Describing FMEA Items

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FMEA Items should be described in an FMEA Table. Since FMEA Tables are based on Generic Tables, the toolbar and the Criteria area work in the same manner.

An FMEA Table allows you to analyze the reliability aspect of your model, and provides you with a convenient way to fill in FMEA Item information using a spreadsheet-like tabular format. Each row in a table represents an FMEA Item. Table columns represent the properties of FMEA Items. In an FMEA Table, you can:

- Create a new FMEA Item directly in a table or add an existing one.
- Directly edit the properties of FMEA Items in a table.
- Generate an FMEA analysis report, and export a table into a CSV or HTML file format.

An FMEA Table has the following columns:

Table column name	Description
Id	An FMEA Item ID.
Name	The name of an FMEA Item.
Classification	The classification of failures (FMEA Items) by certain aspects of a system.
Item	The design model element (Block, Part, Operation or Activity) undergoing analysis related to a particular FMEA Item. **Parts or Blocks?** It is recommended that you select Parts instead of Blocks, because Blocks may be too generic.
Subsystem	An element identifying the subsystem of a model to which an Item belongs. The valid values are Parts and Blocks.
Failure Mode	An element describing the specific manner in which a component, subsystem, system, process, etc., could potentially fail to meet the design intent.
Local Effect of Failure	An element describing the effect that a Failure Mode has on the system element under consideration. An FMEA Item, e.g, a single row of an FMEA Table, can have multiple Local Effects of Failure.
Final Effect of Failure	An element describing the effect that Failure Mode has on an end user or environment. You can specify multiple Final Effect of Failure values for a single FMEA Item. Every Final Effect of Failure can have a default severity value assigned as its property. To assign a value, open the Specification window of a Final Effect of Failure, and set the desired **Severity** value. **Adding severity values** If you add a Final Effect of Failure with a specified severity value to a certain row of an FMEA Table for the first time, the value is automatically entered into the appropriate cell of the SEV column. The value is entered even if the cell already has a value specified. You can manually change the severity value that was automatically added to an FMEA Table. This action does not change the default severity value assigned to the property.
SEV	A property describing the assessment of the severity of the effect(s) of a potential Failure Mode on a component, subsystem, end-user, or environment. The valid values of this property are 1 to 4 (lowest to highest severity). Click an appropriate cell to select its value from a drop-down list.
Cause of Failure	An element indicating the design weakness causing a Failure Mode. An FMEA Item, e.g., a single row of an FMEA Table, can have multiple Causes of Failure. Every Cause of Failure can have a default occurrence and/or detectability value(s) assigned as its property(ies). To assign an occurrence or value, open the Specification window of a Cause of Failure, and set the desired **Occurrence** and/or **Detectability** value(s). **Adding occurrence and detectability values**

OCC	Occurrence (OCC) is a property showing the likelihood that a specific Cause of Failure will occur. The valid values of this property are 1 to 5 (lowest to highest probability of occurrence). Click an appropriate cell to select its value from a drop-down list. If you add a Cause of Failure with a specified occurrence or detectability value (or both) to a certain row of an FMEA Table for the first time, this value is automatically entered into an appropriate cell of the OCC or DET column. The value is entered even if the cell already has a value specified. You can manually change the occurrence or detectability value that was automatically added to an FMEA Table.
Prevention Control and **Detection Control**	A Prevention Control element describes the measures for preventing the occurrence of a possible Failure Mode. A Detection Control element describes the measures for detecting a Failure Mode, if it occurs. You can specify multiple Prevention and Detection Control values for a single FMEA Item. This action does not change the default occurrence or detectability value assigned to a specific Cause of Failure element. **Reusing Prevention and Detection Control values** In an FMEA Table, each Prevention Control and Detection Control value is usually related to a specific Cause of Failure. After adding a Cause of Failure to a specific row of a table, you can quickly reuse the Prevention Control and/or Detection Control value(s) associated with it in another row of the same table. To reuse the values: 1. Right-click the row where you want to reuse a previously associated Prevention Control and/or Detection Control value(s). This row should already have a Cause of Failure element specified. 2. From the open menu, select **Reuse Design Controls**. If the Cause of Failure has a reusable Detection Control and/or Prevention Control element(s), the **Reuse Design Controls** dialog opens. 3. In the open dialog, select the element(s) you want to reuse as Prevention Control and/or Detection Control value(s), and click **OK**.
DET	Detectability (DET) measures the likelihood of discovering a possible failure prior to its occurrence. The valid values of this property are 1 to 5 (highest to lowest detectability). Click an appropriate column cell to select its value from a drop-down list.
OxD	The product of OCC and DET ratings.
RPN	A risk priority number is a derived property calculated by using a customizable function. By default, the function includes SEV, OCC, and DET values.
Hazard Analysis Reference	The Hazard Analysis Reference to a Safety Analysis Item shows that the safety aspect has been analyzed for this particular FMEA Item.
Required Hazard Analysis	A property indicating whether or not an FMEA Item requires hazard analysis. The valid values of this property are *true* or *false*. If you create your project using the *Safety and Reliability Analysis Project* template, the FMEA Items marked as requiring hazard analysis are added to the *FMEAs to Be Analyzed* package. If not, you must configure a Smart Package to manually filter these elements. When a specific FMEA Item is addressed in a Safety Analysis Item, it is removed from the *FMEAs to Be Analyzed* package after refreshing your model.
Recommended Action	The description of a recommended action that will reduce RPN. All critical or significant failures (FMEA Items) should have recommended actions associated with them. Recommended actions should be focused on design, and directed towards mitigating the Cause of Failure or eliminating the Failure Mode.
Mitigation	The reference to any element that mitigates a failure.
Responsibility	A property indicating the person responsible for completing a Recommended Action.
Target Completion Date	A property defining the completion date of a Recommended Action. The value of the Target Completion Date property can be specified in the **Date and Time Settings** dialog.
Action Taken	A property describing what actions have been taken and the results of these actions.
Reduced SEV	A property assessing the seriousness of the effect(s) that a potential Failure Mode has on a component, subsystem, end-user, or environment after the mitigation. The valid values of this property are 1 to 4 (lowest to highest severity). Click an appropriate column cell to select its value from a drop-down list.
Reduced OCC	Reduced occurrence is a property showing the likelihood that a specific Cause of Failure will occur after the mitigation. The valid values of this property are 1 to 5 (lowest to highest probability of occurrence). Click an appropriate column cell to select its value from a drop-down list.
Reduced DET	Reduced detectability measures the likelihood of discovering a possible failure after the mitigation. The valid values of this property are 1 to 5 (highest to lowest detectability). Click an appropriate column cell to select its value from a drop-down list.
Reduced OxD	The product of the Reduced OCC and Reduced DET ratings.
Reduced RPN	A reduced risk priority number is a derived property calculated by using a customizable function. By default, the function includes Reduced SEV, Reduced OCC, and Reduced DET values.

Creating an FMEA Table

To keep your model clean and simple, you should create an FMEA Table in the package that contains FMEA Items that are to be included in the table.

To create an FMEA Table

1. Do one of the following:
   - Right-click the Package in which you want to create an FMEA Table, and select **Create Diagram** from the menu.
   - Select the Package in which you want to create an FMEA Table, and click the **Create Diagram** button on the main toolbar.
2. Click **FMEA Table** under the **Safety and Reliability Analysis** group.
3. If needed, change the name of the newly created FMEA Table.

A new FMEA Table has been created in the selected Package. Now you should add FMEA Items to the table, as described in the next section.

Adding FMEA Items to an FMEA Table

There are two ways to add FMEA Items to an FMEA Table:

- Create new FMEA Items directly in the table.
- Add existing FMEA Items to the table.

To create a new FMEA Item in an FMEA Table

- Do one of the following:
- Click the **Add New** button on the table toolbar.
- Press Insert (Cmd+I on Mac OS).

A row containing a newly created FMEA Item is added at the end of the table. In the model browser, the FMEA Item is placed in the Package containing the related FMEA Table. Now you can define the FMEA Item directly in the table by double-clicking an appropriate cell.

Model structure information
To have a clear model structure, you should create FMEA Items in dedicated Packages.

To add an existing FMEA Item to an FMEA Table

1. Do one of the following:
   - Click the **Add Existing** button on the table toolbar.
   - Press Ctrl+Insert (Cmd+E on Mac OS).
2. In the open dialog, select the FMEA Item you want to add to the table. To select multiple elements, click Multiple Selection, and add the desired FMEA Items to the **Selected elements** area on the right side of the dialog.
3. Click **OK**.

Productivity tip
To make your work quicker, you can add existing FMEA Items to an FMEA Table by dragging them directly to the table. Simply select one or more FMEA Items in the model browser and drag them to an FMEA Table. New rows for the added elements are created automatically.

Selected FMEA Items are added to the FMEA Table as new rows. You can change the properties of the added elements directly in the table by double-clicking an appropriate cell.

Related pages

- Reliability analysis using FMEA
  - Cloning FMEA Table rows