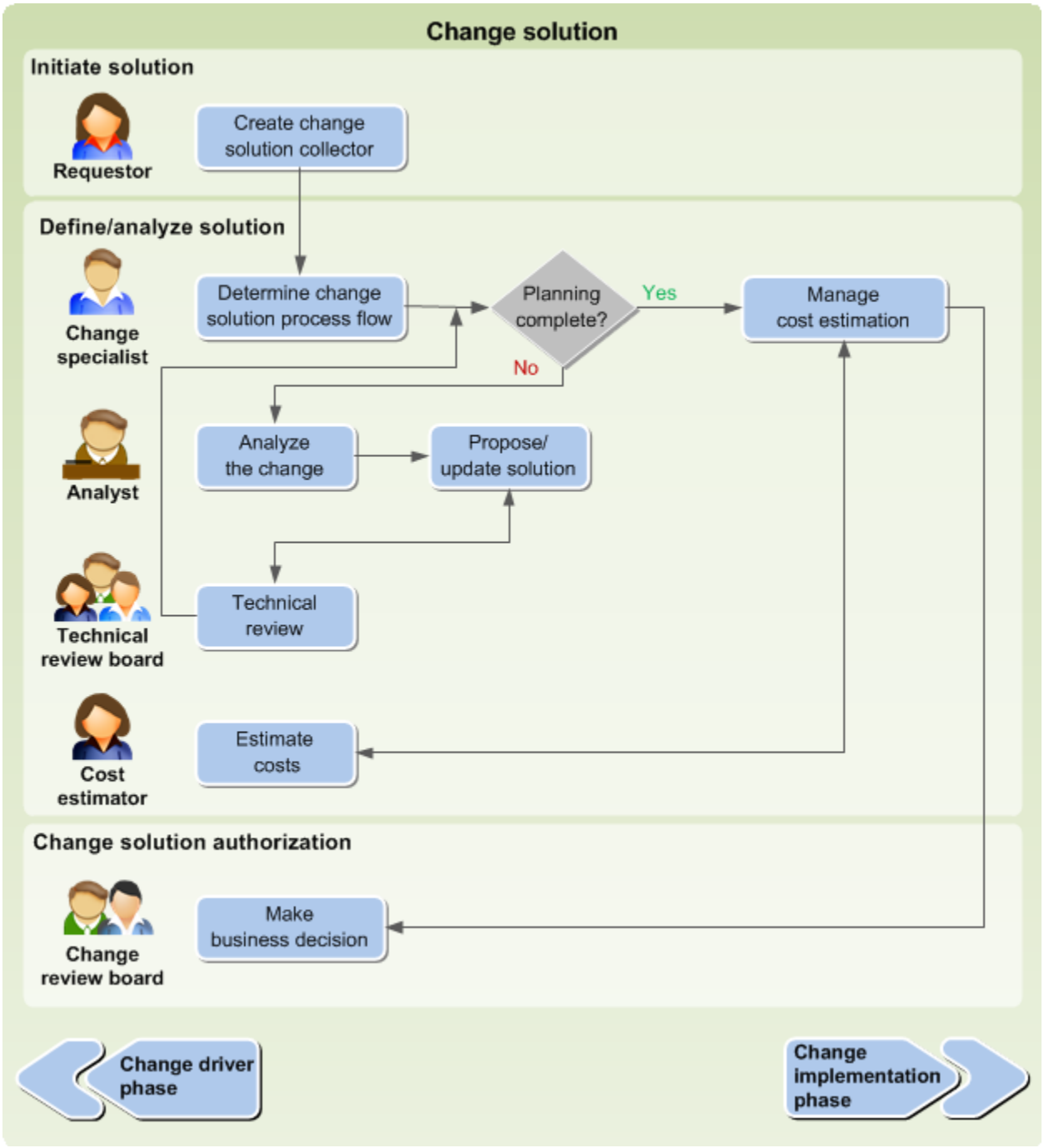


Role	Process overview	Teamcenter tasks
Document change driver		
Requestor	Creates and updates the incident report (called a problem report in Teamcenter) that collects all the information about the incident, including root causes, references, and verification records.	• Create a problem report • Update the problem report
Investigate incident		
	Develops a short-term solution and reproduces the incident. • Determines the best way to resolve the incident as quickly as possible until a long-term resolution can	• Update a change

Role	Process overview	Teamcenter tasks
Analyst	be applied. It is an optional step to quickly address non-conformances. • Reproduces the incident by recreating the conditions when the incident occurred and by repeating the steps leading up to the incident, including adding the problem and impacted items to the change object folders as helpful. • Determines the specific root-causes of an incident to be resolved with corrective actions.	• Managing items related to a change object
Investigate incident and approve		
 **Incident review board**	Evaluates the incident report and, if appropriate, approves it. The incident moves to the Change solution phase. • Evaluates the incident description, including its root causes, reproducibility, severity, ramifications, and short-term resolution, if any. • Decides if the incident requires a long-term resolution. • Returns the incident report for rework or to get answers to questions to be sure of a good decision.	Review a change

Change solution business process

The change solution business process is the documented and authorized solution addressing the change driver.



Role	Process overview	Teamcenter tasks
Initiate solution		
	Initiate solution Creates and updates the change solution collector (called an engineering change request	• Create an engineering change request

Role	Process overview	Teamcenter tasks
Requestor	in Teamcenter) to collect all information about the change solution.	• Relate change objects to other change objects
Define/analyze solution		

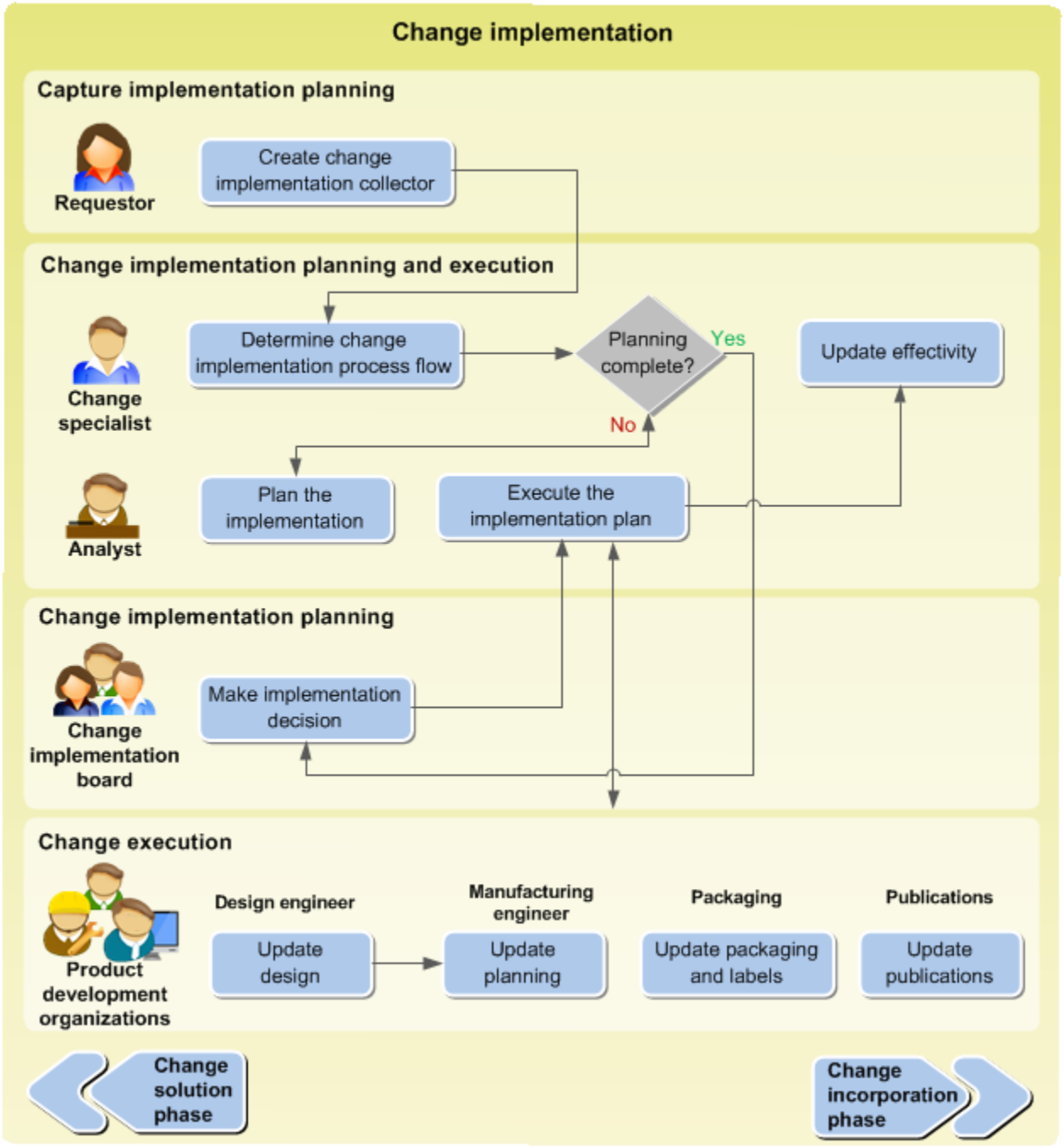

Change specialist
	• Determines if the change solution planning is complete.
	  • Reviews the change solution, the root-cause items, and the impacted items to be sure the solution definition is complete for a business decision to be made.
	  • If enough planning has been completed, manages the cost estimation, and when that is complete, sends the change to the change review board.
	• Determines the process flow for the change solution (standard or informal).
	• Manages the cost estimation.
	  • Assigns the cost estimators, ensures timely completion of the estimates, and evaluates the completeness of the estimate.
	  • Associates the cost estimates with the change solution.
		• About classifying a change
		• Update a change
		• Initiate a workflow process
		• Managing the participants of a change

 **Analyst**	Analyzes the change, and proposes and updates one or more solutions that satisfy the change drivers.	• Update the engineering change request • Relate change objects to other change objects • Managing items related to a change object • Searching for change objects

Role	Process overview	Teamcenter tasks
 **Technical review board**	Reviews the solution from a technical viewpoint. • Evaluates the technical merits of the proposed change solutions, including rough estimate of costs. • Evaluates competing changes. • Selects the recommended solution. • Returns the change solution for rework or to get answers to questions needed to ensure a good decision.	**Review a change**
 **Cost estimator**	Develops an estimate of all the recurring and nonrecurring costs associated with the proposed solution.	**Update the engineering change request**
 **Change review board**	Makes the business decision about the solution by evaluating the cost benefits, the overall budget, and the priority. May return the change solution for rework or to get answers to questions needed to ensure a good decision.	• **Review a change** • **Update the engineering change request**

Change implementation business process

The change implementation business process is a documented and authorized solution addressing the change driver.



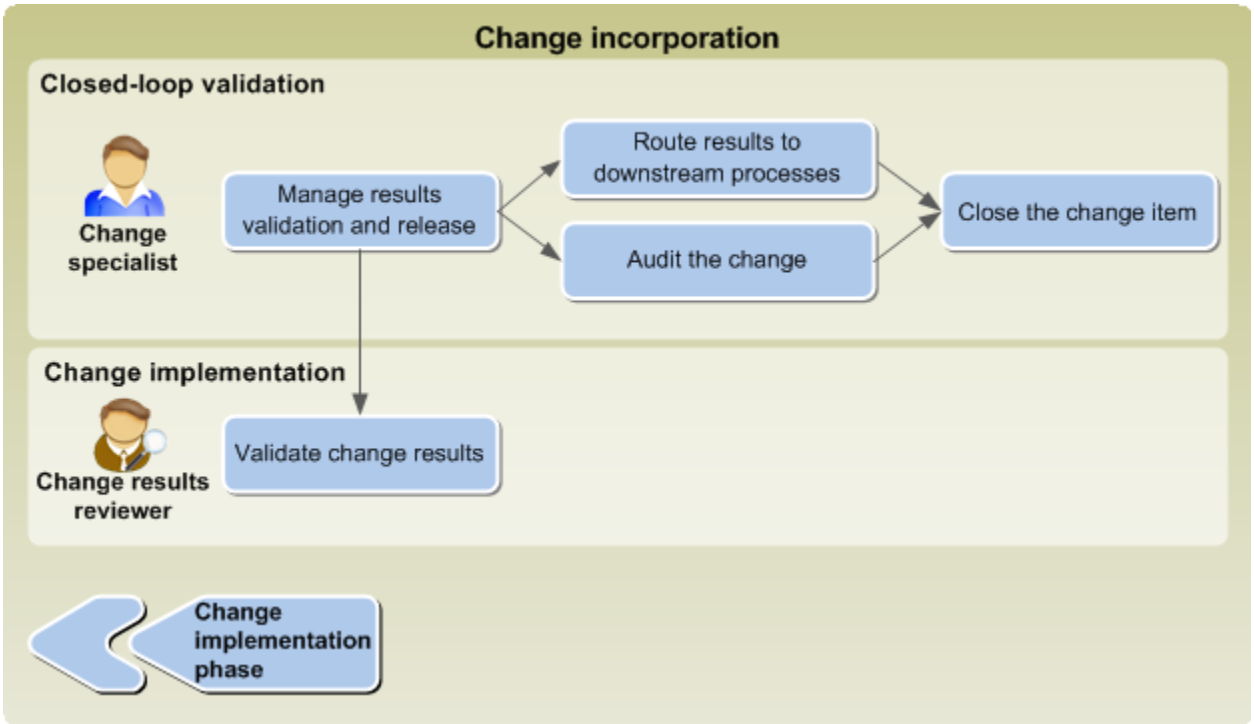
Role	Process overview	Teamcenter tasks
Change implementation planning		
 **Requestor**	Creates change implementation collector (called an engineering change notice in Teamcenter) to collect all information about the change implementation.	• **Create an engineering change notice** • **Relate change objects to other change objects**

Role	Process overview	Teamcenter tasks
Change implementation planning and execution		
 **Change specialist**	• Determines if the change implementation planning is complete. • Determines the process flow for the change solution (standard or informal). • Updates the change effectivity on the change implementation collector. • Reviews the change implementation, the root-cause items, the impacted items, and the implementation plan to make sure the implementation plan is complete enough for the implementation decision. • Records the change effectivity as determined during the implementation decision.	• About classifying a change • Update a change • Initiate a workflow process
 **Analyst**	• Defines the tasks required to implement the change solution. • Confirms and addresses future-effective competing changes. • Includes the tasks to incorporate cancelled future-effective competing changes. Identifies any scope changes, and stop the planning accordingly. • Performs or manages the completion tasks in the approved implementation plan.	• Update a change • Scheduling implementation activities • Managing items related to a change • Create a BOM change • View the status of a workflow in Change Manager • Display work assignments and their status • Managing the participants of a change • Replacing part instances using Mass Update

Role	Process overview	Teamcenter tasks
		• Managing unincorporated changes
Change implementation planning		
 **Change implementation board**	• Evaluates the proposed change implementation plan. • Determines the change effectivity. • Decides if the plan is sufficient to implement the solution to achieve the effectivity. • Returns the change Implementation for rework or to get answers to questions needed to be sure of a good decision.	• Review a change • Update the engineering change notice
Change implementation execution		
 **Product development organizations**	The product development disciplines and organizations make necessary changes, including updating planning, design, packaging and labels, and publications.	Managing the participants of a change

Change incorporation phase

The change incorporation business process applies the updated product definition during product build, manufacturing, and construction to produce the updated product.



Role	Process overview	Teamcenter tasks
Closed-loop execution		
Change specialist	Manages the results validation and release, such as routing results to downstream processes, auditing the change, and more. Also, closes the change. • Assigns the change results reviewers, ensure timely completion of the reviews, evaluate the completeness of reviews, and release approved change results. • Collects change records and resulting items into a package and send the package to recipients. • Reviews every aspect of the change (all change items), the root-cause items, the impacted items, the resulting items, and the implementation plan to ensure all tasks are complete and all requirements have been met. • Marks the change item as closed. Lock the change item and relationships against updates.	• Managing the participants of a change • View the status of a workflow in Change Manager • View workflow assignments and their status • About setting change states

Role	Process overview	Teamcenter tasks
Change implementation		
 **Change results reviewer**	Reviews the resulting items for conformance to the change as-planned. Documents all non-conformances.	• View the status of a workflow in Change Manager • View workflow assignments and their status • Review a change

10. Identifying changes

Ways to identify changes

Any user can create a problem report (PR) identifying a problem. Your administrator can use groups and roles along with conditions in the Business Modeler IDE to configure which change objects users can create. Check with your administrator to see how your change management solution is configured.

You need a license level that enables authoring to create anything besides a PR. If you do not have a higher level license, you are limited to creating PRs only.

You can create a change object three different ways:

- Independent of other existing objects
- In the context of any revisable object (impacted or problem item, 4GD design element, and so on)
- In the context of an impacted or problem item revision
- Derived from another change object; only ECRs, deviation requests, and ECNs can be created this way

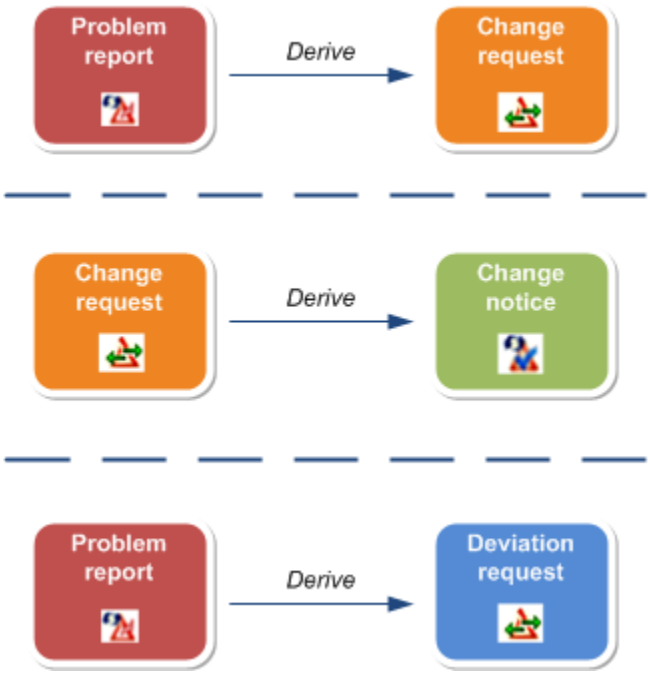
  If you derive a change object from another, you can copy the relations (such as reference items and problem items) and the object's synopsis (name) and description. You can change the synopsis and description.

About deriving a change

You can derive a change object from another to manage the next phase of the change process.

To derive a change, you must have the correct permissions and the change must be in the **change state** state.

- Derive an engineering change request (ECR) from a problem report (PR) to determine a solution for the problem.
- Derive an engineering change notice (ECN) from an ECR to implement the solution to the problem.
- Derive a deviation request from a PR to allow a deviation.



In addition, if your company has custom changes, you can derive one custom change from another. You can also derive a single solution (engineering change request) that addresses multiple problem reports.

Note:

Depending on **how Teamcenter is set up**, the reference, problem, or impacted objects associated with the source change (its relationships) may be **automatically added to the derived change**. See your system administrator for more information.

In the **Create Stylesheet** for the given type being derived, the **CREATERENDERING** property for the custom change notice must point to **ChangeNoticeCreate** and **Propagate Relations** must be checked.

If you are using a custom create stylesheet for the custom Change Notice, which is already configured as the **CREATERENDERING** for your type, add the following line:

```
<customPanel
java="com.teamcenter.rac.cm.wizards.ui.PropsPageRelationshipPanel"
js="displayCMCustomePanel"/>
```

Derive a change from another

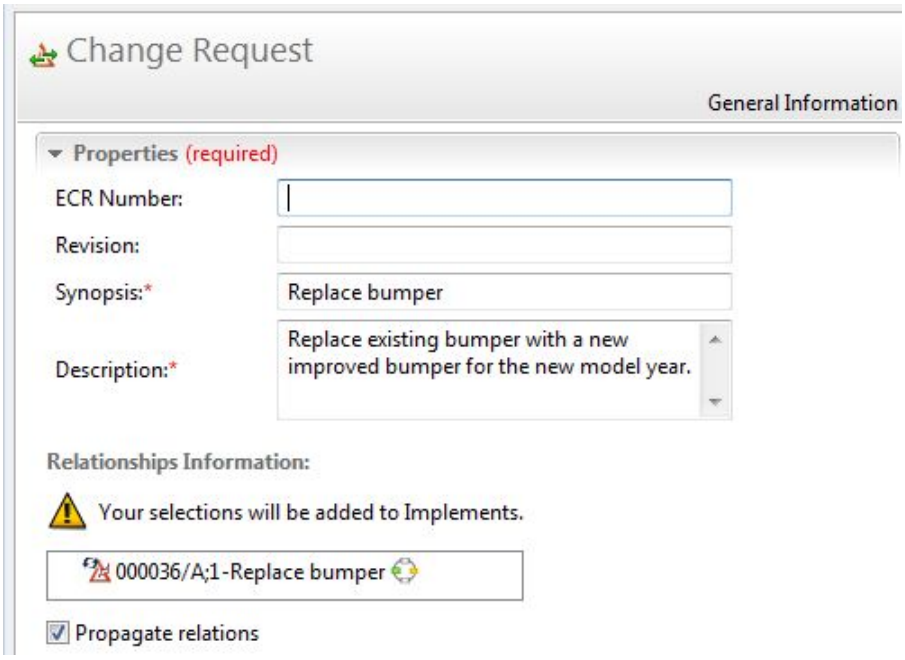
1. Select one or more problem report or engineering change request revisions, right-click, and choose **Derive Change**.

   The revisions must have their properties set to:

Property	Must be
Maturity	**Reviewing**
Disposition	**Approved**
Closure	**Open**

2. In the create dialog box, select the type of change you want to create (engineering change request, engineering change notice, or deviation request), and click **Next**.

   The create dialog box appears with the information about the derived change already filled in. You can edit these boxes.



3. (Optional) Type an ID and revision.

   If you do not provide an ID and revision number, Teamcenter provides them automatically.

4. If you want to copy the relationships (such as reference items and problem items) from the source change object to the derived change, select **Propagate relations**.

   Your system administrator **configures** how reference, problem, or impacted objects associated with the source change object (its relationships) may be automatically added to the derived change. See your system administrator for more information.

5. (Optional) Click **Open on Create** to open the change in Change Manager after it is created.

6. Click **Finish**.

Define deep copy rules for copying options from an ECR to an ECN

Use Teamcenter Business Modeler IDE deep copy rules to configure the copying options when a user derives an ECN from an ECR. Deep copy rules define whether objects belonging to a business object instance can be copied when a user performs a **Derive** operation on that instance. Deep copy rules configure the copy option, providing the ability to select individual objects from the **Affected Items** and **Reference Items** in an ECR.

Using deep copy rules, you can configure whether the following are copied into the ECN:

- **Impacted Items**
- **Problem Items**
- **Reference Items**

You can create rules for the default relation types **CMHasImpactedItem**, **CMHasProblemItem**, **CMReferences**.

Refer to the *BMIDE for Data Model Design* in the Teamcenter collection for more information.

> Note:
>
> Validate that the setting **copyFromOrignal** is set to true on persistent properties to copy them during the derive process. If **copyFromOrignal** is set to false on persistent properties, the properties are not copied during derive.

Create Deep Copy Rules in BMIDE

1. Create a custom template based on the **Change Manager** template.
2. Open the **Change Item Revision Business Object**.

   You can create a **Derive** deep copy rule for **GnChangeRequestRevision** and **GnProblemReportRevision**.

   - Select the **Show Inherited Rules** check box to display all rules inherited from parent business objects.
   - Select the **Organize by Inheritance** check box to sort the rules by parent business object names.
   - Use the **Add**, **Edit**, or **Remove** buttons to work with the deep copy rules.
3. Select the **Deep Copy Rules** tab and click the **Add** button to add a row for each rule.
4. Choose the business object that the deep copy rule is applied to.

Specify the parameters for each rule.

Parameter	Description	
Target Primary?	Mark or clear the check box as appropriate.	
		When the checkbox is marked, **Target Business Object** is the primary object of the relationship specified in the **Relation Type** box. When the business object instance is revised or saved, the secondary objects are carried forward and related using the relation in the **Relation Type** box.
		When the checkbox is cleared, **Target Business Object** is the secondary object of the relationship specified in the **Relation Type** box. When the business object instance is revised or saved, the primary objects are carried forward and related using the relation in the **Relation Type** box.
Operation Type	Select **Derive**.	
Type	**Relation** creates the deep copy relationship	
Relation / Reference Property	Select **CMHasImpactedItem**, **CMHasProblemItem**, or **CMReferences**. You will supply a rule for each relation.	
Attached Business Object	For **CMHasImpactedItem** and **CMHasProblemItem** types select **ItemRevision**. For **CMReferences** select **WorkspaceObject**.	
Condition	Select the condition **isTrue**.	
Action	Choose the kind of copying to be allowed for the business object. The available options differ depending on the type of target business object. Select **CopyAsReference**. This creates a new relation between the new revision and the related object. Therefore, modifications performed on the copied object are propagated to the source object. Note that if the deep copy rule **NoCopy** is set as **isTrue** and **Required**, then this relation does not appear in any panel in Active Workspace.	
Required	Leave blank.	

Parameter	Description
Secured	Select if you want to prevent the deep copy rule from being modified or overridden by another template.
Copy Properties on Relation	Select if you want persistent properties on relation objects carried forward when the primary objects participating in relations are revised or saved as new objects. If not selected, only mandatory properties are carried forward.

5. Click **Finish**.

   The rule is created and appears in the table in the **Deep Copy Rules** editor.

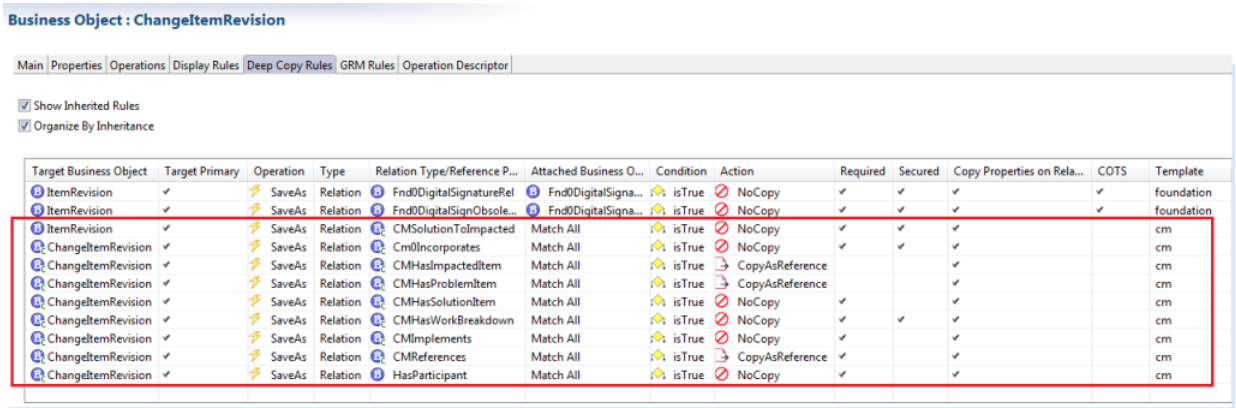
Defining deep copy rules for creating changes from another change

Use the Teamcenter Business Modeler IDE deep copy rules to set what objects and attributes are copied when a user creates a copy of a change from another. Deep copy rules define whether objects belonging to a business object instance can be copied when a user performs a save as or revise operation on that instance. Deep copy rules can be applied to any business object type and are inherited by children business object types.

Using deep copy rules, you can configure whether the following are copied for a change:

- Name, subject, description
- Problem and Impacted Items
- Referenced or related documents

The figure shows the deep copy rules defined by default for a **ChangeItemRevision** in the **Deep Copy Rules** editor. The rules define that when copying a change, copy the problem, impacted, and reference objects, but do not copy the incorporates and solution items.

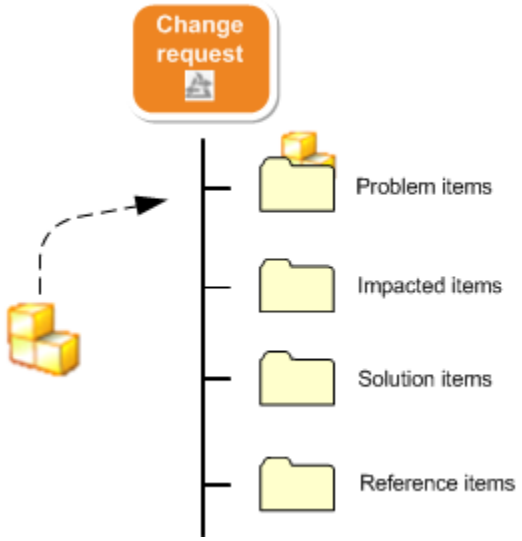


Note:

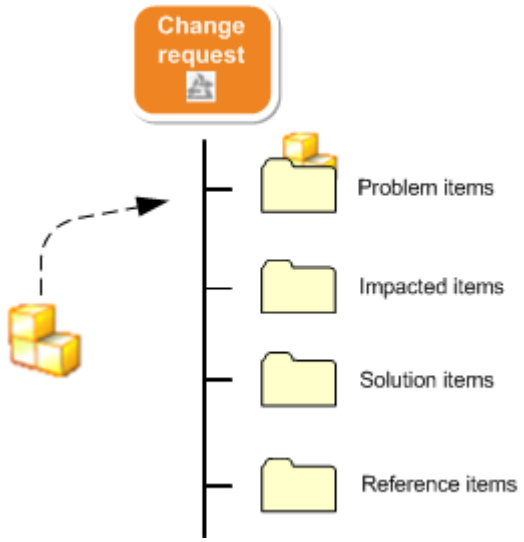
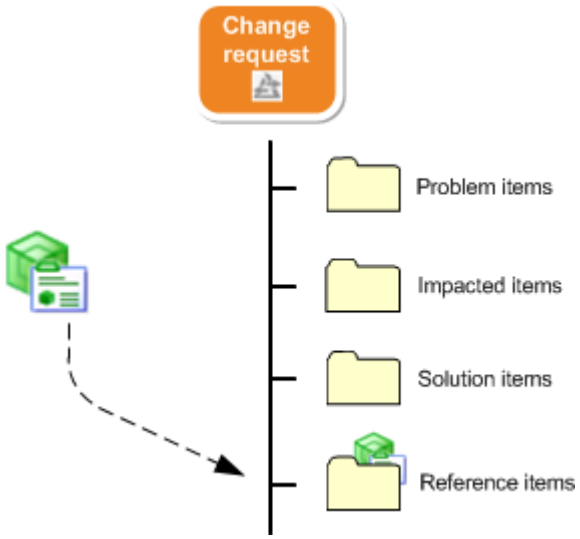
Validate that the setting **copyFromOrignal** is set to true on persistent properties to copy them during a save as or revise operation. If **copyFromOrignal** is set to false on persistent properties, the properties are not copied during save as or revise.

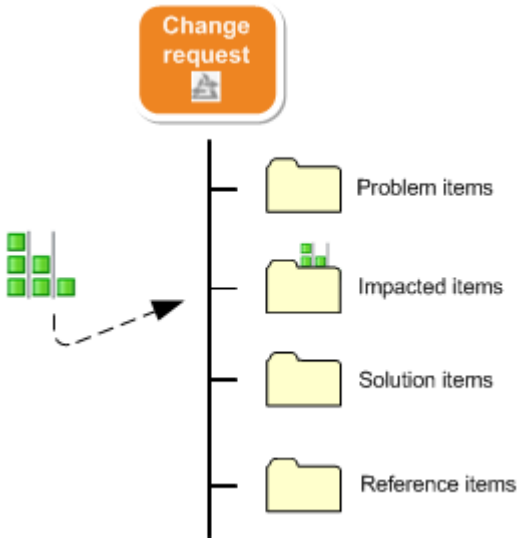
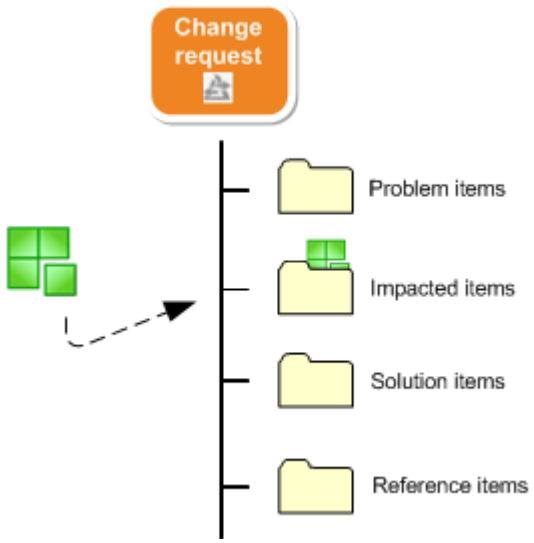
About creating a change in the context of an object

You can create a change in the context of an impacted or problem item revision. The item revision is automatically added to the **Problem Items** folder.



You can create a change in the context of any revisable object (impacted or problem item, 4GD design element, and so on). The object is added to the appropriate folder depending on the type of object, the type of change, and how your Teamcenter is set up. The following table shows the where the different objects are placed by default.

For the object	Placed in the folder (its relation)
Item revision	
Workset	

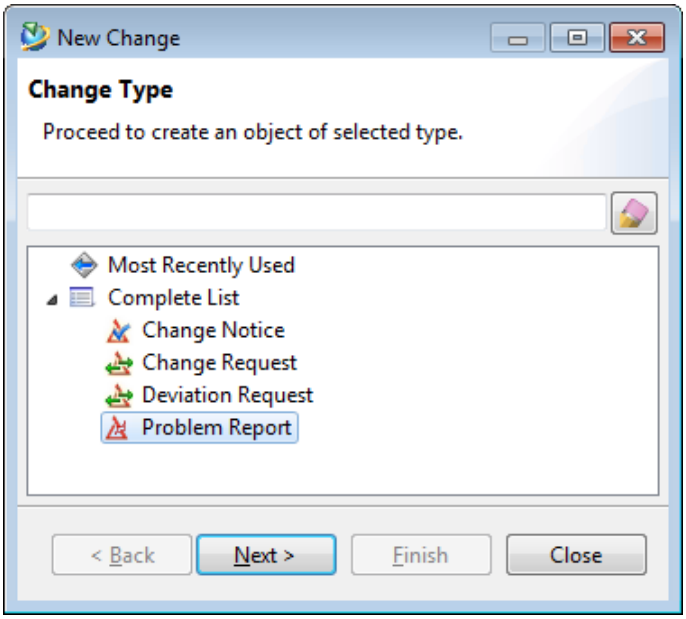
For the object	Placed in the folder (its relation)
Partition	
Design element	

Create a change

Learn about the permissions required to create a change and the different contexts in which to create it.

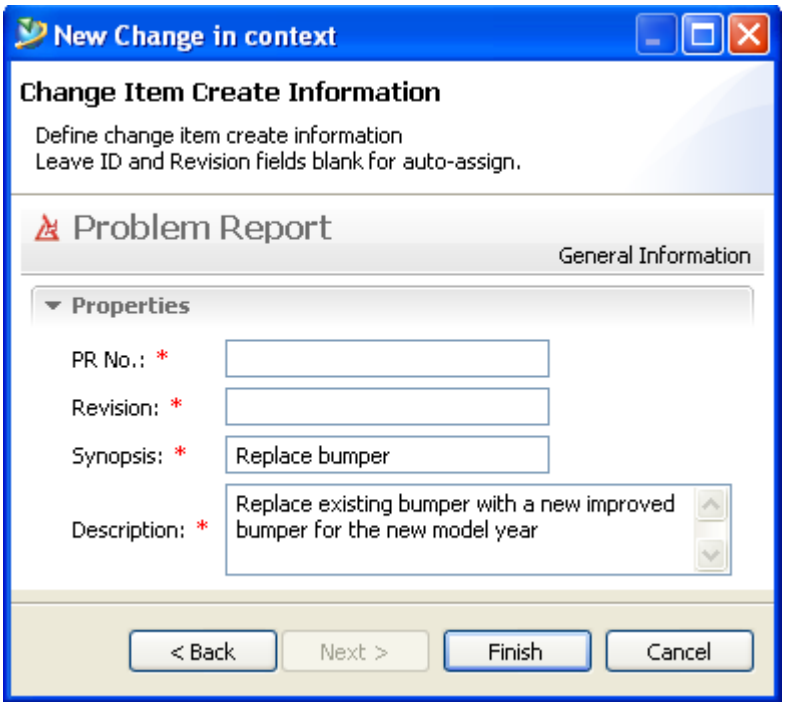
1. Select the folder to contain the change, and choose **File→New→Change**.

2. In the **New Change** dialog box, select the type of change you want to create, and click **Next**.



3. Type a short description of the problem in the **Synopsis** box and a more complete description in the **Description** box, as shown for a problem report.

> Tip:
>
> The synopsis is visible anywhere a list of change objects is found, while the description is only visible when looking at more detailed information about the change, such as in the **Summary** view. Therefore, use the synopsis to help organize your changes and use the description to help others understand and execute the change.



4. (Optional) Type a change ID and revision.

   If you do not provide an ID and revision number, Teamcenter provides them automatically.

5. (Optional) Click **Open on Create** to open the change in Change Manager after it is created.

6. Click **Finish**.

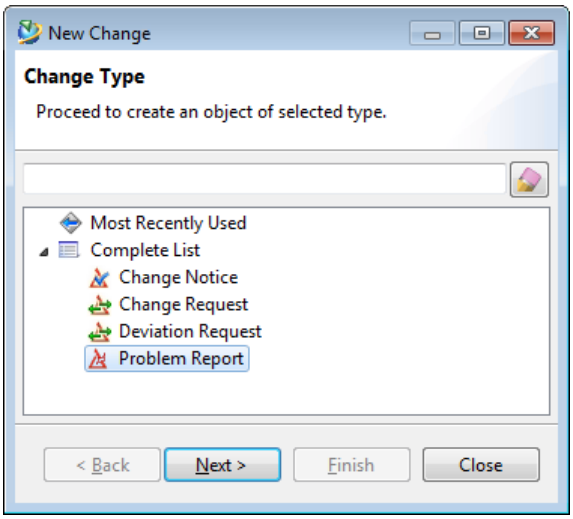
Create a change in the context of a reference object

Learn about the permissions required to create a change and the different contexts in which to create it.

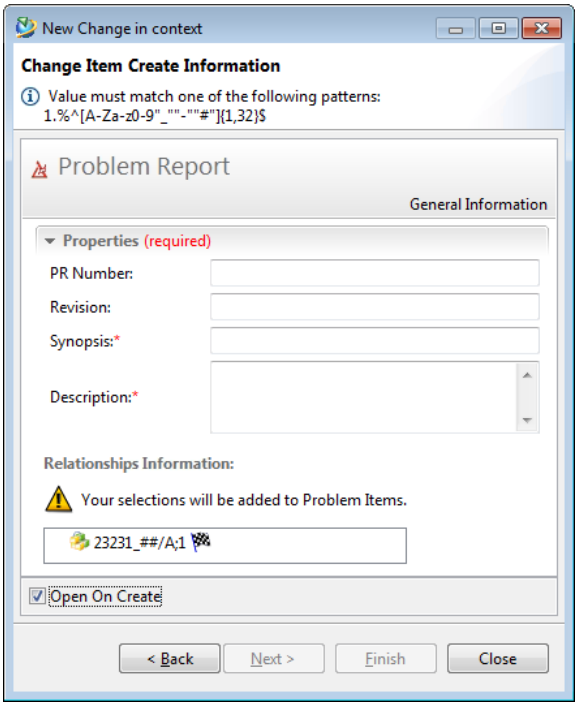
1. Right-click an item revision and choose **New Change in context**.

   Right-click a revisable object, such as an item revision or 4GD design element, and choose **New Change in context**.

2. In the **New Change** dialog box, select the type of change you want to create, and click **Next**.



3. Type a short description of the problem in the **Synopsis** box and a more complete description in the **Description** box, as shown for a problem report.



> Tip:
>
> The synopsis is visible anywhere a list of change objects is found, while the description is only visible when looking at more detailed information about the change, such as in the **Summary** view. Therefore, use the synopsis to help you organize your changes and use the description to help others understand and execute the change.

4. (Optional) Type a ID and revision.

   If you do not provide an ID and revision number, Teamcenter provides them automatically.

5. (Optional) Click **Open on Create** to open the change in Change Manager after it is created.

6. Click **Finish**.

   A thumbnail from the problem item is automatically attached to the change object, if it exists.

> Note:
>
> If you would prefer that the thumbnail be derived dynamically from the items related to change, set the **CM_derive_thumbnail_from_relations** preference to true. **False** is the default option.

The reference object is automatically copied to the appropriate folder.

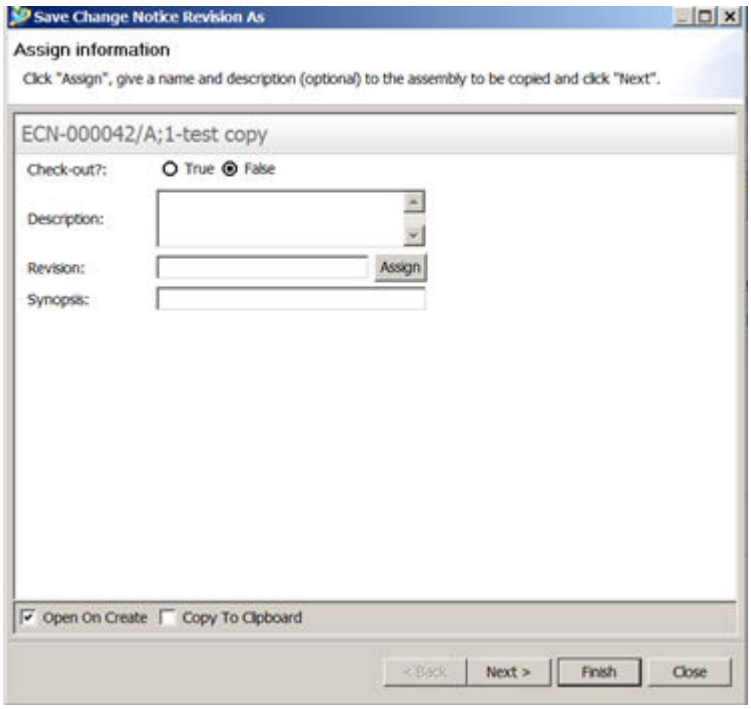
The item revision is automatically copied to the **Problem Items** folder of the change object.

Create a new copy of an ECN using Save As

You can use an existing ECN as the basis for a new ECN by copying it. The new ECN does not carry over solution items from the original revision and has a new, empty change space associated with it.

1. Select the ECN to copy, and select **File→Save As**.

2. In the **Save Change Notice Revision As** dialog box, select **True** or **False** to check out the new ECN.



3. Type a short description in the **Description** box.

4. Enter a revision letter, or click **Assign** to select one automatically.

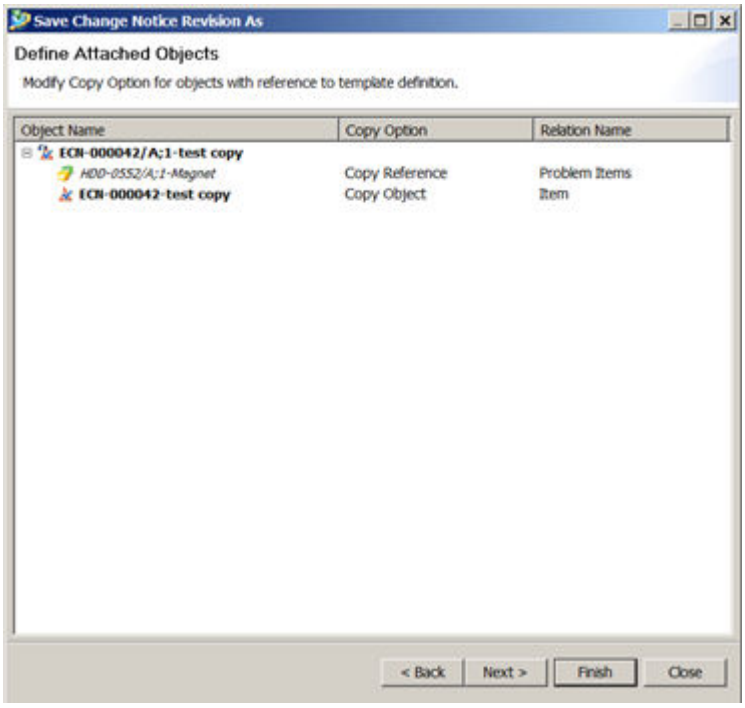
5. (Optional) Click **Open on Create** to open the change in Change Manager.

6. Click **Next**.

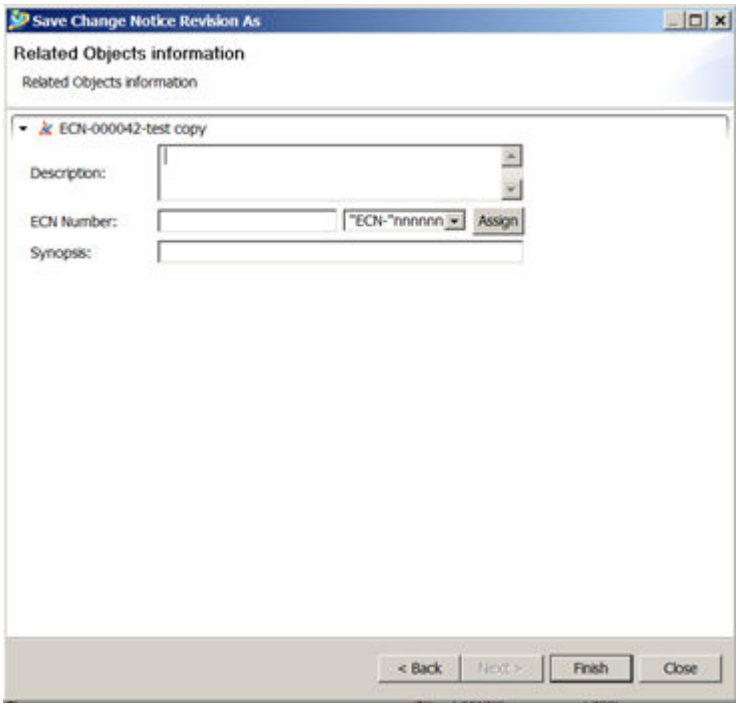
7. Select **Copy Reference**, **Copy Object**, or **No Copy**.

   - **Copy Object** creates a new copy of the attached object.
   - **Copy Reference** points to the original attached object.
   - **No Copy** indicate that neither a reference nor a copy of the attachment is used.

   Select the item, and click **Next**.



8. Type a description for the related objects in the **Description** box.



9. Enter an ECN number, or click **Assign** to generate a number automatically.

10. (Optional) Type a synopsis for the ECN.

11. Click **Finish**.

11. Searching for change objects

Types of searches

There are two kinds of searches that you can use:

- System-defined searches

  Searches created by a Teamcenter administrator shared by all users at a site. They are populated by saved queries and do not require users to provide search criteria. They appear as folders in the **Change Home** view. Teamcenter administrators can create, modify, or delete these searches.

  The **My Open Changes** system-defined search is standard with Teamcenter and appears as a folder in the **Change Home** view.

  To execute the search, expand the folder.

- User-defined searches

  Searches created by individual users for their personal use that are unique to them. They are populated by the searches in the user's **My Saved Searches** list. They appear as folders in the **Change Home** view.

> Note:
>
> A search name cannot contain a forward slash (/).

Create a search in Change Manager

1. In the **Change Home** view, click **Manage saved searches** .

2. In the **Manage Saved Searches** dialog box, click **Add**.

3. The default type is **User-defined**. If you are an administrator, you can select **System-defined** from the list if you want the search available to all users.

4. Leave the **Show** check box selected.

5. Click the **Assigned search** list to select the search that is assigned to the folder.

   The list contains your user-defined saved searches.

   If you add a search that requires the user to provide additional information, an error is displayed when that search folder is opened by a user.

The system-defined searches displayed are searches that query change item revisions and require no user interaction. You can use any of the system-defined searches.

6. The **Search name** defaults to the name of the search you selected in the **Assigned search** list. Optionally, you can change it.

   > Note:
   >
   > A search name cannot contain a forward slash (/).

7. Click **OK**.

Run a search

To run a search, do one of the following:

- If the search folder in the **Change Home** view is closed, open it.
- If the search folder in the **Change Home** view is already open, right-click the search folder and choose **Refresh**.

Display searches in the Change Home view

1. In the **Change Home** view, click **Manage saved searches** .
2. To hide a search, clear the search's **Show** check box in the **Manage Saved Searches** dialog box.
3. To display a hidden search, select the search's **Show** check box.
4. Click **OK**.

Delete a search

1. Right-click the search folder in the **Change Home** view and choose **Delete**.

   You can delete your user-defined searches. You can delete system-defined searches only if you are an administrator.

2. In the **Delete search folder** dialog box, click **OK**.

12. Reviewing changes

About reviewing a change

All the tasks to review and implement changes are typically controlled by workflows that flexibly guide the change through the change process: authoring, review and approval, execution, and closure. When you are requested to review a change, you receive a **Perform Signoff** task in your **Tasks to Perform** folder.

Review a change

1. Select the **perform-signoffs** task in your **Tasks to Perform** folder.

2. Click the **Viewer** tab, and select the **Task View** option.

   The system displays the **Perform Signoff** pane listing process information.

   - **Responsible Party**

     When the **Responsible Party** entry displays as an active link, you can reassign the parent task by clicking the link and selecting a new group, role, and user.

     Reassigning the task transfers ownership of the parent task to the selected user, making that user the **Responsible Party** for the task. It does not, however, transfer your signoff responsibility.

   - **Instructions**

     When the **Instructions** link is displayed, there are instructions for the task. You can view the instructions by clicking the link.

   - **Attachments**

     When there are attachments to the workflow process, you can view them by clicking the **Attachments** link.

     The system displays the **Attachments** dialog box. Target and reference attachments are listed beneath the signoff task in the task tree.

   - **All Comments**

     If the **All Comments** entry is present and is as an active link, comments are written for the task. You can view the comments by clicking the link.

3. (Optional) If you are a privileged user because you are the process owner, the responsible party, or a member of the administration group, you can delegate your signoff responsibility for the **perform-signoffs** subtask to another user.

   Note:

   If you are selected to a signoff team based on your inclusion under a signoff profile, you can only delegate the **perform-signoffs** subtask to another user who can match your signoff profile group and role. Otherwise, you can delegate the **perform-signoffs** subtask to any other user.

   a. Click your linked name in the **User-Group/Role** column.

      The system displays the **Delegate Signoff** dialog box.

   b. Select a new user from the **Group**, **Role**, and **User** lists.

   c. Click **OK**.

      Teamcenter assigns the task to the specified user and the task is placed in their **Tasks to Perform** folder.

4. Sign off the task:

   a. Click the link in the **Decision** column to display the **Signoff Decision** dialog box.

   b. Select an option.

      - If **perform-signoffs** is a subtask of an **Acknowledge** task, select **Acknowledged** or **Not Acknowledged**.
      - If **perform-signoffs** task is a subtask of a **Review** task, select **Approve**, **Reject**, or **No Decision**.

      Note:

      The **Not Acknowledged** and **No Decision** options do not apply to the quorum count. If your decision is necessary to meet quorum requirements, this subtask cannot complete until you select either **Acknowledged** or **Approve**.

   c. (Optional) Type comments in the **Comments** box.

   d. Click **OK**.

      If user authentication is required to complete the task, type your password in the **Password** box, and click **OK**.

> Note:
>
> This authorization is determined by the creator of the process template. If your site employs Security Services, you must use the Security Services password rather than your Teamcenter password.

The task is complete and the **Viewer** tab now displays **No View Data Available**.

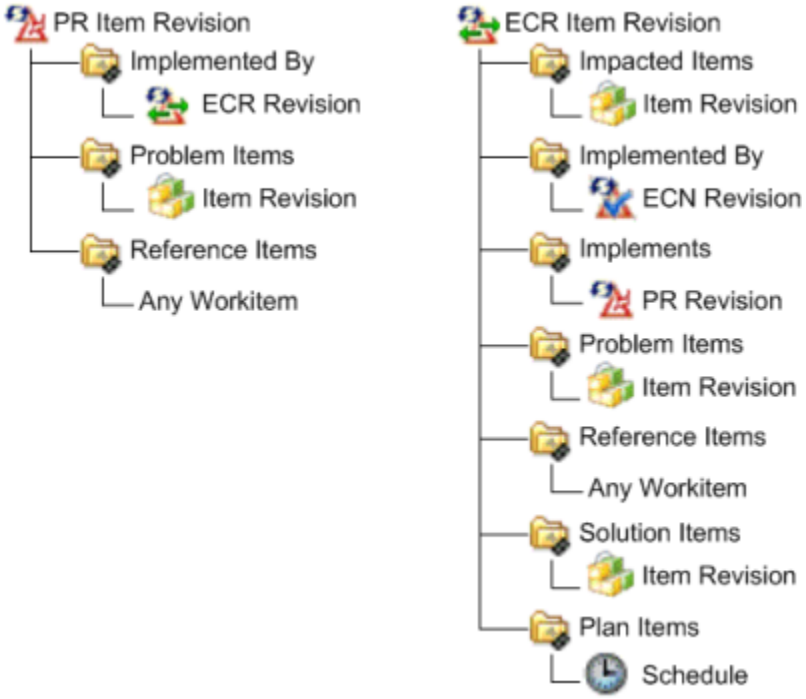
13. Developing and implementing changes

Managing objects related to a change

About relating objects to a change

During the change process, you can relate other business objects (such as items, schedules, assemblies) to change objects or relate the change objects to each other. The relationships are represented graphically as folders, often referred to as pseudo-folders. The folders help you keep track of all business objects related to the change.

For example, as shown in the figure, you could add reference documents to a problem report (PR) to further clarify the problem or specify which item revisions are impacted by an engineering change request (ECR). When you implement a change, the new item revisions created to solve the problem are related as solution items.



You can manually add the objects to the change object to create the appropriate relations or the relations can be automatically created when you create a change object.

- **Manually add the objects to create the relationships**

  You create the appropriate relations by adding objects to the folders of the change object. You do this as you would add objects to any folder in Teamcenter. For example, you add the part that is causing the problem to the PR.

You can also manage relationships using Teamcenter views.

- **Automatically added when you create a change object from another**

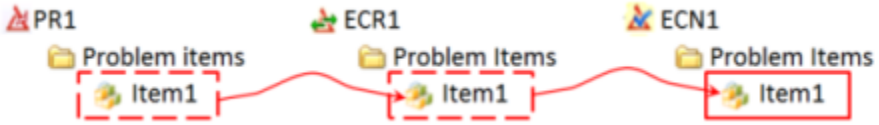
  Some relations, such as problem item relations, can be automatically propagated from a change object to another when you:

  - Create the change object in the context of another

    For example, if you create a change in the context of the problem part, the problem part is automatically added to the **Problem Items** folder.

  - Derive a change from another

    For example, if you derive an ECR from a PR, the problem part associated with the PR is automatically added to the **Problems Items** folder of the ECR. In addition, when you derive the ECN to implement the solution, the problem item moves to the **Problem Items** folder of that ECN as shown in the figure. This makes the object visible from each change object associated with the change.



In addition, the change object from which you derived the change is added to the **Implements** folder, and the object that is implementing it is added to the **Implemented by** folder.

Your administrator can **configure the types of relations to be propagated** when change objects are derived.

Contents of the change folders

The following table lists the change folders, the relationships they define, and the permissions and change states required to add an object to it.

Change folder and its contents	How to add the objects
Problem Items	
Contains item revisions with the problems that the change is to address. This could be the parent assembly.	To create a relationship between an item revision and a change object (PR, ECR, or ECN), add the item revision to the change object's **Problem Items** folder. You must be an assigned participant and the change object property settings must be as follows.

<table>
<tr><th>Change folder and its contents</th><th>How to add the objects</th></tr>
<tr><td></td><td>
<table>
<tr><th>Assigned participant</th><th>Closure/Disposition/Maturity property settings</th></tr>
<tr><td>Requestor</td><td>Open/None/Elaborating</td></tr>
<tr><td>Analyst</td><td>Open/None/Elaborating
or
Open/Investigate/Reviewing</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Impacted Items</td></tr>
<tr><td>Contains item revisions that are being changed as a result of the change process.</td><td>

To create a relationship between an item revision that an engineering change request (ECR) or engineering change notice (ECN) affects and the ECR or ECN.
To add the item revision to the ECR or ECN's Impacted Items folder.

You must be an assigned participant and the ECR or ECN property settings must be as follows.
<table>
<tr><th>Assigned participant</th><th>Closure/Disposition/Maturity property settings</th></tr>
<tr><td>Analyst</td><td>Open/None/Elaborating
or
Open/Investigate/Reviewing</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Solution Items</td></tr>
<tr><td>Contains item revisions that are generated as a result of the change (for example, the new piece parts and the new revision of the parent assembly to contain them).</td><td>
To create a relationship between an item revision and the ECN that implements the change, add the item revision to the ECN's Solution Items folder.
You must be an assigned participant and the ECN property settings must be as follows.
<table>
<tr><th>Assigned participant</th><th>Closure/Disposition/Maturity property settings</th></tr>
<tr><td>Analyst</td><td>Open/Approved/Executing</td></tr>
</table>
Learn more about relating a solution item revision to an impacted item revision.
</td></tr>
</table>

<table>
<tr><th>Change folder and its contents</th><th>How to add the objects</th></tr>
<tr><td colspan="2">Reference Items</td></tr>
<tr><td>Contains any Teamcenter object, including datasets, that reference related information (such as analysis documents and system logs).</td><td>To associate related information (such as analysis documents and system logs) with a PR, ECR, or ECN, add any Teamcenter object, including datasets, to the Reference Items folder.

You must be an assigned participant and the property settings for the PR, ECR, or ECN must be as follows.

<table><tr><th>Assigned participant</th><th>Closure/Disposition/Maturity property settings</th></tr><tr><td>Requestor</td><td>Open/None/Elaborating</td></tr><tr><td>Analyst</td><td>Open/None/Elaborating
or
Open/Investigate/Reviewing</td></tr></table></td></tr>
<tr><td colspan="2">Plan Items</td></tr>
<tr><td>Contains schedules that define tasks in a work breakdown structure.</td><td>To associate related work breakdowns (schedules) with an ECR or ECN, add any schedules to the Plan Items folder.

You must be an assigned participant and the property settings for the ECR or ECN must be as follows.

<table><tr><th>Assigned participant</th><th>Closure/Disposition/ Maturity property settings</th></tr><tr><td>Analyst</td><td>Open/None/Elaborating
or
Open/Investigate/ Reviewing</td></tr></table></td></tr>
<tr><td colspan="2">Implements</td></tr>
<tr><td>Contains change object revisions that reference this change object. An ECR implements PRs. An ECN implements ECRs.</td><td>Note:

A PR does not have a Implements folder because it does not implement a problem, only identifies one.

Usually, the Implements folder is automatically populated as part of the change process, but you can add to it if you are an assigned participant and the property settings are set as follows:</td></tr>
</table>

<table>
<tr><th>Change folder and its contents</th><th>How to add the objects</th></tr>
<tr><td></td><td>
<table>
<tr><th>Assigned participant</th><th>Closure/Disposition/Maturity property settings</th></tr>
<tr><td>Analyst</td><td>Open/Approved/Reviewing</td></tr>
</table>
Learn more about viewing the relationships between change objects.
</td></tr>
<tr><td colspan="2">Implemented By</td></tr>
<tr><td>Contains change object revisions that are referenced by this change object. A PR is implemented by ECRs. An ECR is implemented by ECNs.</td><td>
Usually, the Implemented By folder is automatically populated as part of the change process, but you can add to it if you are an assigned participant and the property settings are set as follows:
<table>
<tr><th>Assigned participant</th><th>Closure/Disposition/Maturity property settings</th></tr>
<tr><td>Analyst</td><td>Open/Approved/Reviewing</td></tr>
</table>
Learn more about viewing the relationships between change objects.
</td></tr>
</table>

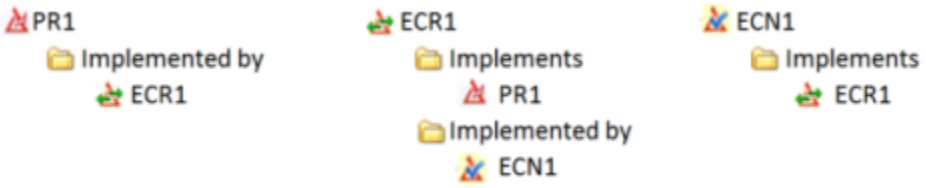
About viewing relationships using the Implements and Implemented by folders

Two change object folders show the **relationships between the change objects** during the stages of the change process:

- A change object's **Implements** folder shows the change objects that are addressing the problem that the change object identified.
- A change object's **Implemented By** folder contains the change objects whose problems the change object is addressing.

For example:

- The engineering change notices (ECN) **Implements** folder contains the engineering change request (ECR) whose problem it is addressing, while that ECR's **Implemented By** folder contains the ECN that is correcting the problem it identified.
- The problem report (PR) **Implemented By** folder contains the ECRs that correct the problem that the PR identified.

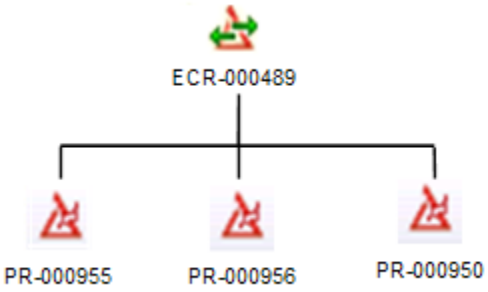


> Note:
>
> A PR does not have a **Implements** folder because it does not implement a problem, only identifies one.

Usually, the **Implements** and **Implemented By** folders are automatically populated as part of the change process but you can add to them if you are an assigned participant and the property settings are set as follows:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Reviewing**

Because you derive a single change object from a change object, you must manually create any relationships you want from other related change object. For example, if you use one ECR to implement multiple PRs, only the PR from which you derive the ECR is added to the **Implements** folder of the ECR. The following shows **ECR-000489**, which implements three PRs.



ECR-000489 was derived from **PR-000955** so **PR-000955** was automatically added to the **Implements** folder of **ECR-000489**. The other two PRs were manually added to the **Implements** folder.

You would also need to add related items to its other folders, such as adding problem items to its **Problem Items** folder.

Relate change objects to other change objects

Usually, the **Implements** and **Implemented By** folders are automatically populated as part of the change process but you can add to them if you are an assigned participant and the property settings are set as follows:

- To associate a PR with an ECR, add the PR to the ECR's **Implements** folder. You can add or delete PRs if you are an assigned participant and the ECR and PR property settings are as follows.

Assigned participant	Closure/Disposition/Maturity property settings	
Requestor	**ECR**	**Open/None/Elaborating**
	PR	**Open/Approved/Reviewing**
Change Specialist	**ECR**	**Open/None/Elaborating** or **Open/Investigate/Reviewing**
	PR	**Open/Approved/Reviewing**

- To associate an ECR with an ECN, add the ECR to the ECN's **Implements** folder. You can add or delete ECRs if you are an assigned participant and the ECN and ECR property settings are as follows.

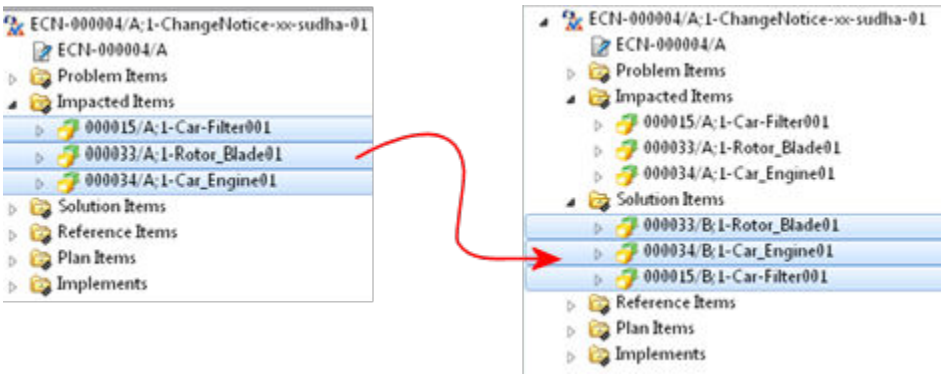
Assigned participant	Closure/Disposition/Maturity property settings	
Requestor	**ECN**	**Open/None/Elaborating**
	ECR	**Open/Approved/Reviewing**
Change Specialist	**ECN**	**Open/None/Elaborating** or **Open/Investigate/Reviewing**
	ECR	**Open/Approved/Reviewing**

Note:

- You can associate more than one PR with an ECR and one PR with several ECRs.
- You can associate more than one ECR with an ECN and one ECR with several ECNs.

Create a new revision of impacted items

A change object can have multiple impacted and solution items. Processing these items one at a time can be inefficient and prone to error. Therefore, you can revise one or more items in the **Impacted Items** folder of an engineering change notice (ECN) and add them as new revisions in the **Solutions Items** folder.



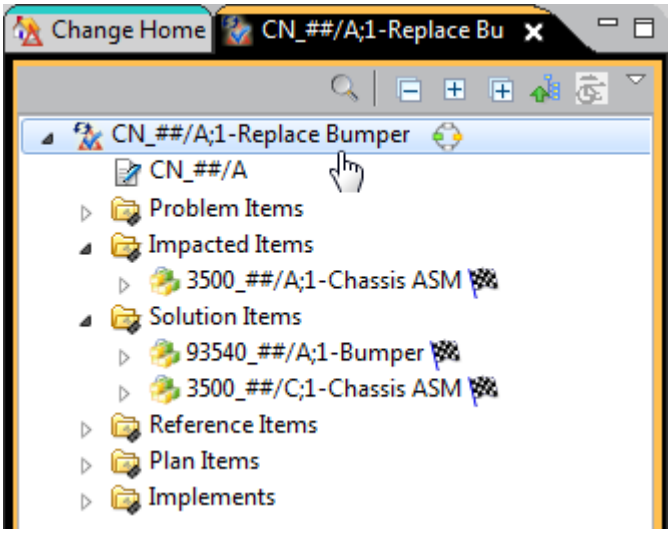
By default, to revise an item in the **Impacted Items** folder, the following properties must be met.

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Executing**

You can also create a BOM change after revising an item.

To revise an impacted item:

1. Double-click the ECN revision to open it in the **Open Change** view as shown.



2. Select the item or items in the **Impacted Items** folder you want to revise.

3. Choose **File→Revise**.

   A new revision appears in the **Solution Items** folder.

The revision rule of the new revision items is determined by the supplemental revision type, if available. There are two situations in which the revision type changes:

- A primary revision type with a primary supplemental set (no secondary set)
- A secondary revision type with a secondary supplemental set

Teamcenter assumes that the supplemental revision type is preferable. Typically, major revisions are made using the standard **Revise** function.

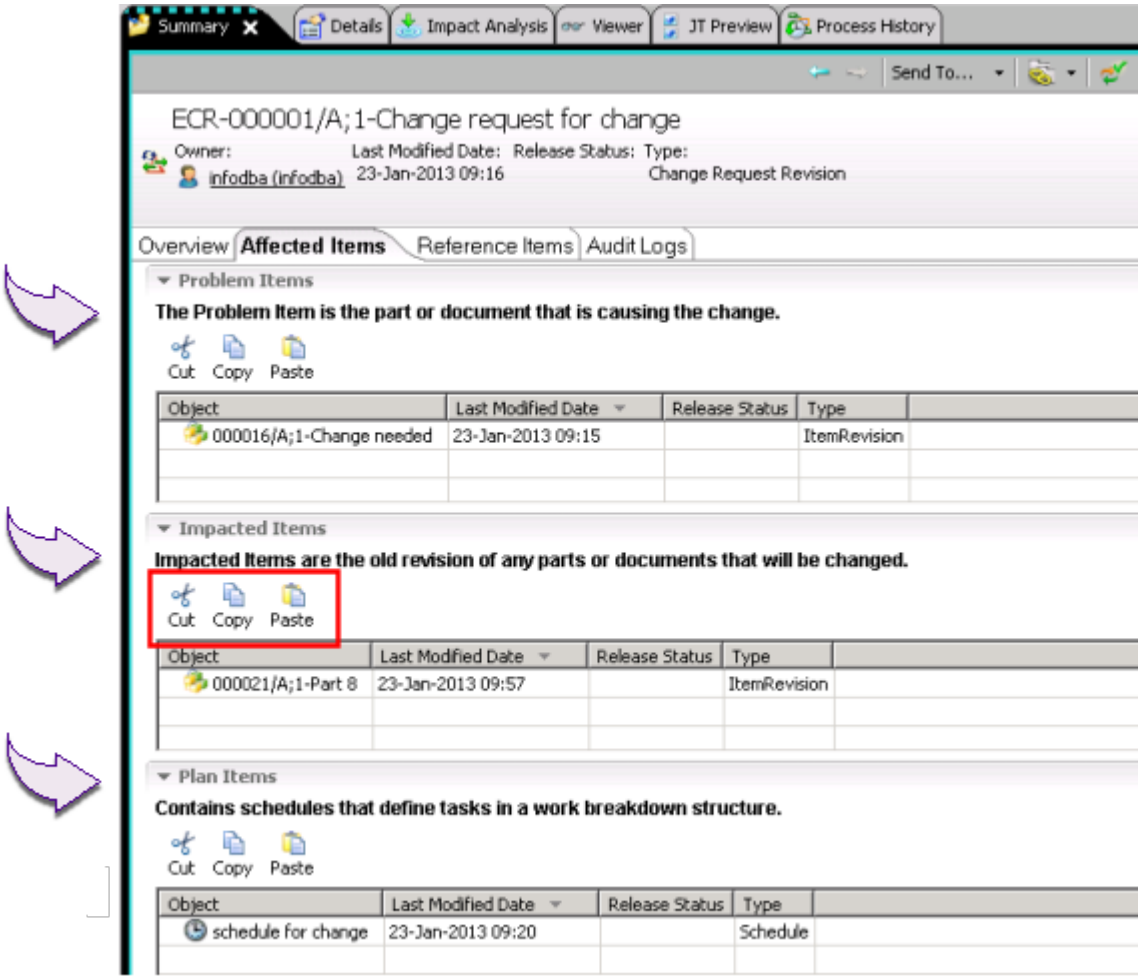
Manage the change relations in the Summary view

In addition to using the standard views to add related items to the change folders associated with the change object as you (the **Change Home**, **Teamcenter Component**, and **Search Results** views), you can use the **Summary** view in Change Manager to display and manage the change item relations for change objects.

You must be an assigned participant and the properties of the object must be set.

1. In a Change Manager view, select a change object, and click the **Summary** tab.

   The **Summary** view displays the **Affected Items** and **Reference** tabs, which show the various folders related to the change object as shown for an engineering change request (ECR). The folders displayed depend on the type of change object or schedule task selected. You can add and remove items as well as create new documents for the **Reference** and **Solutions** folder.



2. Click the **Affected Items** or **Reference** tabs, depending on the type of items you want to manage.

3. Use the **Cut**, **Copy**, and **Paste** tools, as appropriate, to add or remove items from the folders. Use the **Add New** tool to create a new document for the **Reference** and **Solutions** folder.

Relate a solution item to an impacted item

In Change Manager, a solution to an impacted item is not always a revision of the impacted item. It can be a separate item (for example, a markup). In addition, there can be more than one revision of the same item in either or both the **Impacted Items** and **Solution Items** folders.

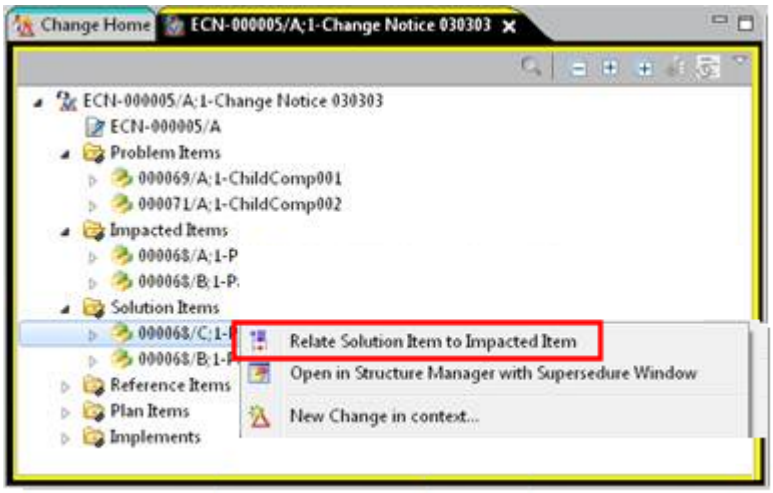
To create BOM change and supersedure records for a change, there must be an exact correspondence between the solution and impacted item revisions. If the change has a single impacted item revision and a single solution item revision of the same item, the BOM change relationship is created automatically. If not, you must use the **Relate Solution Item to Impacted Item** command to set up the relationship.

If the solution item is not related to an impacted item and you send the solution item to Structure Manager, the **Relate Solution Item to Impacted Item** dialog box appears. You must create the relation before the solution item is sent to Structure Manager.

> Note:
>
> Supersedure relationships are always created manually. You must copy the old item revision to the **Impacted Items** folder and the new item revision to the **Solution Items** folder.

1. Double-click the ECN revision to open it in the **Open Change** view as shown.

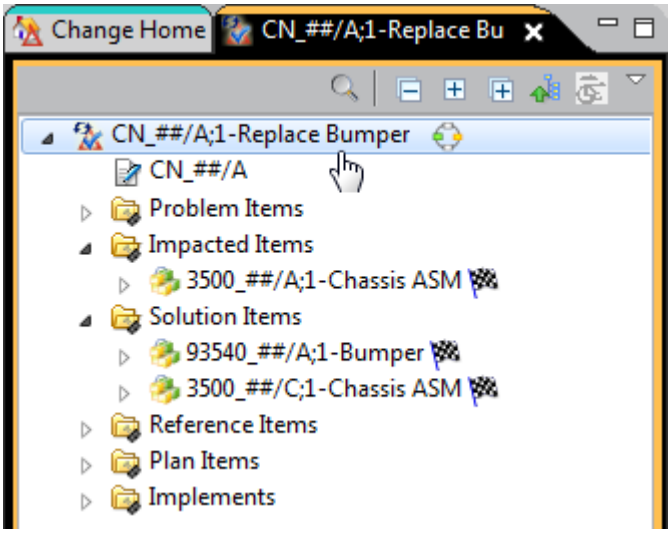
2. Right-click the item revision in the **Solutions Items** folder and choose **Relate Solution Item to Impacted Item**.



BOM changes

Create a BOM change

1. Double-click the ECN revision to open it in the **Open Change** view, as shown.



2. Right-click the item revision of the original assembly in the **Impacted Items** folder of the ECN and choose **Revise Impacted Item(s)**.

   A new revision of the assembly appears in the **Solution Items** folder.

3. Right-click the item revision in the **Solution Items** folder and choose **Send To→Structure Manager**.

4. Make your changes in Structure Manager and click **Save**.

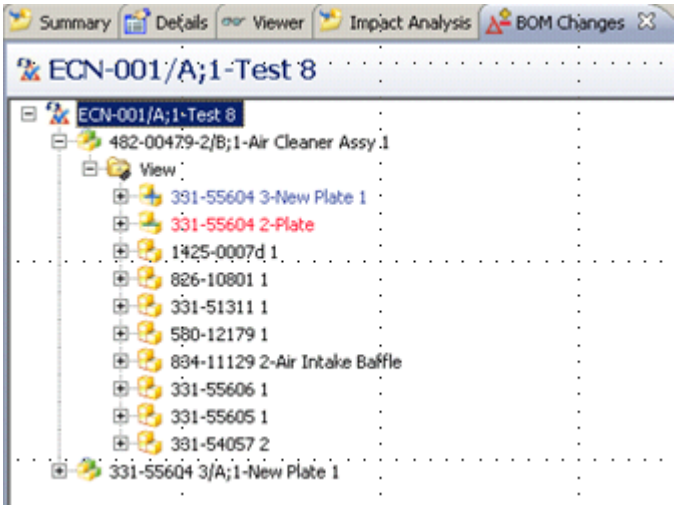
   You see the split window showing BOM changes; you have write access to the assembly.

5. In Structure Manager, you can create the supersedure and view the genealogy.

   Note:

   - Supersedure relationships are always created manually. You must copy the old item revision to the **Impacted Items** folder and the new item revision to the **Solution Items** folder.
   - Be sure the **TC_ValidApprovedStatus** preference is set to a valid status (for example, **TCM Released**). You can then see a visual indication of a potentially superseded component using the **Edit→Show/Hide Superseded** command in Structure Manager when the top line of the assembly is highlighted.

6. After the BOM change is created, you can see it in Change Manager by selecting the change object revision and clicking the **BOM Changes** pane.



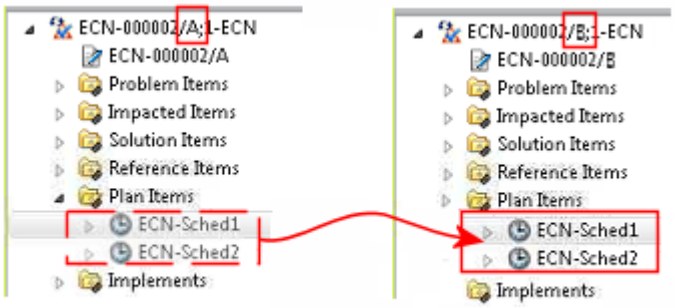
7. (Optional) Create a BOM line item form by selecting the BOM line in the **BOM Changes** pane and clicking **Add Form**.

   You can use the boxes in the form to document the purpose of the change or other change information.

   > Note:
   >
   > To delete the form, you *must* click **Delete Form**. Other deletion methods do not work.

8. (Optional) Cut the schedules associated with the original revision and paste them into the new revision.

   Any schedules associated with the original change item revision are not automatically associated with the new revision (a schedule cannot have two parents). Therefore, you need to cut the schedules in the **Plan Items** folder of the original change item revision and paste them in the **Plan Items** folder of the new revision.

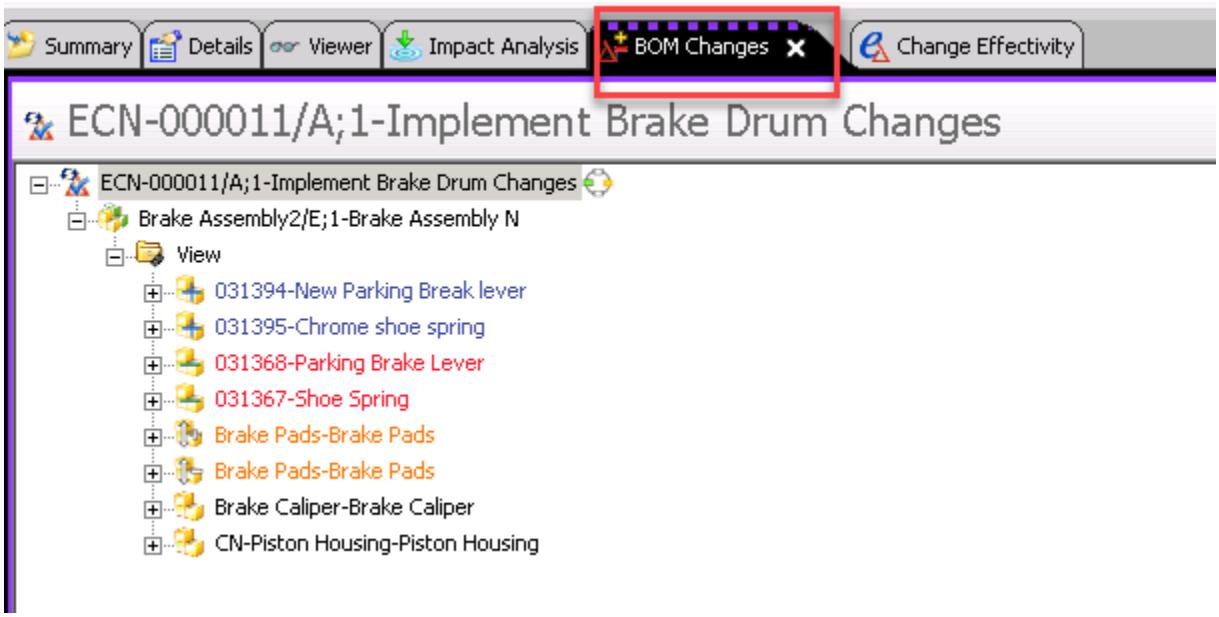


View BOM changes

Click **BOM Changes** to view changes made to a BOM when the following is true:

- A top line revision of a structure is part of an ECN solution.
- Older revisions of the same item are part of **Impacted Items** for the same ECN.
- There is a **SolutionToImpacted** relation between both revisions.

The **BOM Changes** view displays the changes in different colors:



These changes are displayed as follows:

- Adding a new line to the structure displays it in blue.
- Removing a line from the structure displays it in red.
- Changing a line displays it in orange.

View BOM changes tracked with an ECN

The change tracking process for new content and revisions is automated, providing a consistent method across applications to indicate the active change.

Edits are recorded in the specified active change, set by selecting **Active Change** in the **user profile**.

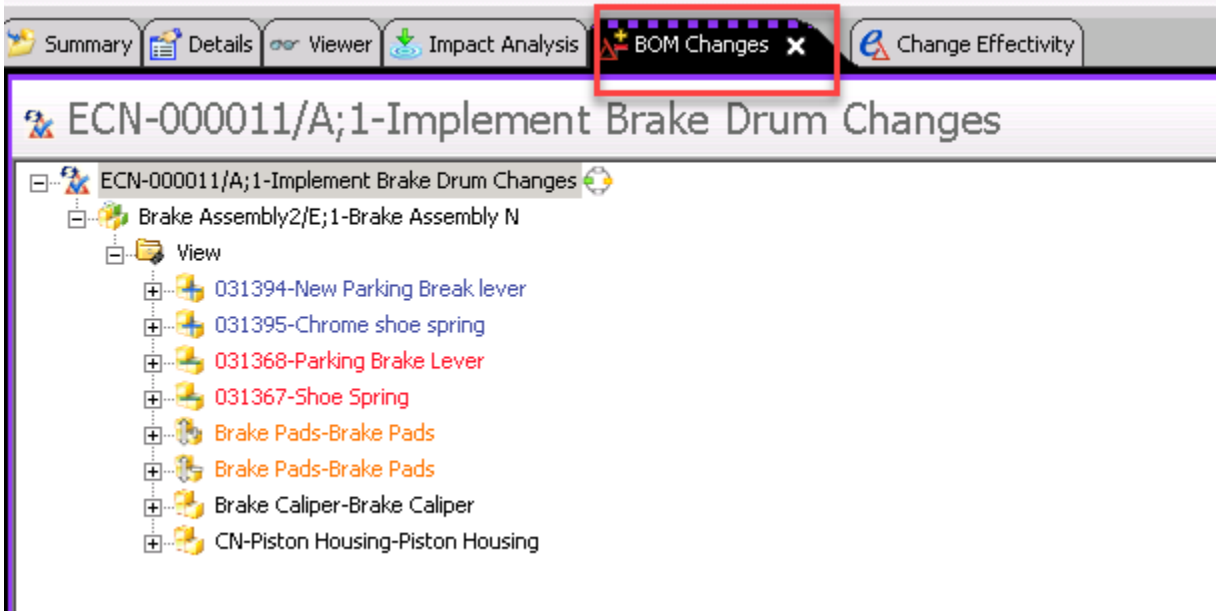
You can define which properties to track by modifying the preference **CM_bomline_tracked_properties**.

- **Create** or **Save As** adds a revision to the solution item of the change notice
- **Revise** adds the new revision to the solution item for the change notice, and the prior revision is added as an impacted item.

These changes are displayed as follows:

- Adding a new line to the structure displays it in blue.
- Removing a line from the structure displays it in red.
- Changing a line displays it in orange.
- Moving a line in the structure displays it as green.

This example shows two additions, two removals, and two changes:



Updating changes

Update a change

After a change object is created, you can update its properties depending on your ownership and participant privileges. For example, you might want to enhance the problem report (PR) description to elaborate on the conditions under which a problem occurred.

1. Select the problem report, engineering change request, deviation request, or engineering change notice that you want to update.

   You can update these objects only if you are the owner or have checkout and checkin privileges granted by an access control list, access rules, or another method.

2. Click either the **Summary** or **Viewer** pane.

3. Click the **Check out and edit** button.

4. **Edit the properties you want to update**.

   Note:

   - You cannot edit the **ID** property.
   - You cannot change the participants from the **Summary** or **Viewer** pane. Choose **Tools→Assign Participants** instead.
   - You cannot change the **Maturity**, **Disposition**, or **Closure** properties from the **Summary** or **Viewer** pane.

     To change these properties, see *About setting change states*.
   - You cannot edit properties on change objects, or their relations, after they are closed.

5. To save your changes in the **Summary** pane, click either the **Save properties and check in** button or the **Save and keep checked out** button.

   To save your changes in the **Viewer** pane, click the **Save** button.

6. To discard your changes in the **Summary** pane, click the **Cancel checkout and revert back to original** button.

   To discard your changes in the **Viewer** pane, click the **Clear** button.

7. If you saved your changes, check them in if they are not already checked in.

   To check in your changes in the **Summary** pane, click the **Save properties and check in** button.

   To check in your changes in the **Viewer** pane, click the **Check-In** button.

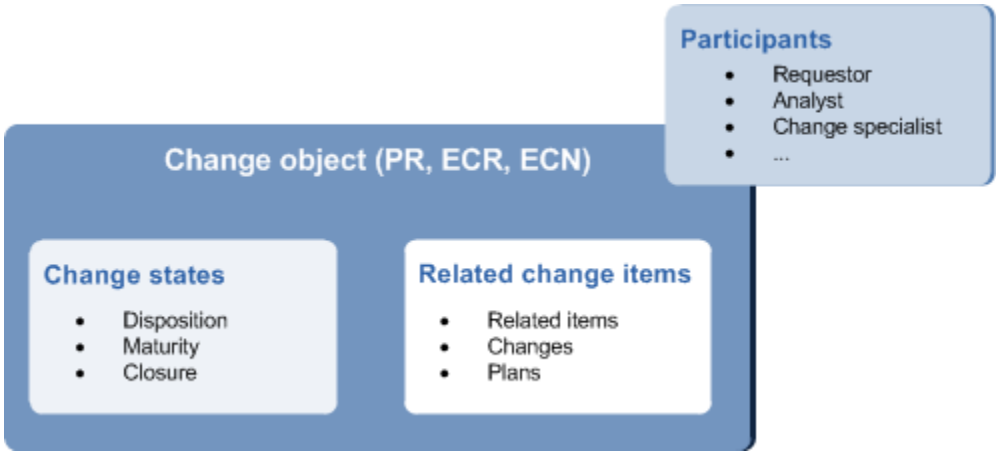
Note:

You cannot use the **Save As** command for a change. Creating a change based on another change violates change management business logic. Therefore, the **Save As** command is not available

for a change object (it is disabled) to prevent you from breaking business rules or creating poor change management data. Instead, create a new object and relate the change items to the appropriate folders in the new object.

Change object properties

Change objects capture the necessary change information either as part of their properties or through establishing relations with other objects as shown.



Participants

Participants are the users involved with identifying, managing, and resolving the change. Participants can be assigned at the start of the change or they can be assigned throughout the change process, depending on the requirements of your company. The participants can also be automatically assigned to workflow tasks. Participants are modeled as separate objects and are not properties of the change object. Participants can be a single user or a group, such as a board.

Here is an example of participants who are assigned.

Change states

Change states define the degree of completion and the latest business decision regarding a specific change. They are set during workflow, and used to control the change. The states, while set on an individual change object, apply to the overall change process. For example, the **Executing** change state references the change notice (ECN) when changes are being made using the solution items.

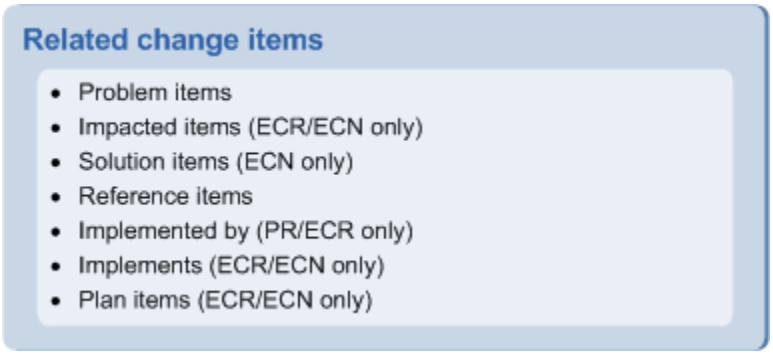
Here is an example of the change states. The bold text shows the defaults.

Related items, changes, and schedules

During the change process, you elaborate a change object by relating other objects to it. For example, you may need to add reference documents to a PR or specify which item revisions are impacted by the change. When you implement a change, new item revisions must be related as solution items. You can also relate schedules to change requests (ECRs) for planning the solution or to change notices (ECNs) for implementing the solution.

Change Manager shows these related items in change folders that it automatically creates for you. The change folders, for example, **Impacted Items**, **Solutions Items**, and **Plan Items**, define the type of relation the item has to the change object. Business rules (modeled as Business Modeler IDE conditions) control the data that can be related under the different folders, by participant type, and what change state.

Here is an example of the folders of the change objects and the types of change objects they are related to:



> Note:
>
> You cannot edit properties on change objects, or their relations, after they are closed.

Listing of change properties

Change object properties store change data during the change process. A user either enters the data or Change Manager automatically creates it during the change process. The values of some of these properties are used to drive workflow decisions, while others are provided for user reference or instruction. Here, we see a subset of the change properties available on different types of change objects. Some properties, such as the State, are common to all change objects.

The following lists the default properties for a change object. To view properties, use the **Viewer** tab.

Properties common to all change objects

The property	Does the following
ID	Provides the change object identification number.
Name	Provides a name for the change object.
Synopsis	Provides a name for the change.
Description	Provides a description of the problem.
State	The state of the change. Can only be changed through a workflow process. • Closure • Maturity • Disposition
Participants	Lists those involved in the change management process. Note: These are not properties, but relations to participant objects. • Requestor • Analyst • Change Specialist 1 • Change Review Board (ECR only)

The property	Does the following
	• Change Implementation Board (ECN only)

Properties of problem reports

The property	Does the following	Property name	LOV name and values
Environment Description	Describes the environment as it was when the problem occurred. For example, if the car door was open and the car was moving in reverse.	**CMEnvironment Description**	None
Sequence of events	Describes what happened before the problem occurred. Provides a guide for reproducing the problem.	**CMSequence OfEvents**	None
Technical review priority	Guides the analyst to the problems to address first. The values, based on CMII, are **1** to **4**, with **1** being the highest priority. Your administrator may have replaced this list of values (LOV) with your company's own.	**CMTech ReviewPriority**	**CM Tech Rev Priority** • **1** • **2** • **3** • **4**
Verification	Describes how the problem was verified. For example, it was reproduced.	**CMVerification**	None
Ramification	Describes what will or might happen if the problem is not resolved. For example, increased incidence of customer injury.	**CMRamification**	None
Severity rating	Indicates the severity of the problem. For example, customer injury rates a 1 (high) while a user manual typographical error rates a 4 (low). The values, based on CMII, are **1** through **4**, with **1** being highest severity. Your administrator can replace this list of values (LOV) with your company's own.	**CMSeverity Rating**	**CM Priority** • **1** • **2** • **3** • **4**

Properties of engineering change requests

The property	Does the following	Property name	LOV name and values
Reason	Provides a short description of the reason for the change. The values are based on CMII. Your administrator can replace them with different types of changes (for example, safety or performance) that your company processes on a regular basis.	**CMReason**	**CM CR Reason** • **To Fix** • **To Prevent** • **To Improve**
Proposed solution	Describes the recommended technical solution in enough detail to enable a cost-benefit decision. The analyst enters this information. For standard track changes, a simple description in this text box is not enough, so the analyst may attach other documents (for example, BOM markups, a preliminary implementation plan (schedule), or any other item needed to describe the proposed solution). In this case, those items should be briefly described here. This property is part of the technical recommendation.	**CMProposed Solution**	None
Is fast track?	Indicates if the ECR should be processed as a **fast track change**.	**CMIsFastTrack**	**CMII CR Fast Track** • **Yes** • **No**
Technical review priority	Guides the change review board and the technical review board (if involved) to the problems to be addressed first. The priorities can be copied from the PR, or the change specialist can set the value. The LOV values are based on CMII.	**CMTech ReviewPriority**	**CM Priority** • **1** • **2** • **3**

The property	Does the following	Property name	LOV name and values
			• **4**
Recurring cost	Provides an estimate of the incremental costs of the changed product.	**CMRecurringCost**	None
Nonrecurring cost	Provides an estimate of the total costs to implement the change.	**CMNonrecurring Cost**	None
Technical recommendation	Forms part of the technical recommendation, along with the **CMTestResults Attached**, **CMTechnical Review**, and **CMProposed Solution** properties. The values are based on CMII.	**CMTechnical Recommendation**	**CM Tech Recommendation** • **Problem Confirmed** • **Problem Not Confirmed** • **Another Problem**
Test results attached?	Answers the question of whether the analyst has attached documentation of the test results. This property is part of the technical recommendation.	**CMTest ResultsAttached**	**CM YesNo** • **Yes** • **No**
Technical recommen-dation date	Specifies the date of the recommendation.	**CMTech RecommDate**	None
Timing factors	Provides an opinion or guidance from the change review board or analyst to the change implementation board about setting the effectivity and the implementation timing.	**CMTimingFactors**	None

Properties of engineering change notices

The property	Does the following	Property name	LOV name and values
Implemen-tation priority	Guides the analyst about the relative priority of implementing the change.	**CMImplPriority**	**CM Priority** • **1**

The property	Does the following	Property name	LOV name and values
			• **2** • **3** • **4**
Special instruction	Captures any special instructions the change Implementation board has for the analyst and the change implementation team itself.	**CMSpecial Instruction**	None
Is customer approval required?	Indicates if one or more customers must approve the change.	**CMSpecial Instruction**	None
Status of customer approval	Indicates whether or not the customers approved or disapproved the change.	**CMStatusOf CustApproval**	**CM CN Approval** • **Approved** • **Disapproved**
Date of customer approval	Indicates the date of the customers' approval or disapproval.	**CMDateOf CustApproval**	None

Managing unincorporated changes

About incorporating changes

An unincorporated change is a change that is approved but not yet incorporated in the design of a product. Usually, changes are not incorporated fully because there is not enough time, importance, or budget to incorporate the changes completely through the development process.

The unincorporated change functionality is intended to track unincorporated changes to existing designs. It does not support tracking unfinished work of new, unreleased designs.

Unincorporated changes can only be applied to ECNs.

> Example:
>
> A designer releases Revision A of **Item1** for production, and begins working on a new revision (Revision B). On the shop floor, a minor modification is performed over Revision A and production starts. This changed version needs to be recorded in Teamcenter. Therefore, a new supplemental revision (A01) is created and released. Because the change still needs to be incorporated into the main release, (revision B, in this case), the change is considered partially incorporated.

An ECN can also either partially or fully incorporate markups. However, a markup is considered fully incorporated into all the solution items of the incorporating ECN, which has the change partially incorporated into the same item.

> Example:
>
> A designer creates a ECN (**CN1**), with a markup (**MU1**) as a solution item. The designer sets the Incorporation status of several of the impacted items to **Partially Incorporated**.
>
> The designer then creates a second ECN (**CN2**) to incorporate markup **MUI**. The designer creates an incorporates relation between **CN2** and **MU1**.
>
> **CN1/MU1** are now considered fully incorporated into the solution items of **CN2** that belong to the impacted items of **CN1** and have an Incorporation status of **Partially Incorporated**.

For a full example of incorporating changes, see **Example of incorporating changes**.

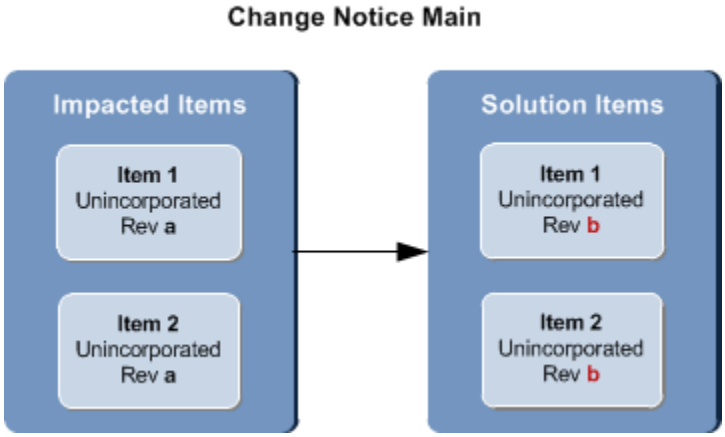
Example of incorporating changes

The following is an example showing the steps to incorporate changes partially and then fully when an engineering change notice (ECN) impacts multiple change items.

Step 1 – Create engineering change notice implementing changes

Company ABC creates an ECN (**Change Notice Main**) to implement a change needed on two items (**Item 1** and **Item 2**). The item revision of the items in the **Solutions** folder is Revision b.

The ECN change state is **Open**, **Executing**, and **Approved**.



The following shows the status for the items as it would appear in the **Change History** dashboard.

Revision/ Markup	Authorizing Change Notice	Change Notice Closure	Change Notice Maturity	Change Notice Disposition	Incorporates Changes of	Incorporated by	Incorporated into	Incorporation Status of Change
a	01-0007/a;1-CN0	Closed	Complete	Approved	~	~	~	Incorporated
b	01-0008/a;1-Change Notice Main	Open	Executing	Approved	~	~	~	Unincorporated

Note:

ECN **CN0** in the **Change History** dashboard is not shown in the figures to avoid complexity. **CN0** is the ECN that initially created **Item 1**, Revision a, and **Item 2**, Revision a as solution items.

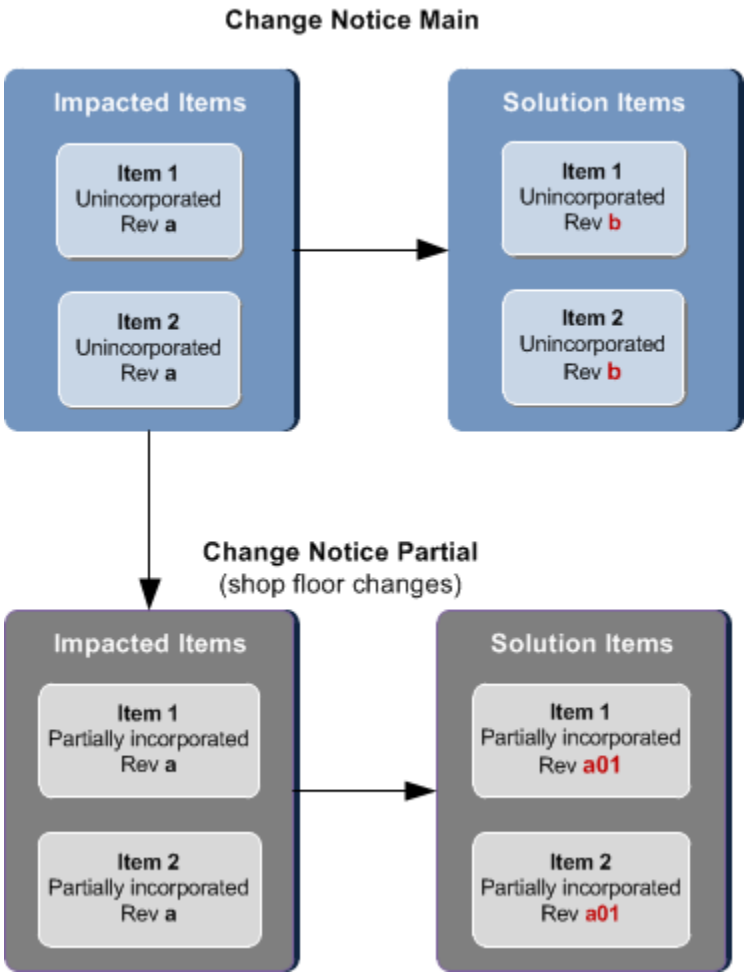
Step 2 – Make the partially incorporated changes

On the shop floor, a minor modification is done over Revision a of the two items (**Item 1** and **Item 2**) and production is started. Company ABC needs to immediately incorporate the change into Teamcenter. The items have work-in-process revisions so the change cannot be incorporated into these.

Therefore, a designer creates new revisions to incorporate the shop-floor changes and starts a new change notice (**Change Notice Partial**) to manage the implementation. The designer sets the incorporation status on the items in the **Impacted Items** folder of **Change Notice Partial** to **Partially Incorporated**.

The designer closes **Change Notice Partial** after creating Revision a01 of **Item 1** and **Item 2**.

Work still continues on Revision b in **Change Notice Main**, and it remains open.

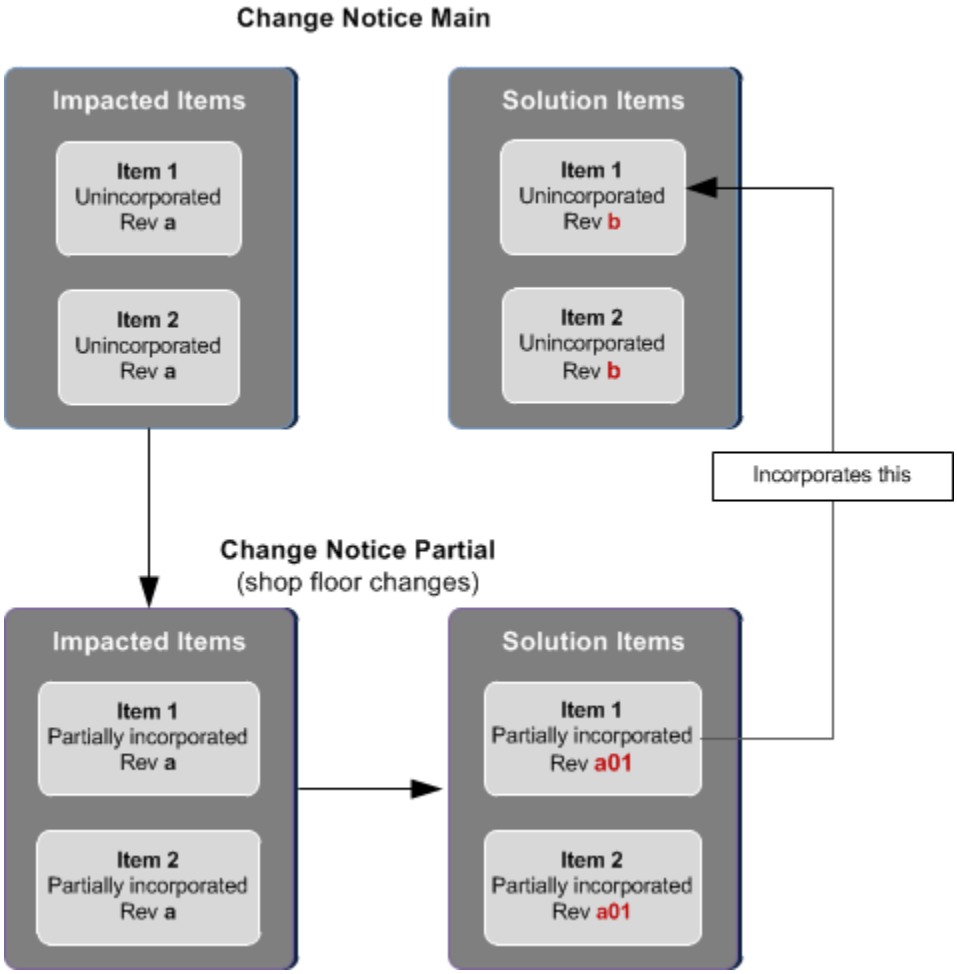


The change states of the ECNs are:

- **Change Notice Main** – **Open**, **Executing**, and **Approved**
- **Change Notice Partial** – **Closed**, **Complete**, and **Approved**

Step 3 – Incorporate changes from Item 1, Revision a01, into Revision b in Change Notice Main

The designer finishes the work in **Change Notice Main** on Revision b of the items. The designer wants to incorporate the change to **Item 1** in **Change Notice Partial** into Revision b of **Change Notice Main**, but not the change that was done to **Item2**. To indicate this, the designer creates an **Incorporates this** relation between **Change Notice Main** and Revision a01.

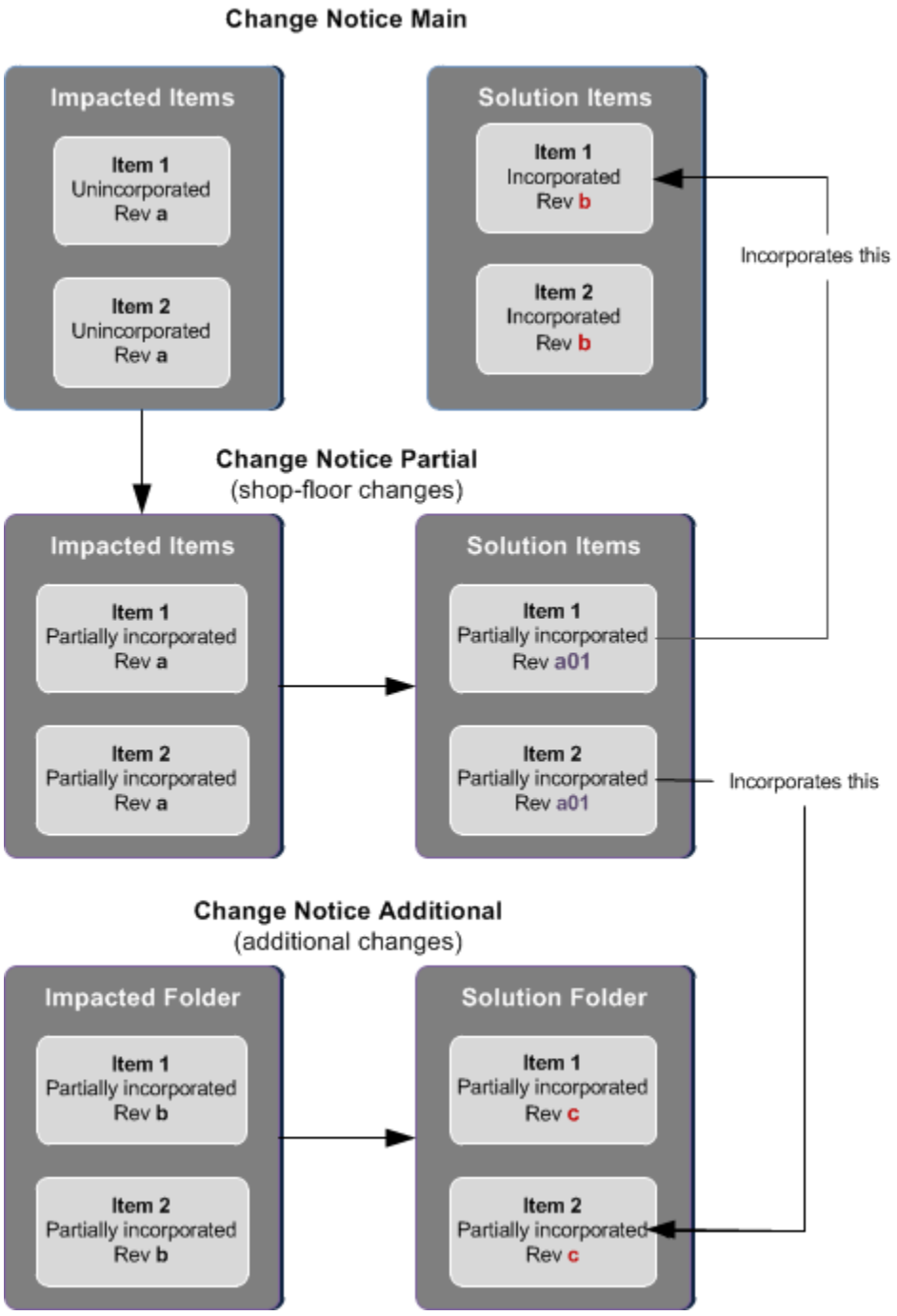


The change states of the ECNs are both Closed, Complete, and Approved.

Step 4 – Incorporate changes from Item 2, Revision a01, into Revision b in Change Notice Additional

Much later, more changes are recommended for **Item 1** and **Item 2**. Therefore, Company ABC creates a third change notice (**Change Notice Additional**). During that change, the designer implements the changes that were in **Change Notice Partial** for **Item 2** into Revision c.

At this point, all change notices are closed.



The change states of the ECNs are all Closed, Complete, and Approved.

Conditions that must be met to set Incorporation status

The following conditions must be met before you can set the Incorporation status of an item revision. By default, all impacted items in the **Impacted Items** folder of an ECN are set to **Unincorporated**.

In addition, when an ECN is closed through a workflow, all impacted items with a status of **Unincorporated** are automatically set to **Incorporated**.

Conditions required for a change to be partially incorporated

A change authorized by an ECN revision is considered partially incorporated in an item revision if the following are met:

- The item revision is a solution item of the ECN (in its **Solution Items** folder). If it is, then it meets the Business Modeler IDE condition **CMHasSolutionItem**.

  > Note:
  >
  > The **CMHasSolutionItem** condition is not supported by change revisions (ECR).

- The ECN has an impacted item in its **Impacted Items** folder and its Incorporation status is set to **Partially Incorporated**.

  The **CMHasImpactedItem** relation object has the ECN revision as its primary object and an item revision of the same item as its secondary object In addition, the value of the property **Cm0IncorporationStatus** on the **CMHasImpactedItem** relation object is set to **Partially Incorporated**.

Conditions required for fully incorporating a change

A change previously partially incorporated into an item revision, (for example, Revision a01) is considered fully incorporated into another item revision (for example, Revision b) of the same item if all the following are met:

- The ECN authorizing the item revision (in this example, Revision b) is a primary object of a **Cm0Incorporates** relation object and the previous revision (for example, Revision a01) is the secondary object.

- The ECN has an impacted item in its **Impacted Items** folder and its incorporation status is set to **Incorporated**.

  The **CMHasImpactedItem** relation object has the ECN as the primary object and an item revision of the same item as its secondary object. In addition, the value of the property **Cm0IncorporationStatus** on the **CMHasImpactedItem** relation object is set to **Incorporated**.

- The ECN revision authorizing the item revision (in this case, Revision b) is closed.

Conditions required for incorporating markups

An ECN incorporates a markup partially or fully in the same way it does item revisions, as explained in the two earlier sections. However, a markup is considered fully incorporated into all the solution items of the incorporating ECN that has the change partially incorporated into the same item.

> Example:
>
> A markup (**MU1**) is a solution item of an ECN (**CN1**) and the incorporation status of a few of the impacted items of **CN1** is set to **Partially Incorporated**.
>
> A designer later creates an **Incorporates** relation between a new ECN (**CN2**) and the markup **MU1**.
>
> Now CN1 and MU1 are considered fully incorporated into the solution items of **CN2**, which belong to the impacted items of **CN1** with the Incorporation status set to **Partially Incorporated**.

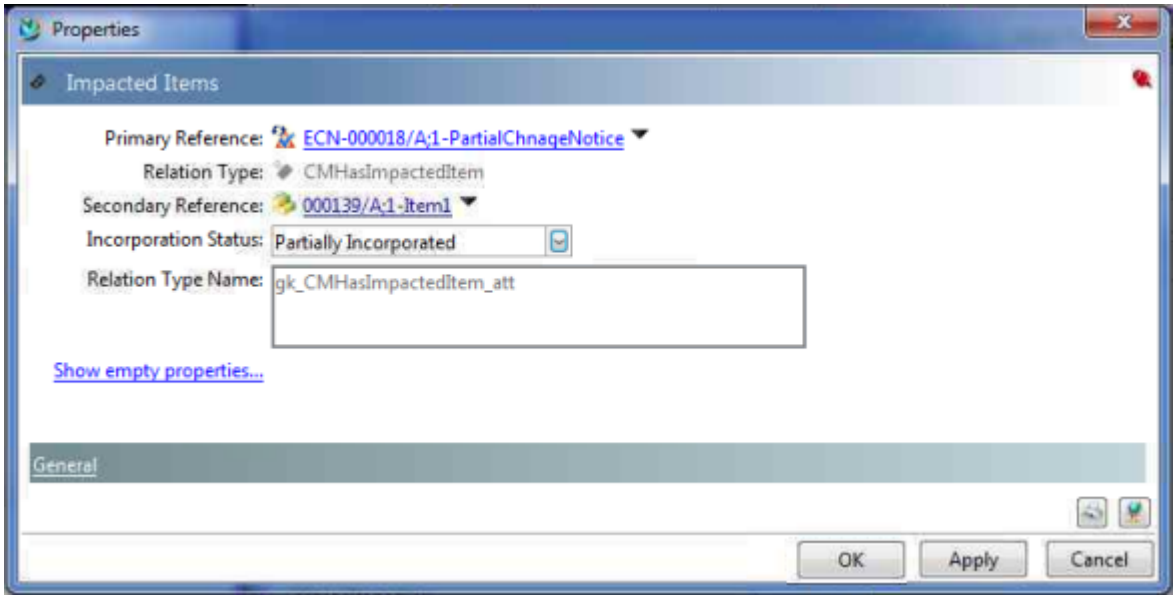
Set the Incorporation status of an object

Before you can set the Incorporation status of an item revision:

- The item revision must be related to an engineering change notice (ECN) as an item that it impacts.
- **Conditions must be met to set the Incorporation status of item revision**.

> Note:
>
> By default, the **Incorporates** relation is not displayed as a folder under the ECN revision.
>
> For information about displaying a folder with this relation under the ECN, see **Configure a folder to display Incorporation status**.

1. In My Teamcenter or Change Manager, right-click the item revision and choose **Properties on Relation**.
2. In the **Properties** dialog box, scroll to **Incorporation Status** and set it to one of the following:



- **Unincorporated**

  The change has not been incorporated.

- **Partially Incorporated**

  The change as defined has been partially incorporated. It may or may not already be fully incorporated by a subsequent change.

- **Incorporated**

  The change as defined has been fully incorporated. No subsequent changes are required to fully incorporate the defined change.

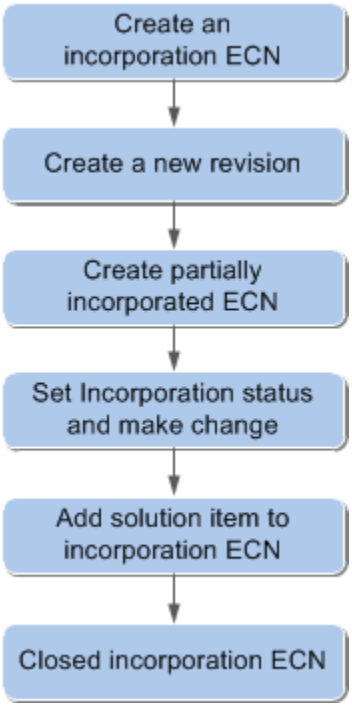
- **Cancelled**

  The change as defined is not incorporated in any way. This value indicates that an item has been identified as an impacted item, but the change as defined is not applied to that item. This status can be applied before a change solution definition or change execution has begun, or it can be updated after the change execution has begun.

3. Click **OK**.

General process for incorporating change items in an ECN

The following shows the general process for incorporating change items in an engineering change notice (ECN). It is followed by a summary of the steps.



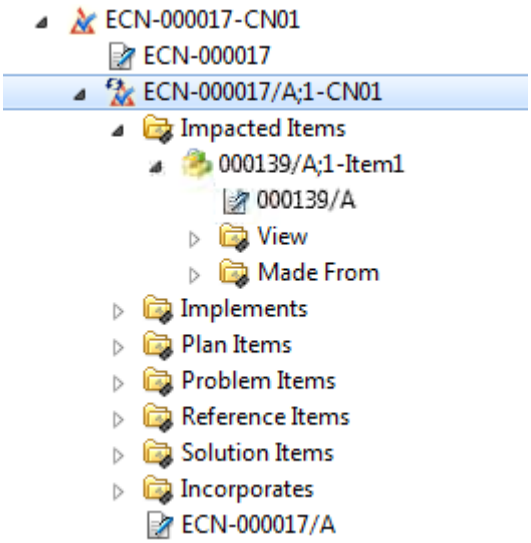
Note:

The examples use primary revisions. We recommend that you use secondary revisions when partially incorporating change items. For example, use A01 or A02 and not A, B, and C.

1. Create the ECN to completely incorporate the item revision.

   a. Create the ECN.

   b. Add the item revision to be incorporated to its **Impacted Items** folder.



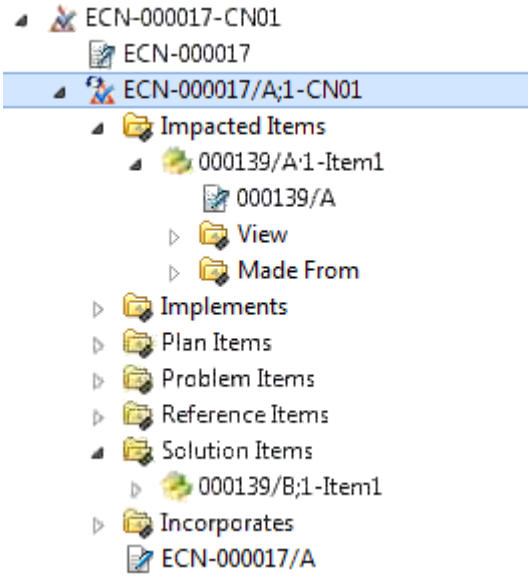
c. Assign participants and start a workflow.

2. Create the new item revision.

a. Use the **Revise Impacted Items(s)** command to create a new revision of the item revision and add it to the **Solutions Items** folder.

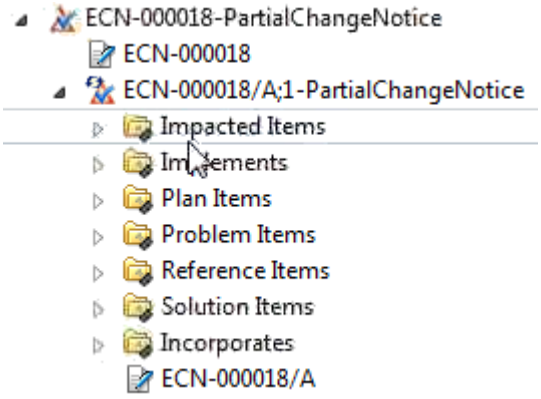
The following properties must be met:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Executing**



3. Create the second ECN that is to incorporate the item revision partially (the partially incorporated ECN).

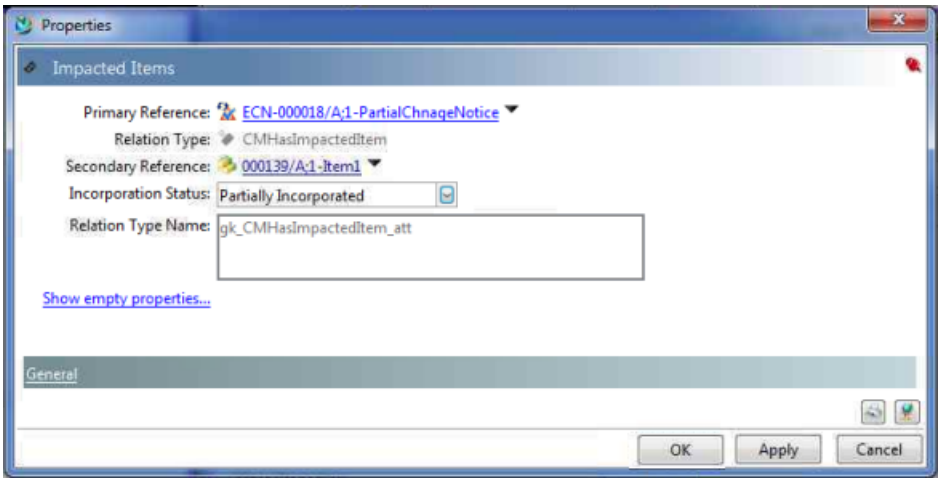
a. Create the partially incorporated ECN.



b. Assign participants and start a workflow.

4. Set the Incorporation status and make the change.

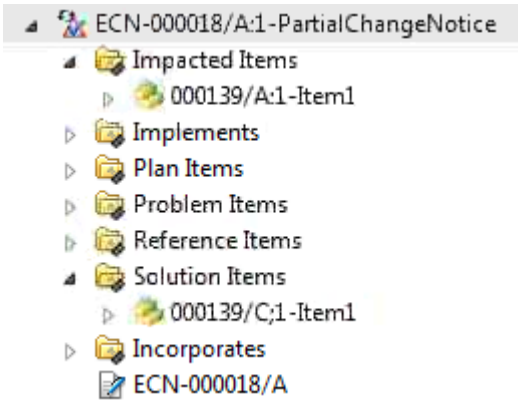
a. Use the **Properties on Relation** command to set the Incorporation status of the item revision to **Partially incorporated**



b. Use the **Revise Impacted Items(s)** command to create a new revision of the item revision and add it to the **Solutions Items** folder.

The following properties must be met:

Assigned participant	**Closure/Disposition/Maturity property settings**
Analyst	**Open/Approved/Executing**



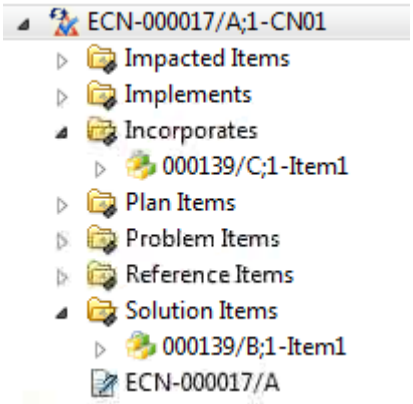
c. Make the change.

5. Add solution item to incorporation ECN.

a. Add the item revision from the **Solutions Items** folder of the second ECN to the **Incorporates** folder of the first ECN that will incorporate all changes.

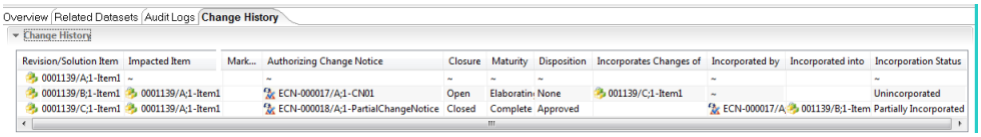
The following properties must be set to add the item revision to the **Incorporates** folder:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Elaborating**



6. Close the incorporation ECN.

a. Close the first ECN that incorporates the solution item. Closing the ECN automatically sets the Incorporated status of the solution item to **Incorporated** as shown in the **Change History** dashboard.



The following preferences control defaults in change item revisions:

ChangeItemRevision_Cpd0SubsetDefaults_default_relation	
Description	When creating a change object in the context of a subset, specifies the relation the subset has to the created change item revision. The default is that the subset is a reference item.
Default	**CMReferences**
Default Protection Scope	User

ChangeItemRevision_Cpd0DesignElement_default_relation	
Description	When creating a change object in the context of a design element, specifies the relation the design element has to the created change item revision. The default is that the design element is an impacted item.
Default	**CMHasImpactedItem**
Default Protection Scope	User

ChangeItemRevision_Cpd0WorksetRevision_default_relation	
Description	When creating a change object in the context of a workset, specifies the relation the workset has to the created change item revision. The default is that the workset is a reference item.
Default	**CMReferences**
Default Protection Scope	User

ChangeItemRevision_DefaultChildProperties	
Description	Specifies the list of properties that can be displayed as children of a **ChangeItemRevision** node.
Default	**IMAN_master_form_rev** **IMAN_specification** **IMAN_requirement** **IMAN_manifestation** **IMAN_reference** **release_status_list** **TC_Attaches**

	CMImplements **CMImplementedBy** **CMHasImpactedItem** **CMHasProblemItem** **CMReferences** **CMHasSolutionItem** **CMHasWorkBreakdown**
Default Protection Scope	Site

ChangeItemRevision_ItemRevision_default_relation	
Description	When creating a change object in the context of an item revision, specifies the relation the item revision has to the created change item revision. The default is that the item revision is a problem item, as shown in the figure for a change request.
Default	**CMHasProblemItem**
Default Protection Scope	User

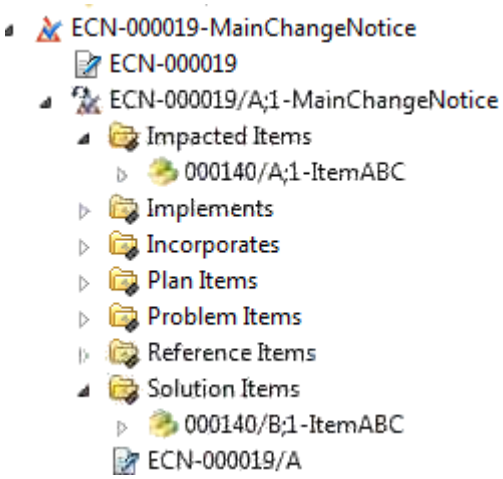
ChangeItemRevision_Ptn0Partition_default_relatio	
Description	When creating a change object in the context of a partition, specifies the relation the partition has to the created change item revision. The default is that the partition is an impacted item, as shown in the figure for a change request.
Default	**CMHasImpactedItem**
Default Protection Scope	User

General process for incorporating markups in an ECN

The following provides the general process for incorporating change items in an engineering change notice (ECN) when the solution item is a markup of the impacted item (they are different items; not revisions of each other).

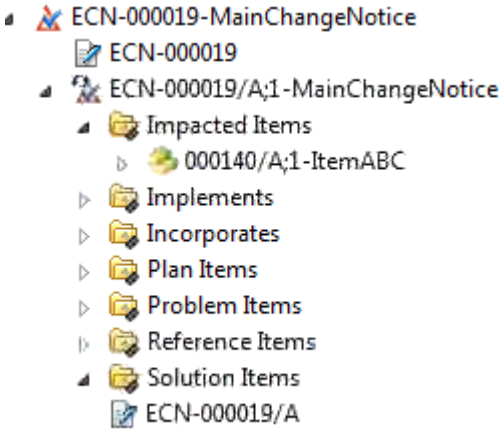
> Note:
>
> The examples use primary revisions. We recommend that you use secondary revisions when partially incorporating change items. For example, use A01 or A02 and not A, B, and C.

1. Create the ECN to completely incorporate the change.



a. Create the ECN.

b. Add the item revision to be incorporated to its **Impacted Items** folder.

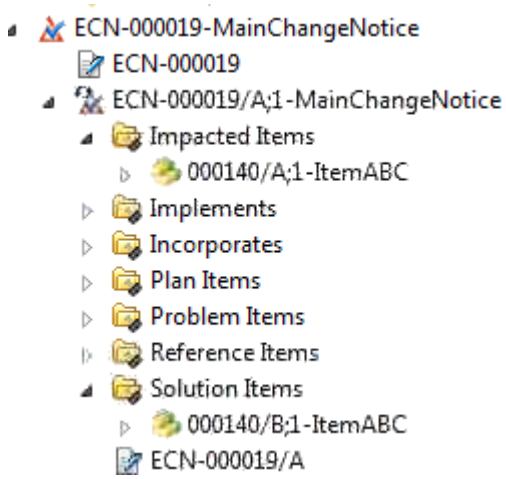


c. Assign participants and start a workflow.

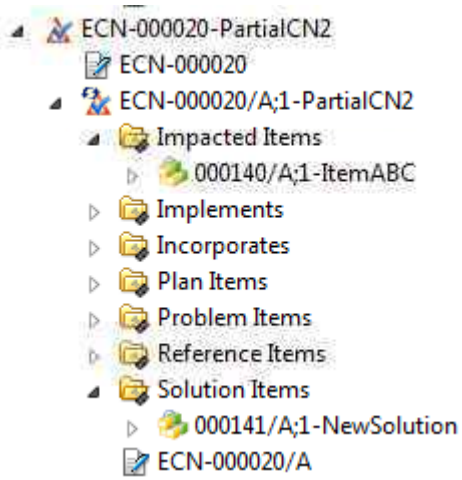
d. Use the **Revise Impacted Items(s)** command to create a new revision of the item revision and add it to the **Solutions Items** folder.

The following properties must be met:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Executing**

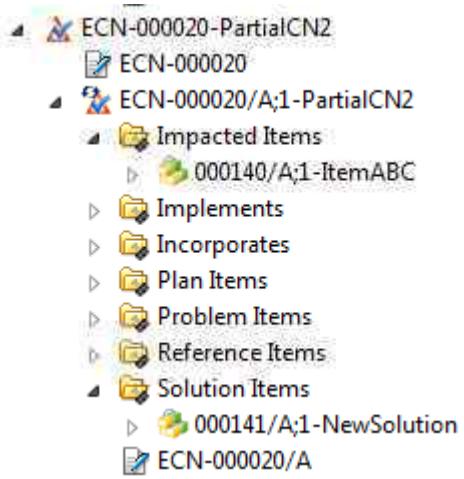


2. Create a second ECN that is to incorporate the item revision partially and make the partial change. The following shows the completed ECN with different impacted and solution items.



a. Create the second ECN.

b. Add the item revision to be partially incorporated to its **Impacted Items** and **Solutions Items** folders. In this case, they are different items that are unrelated.

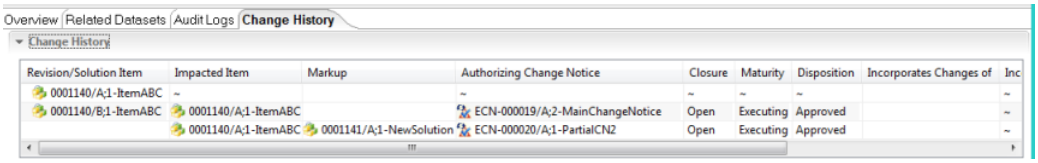


c. Assign participants and start a workflow.

d. Use the **Properties on Relation** command to set the Incorporation status of the item revision in the **Impacted Items** folder to **Partially incorporated**

For more information about setting the Incorporation status of a change item, see **Set the Incorporation status of an object**.

e. Use the **Relate Solution Item to Impacted Item** command to relate the solution item to the impacted item, which creates a link between them, as shown in the **Change History** dashboard.



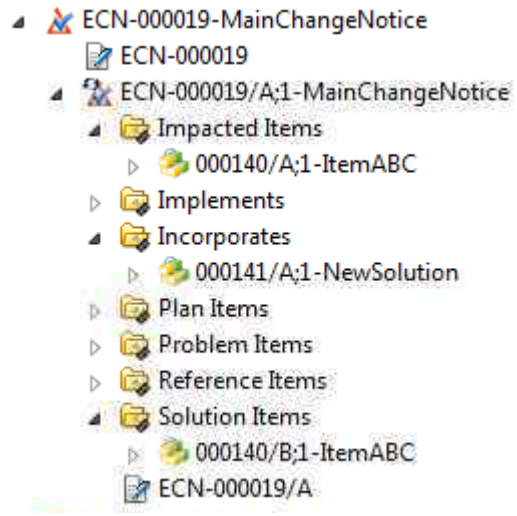
For more information about the **Change History** dashboard, see **View Incorporation status and history**.

f. Make the change and close the ECN.

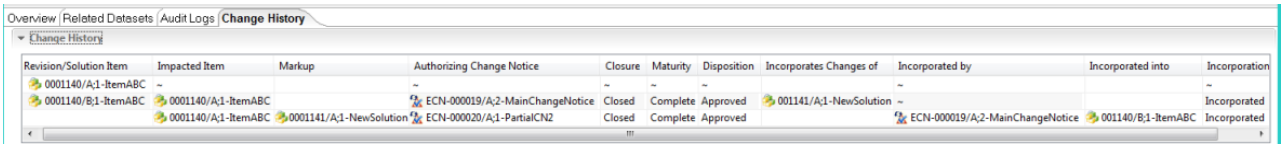
3. Add the item revision from the **Solutions Items** folder of the second ECN to the **Incorporates** folder of the first ECN that will incorporate all changes.

The following properties must be set to add the item revision to the **Incorporates** folder:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Elaborating**



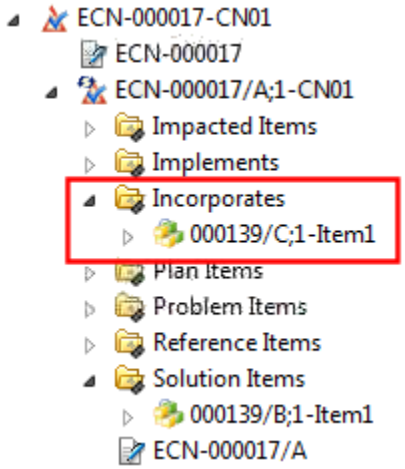
4. Close the first ECN that incorporates the solution item. Closing the ECN automatically sets the Incorporated status of the solution item to **Incorporated** as shown in the **Change History** dashboard.



For more information about the **Change History** dashboard, see **View Incorporation status and history**.

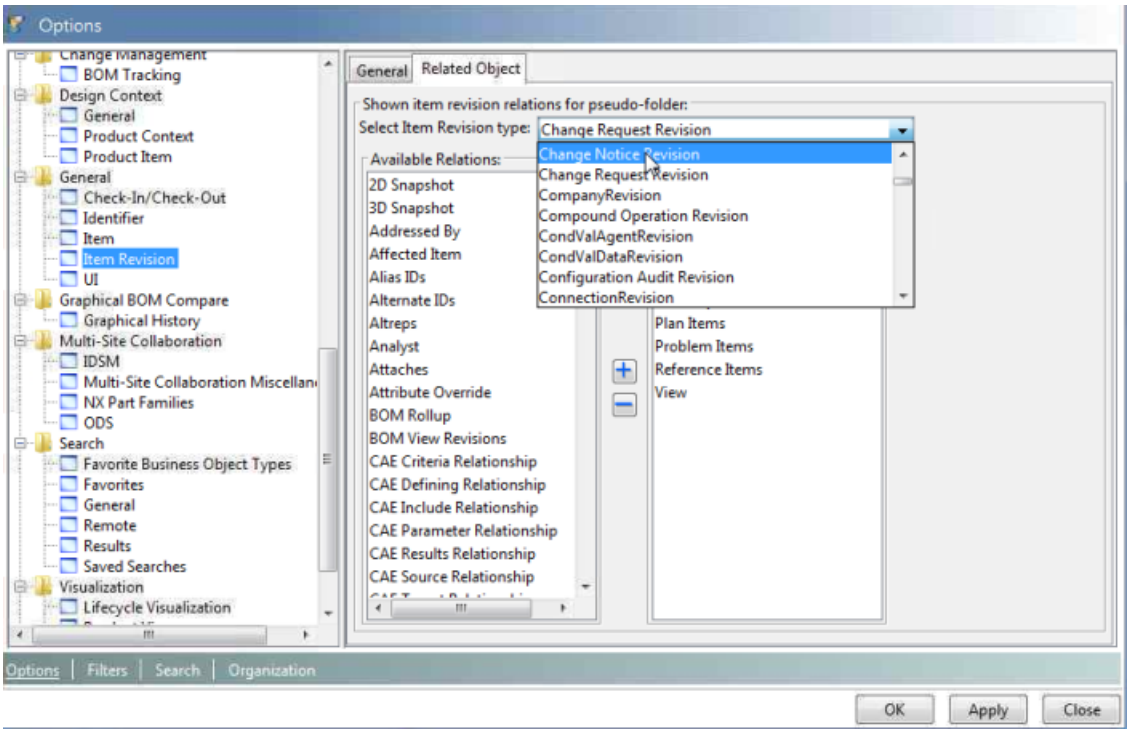
Configure a folder to display Incorporation status

By default, the Incorporation status **Incorporates** is not displayed as a folder under an engineering change notice (ECN) revision.



Use the **Options** dialog box to specify that the **Incorporates** property should be displayed for an ECN.

1. Choose **Edit→Options**.
2. In the list on the left, select **General** and then select **Item Revision**.
3. Click the **Related Object** tab.
4. Set **Select Item revision type** to **Change Notice Revision**.



5. In the **Available Relations** list, double-click **Incorporates**.

   Incorporates moves to the **Shown Relations** list.

6. Now click the **General** tab, and set up that the same relations be shown following Steps 4 and 5.
7. Click **OK**.

Viewing Incorporation status and history

View Incorporation status and history

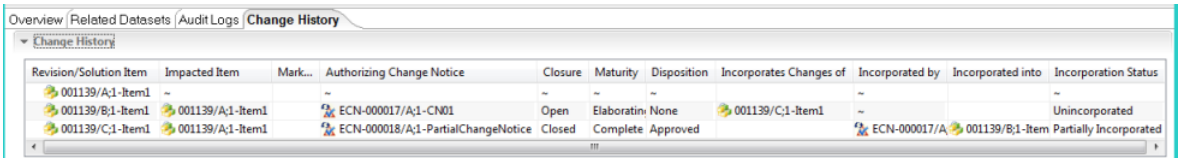
You can view the incorporation status of an engineering change notice (ECN) or an item revision using the **Change History** dashboard of the **Summary** tab.

Note:

The **Change History dashboard must be configured**.

1. In My Teamcenter or Change Manager, select an item or ECN.
2. Click the **Summary** tab.
3. Click the **Change History** tab.

   The following shows the **Change History** dashboard when an item revision is selected.

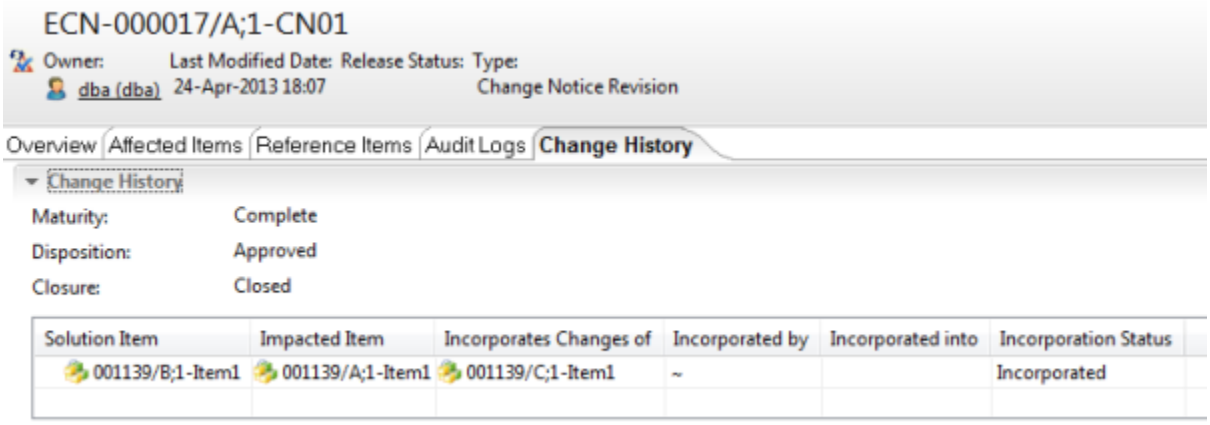


   Each row in the dashboard represents one revision of the item or the ECN authorizing the revision (no two rows represent the same revision). The columns in the dashboard change depending on whether you selected to view the incorporation history of an item revision or ECN:

   - **Columns in the Change History dashboard for an item**
   - **Columns in the Change History dashboard for an ECN**

Understanding the columns in the Change History dashboard for an ECN

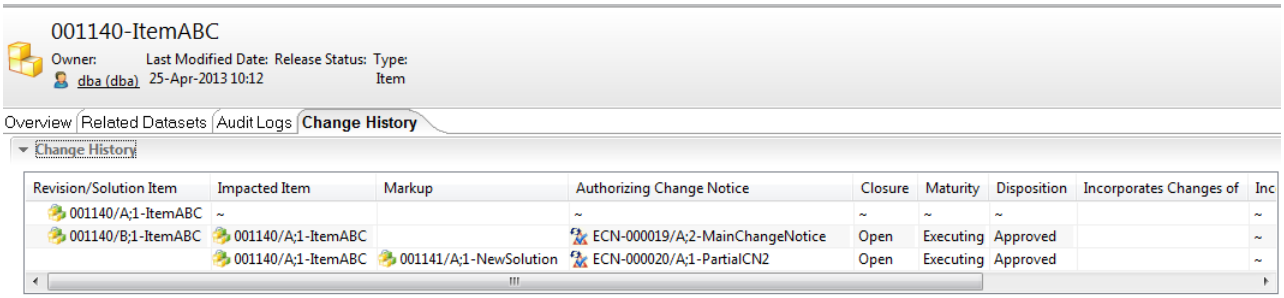
When you select to view the Incorporation status of an engineering change notice (ECN) in the **Change History** tab of the **Summary** tab, the **Change History** dashboard appears with the following columns.



The column	Displays
Solution Item	The name of the solution item of the ECN.
Impacted Item	The name of the Impacted Item in the ECN.
Incorporates Changes of	The names of the item revisions or markups that the ECN is incorporating.
Incorporated by	The name of the ECN revision that is incorporating the object listed in **Solution Item** column.
Incorporated into	The Incorporation property of the ECN revision.
Incorporation Status	The Incorporation status of the impacted item, except if the Incorporation status is set to **Partially Incorporated**. Then, this indicates that another ECN has incorporated the change fully.

Understanding the columns in the Change History dashboard for an item

When you select to view the Incorporation status of an item in the **Change History** tab of the **Summary** tab, the **Change History** dashboard appears with the following columns.



The column	Displays
Revision/Solution Item	The ID and name of the solution item.
Impacted Item	The ID and name of the impacted item.
Markup	The name and ID of any markup.
Authorizing Change Notice	The name of the ECN revision.
Closure	The Closure of the ECN.
Maturity	The Maturity of the ECN revision.
Disposition	The Disposition of the ECN revision.

The column	Displays
Incorporates Changes of	IDs of the item revision or the name of the markup being incorporated by the ECN revision.
Incorporated by	The name of the incorporating ECN revision.
Incorporated into	The ID of the revision the change was incorporated into.
Incorporation Status of Change	Shows the Incorporation status set on the impacted item, except if the Incorporation status is set to **Partially Incorporated**. Then, this indicates that another ECN has incorporated the change fully.

Configure the Change History dashboard

1. Associate the **Change History** tab with more workspace objects.

   Change Manager associates the **Change History** tab with all standard workspace objects involved in a change management process, such as item revisions and change objects. If you want to display the **Change History** dashboard for other workspace objects, such as document revisions, you can modify the style sheet for the **Summary** view of the object by adding the following code.

```
    <page titleKey="tc_xrt_ChangeHistory" title="Change
History" visibleWhen="{pref:CM_Change_History_Enable}==true">
        <section titleKey="tc_xrt_ChangeHistory"
title="Change History" initialstate="expanded">
            <customPanel
java="com.teamcenter.rac.cm.views.ItemChangeHistoryPanel"
js="displayItemCustomPanel"  />
        </section>
    </page>
```

   If you have modified the style sheet of a subtype of **Item/ItemRevision**, the **Change History** would not appear in its **Summary** view, and you need to add the code shown.

2. Turn on and off the display of **Change History** dashboard.

   Use the **CM_Change_History_Enable** preference to turn on or off the display of the **Change History** dashboard.

3. Change the columns in the dashboard and their order.

   - **CM_Item_ChangeHistory_Columns**

     Changes the columns displayed for an item revision.

   - **CM_CNR_ChangeHistory_Columns**

     Changes the columns displayed for an engineering change notice.

Performing mass-updates of objects

About the mass-updating of objects

Using Change Manager or My Teamcenter, you can make updates, in bulk, to part instances or to the source objects of realized design elements in 4th Generation Design (4GD). For example, you can identify and automatically replace every occurrence of an impacted part with its solution item. Using Change Manager allows you to control the process through change management in two phases. Both methods provide you with a wizard to step you through the process.

Configuring the mass-updating of parts and realizations

(Recommended) Suppressing the mass update commands

By default, the **Mass Update** and the **Mass Update Realization** commands are available to all users. Siemens Digital Industries Software highly recommends that you suppress access to these commands using the Command Suppression application. It controls the suppression of menu options based on a user's group or role.

Setting up where-used search for the mass-updating of parts

For users to be able to see the assemblies that are impacted by the mass-updating of parts using the **Mass Update** command, you must set the **MassUpdateDefaultRevRule** preference to define the revision rule that is used to perform a where-used search on the target part of a mass update. By default, the rule is **Latest Working**.

Configuring the mass-updating of objects using change management

An administrator must configure the following for users to be able to perform mass updates during a change management process using Change Manager:

- **Install Change Manager**

Mass updates use the **CM_Massupdate_Support_Change** preference to activate change object support. The preference is automatically installed when Change Manager is installed. By default, it is set to **true**, indicating that Change Manager is installed.

If the preference does not exist (that is, Change Manager is not installed) or it is set to **false**, mass updates do not work with a change object, but they do work outside of Change Manager using the **single-phase process in My Teamcenter**.

- **Install 4GD template to perform mass updating of realizations**

  To use a change object to manage the mass-updating of the source objects of design elements (realizations), install the 4th Generation Design Integration for Change management template.

- **Configure Change Manager to allow access to change objects and their folders**

  Mass-updating relies on the Business Modeler IDE conditions and rules being used in Change Manager to determine what change objects and folders it can access. Therefore, the change states of the change object (**Closure**, **Maturity**, and **Disposition**) must be set so mass update can access the folders associated with the object and change the item revisions.

  Mass update evaluates the following Change Manager conditions:

  - **Cm0isCMHasImpactedItemCreatableForPrimary**
  - **Cm0isCMHasSolutionItemCreatable**
  - **Cm0isCMHasProblemItemCreatable**
  - **Cm0isCMHasImpactedItemCreatable**
  - **isChangeExecutionAllowed**

  In addition, users performing a mass update must be in the correct group and be participants of the change management process. Otherwise, the **conditions prevent the users from adding objects** to the **Problem**, **Impacted Items**, and **Solution** folders.

  When mass-updating parts, you could easily collect so many assemblies that no single user in your organization has permission to update them all. To resolve such issues, the Mass Update wizard allows you to rerun updates and attempt any updates that failed the first time. You could also use workflow access controls to grant permission to the user at the appropriate step.

  The following shows the default conditions set for all change objects: problem report (PR), engineering change request (ECR), engineering change notice (ECN).

  - To add item revisions to the **Problem Items** or **Referenced Items** folders:
    - Must be **Analyst** or **Requestor**

- **AND**

  Disposition: None **Maturity:** Elaborating (Default) (until the Reviewing stage)

- **OR**

  Analyst

- **AND**

  Disposition: Investigate **Maturity:** Reviewing (once in Review, but only if Investigate (that is, rework)

- To add item revisions to the **Impacted Items** folder:

  - Must be **Analyst**

  - **AND**

    Disposition: None **Maturity:** Elaborating (Default) (Before Review, first time round)

  - **OR**

    Disposition: Investigate **Maturity:** Reviewing (Default) (after review rework required – second time round)

- To add item revisions to the **Solution Items** folder:

  - Must be **Analyst**

  - **AND**

    Disposition: Approved **Maturity:** Executing (Only when running an approved change)

  - **OR**

    Disposition: Investigate **Maturity:** Reviewing (Default) (after review rework required – second time round)

- **Specify objects that can be added to folders**

  Use the following preferences to define the Generic Relationship Management (GRM) rules to use when adding item revisions to the **Problem**, **Impacted Item**, and **Solution** folders. GRM rules limit what objects can be pasted to other objects.

  - **CM_Massupdate_Problem_PseudoFolder**

Specifies the GRM rule to use when adding problem parts to a change object.

- **CM_Massupdate_Impacted_PseudoFolder**

  Specifies the GRM rule to use when adding impacted parts to a change object.

- **CM_Massupdate_Solution_PseudoFolder**

  Specifies the GRM rule to use when adding solution parts to a change object.

- **Set the types of change objects**

  Use the following preferences to specify the types of change objects with which the mass updates can be performed:

  - **CM_massupdate_allowed_ECN_types**

    Change Manager change object revision types that are used for ECN operations. By default, it is set to **ChangeNoticeRevision**.

  - **CM_massupdate_allowed_ECR_types**

    Change Manager change object revision types that are used for ECR operations. By default, it is set to **ChangeRequestRevision**.

Performing mass-updates of part instances

About the mass-updating of part instances

You can make bulk updates to multiple assemblies as part of a change management process or in a single phase using the Mass Update wizard. For example, you can identify and automatically replace every occurrence of an impacted part with its solution item.

The Mass Update wizard automates the check-out/check-in process and the creation of the necessary revisions of assemblies. It also tracks the assemblies that you cannot edit (for example, because they belong to another group). You view the results of the mass update as a report.

You can replace parts in **nine different ways**, including replacing, removing, adding, and manually updating (revising parts that are released). You can also add, modify, and remove updates associated with the change object during the ECR and ECN processes before they are executed.

The updates are stored in the folders of the associated change object or in the **Newstuff** folder if you perform the update without a change object. For example, new assembly revisions are automatically added to the **Solution Items** folder.

Note:

- By default, the **Mass Update** command is available to all users. Siemens PLM highly recommends that you suppress access to this command using the Command Suppression application. It controls the suppression of the **Mass Update** menu option based on a user's group or role.
- Mass updates are only performed on data in a local database. The updates do not span globally to other site databases.
- Mass updates are only structural replacements. If you have additional data, such as torque information, you need to update it manually.
- You must have the **necessary permissions to perform a mass update and Change Manager must be configured for mass updates**.

Note:

The Teamcenter change management process does not support displaying substitutes on separate BOM lines in Structure Manager. Turn off the substitutes display (set **PSEShowSubstitutesPref** to **0**) when working with change-management related features.

Types of mass updates you can perform for parts

Nine operations are available from the Mass Update wizard for replacing part instances as listed in the examples. The operations allow you to replace parts, make substitutes, or manually update the assembly.

Note:

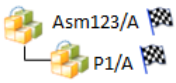
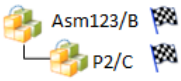
The examples show the assemblies released in the end state. However, the state of the assemblies depends on the workflows of the engineering change notice (ECN) at the time the replacement occurs.

- **Replace Part**

  Replaces the target part in a structure if the target part has no substitutes or if it is the preferred substitute.

- If the target part is an alternate substitute, it is not replaced.
- If the target part is a preferred substitute, all the alternate substitutes are retained with the replacement part.

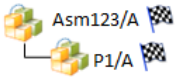
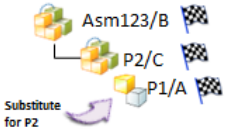
Example:

If the assembly is	And the target is	And the replacement is	Then the result of the replacement is
			

- **Replace Part and Keep as Substitute**

  Replaces the target part in a structure if the target part has no substitutes or it is a preferred substitute. If the target part is an alternate substitute, it is not replaced. The target part is added as an alternate substitute after the target part has been replaced.

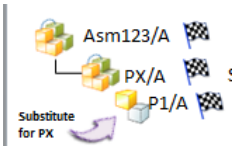
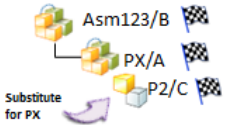
Example:

If the assembly is	And the target is	And the replacement is	Then the result of the replacement of the part as a substitute is
			

- **Replace Substitute**

  Replaces the target part in a structure if the target part is an alternate substitute. If the target part has no substitutes or the target part is a preferred substitute, it is not replaced.

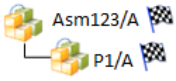
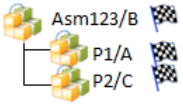
Example:

If the assembly is	And the target is	And the replacement is	Then the result of the replacement of the substitute is
			

- **Add Part**

  Adds a part to a structure that contains the target part, regardless of whether or not the target part has substitutes or whether the target part is the preferred or alternate substitute. The part is added to the structure and you must reposition the component within the structure.

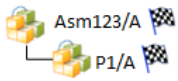
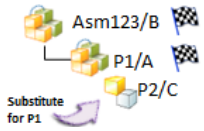
Example:

If the assembly is	And the target is	And the replacement is	Then the result of the addition is
			

- **Add Part as Substitute**

  Adds a part to a structure as an alternate substitute to the target part, regardless of whether or not the target part has substitutes or if the target part is the preferred or alternate substitute. The part is added as an alternate substitute to the target part and you must reposition the component within the structure.

Example:

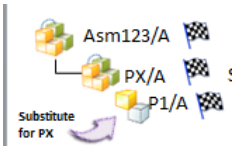
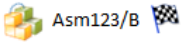
If the assembly is	And the target is	And the replacement is	Then the result of the addition is
			

- **Remove Part and Substitute**

  Removes the target part in a structure if the target part has no substitutes or it is a preferred substitute.

  - If the target part is an alternate substitute, it is not removed.
  - If the target part is a preferred substitute, all the alternate substitutes are removed with the target part.

Example:

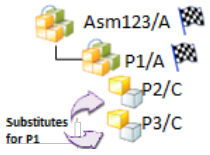
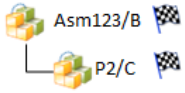
If the assembly is	And the target is	And the replacement is	Then the result of the removal is
		None	

- **Remove Part and Keep Substitute**

  Removes the target part in a structure if the target part has no substitutes or it is a preferred substitute.

  - If the target part is an alternate substitute, it is not removed.
  - If the target part is a preferred substitute, the first alternate substitute becomes the preferred substitute.

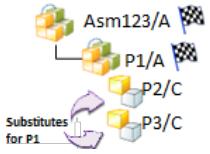
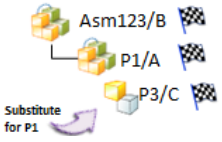
Example:

If the assembly is	And the target is	And the replacement is	Then the result of the removal is
		None	

- **Remove Substitute**

  Removes the target part in a structure if the target part is an alternate substitute. If the target part is not a substitute or is the preferred substitute, it is not removed.

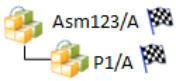
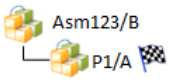
Example:

If the assembly is	And the target is	And the replacement is	Then the result of the removal is
		None	

- **Manual Update**

  Revises structures that contain the target part and does not make any structural changes. It does this regardless of whether or not the target part has substitutes or whether the target part is a preferred or alternate substitute. You must manually make the changes to the revised structures.

Example:

If the assembly is	And the target is	And the replacement is	Then the result of the removal is
		None	

Good part update practices

- By default, the **Mass Update** command is available to all users. It is highly recommended that you suppress access to this command using the Command Suppression application. It controls the suppression of the **Mass Update** menu option based on a user's group or role.
- Be sure to select **Propagate relations** when deriving the engineering change notice (ECN) from the engineering change request (ECR) to include the mass updates in the **Problem Items** and **Impacted Items** folders of the ECR.
- If you want to make a series of updates within the same change management process, select **Manage Update** to display the **Manage Updates** dialog box and add or remove updates.
- If no single user in your organization has permission to update all the assemblies in one mass update, rerun the mass update and attempt any updates that failed the first time. You could also use workflow access controls to grant permission to the user at the appropriate step in the mass update.
- When performing updates under a change management process, you can automatically submit all the updates to workflow as a single package.

Performing mass-updates of part instances under change management

About the mass-updating of parts using change management

Updating parts using change management are performed in two phases:

> Note:
>
> You can perform mass-updates on parts using either an ECR or an ECN. Mass-updates using an ECN are not dependent on creating an ECR first.

- **Authorization of the mass update** during an engineering change request (ECR).
- **Running the updates** during an engineering change notice (ECN).

Authorize part updates during an ECR

During an engineering change request (ECR) change process, you can authorize the updates to be made to an assembly. Authorizing the updates is the first phase in the two-phase change management process. The second phase is running the updates, which can be done in the engineering change notice (ECN) that is derived from the ECR.

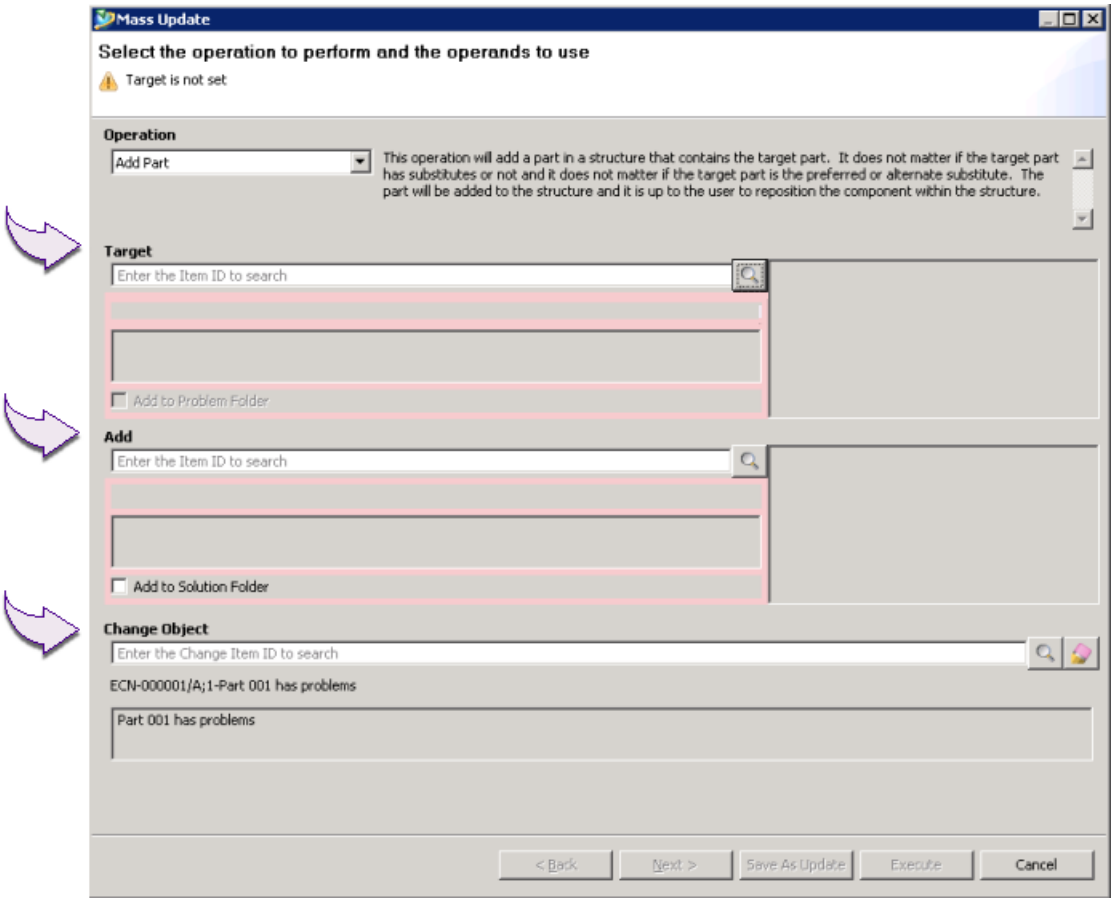
After the authorization of the update in the ECR, an authorization report appears. The authorization report is attached to the change object, along with all the operational data that tells what mass update changes are to be performed during the ECN.

Before the update is run, you can **validate and fix any synchronization issues with the update**. You can also add or remove updates.

> Note:
>
> You must have **write access** to add items to the **Problem Items** and **Impacted Items** folders of the change object.

1. If necessary, **create an ECR** to track the updates and submit it to workflow.
2. In My Teamcenter or Change Manager, select the part on which to base the change (an item revision) or the ECR.
3. Choose **Edit→Mass Update** .

   The Mass Update wizard appears.



4. From the **Operation** list, select the **type of operation** you want performed during the mass update.

5. In the appropriate boxes of the Mass Update wizard, **search for the parts and change objects** to be included in the authorization. If you selected a change object or a target part when you started the mass update, the object or part is already entered. If you selected to remove a part or perform a manual update, you do not select a replacement or additional part.

   - **Target**

     The part on which to base the change. The target part is used to identify the assemblies that are impacted by the mass update.

   - **Change object**

     The change object in which to store the parts, the requested updates, and the results of the mass updates.

> Note:
>
> The change object that you select must be in an ECR workflow and have no updates associated with it. If the change object you select contains an update, select a different change object or select **Manage Update** to **manage the updates** associated with the change object.

- **Replacement/Add**

  The part to be replaced or added to the target part, **depending on the operation selected for the mass update**. Defining a replacement part is not required if you are removing a part or performing a manual update.

> Note:
>
> The boxes that appear depend on the operation selected.

A thumbnail of the parts appear in the Mass Update wizard.

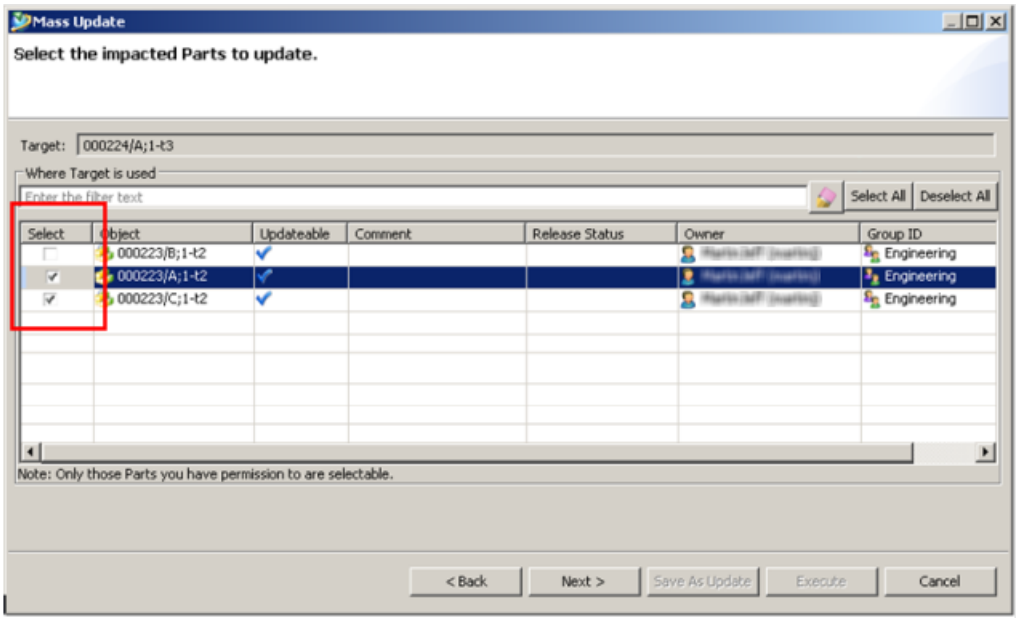
6. Choose the following options beneath the parts:

   - Click **Add to Problem folder** to store the target part in the change object's **Problem** folder.
   - Click **Add to Solution folder** to store the replacement part in the change object's **Solution** folder.

> Note:
>
> The labels of these options is **Add to Newstuff folder** until you select a change object.

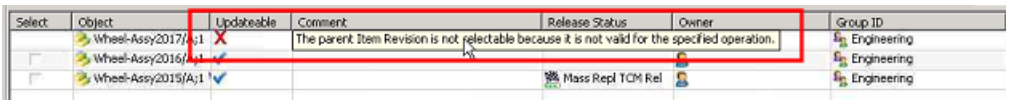
7. Click **Next**.

8. On the **Select the impacted Parts to update** page, in the **Select** column, select the impacted assemblies you want to update. You can only select assemblies to which you have write permission.



Tip:

- If you cannot edit an assembly, an **X** appears in the **Updatable** column.

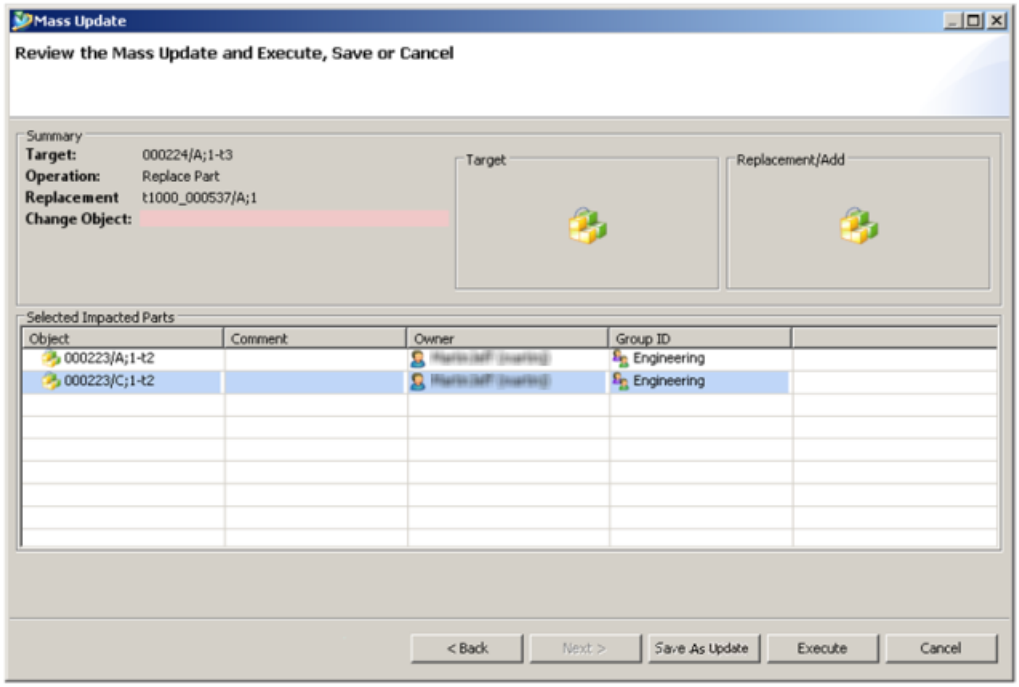


  There are many reasons why you cannot edit an assembly, including not having write access to it, the assembly does not belong to you, or the mass update operation does not perform that type of replacement or substitution (for example, the part already has an alternate substitute or it is the preferred substitute). **Review the operations for any limitations on substitutes**.

- To help make the selection process easier, enter a keyword in the **Where Target is used** box to filter the table and reduce the amount of information being displayed.
- To remove all table keyword filters in the **Where Target is used** box, click **Erase**.
- To select all assemblies, click **Select All** and to clear the selection, click **Deselect All**.

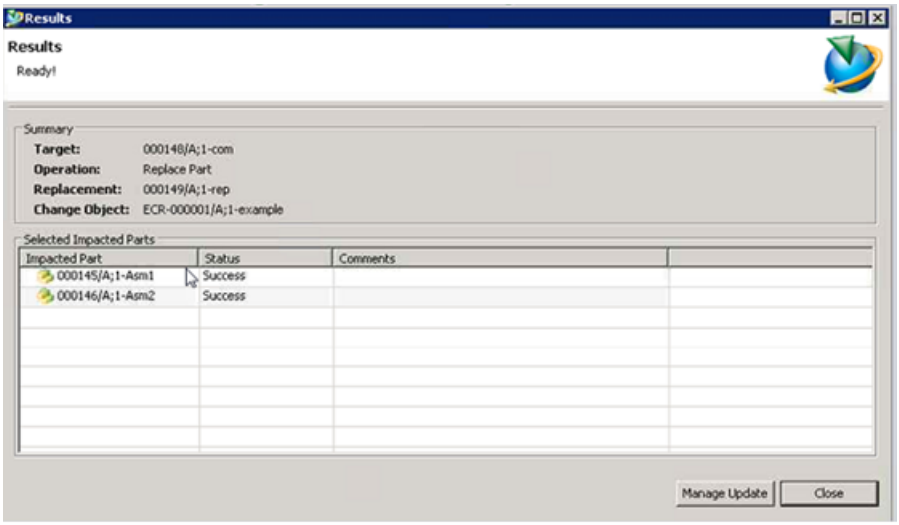
9. Click **Next**.

   The **Review the Mass Update and Execute, Save or Cancel** page appears.



10. Confirm the selection and select **Save As Update**.

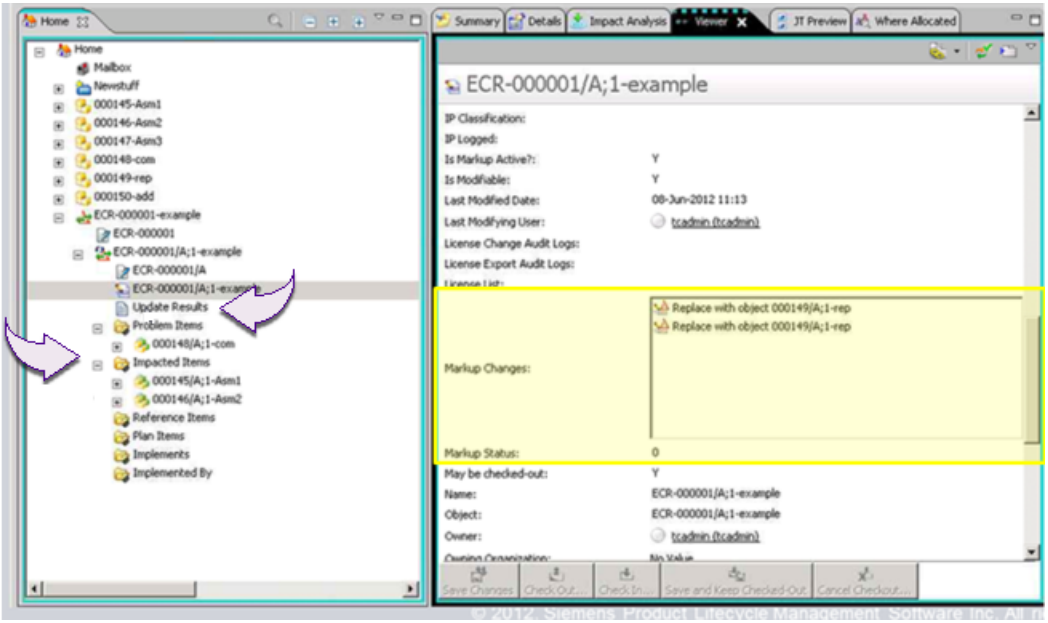
    The results of the update appears.



11. Review the results of the mass update, and select **Close**.

> Note:
>
> You can also select **Manage Update** to display the **Manage Updates** dialog box and **add or remove updates**. This is particularly helpful if you want to make a series of updates within the same change management process.

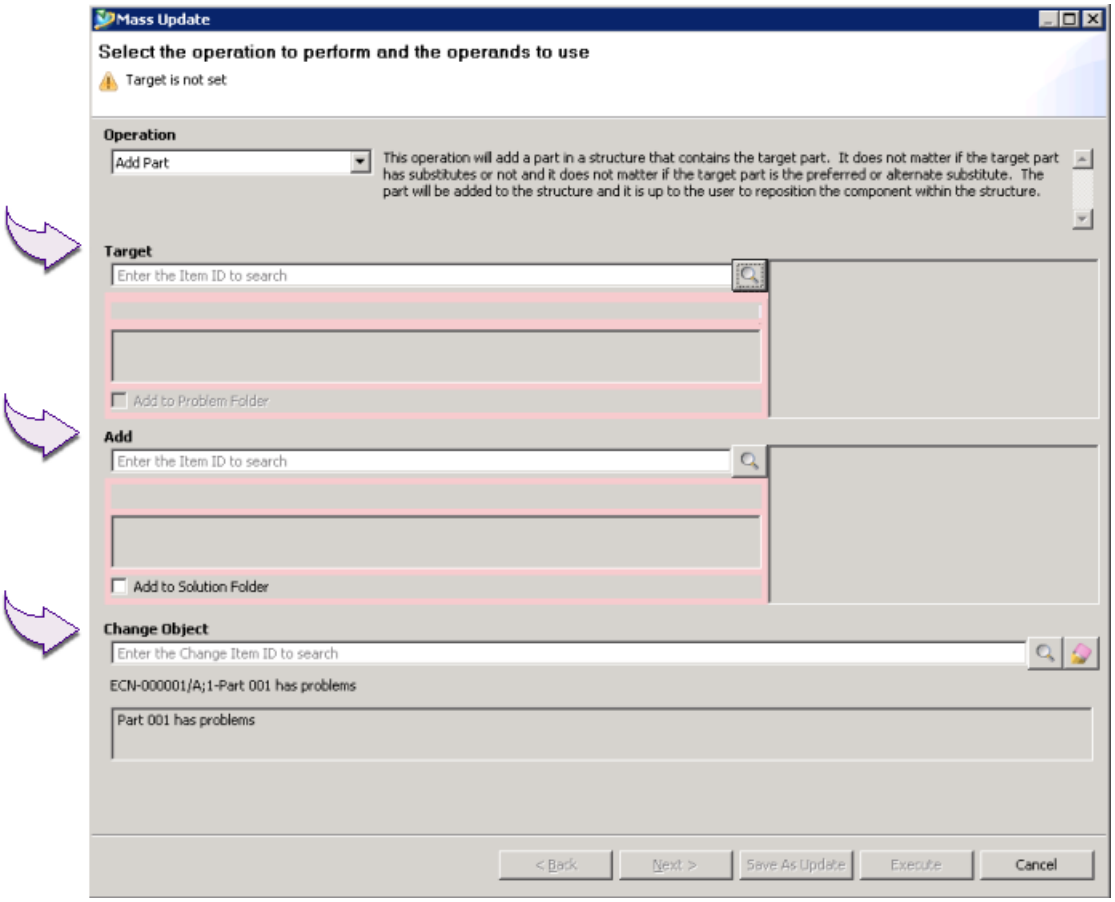
The Mass Update wizard updates the **Problem** and **Impacted** folders of the change object. It also adds the results of the update to the ECR.



Search for parts or change objects while updating parts

1. In the Mass Update wizard, in the **Target**, **Add/Replacement** or **Change object** box, enter the search criteria for the part or change object and click the **Search** tool, as shown in the figure. The figure shows the Mass Update wizard when adding a part.

> Note:
>
> Entering a change object is optional when performing a mass update in a single step using My Teamcenter.



2. In the **Search** dialog box that appears, enter additional search criteria and click **Search**.

> Tip:
>
> To clear the search criteria, click **Clear**.

3. From the table, select the part or change object.

> Tip:
>
> The table displays a maximum of 10 items. Use the buttons along the bottom to navigate through the table. You can also click a number to go to that page.

4. Click **OK**.

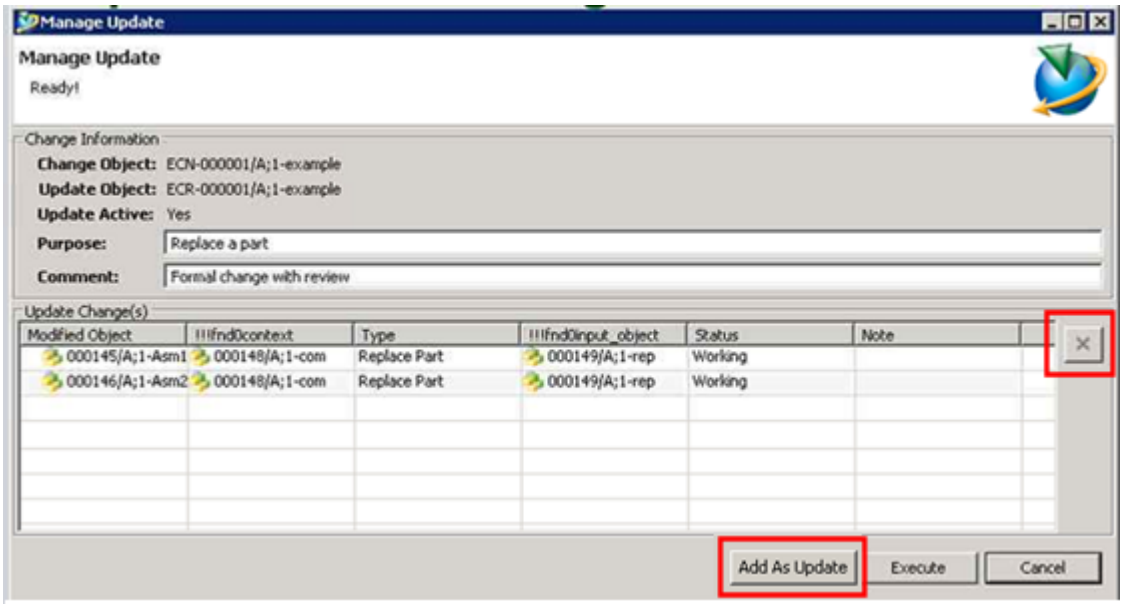
Manage part updates during an ECR

You can manage the updates to an engineering change request (ECR) while they are still under the control of the ECR process (they have been authorized but not run). For example, you can add additional updates or remove an update.

1. In My Teamcenter or Change Manager, select either a part or the ECR with the authorized update.

2. Choose **Edit→Mass Update** .

   The updates that have already been added appear.



3. Do one of the following:

   - To remove an update, select the update and to the right of the table, click **X**.
   - To add updates, click **Add As Update** to display the Mass Update wizard. You can also **authorize another update**.

     Note:

     You cannot change the change object selection. The change object is locked because the update is associated with that change object.

Run part updates during an ECN

After the engineering change request (ECR) authorizing a mass update is approved, start an engineering change notice (ECN) to run the mass update.

The process updates the **Solution Items** folder of the ECN.

Note:

You must have write access to add items to the **Solution Items** folder of the ECN.

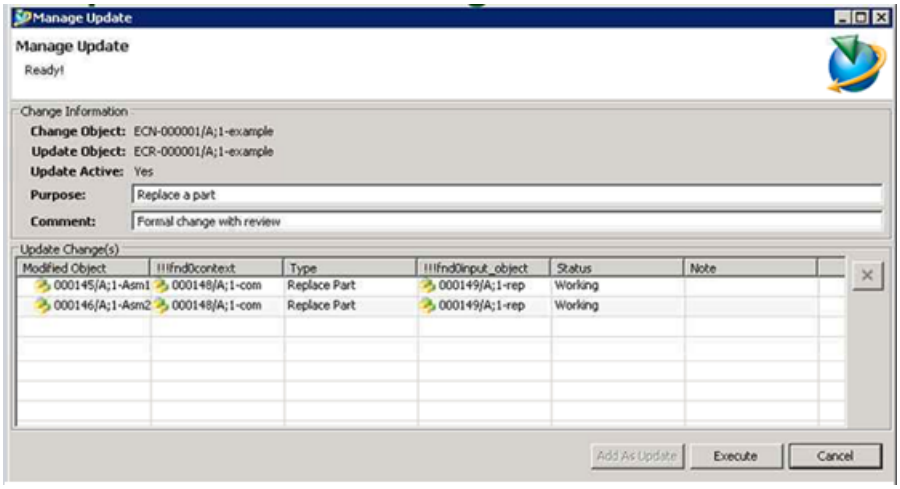
1. Derive an ECN from an ECR that contains an authorized mass update and submit it workflow.

   > Note:
   >
   > Be sure to select **Propagate relations** when deriving the ECN from the ECR to include the mass updates in the **Problem Items** and **Impacted Items** folders of the ECR.

2. In My Teamcenter or Change Manager, select either a part (item revision) or the ECN with the authorized update.

3. Choose **Edit→Mass Update** .

   The **Manage Update** dialog box appears showing the updates to be run.

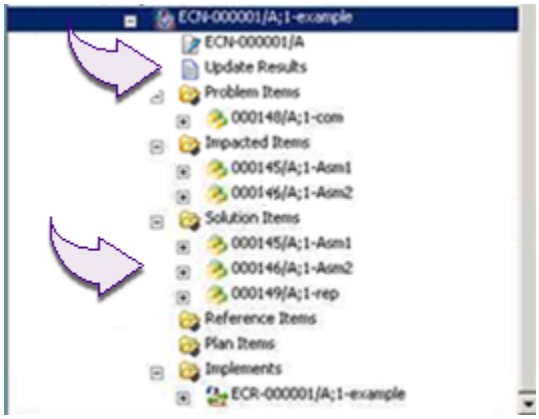


4. Click **Execute**.

   A **Mass Update Execution** report appears with the results of the mass update.

5. Review the report, and if necessary, fix any problems and run the parts replacement again.

The mass update creates a new revision for all the released assemblies, checks out all the assemblies to which you have write access, and adds the results in the **Mass Update Execution** report to the ECN.



Rerun part updates during an ECN

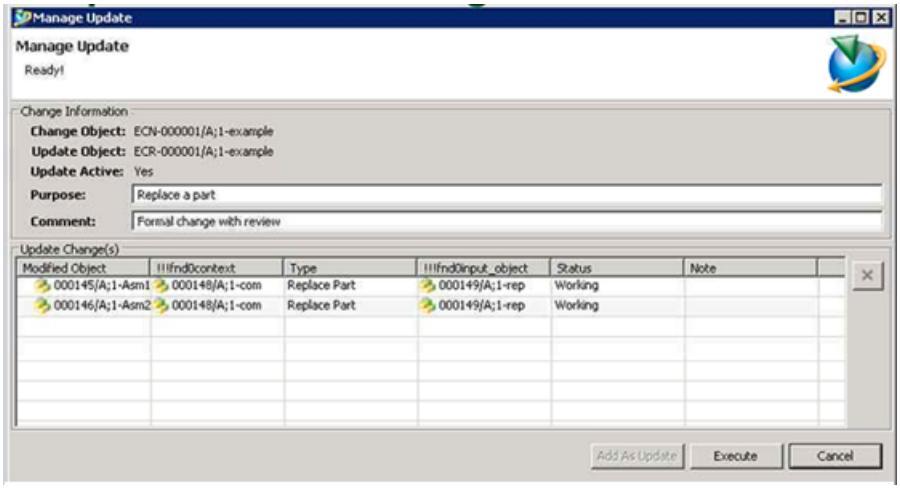
During an open engineering change notice (ECN), you can run a mass update again to replace parts if there were failures during the original run that you have corrected.

> Note:
>
> Rerunning a mass update only performs updates on changes that did not run or failed. Successful updates are not run again.

1. In My Teamcenter or Change Manager, select an ECN with an authorized update.

2. Choose **Edit→Mass Update** .

   The remaining updates to run appear.

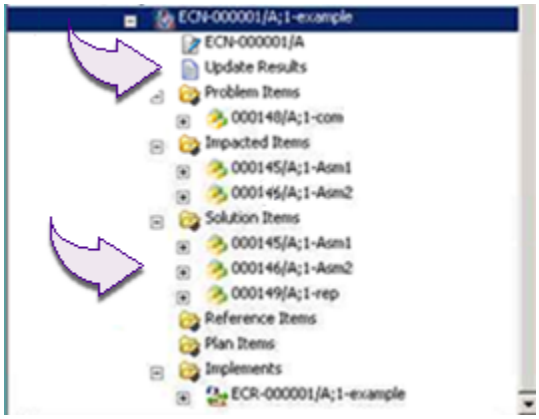


3. Click **Execute**.

   A **Mass Update Execution** report appears with the results of the mass update.

4. Review the report.

The mass update creates a new revision for all the released assemblies, checks out all the assemblies to which you have write access, and adds the results in the **Mass Update Execution** report to the ECN.



Performing mass-update of part instances in a single phase

Mass-update part instances in a single phase

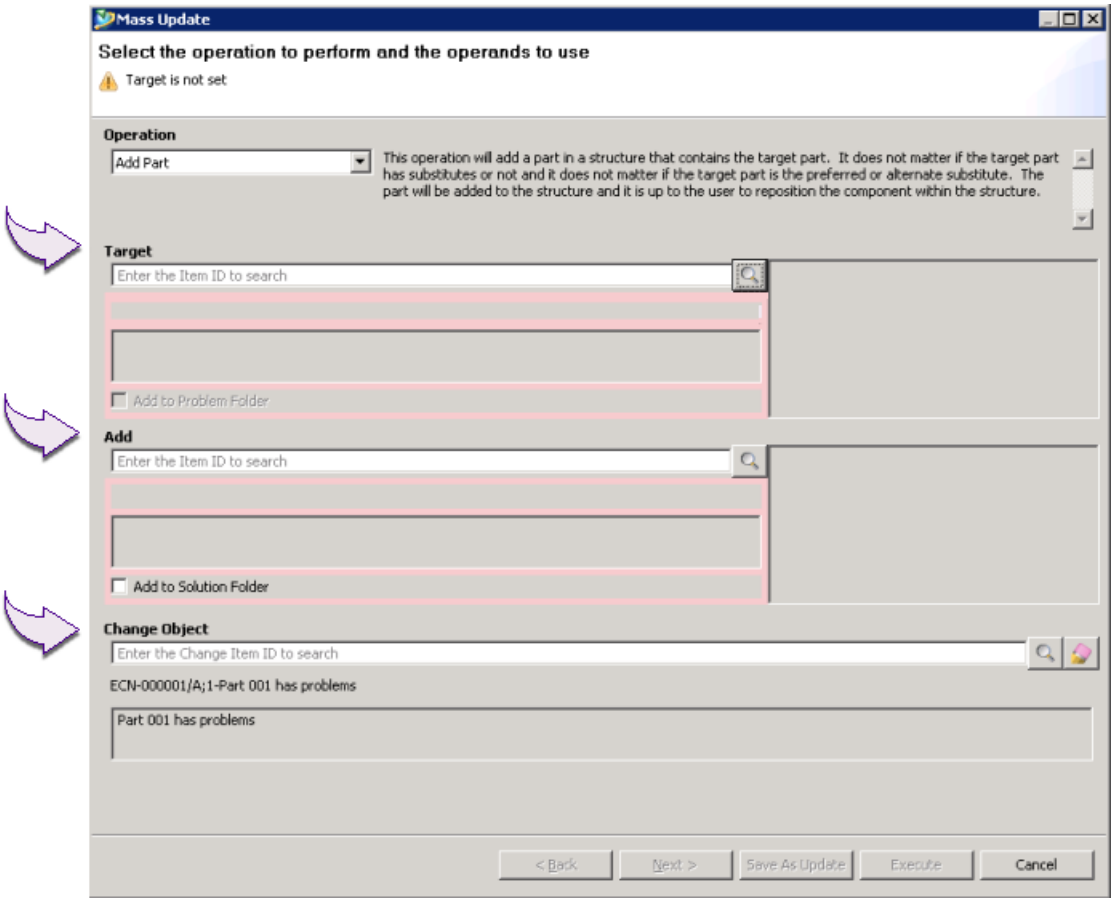
Using My Teamcenter, you can replace parts in an assembly in one phase. After the update, an authorization report appears, explaining the results of the update. You can optionally select a change object in which to store the updates. If you do not select a change object, the updates are stored in your **Newstuff** folder.

> Note:
>
> You must have write access to the assemblies to be updated.

1. In My Teamcenter, select the part on which to base the update.

2. Choose **Edit→Mass Update** .

   The Mass Update wizard appears.



3. From the **Operation Type** list, select the **type of operation** you want performed during the mass update.

4. In the appropriate boxes of the Mass Update wizard, **search for the parts** to be included in the mass update.

   - **Target**

     The part on which to base the change. The target part is used to identify the assemblies that are impacted by the mass update.

   - **Replacement/Add**

     The part to be replaced or added to the target part, **depending on the operation selected for the mass update**. Defining a replacement part is not required if you are removing a part or performing a manual update.

   - **Change object**

     The change object in which to store the parts, the requested updates, and the results of the mass updates.

Note:

- The boxes that appear depend on the operation you selected.
- Selecting a change object is optional when performing a single-step process. If you do not select a change object, the updates are stored in your **Newstuff** folder.

Thumbnails of the parts appear in the Mass Update wizard.

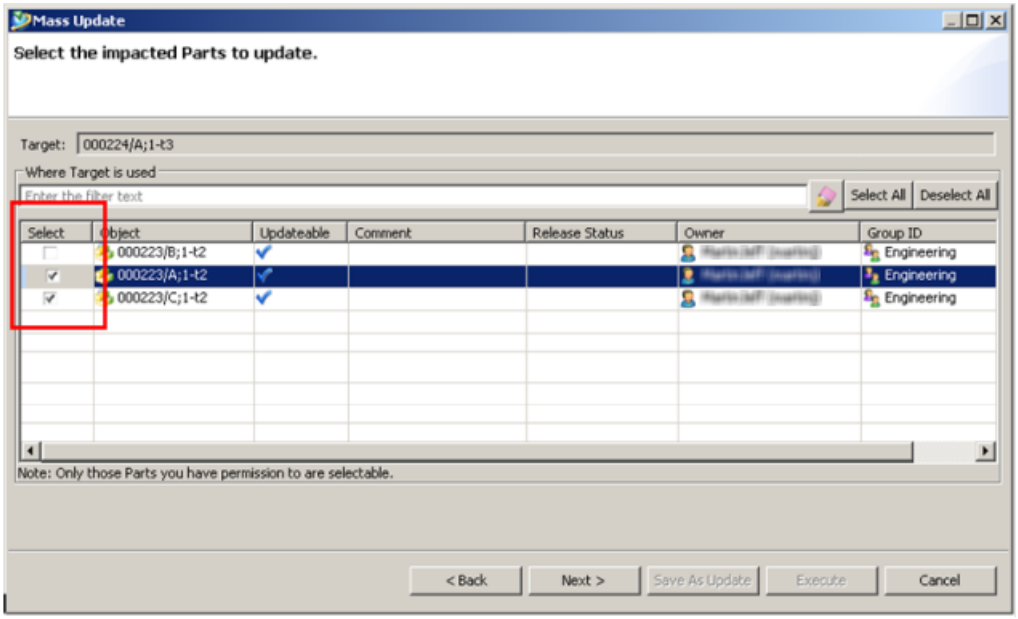
5. Beneath each part, click **Add to Newstuff folder** to store the results of the update in the **Newstuff** folder.

Note:

Select the **Add to Newstuff folder** to ensure you have an update history. You can use Audit Manager to view who performed the operation.

6. Click **Next**.

7. In the **Select** column of the **Select the impacted Parts to update** dialog box, select the impacted assemblies you want to update. You can only select assemblies to which you have write permission.



Tip:

- If you cannot edit an assembly, an **X** appears in the **Updatable** column.

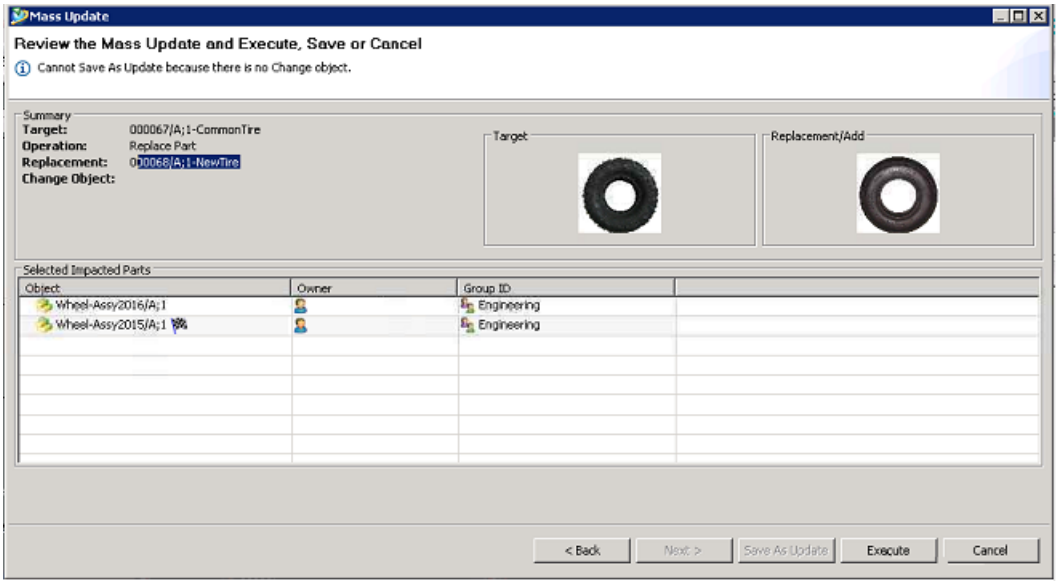
There are many reasons why you cannot edit an assembly, including not having write access to it, the assembly does not belong to you, or the mass update operation does not perform that type of replacement or substitution (for example, the part already has an alternate substitute or it is the preferred substitute).

Review the operations for any limitations on substitutes.

- To help make the selection process easier, type a keyword in the **Where Target is used** text box to filter the table and reduce the amount of information being displayed.
- To remove all table keyword filters in the **Where Target is used** text box, click **Erase**.
- To select all assemblies, click **Select All** and, to clear the selection of all assemblies, click **Deselect All**.

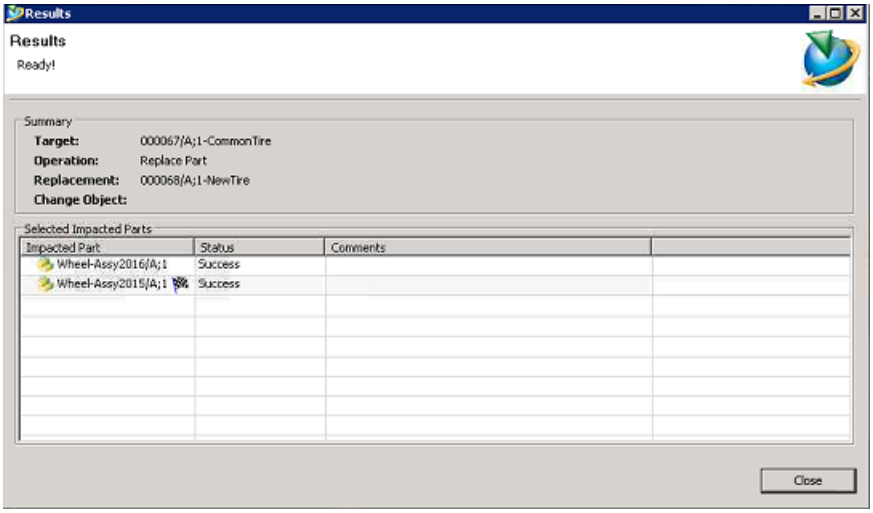
8. Click **Next**.

   The **Review the Mass Update and Execute, Save or Cancel** page appears.

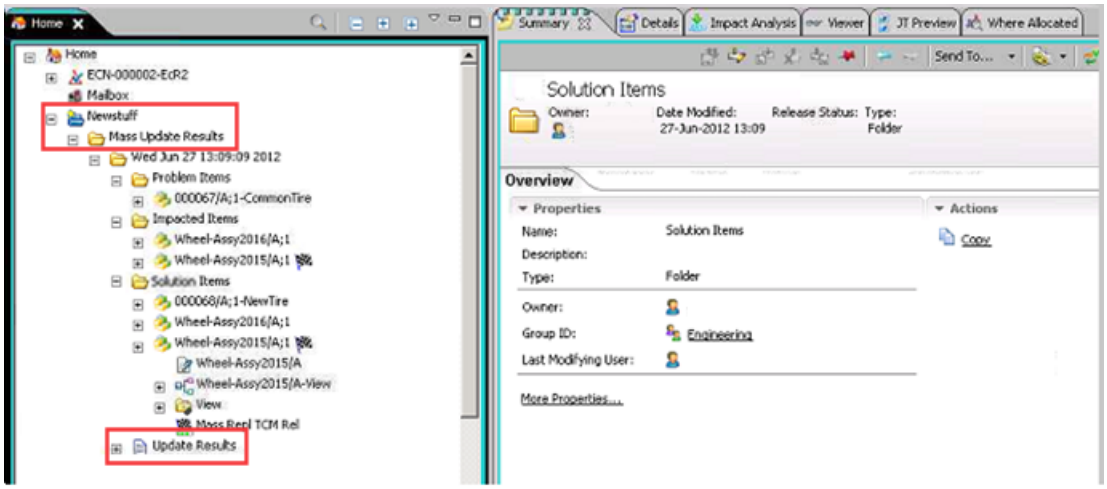


9. Confirm the selection and select **Execute**.

   The results of the update appears.



10. Review the results of mass update, and select **Close**.



Folders that store the part mass updates

You can optionally store the results of a mass update that you perform in a single phase in the **Newstuff** folder, as shown in the figure. The results appear under the subfolder **Mass Update Results** with the actual update stored under a folder with the date of the update. Under the date folder are folders containing the results, which are the same types of folders used to manage a change. A report of the results is also stored in the folder.

- **Problem Item**

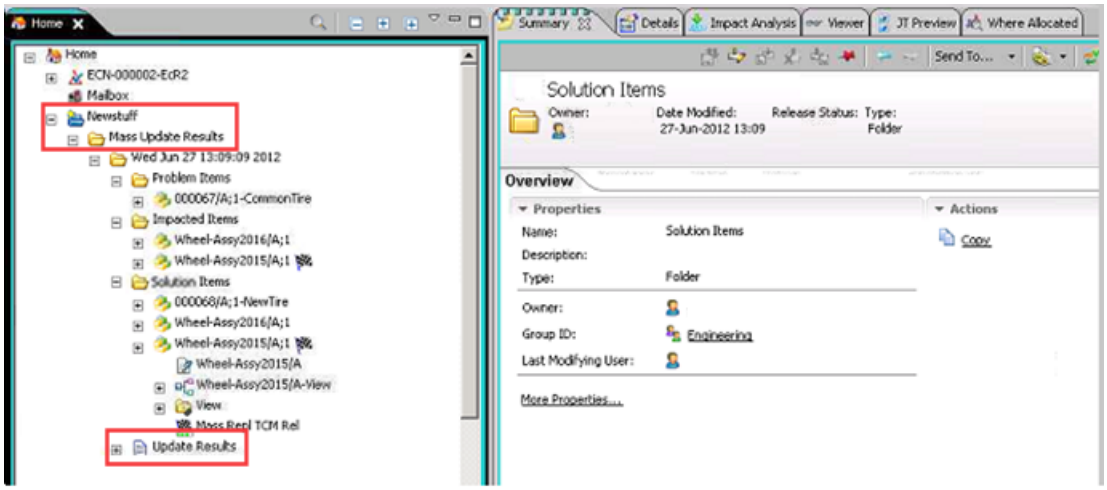
  The target item (the item revision that was added or replaced).

- **Impacted Items**

  The assemblies that were impacted by the update.

- **Solution Items**

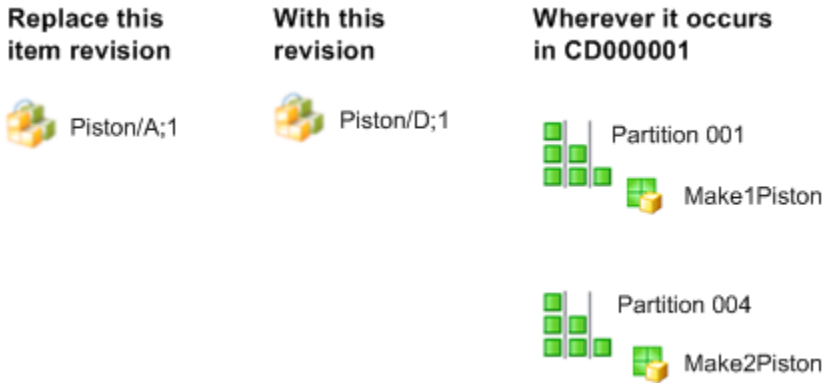
  The additional or replacement part (the item revision that was added or that replaced the target).



Performing mass-updates of source objects in 4GD design elements

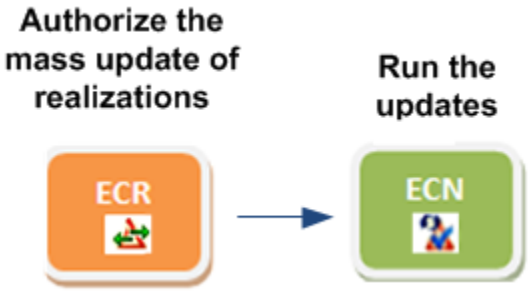
About mass-updating source objects in 4GD design components

You can update, in bulk, the source objects of multiple reuse design components using the **Mass Update Realization** wizard. For example, you can identify and automatically replace the source object of every realization of an impacted part with its solution item everywhere it occurs. You can refine the update to include only specific product designs or partitions. For example, you could update, in bulk, all the realizations of a piston in two of the functional partitions of the product design **CD000001**.



You can make the change in two ways:

- In Change Manager, using change objects to track and manage the updates in a two-phase process.



- In My Teamcenter, using a single-phase update process without a change object.

The mass update realization process automates the creation of the necessary revisions. It also tracks the item revisions that you cannot edit (for example, because they belong to another group). You view the results of the mass update on the screen as well as in a realization update report.

Additionally, the updates are stored in the folders of the associated change object or in the **Newstuff** folder if you perform the update without a change object. For example, new replacement item revisions and updated impacted object revisions are automatically added to the **Solution Items** folder.

Note:

- Only reuse design components with a source object of an item revision can be updated.
- Subordinate design components cannot be updated.
- By default, the **Mass Update Realization** command is available to all users. Siemens Digital Industries Software highly recommends that you limit access to this command using the Command Suppression application. It controls the suppression of the **Mass Update Realization** menu option based on a user's group or role.

  To learn how to suppress the **Mass Update Realization** menu option, see the *Teamcenter Administration*.
- Mass update realization is available in the rich client only.
- You must have the necessary permissions to perform a mass update realization and if you want to use a change object for the process, the **4th Generation Design Integration for Change Management** template must be installed.

Good practices for performing mass-updates of source objects

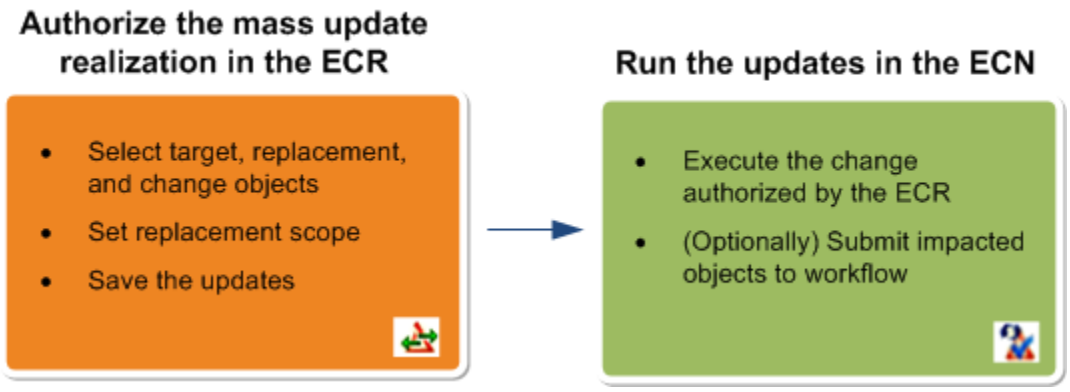
- By default, the **Mass Update Realization** command is available to all users. Siemens PLM highly recommends that you suppress access to this command using the Command Suppression application. It controls the suppression of the **Mass Update Realization** menu option based on a user's group or role.

To learn how to suppress the **Mass Update Realization** menu option, see the *Rich Client Customization*.

Performing mass-updates of source objects using change management

About the mass-updating of source objects using change management

During an engineering change request (ECR) change process, you can authorize the updates to be made to design elements. Authorizing the updates is the first phase in the two-phase change management process. The second phase is running the updates, which can be done in the engineering change notice (ECN) that is derived from the ECR.



After authoring the updates in the ECR, a mass update realization update report is generated. This report is attached to the change object.

Note:

- You must have write access to add items to the **Problem Items** and **Impacted Items** folders of the change object.
- You can add/remove updates only when the ECR has the change states for creating an impacted item.

Learn more about configuring the mass-updating of objects.

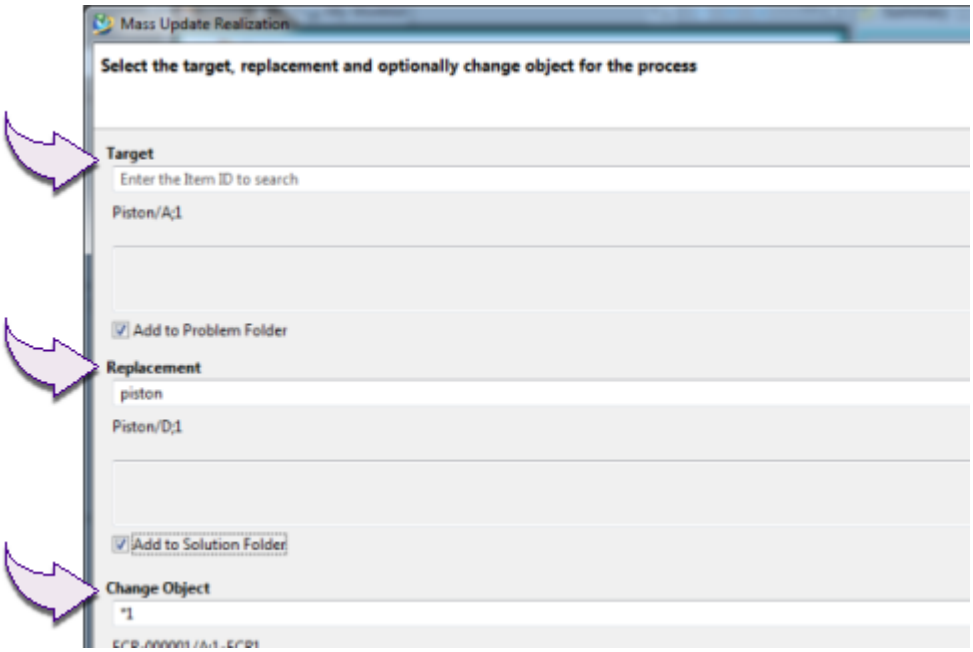
Phase 1 - Authorize mass updates using an ECR

Select the target, replacement, and change objects

1. If necessary, **create an ECR** to track the updates.
2. In My Teamcenter or Change Manager, select the item revision on which to base the change or the ECR.

3. Choose **Edit→Mass Update Realization**.

The Mass Update Realization wizard appears.



It displays three areas for specifying the objects to be replaced and the change object to manage them.

- **Target Object**

  The item revision on which to base the change. The Mass Update Realization wizard searches for realizations of this object within the specified collaborative designs and/or partitions.

- **Replacement Object**

  The part to be replaced for the target object. It can be a revision of a different item than the target object. All realizations of the target object are updated to use this object as their source object.

- **Change object**

  The change object in which to store the parts, the requested updates, and the results of the mass updates.

  > Note:
  >
  > If the change object you select contains an update, the **Manage Update** button appears on the first page of the wizard for you to **manage the updates associated with the**

change object. The **Manage Update** button only appears if the change object contains existing markups.

4. In the **Target Object**, **Replacement Object**, and **Change Object** boxes, enter the objects to be included in the update. You can also search for the objects.

5. Choose the following options beneath the parts:

   - Click **Add to Problem folder** to store the target part in the change object's **Problem** folder.
   - Click **Add to Solution folder** to store the replacement part in the change object's **Solution** folder.

   Note:

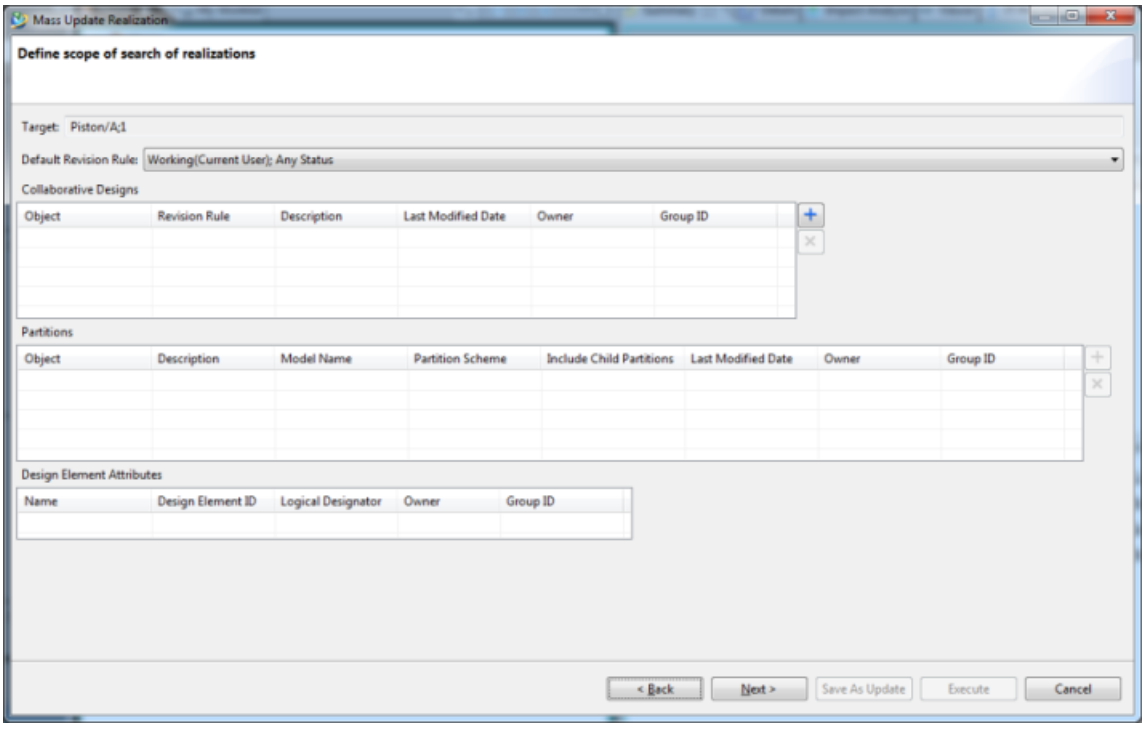
   The labels of these options is **Add to Newstuff folder** until you select a change object.

6. Click **Next** and set the scope of the replacement.

Set the scope of the mass updates

Realizations are only searched for in the selected collaborative designs and/or partitions.

1. In the corresponding section of the **Define scope of search of realizations** page, set how you want to limit the replacement of realizations.



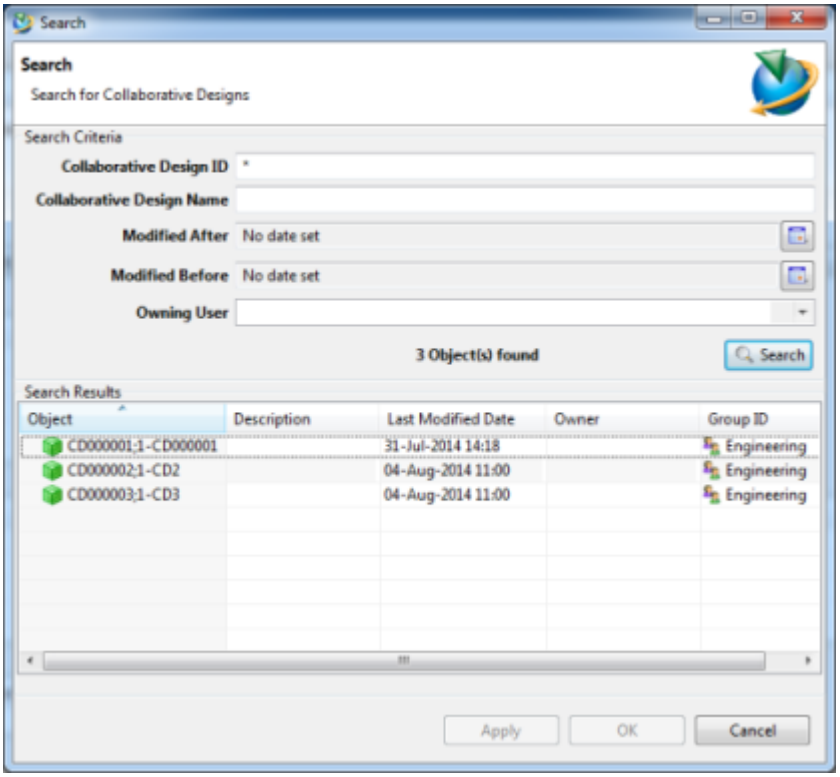
- **Default Revision Rule**

  Select the revision rule to be applied when finding partitions and design elements.

- **Collaborative Designs**

  a. Click the plus (+) next to the **Collaborative Design** table.

  b. In the **Search for Collaborative Designs** dialog box, set the ID, name, modification dates, and owning user attributes for the collaborative designs to be included in the updates.



  c. Click **Apply**.

  The results of the search appear.

  d. (Optional) Set the values again to search for a different collaborative design.

  e. Click **Apply** or when finished, click **OK**.

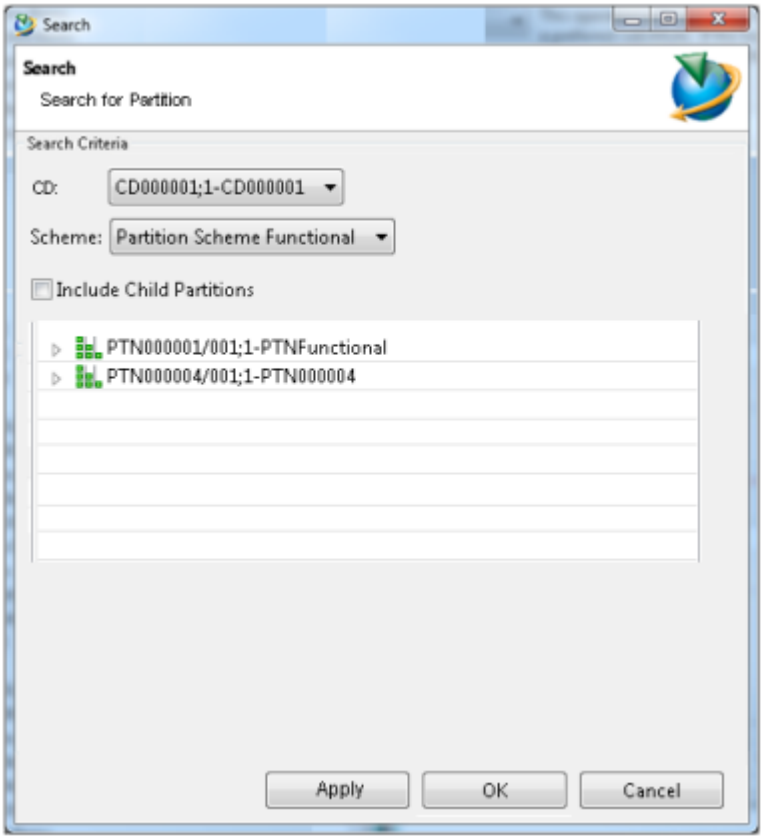
  Selected collaborative designs appear in the **Collaborative Design** table of the **Define scope of search of realizations** page.

- **Partitions**

Realizations are only searched for in the selected partitions for the corresponding collaborative designs.

a. Click the plus (+) next to the **Partitions** table.

b. In the **Search for partition** dialog box, set **CD** to a previously found collaborative design.



c. Set **Scheme** to a partition scheme type from the list of types available for the selected collaborative design.

The top-level partitions of that scheme type in the given mode appear.

d. Expand any of the listed partition and select the partitions to include in the search.

e. Select **Include Child Partitions** to include the child partitions of the selected partitions in the search scope.

f. Click **Apply**.

The selected partitions from the results of the search will appear in the partition table of **Define scope of search of realizations** page.

g. (Optional) Set the values again to search for different partitions.

h. Click **Apply** or when finished, click **OK**.

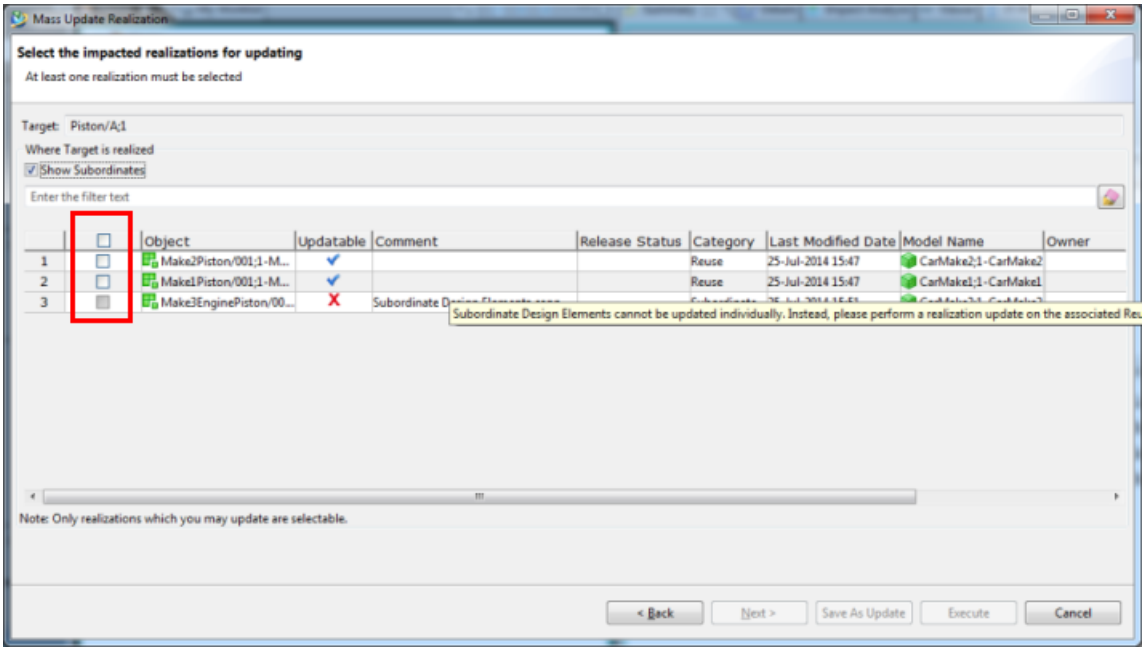
- **Design Elements Attributes**

  Define criterion for including design elements in the search results. The criteria is applied when searching for design elements. User can define criteria based on the name, ID, logical designator, owner, and owning group.

> Tip:
>
> To remove a collaborative design or partition, select the collaborative design or partition you want to remove, and click **X** next to the table.

2. Click **Next**.

   The Mass Update Realization wizard displays all the realizations (reuse and subordinate design elements) of the target object. Subordinate design elements are hidden by default. Display the subordinate design elements by clicking **Show subordinate DEs**.



3. (Optional) Filter the design elements further by entering text in the box that appears below **Where Target is realized**. You can clear the filter text by removing the text or clicking the **Clear** button  .

4. In the **Select** column (the column with check boxes and highlighted in red in the earlier figure), select the impacted realizations you want to update. You can only select realizations to which you have write permission.

If a realization cannot be updated, an **X** appears in the **Updatable** column. The **Comment** columns state the reason for you not being able to update it. In addition, the check box in the **Select** column cannot be selected (it is displayed in gray).

5. Do one of the following depending on the type of process:

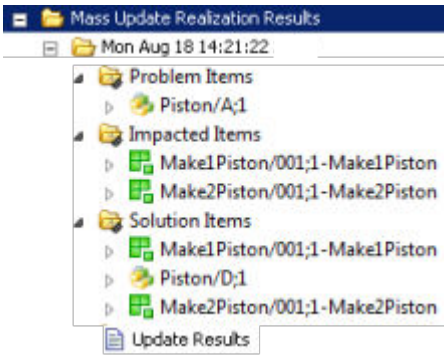
   - If you are updating realizations using the two-phase change management process, click **Next** and continue to the next step to **save the update for execution later**.

   - If you are using the single-phase process in My Teamcenter:

     a. Click **Execute**.

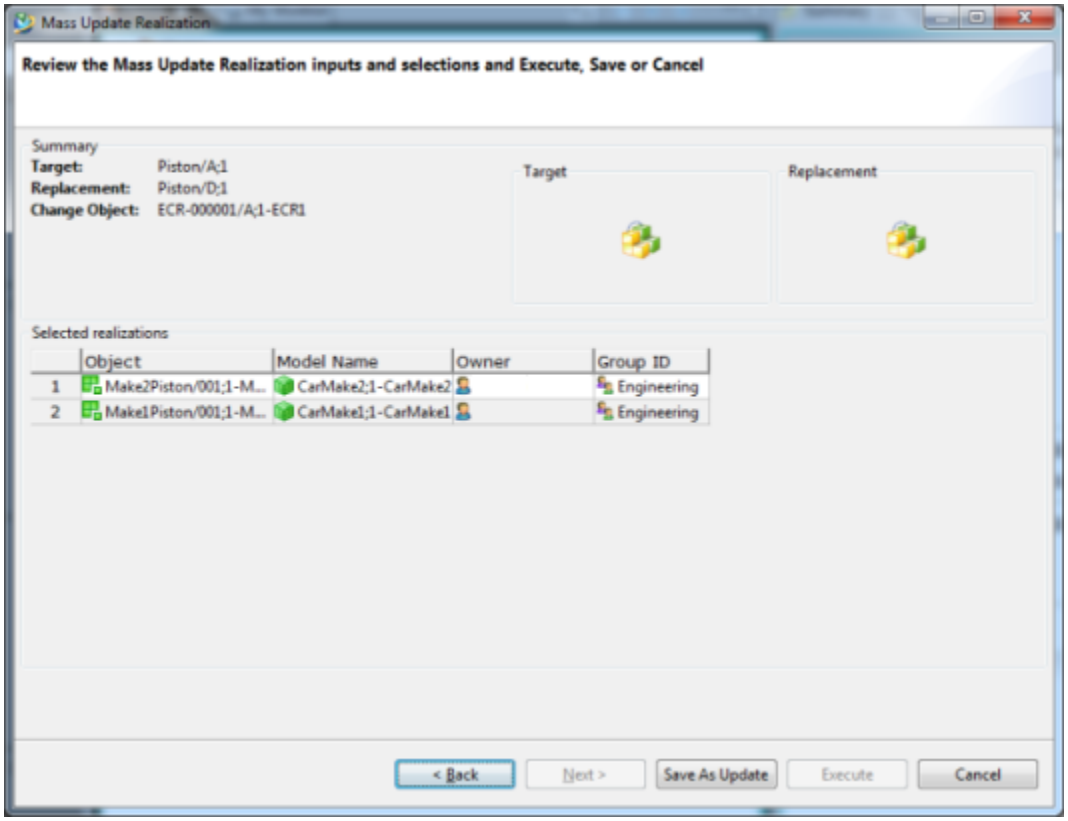
     b. Review the results of mass update, and select **Close**.

        The mass updates appear in the **Newstuff** folder as shown in the figure.



Save the update for execution later

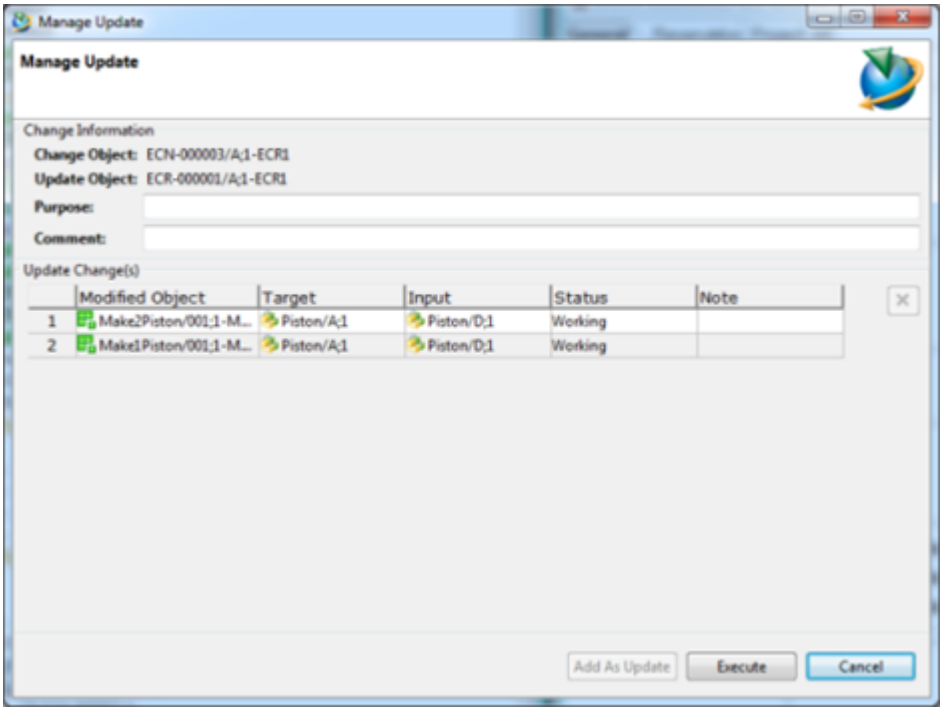
After clicking **Next** in the previous step, the **Review the Mass Update Realization and Execute, Save or Cancel** page appears.



1. (Optional) Click **Back** to make changes to the inputs.

2. Confirm the selection and select **Save As Update**.

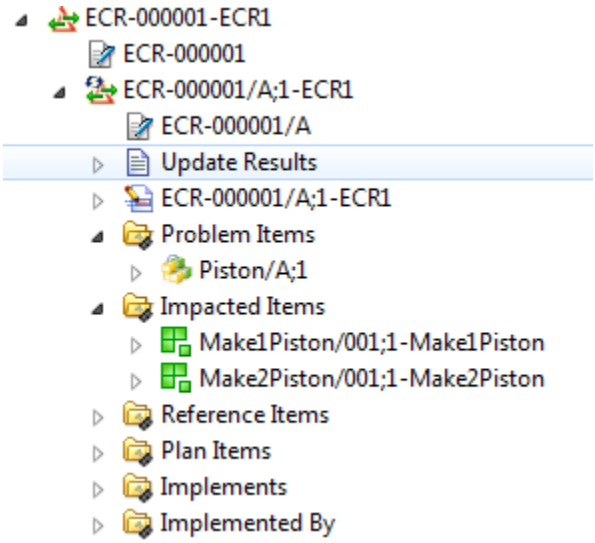
   A dialog box appears that informs you of which of the updates were successfully saved for later execution and which were not.



3. Review the results of the save-as update, and optionally **add or remove updates**.

> Note:
>
> When you select **Add As Update**, a page appears to let you select the target and replacement objects (but not the change object). This is particularly helpful if you want to make a series of updates within the same change management process.

The Mass Update Realization wizard updates the **Problem** and **Impacted** folders of the change object. It also adds the results of the update to the ECR.



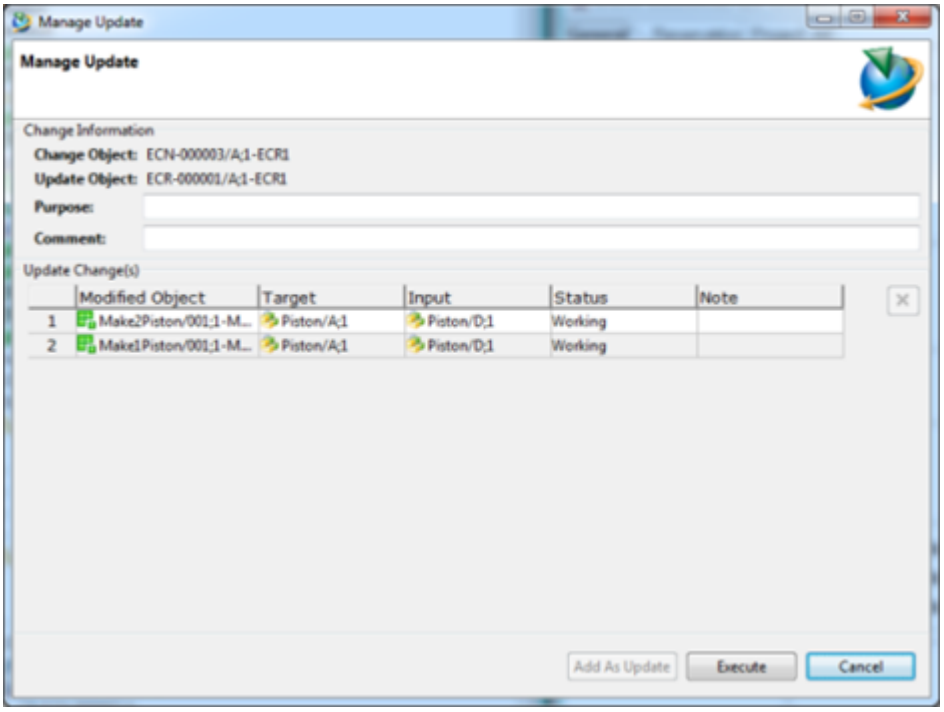
Edit the authorized update before running

You can manage the updates to an engineering change request (ECR) while they are still under the control of the ECR process (they have been authorized but not run). For example, you can add additional updates or remove an update.

1. In My Teamcenter or Change Manager, select either a part or the ECR with the authorized update.

2. Choose **Edit→Mass Update Realization** .

   The updates that have already been added appear.



3. Do one of the following:

   - To remove an update, select the update and to the right of the table, click the **X**.
   - To add updates, click **Add As Update** to display the Mass Update Realization wizard and authorize another update.

     Note:

     You cannot change the change object selection. The change object is locked because the update is associated with that change object.

Phase 2 - Run the authorized update using an ECN

Run the authorized updates using an ECN

After the engineering change request (ECR) authorizing a mass update is approved, start an engineering change notice (ECN) to run the mass update.

The process updates the **Solution Items** folder of the ECN.

> Note:
>
> You must have write access to add items to the **Solution Items** folder of the ECN.

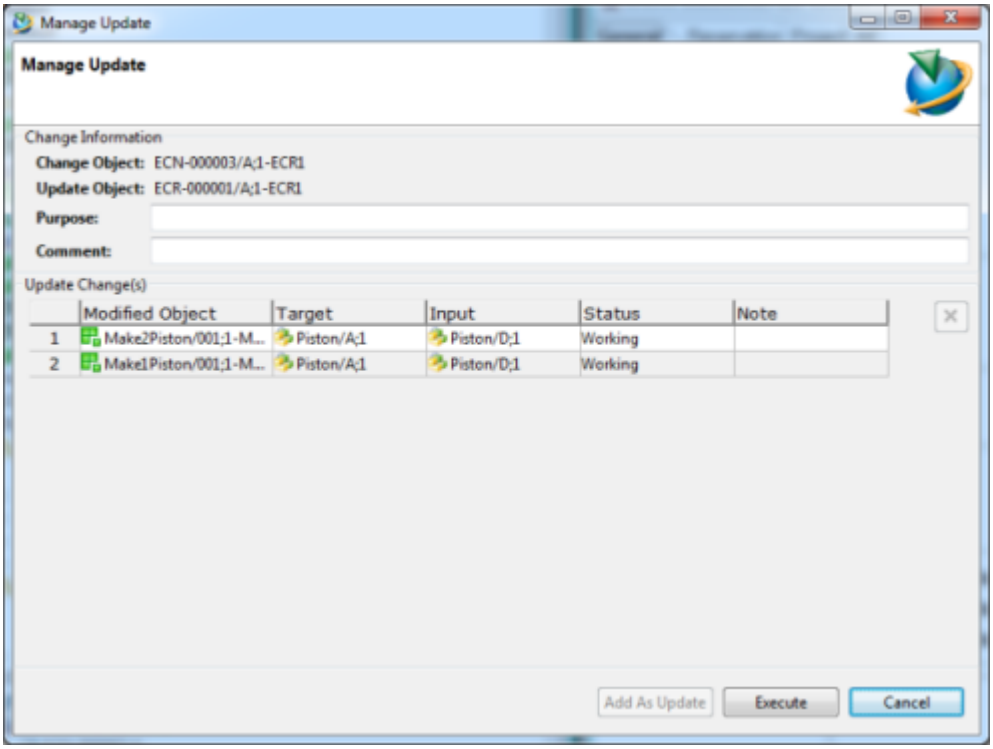
1. Derive an ECN from an ECR that contains an authorized mass update.

   > Note:
   >
   > Be sure to select **Propagate relations** when deriving the ECN from the ECR to include the mass updates in the **Problem Items** and **Impacted Items** folders of the ECR.

2. In My Teamcenter or Change Manager, select either a part (item revision) or the ECN with the authorized update.

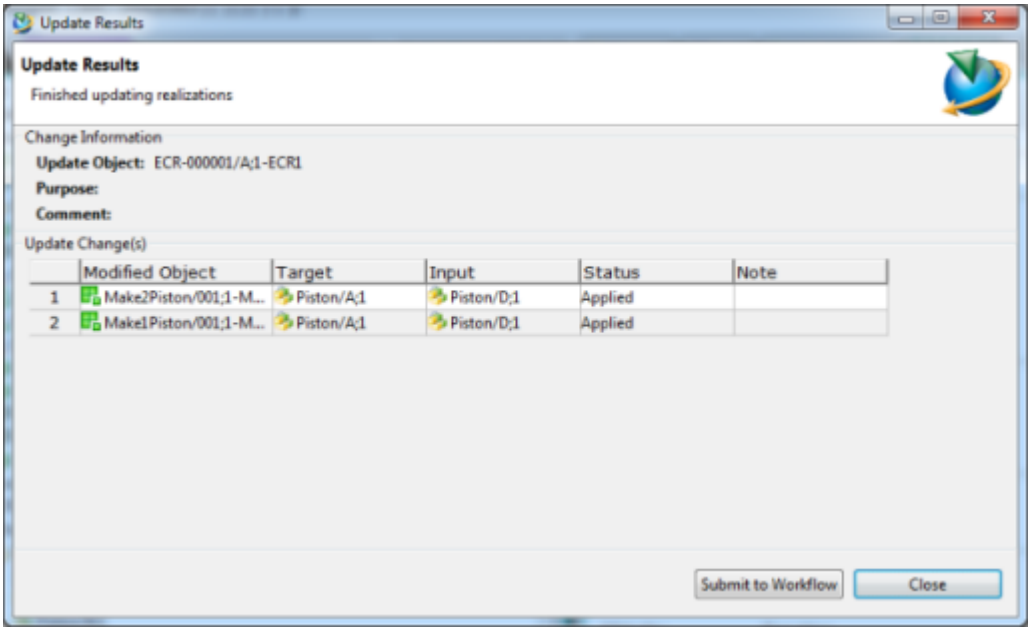
3. Choose **Edit→Mass Update Realization**  .

   The **Manage Update** dialog box appears showing the updates to be run.



4. Click **Execute**.

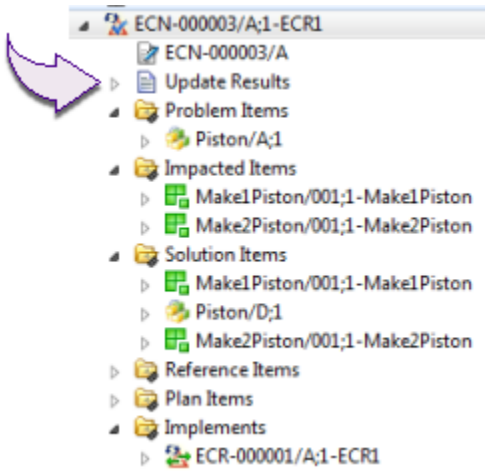
   The **Update Results** dialog box appears with the results of the mass update.



5. Review the results, and if necessary, fix any problems and rerun the ECN. You can also click **Submit to Workflow** to open a workflow dialog box and submit the impacted objects selectively

to workflow. For example, once update realization is completed, you many want to notify stakeholders.

The Mass Update Realization wizard creates a new revision for all the released design elements, updates all the design elements to which you have write access, and adds the results to the **Update Results** report to the ECN.



Rerun the authorized updates using an ECN

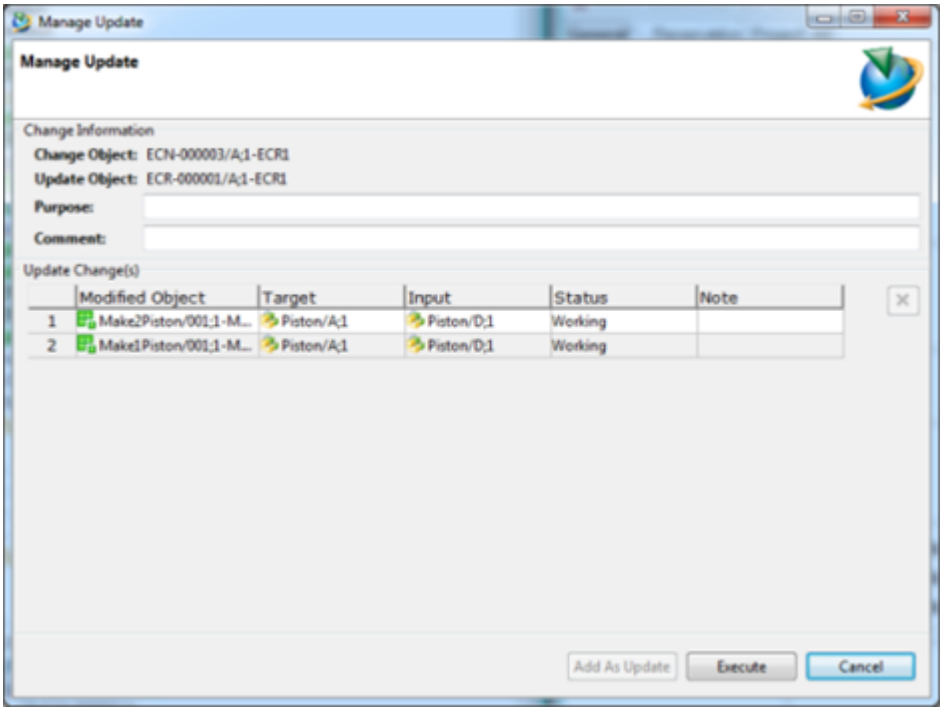
During an open engineering change notice (ECN), you can run a mass update again to replace realizations if there were failures during the original run that you have corrected.

> Note:
>
> Rerunning a mass update only performs updates on changes that did not run or failed. Successful updates are not run again.

1. In My Teamcenter or Change Manager, select an ECN with an authorized update.

2. Choose **Edit→Mass Update Realization** .

   The **Manage Update** dialog box appears.

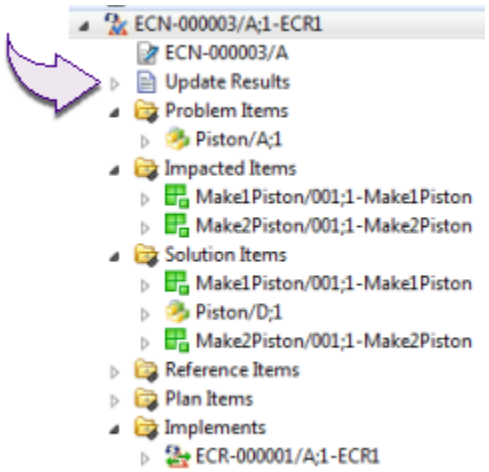


3. Click **Execute**.

   A dialog box appears with the results of the mass update realization.

4. Review the results.

The Mass Update realization creates a new revision for all the released design elements, checks out all the design elements to which you have write access, and adds the results in the **Update Results** report to the ECN.



Performing mass-updates of source objects in a single phase using My Teamcenter

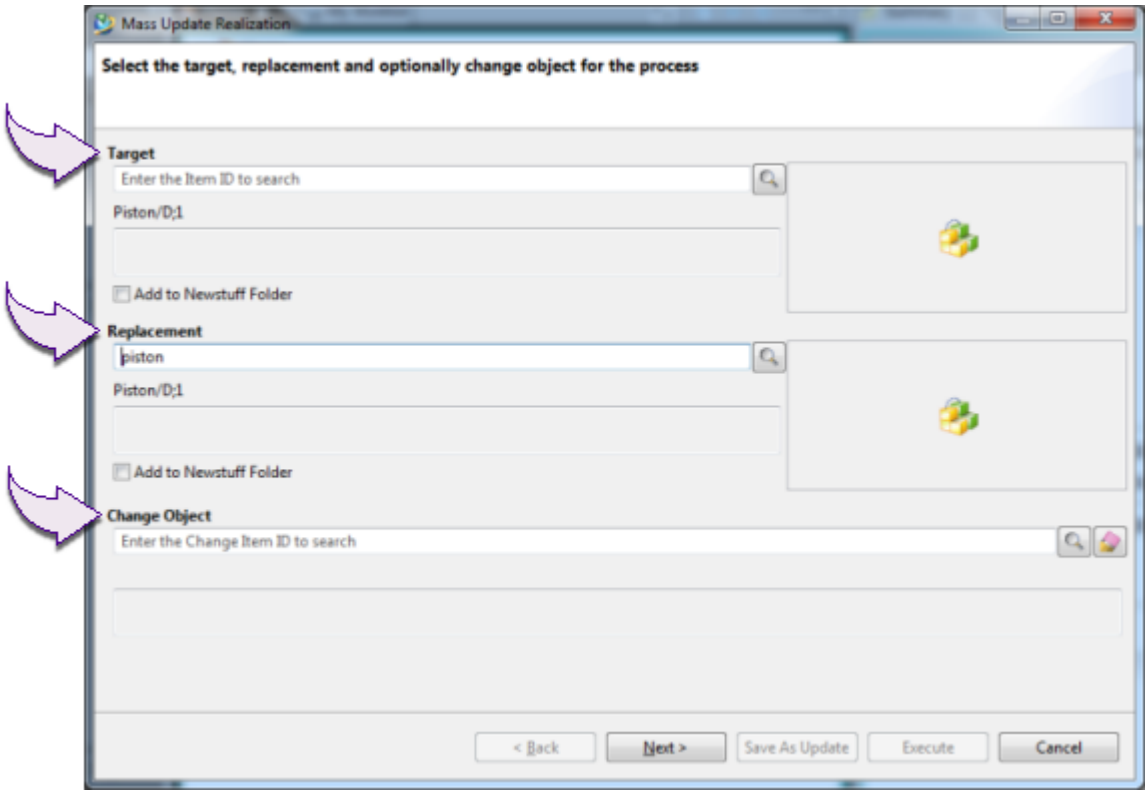
Mass-update source objects in a single phase using My Teamcenter

Using My Teamcenter, you can update the source objects of design elements a single phase from selection to execution. The updates are stored in your **Newstuff** folder.

1. In My Teamcenter, select the item revision on which to base the update.

2. Choose **Edit→Mass Update Realization**.

   The Mass Update Realization wizard appears.



   It displays three areas for specifying the objects to be replaced and the change object (optional) to manage them.

   - **Target Object**

     The item revision on which to base the change. The Mass Update Realization wizard searches for realizations of this object in design elements within the specified collaborative designs or partitions.

   - **Replacement Object**

The part to be replaced for the target object. It can be a revision of a different item than the target object. All realizations of the target object will be updated to use this object as their source object.

- **Change object**

  Do *not* select a change object in a single-phase process. If you select a change object, the mass update becomes a **two-phase process under change management**.

3. In the **Target Object** and **Replacement Object** boxes, enter the objects to be included in the update or **search for the objects**.

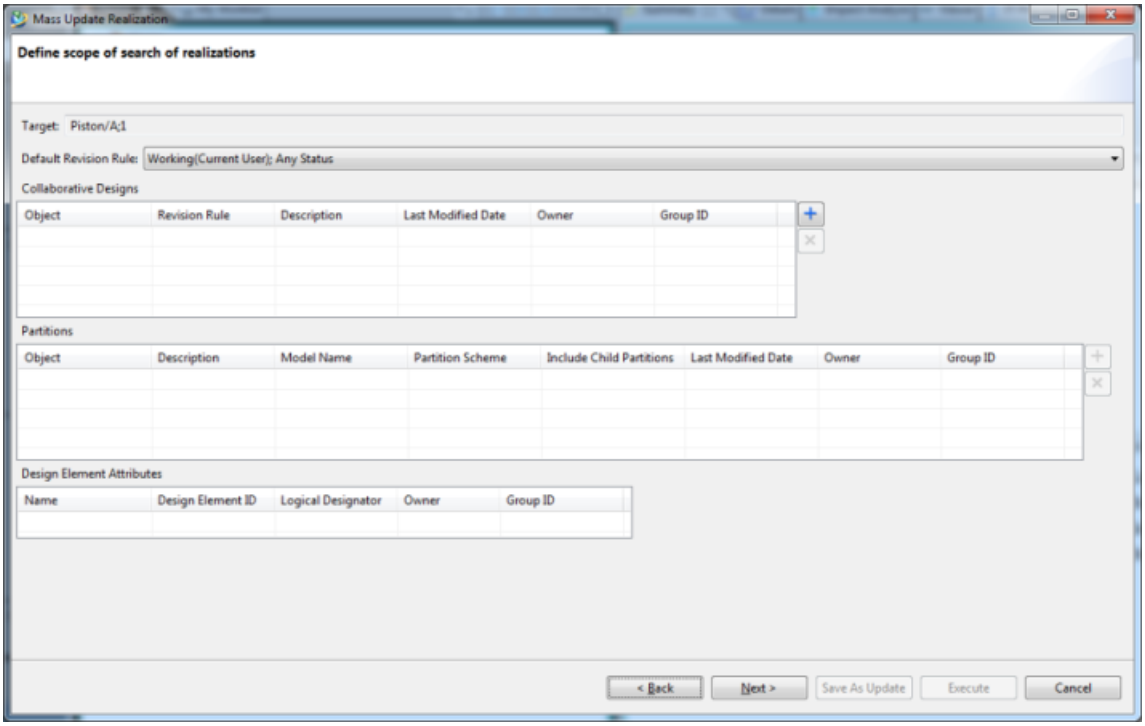
4. Select **Add to Newstuff folder** to store the target and replacement parts in the **Newstuff** folder.

5. Click **Next** and set the **scope of the replacement**.

Set the scope of the mass updates

Realizations are only searched for in the selected collaborative designs and/or partitions.

1. In the corresponding section of the **Define scope of search of realizations** page, set how you want to limit the replacement of realizations.



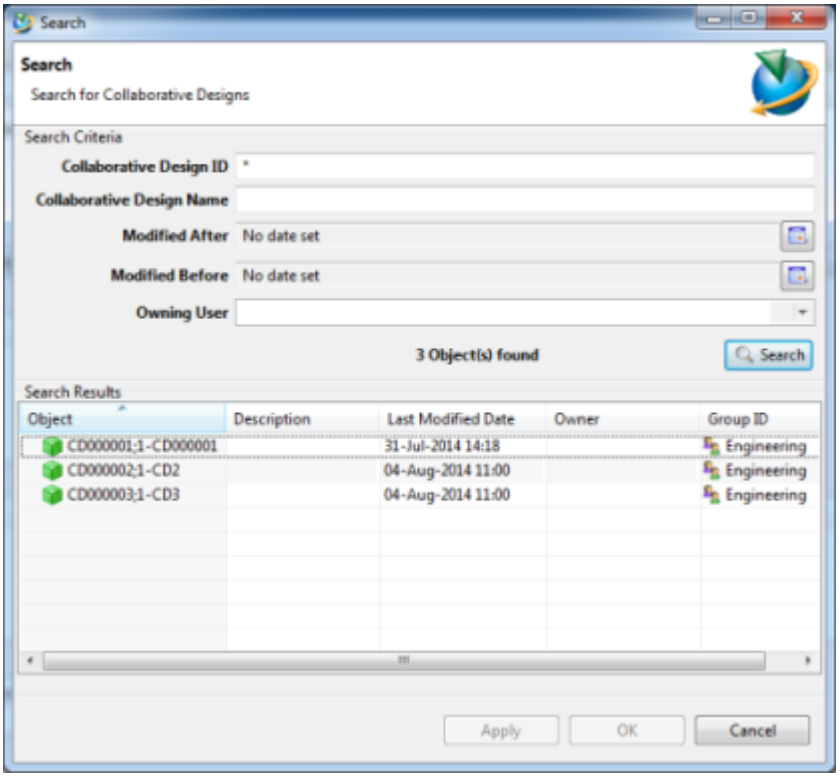
- **Default Revision Rule**

  Select the revision rule to be applied when finding partitions and design elements.

- **Collaborative Designs**

  a. Click the plus (+) next to the **Collaborative Design** table.

  b. In the **Search for Collaborative Designs** dialog box, set the ID, name, modification dates, and owning user attributes for the collaborative designs to be included in the updates.



  c. Click **Apply**.

     The results of the search appear.

  d. (Optional) Set the values again to search for a different collaborative design.

  e. Click **Apply** or when finished, click **OK**.

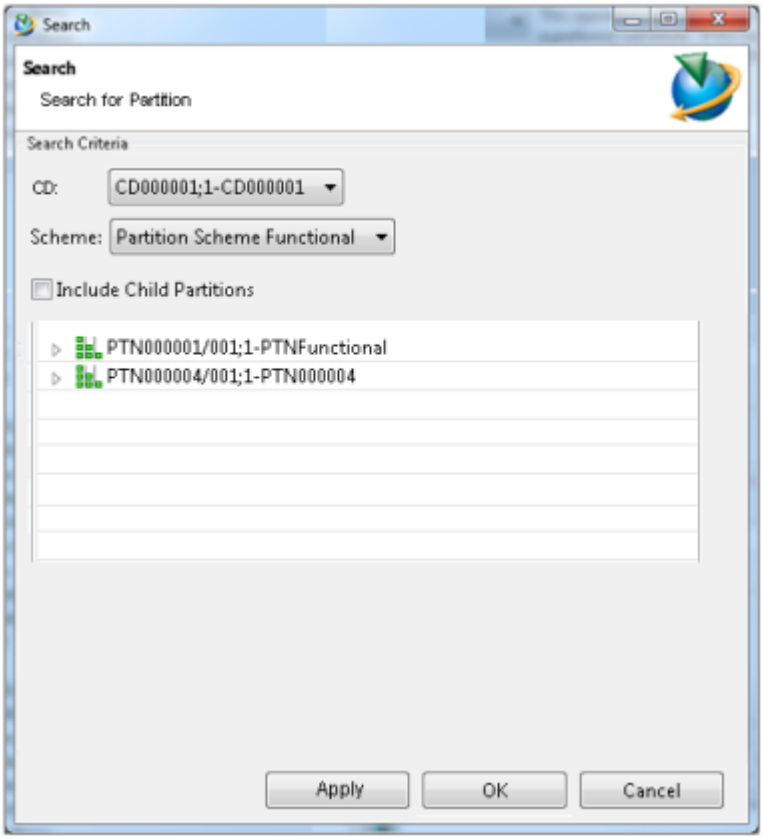
  Selected collaborative designs appear in the **Collaborative Design** table of the **Define scope of search of realizations** page.

- **Partitions**

  Realizations are only searched for in the selected partitions for the corresponding collaborative designs.

  a. Click the plus (+) next to the **Partitions** table.

b. In the **Search for partition** dialog box, set **CD** to a previously found collaborative design.



c. Set **Scheme** to a partition scheme type from the list of types available for the selected collaborative design.

The top-level partitions of that scheme type in the given mode appear.

d. Expand any of the listed partition and select the partitions to include in the search.

e. Select **Include Child Partitions** to include the child partitions of the selected partitions in the search scope.

f. Click **Apply**.

The selected partitions from the results of the search will appear in the partition table of **Define scope of search of realizations** page.

g. (Optional) Set the values again to search for different partitions.

h. Click **Apply** or when finished, click **OK**.

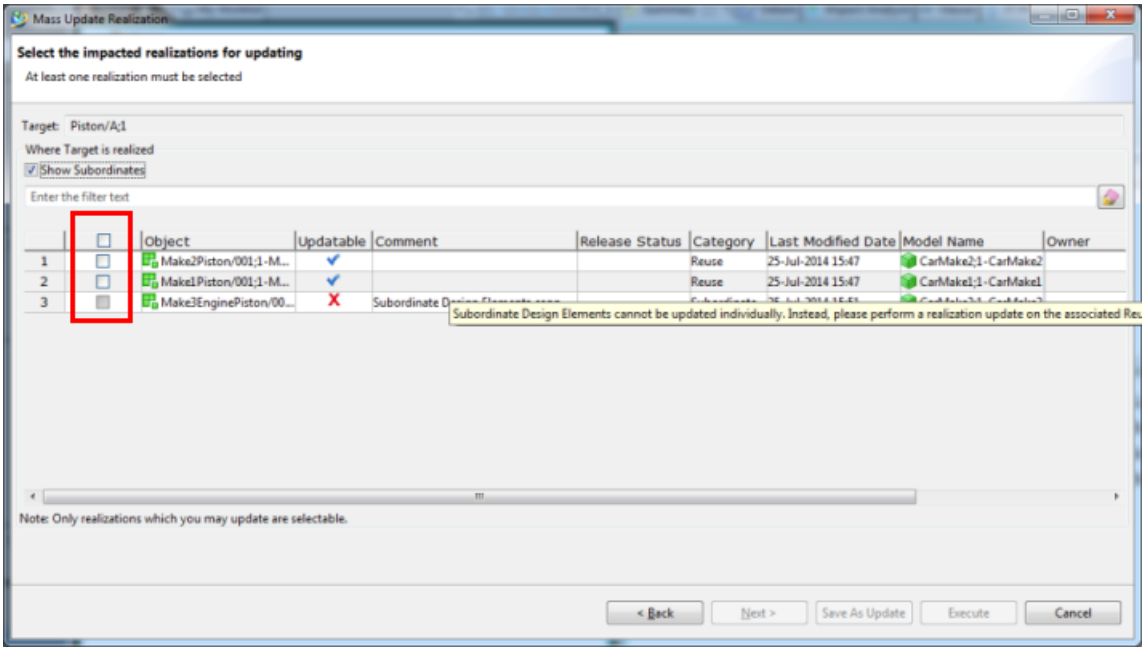
- **Design Elements Attributes**

Define criterion for including design elements in the search results. The criteria is applied when searching for design elements. User can define criteria based on the name, ID, logical designator, owner, and owning group.

> Tip:
>
> To remove a collaborative design or partition, select the collaborative design or partition you want to remove, and click **X** next to the table.

2. Click **Next**.

   The Mass Update Realization wizard displays all the realizations (reuse and subordinate design elements) of the target object. Subordinate design elements are hidden by default. Display the subordinate design elements by clicking **Show subordinate DEs**.



3. (Optional) Filter the design elements further by entering text in the box that appears below **Where Target is realized**. You can clear the filter text by removing the text or clicking the **Clear** button  .

4. In the **Select** column (the column with check boxes and highlighted in red in the earlier figure), select the impacted realizations you want to update. You can only select realizations to which you have write permission.

   If a realization cannot be updated, an **X** appears in the **Updatable** column. The **Comment** columns state the reason for you not being able to update it. In addition, the check box in the **Select** column cannot be selected (it is displayed in gray).

5. Do one of the following depending on the type of process:

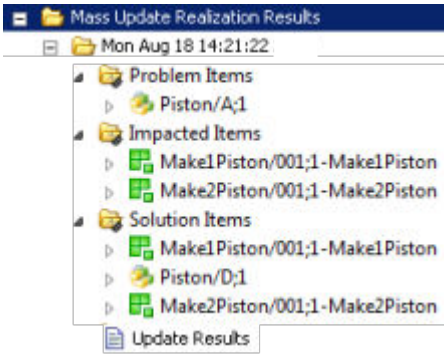
- If you are updating realizations using the two-phase change management process, click **Next** and continue to the next step to **save the update for execution later**.

- If you are using the single-phase process in My Teamcenter:

  a. Click **Execute**.

  b. Review the results of mass update, and select **Close**.

     The mass updates appear in the **Newstuff** folder as shown in the figure.



Folders that store the updates

You can optionally store the results of a mass update that you perform in a single step in the **Newstuff** folder, as shown in the figure. The results appear under the subfolder **Mass Update Results** with the actual update stored under a folder with the date of the update. Under the date folder are folders containing the results, which are the same types of folders used to manage a change. A report of the results is also stored in the folder.

- **Problem Item**

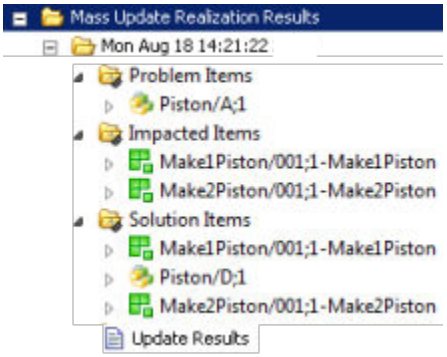
  The target item (the item revision that was added or replaced).

- **Impacted Items**

  The assemblies that were impacted by the update.

- **Solution Items**

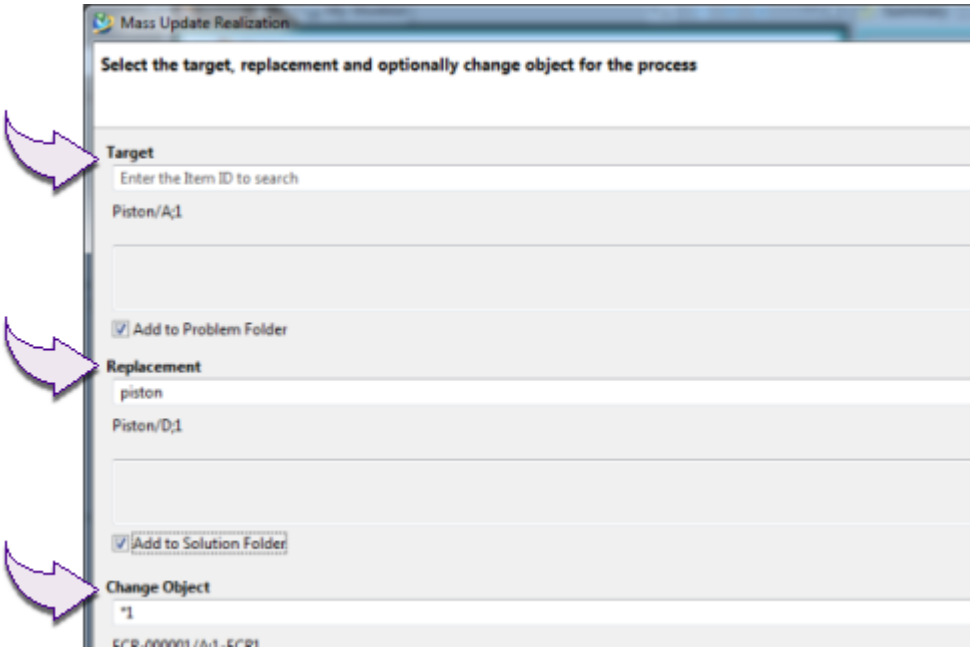
  The additional or replacement part (the item revision that was added or that replaced the target).



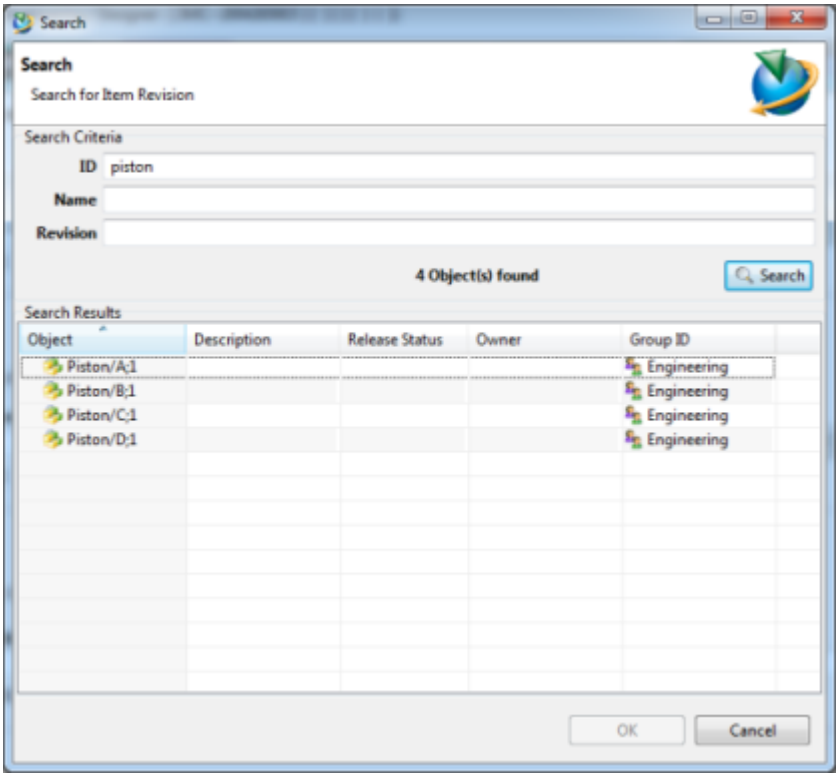
Search for target, replacement, and change objects

In the Mass Update Realization wizard, you can search for the objects to be included in the update.

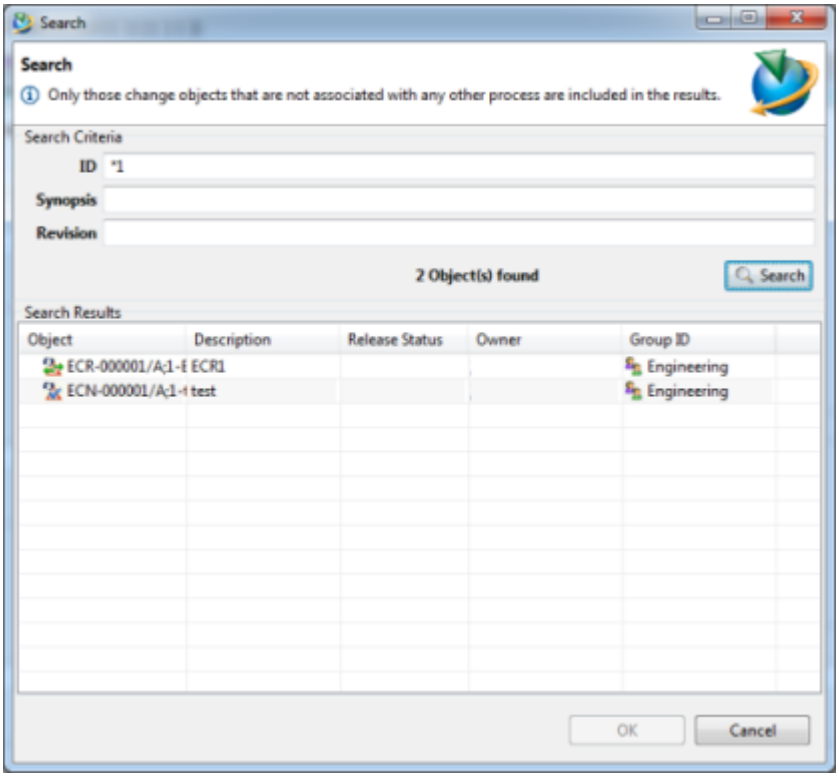
1. In the **Target Object**, **Replacement Object**, and **Change Object** boxes, enter any search criteria for objects to be included in the update, and click the **Search** tool, as shown in the figure.



A **Search** dialog box appears, depending on the type of object. The following shows the search dialog box for the target object. The options are the same for a replacement object. You can search based on ID, name, and revision.



The following shows the search dialog box for a change. You can search based on ID, synopsis, and revision.



2. From the table, select the part or change object.

3. Click **OK** to return to the Mass Update Realization wizard.

   A thumbnail of the selected objects appear in the Mass Update Realization wizard.

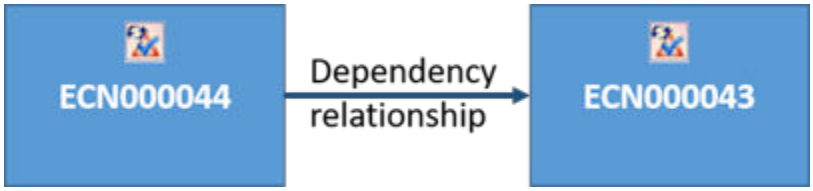
14. Managing a change

About change dependencies

Change dependency

ECNs can be ordered and sequenced with respect to each other by designating an ECN as before, after, or concurrent. This is done by creating a relationship between the dependent ECNs.

- Before Dependency - one ECN needs to be addressed before the other
- After Dependency - one ECN needs to be addressed after another
- Concurrent Dependency - the ECNs should be addressed simultaneously



These relationships lay out a sequence for moving the ECNs forward in the change process.

Change dependencies can be used to detect references across changes and report them to users. The system then allows or prevents certain actions based on the dependencies. For example:

- When sharing for collaboration, all concurrent ECNs must be shared together. If a user attempts to submit a single ECN with concurrent dependencies to the **ChangeNoticeRevision Share** workflow, the system will display an error.
- When closing an ECN by releasing it, all concurrent ECNs must be released together. They must be targets of the same workflow process such as the **ChangeNoticeRevisionDefaultWorkflow**.
- You cannot reference an item that is in context of another ECN unless either the changes are concurrent or the ECN whose content is being referred to is ahead of the referring ECN in the sequence.

Create a change dependency

1. Right-click the dependent ECN and choose **Copy** .
2. Select the other ECN and choose **Edit→Paste Special**.

3. In the **Paste Special** dialog box, select **Concurrent Dependency** and click **OK**.

   A change dependency has been created between the two ECNs.

About Active Change

When you set the Active Change in your user profile, you see a list of ECNs returned via the saved query **My Change Notices**. By default, all ECNs are listed where you are a change analyst, or a change contributor. You can designate the ECN to receive all of your new and modified content to be tracked by default. This feature means that you never have to navigate away from the structure you are modifying, once the Active Change is set.

> Note:
>
> If you have created a custom participant or custom user profile, you must add the new attribute to the **Search Criteria** section for the **My Change Notices** query.

A business object constant is added to facilitate this function, **Cm0ChangeManaged**, and its default setting is **true** for **ItemRevision** and **Configurator** objects. If this constant is set to **true**, the new object is tracked against the global change context (set in the **User profile**).

About managing a change

Using Change Manager, you can propose a change to a product, and then manage the entire cycle of investigation, elaboration, review, approval, and implementation of the change. These tasks are typically controlled by workflows that flexibly guide the change through the four phases of the change process. Once selected and configured, the workflow guides each participant through the steps of the process by adding tasks to the My **Worklist** folder of each participant directing them to perform necessary actions, such as assigning reviewers, reviewing document changes, or entering data.

The work required to manage the change process is:

- Begin the change process.
- Assess the change's impact on any managed business items, such as parts or documents.
- Assign and modify participants.
- Initiate any workflows and monitor the progress and completion.

Initiate a workflow process

1. Select the change object, and do one of the following:

   - Choose **File→New→Workflow Process**.

- Click the **Summary** view and select **New workflow process**,

The **New Process Dialog** dialog box appears.

2. Type a name for the process in the **Process Name** box.
3. Type a description to identify the process in the **Description** box.
4. Click the **Process Template** list to view process templates and make a selection.
5. (Optional) Select the **Show Under Construction Templates** check box.
6. Select a **Process Template Filter** option, if available.

> Caution:
>
> Legacy **Process Template Filter** functionality has been deprecated as of Teamcenter 11.2, and is turned off by default. This functionality is replaced by Business Modeler IDE conditions used to associate templates.

- To view all available process templates, select the **All** option.
- To view only those process templates assigned to your group, select the **Assigned** option.

7. Click the **Attachments** tab to view or assign target and reference attachments.

   It is not necessary to assign target data at the initiation of a process.

   - If necessary, generate a list of objects from several sources, including search results, Structure Manager, and other active Teamcenter applications, that can be pasted as references or attachments.

8. Click the **Process Template** tab to view the process template selected as the basis of the new process.
9. (Optional) Assign all tasks in the process.

   a. Click the **Assign All Tasks** tab.

      The system displays the assignment list information.

   b. Select a list from the **Assignment Lists** list.

      Teamcenter applies the assignment list to the tasks in the process. Users are displayed as nodes in the process tree and the action assigned to the user is displayed to the right of the tree under the **Actions** heading.

> Note:
>
> The **select-signoff-team** and **perform-signoffs** subtasks associated with **Route**, **Review**, and **Acknowledge** tasks are not displayed in the tree.

c. (Optional) Assign responsible parties:

A. Select the task node in the tree.

B. Click **Add** (**+**).

The system displays the user information and action assigned to that user beneath the task node in the process tree.

C. Repeat the previous steps to assign a responsible party for other tasks in the process.

d. (Optional) Assign users:

A. Expand the task node in the tree to begin to assign users to review, acknowledge, or receive notification of a task.

The system displays either the **Users** node or **Profiles** node.

- The **Users** node allows you to assign resources using an ad hoc selection process.
- Profiles limit the pool of users that can be assigned to the task.

  The system displays the **Profiles** node when user profiles were defined as part of the process template.

B. Select the **Users** or **Profiles** node.

C. Use the **Group**, **Role**, and **User** lists to select a user.

D. Select an action from the list.

The system displays the actions in this list based on the task template type. For example, if a **Route** task is selected, the **Review**, **Acknowledge**, and **Notify** actions are displayed. If a **Review** task is selected, only the **Review** action is available; if an **Acknowledge** task is selected, only the **Acknowledge** action is available.

E. Click **Add** (**+**).

The system displays the user information and action assigned to that user beneath the task node in the process tree.

F. Repeat the previous steps to assign users to review, acknowledge, or receive notification of other tasks in the tree.

> Tip:
>
> You can copy user nodes and paste them in to another task using the **Copy** and **Paste** buttons located beneath the tree.

e. (Optional) Modify or set the quorum value for **Review** and **Acknowledge** tasks in the **Rev Quorum** and **Acknow Quorum** boxes.

f. (Optional) To save modifications to the process assignment list, select the **Save Modifications Back to List** check box.

> Note:
>
> You can only save modifications to personal process assignment lists. Shared lists can be modified, but the changes cannot be saved.

10. Click **OK** to initiate the process.

> Note:
>
> Click **Cancel** at any time to cancel the operation without initiating a process.

View the status of a workflow in Change Manager

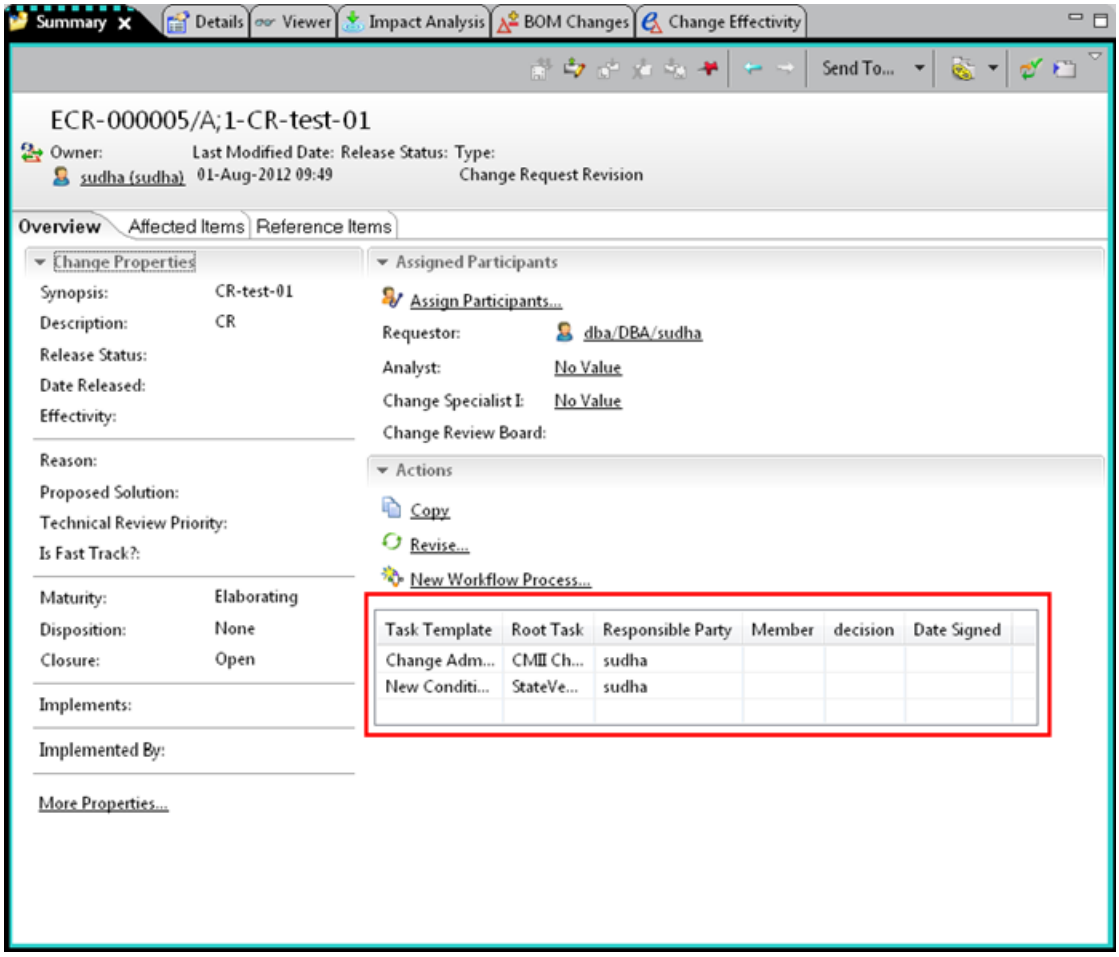
Within Change Manager, you can view the tasks in a workflow associated with a change object or schedule using the Workflow Viewer as shown. It provides a task view representation of the workflow to which the selected change object or schedule task is submitted.

- In a Change Manager view, such as **Change Home**, right–click a change object or schedule with a workflow submitted, and choose **Workflow Viewer**.

  The workflow tasks appear in the **Workflow Viewer** tab.

View workflow assignments and their status

Using the **Summary** view in Change Manager, you can view the tasks in a workflow associated with a change object or schedule, their status, and the assigned participants, as shown for an engineering change request (ECR). You can also start a new workflow process.



1. In a Change Manager view, such as **Change Home**, select a change object or schedule with a workflow submitted.

2. Click the **Summary** tab.

   View the workflow status and assignments.

About classifying changes

Changes are classified to determine the level of approval required.

- **Fast track**

  In a fast track classification, an engineer uses an engineering change request (ECR) followed by an engineering change notice (ECN) to develop a solution for a change and implements the change without going through a formal review process. Fast track changes meet prescribed criteria, such as low risk or low cost. Typically, the majority of changes are processed through fast track.

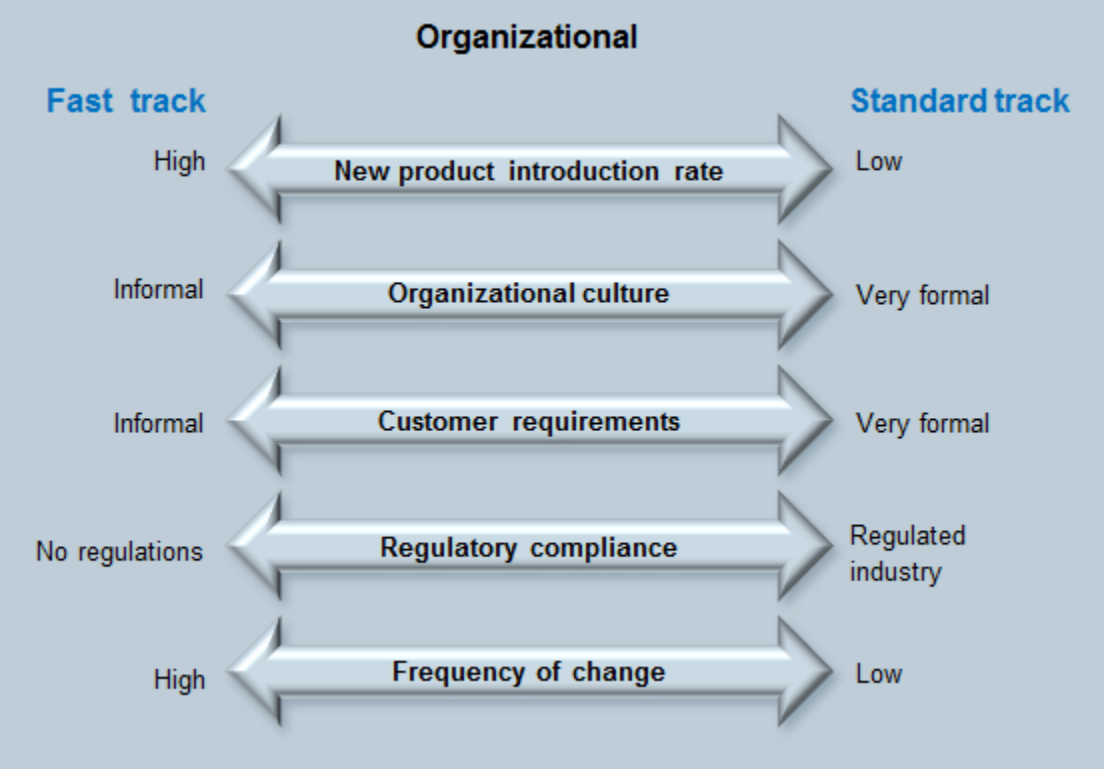
- **Standard track**

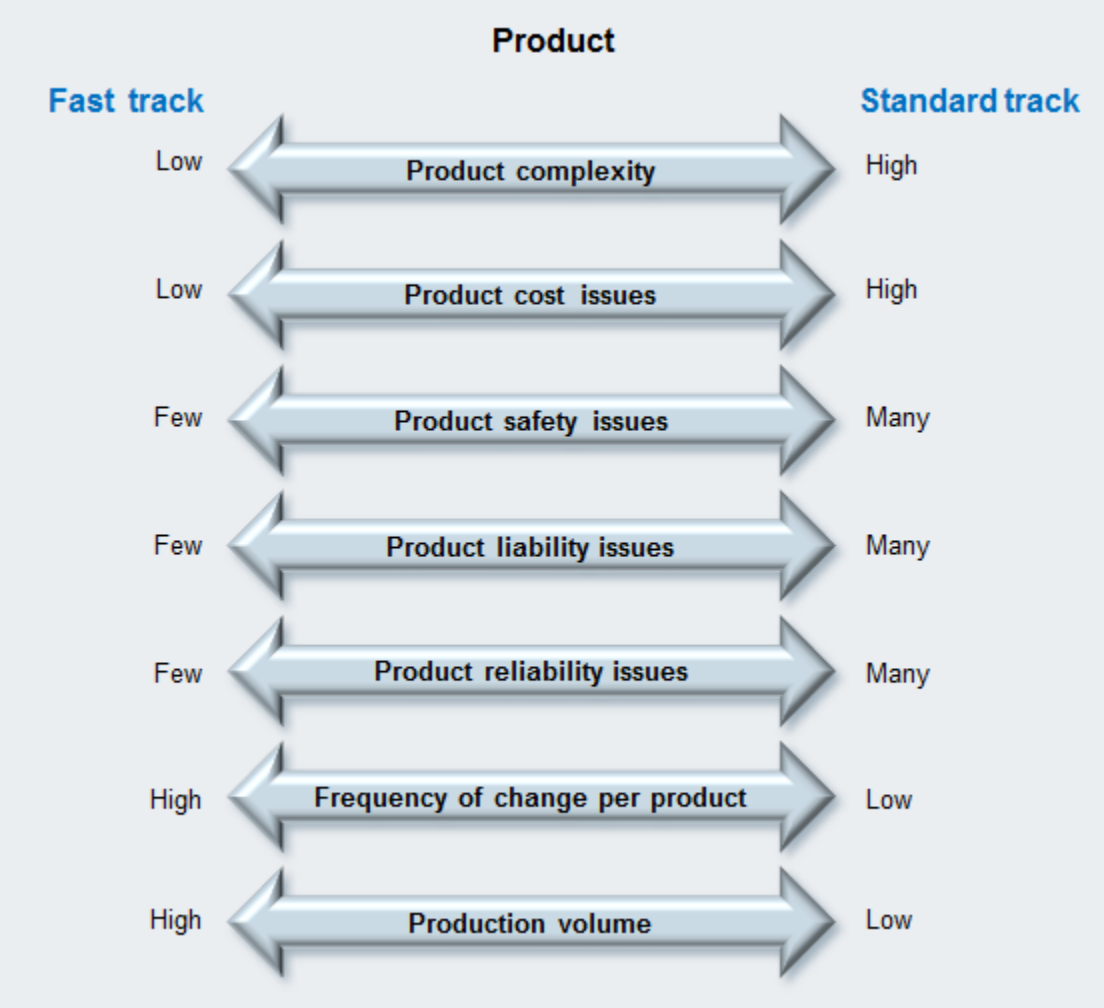
A standard track classification follows a formal change process including change and implementation review boards. They are for changes that do not meet the fast track criteria (for example, for high-risk, high-cost, complex changes). It requires an ECR, separate ECNs, and an approval process to manage the change implementation and approval. Because of the cost and length of time to make such a change, schedules are typically used to plan and manage the solution development and implementation.

Teamcenter provides an **Is Fast Track?** property on the ECR that directs changes down one of these two tracks during workflow.

Edit the properties of a change object.

The following are organization and product considerations that are often used to determine whether a change goes through a fast or standard track for.





Replicating change objects on remote sites

Using Schedule Management — Deployment and Rich Client Usage, you can replicate change objects on remote sites by creating workflows on remote sites. Teamcenter creates a workflow as a remote workflow whenever the privileged user is a remote user (or, in absence of a privileged user, the workflow owner is a remote user).

When the system creates the remote workflow, it completes the following:

- Links the schedule task to that workflow.
- Attaches all task attachments including **Solution Items, Problem Items,** and **Impacted items** using GRM relations.
- Checks attachments out remotely or transfers ownership to the remote site.

The change object is replicated along with its **Reference Items.**

Managing the participants of a change

About the participants in the change process

Different types of users are involved in various phases of the change process.

For example, at the start of the change process, a requestor creates a change object. During the life of the change object, analysts review it, provide input, and implement the change; and change specialists (change administrators) facilitate its movement through the change process. Members of a change review or change implementation board may review and approve or disapprove the change.

The terms *requestor*, *analyst*, *specialist* (administrator), *implementation board*, and *review board* refer to roles that participants perform at different steps of the change process. Depending on the complexity of a change, the same person may perform many roles, or many people may perform the same role.

A change specialist assigns users for each participant type used in the change object. A change management workflow can then be configured to automatically assign workflow tasks to the appropriate users based on their participant type on the change object.

For example, the workflow can automatically assign the analyst to perform the **Implement Change** workflow task. These users are referred to as **dynamic participants**.

Note:

- See your workflow administrator for information about how your company's change management workflows are configured or learn more about extending the dynamic participants.
- Rules that control who can perform what and at what stage of the change process are defined as **Change Manager conditions**.
- You can also **set participants programmatically** using the Integration Toolkit (ITK).
- Change contributors can also be added. Change contributors can create solutions for the change notice just like an analyst. They act as a secondary analyst.

Types of participants

Participants	Description
 **Requestor**	Creates a change object or is delegated a change object by another requestor. The requestor is responsible for elaborating the definition of a change and for providing as much detail as possible to define the problem or request at hand. A requestor may perform the elaboration, or a

Participants	Description
	change specialist may delegate responsibility for elaborating a change to another user (an analyst or requestor). When you create a change object, you are its requestor. If responsibility is delegated to another user, that user becomes the current requestor and you are no longer the requestor.
 **Analyst**	Assesses the technical feasibility of a change or the technical feasibility of implementing the low-level details of a change. An analyst elaborates the details of a change by providing a technical recommendation, performing an impact analysis, and planning the implementation. The analyst may perform the implementation or delegate the work to others. During the implementation phase, the analyst monitors the change execution and is ultimately responsible for ensuring the implementation is performed correctly and according to the plan. This person is generally a senior technical person with knowledge of technical issues and a site's products and business goals.
 **Change specialist (change administrators)**	Facilitates and manages movement of a change or deviation through the appropriate processes at a site. Change specialists also work to continuously improve the change process itself. They have an understanding of product definitions and a site's change process. There can be three levels of change specialists: • Change specialist I is responsible for coordinating the flow of problem reports, deviation requests, and ECRs through the analysis phase, preparing cost estimates for complex ECRs, and creating the agenda for change review board meetings. Change specialist I also chairs those meetings. • Change specialist II prepares ECNs for implementing approved ECRs by identifying those that can be grouped and implemented with one ECN. The item and document impact matrix within the ECN form provides an ideal road map for the change implementation board to develop a detailed implementation plan. Change specialist II strives to minimize the cost of implementing approved ECRs while also achieving end-item traceability. ECNs are released to the change implementation board on the basis of the ECR priorities and available capacity. Change specialist II does not initially appear in Change Manager by default. **Modify the**

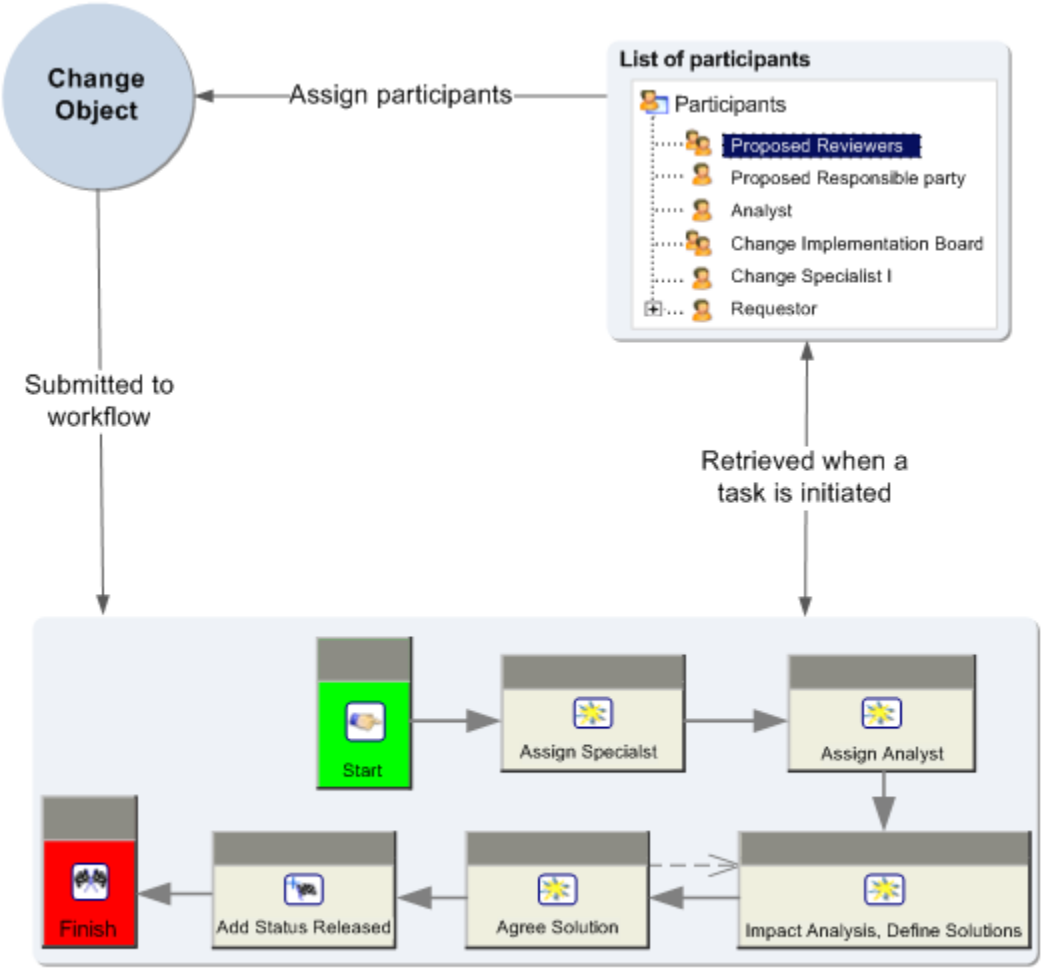
Participants	Description
	isChangeSpecialist2Assignable condition so a user can be assigned as change specialist II. • Change specialist III audits ECN packages to assure continuity between superseded and superseding documentation, records, and data. ECNs and detailed implementation plans are used as checklists of audit requirements. Change specialist III releases documents, records, and data that conform to these requirements. Change specialist III is essentially an inspection function, and the objective is to streamline the process and eliminate the need for inspection. Change specialist III does not initially appear in Change Manager by default. **Modify the isChangeSpecialist3Assignable condition** so a user can be assigned as change specialist III.
 **Change review board**	Reviews, approves, and authorizes engineering change requests and deviation requests. The review board makes a business decision about whether a change or deviation request should proceed. Review board members are generally senior individuals from various functional areas within a site or individuals who have expertise in some aspect of a change or deviation.
 **Change implementation board**	Reviews, approves, and authorizes change notices. This group reviews the detailed implementation plan for an engineering change notice and makes a technical decision about whether to implement the planned change. The group also makes an implementation plan. The membership of the implementation board generally includes both people with technical knowledge and managers with control of resources and schedules. Membership may vary depending on the complexity, cost, and other characteristics of a change.

About dynamic participants

Dynamic participants are workflow handlers that automatically assign users to perform different workflow tasks based on the participant types assigned to a change object that has been submitted to workflow. The default participant types include **Analyst**, **ChangeSpecialist1**, **Requestor**, and **Change Contributor**, as well as others.

A change specialist uses the **Assign Participants** command to assign participants for a change object. Then, when the workflow that is configured for dynamic participants reaches a task and needs to

determine who the participants are, the workflow looks at the current assignee for the participant type (for example, **Reviewer** for a **Review** task) and sends it to that user's inbox. If the user assigned to a participant type changes after the workflow starts, the workflow automatically recognizes the new user for any tasks that have not started.



If a workflow is not set up to have dynamic participants, the participants are determined explicitly by selecting users. Those participants are fixed and cannot change.

> Caution:
>
> A user is assigned as a participant with a specific group *and* role. The user's session context must be set to the same group and role they are assigned as to satisfy any Change Manager conditions that are applied.

Note:

You can **set the participants using the Integration Toolkit (ITK)**.

Assign participants

Note:

- To use the **Assign Participants** command to assign review members based on their roles, a workflow must be configured to use **dynamic participants**.

  See your workflow administrator for information about how your company's change management workflows are configured or learn about designing a workflow with dynamic participants.

- You must have permission to assign participants.

1. Select the change object that you want to assign participants to.

2. Choose **Tools→Assign Participants**.

3. In the **Assign Participants** dialog box, select the participant type (for example, **Change Specialist I**).

4. Click either the **Organization** or **Project Teams** tab and select a user to assign to the participant type.

   You can search for a group, role, or user in the box below the tabs.

   Use **Resource Pool Options** to assign a set of group or role members as participants instead of individual users. When a group or role is selected, additional options become available.

   - If you select a group, you can click **Any Member** so any member of the group can be the participant for that type.

   - If you select **Proposed Reviewers**, **Change Review Board**, or **Change Implementation Board**, and then select a group, you can click **All Members** to assign all members of the group.

   - If you select a role under a group, you can click **Any Member** and choose **Specific Group** to assign any member of the combined group and role as the participant type or choose **Any Group** to assign any member of any group and the selected role as the participant type.

5. To remove a user as a participant, select the user under the participant type and click **Remove**.

6. To change a participant, select the user under the participant type, select the new user in the **Organization** or **Project Teams** tab, and click **Modify**.

7. Click **Add**.

8. When you are finished assigning participants, click **OK**.

> Note:
>
> If the change object does not automatically display the assigned participants in the Summary, it may be necessary to manually refresh the window.

About setting change states

To set the change states of a change, use the **EPM-set-property** workflow handler on your workflow process.

For example, if you want to change the value of the **Disposition** property to **Approved**, set the handler to the following on the appropriate task in your workflow process:

EPM-set-property –props=CMDisposition –values=Approved –to_att_type=TARGET –bypass

> Note:
>
> You must use the **–bypass** argument to change the property value.

The **EPM-set-property** handler requires a list of explicit classes as explained below for each of the change objects.

For the change object	The class is
Problem reports	**-include_types=ProblemReportRevision**
Change requests	**-include_types=ChangeRequestRevision**
Change notices	**-include_types=ChangeNoticeRevision**

Setting change effectivities

About setting change effectivities

Revision effectivities specify the actual timing of when an engineering change notice (ECN) takes effect. Effectivities state the implementation point for the change in the product structure, and they can be stated in a variety of ways. The product structure can be configured for a particular date or unit (serial) number by applying a revision rule.

Effectivity type	Description
Date	Specifies the range of dates for which the results of a change take effect. You can assign a date effectivity to an ECN.
Unit	Specifies the range of item units or serial numbers for which the results of a change take effect. You can assign a unit effectivity to an ECN.

Note:

Effectivities can only be applied to an ECN after it is reviewed and approved, but before it has been implemented. The ECN revision must have a release status added to it.

- The change notice must have a release status.
- The change notice **Disposition** state must be set to **Approved**.
- The change notice **Maturity** state must be set to **Reviewing**.

The effectivity must be applied manually to the **Solution Items** assemblies so the product structure can be configured using effectivity. The effectivity is not automatically propagated from the ECN.

Assign effectivity

1. Select the change notice revision that you want to assign an effectivity to. To set an effectivity, the change notice must have the following:

   - You must be assigned as a change specialist for the change notice.
   - The change notice revision must have a release status.
   - The change notice **Disposition** state must be set to **Approved**.
   - The change notice **Maturity** state must be set to **Reviewing**.

2. Click the **Change Effectivity** pane.

3. Click **Create**.

4. Click **Units** or **Dates** effectivity, as appropriate, and define the range.

   If defining a unit effectivity range, type the desired effectivity range in the **Units** box. Use the **-** character within a continuous range and the **,** character to separate discontinuous ranges. For

example, the unit range **1-5,7-9** defines effectivity for units 1 through 5 and 7 through 9 (but not effective for unit 6).

If defining a date effectivity range, select a date from the calendar (and optionally enter a time), and click **Set Date** to place that date in the **From Date** cell. Select another date (and optionally enter a time), and click **Set Date** to place that date in the **To Date** cell. Repeat these steps for additional date ranges until you enter all the desired date ranges. Click the **Clear Date** button to remove a date from the currently selected cell.

- Click the **UP** button to add the **and up** (open-ended effectivity) condition to the end of the unit or date effectivity range.
- Click the **SO** button to add the **stock out** condition to the end of the unit or date effectivity range.
- If you use effectivity mapping, select the **Shared Effectivity** check box.
- Select the **Apply Access Manager effectivity protection** check box to apply the predefined access rules to this effectivity.

> Note:
>
> Teamcenter interprets **UP** and **SO** conditions as open-ended for revision configuration purposes. The revision is considered effective for any value greater than or equal to the unit or date value immediately preceding the **UP** or **SO**. *Stock out* indicates that existing stocks of a component revision should be used up before the next revision.

5. For unit effectivity, define an end item to qualify the effectivity range. You *must* use this with the unit effectivity range to specify a product, module, or subsystem that carries the unit number to which this effectivity refers. You can select an end item in one of the following ways:

   - Click **Open by Name** adjacent to the **End Item** box and search for an item by identifier and/or name.
   - Copy an item to the clipboard and click **Paste** adjacent to the **End Item** box.
   - Click **MRU** adjacent to the **End Item** box.

   > Note:
   >
   > If you want to remove the entered end item, click **Clear** adjacent to the **End Item** box.

   Once you select the end item, select the revision from the list to the right of the **Clear** button.

6. For **Intent**, select the intent for each line in the ECN.

> Note:
>
> One of the effectivity properties must be specified, either **Date** or **Unit**. To choose multiple intents, your site must be configured to do so.

7. When you are finished, click **OK**.

About proposed effectivity

Proposed effectivity is set on a change notice before a release status is added. This effectivity is planned prior to the completion of a change and the release of its solution items.

> Note:
>
> Proposed effectivity is assigned and edited in Active Workspace.

1. Select the change notice that you want to view a proposed effectivity.
2. Click **More Properties** in the **Summary** pane.
3. Select the **All** tab and scroll to **Proposed Effectivity**.
4. If **Proposed Effectivity** is not in the list, and to verify it is not set, select **Show Empty Properties** at the end of the **Edit Properties** window.

Generate the As Planned/As Released baseline report

The **As Planned/As Released baseline report** displays the structural hierarchy of an object and provides details about attached documents, the authorizing change notice, effectivity, and release date. It also displays the planned change notice for in-process documents as well as change effectivity.

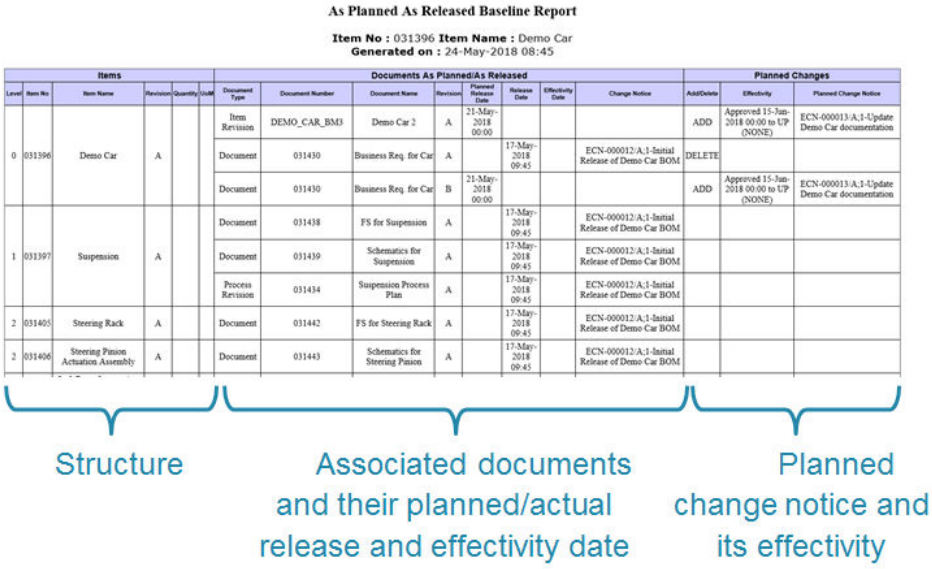
> Example:
>
> Run the report on an assembly with multiple levels, attachments, and revisions. The report identifies affected items with document attachments and their respective change notices.
>
> To see the structure of an ECN, generate the Change Item Report.

1. Select a change object.
2. Right-click the change object and click **Generate Report**.
3. Select **As Planned As Released Baseline Report** and click **Next**.
4. Click **Finish** to run the report.

The report opens in a browser window.

5. (Optional) Generating the report could take several minutes. You can click **Run in Background** to continue working while the report is generated.

The report provides the following information in a table format:



As Planned As Released Baseline Report

Item No : 031396 **Item Name :** Demo Car
Generated on : 24-May-2018 08:45

Items						Documents As Planned/As Released								Planned Changes		
Level	Item No	Item Name	Revision	Quantity	UoM	Document Type	Document Number	Document Name	Revision	Planned Release Date	Release Date	Effectivity Date	Change Notice	Add/Delete	Effectivity	Planned Change Notice
						Item Revision	DEMO_CAR_BM3	Demo Car 2	A	21-May-2018 00:00				ADD	Approved 15-Jun-2018 00:00 to UP (NONE)	ECN-000013/A;1-Update Demo Car documentation
0	031396	Demo Car	A			Document	031430	Business Req. for Car	A		17-May-2018 09:45		ECN-000012/A;1-Initial Release of Demo Car BOM	DELETE		
						Document	031430	Business Req. for Car	B	21-May-2018 00:00				ADD	Approved 15-Jun-2018 00:00 to UP (NONE)	ECN-000013/A;1-Update Demo Car documentation
1	031397	Suspension	A			Document	031438	FS for Suspension	A		17-May-2018 09:45		ECN-000012/A;1-Initial Release of Demo Car BOM			
						Document	031439	Schematics for Suspension	A		17-May-2018 09:45		ECN-000012/A;1-Initial Release of Demo Car BOM			
						Process Revision	031434	Suspension Process Plan	A		17-May-2018 09:45		ECN-000012/A;1-Initial Release of Demo Car BOM			
2	031405	Steering Rack	A			Document	031442	FS for Steering Rack	A		17-May-2018 09:45		ECN-000012/A;1-Initial Release of Demo Car BOM			
2	031406	Steering Pinion Actuation Assembly	A			Document	031443	Schematics for Steering Pinion	A		17-May-2018 09:45		ECN-000012/A;1-Initial Release of Demo Car BOM			

The table is broken down into three main sections. The contents of the columns are dependent on the structure configuration, whether or not an attachment is revised or released, and if it is part of a change notice.

> Note:
>
> Revisions to document attachments are not automatically updated in the **Attachments** tab. When a document attachment is revised, manually add it to the **Attachments** in order to accurately display the revision history in the **As Planned As Released** report

Items

Contains all of the items in an assembly.

Documents As Planned/As Released

Contains documents and other attachments. If an attachment is released as part of a change with a **Proposed Effectivity** this is listed in the Effectivity Date column with the related change notice number in the Change Notice column. If the attachment was not released as part of a change, those columns are empty.

Planned Changes

Contains only items that currently part of an unreleased change. Solution items that are revisions of an impacted item are added and include the ECN. The related impacted items shows that it will be deleted.

The **CM_PRIMARY_DOCUMENT_RELS** preference must be configured in order for the baseline report to run. It defines the relations through which a document is attached to an Item Revision. If a document is primary and the Item Revision is secondary in the relationship, the prefix **S2P:** must be provided.

The default settings are as follows:

IMAN_specification

Fnd01isDescribedByDrawing

FND_TraceLink

FND0DesignToBomRelation

IMAN_METarget

Allowable values are any relation that can be associated with an **ItemRevision**.

15. Administering the change management process

About administering the change management process

Because change management processes differ from company to company, you can configure and customize Change Manager to meet your business needs and help you follow your documented process.

- Set Change Manager options.
- Set up groups and roles for users to be involved in the change process.
- Set up how changes are derived.
- (Optional) Define custom change management objects.
- Configure conditions to control the actions of participants.
- Create workflows for the change process.

Migrating to Change Manager

If you used Change Viewer in the past, when you upgrade to the latest version of Teamcenter, existing Change Viewer classic change objects are not upgraded; in other words, their database storage is not changed. You will need to create a Change Manager object and link the Change Viewer classic object to it.

Existing Change Viewer classic objects are likely moving through an active workflow. You cannot migrate these objects without disrupting the workflow. You must determine which milestones are important to check and accommodate in the workflow if you want to start a Change Manager object at the point in the workflow where the corresponding Change Viewer classic object stopped. If you have Change Viewer classic objects, you must develop a process and ensure workflow contributors are aware of the migration to Change Manager.

Therefore, we recommend that you:

1. At a given milestone, create a Change Manager object and link the Change Viewer classic object using the **Reference Items** folder.
2. Either allow the Change Viewer classic object to continue through its workflow or terminate the current workflow and start a new workflow for the Change Manager object. You can add conditional evaluations in the workflow to forward the new change object to the correct step in the workflow process.

3. Create all new change objects using Change Manager.

Setting Change Manager preferences

You can set the following Change Manager preferences:

- To view Change Manager, set **HiddenPerspectives** (make sure Change Manager is removed from the list of hidden perspectives and **CMViewerClassic** is in the list (hidden).

- The Teamcenter change management process does not support displaying substitutes on separate BOM lines in Structure Manager. Turn off the substitutes display (set **PSEShowSubstitutesPref** to **0**) when working with change-management related features.

Setting up users

About setting up users

You will want to set up rules to restrict change management actions to authorized users. For example, you may want to define rules to limit the creation of engineering change requests (ECR) and engineering change notices (ECN) to change specialists who are members of the **Change Management** group.

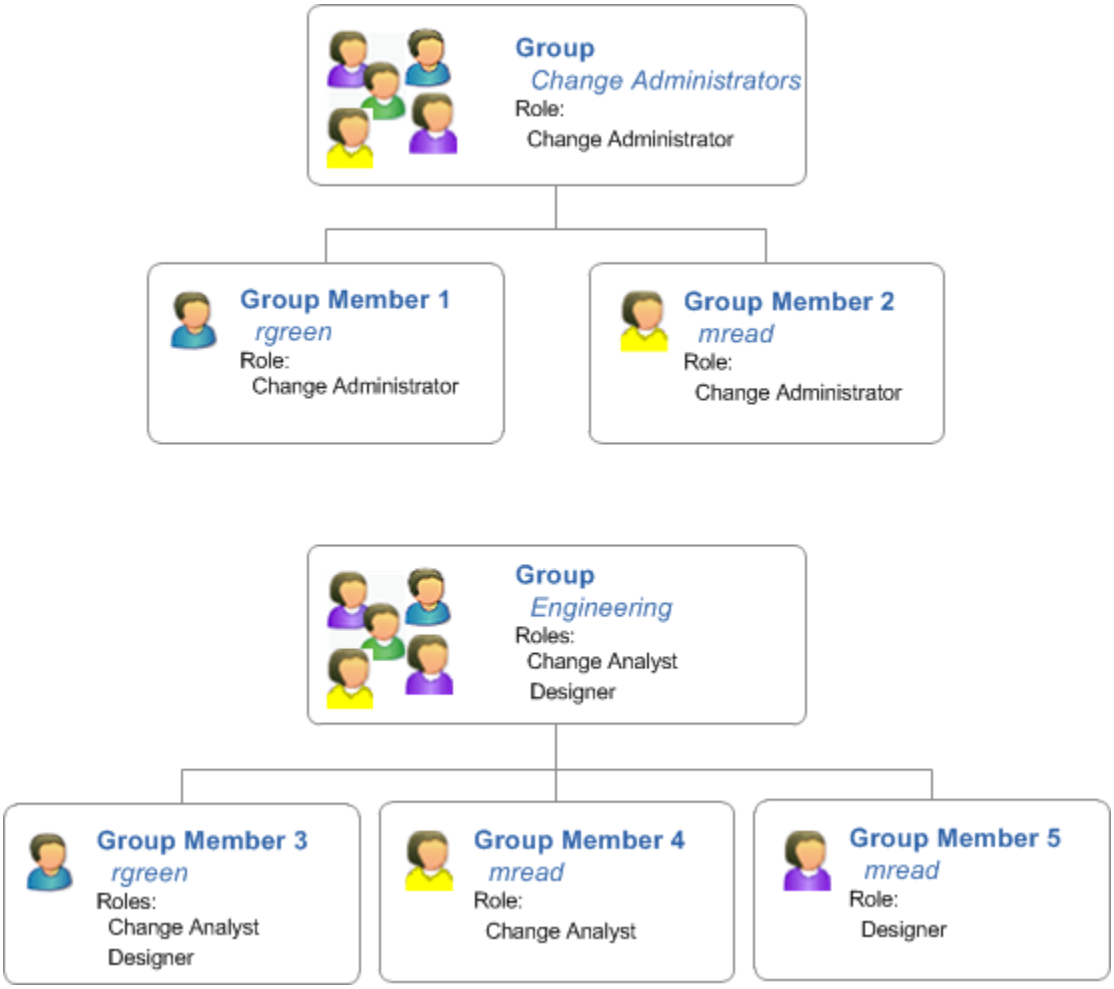
- Use the Organization application to define groups and roles and associate the roles with the participant types. A typical approach is to create a change management group to contain the change specialists.

- Use the Business Modeler IDE to define the conditions that drive access rules used to manage object permissions. In the example shown here, the business rule for creating ECRs is limited to those who are members of the **Change Management** group:

```
isChangeRequestCreatable
OR u.group_name = "Change Management"
```

It is recommended that you create the roles with a similar name to the participant types to avoid confusion. For example, create the **Change Specialist** role to match the **ChangeSpecialist1** participant type. If you want to use different change specialists, create roles, such as **Change Specialist 1**, **Change Specialist 2**, and so on.

Change analysts can be selected from anywhere in the organization, but it might be useful to identify those users who can perform the technical input for changes in an **Analyst** role. A sample of a typical organization tree is shown in the figure.



Example of configuring groups to create change requests and change notices.

Note:

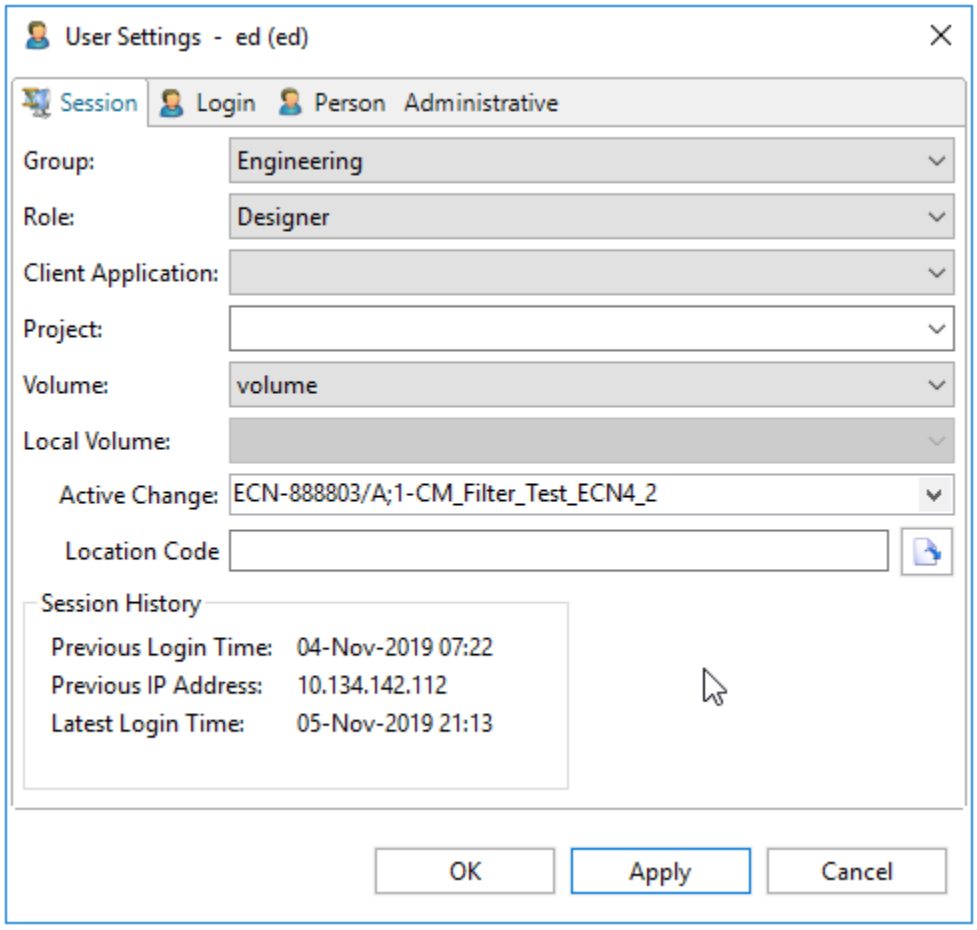
Users need a Teamcenter Change Management license level that enables authoring to use all Change Manager functionality. If they do not have a higher level license, they are about creating issues and penetration requests limited to the following functionality:

- Creating a problem report (PR).
- Checking in a PR and submitting it to a workflow process.
- Adding business items to the PR **Problem Items** and **Reference Items** folders.
- Searching for and viewing change objects: PRs, engineering change requests (ECRs), engineering change notices (ECNs), and deviation requests (DRs).

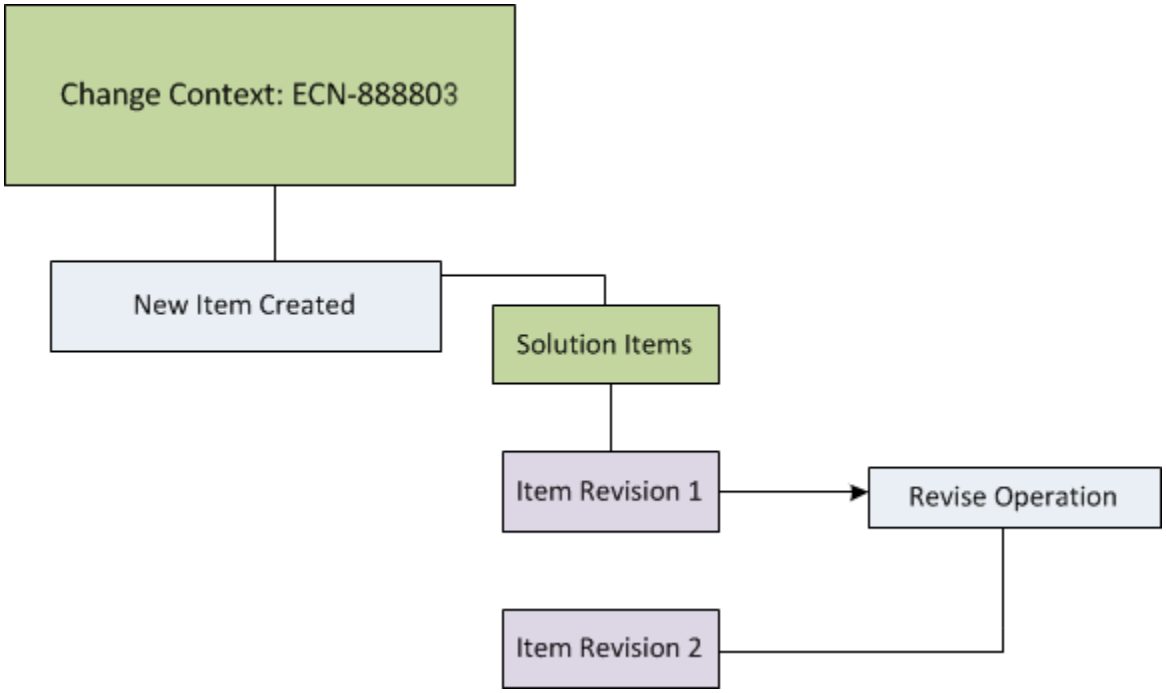
- Receiving and acting on workflow assignments and tasks.

Set Active Change in user profile

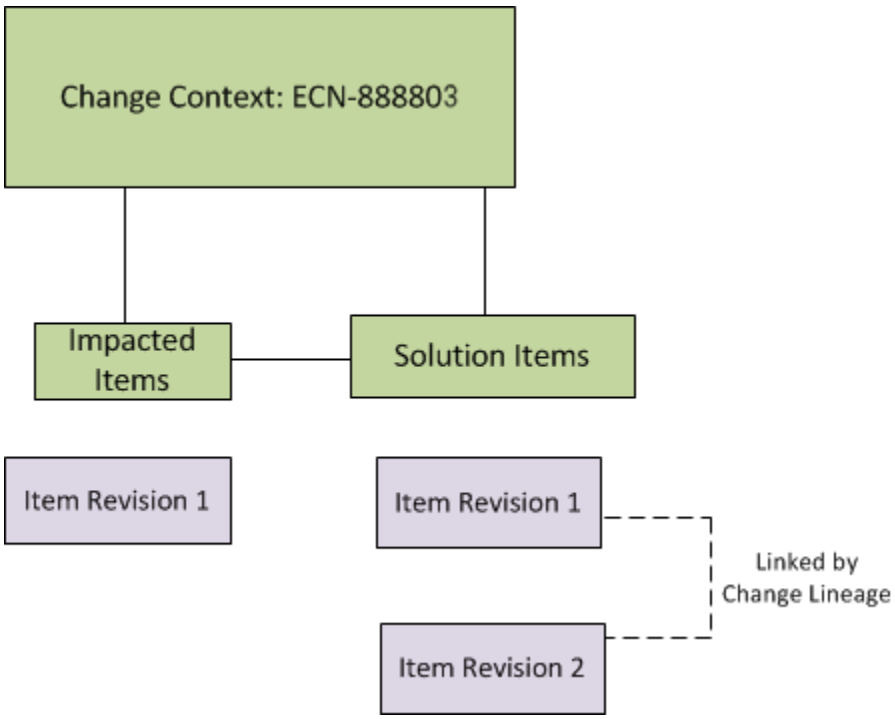
You can edit the **Active Change** in the **User Settings** dialog box. The **Change Context** shows a list of available change notices when you are either the change analyst or a change contributor. Once selected, the change notice revision also displays in subsequent sessions as the **Active Change**.



For example, when a new item is created and ECN-888803 is selected as the change context, its first **Item Revision** appears in the solution items of ECN-888803. Likewise, if a revise operation is performed on an existing **Item Revision**, the newly-created item revision is also attached to ECN-8888803 as a solution item.



If the original item revision was already attached to ECN-888803 as an impacted item, then in addition to adding the new item revision as a solution item, the original revision and the new revision are also automatically associated to each other with a change lineage.



Setting participants programmatically using ITK

You can set the participants of a workflow using the Integration Toolkit (ITK). The following example shows how you can set participants using the ITK.

```
TCTYPE_find_type("ChangeSpecialist1", "ChangeSpecialist1",
&participant_type);

EPM_create_participant(group_member, participant_type, participant_tag);

GRM_find_relation_type("HasParticipant", &relation_type));

GRM_create_relation(cn_rev_tag, participant_tag, relation_type,

 NULLTAG, &relation));

GRM_save_relation(relation));
```

Note:

For more information about using the ITK, see the *Integration Toolkit Function Reference* on Support Center.

Configure a group to create change requests and change notices

1. In Organization, create a group that contains users who work with change objects and add those users to the group. For example, create the **Change Management** group.

2. Open the Business Modeler IDE.

3. Access the **Advanced** perspective by choosing **Window→Open Perspective→Other→Advanced**.

4. In the **Extensions** view, select the project in which you want to create the condition. Right-click the project and choose **Organize→Set active extension file**. Select the file where you want to save the data model changes.

5. Expand the project and the **Rules→Conditions** folders.

6. Double-click the **isChangeRequestCreatable** condition.

7. In the **Expression** box, type the following after the existing text:

   ```
   OR u.group_name = "new-group"
   ```

If you use the example group from step 1, type the following:

```
OR u.group_name = "Change Management"
```

8. Double-click the **isChangeNoticeCreatable** condition.

9. In the **Expression** box, type the following after the existing text:

   ```
   OR u.group_name = "new-group"
   ```

   If you use the example group from step 1, type the following:

   ```
   OR u.group_name = "Change Management"
   ```

10. To save the changes to the data model, choose **File→Save Data Model**, or click the **Save Data Model** button on the main toolbar.

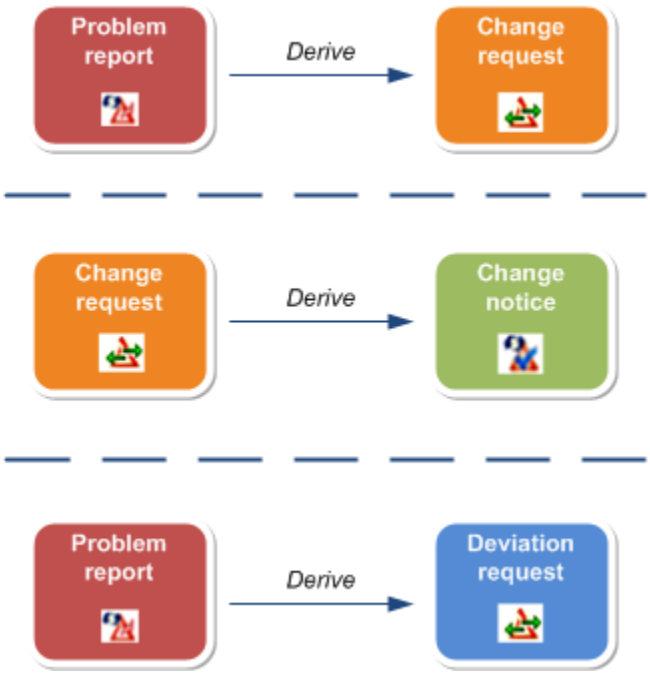
11. Deploy the data model to the database.

    Users in the **Change Management** group can create change requests and change notices.

Configuring how changes are derived

As system administrator, use the **CM_change_derivations** preference to configure which change object can be derived from another.

- Derive an engineering change request (ECR) from a problem report (PR) to determine a solution for the problem.
- Derive an engineering change notice (ECN) from an ECR to implement the solution to the problem.
- Derive a deviation request from a PR to allow a deviation.



Note:

Refer to Define deep copy rules for creating changes from another change for more information on configuring **Copy Options**.

Defining custom change management objects

Use the BMIDE for Data Model Design to create custom change management objects representing the change objects for your change process. The custom objects you create are templates of the different change processes to be used at your site. End users create instances of these change objects, such as change requests, and use them in their workflow processes. Also, to enable users in the change process to create the custom business objects, make new conditions allowing the creation.

List of standard change management business objects.

In addition to creating the custom change management objects, you can also:

- Configure Change Manager pseudofolders in which to store objects related to the created objects and which automatically appear when a user creates an object of that type.
- Create new forms as needed in which to hold custom information about the change management object.
- Add properties, such as change type, to existing change management objects.

  If you want to add persistent properties to change objects, you can extend business classes directly using the Business Modeler IDE. You can also create a dialog box definition by specifying the required

and optional properties for an instance creation. Subclasses that do not have their own dialog box definition inherit the dialog box definition of their parent class. To display new properties, you must add them to the style sheets defined for the change object.

> Note:
>
> Before working with Change Manager objects, you must install the Change Management template (**cm_template.xml** file) to your project. During installation, select **Change Management** in the Business Modeler IDE Templates panel in Teamcenter Environment Manager.

Configuring conditions to control the actions of participants

About configuring conditions to control the actions of participants

Use the BMIDE for Data Model Design to configure Change Manager to fit your business process by setting specific conditions or rules. They control which participants can perform specified actions under certain **Maturity**, **Disposition**, and **Closure** change states.

Conditions generally apply to all types of change objects (PRs, ECRs, and ECNs).

- **Summary of default Change Manager conditions**
- **Examples of Change Manager conditions**.
- Working with conditions when adding a custom naming rule to standard Change Manager objects.

To see a listing of all the Change Management on Active Workspace — Usage conditions, see the *Teamcenter Data Model Report* in the Teamcenter documentation on Support Center.

Examples of Change Manager conditions

- **Restrict who can add item revisions to the Solution Items folder and when**
- **Restrict who can add item revisions to the Problem Items folder and when**
- **Restrict who can assign the analyst and when**

Restrict who can add item revisions to the Solution Items folder and when

Use the following condition to allow only an analyst to add item revisions to the **Solutions Items** folder when the following states are met:

- **Closure** is **Open**
- **Disposition** is **Approved**

- **Maturity** is **Executing**

```
Cm0isCMHasSolutionItemCreatableForPrimary ( ChangeItemRevision o ,
UserSession u)
```

Then, define the following expression:

```
(Condition::isAnalyst (o, u) AND o.CMClosure = "Open"
AND o.CMDisposition = "Approved" AND o.CMMaturity = " Executing“ )
```

If this condition is not met, the analyst cannot add the solution item and an error message appears.

Restrict who can add item revisions to the Problem Items folder and when

Use the following condition to restrict when a requestor or analyst can add item revisions to the **Problem Items** folder. It sets one combination of required states for the requestor and a different combination for the analyst. Such restrictions ensure that the requestor can no longer add problem items after completing the elaboration phase and the analyst can no longer add problem items after completing the review phase.

```
Cm0isCMHasProblemItemCreatableForPrimary ( ChangeItemRevision o ,
UserSession u)
```

Then, define the following expression:

```
(Condition::isRequestor(o,u) AND o.CMClosure = "Open" AND o.CMDisposition =
"None"
AND o.CMMaturity = "Elaborating") OR (Condition::isAnalyst(o, u) AND
((o.CMClosure = "Open" AND o.CMDisposition = "None" AND o.CMMaturity =
"Elaborating") OR (o.CMClosure = "Open" AND o.CMDisposition = "Investigate"
AND o.CMMaturity = "Reviewing") OR (Condition::isChangeExecutionAllowed(o,
u)))))
```

The expression does the following:

- First, it sets the restrictions for when the requestor (**isRequestor**) can add item revisions:

  ```
  (Condition::isRequestor(o, u)  AND o.CMClosure = "Open" AND
  o.CMDisposition = "None" AND o.CMMaturity = "Elaborating“
  ```

  It only allows the requestor to add items revisions to the **Problem Items** when:

  - **Closure** is **Open** (**o.CMClosure = ”Open”**)
  - **Disposition** is **None** (**o.CMDiposition = ”None”**)

- **Maturity** is **Elaborating** ((**o.CMMaturity = " Elaborating“**)

- Next, it sets the same restrictions for the analyst (**isAnalyst**):

```
Condition::isAnalyst(o, u) AND ((o.CMClosure = "Open" AND o.CMDisposition
= "None" AND o.CMMaturity = "Elaborating“ )
```

  - **Closure** is **Open** (**o.CMClosure = ”Open”**)

  - **Disposition** is **None** (**o.CMDiposition = ”None”**)

  - **Maturity** is **Elaborating** ((**o.CMMaturity = " Elaborating“**)

- Then, it sets a second case for when the analyst can add item revisions:

```
OR ( o.CMClosure = "Open" AND o.CMDisposition = "Investigate" AND
o.CMMaturity = "Reviewing")))
```

  The second case allows the analyst to add item revisions to the **Problem Items** folder when:

  - **Closure** is **Open** (**o.CMClosure = ”Open”**)

  - **Disposition** is **Investigate** (**o.CMDiposition = ”Investigate”**

  - **Maturity** is **Reviewing** (**o.CMMaturity = "Reviewing“**)

Restrict who can assign the analyst and when

Use the following condition to set that either the analyst or the change specialist can assign or reassign the analyst and when.

```
isAnalystAssignable ( ChangeItemRevision o , UserSession u)
```

Then, define the following expression, so both the analyst and change specialist can assign the analyst during the elaboration phase, but only the analyst can assign (that is, reassign) the analyst during the review phase:

```
((u.user_id = o.change_analyst_user_id)
AND
((o.CMClosure = "Open“ AND o.CMDisposition = "None"
     AND o.CMMaturity = " Elaborating“)
OR
(o.CMClosure = "Open" AND o.CMDisposition = "Investigate“
     AND o.CMMaturity = "Reviewing")))
OR
((u.user_id = o.change_specialist1_user_id)
```

```
AND
(o.CMClosure = "Open" AND o.CMDisposition = "None" AND
o.CMMaturity = " Elaborating"))
```

The expression does the following:

- First, it checks if the user logged into the session is the analyst assigned to the change object:

  ```
  (u.user_id = o.change_analyst_user_id)
  ```

  If the user is the analyst, it sets when that user can reassign the change object:

  ```
  (o.CMClosure = "Open“ AND o.CMDisposition = "None"
       AND o.CMMaturity = " Elaborating“)
  OR

  (o.CMClosure = "Open" AND o.CMDisposition = "Investigate“
       AND o.CMMaturity = "Reviewing")
  ```

  The change states for when the analyst can reassign the change object are:

  - **Closure** is **Open** (**o.CMClosure = ”Open”**)
  - **Disposition** is **None** (**o.CMDiposition = ”None”**)
  - **Maturity** is **Elaborating** ((**o.CMMaturity = " Elaborating“**)

  And:

  - **Closure** is **Open** (**o.CMClosure = ”Open”**)
  - **Disposition** is **Investigate** (**o.CMDiposition = ”Investigate”**
  - **Maturity** is **Reviewing** (**o.CMMaturity = "Reviewing“**)

- If the user is not the analyst but the change specialist:

  ```
  (u.user_id = o.change_specialist1_user_id)
  ```

  If the user is the change specialist, it sets when that user can assign or reassign the change object:

  ```
  AND (o.CMClosure = "Open"
       AND o.CMDisposition = "None" AND o.CMMaturity = " Elaborating"))
  ```

  - **Closure** is **Open** (**o.CMClosure = ”Open”**)

- **Disposition** is **None** (**o.CMDiposition = ”None”**)
- **Maturity** is **Elaborating** ((**o.CMMaturity = " Elaborating”**)

> Note:
>
> Change object modification is permitted only when **CMClosure** is set to **Open**.

Summary of default Change Manager conditions

The default rules generally apply to all types of change objects: problem report, engineering change request (ECR), and engineering change notice (ECN):

- To add item revisions to the **Problem Items** folder:

Assigned participant	Closure/Disposition/Maturity property settings
Requestor	**Open/None/Elaborating**
Analyst	**Open/None/Elaborating** or **Open/Investigate/Reviewing**

- To add any object to the **Referenced Items** folder:

Assigned participant	Closure/Disposition/Maturity property settings
Requestor	**Open/None/Elaborating**
Analyst	**Open/None/Elaborating** or **Open/Investigate/Reviewing**

- To add item revisions to the **Impacted Items** folder:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/None/Elaborating** or **Open/Investigate/Reviewing**

- To add item revisions to the **Solution Items** folder (applies to ECN only):

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**Open/Approved/Executing**

- To add a schedule to the **Plan Items** folder (applies to ECR or ECN only):

Assigned participant	Closure/Disposition/Maturity property settings
Analyst	**None/Elaborating** (default)/**Reviewing** or **None/Investigate/Reviewing**

- To propagate a change item to a schedule task folder:

Assigned participant	Closure/Disposition/Maturity property settings
Analyst or Task owner	**None/Elaborating** (default)/**Reviewing** or **None/Investigate/Reviewing**

16. Managing the change process through a workflow

About managing the change process through a workflow

Workflows guide a change through the different phases of a change process: authoring, review and approval, execution, and closure. These phases are modeled as states of the change.

For example, a workflow process moves the **Disposition** attribute of a change from **Investigate** to **Approve**. (Change states cannot be manually updated.) Using Change Manager with Workflow Designer, therefore, tracks the evolution of changes through your organization according to a controlled, repeatable process. In addition, you can:

- Tie a workflow to a scheduled task so as tasks are worked on and updated in Teamcenter workflow, the information is sent to Schedule Manager where the corresponding information is updated. You can also configure a Teamcenter scheduled task so the associated workflow can be initiated when certain conditions are met.

- Set up a workflow to automatically assign review members from assigned participants by configuring the workflow for dynamic participants.

To do this, you need to use the following workflow action handlers:

- The **EPM-set-property** handler to set the change state properties when they change during the workflow.

- The **EPM-auto-assign** handler to assign the appropriate participant on the change object as the responsible party for the current task.

These Change Manager preferences determine which workflows start when a change revision is submitted:

Preference	Change Object
ChangeNoticeRevision_default_workflow_template	Change Notice Revision
ChangeRequestRevision_default_workflow_template	Change Request Revision
ProblemReportRevision_default_workflow_template	Problem Report Revision

Note:

A default workflow process template is used when **Submit** is selected on the **Create** panel. For a change revision submitted *after* creation, the default template is pre-selected for the matching change type, making it easier to submit to the default workflow on pre-existing change revisions.

The following are three examples of workflows for a problem report, engineering change request, and engineering change notice:

- **Problem report (PR) process**
- **Engineering change request workflow**
- **Engineering change notice workflow**

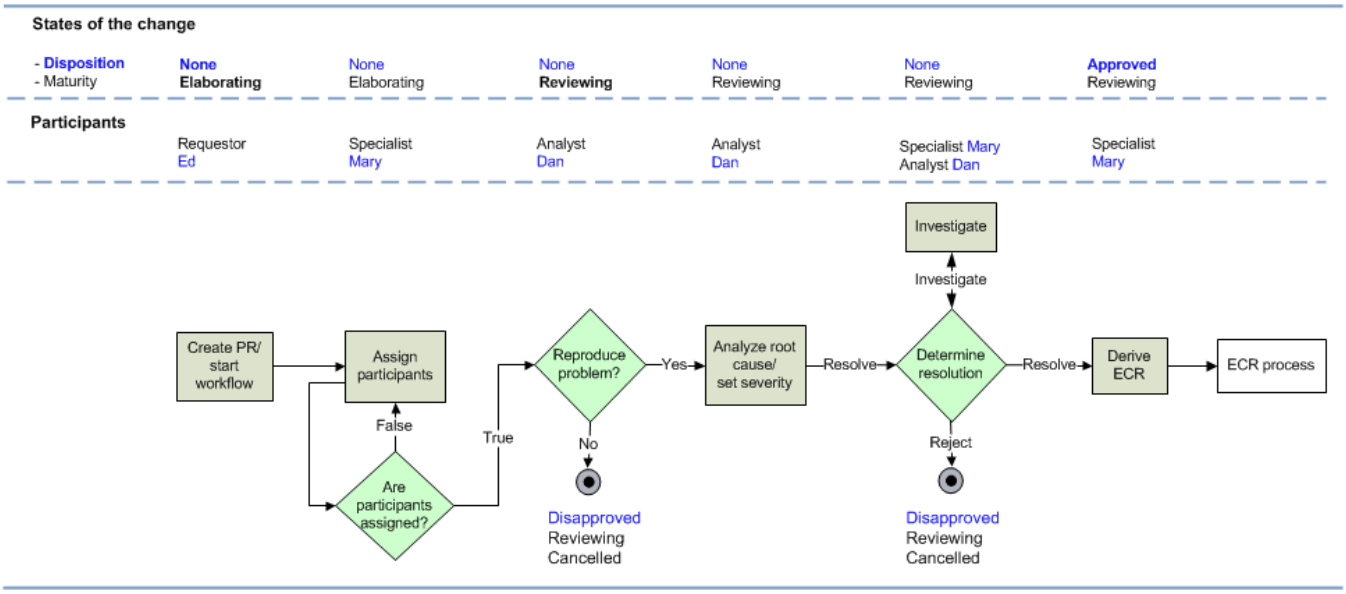
Tip:

Learn more:

- Work through a tutorial of creating an ECR workflow
- Create your own workflows using the Workflow Designer
- **Set change states**
- Initiate a workflow from a schedule task.
- **Set dynamic participants**.

Problem report workflow example

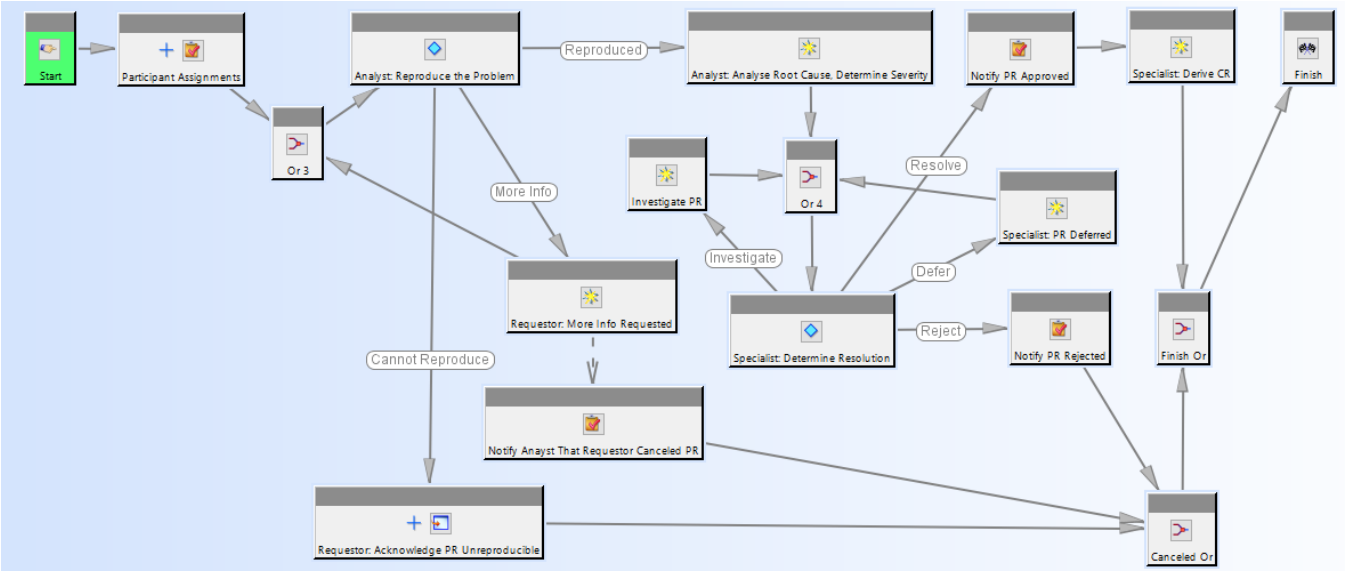
A typical process flow for managing problem report (PR) is shown in the figure. It includes the change states at each stage and the participants assigned.



Any user (whether internal or external) can raise a PR. The process steps through assigning participants, identifying the root cause, and determining if a change is required. If a change is required, an engineering change request (ECR) is derived from the PR to define the solution.

> Note:
>
> The PR process does not define the solution. Non-product solutions, such as resolving a user error, may be resolved as part of the PR process. Expand the signoff outcomes of the Determine Resolution condition task to accommodate these.

The PR workflow is shown next:



PR Properties

Properties exist on the PR to record the pertinent details. Automated branching based on the Priority or Severity values can be added through a condition task, if required.

Problem report properties are:

Property	Description	LOV
CMEnvironmentDescription	Describes the environment as it was when the problem occurred. For example, if the car door was open and the car was moving in reverse.	None
CMSequenceOfEvents	Describes what happened prior to the problem occurring. Provides a guide for reproducing the problem.	None
CMTechReviewPriority	Provides guidance to the analyst regarding which issues should be addressed first. Values 1-4 are from CMII, with 1 being the highest priority. You may want to replace this list of values with your own.	**CM Tech Review Priority (1,2,3,4)**
CMVerification	Describes how the problem was verified	None
CMRamification	Describes what may happen if the problem is not resolved. For example, increased incidence of customer injury.	None
CMSeverityRating	Indicates the severity of the problem. For example, customer injury rates a 1 (high) while a user manual error rates a 4 (low). Values 1-4 are from CMII, with 1 being the highest severity. You may want to replace this LOV with your own values.	**CM Priority (1,2,3,4)**

Process Participants

- **Requestor**

  Initiates the PR.

- **Change Specialist**

Administers/coordinates the PR. Assigns the Analyst.

- **Analyst**

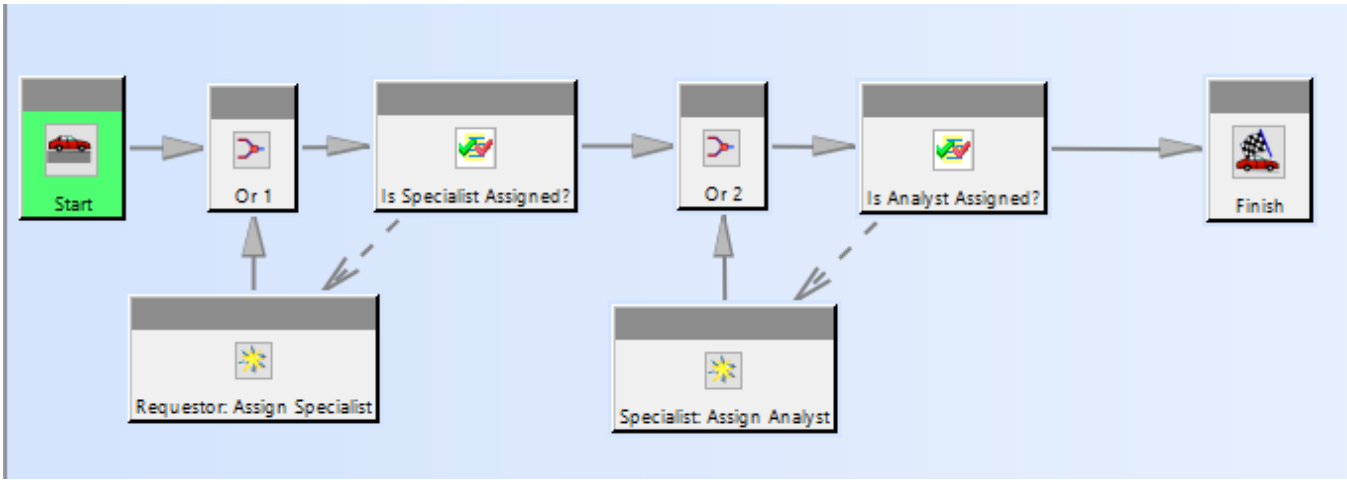
  The technical expert/lead. Evaluates and reproduces the problem. Identifies the root cause(s).

Process Template Detailed Notes

Ensure participants are assigned- Validate task

The **EPM-check-object-properties** rule handler is used with the arguments shown. If the attribute **ChangeSpecialist1** (on the PR, single target of the workflow) has a NULL value, the process exits along the failure path to the Do task to assign the participant.

> Note:
>
> Choose the exit path [Set to Error Path] from the Validate task. Do not select [Set Error Code] as this is not applicable in this case.



- The first **Or** branch sends the workflow to the **Is Specialist Assigned?** *verification task*, determining whether a change specialist has been assigned.
- If the change specialist has not been assigned, the workflow sends the **Assign Specialist** *do task* to the requestor to assign the change specialist.
- The workflow then branches back to the first **Or** task, which again sends the workflow to the **Is Specialist Assigned?** verification task to verify that the specialist has been assigned.
- When the specialist is assigned, the workflow moves to the second **Or** task, which begins the same process but this time to verify that the analyst is assigned and, if necessary, assigns the analyst.
- **Workflow handlers**

- The **EPM-check-object-properties** action handler checks that the value for **ChangeSpecialist1** or **Analyst** is not null.

  > Note:
  >
  > As a best practice, the **Assign Analyst** task should be a separate task from the **Assign Specialist** task. This task is auto-assigned to the **Change Specialist** participant type (now populated).

- The **EPM-auto-assign** handler assigns the participants. The default value is **REQUESTOR**. Your organization can change this to a dedicated group or role. For example, if a change management group is CMII compliant and independent from the engineering department, process integrity is ensured.

  In this example, the participant type **ChangeSpecialist1** is used. If you desire CMII compliance, **ChangeSpecialist2** and **ChangeSpecialist3** are also provided. Contact your administrator.

  In the Do task **Assign Change Specialist**, the assignee for the auto-assign handler is set to the **REQUESTOR**

  The **EPM-auto-assign** handler should be included in the Do task for all workflow templates (Problem Report, Change Request, and Change Notice).

  > Note:
  >
  > The **check-condition** handler is created automatically by the system. The argument on the **check-condition** rule handler on the **Assign Specialist** Do task is set to **any** because the **[Set to Error Path]** was used.

Table 16-1. Workflow Handlers for check and assign tasks

Task	Handler	Argument	Value
Check whether the change specialist is assigned.	EPM-check-object -properties	-type -props	ProblemReportRevision ChangeSpecialist1
Check for the analyst	EPM-check-object-properties	-type -props	ProblemReportRevision Analyst
Assign the specialist	EPM-auto-assign	-assignee	$REQUESTOR
Assign the analyst	EPM-auto-assign	-assignee	$CHANGE_SPECIALIST1

Task	Handler	Argument	Value
			Note: The handler produces an error if the property is null.

Assign Analyst

The Change Specialist assigns the Analyst. This is controlled by BMIDE conditions.

Assign participants prior to starting the workflow process

If either (or both) the Change Specialist and Analyst are assigned to the PR prior to the workflow process starting, the Validate task checks result in true (non-error) results and the PR progresses forward to the reproduce problem step.

To assign participants prior to the workflow:

1. Select the PR revision.

2. Select **Tools**, **Assign Participants,** and **Change Specialist.**

3. If you assigned yourself as the Change Specialist, click **Apply**, assign the Analyst, and click **OK**. The BMIDE condition specifies that only the Change Specialist can assign the Analyst, so that assignment must be completed first. In a production setting, you would most likely edit the condition to enable other users to assign the Analyst, as appropriate for your organization's business rules.

   If you did not assign yourself as the Change Specialist, click **OK** to exit the assignment, log in as the assigned Change Specialist user, and assign the Analyst.

Reproduce the problem

The assigned analyst determines whether the problem can be reproduced (**Reproduce the Problem** condition task) to validate it.

The analyst can choose the following paths:

- **Need More Info branch - More Info do task**

  If the analyst needs more information from the requestor, this branch is selected.

Handler	Set to
EPM-auto-assign	$REQUESTOR

- **Requestor cancels PR**

  The requestor may decide there is not a problem after all, or cannot provide the required information, in which the [**Unable to Complete**] path goes to the **Requestor cancels PR** task, allowing the PR to be terminated.

  This is a Do task with a notify handler to inform the analyst, with no need for acknowledgment.

Property	Set to
Closure	Canceled
Disposition	Disapproved
Maturity	Complete

- **Cannot reproduce the problem**

  If the analyst cannot reproduce the problem, the workflow sends the **Inform Requestor** *acknowledge task* to the requestor. This task records the requestor's acknowledgment.

Property	Set to
Closure	Canceled
Disposition	Disapproved
Maturity	Complete

- **Analyze root cause, determine severity**

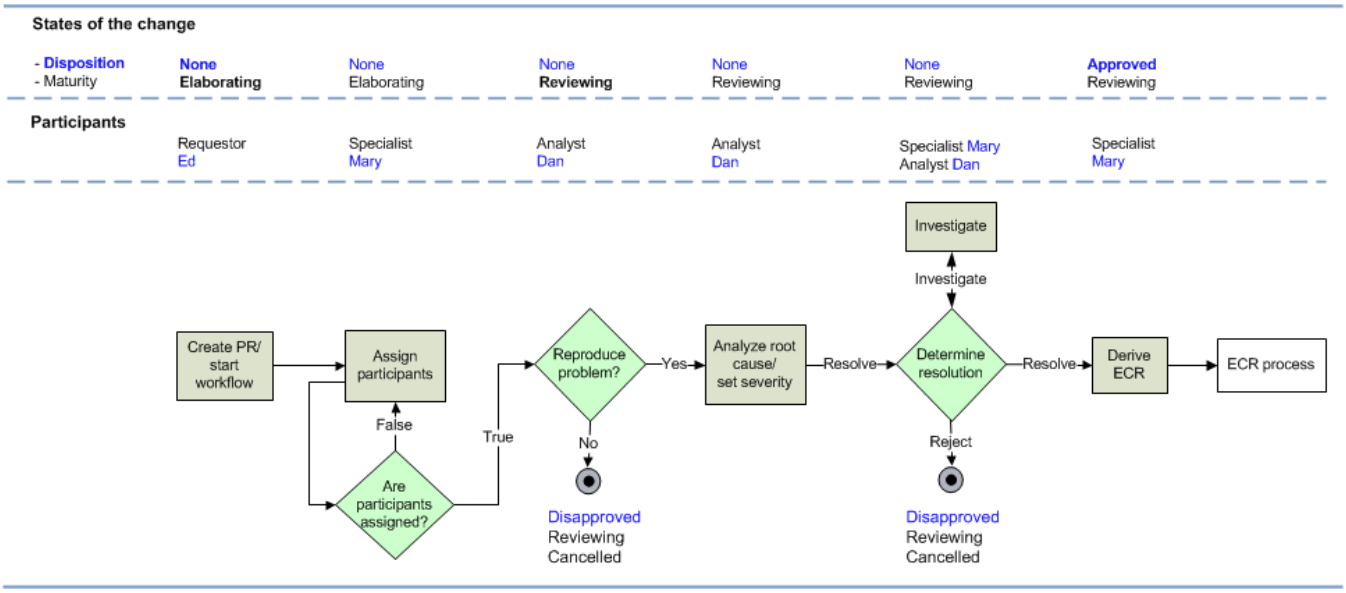
  The analyst performs this task, which is defined separately from the **Reproduce problems** task. In a production setting, there may be different users producing the problem and identifying the root cause. In some cases, the same user (the analyst) may perform both steps, in which case you can combine them.

  The analyst determines which business objects must be replaced or fixed. These objects must be related to the PR as **problem items.** If any items are already related as such, the relationships can be retained if the items truly need to be replaced, but should be removed if they do not.

  Impacted items, items requiring revising to enable the replacement of problem items, are identified during the CR process during the where used search of the impact analysis, and should not be identified here.

Note:

Manual condition tasks only differ from a Do task by allowing multiple exit paths to be defined. Those exit paths can be given custom names, which appear as the signoff options.



Analyze the root cause and determine severity

The **Analyst** performs this task, defined as a separate task from the **Reproduce Problem** task. In a production setting, different users may be reproducing the problem and identifying the root cause. The analyst may perform both steps, in which case they can be combined.

The **Analyst** must determine which product business objects need to be replaced or fixed. These business objects must be related to the PR as **Problem Items**. If any items are already related as such, the relationships can be retained if the items must be replaced, but should be removed if they do not.

Impacted items (items that must be revised to enable the replacement of the problem items) are identified during the CR process during the where-used search of the impact analysis and are not typically identified here.

Determine the resolution

The change specialist performs the **Determine Resolution** condition task. The change specialist can decide the following based on the analysis. There are 4 possible outcomes or exit paths:

Resolution	Description
Resolve	Continues to **Notify Approved** task.
Deferred	Goes to the **PR Deferred** task, which sets the **Disposition** property to deferred. Then it branches back to the **Determine Resolution** task, where it remains in the Change Specialist's inbox as a reminder.
Investigate	Goes to the **Investigate PR** task for more research. The task sets the **Disposition** property to investigate, allowing the analyst to add items to the change folders (Problem Items and Reference Items), or update the PR properties.
Reject	Goes to the **Notify PR Rejected** task. The requestor and analyst are notified that the PR has been rejected. They do not acknowledge the notification. The **Disposition** property is set to disapproved on the following **Or** task.

- **Approve the problem**

  The change specialist can approve the problem resolution (**Resolve**). The **Resolve** task sets the **Disposition** property to **Approved** and notifies the requestor and analyst.

- **Send it back for rework**

  If the change specialist determines more work is required (**Investigate**), the workflow returns to the **Investigate PR** task for more research.

  The task sets the **Disposition** property to **Investigate**, allowing the analyst to add items to the change folders (**Problem Items** and **Reference Items**) or update the PR properties.

- **Reject it**

  If the change specialist rejects the PR (**Reject**), the workflow moves to the **Notify PR Rejected** task. The requestor and analyst are notified that the PR has been rejected. They do not acknowledge the notification.

  The **Disposition** property is set to **Disapproved**.

- **Defer it**

  If the change specialist is undecided and wants to leave the decision for later (**Deferred**), the workflow moves to the **PR Deferred** task, which sets the **Disposition** property to **Deferred**. Then it branches back to the **Determine Resolution** task so it remains in the change specialist's inbox as a reminder.

It also notifies the requestor and analyst that the PR is deferred.

Derive ECR and complete

If the change specialist resolves the problem report, a change request is derived from the PR (**DeriveCR**).

At the beginning of this task, the **Maturity** property is set to **Reviewing**, which is required for the ECR to be derived. The following Business Modeler IDE rule controls this:

```
isCMImplementsCreatableForSecondary ( ChangeItemRevision o , UserSession
u)

o.CMClosure = "Open" AND o.CMDisposition = "Approved" AND o.CMMaturity =
"Reviewing"
```

After the ECR has been derived and starts its processing, the **Maturity** property is set to **Executing** to indicate to observers that the PR is being resolved.

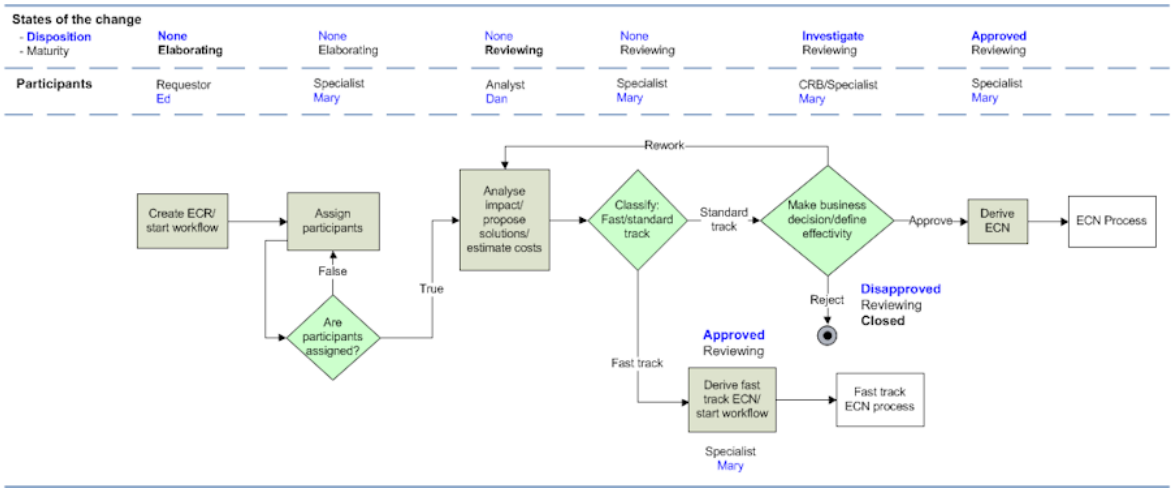
- **Workflow handlers**

  The **EPM-auto-assign** handler automatically assigns the task to the change specialist.

- **EPM-set-property** sets the states noted in the task descriptions.

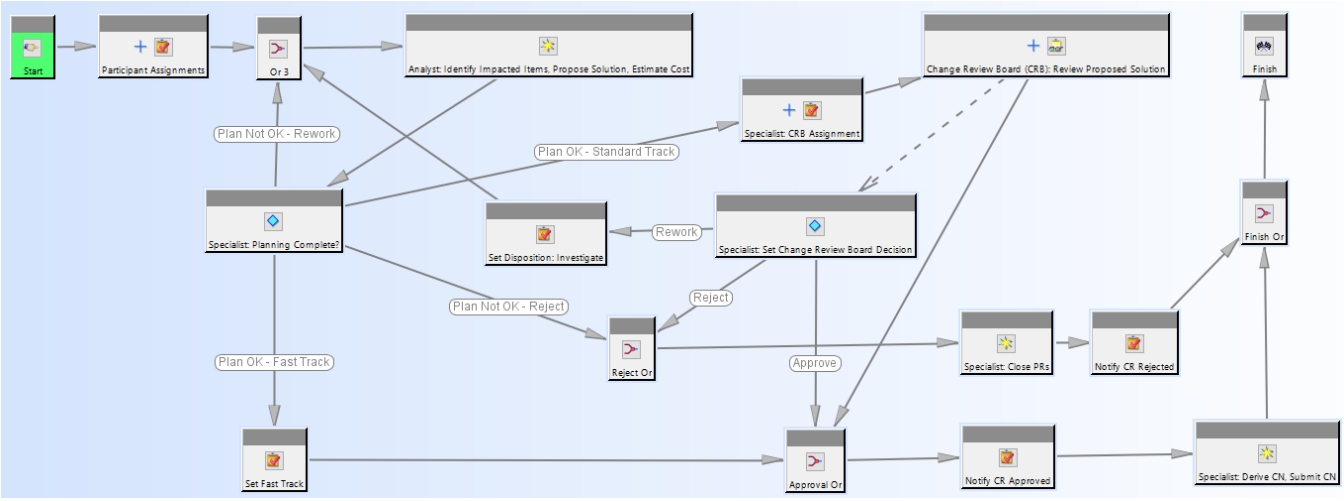
Engineering change request workflow example

A typical ECR process is shown in the figure. It includes the change states and the participants assigned at each stage.



The following ECR workflow steps through the process of verifying that participants are assigned to the workflow, identifying the impacted items, and generating and recommending a solution. The ECR

can follow either a fast or standard track. You can set a cost or other criteria threshold separately to determine which track the ECR follows.



- If the change falls below the set threshold, the change follows a fast track.

  Changes that follow a fast track are those with:

  - Limited cost, typically requiring only revision changes.
  - No interchangeability issues.
  - Require little review.

  The abbreviated ECR process is followed by an abbreviated ECN process to implement the change, which no change implementation board review. The abbreviated ECR process is followed by an abbreviated ECN process to implement the change with no change implementation board review.

- If the change exceeds the set threshold, the change follows a standard track and is reviewed by the change review board.

  Changes that follow a standard track use both a full ECR process with a review by the change review board and a full ECN process with review by the change implementation board. The change also requires an implementation plan.

An ECN is always derived to implement a solution, even for an ECR that went through a fast track process. However, the workflow for the fast track ECN is very short, with a minimal number of steps, as shown in this example. It is necessary to create an ECN so the analyst can add solution items, which is not possible in the ECR, whose purpose is only to define a proposed solution. For example, a **Solution Items** folder is not even associated with an ECR.

> Note:
>
> It is technically feasible to configure an ECR to display the **Solution Items** folder and, therefore, use it to implement a solution. However, this exposes the **Solution Items** folder for all ECRs, which would not be applicable to standard track changes and would confuse users.

If after the workflow ends, an ECR is approved, a new or existing change notice (ECN) is derived.

The process flow of the Change Manager example workflow process for an ECR is:

- Perform impact analysis: how many and which parts are affected? This provides an early idea of cost.
- Propose one or more technical solutions so that the most cost-effective solution can be selected.
- Estimate the costs (initial and recurring), to assist the Change Review Board in making a decision.
- Progress to solve or reject.

> Tip:
>
> **See a complete explanation of the change states an ECR goes through**.

Change Request Properties

These CR-specific properties are available:

Property	Description	LOV
CMReason	Provides a short name describing the change reason. The LOV values come from CMII. Organizations can usually identify different types of changes (for instance, safety or performance) processed on a regular basis.	**CM CR Reason** To fix, to prevent, to improve.
CMProposedSolution	The Analyst describes the recommended technical solution in enough detail to enable a cost-benefit decision. For Standard Track changes, the Analyst may attach other documents, BOM markups, preliminary schedule, or any other item necessary to describe the proposed solution. Those items should be briefly described here. This property is part of the technical recommendation.	None

Property	Description	LOV
CMIsFastTrack	Indicates whether the CR should be processed as a Fast Track change.	**CMII CR Fast Track** Yes, No
CMTechReviewPriority	Provides guidance to the Change Review Board and/or Technical Review Board (TRB). Can be copied from the PR, or the Change Specialist can set the value for the CRB or TRB.	**CM Priority** 1,2,3,4
CMRecurringCost	The estimate of the incremental costs of the changed product.	None
CMNonrecurringCost	The estimate of the total costs to implement the change.	None
CMTechnicalRecommendation	This property forms part of the technical recommendation, in addition to **CMTestResultsAttached, CMTechnicalReview,** and **CMProposedSolution**	**CM Tech Recommendation** Problem Confirmed, Problem Not Confirmed, Another Problem
CMTestResultsAttached	This property is part of the technical recommendation, indicating whether the Analyst has attached test results documentation.	**CM YesNo** Yes, No
CMTechnicalReview	*This property is not displayed by default.* Values 1-2 come from CMII. This property should be part of the technical recommendation	**CM Tech Review** 1 = Requestion Solution is Acceptable; 2 = Another Solution is Proposed
CMTechRecommDate	Specifies the date of the recommendation.	None
CMTimingFactors	The CRB or Analyst may provide requirements, opinions, or guidance to the CIB regarding the setting of effectivity, and therefor implementation timing, for the change	None

Process Participants

- **Requestor**

  Initiates the change.

- **Change Specialist**

  Administers/coordinates the change. Assigns the Analyst.

- **Analyst**

  The technical expert or lead. Performs impact analysis and proposes the solution.

- **Change Review Board (CRB)**

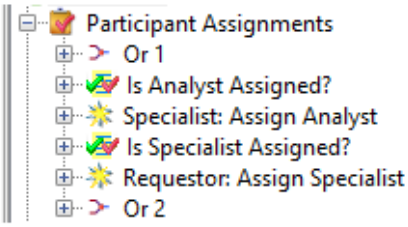
  Business managers to make the cost-benefit analysis and provide financial approval.

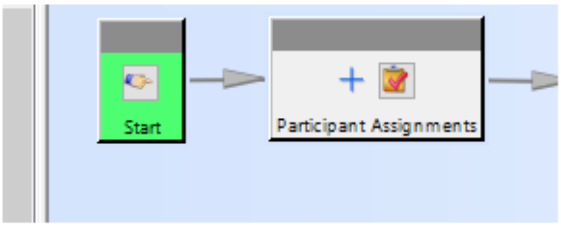
Workflow process template notes

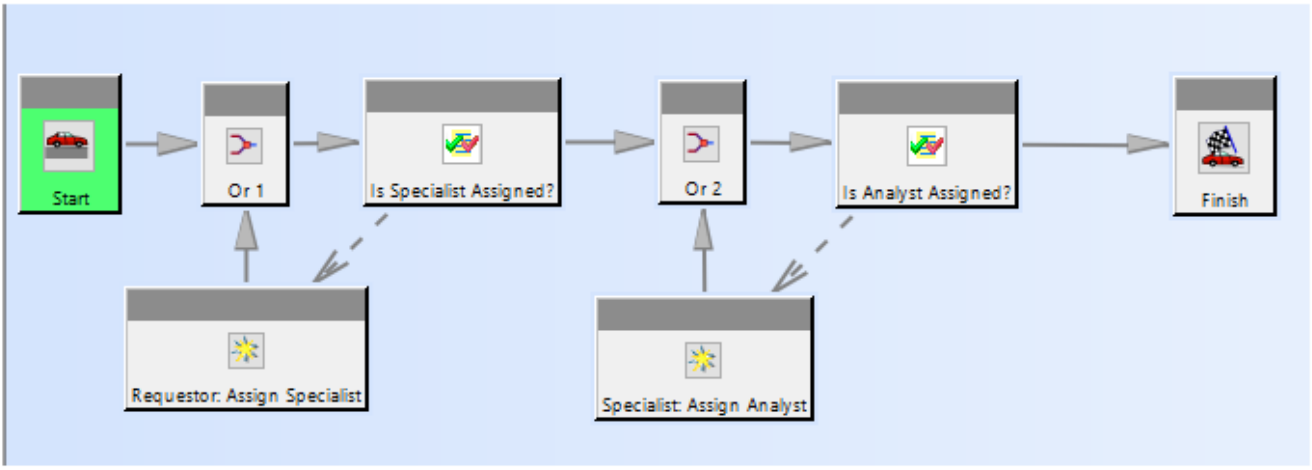
Ensure participants are assigned - Validate task

The **EPM-check-object-properties** rule handle, with the arguments shown below, is used to validate whether participants are assigned. If the attribute **ChangeSpecialist1** (on the CR, the single target of the workflow) has a null value, the process exists along the failure path to the Do task to assign the participant.

The workflow starts by verifying whether this assignment has been completed using two **Or** branches as was done for the PR. In this case, the branches verify and assign the change specialist, and the second branch verifies and assigns the change analyst/change review board (CRB).







Workflow Handlers for check and assign tasks

Task	Handler	Argument	Value	Notes
Check whether the change specialist is assigned.	**EPM-check- object-properties**	-include_type -property	ChangeNoticeRevision Analyst	None
Check for the change analyst and change review board (CRB)	**EPM-check- object-properties**	-include_type -property	ChangeRequestRevision ChangeReviewBoard	The handler produces an error if either the analyst or CRB properties have null values. The argument is ChangeReviewBoard (not $CHANGE_REVIEW_BOARD as used in the auto-assign handler.

Task	Handler	Argument	Value	Notes
Assign the specialist	**EPM-auto-assign**	-assignee -source_task	$REQUESTOR Is Specialist Assigned?	The **auto-assign** handler should be included in the Do task for all workflow templates (PR, ECR, ECN). Participant assignments are not carried over from the change object to the derived change. The change specialist must be assigned for each new change object (ECR, ECN). Typically, the change specialist derives/ creates the ECR/ECN, and assigns herself. The **EPM-check-condition** is created automatically by the system.
Assign the analyst and CRB	**EPM-auto-assign**	-assignee	$CHANGE_SPECIALIST1	The change specialist assigns the analyst and the CRB. The ability to make these assignments is controlled by BMIDE conditions.

Assign participants prior to starting workflow process

If the Change Specialist, or the Analyst and CRB are assigned to the CR prior to starting the workflow process, the validate task checks result in true (non-error) outcomes, and the CR automatically progresses forward to the **Identify Impacted Items, Propose Solution, Estimate Cost** step.

To assign the participants prior to the workflow:

1. Select the CR revision.
2. Select **Tools**, and then **Assign Participants**, and assign the Change Specialist.
3. If you did not assign yourself as the Change Specialist, click **OK** to exist the assignment. Log in as the assigned Change Specialist user and assign the Analyst and CRB.
4. If you did assign yourself as the Change Specialist, click **Apply.**
5. Assign the Analyst and CRB, and click **OK**.

The BMIDE condition specifies that only the Change Specialist can assign the Analyst, so that assignment must be completed first. In your organization, you would most likely edit the condition to enable other users to assign the Analyst, as appropriate for your organization's business rules.

Identify impacted items, propose a solution, and estimate costs

The analyst assigned to the next task (**Identify Impacted Items, Propose Solution, Estimate Cost** *do task*) identifies the impacted items and generates and determines a solution. The analyst elaborates the change object by adding related objects to it, including creating markups on documents, Word documents, presentations, and so on.

The analyst determines whether new objects (items) or simply new revisions are required with cost and interchangeability implications. This must be clear to the engineer who later makes the changes. The change review board can amend the solution.

Determine if the planning is complete and which track to follow

Once the analyst determines a solution, the workflow moves to the **Planning Complete?** *condition task*, which is assigned to the change specialist who evaluates if the ECR is ready to move forward and on which track (fast or standard).

The task has these possible outcomes or exit path:

- **The plan is not complete – rework**

  The change specialist chooses this branch (**Plan Not OK - Rework**) if the analyst needs to add more definition to the solution. The workflow returns to **Identify Impacted Items, Propose Solution, Estimate Cost** task through the **Or** task. The analyst performs additional impact or other analyses as required to fully define the proposed solution. The process returns the ECR to the change specialist at the **Planning Complete?** task for another verification.

- **The plan is not complete – reject**

  The change specialist closes PRs. Selecting this branch cancels the CR.

- **The plan is complete and does not need review**

  The change specialist chooses the **Plan OK – Fast Track** branch if the change meets the fast track criteria and is ready for implementation.

  The workflow moves to the **Derive CN** task, where the change specialist derives an ECN from the ECR and initiates the ECN fast track workflow process.

  While an ECR may fit the fast track criteria, it is considered a best practice to follow it with an ECN, especially for new or updated product data. In addition, at the ECN stage, it may be combined with other changes for implementation. The result may or may not be a fast track ECN.

- **The plan is complete but needs review**

  (**Plan OK – Standard Track**)

  The change specialist chooses this branch if the planning is complete and now can be reviewed by the change review board. It moves to the **CRB Review proposed solution** task.

  The ECR's change states are updated to lock the ECR and its folders against change while it is being reviewed:

  - **Disposition** of **None**
  - **Maturity** of **Reviewing**
  - The **Reject** path is followed if it is not approved. The workflow moves to the condition task **Set Change Review Board Decision**. The change specialist records the CRB's desired outcome and sets the path accordingly. This can be done by reviewing the signoff comments, phone or email survey, or a meeting with the CRB to review the desired outcome.

    You can have an approval from the condition task after a reject from the review. The reject may not be a complete rejection – it could be an approval with comments. It also provides a second opportunity for reviewers to change their minds, after discussion with the CRB.

    There are several ways to model this:

    1. The CRB meets offline, and the change specialist enters the decision - use only the condition task with multiple outcomes.
    2. The CRB meets online, and the change specialist only observes - use only the review task with approve/reject outcomes. This can interpret 100% approval as approve, and 100% rejection as reject, and any mix of those as requiring rework.
    3. The CRB meets online, the change specialist reviews comments and enters the decision - using both the review task and condition task. 100% approval from the CRB review is automatically interpreted as approve.

  At completion, the CR is updated to indicate to observers that the CR is being implemented (**Maturity** of **Executing.**)

  If all members of the change review board do not approve, the workflow moves to the **Set Change Review Board Result** *condition task*.

- The start action of the **Review** tasks sets the **Maturity** to **Reviewing.** The CR is locked to prevent any changes while it is in review.

Handler	Argument	Value
EPM-set-property	-property	CMMaturity
	-value	Reviewing
	-to_attach	target
	-include_type	ChangeRequestRevision
	-bypass	
EPM-set-rule- based-protection	-acl	Vault
EPM-adhoc-signoffs	-assignee	$CHANGE_REVIEW_BOARD
	-auto_complete	
	-ce	

You must specify a Workflow ACL to enable correct access to the attached items.

Use the **adhoc-signoffs** handler with the assignee **$CHANGE_REVIEW_BOARD** to assign the members of the CRB automatically.

Assign the CRB to perform the signoffs. In the following example, the participant type **Change Review Board** is used.

- **Who should be assigned to the CRB?**

  A number of groups can be created in the organization to contain the members of the CRB for different types of review; for instance standard, safety impact, and so forth. One of these groups is assigned as the CRB participant type.

  Another approach is to assign a number of users to the Change Management group, with role CRB, and then assign those members as appropriate to the Change Review Board participant.

  > Note:
  >
  > The CRB participant can have multiple users (indicated by the double head icon).

Set Change Review Board Result

This is automatically assigned to the change specialist. The condition task has three possible outcomes or exit paths:

1. **Approve**

   Continues to the **Notify CR Approved**task.

2. **Rework**

   Rework path goes to a task that sets the **Disposition** to **Investigate,** and then back to the **Identify Impacted Items, Propose Solution, Estimate Cost** task. This allows the analyst to add items to the change folders **Problem Items, Reference Items,** and **Impacted Items.**

3. **Reject**

   Continues to the **Identify Impacted Items, Propose Solution, Estimate Cost** task.

Notify CR approved

Notify and set the **Disposition** state to **Approved** and **Maturity** to **Reviewing**. BMIDE rules will not allow objects to be added to the change.

Handler	Argument	Value
EPM-notify	-recipient	$REQUESTOR, $ANALYST
	-subject	CR Approved
	-attachment	target
EPM-set-property	-property	CMMaturity, CMDisposition
	-value	Reviewing, Approved
	-to_attach	target
	-include_type	ChangeRequestRevision
	-bypass	

Notify CR Rejected

Notify requestor and analyst; set **CMClosure** = **Canceled** , **CMDisposition** = **Disapproved** and **CMMaturity** = **Complete**using the **EPM-set-property** handler.

Handler	Argument	Value
EPM-notify	-recipient	$REQUESTOR, $ANALYST
	-subject	CR Rejected
	-attachment	target
EPM-set-property	-property	CMClosure, CMDisposition, CMMaturity
	-value	Canceled, Disapproved, Complete
	-to_attach	target
	-include_type	ChangeRequestRevision

Handler	Argument	Value
	-bypass	

Derive the change notice

The Change Specialist chooses this branch if the change meets fast track criteria and is ready for implementation.

For a fast track, the change specialist derives an ECN from the ECR and initiates the ECN workflow process. For a standard track, the creation occurs after the Change Review board has approved the ECR (**Derive CN**). For a fast track, the creation occurs after the change specialist has approved that the ECR follow a fast track (**Derive CN, Start CN, Fast Track**).

At the beginning of either task, the ECR state is updated so the ECN can be derived controlled by BMIDE:

```
isCMImplementsCreatableForSecondary ( ChangeItemRevision o , UserSession u)
o.CMClosure = "Open" AND o.CMDisposition = "Approved" AND o.CMMaturity =
"Reviewing"
```

- **In the start section**

Handler	Argument	Value
EPM-auto-assign	-value	$CHANGE_SPECIALIST
EPM-set-property	-property	CMDisposition, CMMaturity
	-value	Reviewing, Approved
	-to_attach	target
	-include_type	ChangeRequestRevision
	-bypass	
EPM-adhoc-signoffs	-assignee	$CHANGE_REVIEW_BOARD
	-auto_complete	
	-ce	

At the end of the process, after the change notice has been derived and started its processing, the ECR state is updated to indicate to others that the ECR is being implemented: **Maturity** of **Executing**.

Handler	Argument	Value
EPM-set-property	-property	CMMaturity
	-value	Executing
		target

Handler	Argument	Value
	-to_attach	ChangeRequestRevision
	-include_type	
	-bypass	

Close PRs

The change specialist performs this task manually. **EPM-set-property** can be automated to close implemented PRs if your organization has implemented this feature.

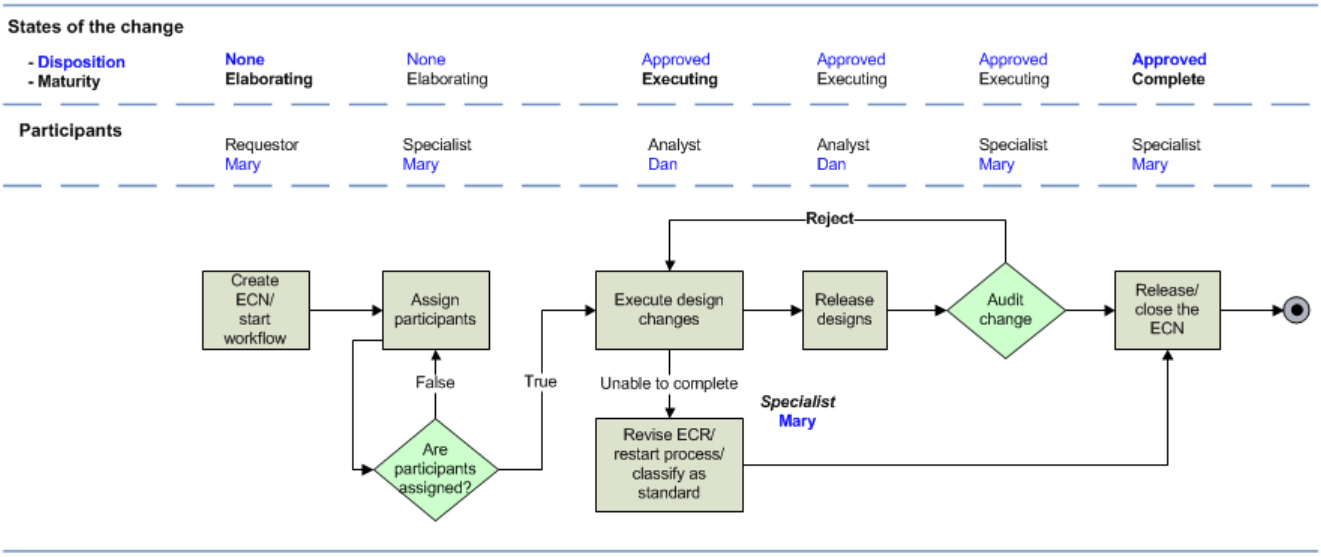
In the instance where the CR is to be canceled: Any PRs that are in the implements list of other open CRs should be removed from the implements list of this CR. Any remaining PRs in this CR's implements list, that need closing, should be submitted to a PR workflow that will close them.

Handler	Argument	Value
EPM-auto-assign	-value	$CHANGE_SPECIALIST1
EPM-set-property	-property	CMClosure, CMDisposition, CMMaturity
	-value	Canceled, Disapproved, Complete
	-to_attach	target
	-include_type	ChangeRequestRevision
	-bypass	
EPM-adhoc-signoffs	-assignee	$CHANGE_REVIEW_BOARD
	-auto_complete	
	-ce	

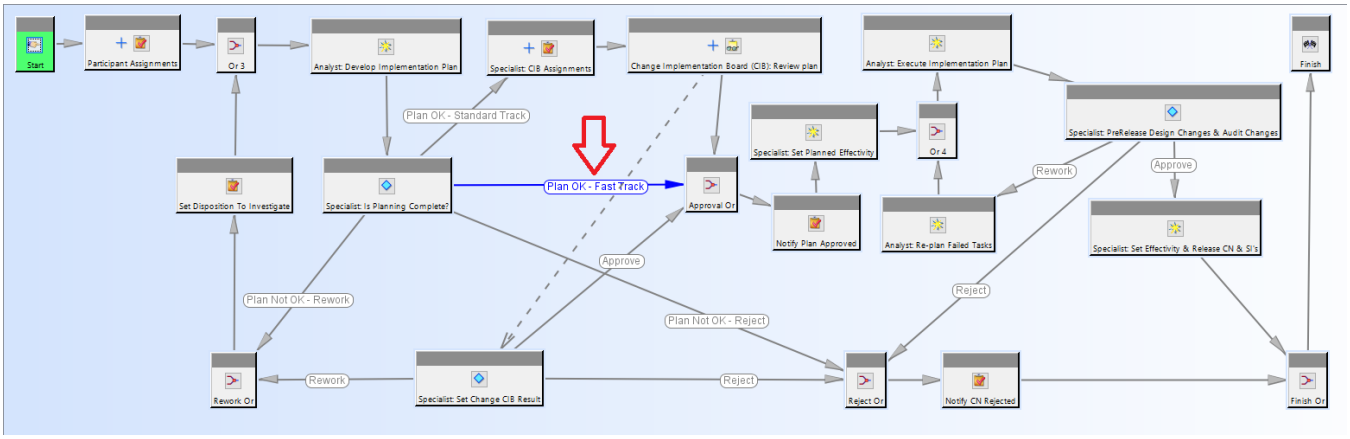
This task sets the following CR states: **Closure** = **Canceled**, **Maturity** = **Complete**, **Disposition** = **Disapproved**

Engineering change notice fast track workflow example

A typical fast track engineering change notice (ECN) process is shown in the figure. It includes the change states and the participants assigned at each stage.



The workflow to implement this process is shown in the next figure.



The workflow steps through the process of verifying that participants are assigned to the workflow, implementing the change, and verifying its implementation through an audit. When the implementation is complete, the workflow closes the ECNs, associated problem reports (PRs), and engineering change requests (ECRs).

A fast track ECN provides a quick and controlled change process that can be audited. An analyst usually performs this when the cost of the change is below a company's set threshold. Therefore, you should have a preceding ECR process and object whose purpose is to define the cost and the proposed solution, and determine the appropriate processing track.

The analyst typically owns the items requiring change (in CMII terms, the analyst is the creator), and can modify and release them without additional approval (CMII rules for a fast track process).

The change specialist monitors the fast track process and performs the final audit.

Note:

The fast track ECN process does not include setting a planned effectivity. If you need to set effectivity, use a standard track process. The actual effectivity is set as-needed at the **Set Status Released** task.

The process flow for the Change Manager example workflow process for an ECN fast track is:

- Start the workflow and assign participants
- Develop the implementation plan
- Is planning complete?
- Notify plan approved
- Set Planned Effectivity
- Execute Implementation Plan
- Notify ECN Rejected
- Set Disposition to Investigate
- Perform the change tasks and create supersedure

Process Participants

- **Requestor**

  Initiates the ECN.

- **Change Specialist**

  Administers/coordinates the change. Assigns the analyst.

- **Analyst**

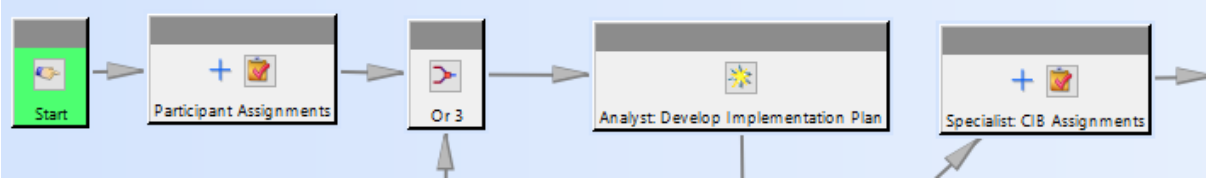
  The technical expert/lead. Performs the change tasks.

Start the workflow and assign participants

Participant assignments are *not* carried over from the change object to the derived change. Therefore, the change specialist needs to be assigned for each new change object (either an ECR or an ECN). Typically, the change specialist derives or creates the ECR or ECN, and therefore, would assign

themselves as change specialists. They can do this because they have write access as owners of the object. However, the Business Modeler IDE conditions must also be met (the creator must be in the Change Management group).

The workflow starts by verifying whether this assignment has been completed using two **Or** branches as was done for the PR. In this case, the branches verify and assign the change specialist, and the second branch verifies and assigns the analyst.



Workflow handlers

- The **EPM-check-object-properties** action handler checks that the **ChangeSpecialist1** is assigned. If it is not, the workflow is routed to a task requesting its assignment.
- The **EPM-auto-assign** handler assigns the participants.

Workflow Handlers for check and assign tasks

Task	Handler	Argument	Value
Check whether the change specialist is assigned.	EPM-check-object-properties	-include_type -property	ChangeNoticeRevision ChangeSpecialist1
Assign the Change Specialist 1 participant on the ECN revision. Complete task when assignment is done.	EPM-auto-assign	-assignee	$REQUESTOR
Check for the analyst	EPM-check-object-properties	-include_type -property	ChangeNoticeRevision Analyst
Assign the analyst	EPM-auto-assign	-assignee	$CHANGE_SPECIALIST1

Task	Handler	Argument	Value
			Note: The handler produces an error if the property is null.

Assign participants prior to starting workflow process

If the Change Specialist, or the Analyst and Change Implementation Board (CIB) are assigned to the ECN prior to starting the workflow process, the validate task checks result in true (non-error) outcomes, and the ECN automatically progresses forward to the **Change Implementation Board (CIB): Review Plan** step.

To assign the participants prior to the workflow:

1. Select the ECN revision.
2. Select **Tools**, and then **Assign Participants**, and assign the Change Specialist.
3. If you did not assign yourself as the Change Specialist, click **OK** to exist the assignment. Log in as the assigned Change Specialist user and assign the Analyst and CIB.
4. If you did assign yourself as the Change Specialist, click **Apply.**
5. Assign the Analyst and CIB, and click **OK**.

   The BMIDE condition specifies that only the Change Specialist can assign the Analyst, so that assignment must be completed first. In your organization, you would most likely edit the condition to enable other users to assign the Analyst and CIB, as appropriate for your organization's business rules.

Develop implementation plan

The implementation plan can take several forms. Typically, the simplest changes are outlined in the **Description** property. More complex changes can be handled by creating a schedule (using Schedule Manager) and relating it to the ECN using the **Plan Items** relationship. Ad-hoc schedules can be created to meet the requirements of each individual ECN, or they can be copied from a schedule template. Schedule templates provide a pre-defined schedule of tasks established for changes of a specific type. When you plan the implementation for such a change, start with the corresponding schedule template. Any number of schedules can be defined and related to the ECN.

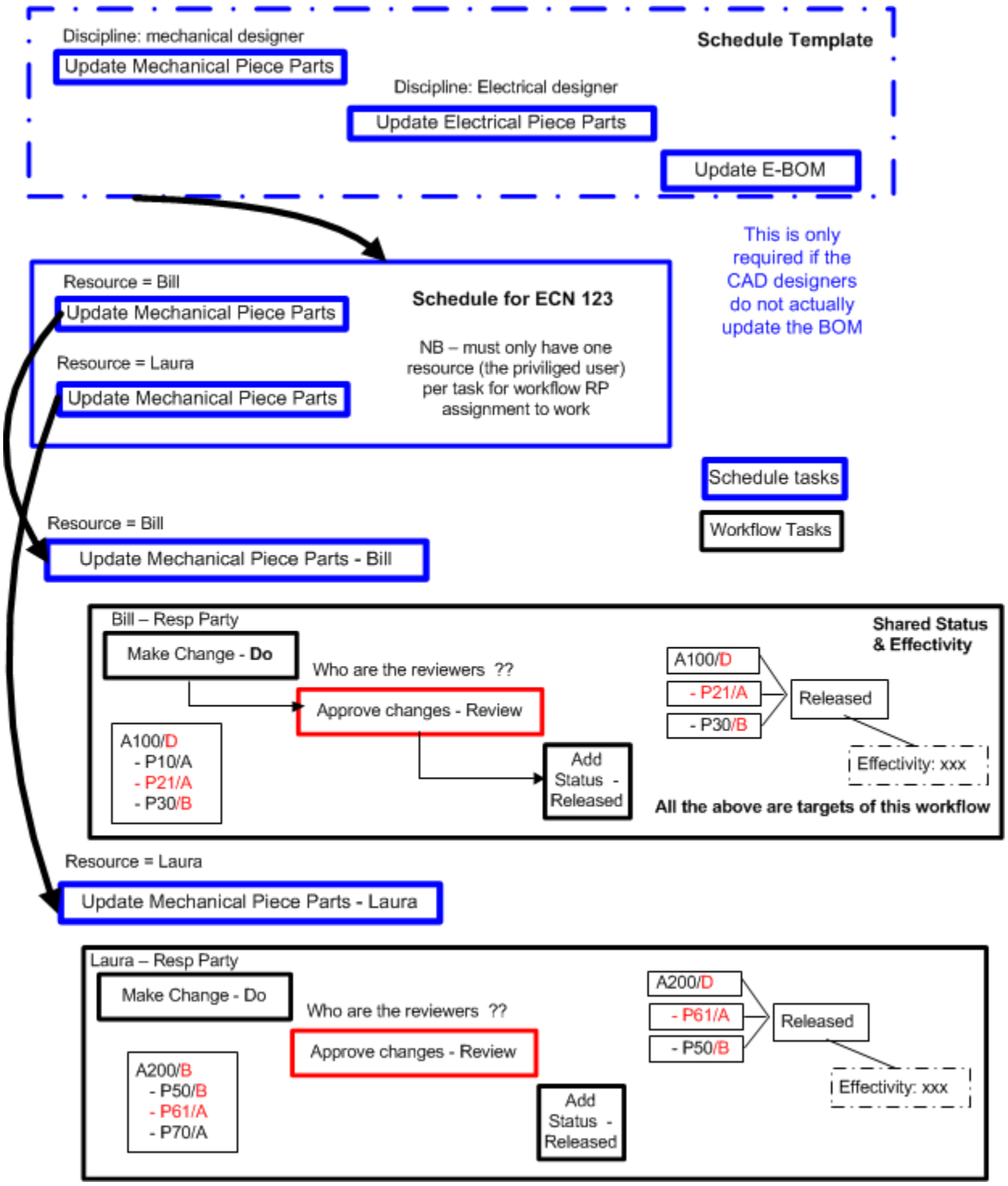
The schedule has tasks for each discipline (or user) to create new revisions or items, and make the changes to implement the proposed solution. Depending on the change work, you may have one task

per assignee covering the changes for any number of items assigned to that user, or you may have one task per **problem item** or **impacted item**, or any other work breakdown style you choose.

each schedule task has a small workflow to manage the execution of the task and to route the task and related objects to the assignees. Such a workflow may include tasks to approve the changes made to each item revision, or such validation can be left to a later step. This applies a status such as pre-released.

> Note:
>
> If you use a schedule with the change items, the workflow associated to the schedule tasks must use the **EPM-set-rule-based-protection** handler with the **Task Single Assignee Write** ACL to enable impacted item revision.

For example, in the following illustration, the schedule for ECN 123 was crated from a standard schedule template, and then modified to meet the ECN's requirements (copying the update mechanical piece parts task for Bill and Laura). Each task has the same small workflow template attached, routing the tasks to the assignee (Bill), routes to a review of the resulting items, and then adds a status to the resulting items.



The approach over the span of tasks includes:

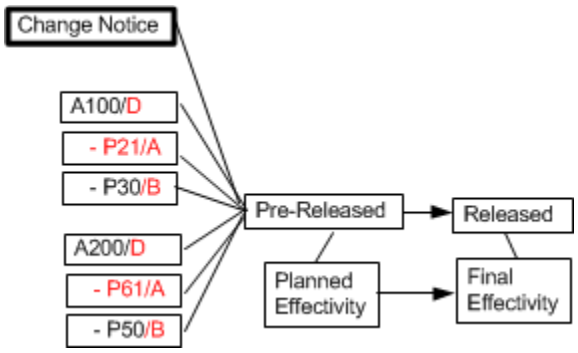
- Apply the status **PreReleased** to the ECN, so planned effectivity can be set.
- Attach the **Solution Items** as targets of the workflow process.

- Apply the **PreReleased** status (already created by the **create-status** handler and attached to the root workflow task) to the solution items when approved. The solution items will share the same status object as the ECN, and have the same effectivity.

- Finally rename the status on the ECN and solution items to **Released** once the overall ECN has been audited.

This approach means that all of the solution items share the same status and effectivity, and will be implemented at the same point. Any subsequent updates to the effectivity on the ECN automatically apply to all the solution items.

The release status on the solution items is important for structure configuration. The following diagram illustrates this approach:



Workflow handlers

- **Workflow handlers**

  The **EPM-set-status** handler removes any status objects from the ECN that were carried into this task from an earlier loop through this workflow process, or from an earlier workflow process. If this is the first time through this task, this handler has no affect.

- The **EPM-remove-objects** handler removes all workflow attachments that were carried into this task from an earlier loop through this workflow process or from an earlier workflow process, leaving only the ECN. If this is the first time through this task, this handler has no affect.

- The **EPM-auto-assign** handler assigns the task to the analyst.

- The **EPM-set-rule-based-protection** handler is required to enable the analyst to sign off the task, triggering the attachment of the related items. The related items are actually modified by the attachment to the workflow. Therefore, write access is required. It also requires an appropriate ACL.

  After the change has been executed, the solution items and any other items related to the ECN are attached to the workflow task to enable easy management of status objects and effectivity.

- The **EPM-attach-related-objects** handler attaches related objects to the ECN in the Complete action portion of the task. For example:

  -relation=IMAN_specification
  -attachment=target

  Or

  -relation CMHasSolutionItem

  -attachment target

  Therefore, when the status is applied in the next task (**Audit Change**), it is added to the solution items.

> Note:
>
> The same status object is shared with the ECN and all of its resulting items. Any effectivity added to the status object applies to all of the resulting items equally. In addition, if the status object is changed or deleted, all of the resulting items are affected equally. Therefore, all the solution items share the same status and effectivity, and are implemented at the same point. Also, any updates to the effectivity on the ECN automatically apply to all the solution items.
>
> Therefore, all the solution items share the same status and effectivity, and are implemented at the same point. Also, any updates to the effectivity on the ECN automatically apply to all the solution items.

Is planning complete?

This task is assigned to the change specialist, who evaluates whether the ECN is ready to move forward. The condition task has four possible outcomes/exit paths:

- Plan OK- standard track (if CIB review is necessary)
- Plan OK- fast track (if CIB review is unnecessary)
- Plan Not OK- rework
- Plan Not OK- reject

Notify plan approved

If the plan is approved, a notify handler is used to avoid a required acknowledgment. The **Notify Plan Approved** task sets the disposition to approved. This is set on the Start action, so resulting items can be added to the **Solution Items**folder.

Handler	Argument	Value
EPM-set-property	-property	CMDisposition
	-value	Approved
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Set Planned Effectivity

The **Set Planned Effectivity** task sets the **Maturity** to **Executing.** This is set on the Start action so resulting items can be added to the **Solution Items** folder.

Handler	Argument	Value
EPM-set-property	-property	CMMaturity
	-value	Executing
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Execute Implementation Plan

The analyst is responsible for executing the change, creating solution items, and revising impacted items. The analyst can in turn make the changes or delegate to other team members. Since this is a fast track change, it is typically performed by the analyst.

Workflow handlers

- The **EPM-set-status** handler is used to remove any status objects from the ECN that were carried into the task from an earlier loop through workflow process execution, or from an earlier workflow process execution. This handler has no effect if it is the first time through this task.
- **EPM-remove-objects** is used to remove all workflow attachments that were carried into this task from an earlier loop through this workflow process execution, or from a previous workflow process. This handler has no effect if it is the first time through this task.
- **EPM-auto-assign** assigns the analyst to implement the change.
- **EPM-set-rule-based-protection** is required to enable the user to sign off the task, triggering the attachment of the related items. The related items are modified by the attachment to the workflow, so write access is required.

Handler	Argument	Value
EPM-set-status	-action	delete
EPM-remove-objects	-keep_targets	ChangeNoticeRevision
EPM-auto-assign	-assignee	$ANALYST
EPM-set-rule-based-protection	-acl	Task Single Assignee Write

After the change is executed, the solution items and any other items related to the CN are attached to the workflow task. This enables easy management of status objects and effectivity.

Note:

This implementation approach takes advantage of sharing the same status object with the CN and all of the resulting items. Any effectivity added to the status object applies to all of the resulting items equally. If the status object is changed or deleted, all of the resulting items are affected equally.

Handler	Argument	Value
EPM-attach-related-objects	-relation	CMHasSolutionItem
	-attachment	target
EPM-attach-related-objects	-relation	IMAN_specification
	-attachment	target
EPM-attach-related-objects	-relation	TC_Attaches
	-attachment	target

The task is assigned to an analyst who manages the execution. If a schedule was created, the plan is executed. The schedule automatically executes the tasks once the first task is started by the analyst.

Notify ECN Rejected

This is an automatic task, using the **notify** handler to inform the analyst and requestor participants that the ECN is rejected.

- **Closure** = canceled
- **Maturity** = complete
- **Disposition** = disapproved

Handler	Argument	Value
EPM-set-property	-property	CMClosure, CMMaturity, CMDisposition
	-value	Canceled, Complete, Disapproved
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Set Disposition to Investigate

This task uses the **EPM-set-property** handler to set the disposition to investigate. This allows the analyst developing the plan to change the implementation plan for the change notice, or add a new plan.

Handler	Argument	Value
EPM-set-property	-property	CMDisposition
	-value	Investigate
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Set Planned Effectivity

The change specialist sets the planned effectivity, using the following rules:

- You must be assigned as the change specialist for the ECN
- The ECN revision must have an attached status object.
- The **Disposition** state must be set to **Approved**.
- The ECN **Maturity** state must be set to **Reviewing**.

These rules can be adjusted by updating the BMIDE conditions.

On the start action, the **EPM-set-status** handler attaches the status object to the ECN (already the process target).

The change specialist sends the ECN to the Change Manager application and opens the **Change Effectivity** tab. The planned effectivity can be set on the status object. Once the effectivity is set, the **Maturity** state is set to **Executing**.

Handler	Argument	Value
EPM-set-status	-action	replace
EPM-set-property	-property	CMMaturity
	-value	Executing
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Perform the change tasks and create supersedure

After the change tasks are complete, if a BOM has been changed, each task assignee should create supersedure records for their parts of the change.

1. Receive the ECN in **My Worklist**.
2. Send the ECN to Change Manager.
3. Select the impacted item; **RMB > Revise Impacted Item.** This revises the item to the next revision and pastes it into the solution items folder.
4. If the replacement item is already in the solution items folder, copy the replacing item revision.
5. Select the new solution item; **RMB > Open in Structure Manager** with Supersedure Window.
6. In Structure Manager, select the problem item to be replaced.
7. Click **Edit > Replace** to replace the existing item with the replacing item.
8. Save the BOM changes.
9. Select the problem item in the left window and the replacing item in the right window. Click the **Create Supersedure** icon.
   - The supersedure is created, where you can expand to see the adds and cancels.
   - If a message appears indicate that no problem item exists, click **Yes**.
   - If a message appears indicating you must update the BOM changes outside of Change Manager, click **Yes**.
   - If you receive an error, close Structure Manager and reopen it from Change Manager (repeat step 5).

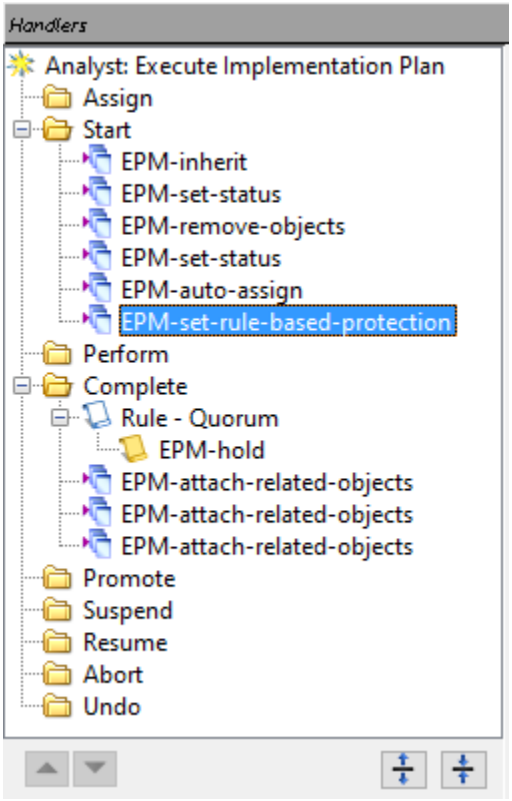
10. Go to Change Manager and select the ECN.

11. Select **BOM Changes** and expand to see the adds and cancels.

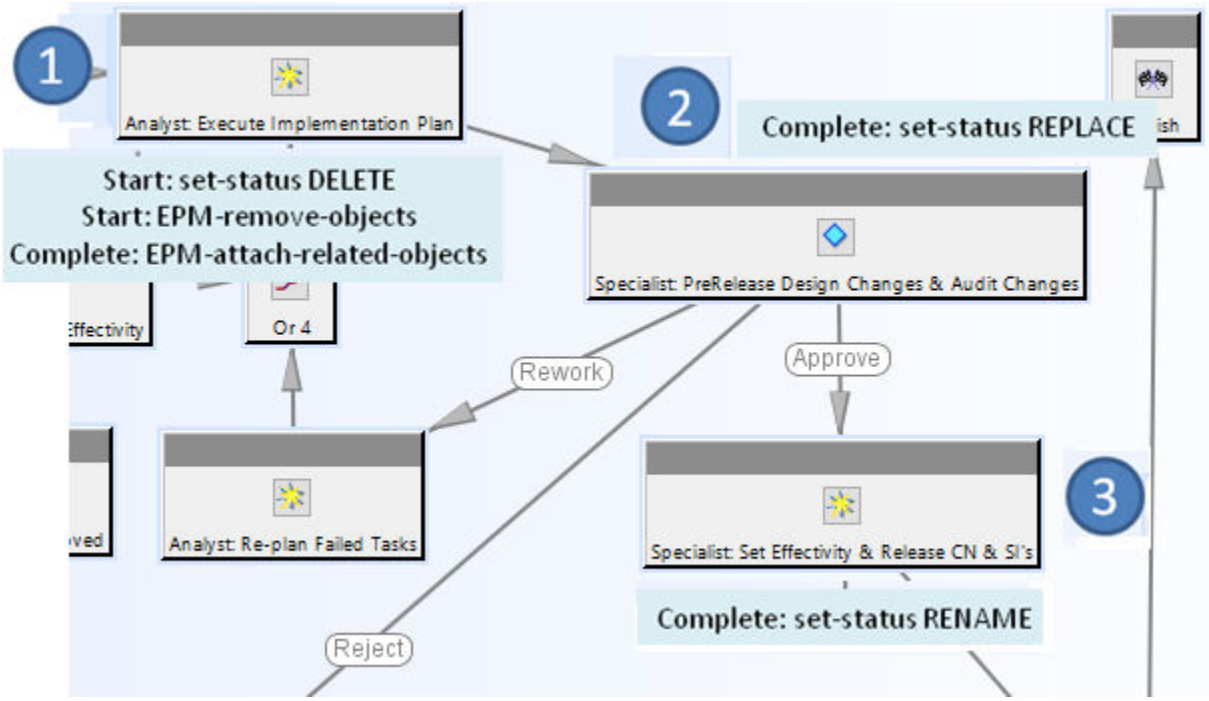
12. Go to **My Worklist**to sign off your task.

Designing the workflow for loops

Workflow loops must be designed so that they behave correctly after a reject or retry loop, for instance, when the task is executed for a second time. Care must be taken when attaching the release status object and related solution items. Workflow handler order is important:



The logic is as follows:



Before executing the change tasks, all status objects are removed from the workflow targets, including both the ECN and any of its related items (for example, solution items). Then the related items are removed from the workflow and are no longer targets. At this time, change tasks can be performed. Once they are complete and the user has signed off the task, the related items are attached to the workflow as targets.

The results of the change are reviewed for completeness, and if approved, they are given **PreReleased**status, along with the ECN. If they are disapproved, they return to step 1 where the status object is removed and the targets are reset to the ECN. The **EPM-create-status** handler for the **PreReleased** status is placed on the root task, start action, so that the status object is only created once.

The results of the change are reviewed for formal release and if approved, they are given **Released** status, along with the ECN. Any effectivity settings are retained. If disapproved, they return to step 1, where the status object is removed and the targets are reset to the ECN.

> Note:
>
> Attaching and detaching items to the workflow do not affect the relationships to the ECN. Relationships are manipulated by the users performing their assignments.

PreRelease design changes and audit changes

These tasks are assigned to the change specialist. The specialist checks to ensure that the change should have been solved through a fast track process. This is in addition to the safety checks against the inappropriate use of the fast track process provided in the ECR process where the change specialist validates the criteria before the change review board review, and when the change specialist derives the fast track ECN from the ECR. The **EPM-auto-assign** handler is set to the change specialist.

Set Effectivity and Release ECNs and SIs

In your organization, this task may be performed by the lead designer or a checker. Since this is a fast track change, the analyst could check her own work, but a designated user is beneficial.

This task renames the ECN and solutions status from **PreReleased** to **Released** and retains the effectivity. The specialist can change the effectivity and implements relations. Upon task completion the ECN and its Implements ECRs, and their Implements PRs are closed.

Handler	Argument	Value
EPM-set-status	-action	rename
	-status	PreReleased
	-new_status	Released
EPM-set-property	-property	CMMaturity
	-value	Executing
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

The **EPM-set-status** handler can also set the status object effectivity automatically, using the **set_effectivity** argument. By itself, it sets the effectivity as an open-ended date effectivity with the start date set to the time of execution. If it is used with the **retain_release_date** argument, the original release data of the target object is retained and used as the start date for the effectivity.

This task sets **Maturity** to **Complete**.

Handler	Argument	Value
EPM-set-property	-property	CMMaturity
	-value	Complete
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Upon task completion, the ECN, its Implements CRs and their Implements PRs are closed.

The **EPM-attach-related-objects** handler automatically attaches the related objects with the Implements relation.

Handler	Argument	Value
EPM-attach-related-objects	-attachment	target
	-include_related_type	ProblemReportRevision
	-relation	CMImplements
EPM-set-property	-property	CMClosure
	-value	Closed
	-to_attach	target
	-include_type	ChangeNoticeRevision,
	-bypass	ChangeRequestRevision,
		ProblemReport

Engineering change notice standard track workflow example

The Engineering Change Notice (ECN) process is performed by the analyst who is responsible for developing an implementation plan, possibly using a schedule to plan all the tasks. The change does not fit Fast Track criteria, so the change implementation board (CIB) must approve the plan.

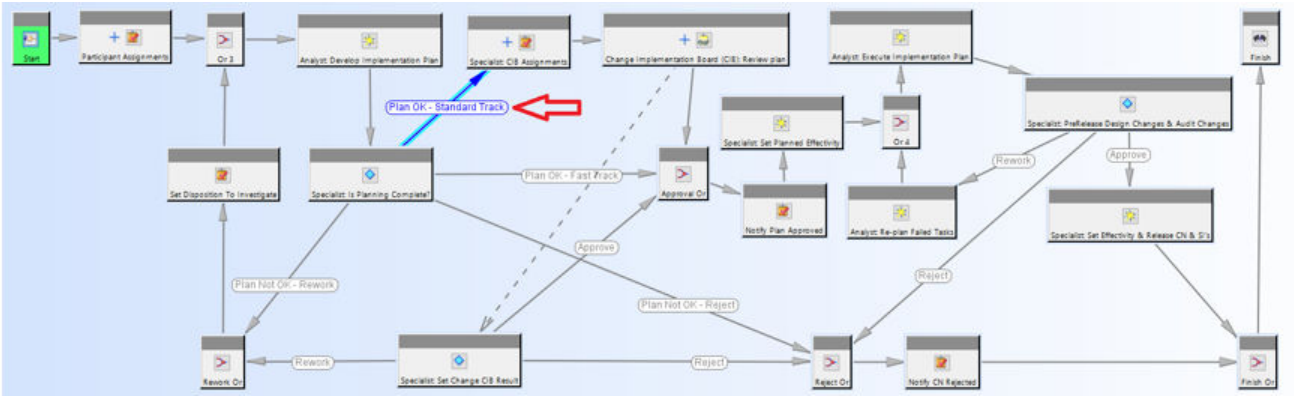
Note:

Fast Track criteria are defined by your organization.

The objectives of the ECN process are to:

- plan and implement the change within the budget agreed on the change request.
- set the effectivity for the deployment of the new configuration.
- Release the resulting items from engineering to downstream processes such as manufacturing.

The workflow looks as follows:



ECN Properties

The following ECN-specific properties are available:

Property	Description	LOV
CMImplPriority	Provides guidance to the analyst regarding the relative priority of implementing this change	**CM Priority** 1, 2, 3, 4
CMSpecialInstruction	The CIB can record any special instructions to the analyst and implementation team	None
CMIsCustApprovalRequired	Indicates if one or more customers must approve the change.	**CMSpecialInstruction** None
CMStatusOfCustApproval	Indicates whether the customers have approved or disapproved.	**CMDateOfCustApproval** None
CMDateofCustApproval	The date the customer approved or disapproved.	None

Process Participants

- **Requestor**

  Initiates the ECN.

- **Change Specialist**

  Administers/coordinates the change. Assigns the analyst.

- **Analyst**

  The technical expert/lead. Performs the change tasks.

- **Change Implementation Board (CIB)**

  Operations managers to make the implementation analysis and provide approval.

Process template detailed notes

The standard track contains three specific tasks that differ from the fast track: the specialist makes assignments to the CIB, the CIB reviews the plan, and the specialist sets the result of the CIB review. The remaining tasks are outlined in the Fast Track section.

CIB Assignments

The Change Implementation Board (CIB) participant assignments are checked, and if empty, the user is prompted to assign them.

Handler	Argument	Value
EPM-check-condition	-source_task	Specialist: Is Planning Complete?
	-decision	Plan OK- Standard Track

Change Implementation Board Review Plan

The Start action sets **Maturity** to **Reviewing** and the CIB reviews the plan.

The CIB is assigned using the **select-signoff-team** task using the **adhoc-signoffs** handler. If all members approve, the approve path continues to the **notify plan approved** task. If all members do not approve, the reject path continues to the **set change CIB result** condition task for a meeting to be held. The ECN **maturity** is set to **reviewing.**

Handler	Argument	Value
EPM-set-property	-property	CMMaturity
	-value	Reviewing
	-to_attach	target
	-include_type	ChangeNoticeRevision
	-bypass	

Set Change CIB Result

This task has the CIB review the signoff comments, polls the CIB members or convene a meeting. The **EPM-auto-assign** handler assigns it to the change specialist. The change specialist then calls a meeting of the CIB to determine how to proceed. Three paths are available:

- Approve. Continue to the **Notify Plan Approved** task.
- Reject. Go to the **Notify CN Rejected** task.
- Rework. Go to the **Set Disposition: Investigate** task and back to the **Develop Implementation Plan** task.

BMIDE configuration

You may want to update the BMIDE conditions governing Change Manager behaviors to reference the groups and roles configured in your organization.

States

States apply to a specific change object, not the overall process, and control what can be done with relations to that objects.

These properties can only be changed using the **EPM-set-property** handler in workflow.

State	Description
Closure	Open or closed: Open, Closed, Canceled, On Hold
Maturity	Stage of process: Elaborating, Reviewing, Executing, Complete
Disposition	Decision: None, Approved, Disapproved, Investigate, Deferred.

Licensing

Any user, whether consumer or author, can create a PR. Only authors can create an ECR or ECN.

Business Rules

Business rules control which users can add information to a change and at what change in the change process.

BMIDE conditions

Change Manager installs a set of BMIDE conditions defining specific rules to control access to change objects and their relationships.

Condition to control ECN derivation

To create the **Implements**relation for an ECR to ECN, the conditions state that **Maturity** must be **Reviewing.**

The **Implements** relationship is defined with the implementing change item (the ECN) as the primary item and the implemented change item (the ECR) as the secondary item. The secondary item in the relationship controls when the CN can be derived from the ECR.

The primary controls the LHS: ECN- Implements ECR

The secondary controls the RHS: CR- Implemented By CN

```
isCMImplementsCreatableForSecondary ( ChangeItemRevision o , UserSession u)
o.CMClosure = "Open" AND o.CMDisposition = "Approved" AND o.CMMaturity = "Reviewing"
```

Condition to Control CN Implements Relationship

This condition controls who, on the change item, can create the **Implements** relation to another change item (for instance, add an ECR to an ECN).

```
isCMImplementsCreatableForPrimary ( ChangeItemRevision o , UserSession u)
(Condition::isRequestor(o, u)  AND o.CMClosure = "Open" AND o.CMDisposition = "None" AND
o.CMMaturity = "Elaborating")
OR (Condition::isChangeSpecialist1(o, u) AND ((o.CMClosure = "Open" AND
o.CMDisposition = "None"
AND o.CMMaturity = "Elaborating")  OR (o.CMClosure = "Open" AND
o.CMDisposition = "Investigate"
AND o.CMMaturity = "Reviewing")))
```

You can be the requestor of the ECN, or the change specialist of the ECN. The ECN must have these values:

- **Closure** = **Open**
- **Disposition** = **None**
- **Maturity** = **Elaborating**

The ECR must have these values:

- **Closure** = **Open**
- **Disposition** = **Approved**
- **Maturity** = **Reviewing**

Condition to control ECN solution items relationship

To add item revisions to the solution items folder (applies to ECN only):

```
Cm0isCMHasSolutionItemCreatableForPrimary ( ChangeItemRevision o , UserSession u)
(o.is_modifiable = true) AND Condition::isChangeExecutionAllowed(o, u)
```

```
isChangeExecutionAllowed ( ChangeItemRevision o , UserSession u)
( Condition::isAnalyst(o, u) OR o.fnd0IsParticipant("Cm0ChangeContributors") )
AND o.CMClosure = "Open" AND o.CMDisposition = "Approved" AND
o.CMMaturity = "Executing"
AND u.fnd0ConditionHelper.fnd0isSubTypeOf(o, "ChangeNoticeRevision")
```

You must be the analyst of the ECN, and the ECN must have these values:

- **Closure** = **Open**
- **Disposition** = **Approved**
- **Maturity** = **Executing**

Rules to control change item property edits

Under most circumstances, the ability to check out and edit the properties of a change item is controlled by the same BMIDE conditions controlling the creation of the change items. For example:

```
isChangeNoticeCreatable (UserSession u) Condition::isTrue()
```

> Note:
>
> BMIDE conditions prevent edits to a change item having a disposition of approved, with one exception. The owning user and owning group have write access, regardless of the values of the **Closure, Maturity** and **Disposition** properties.

Workflow

Workflow tasks generally give access to the target objects to the responsible party of the workflow task. In these workflow templates, most task assignments are to the dynamic participants of the change item. Usually this is enough, but in some cases specific access is granted to the change item or related items by workflow ACLs applied using the **EPM-set-rule-based-protection** handler.

Managing change management folders through a workflow

Folders under change objects (such as engineering change notices, problem reports, and engineering change requests) contain items that are related to the objects of that type.

For a listing of the folders and the objects in them, see *About relating objects to a change*.

The relation	Does the following
CMHasImpactedItem	Relates the **ChangeItem** object (such as **ProblemReport**, **ChangeRequest**, and **ChangeNotice**) to impacted item revisions.
CMHasProblemItem	Relates the **ChangeItem** object (such as **ProblemReport**, **ChangeRequest**, and **ChangeNotice**) to problem item revisions.
CMHasSolutionItem	Provides for the traceability of the deliverable that results from the execution of the product plan by relating **ChangeNotice** objects to a solution item.
CMHasWorkBreakdown	Provides for work breakdown relations.
CMImplements	Allows **ProblemReport** objects to be implemented by **ChangeRequest** objects, and **ChangeRequest** objects to be implemented by **ChangeNotice** objects. It is used for navigating change resolutions.
CMReferences	Allows problem reports, change requests, and change notices to reference items and datasets. Relates the **ChangeItem** object (such as **ProblemReport**, **ChangeRequest** and **ChangeNotice**) to impacted item revisions.

Example

During a workflow process, the **EPM-attach-related-objects** handler is used to add the items and takes a **-relation** argument.

Argument	Values
-relation	**CMHasSolutionItem**
-attachment	**target**

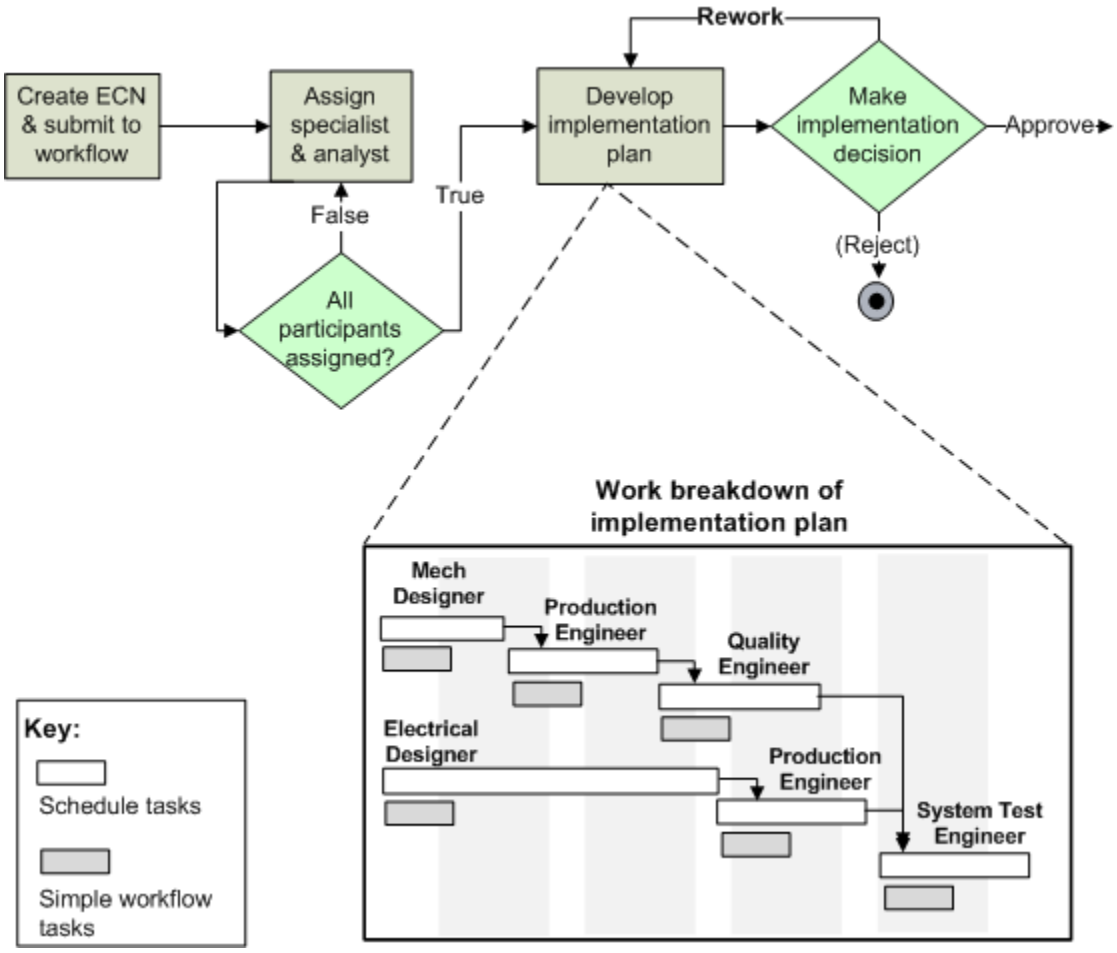
17. Scheduling implementation activities

About scheduling implementation activities

Schedule Manager is integrated into Change Manager so you can use it to schedule implementation activities (work breakdowns) associated with a change. The **Plan Items** folder stores the work breakdowns. Creating work breakdowns are useful to:

- Analyze the impact of the change to determine the amount and scope of the work required for the change. It can also identify the parts and documents impacted by the change.

- Plan the implementation of the change to specify the actions, or tasks, that address the change.



Example of a schedule work breakdown

Whether you create a work breakdown and define tasks depends on the complexity of the change and the conventions at your site. A simple change request, for example, may require relationships only to affected parts, affected documents, and supporting information, while a more complex change requires

information about subassemblies or other components that only becomes clear after detailed analysis. In addition, during the change creation, you may not know what other items must be added until the tasks are built and executed.

Schedules can be created in an ad-hoc manner to meet the requirements of each individual change object, or they can be created (copied) from a schedule template. A schedule template is a pre-defined schedule of tasks that is established for changes of a specific type. When you plan the implementation for such a change, you start with the corresponding schedule template. Any number of schedules can be defined and related to a change object.

The schedule can have tasks for each discipline or user to create new revisions or items and then make the changes to implement the proposed solution. Depending on the change work to be done, you could have one task per assignee that covers the changes for any number of items assigned to that user, or you could have one task per problem item or impacted item, or any other style of work breakdown you choose.

Because schedule tasks are not routed to users, it is good practice to have a simple one-step workflow task associated with each schedule task, as shown in the figure. The workflow routes the schedule task to the assignee's inbox and manages the implementation of the task. The resource associated with the schedule task is automatically assigned as the user to perform the workflow task. If more than one user is assigned to the schedule task, the single privileged user is assigned to the workflow. The workflow could include tasks to approve the changes made to each item revision, or this type of validation can be left to a later step (a later task in the schedule or a later workflow task in the ECN workflow). This would apply a status (for example, **Pre-Released**).

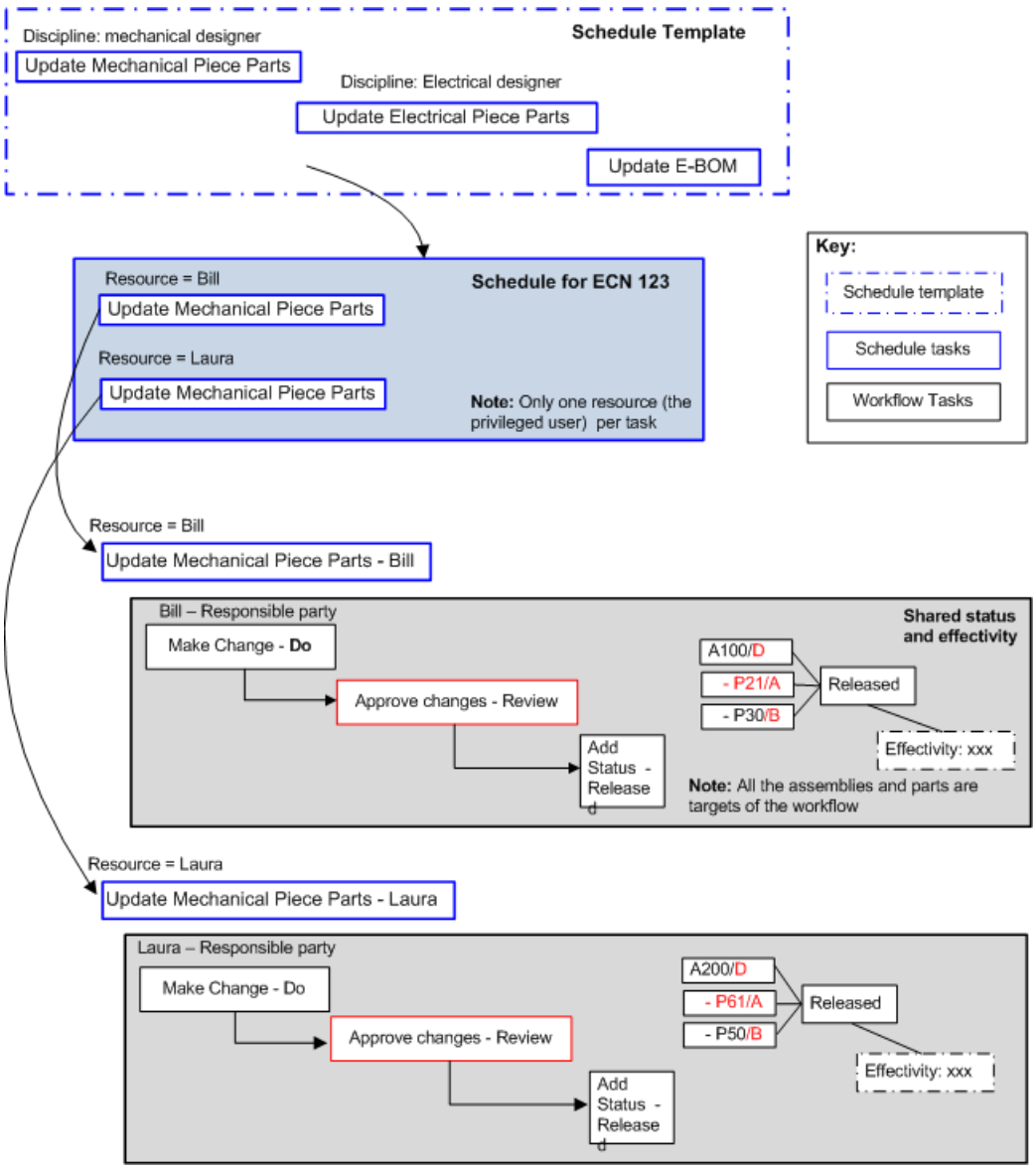
Flexibility of schedules

The advantage of a schedule is its flexibility. A schedule can easily be made larger or smaller, depending on the need. By contrast, workflows are much more rigid as they control the process and decision-making authority. Workflows should be kept simple, and schedules used when more complexity is required. Typically schedule templates are used to make defining the schedule for a particular ECR or ECN much quicker.

An analyst usually creates a work breakdown schedule, but another type of user can create it, and the analyst can then relate the schedule to the change object through the **Plan Items** or **Work Breakdown** relationship.

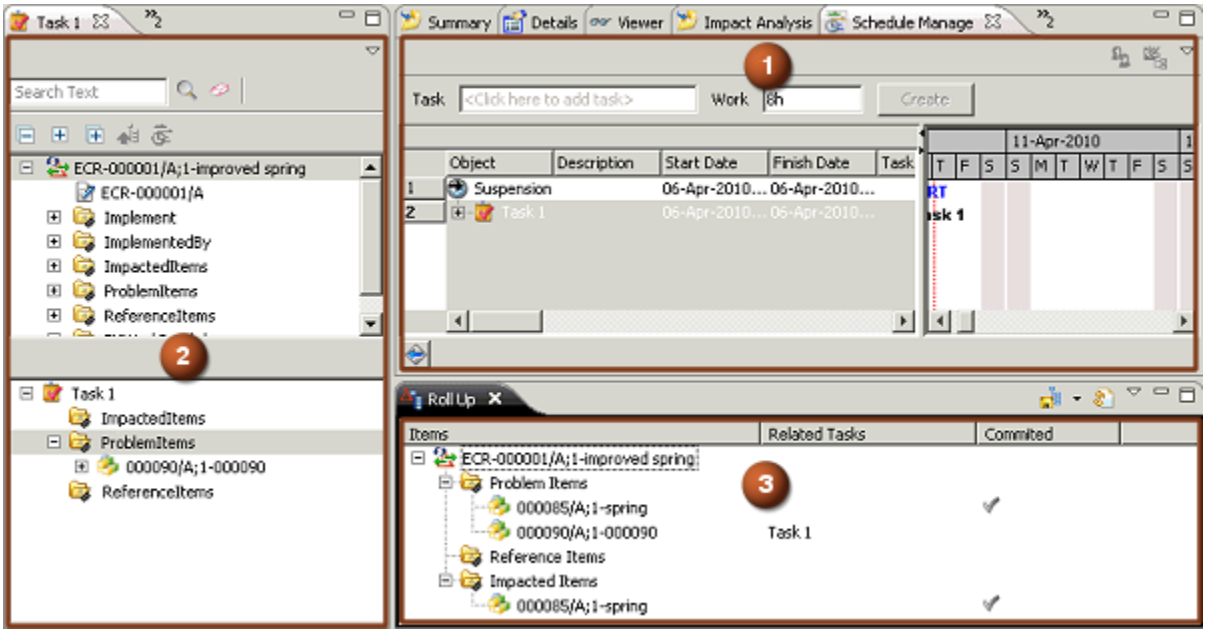
Example of a schedule work breakdown

The following is a simple example of a work breakdown for an engineering change notice (**ECN 123**). The work breakdown was created based on a standard schedule template (shown in the figure with dashed lines). The schedule was then modified to meet the ECN's requirements, creating copies of the Update Mechanical Piece Parts task for the two designers involved (Bill and Laura). Each of those tasks has the same small workflow template attached, which routes the task to the assignee (for example, Bill), then routes it for review of the changed and new items, and finally adds a status to them.



Work Breakdown Schedule Manager view

You use the **Work Breakdown Schedule Manager** view to display the structure of the schedule and task breakdown or modify or create a new one. Schedule Manager must be installed to see this view.



1	**Schedule Manager** view	Lists all the work breakdown tasks created in the schedule.
2	**Open Task** view	Displays the change folders associated with the task: • **ImpactedItems** • **ProblemItems** • **ReferenceItems** • **SolutionItems** (ECN only) You can add items to the change folders and quickly propagate the folders. After a task is complete, you can roll the change items in the task folders to the change object folders.
3	**Roll Up** view	Provides viewing of the entire work breakdown structure at a glance, letting users see the contributions from the tasks. You can then roll these tasks up to the change object, saving you from having to relate them manually. For example, you can roll up the item revisions in your task folders to the change object folders. Once the change is complete, you can make the rolled-up objects permanent by committing them.

Create a work breakdown using Schedule Manager

> Note:
>
> You can copy an existing schedule, but it can only be associated with one change object.

1. Select the **Plan Items** folder of the engineering change request (ECR) or engineering change notice (ECN) for which you want to create a work breakdown.

   For an ECR or ECN, you can add objects to the **Plan Items** folder if you are an assigned participant and the change object property settings are as follows.

Assigned participant	Closure	Disposition	Maturity
Analyst	**Open**	**None**	**Elaborating**
	or		
	Open	**Investigate**	**Reviewing**

2. Choose **File→New→Schedule**.

   This starts the **New Schedule** wizard in Schedule Manager where you create your work breakdowns.

   Complete the steps in the **New Schedule** wizard to create the new schedule.

   You can create several schedules to help you analyze the change.

   > Note:
   >
   > You must be an **Author** user to create schedules.

3. In the **Open Change** view, select the schedule in the **Plan Items** folder and click **Open Schedule**  .

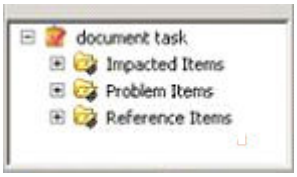
   The **Schedule Manager** view appears.

4. Add tasks to your schedules.

5. Assign resources to tasks, including selecting responsible people using the **Membership** button .

6. In the **Schedule Manager** view, click **View Task folders**  .

   Change Manager displays the **Open Task** view.



7. **Add change items** to be associated with the tasks, as necessary.

8. (Optional) **Roll up the item revisions in your task folders to the change object folders**.

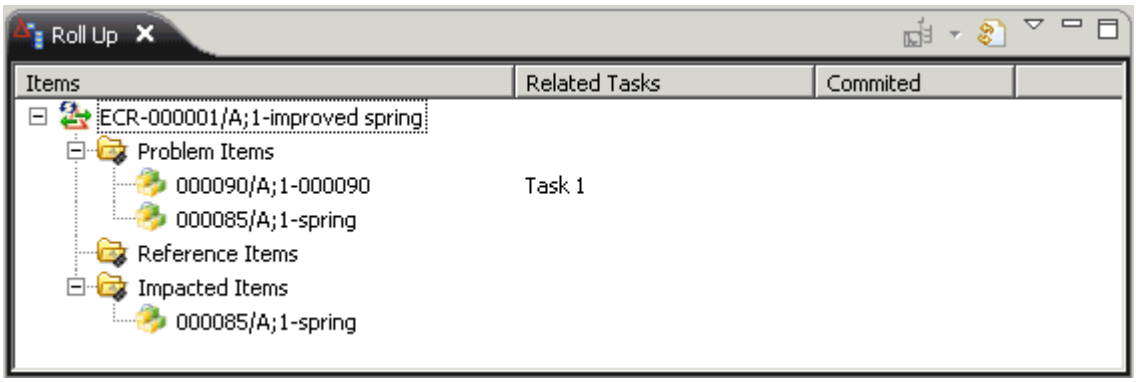
Roll up objects associated with a change object

The **Roll Up** view displays all objects in the folders of the selected change and its associated work breakdown tasks at one level, eliminating the need to look through multiple levels of the work breakdown structure. This view is static and the related objects are not moved. You can also roll up the objects to the change object and commit the changes.

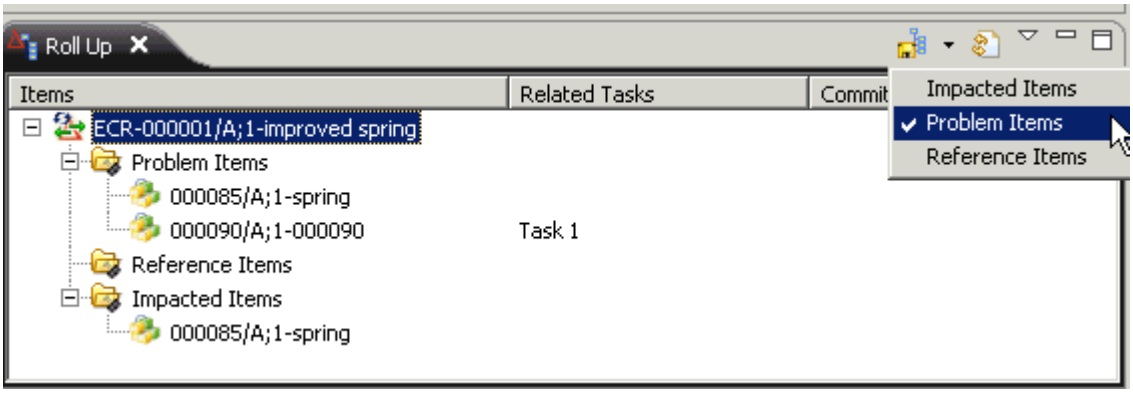
1. Double-click the change object in the **Change Home** view and select the change object in the tab that just opened.

2. Click the **Rollup** button.

   The **Roll Up** view displays the objects, its folders, and tasks.



3. In the **Roll Up** view, click the list button of the **Commit Rollup** button and select the relations to commit.

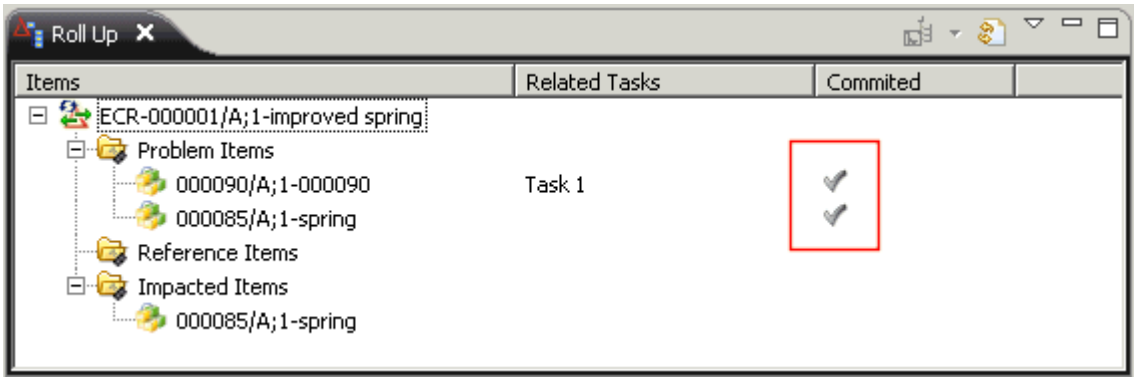


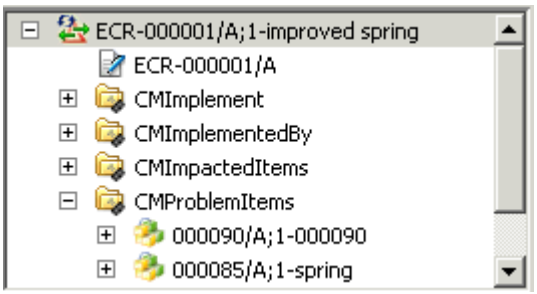
A message appears asking you if you want to commit the changes.

4. Click **OK**.

5. To commit the rollup, click the **Commit Rollup** button in the view.

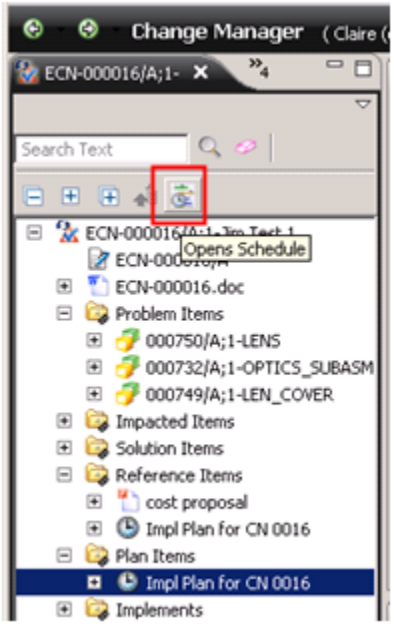
   The objects committed appear with a check next to their names and the objects appear in the change folders.





Display a schedule work breakdown

- In the **Open Change** view, select the schedule in the **Plan Items** folder you want to display, and click the **Open Schedule** button .

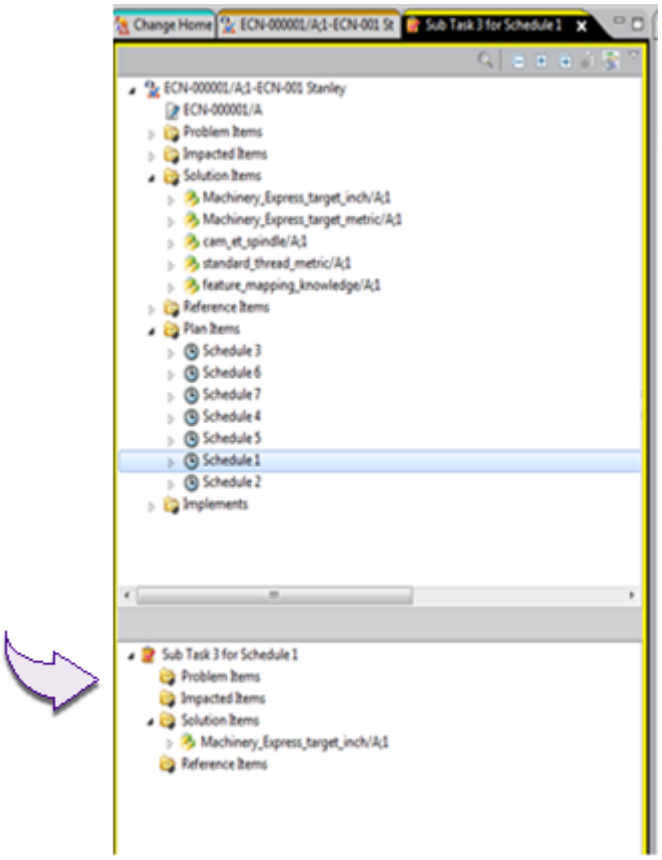


The schedule appears in the **Schedule Manager** view.

Managing change items associated with a schedule task

Use schedule task to manage changes

A complex change can have dozens or hundreds of problem, impacted, and solution items to manage. You can efficiently manage these as change items under a single change object by using a schedule task in one or more schedules (change plan items).



When you create a schedule task as a change object, you can add the change items—problem, impacted, and solution items—to the task, so users can quickly access them. The change items associated with a schedule task appear in the **Open Task** view where you can do the following:

- Add and remove items from the change object
- Work on multiple items at once
- Propagate change items to a schedule task

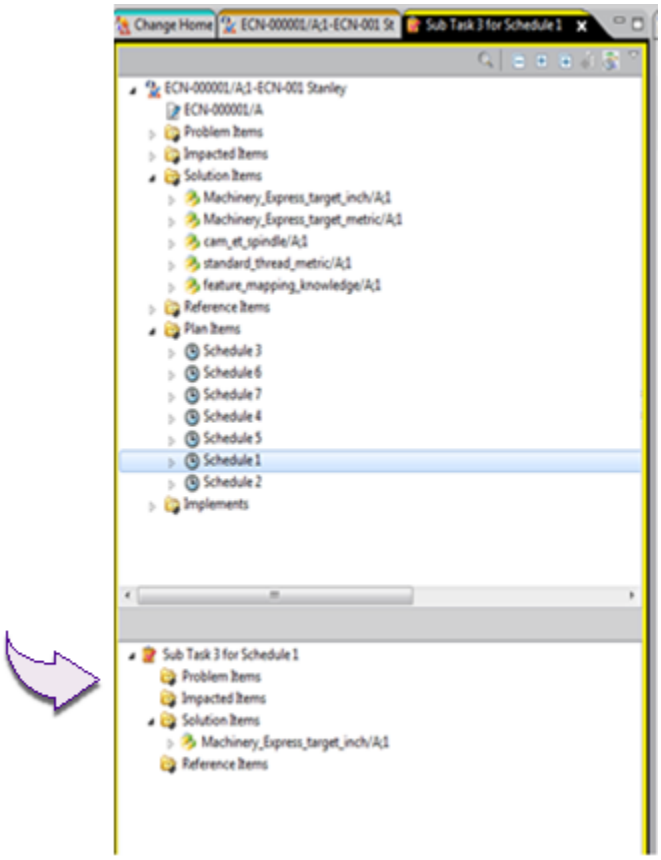
Remote workflows that contain remote schedule tasks with change items function as follows:

- Solution items, problem items, and impacted items on the schedule task are replicated
- The change object and its reference items are replicated and attached to the workflow as a reference
- When the user selects a task from **My Worklist, Summary** view displays the **Problem Items, Solution Items, Impacted Items**, and **Reference Items**

Display the change items associated with a schedule

- In the **Schedule Manager** view in Change Manager, click the **View Task folders** button.

  The **Open Task** view appears.

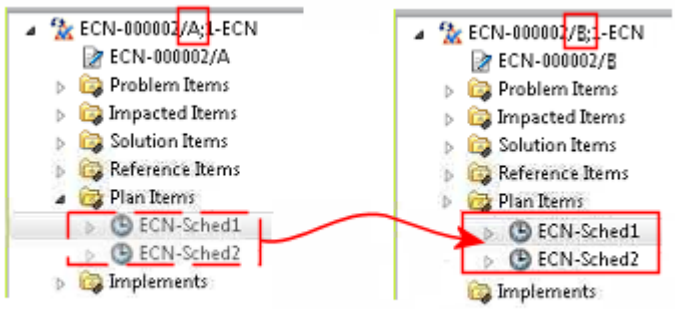


Manage the change items associated with a schedule using the Open Task view

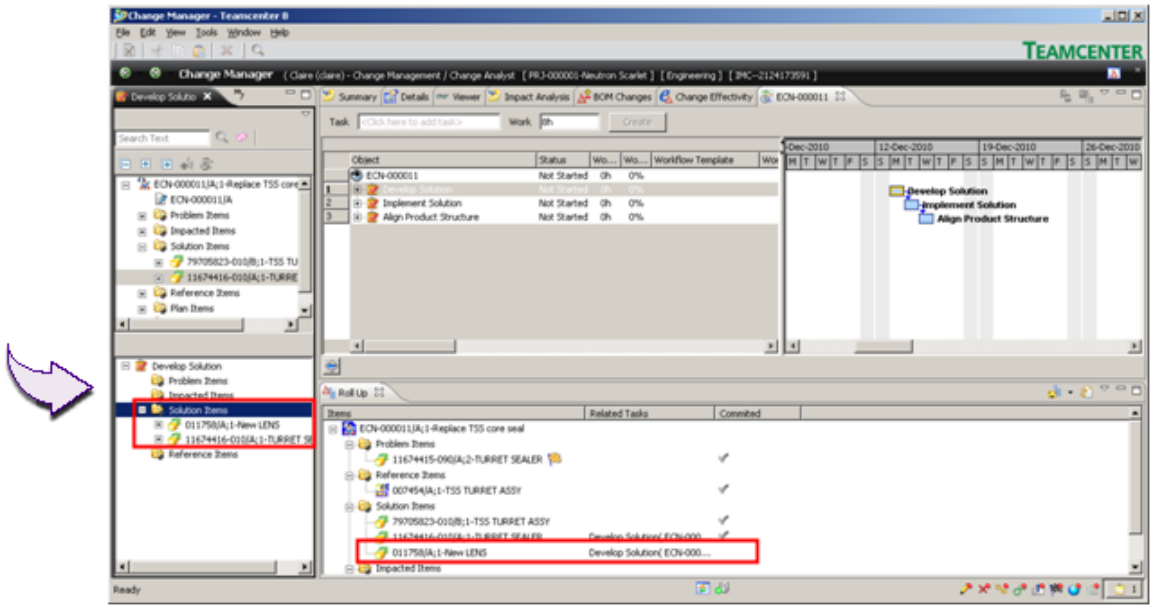
You can manually add change items to the folders of a schedule.

Note:

- You can also propagate change items to the folders of a schedule task.
- If you create a new revision of a change item, any schedules associated with the original revision are not automatically associated with the new revision (a schedule cannot have two parents). Therefore, you need to cut the schedules in the **Plan Items** folder of the original change item revision and paste them in the **Plan Items** folder of the new revision.



1. In the **Schedule Manager** view, click the **View Task folders** button to display the **Open Task** view



2. Select a task folder, such as the **Solution Items** folder, as shown above.

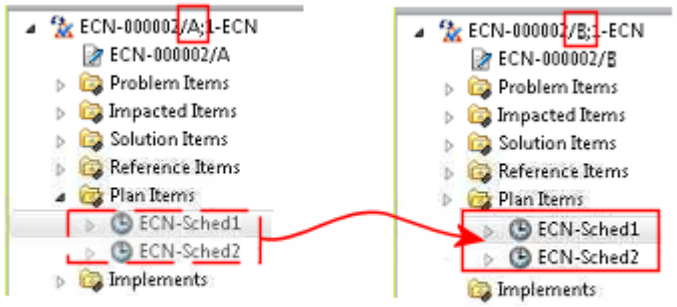
3. Paste the item revision (for example, **New Lens**) into the folder. You also see the item revision appear in the **Roll Up** view.

Manage the change items associated with a schedule using the Change Details view

You can use the **Change Details** view to add and remove change items associated with a schedule task. In addition, you can add multiple items at once.

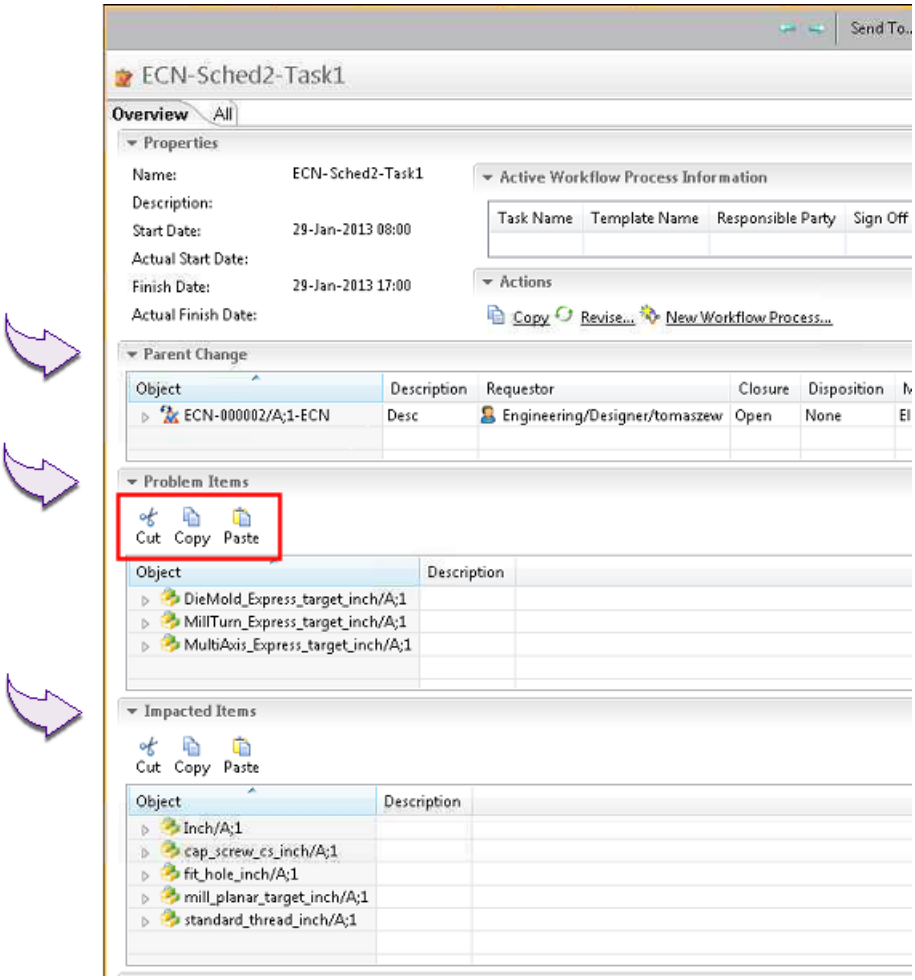
Note:

- You can also propagate change items to a schedule task.
- If you create a new revision of a change item, any schedules associated with the original revision are not automatically associated with the new revision (a schedule cannot have two parents). Therefore, you need to cut the schedules in the **Plan Items** folder of the original change item revision and paste them in the **Plan Items** folder of the new revision.



1. In the **Schedule Manager** view in Change Manager, right-click a schedule task and choose **Change Details**.

   The **Change Details** view displays the change associated with the task (the Parent Change). It also displays each folder (problem, impacted, reference, and, if applicable, solution items) associated with the tasks and its contents.



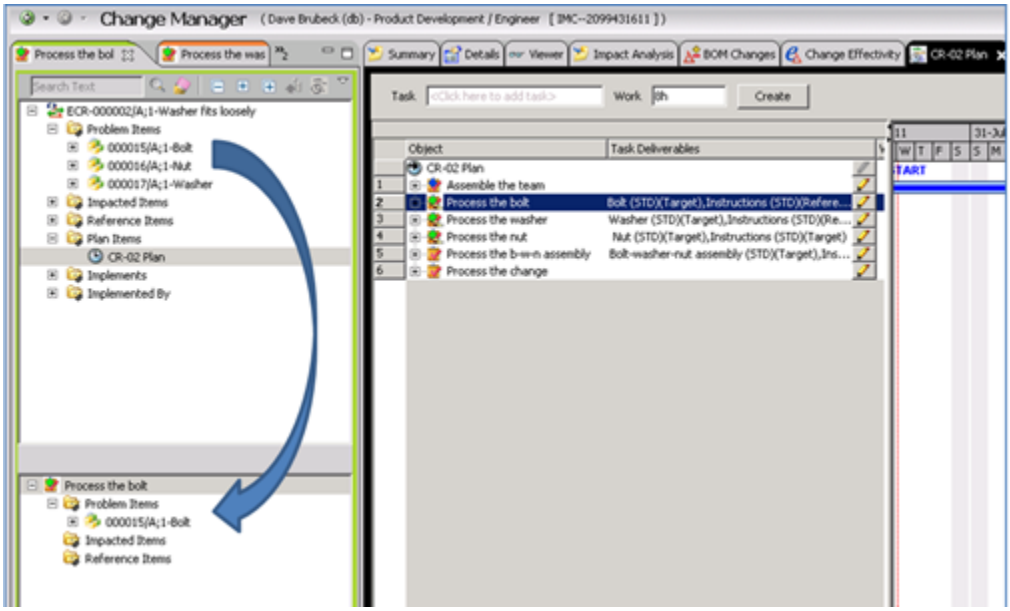
2. Use the **Cut**, **Copy**, and **Paste** tools, as appropriate, to add or remove items from the folders of the schedule task.

Propagating change items to schedules

About propagating change items to schedules

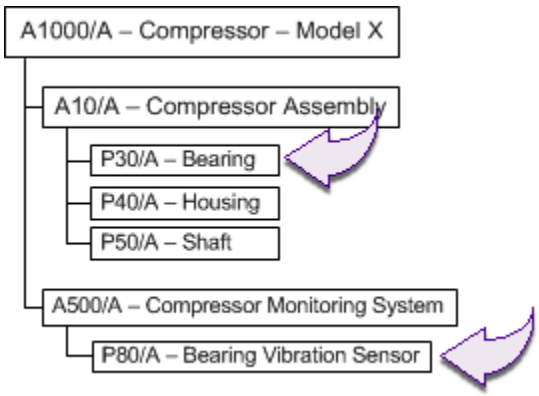
You can selectively propagate the items related to a change object (problem, impacted, solution, and reference items) to related plan items (schedule tasks) associated with the change object, as shown. This allows you to quickly associate the change items to be worked on during a task with the task so a user can easily access them. For example, you can propagate the assembly with the problem bumper to the scheduled task so the user can replace the bumper with a new one.

You can choose to associate all the items in a folder or just individual items. You can initiate the propagation from a change object (change notice, change request, and deviation request) or from a schedule. Your workflow administrator can also set up a workflow to propagate change items to a schedule through a workflow process.



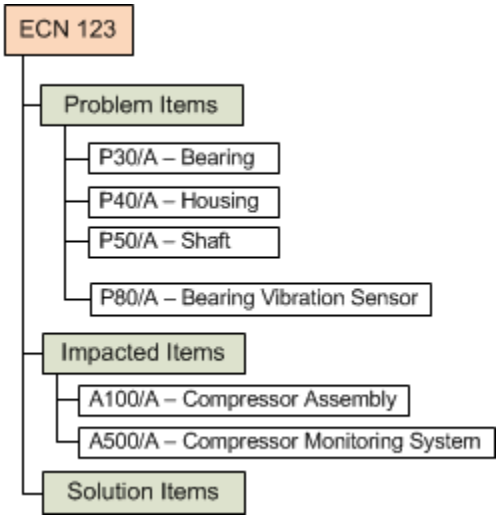
Example of propagating change items to a schedule

Company ABC has a problem with the bearing in a compressor assembly. In addition, the vibration sensor needs to be changed. It is a large change, and Company ABC will use a schedule to plan and implement all the tasks.



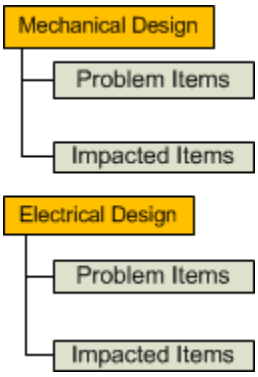
Engineering change notice (ECN)

Company ABC creates an engineering change notice to manage the change.



Schedules

The change analyst creates two separate schedules, one for the mechanical designer and one for the electrical. These schedules require different items for each user. For example, the mechanical designer requires the mechanical items (bearing, housing, shaft, and the compressor assembly), while the electrical designer requires the electrical items (bearing vibration sensor and the compressor monitoring system). The change specialist propagates the items as appropriate to the different schedules.

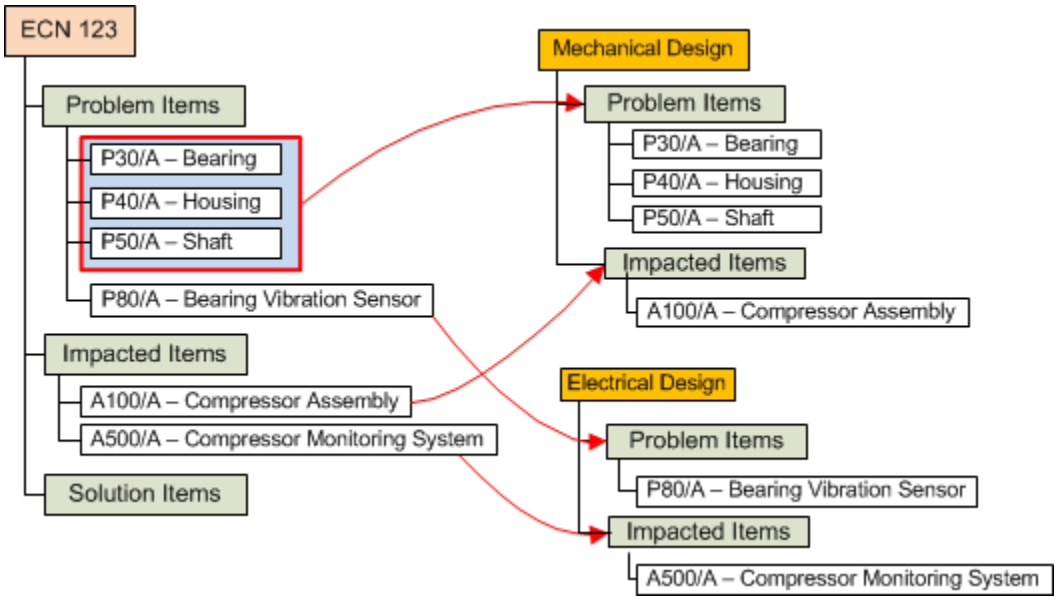


Participants

- **Change specialist:** Manages change items, including the propagation of the items to the schedules.
- **Change analyst:** Creates and manages the high-level plan.
- **Team leader:** Creates and manages the detailed plan.
- **Team members:** Execute the work. Change Manager automatically updates their work status.

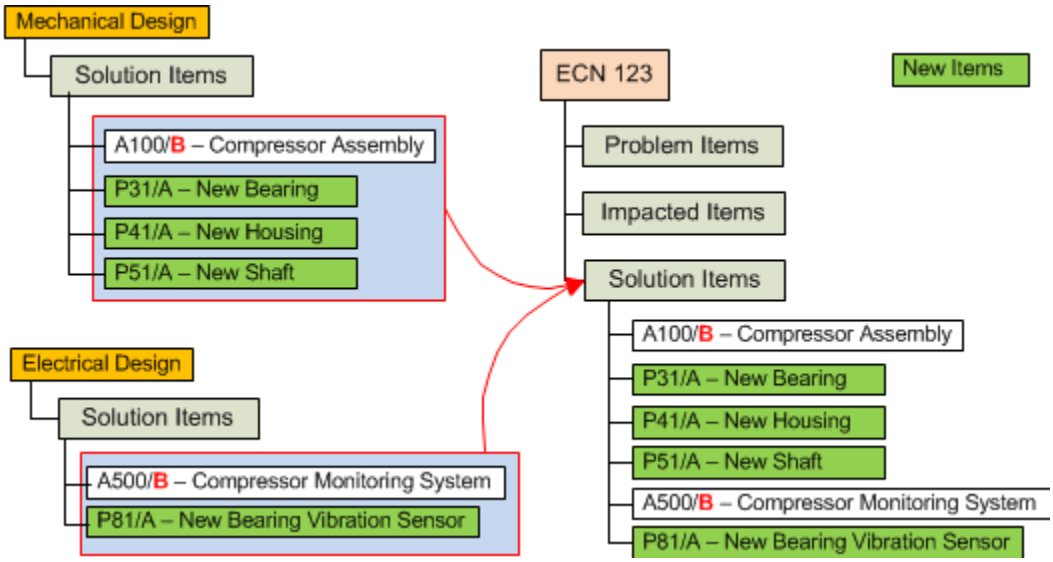
Propagation

Using the Change Manager propagate capability, a change specialist relates the objects attached to the ECN (problem and impacted items) to the two schedule tasks in the plan.



Completion

After creating new revisions of the impacted items in the **Solutions items** folder of the schedule, the designer who created them, pastes them in the **Solution items** folder of the ECN.



Configuring who can propagate change items to schedules

By default, a change specialist or the user assigned to a task can propagate change items in change folders to schedule folders. In earlier versions of Teamcenter, this was hard-coded in the conditions. Now, you can use Business Modeler IDE conditions that begin with **Cm0** to control how the propagation is handled and they must be met for the propagation to be successful. These conditions call the Teamcenter conditions that had hard-coded the propagation. Therefore, if you have used those conditions, you still receive the configurations defined in them.

The condition	Calls
Cm0isCMHasImpactedItem CreatableForTask	**isCMHasImpactedItemCreatable ForTask**
Cm0isCMHasProblemItem CreatableForTask	**isCMHasProblemItemCreatable ForTask**.
Cm0isCMHasSolutionItem CreatableForTask	**isCMHasSolutionItemCreatable ForTask**
Cm0isCMReferencesCreatable ForTask	**isCMReferencesCreatable ForTask**

The following shows the expression for **Cm0isCMHasImpactedItemsCreatableforTask** calling in **isCMHasImpactedItemCreatableForTask**:

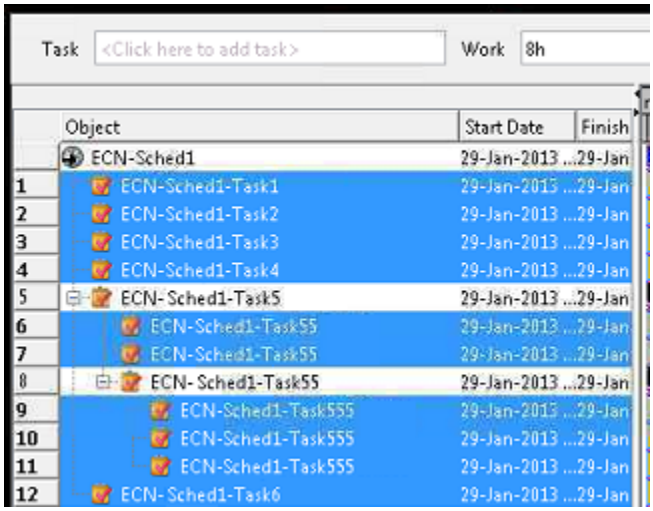
```
(o.CMClosure = "Open" AND o.CMDisposition
        = "None" AND o.CMMaturity = "Elaborating") OR (o.CMClosure =
"Open" AND
        o.CMDisposition = "Investigate" AND o.CMMaturity = "Reviewing")
OR
        Condition::isChangeExecutionAllowed(o, u))
```

> Note:
>
> Change object modification is permitted only when **CMClosure** is set to **Open**.

Propagate change items to schedules

You can propagate the items related to a change object in its **Solution**, **Problem**, **Impacted**, or **References** folders to selected schedules.

The change items are propagated to the lowest tasks in the selected schedules (those with no children, referred to as leaf-level tasks). For example, when you select to propagate the change items to the **ECN–Sched1** schedule, the items are propagated to the highlighted leaf-level tasks:

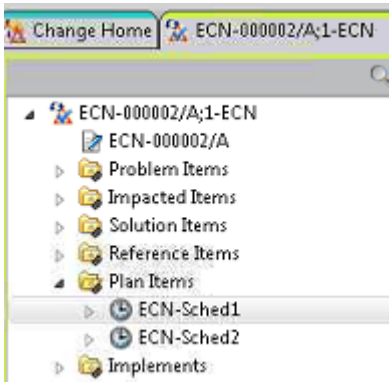


1. In the **Change Home**, **My Open Changes**, or the **Open Change** view, display the change object.

2. Do one of the following:

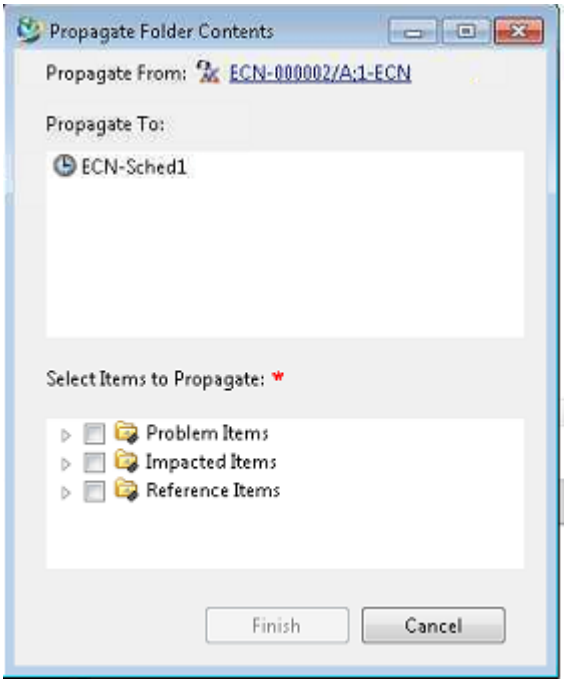
   - To select all the schedules associated with the change object, select the **Plan Items** folder.

   - To select one or more schedules, expand the **Plan Items** folder and select one or more schedules, as shown for selecting **ECN-Sched1** in the **Open Change** view.



3. From Change Manager, choose **Tools→Propagate Folder Contents**.

   Change Manager validates that the propagation can be performed, and if it can, it displays the **Propagate Folder Contents** box.



- The schedules you selected appear in the **Propagate To** list. The change items are propagated to them.
- The items associated with the change object appear in the **Select Items to Propagate** list.

4. (Optional) Click the link next to the change object to view its properties.
5. In the **Select Items to Propagate** tree, do one of the following:
   - To include all the items in a folder, select the check box next to the folder.
   - To select one or more items in a folder, expand the folder and select the individual items.
6. Click **Finish**.

   If you do not have access to create any of the relationships, access to one or more selected objects, or the conditions are not met, Change Manager processes all the actions that are allowed. It displays a message indicating what relationships were not created. It does not report on successes. It also ignores that an item might have already been propagated.

Note:

You may need to refresh Teamcenter to view the propagated change items.

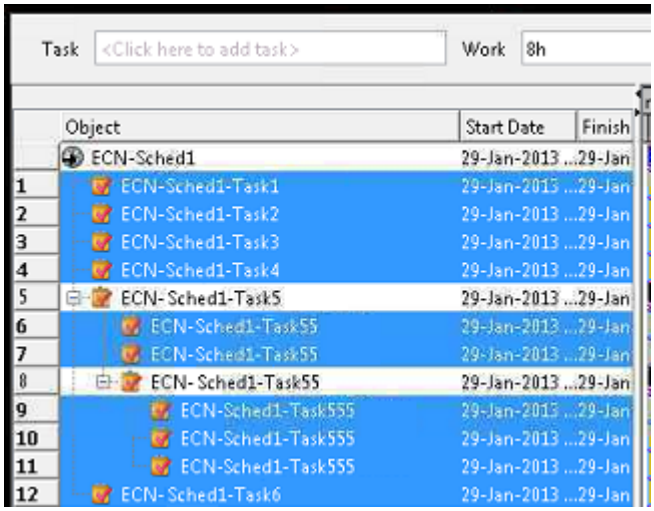
Propagate change items to selected schedule tasks

You can propagate the items related to a change object in its **Solution**, **Problem**, **Impacted**, or **References** folders to the related schedule tasks.

The following explains how to initiate the propagation from a schedule. When you initiate the propagation from the schedule, you can select the individual tasks to which you want the items to be propagated.

1. In the **Schedule Manager** view in Change Manager, select the schedule or schedule tasks to which you want to propagate the change items.

   - If you select a schedule, the change items are propagated to the lowest tasks in the schedule (those with no children, referred to as leaf-level tasks). For example, if you select to propagate the change items to ECN-**Sched1**, the items are propagated to the following tasks:



- If you select a schedule summary task, Change Manager propagates the change items to all leaf-level tasks change folders but not to the schedule summary task.

- If you select a summary task (task with sub-tasks), Change Manager propagates the change items to all leaf-level tasks change folders under the selected summary task but not to the summary task itself.

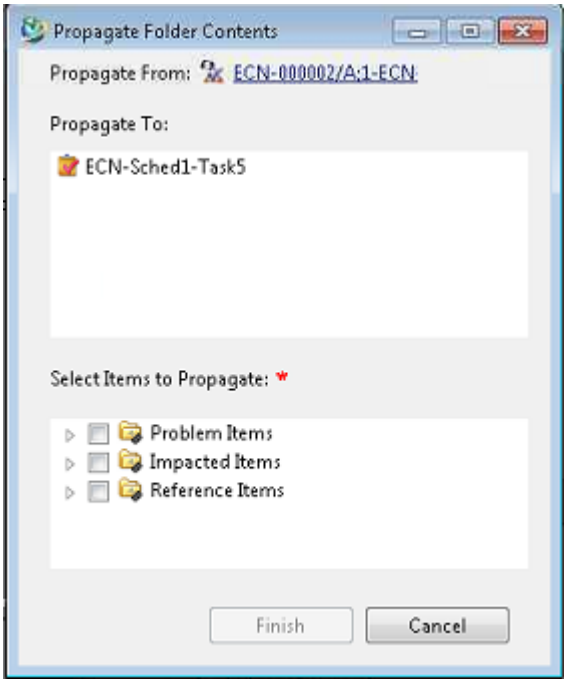
- If you select a leaf-level task (task with no sub-tasks), Change Manager propagates the change items to the selected leaf-level tasks change folders.

  Note:

  - The selected schedules must have the same parent change object.
  - A proxy task does not have change folders, so it is grayed and you cannot select it.
  - A milestone task does have change folders, and you can propagate change items to it.

2. From Change Manager, choose **Tools→Propagate Folder Contents**.

   Change Manager validates that the propagation can be performed, and if it can, it displays the **Propagate Folder Contents** box. The following shows the **Propagate Folder Contents** box when one schedule task is selected.



- The schedule or tasks you selected appear in the **Propagate To** list. The change items are propagated to them.
- The items associated with the change object appear in the **Select Items to Propagate** list.

3. (Optional) Click the link next to the associated change object to view its properties.
4. In the **Select Items to Propagate** tree, do one of the following:
   - To include all the items in a folder, select the check box next to the folder.
   - To select one or more items in a folder, expand the folder and select the individual items.
5. Click **Finish**.

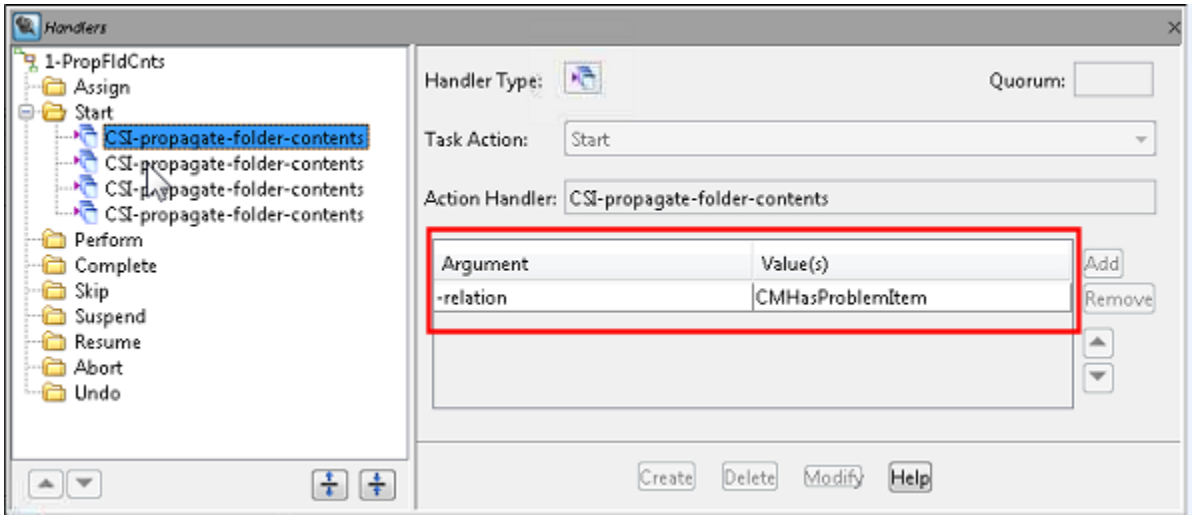
   If you do not have access to create any of the relationships, access to one or more selected objects, or the conditions are not met, Change Manager processes all the actions that are allowed. It displays a message indicating what relationships were not created. It does not report on successes. It also ignores that an item might have already been propagated.

Propagate change items to schedules through a workflow

A workflow designer can include the workflow handler **CSI-propagate-folder-contents** as part of a workflow template to propagate change items to all the change folders or the related schedule tasks. The designer can use the arguments to **CSI-propagate-folder-contents** to define:

- Which folders to propagate (problem, impacted, reference and, if applicable, solution).

  You need to create a **CSI-propagate-folder-contents** handler for each relation you want propagated. For example, if you want to propagate the change items to all folders, you would create four handlers. The **CSI-propagate-folder-contents** arguments shown are for problem items.



- Types of objects to include or exclude.
- Status of objects to allow or not allow.
- Whether condition checking should be bypassed.