Infor EAM RCM

Contents

Introduction

Reliability Centered Maintenance (RCM) in Infor EAM lets you define either a Risk Assessment or a Risk Analysis for a location, a system, a position or an asset. During a Risk Assessment you define functions, functional failures and the consequences of these failures. A Risk Assessment is typically performed on locations and equipment on higher levels in the equipment hierarchy, such as a storage location or a production line. A Risk Analysis is similar to a Risk Assessment but also includes definition of failure modes. Risk Analysis is more detailed research of the equipment risk and therefore is mostly done on equipment on lower levels in the equipment hierarchy.

RCM Setup

RCM Setup mainly consists of the definition of a RCM Project and an associated Risk Matrix.

System Codes screen

You can define new RCM Projects using the **System Codes** screen. Use Entity **STPR** (RCM Project) under **Codes**:

1 **User Code**—RCM Project Code. Maximum of eight characters.

2 **System Code**—* is the only option here.

3 **Description**—Project description.

4 **Default**—The Risk Matrix associated to the default project will be used for all equipment and locations, unless you select a **RCM Project** for the Organization of that equipment or location.

Organization screen

The **Organizations** screen has the following important attribute related to the RCM setup:

1 **RCM Project**—Select the project you want to use for equipment and locations attached to this Organization. If you leave this field blank, the system will use the default RCM Project as it is defined on the System Codes screen.

Risk Matrix Setup screen

Define your RCM risk matrix by setting up risk levels, probabilities, consequence categories, and consequences for the consequence categories. You should create a risk matrix for each **RCM Project** that you have defined. The **Risk Matrix Setup** screen has the following important attributes:

1 **Code**—Unique code for the record.

2 **Description**—Description for the record.

3 **RCM Project**—Select the project for which you are entering the risk matrix.

4   **Type**—There are three options:

    a   **Consequence Category**-The record describes a consequence category. Examples of consequence categories are Safety, Environment, Company Image, Profitability, etc.

    b   **Probability**-The record describes the probability that a failure will occur. Examples of probabilities are Less than a year, 1 to 5 years, 10 to 20 years, More than 20 years, etc.

    c   **Risk Level**-The record describes the risk level that will be assigned to the equipment or location after the Risk Assessment or Analysis is completed. Examples of risk levels are Desirable, Acceptable, Undesirable, Unacceptable, Catastrophic, etc.

5   **Rating/Threshold—**Risk Levels and Probabilities are assigned a **Rating/Threshold**. The Risk Level determined for equipment or locations is based on this value. The system will compare the Rating/Threshold with the Risk Priority Number of the equipment and assign the Risk Level based on that comparison. Higher numbers represent the less desirable Risk Levels. The Risk Priority Number itself is based on the Probability and the selected Consequence of any of the identified functional failures or failure modes, i.e. Probability Rating times Consequence Severity. For the probability 1 to 5 years you would typically pick a higher **Rating/Threshold** than for the 10 to 20 years probability. For both Probabilities and Risk Levels the most desirable entry is assigned the lowest possible value 1 (one).
NOTE: Consequence Categories cannot be assigned a value here. Consequences will get a value assigned on the **Consequences** tab of this screen.

6   **Color—**Assign a color to entries in your matrix. Green would be a logical choice for more desirable Probabilities and Risk, and red would be used for the other side of the spectrum. Only colors assigned to Risk Levels are currently used on the Risk Matrix report.

7   **Icon—**Assign an icon to entries in your matrix. Icons will be displayed on the RCM tab of the equipment and location screens.

8   **Icon Path—**Rather than use the pre-delivered icons, you can use your own icons if you select 'Other' in the **Icon** field. Icons must start with http:// or https:// or // or \\. Icons should be 16*16 pixels with preferred GIF, JPEG or PNG format and requiring that file type extension. If the image is more than 16*16 pixels, EAM will show the top right corner of the image.

Risk Matrix Setup screen Consequences tab

For Consequence Categories defined on the **Risk Matrix Setup** screen you can define Consequences on this tab. The **Consequences** tab has the following important attributes:

1   **Code**—Unique code for the Consequence.

2   **Description**—Description for the Consequence. Examples of consequences for the consequence category Safety are No Incidents, Incident with absence, Injuries, etc. Examples for Environment could be No Effect, Minor spill, Major pollution, etc.

3   **Severity—**A higher **Severity** represents the less desirable situation. So for a consequence like injury or pollution you would typically pick a higher number than for a negligible consequence. The most desirable consequence is assigned the lowest possible value 1 (one).

4   **Icon—**See above.

5 Icon Path—See above.

You can define Consequences for Probabilities and Risk Levels, but these will not be used by any of the RCM functions in Infor EAM. We strongly recommend not entering Consequences other than for Consequence Categories.

Changing the Consequence **Severity** or the **Rating/Threshold** of a Probability or Risk Level is allowed, but at this time does not trickle down to the equipment and locations that reference these on their Risk Assessment or Analysis. Therefore, after making changes to the Risk Matrix Setup it is strongly recommended to individually verify the impact of these changes on all equipment and locations using that matrix. You verify this on the **RCM** tab. This is also applicable for adding and deleting Consequence Categories and Consequences. None of these are automatically applied to the existing Risk Assessment or Analysis. Manual verification of the impact on individual equipment and locations is strongly recommended.

Risk Assessment or Analysis

You can perform a Risk Assessment or Analysis on all equipment and locations. The **Assets, Positions, Systems and Locations** screen in Infor EAM can be used for that purpose.

Assets, Positions, Systems, and Locations screen

The following important attributes relate to the RCM Risk Assessment or Analysis:

1 **RCM Level**—Select **Risk Assessment** or **Risk Analysis**. The assessment is less detailed and is typically performed on equipment and locations that can be found on the higher nodes in the equipment hierarchy. Assessments are often performed on locations or production lines and then represent all equipment (children) part of that location or production line. An analysis is often performed on equipment lower in the hierarchy and often only after an assessment on higher level has indicated higher Risk Levels.
It is possible to change between Risk Assessment and Risk Analysis, but it depends on the data already present on the RCM tab.

   a   If you entered no data yet, the change is obviously no problem.

   b   If you have done a Risk Assessment already and want to change that to a Risk Analysis, the system will let you do that as well. Make sure that after the change you go to the **RCM** tab to refresh the **Risk Level** and **Risk Priority Number** and to add the necessary Failure Modes. The **RCM** tab will still show the same Functions, Functional Failures, and Consequences. Note that the Functional Failures still show the previously selected **Probability** as well. The system will only clear these if you update the Functional Failure. Regardless, the system will not use the **Probability** defined on the Functional Failures when determining the **Risk Priority Number** and **Risk Level** in case of a Risk Analysis. It will use the **Probability** defined on the Failure Modes instead.

   c   Once you have done a Risk Analysis you cannot return to a Risk Assessment until you delete all the Failure Modes from the **RCM** tab first.

2 **Risk Level**—Determined by the assessment or analysis performed on the **RCM** tab. This is a protected field.

3 **Risk Priority Number**—Determined by the assessment or analysis performed on the **RCM** tab. This is a protected field.

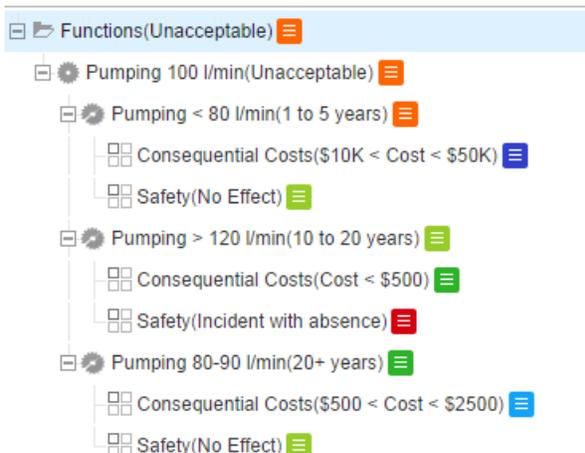# Assets, Positions, Systems, and Locations screen – RCM tab

On the **RCM** tab of the equipment and location screens, you can perform the Risk Assessment or Analysis. The tab shows the assessment or analysis in hierarchical form. You build the tree top-down as follows:

1   **Add Function–**Add new Functions, or edit existing ones, by clicking the **Add/Edit Functions** button. Once the **Functions** screen is up enter:

   a   **Description**—Enter the description of the Function.

   b   **Sequence**— Use the **Sequence** to order the Functions in the tree. Otherwise they will be listed alphabetically.

   c   **Note**—You can enter some background information regarding the Function.

   d   **RCM Project**—References the RCM Project and indirectly the Risk Matrix in use for the assessment or analysis.

2   **Add Functional Failure**–After you have added one or more Functions you can add new Functional Failures, or edit existing ones, by clicking the **Add/Edit Functional Failures** button. Once the **Functional Failures** screen is up enter:

   a   **Function**—Every Functional Failure is always attached to a Function. You can pick any Function defined for the equipment.

   b   **Description**—Enter the description of the failure.

   c   **Probability**—Enter the probability of the failure. This field is only available on this screen if this concerns a Risk Assessment, which is determined by the selected **RCM Level** on the equipment screens.

   d   **Sequence**— Use the **Sequence** to order the Functional Failures in the tree. Otherwise they will be listed alphabetically.

   e   **Note**—You can enter some background information regarding the failure.

3   **Add Functional Failure Consequence**–After you have added one or more Functional Failures you can add or edit Consequences by clicking the **Add/Edit Functional Failure Consequences** button. Once the **Functional Failure Consequences** screen is up enter:

   a   **Functional Failure**—Consequences are defined per Functional Failure. You can pick any Functional Failure defined for the equipment.

   b   **Function**—The system will display the Function associated to the selected Functional Failure.

   c   **Consequence Category**—Automatically populated by the system.

   d   **Consequence**—Enter a Consequence for the Consequence Category. There is a lookup available (F9).

   e   **Sequence**— Use the **Sequence** to order the Consequence Categories in the tree. Otherwise they will be listed alphabetically.

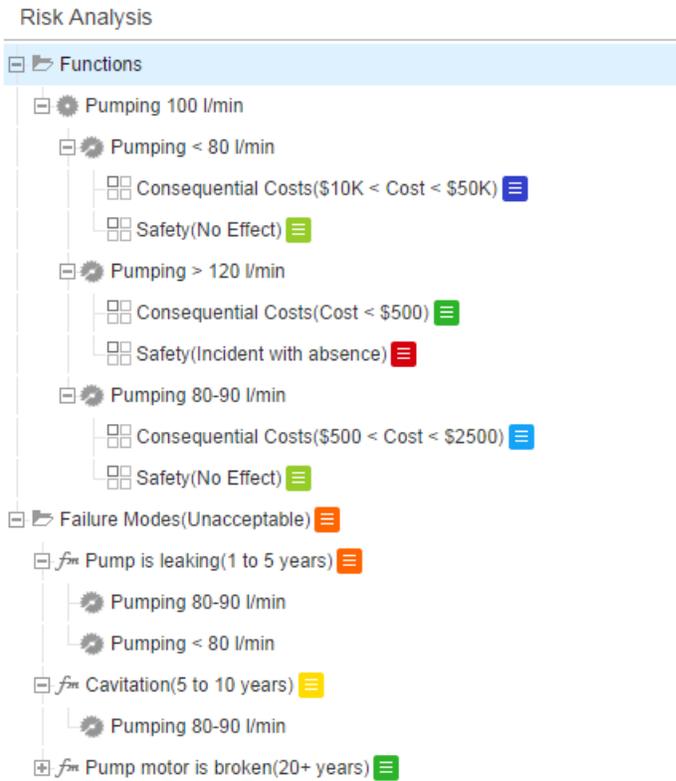   f   **Note**—You can enter some background information regarding the consequence.

4   **Add Failure Modes–**Add new Failure Modes, or edit existing ones, by clicking the **Add/Edit Failure Modes** button. You can only add Failure Modes if you have selected to perform a Risk Analysis (**RCM Level** on the equipment screens). Once the **Failure Modes** screen is up enter:

   a   **Description**—Enter the description of the Failure Mode.

   b   **Probability**—Enter the probability of the Failure Mode.

   c   **Sequence**— Use the **Sequence** to order the Failure Modes in the tree. Otherwise they will be listed alphabetically.

   d   **Note**—You can enter some background information regarding the Failure Mode.

   e   **RCM Project**—References the RCM Project and indirectly the Risk Matrix in use for the analysis.

5   **Add Functional Failures to Failure Modes**–This is the last step in the analysis where you can associate one or more Functional Failures to any of your defined Failure Modes by clicking the **Add/Edit Functional Failures for Failure Modes** button. Once the **Functional Failures for Failure Modes** screen is open enter:

   a   **Failure Mode**—Select a Failure Mode. You can pick any Failure Mode defined for the equipment.

   b   **Functional Failure**—Select the Functional Failure. You can pick any Functional Failure defined for the equipment.

   c   **Sequence**— Use the **Sequence** to order the Functional Failures in the tree. Otherwise they will be listed alphabetically.

   d   **Note**—You can enter some background information regarding the relationship between Functional Failure and Failure Mode.

Once your tree is complete use the **Expand All** and **Collapse All** buttons to quickly expand and collapse the tree. Below is an example of a populated tree for an assessment:

Below is an example of a populated tree for an analysis:

Risk Analysis

- Functions
  - Pumping 100 l/min
    - Pumping < 80 l/min
      - Consequential Costs($10K < Cost < $50K)
      - Safety(No Effect)
    - Pumping > 120 l/min
      - Consequential Costs(Cost < $500)
      - Safety(Incident with absence)
    - Pumping 80-90 l/min
      - Consequential Costs($500 < Cost < $2500)
      - Safety(No Effect)
- Failure Modes(Unacceptable)
  - Pump is leaking(1 to 5 years)
    - Pumping 80-90 l/min
    - Pumping < 80 l/min
  - Cavitation(5 to 10 years)
    - Pumping 80-90 l/min
  - Pump motor is broken(20+ years)

Reports

The following RCM reports are available:

Risk Matrix

The **Risk Matrix** report shows the setup of the Risk Matrix. Important report parameters:

1. **Organization**—Leave blank for all. Supports wildcards if "Include Children" is not checked.

2. **RCM Project**—Enter the RCM Project.

3. **Consequence Category**—Enter the Consequence Category.

4. **Probability**—You can leave this field blank and all Probabilities of the project will be included. Alternatively you can select one or more Probabilities if you are interested in specific values.

5. **Consequence**—Similar to the Probability, but for the Consequences of the selected Consequence Category.

6. **Equipment**— Leave blank for all. Supports wildcards if "Include Children" is not checked.

7. **Include Children**—The report will include the children of the select Equipment. For example if you report on a production line all assessments and analysis from children will be included.

8. **Show Equipment**— If selected, each cell of the matrix will display the number of functional failures with that Probability and Consequence for the equipment included in the selection.

9. **Show Failure Modes**— If selected, each cell of the matrix will display the number of Failure Modes with that Probability and Consequence for the equipment included in the selection. Consequence here is derived from the Functional Failure attached to the Failure Mode. Note that there can be multiple Functional Failures per Failure Mode.

10. **Show Legend**—Displays Risk Levels and associated Thresholds, if selected.

Consequence Category	MVCONCOST [Consequential Costs]					

		20+ years	10 to 20 years	5 to 10 years	1 to 5 years	0 to 1 year
Cost > $50K	Equipment Failure Modes					
$10K < Cost < $50K	Equipment Failure Modes	1			1	
$2500 < Cost < $10K	Equipment Failure Modes					
$500 < Cost < $2500	Equipment Failure Modes			1	1	
Cost < $500	Equipment Failure Modes					

RCM Risk Levels

The **RCM Risk Levels** report shows all equipment that has an associated Risk Assessment or Risk Analysis. Important report parameters:

1   **Organization**—Leave blank for all. Supports wildcards if "Include Children" is not checked.

2   **RCM Project**—Enter the RCM Project.

3   **Equipment**—Leave blank for all. Supports wildcards if "Include Children" is not checked.

4   **Risk Level**—Leave blank for all. If you select a value the system will only include equipment with the same Risk Level or higher. Higher here means the **Rating/Threshold** of the included Risk Levels is the same or higher than that of the selected Risk Level.

5   **RCM Level**—Set to include equipment with a Risk Assessments, with a Risk Analysis, or with both.

6   **Include Children**—The report will include the children of the select Equipment. For example if you report on a production line all assessments and analysis from children will be included.

7   **Include Functions**—The report will list the Functions of the included equipment.

8   **Include Failure Modes**—The report will list the Failure Modes of the included equipment.

RCM Equipment at Risk

The **RCM Equipment at Risk** report shows all equipment that has an associated Risk Assessment or Risk Analysis with a certain Risk Level and that has no PM Schedule or Maintenance Pattern attached or, if attached, it is not activated. Based on the Risk Assessment / Analysis it may be worth to consider doing preventive work on the listed equipment. Important report parameters:

1   **Organization**—Leave blank for all. Supports wildcards.

2   **RCM Project**—Enter the RCM Project.

3   **Equipment**— Leave blank for all. Supports wildcards.

4   **Minimum Risk Level**— Leave blank for all. If you select a value the system will only include equipment with the same Risk Level or higher. Higher here means the **Rating/Threshold** of the included Risk Levels is the same or higher than that of the selected Risk Level.

RCM Potential Yearly Savings

The **RCM Potential Yearly Savings** report shows all equipment that has an associated Risk Assessment or Risk Analysis with a certain Risk Level and that has one or more PM Schedules or Maintenance Patterns attached and activated. Based on the Risk Assessment / Analysis it may be worthwhile to consider not doing any preventive work on the listed equipment. Important report parameters:

1   **Organization**—Leave blank for all. Supports wildcards.

2   **RCM Project**—Enter the RCM Project.

3   **Equipment**—Leave blank for all. Supports wildcards.

4   **Maximum Risk Level**—Leave blank for all. If you select a value the system will only include equipment with the same Risk Level or lower. Lower here means the **Rating/Threshold** of the included Risk Levels is the same or less than that of the selected Risk Level.

5   **Years Included in Avg.**—The average cost calculation of this report uses this parameter to determine how far to go back in history for the cost calculation.